

PICTORIAL HANDBOOK
INDIAN LAND SNAILS

**S. C. MITRA
A. DEY
RAMAKRISHNA**



ZOOLOGICAL SURVEY OF INDIA



Photo courtesy : M. Aravind



PICTORIAL HANDBOOK
INDIAN LAND SNAILS

(Slected Species)

S. C. MITRA

A. DEY

RAMAKRISHNA

Zoological Survey of India, M-Block, New Alipore, Kolkata-700 053

Edited by the Director, Zoological Survey of India, Kolkata



Zoological Survey of India
Kolkata

CITATION

Mitra, S. C., Dey, A. and Ramakrishna. 2004. *Pictorial Handbook—Indian Land Snails* (Selected Species) : 1-344 (Published—Director, Zool. Surv. India, Kolkata)

Published : January, 2005

ISBN 81-8171-050-9

© Govt. of India, 2005

ALL RIGHTS RESERVED

- No part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise without the prior permission of the publisher.
- This book is sold subject to the condition that it shall not, by way of trade, be lent, re-sold hired out or otherwise disposed of without the publisher's consent, in any form of binding or cover other than that in which it is published.
- The correct price of this publication is the price printed on this page. Any revised price indicated by a rubber stamp or by a sticker or by any other means is incorrect and should be unacceptable.

PRICE

India Rs. 1100.00

Foreign \$ 75; £ 60

Published at the Publication Division by the Director, Zoological Survey of India, 234/4, AJC Bose Road, 2nd MSO Building, (13th Floor), Nizam Palace, Kolkata-700 020 and printed at Calcutta Repro Graphics, Kolkata-700 006.

CONTENTS

1. Introduction	1
2. Ecology/Habitat	2
3. The Shell	7
4. Adaptation to terrestrial habitat	13
5. Feeding	17
6. Reproduction	21
7. Aestivation	21
8. Arboreal habits	22
9. Snails and Man	22
10. Snail hazards	23
11. Diversity and Endemicity	24
12. Collection	30
13. Fixation and Preservation	31
14. Classification	32
15. Systematic accounts	38
16. Bibliography	327
17. Glossary	334
18. Index	338

ACKNOWLEDGEMENT

We are thankful to Dr. J.R.B. Alfred, Director, Zoological Survey of India, for the facilities to carry out the work and to make use of National Zoological Collections.

We are indebted to Dr. N.V. Subba Rao, former Joint Director and in-charge, Malacology Division, Zoological Survey of India, the Chief architect of Indian Malacology in post independence era, but for whose inspirations and guidance the study would have not been possible. Our thanks are also due to Shri K.V. Surya Rao, another former Deputy Director and Officer-in-charge, Malacology Division, for his encouragement and suggestions.

We sincerely acknowledge the helps and co-operations we received from all our sectional colleagues in various ways during the course of our work.

Sincere thanks are also due to Shri A.K. Mukherjee, Jr. Zool. Asstt. and Shri B. K. Halder, Sr. Photographer, for the photographs of shells, to Shri S.K. Majumder, Senior Artist for the pains-taking drawings of the text-figures and to Shri Rati Ram, Publication Production Officer for prompt processing and initiatives for betterment of the production.

Finally we are grateful to Dr. Fred Naggs, Biodiversity & Conservation Officer, Molluscan Research group, The Natural History Museum, London, U.K., who inspite of his all preoccupations and international commitments found time to kindly go through the manuscript and offer his valuable suggestions.

INTRODUCTION

What are molluscs?

Soft-bodied molluscs (derived from the Greek term Mollos) are one of the most ancient groups of animals on earth. They date back to more than 500 millions years to the oldest Cambrian deposits. They are also among the most successful groups, second only to the insects in numerical terms and they have colonized a wide range of habitats on land, freshwater, the seas, and some have even adapted to the arboreal habitats.

Land molluscs

Land molluscs belong to the Class Gastropoda and are characterised by a head, fleshy foot and paired tentacles.

Fossil records of land molluscs extend back to the Carboniferous, 350 million years ago.

Among molluscs, the marine forms, mainly because of their attractive colouration, myriad structural diversity and commercial value have always received more attentions than land snails. Nevertheless, starting from the days of Roman civilisation, land molluscs also have occupied an important place in the life of man.

Be it for their innocuous look and nature, be it for their slow and patient crawl or for their unique shell, land molluscs have all along captured the fascination of man. In a bush or a kitchen garden or on a damp wall of house a stray molluscan shell has seldom failed to draw the attention of a child or an adult alike.

Studies on Indian land molluscs and a run up to the present work

Woodward (1856) published the first ever review of Indian land molluscs. Later workers who contributed to the taxonomy of Indian land molluscs in the preindependence era, included Annandale & Rao (1933a,b), Benson (1832, 1836, 1851, 1852, 1854, 1857, 1859a,b,c,d, 1860a,b, 1861a,b, 1863a,b,c, 1864), Beddome (1875, 1891, 1906), Blanford (1862, 1865, 1870, 1880, 1899), Blanford and Blanford (1860,1861), Godwin-Austen (1876, 1879, 1882-1920, 1893, 1895, 1914-1918, 1917), Gude (1906, 1915), Hanley and Theobald (1876), Hutton (1834), Nevill (1878,1881), Pilsbry (1909-10), Preston (1908, 1915), Rao (1924), Theobald (1860, 1875, 1876,1878) and Tryon (1869).

A bibliography of their work is included under references at the end of this volume. While most of these early works were isolated reports and descriptions of new taxa, the studies on Indian molluscs culminated and took a final shape in the form of the "Fauna of British India" mollusca volumes; Blanford and Godwin-Austen (1908), Gude

(1914, 1921) and also Godwin-Austen's "Land and freshwater molluscs of India's volumes. But even the most recent of these publications, dates back to 1920-21. During the intervening decades (a span of more than eighty years) international studies on the taxonomy and classification of land molluscs have resulted in significant changes. Moreover, the publications cited above were specialist works aimed at malacologists rather than a more general audience of naturalists.

More recent systematic works on the Indian land molluscs viz. Dey *et. al* (1985, 2003), Dey and Mitra (2000), Mitra and Dey (1990, 1992), Mookherjee *et. al.* (2000), Rajagopal & Subba Rao(1972), Ramakrishna and Mitra (2002), Ray (1951), Subba Rao & Mitra (1979, 1991), Subba Rao *et. al.* (1981, 1989a,b, 1995), Surya Rao & Mitra (1997, in Press), Surya Rao *et.al* (1997,in Press a, b, c), Thakur *et. al.* (1992), on the other hand are all fragmentary reports dealing with land molluscs of a particular area.

Subba Rao' (1989) Handbook on freshwater molluscs of India admirably serves the purpose of presenting the entire fauna of freshwater moluscs in a single volume. However there is nothing comparable in case of land molluscs, because the literature on land snails is fragmentary and scattered in numerous journals, many of which are rare and available to few. The present work is but a step towards addressing the situation.

Different aspects, such as habit, habitats, feeding, reproduction, defense, ecology, distribution and also various roles played by the land molluscs have been discussed in the following chapters. An effort has also been made to utilise the latest and up-to-date information on classification and nomenclature of land snails. The work is by no means a complete guide to Indian land snails as a whole (exceeding 1200 species), but the basic objective is to enable a person/collector to identify a shell at least up to the genus level. Since it is very difficult to treat all the species of Indian land snails in the Handbook, we have selected approximately 150 common species covering all the genera. Selection of the common species to be included has been made on the following criteria. i) Our own field experience, knowledge about commonly encountered species ii) Information from the literature and also from the material present in the National Zoological Collections, iii) the material which we receive for identification from various sources, from different regions of the country. The availability of material also was an important factor in selection of the species. The status of different species, such as, abundant, common, rare has also been fixed following the same considerations.

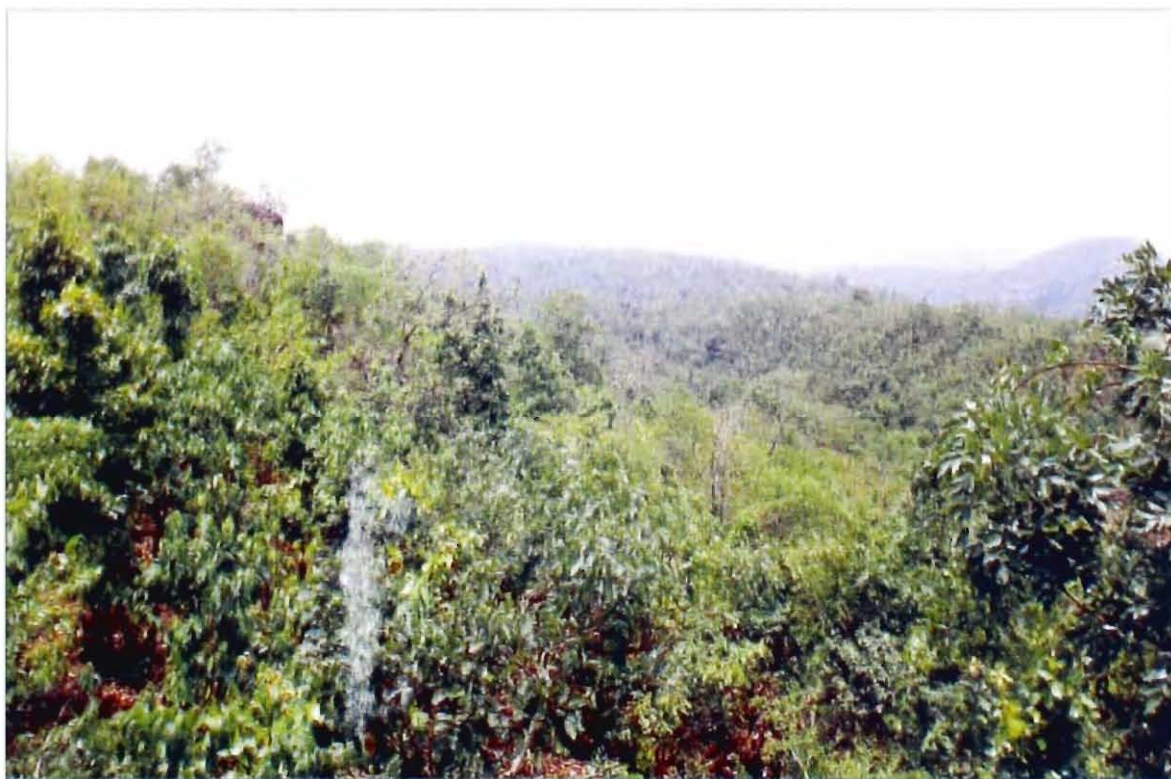
ECOLOGY/HABITAT

Land molluscs are mostly ground dwellers and can be found in habitat ranging from parks, gardens, bushes, and vegetation patches to natural forests. Unlike aquatic molluscs, which always remain surrounded by water, landforms are often restricted

PLATE - I



A



B

Tropical rain forests of north-eastern India, home of nearly 1/3rd of total Indian land snails.
A. Tamenlong, Manipur; B. Lungsen, Lunglei, Mizoram. Courtesy : T. P Bhattacharya

PLATE - II



A. Tropical rain forests of north-eastern India, Sairep, Lunglei, Mizoram



B. Typical landscape of low hill ranges of Manguraha, West Champaran, Bihar, inhabited by species like *Pterocyclus rupestris*, *Cryptozona ligulata*. Courtesy : T. P. Bhattacharya

PLATE - III



A. High altitude forest of Bir, Dharmasala, Himachal Pradesh, haunting ground for Himalayan genera like *Bensonies*, *Euaustenia*, *Syama*, etc.



B. Sandy stretches on river bank, Andhra Pradesh, abounding in shells of *Zootecus insularis*

PLATE - IV



A



B

Eastern Ghat inhabited by many ariophantids including the endemic species *A. kadapaensis*.
A. Addatigala, East Godavari, Andhra Pradesh; B. Koraturu, West Godavari, Andhra Pradesh.
Courtsey : T. P. Bhattacharya

to habitats that offer sufficiently shady and moist situation for their survival. Thus the primary habitat for them are damp shady corners among vegetation, under fallen leaves, litters, under stones, wooden logs, and in crevices. Some species actively crawl on damp walls, e.g. (*Opeas gracile*, *Macrochlamys* spp.), with algal growth, particularly during rainy season. Some inhabit the humid tracts of sub-Himalayan mountain ranges. A few prefer salty environment and live in bushy patches within a few hundred meters from seacoast (e.g. *Trachia vittata*), others have adapted to the branches and leaves or inside bark of tree (*Succinea* spp. *Rhachis* spp.). Some are subterranean staying at subsurface level of soil (*Ferussacia* sp., *Cecilioides* sp.). Yet others are specially adapted to arid and semi desert situations (*Pupoides* sp., *Zootecus* spp. and some Buliminids). Lacking the protective shell cover, slugs may be more choosy, often taking shelter inside the petioles or folds of banana leaves etc. Young ones are sometimes found attached to the underside of leaves of herbs. Usually slugs avoid sunlight so they are more active during night, or very early morning.

THE SHELL

Land molluscs belong to the Class Gastropoda (Stomach footed), most of them are snails possessing a coiled calcareous shell, which encloses the body and is carried above a long broad foot. Shells constitute the most important morphological character of molluscs for identification and exhibit a high degree of variation in shape, size, sculpture, texture and so on. In size, the shell ranges between 1-2mm (*Acmella*, *Georissa*, *Diplommatina*, *Pupisoma*, *Pupilla*, *Pyramidula* etc.) to 80-100 mm (*Achatina*, *Hemiplecta*, *Prosopoeas*). Prosobranch shells are operculate, possessing an operculum which closes the shell aperture, whereas pulmonates lack an operculum.

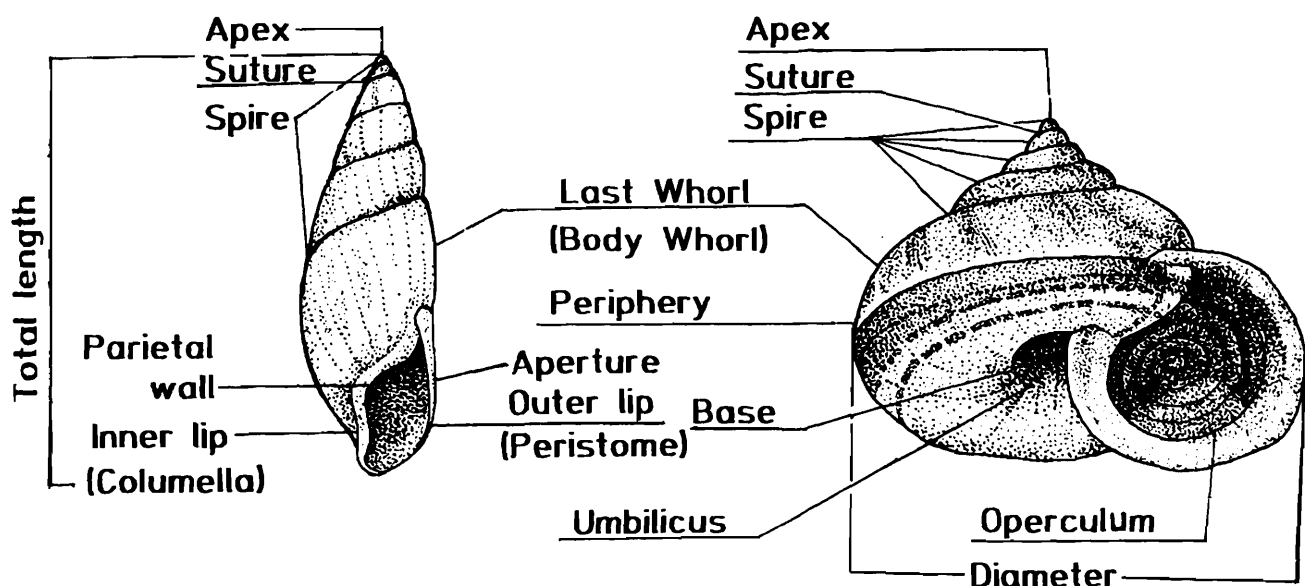


Fig. 1. Showing the different parts of shell

Depending upon the side on which the aperture opens, a shell is called dextral or sinistral (fig. 2 a & b). When a shell is held in hand with the aperture facing the observer and the apex uppermost, if the aperture opens on the left side, the shell is a sinistral one; if it opens on the right the shell is then a dextral one. Dextral shells are more common, sinistral shells are seen in members of some genera such as *Ariophanta*, *Amphidromus*, *Phaedusa*, *Plectopylis*. Shell may be thick and strong, as in *Cyclophorus*, *Hemiplecta*, *Achatina* or may be thin and fragile as in *Cryptaustenia*, *Succinea*, *Austenia*, *Indrella*.

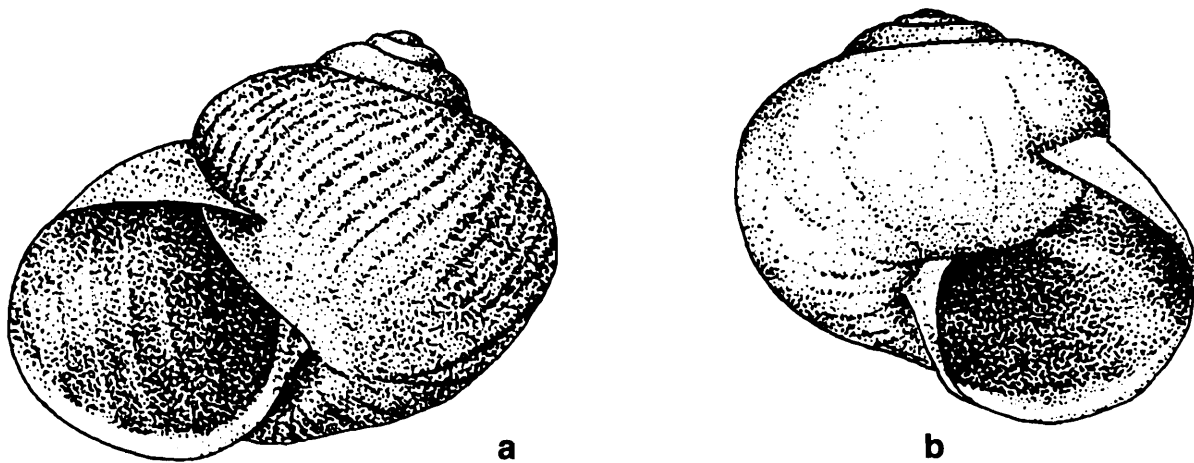


Fig. 2. Sinistral and Dextral Shell : a. Sinistral Shell of *Ariophanta bajadera*; b. Dextral shell of *Cryptozona semirugata*

The following shell characters are important for identification : i) Shape of shell, ii) umbilicus, open or closed, iii) sculpture, iv) form of aperture, v) number of whorls and vi) presence or absence of operculum. The following type of shells are usually seen in Indian land molluscs; pupiform (*Pupina*, *Gulella*, *Zootecus*, Figs. 3d, 57, 58); elongate-ovate (*Ena*, *Rhachis*, *Glessula*, Figs. 3c, 9j); elongate-turreted (*Prosopeas*, *Allopeas*, Figs. 3b & 3e); globosely depressed (*Macrochlamys*, *Cryptaustenia*, 207, 218) : depressed (*Videna*, *Sivella*, *Planispira*, *Theobaldius*, 280, 3h, 20); globose (*Cryptozona*, *Cyclophorus*, Fig. 2b, C3); conical (*Ganesella*, *Kaliella*, *Sitala* 301, Fig. 49, 273) and ear-shaped, shallow (*Austenia*, Fig. 3f). The form and shape of last whorl is also important, it may be ascending (Fig. 10a) or descending (fig. 13d) near the aperture, it may also be rounded (Figs. 2a & b) or keeled (Fig. 3h) at the periphery.

Form of aperture

Circular (mostly restricted to a single family, Cyclophoridae, Fig. 3a); lunate (most common in land snails, *Macrochlamys*, Fig. 4b); sub-quadrangle (*Videna*, *Sivella*, Fig. 3h); ovate (Subulinidae, Enidae, (Fig. 3b & e). Some of the genera in Cyclophoridae possess a double peristome (Fig. 3a) and some in the Streptaxidae, Pupillidae and Plectopylididae have teeth or lamellae inside the aperture (Figs. 9g, 11c, 14b). A strongly reflected peristome can be seen in Cyclophoridae (Figs. 3a, 4a). The columella

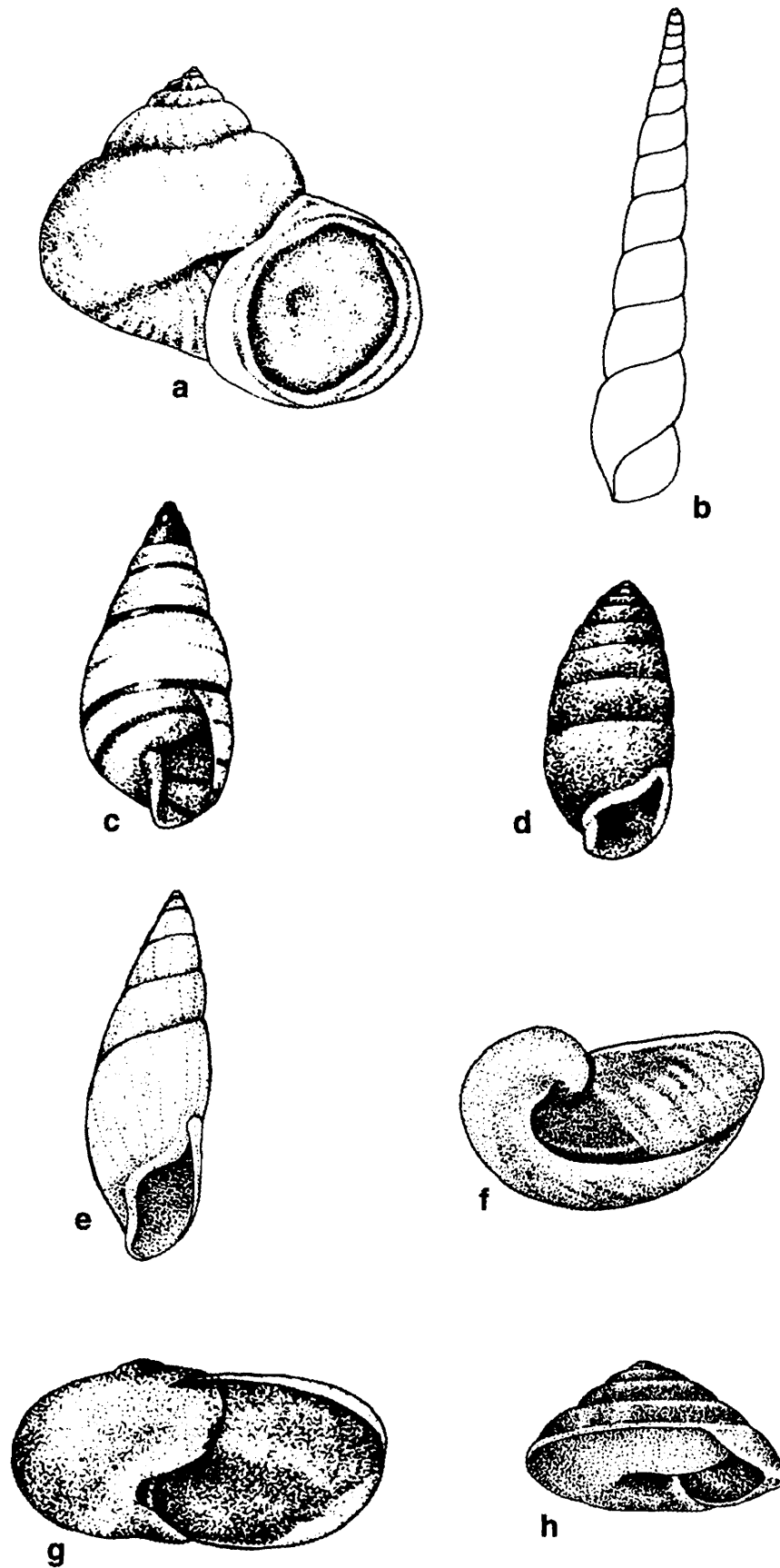


Fig. 3. Shape of shells : a. Strongly reflected peristome of *Cyclophorus*, b. Turreted shell of *Subulina*, c. Spiral bands in *Rhachis bengalensis*, d. *Zootecus insularis*, e. *Prosopeas*, f. shallow ear like shell of *Austenia*, g. depressed shell of *Euaustenia*, h. keeled shell of *Sivella castra*

may be rounded (Fig. 9c) or truncated (Fig. 9j) at the base, sometimes it has an angular process at the umbilicus (Fig. 14a); the lip of aperture is sometimes thickened (Fig. 13c).

Sculpture

While many of the genera (Pupinidae, Helicinidae, and Enidae, Fig. 5e) have smooth and polished shells, the majority of the shells are variously sculptured; the most common sculpture consists of striae, fine or coarse (Figs. 5b, c, d). Radial striae are seen in *Gulella*, *Ariophanta*, *Khasiella* (Figs. 2a, 5d); spiral striae are seen in *Sitala*, *Georissa*, *Cyclophorus*, *Pterocyclus* etc. (Fig. 5a). Some taxa possess decussating sculpture, both radial and spiral together (*Oxytesta*, *Bensonies*, *Cryptozona*, fig. 14c). Examples of imperforate shells with closed umbilicus are found in the (Helicinidae, Subulinidae etc, Figs. 5e, 9j); a widely open umbilicus is seen in the Cyclophoridae,

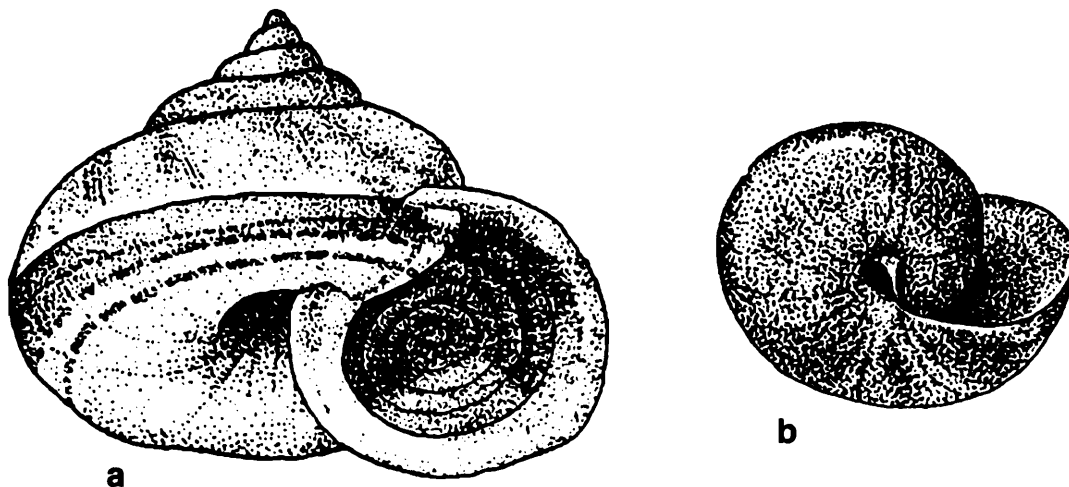


Fig. 4. a. *Cyclophorus*—rounded bodywhorl, reflected peristome, widely open umbilicus, circular aperture, b. *Macrochlamys*—simple peristome, narrowly open umbilicus, lunate aperture.

Corillidae etc. (Figs. 4a, 9d); a narrowly open perforation (Perforate) is present in the shell of Ariophantidae, Helicarionidae etc. (Fig. 4b). Some shells possess fringe of hairs or bristles (Figs. 10e, 13d). Sutures can be shallow and superficial (Fig. 14b) or deep and canalised (Fig. 14d). Coloured bands are seen in shells of *Rhachis*, *Amphidromus*, *Trachia* and some species of *Cryptozona* (Fig. 3c, C47-55).

Some terrestrial gastropod groups possess greatly reduced shell or the shell may be completely absent. Sometimes a rudimentary part of the shell is enclosed inside the body as in *Mariaella* or *Anadenus*. The shell-less forms belong to a highly adaptable and specialized group called slugs. In general, humid situations with low calcium contents encourage slug populations. Lack of shell is a derived character and slugs enjoy a few tactical advantages over the shelled snails, such as being able to access confined shelters denied to snails. The elastic shell-less body can adjust and wriggle through small crevices. They are more often more active and usually cover longer distances shuttling between their feeding place and hiding place.

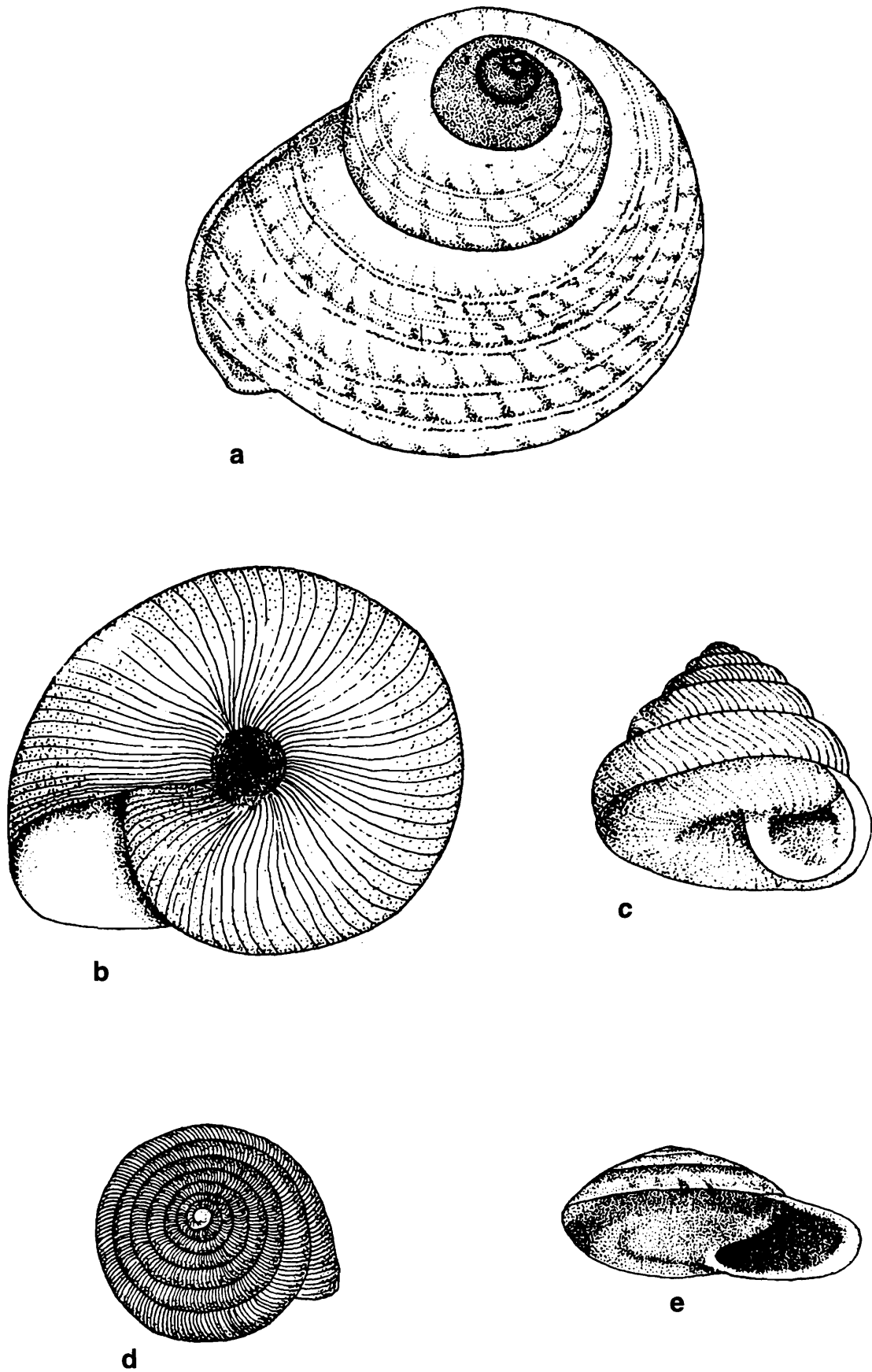


Fig. 5. a. Shell with spiral sculpture; b. finely sculptured shell; c,d. coarsely sculptured shells of *Rahula* and *Khasiella*, e. shell of *Sulfurina* with closed umbilicus.

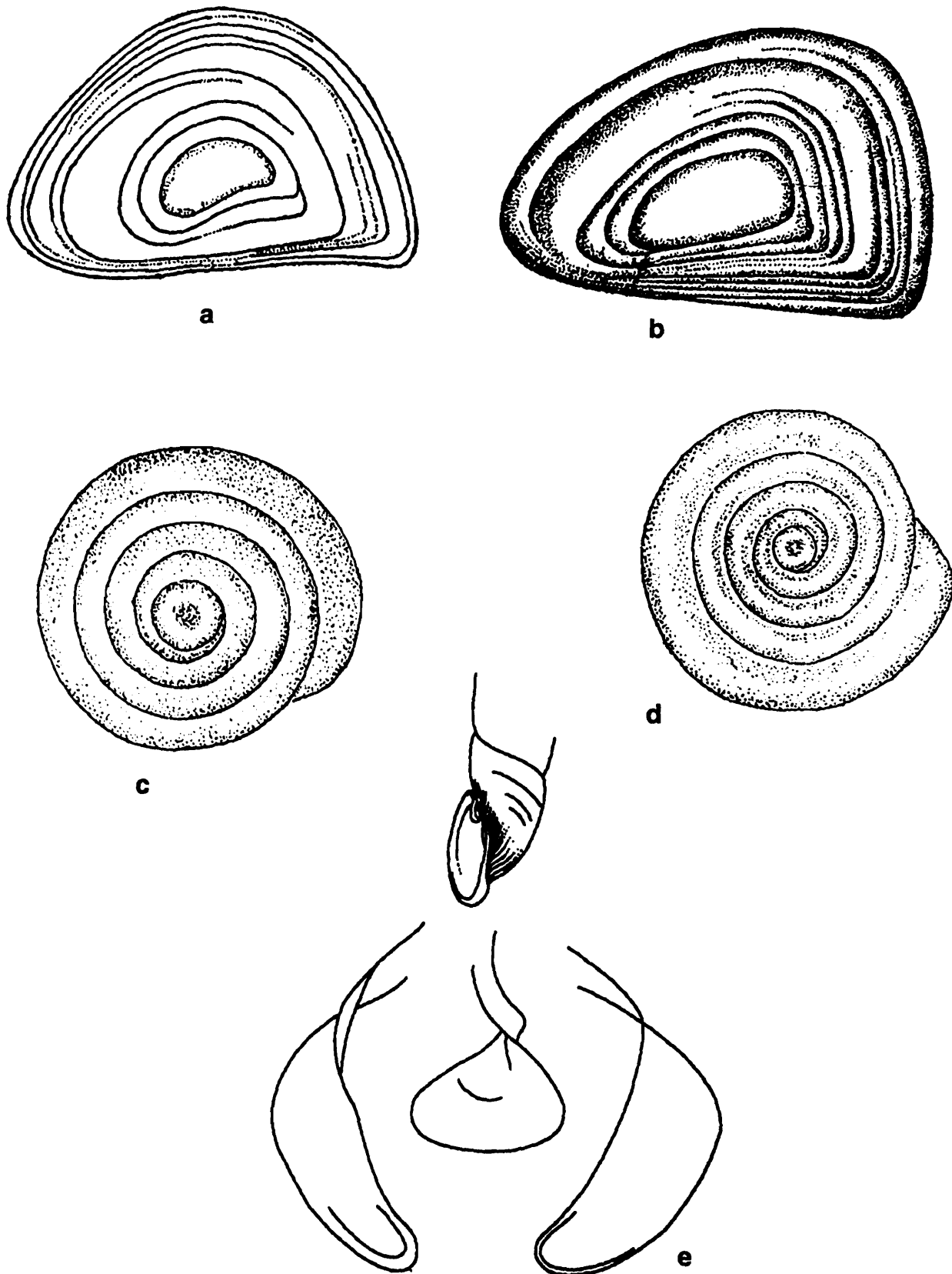


Fig. 6. Operculum of a. *Sulfurina zelebori*; b. *S. behniana*; c. *Leptopoma immaculata*; d. *Cyclophorus leai*; e. Clausilium of *Oospira loosjesiana*.

Apart from the wide variations in the shell characters as discussed above, land molluscs exhibit an interesting and very clear gradation in shell formation so far as enclosing the animal is concerned.

i) Shell containing the animal completely and possessing an operculum (trap-door) which can seal the aperture (*Pearsonia*— Fig. 7a).

ii) Shell encloses the animal completely but lacks an operculum, the aperture remains open (a temporary- paper like ephiphragm may be produced when necessary) (*Macrochlamys* Fig. 7b)

iii) Shell shallow does not enclose the animal completely (*Austenia*, Fig. 7c).

iv) Shell thin and flat, partly internal partly external (*Girasia*, Fig. 7d).

v) A residual plate- like shell, completely internal (*Anadenus* – Fig. 8a).

vi) A shell is totally lacking (*Meghimatium*, Fig. 8b).

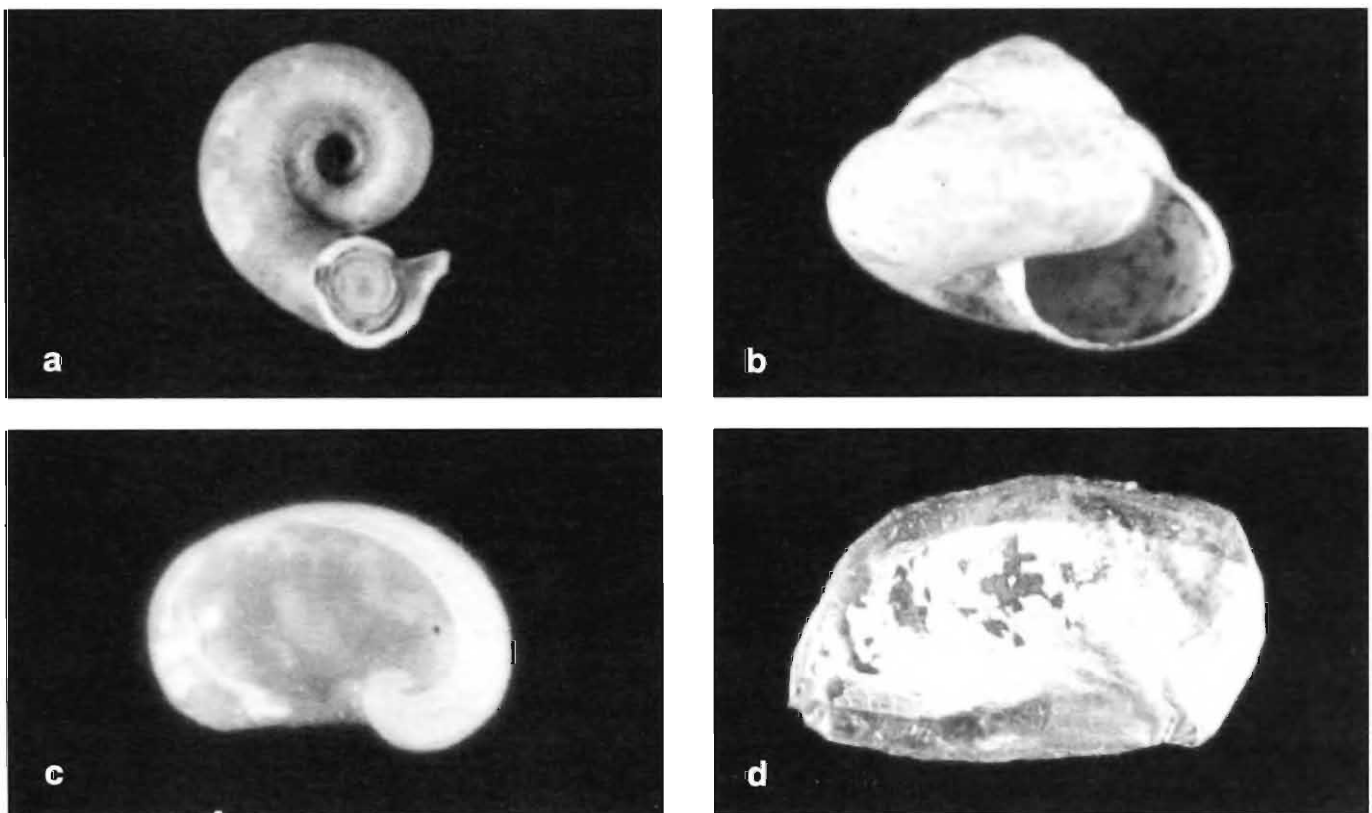


Fig. 7. a. *Pearsonia*—shell with operculum; b. *Macrochlamys*—shell without operculum; c. Ear like shallow shell of *Austenia*; d. Partly internal flat shell of *Girasia*.

ADAPTATION TO TERRESTRIAL HABITAT

Shells in general provide primary protection to land snails. Some snails bear on the top of their foot, a round, thin, usually calcareous lid, the operculum (trap-door) and that is why they are termed operculates. With this they close their apertures

when disturbed or when faced with adverse conditions. The pulmonates, with few exceptions, have lost the operculum. They have often developed more sophisticated device instead. Some of them (the family Clausiliidae) secrete a thin, chitinous “lid” (clausilium plate) analogous to the operculum. These structures are attached with strip of muscle acting as hinge, and can be closed when necessary, fitting tightly among the lamellae or plicae inside the aperture (Fig. 6e). In addition, when resting during unfavourable periods pulmonates may also secrete a thin paper like seal, the epiphragm (Fig. 8d). An epiphragm is semipermeable in nature and creates no hindrance to gaseous exchange with the atmosphere.

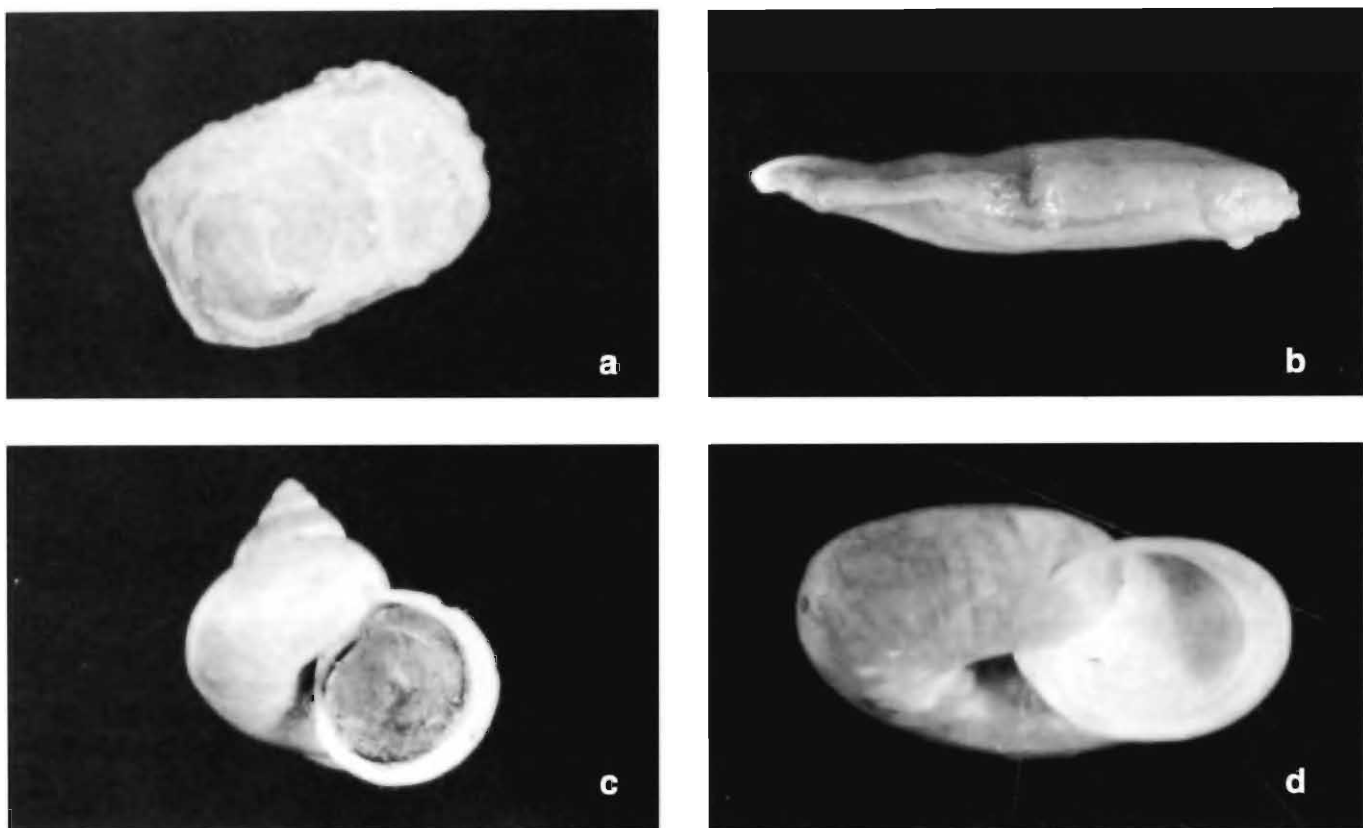


Fig. 8. a. Plate like internal shell of *Anadenus*; b. *Meghimatium*–slug without shell; c. *Leptopoma*–shell with true operculum; d. *Chloritis*–shell with false operculum.

Both operculates and pulmonates or non-operculates originated from sea dwellers that had invaded land. They have developed ways of air breathing, feeding and also of producing offsprings independent of water. Non-operculates are more successful on land because they are more developed for a terrestrial existence. Operculates are most successful in the moist and humid parts of the tropics. Non-operculates are much more widely distributed occupying varied situations from Alaska to Siberia, starting from the driest desert on the earth, on to the high mountain ranges upto 4,500M. Overall, the non-operculates outnumber the operculates by 5:1 ratio. In India it is approximately 2 : 1.

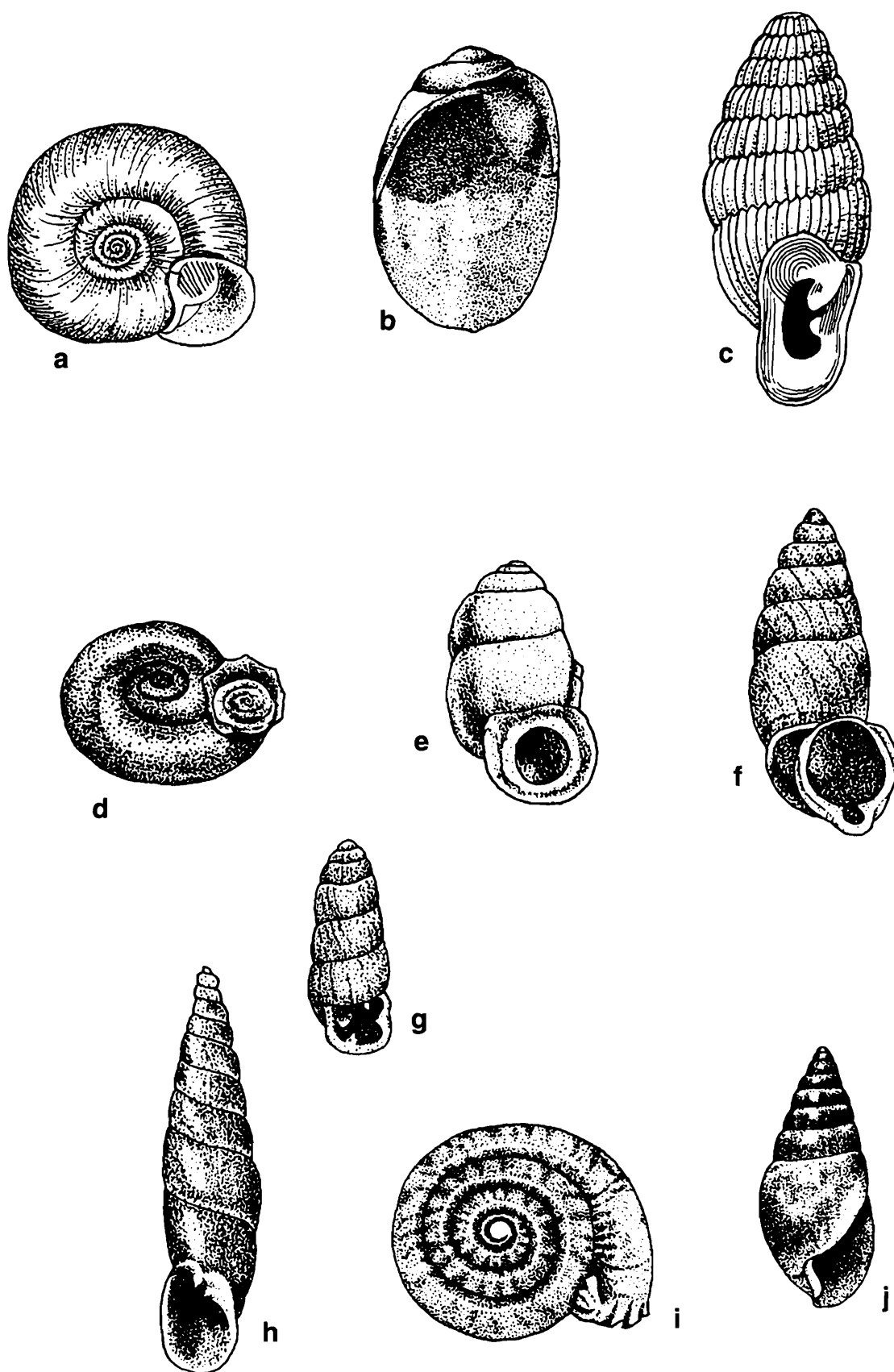


Fig. 9. a. *Plectopylis muspratti*; b. *Lithotis rupicola*; c. *Ennea vara*; d. *Pearsonia hispida*; e. *Raphaulus* sp. f. *Tortulosa* sp. g. *Gulella bicolor*; h. *Oospira corticina nicobarica*; i. *Pterocyclus bilabiatus*, j. *Glessula subtornensis*.

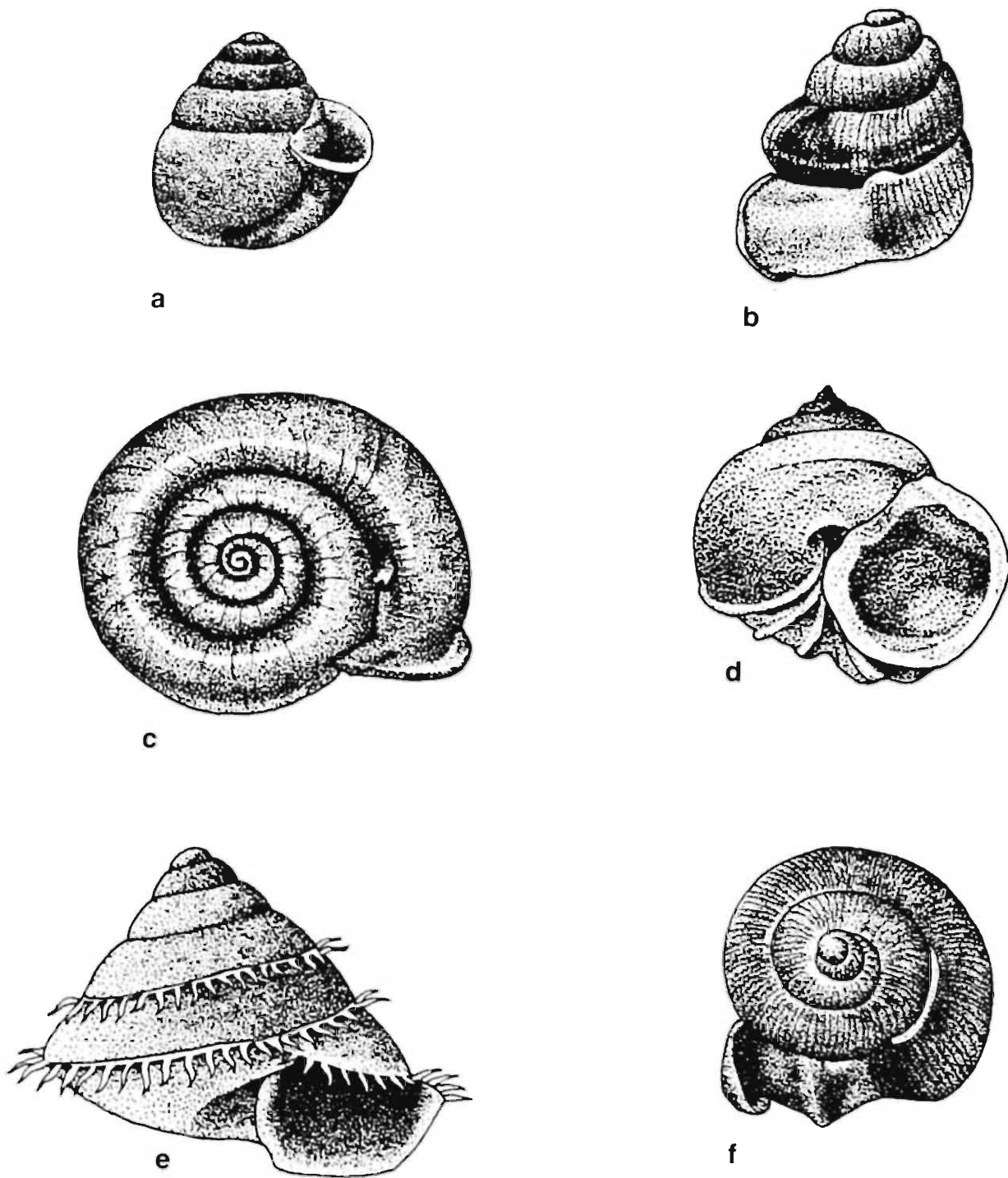


Fig. 10. a. *Boysia* sp.—ascending body whorl; b. *Cycloryx graphicus*—short and closed sutural tube; c. *Pearsonia* sp.—open sutural tube; d. *Cyclophorus foliaceus*—showing a series of varices; e. *Craspedotropis* sp.—rows of hairs; f. *Alycaeus stylifer*—long and closed sutural tube.

Breathing and shell modification

Land snails are air breathers; some oxygen is absorbed along the whole surface of the body. Operculates respire through the membrane of body cavity, which is charged with thin blood vessels. Non-operculates have more improved lungs, but the lung of molluscs is by no means as complex or as developed as in higher animals.

Various modifications in shells are shown by a number of genera like, *Streptaxis* (Figs. 9c, 11c), *Plectopylis*, *Pupilla*, *Gulella* (Fig. 9g). Modification includes microprojections in some cases. Though these serve as barriers for the predatory invertebrates, these may also to associated with prevention of water loss.

A remarkable feature, apertural modification is basically a speciality of the land operculates in the tropics and is considered to be a device to facilitate passage of air for breathing. Among the Indian land operculates at least 12 genera have various modifications including tubes, notches, canals, grooves etc. These specialised structures are located either at the peristome or close to it. There exists a well-marked gradation in these modified structures. Well-formed tubes are present in genera like *Alycaeus* (Fig. 10f), *Dioryx* (35), *Raphaulus*, *Pearsonia* (Figs. 9e, 10c, 45, 47). In the first two genera the tubes are porous and closed at one end and remain adhered to the suture. In the two latter genera the tubes are open at both the ends and vary in position from species to species. *Rhiostoma* and *Pterocylus* (Fig. 9i, 38) have imperfectly built tubes. Canals, grooves and notches are found in *Pupina* (57, 59), *Tortulosa* (Fig. 9f), *Schistoloma* (68). *Diplommatina* (Fig. 22) has a columellar elevation. Obviously, these structures have been developed to maintain contact with outer atmosphere even when the snails remain fully retracted behind their operculum.

The genus *Alycaeus* has a strongly formed trumpet shaped aperture. In *Opisthostoma* (Figs. 11a, 12a-f), the minute genus from the peninsular India, the shell is upturned, the bodywhorl is curved upward and as a result when moving the shell is carried upside down (spire close to the ground).

A remarkable modification in shell character is shown by the genus *Lithotis* (Fig. 9b) to suit its semiaquatic habitat, on vertical surface along hill streams. Besides assuming a limpet shape to facilitate the flow of water with reduced resistance, it has a special feature—the pneumostomal ridge (Patterson, 1973), which channels the water over the shell (both sides of the ridges) and ensures air space for the pneumostome or breathing pore.

FEEDING

Most land snails are generalist feeders, not specialists and subsist on a varied diet. The diet chart includes, dead organic matters (flesh of dead animals including snails), papers, polythene bags among others. Most of them are scavengers, preferring dead or live plant matters, the fungal rich detritus available in bushes and damp soils,

PLATE - V



A. Feeding of *Glessula subtornensis* in a garden of North Kolkata



B. Feeding of *Glessula* sp. from a garden, Canning 24-Paraganas (South), West Bengal

PLATE - VI



A. Feeding of *Macrochlamys indica*. in a Kitchen garden at Baranagar, 24-Paraganas (North), West Bengal



B. Feeding of *Macrochlamys* sp. from a garden, Canning, 24-Paraganas (South), West Bengal

PLATE - VII



A. Deer Park at Bhakrapet, Chittoor, Andhra Pradesh (Aestivating snails of *Cryptozona bistrialis* were collected from tree trunks).



B. *Succinea elegantior* collected from leaves of bushes, Manipur.

brick walls, tree trunks etc. Their behaviour is consistent with the theory that similarity in diet leads to behavioural adaptation to reduce competition. Cain (1977) suggested that even shell shape (depressed or elongate) has a role in appropriate feeding on different surfaces (horizontal or vertical). Scrapping is effected by a series of teeth, arranged in a ribbon like fashion- the radula. Variations exist in the arrangement, shape and structure of the rows of teeth. A small percentage of land molluscs are carnivorous (e.g. Streptaxidae), they have long, slender snouts, which can be pushed inside the aperture of other snails for feeding. In carnivorous snails the teeth are usually elongate. Some are primarily detritivores but facultive carnivores.

REPRODUCTION

Reproductive capacity

Land snails in general have a highly complex reproductive system. Usually land snails are hermaphrodites (except the operculates). Cross-fertilisations are more common but self-fertilisation also takes place. Soft or hard calcareous eggs are laid either individually or in a gelatinous mass. Loose soil with sufficient moisture, inter spaces of stones, bricks, litters, decomposed leaves, humus etc. are the common sites selected for egg laying. Snails living on tree lay eggs in leaf moulds. Some species such as the Giant African snails dig small holes for this purpose. Other species brood internally and produce fully formed snails.

The breeding season for land snails coincides with the rainy season and the number of eggs laid by an individual in a season varies with the species. The number of eggs laid steadily increases with increasing age till it reaches its peak. The number of eggs laid ranges from around 150 per individual in a life span for some species like, *Opeas gracile*, to around 2000 per individual in a life span of 5 years for some highly productive species like the Giant African snail. Some of the common flat slugs such as *Laevicaulis alte* lay eggs in a string and total number of eggs produced by an individual slug during the whole life span is around 800, as seen under laboratory conditions (Subba Rao *et. al.* 1989).

Thus a wide range of reproductive strategies and survival rates are present in snails. All the eggs produced do not hatch and all the young ones do not survive to grow up to an adult. In general, survival rate is 50% to 70% for some common species, as seen in the laboratory. In natural conditions aestivation –linked mortality is a major factor to be taken into account. Some species lay all of their eggs before going into aestivation, and a large portions of these eggs never hatch.

AESTIVATION

In dry situations snails become dormant in a condition known as aestivation. During aestivation, operculates close their apertures with the operculum. Many non-operculates

produce temporary seals called epiphragms, which are produced from secretions that deposit calcium carbonate. Sheltered conditions are generally favoured for aestivation such as in leaf litter, buried in soil, under stones and logs and in crevices of tree and shrubs. Aestivation in exposed areas on tree and walls is also common. Tree snails attach themselves under bark or on the underside of branches. Aestivation on wooden structures on the ceiling of rooms has been observed in *Rhachis bengalensis*. Some snails aestivate in leaf litter, for example, without attachment, others seal the shell aperture to a surface before retracting into the shell and producing an inner epiphragm..

The period of aestivation ends with the return of sufficient humidity levels and its duration varies between species. A two to six months span is usual but there are “kumbha-karnas” among snails that may remain dormant for long periods. For instance, uninterrupted aestivation for a period of 11 months was recorded for *A. fulica* (Raut & Ghose, 1984).

ARBOREAL HABITS

Many land snails have developed the arboreal habit and live in trees. *Achatinella*, *Partula*, *Liguus*, *Amphidromus* etc. are the important ones. Among the Indian snails *Amphidromous*, *Rhachis*, *Indosuccinea* and some species of *Succinea* are tree living forms. The former two genera include a number of beautifully coloured snails. One species, *A. andamanicus* is endemic to the Andaman Island. The genus *Indosuccinea* is a native of the Indian subcontinent (India and Myanmar) and has a thin transparent shell.

All these snails have the specialised diet and feed on fungus, moss, and lichens from the barks of the trees they live on. Unlike “Kalidasa,” they avoid causing harms to their host by feeding on the tree itself. Most of the Indian species have developed the nest making behaviour, by sticking or rolling leaves together and laying eggs (Bentham Jutting, 1950a). *Indosuccinea semiserica* usually remains on the dorsal surface of the leaves (Raut & Ghose, 1984).

SNAILS AND MAN

The majority of the land snails are like our “saints” who prefer solitude and undisturbed forests. But there are some which usually prefer the company of man and occur near the human habitations. Such species are termed as “anthropomorphic” Normally they inhabit cultivated areas, kitchen gardens, damp walls, potted plants etc, and are not found in natural forests. Though there are no clear cut divisions, examples of snails which fall under these categories are, a few species of *Macrochlamys* (*M. indica*, *M. petrosa*, *M. glauca*, *M. sequax* etc), *Allopeas gracile*, *Achatina fulica*, *Gulella bicolor*, *Kaliella barrakporensis*, *Ariophanta interrupta*, *Cryptozona ligulata* etc. These molluscs are generally found close to human habitations and one need not

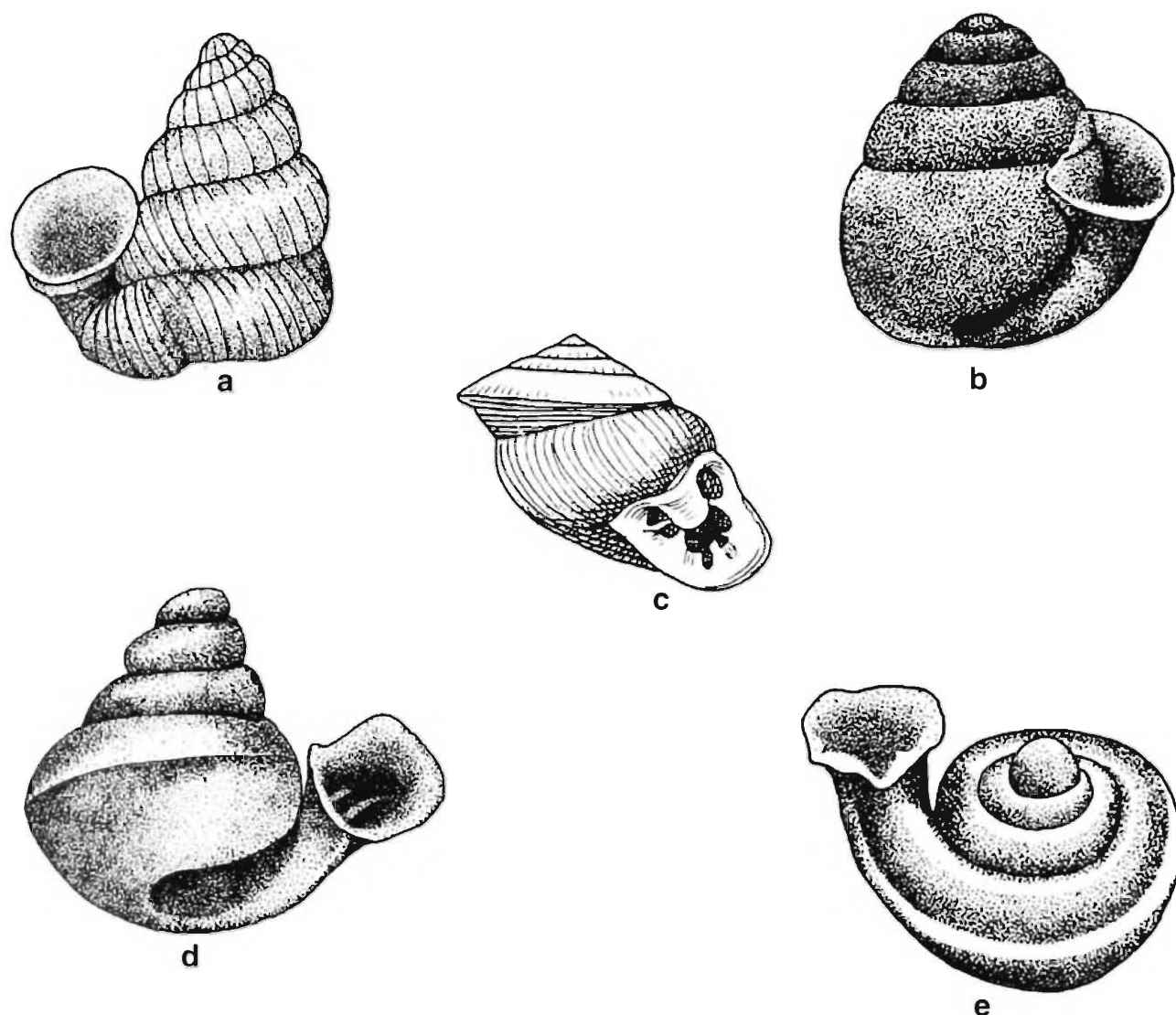


Fig. 11. Some curiously shaped shells : Upright mouthed shell of a. *Opisthostoma macrostoma*; b. *Boysia boysi*; c. Eccentric shell of *Streptaxis canarius*—aperture heavily laden with teeth; d. *Gylotrachela*—up turned trumpet shaped aperture with teeth inside; e. *Hypselostoma tubiferum*—aperture curved to the top.

enter a forest to encounter them. In fact a few of these speices may often be found crawling inside bathrooms and kitchen areas. The exceptionally wide ranges of distribution of some of these species (*A.gracile*, *A. fulica*, *K. barrakporensis*, *B. similaris*) are commonly attributed to human agency.

SNAIL HAZARDS

a) Snails as pests

Many of these poor creatures, by way of their feeding cause considerable damage and loss to agriculture and are branded as agri-horticultural pests. *Achatina fulica*,

the exotic “giant” is a universally hated pest and has achieved the dubious distinction of being at the top of the list. Corresponding to the comparatively long rainy season, it has long active periods in the eastern region of the country and also in the Andaman and Nicobar Islands. It causes extensive damage to various crops. Among the pests, *Macrochlamys indica*, *Allopeas gracile* (though a rather minor one), with the help of their “national permit” (all India range of distribution) have wide areas of activities and affect varieties of cultivated plants.

A secondary group of snails with limited ranges of distribution, cause damage to particular crops in restricted areas. Examples are, *Bensonies monticola* a pest on beans and lady's finger plants in Himachal Pradesh (Bharadwaj and Thakur, 1973; Bhalla and Pawar, 1977), *Ariophanta solata* a pest on coffee plants in parts of Karnataka, (Subba Rao, 1975), *Cryptozona semirugata* a pest on medicinal plants in peninsular India. The degree of damages caused by this secondary group of pest snails depends upon the abundance of particular species in a particular area. Besides causing extensive damage by devouring the young leaves, twigs and floral buds of the plants, some large bodied snails such as *A. fulica*, *C. semirugata* destroy delicate crop plants by leaving a trail of damaged plants covered by snail mucus.

b) As disease carrier

Some of the terrestrial snails are known carriers of parasites infecting domestic animals. The species, *Achatina fulica* has been reported as an intermediate host of the human lungworm *Angiostrongylus cantonensis* in Thailand (Abbott, 1989). *Angiostrongylus* infecting some other snails species in India has also been reported (Limaya *et al.*, 1988).

DIVERSITY AND ENDEMICITY

The total world fauna of land molluscs is estimated at between 30,000 to 40,000 in the minimum (Solem, 1984, Abbott, 1989), though a more conservative estimation puts the number of valid described species at around 10,000. The fauna of Indian land molluscs consists of a little less than 1,500 species under around 140 genera and 34 families. India, with her vast land area (approx. 75 million hectares) and widely varied topographic and climatic conditions accommodate around 5% of the total world fauna. The moist and humid northeast and peninsular parts of the country harbour above 500 species of land operculates. The landmass of India encompasses large areas of high mountains, deserts, island, tropical rain forest and thickly populated plains. The moisture supply varies between nearly 100 mm., precipitations in the desert wastelands to above 2000 mm. annual rainfall in the eastern Himalaya. Vegetation type varies between thorny xerophytes of the desert to the lush green tropical rain forests of the northeast. The moisture retaining lime-rich alluvial and black soils between them cover approximately 15,546,000 sq.kms of land area. Considering these

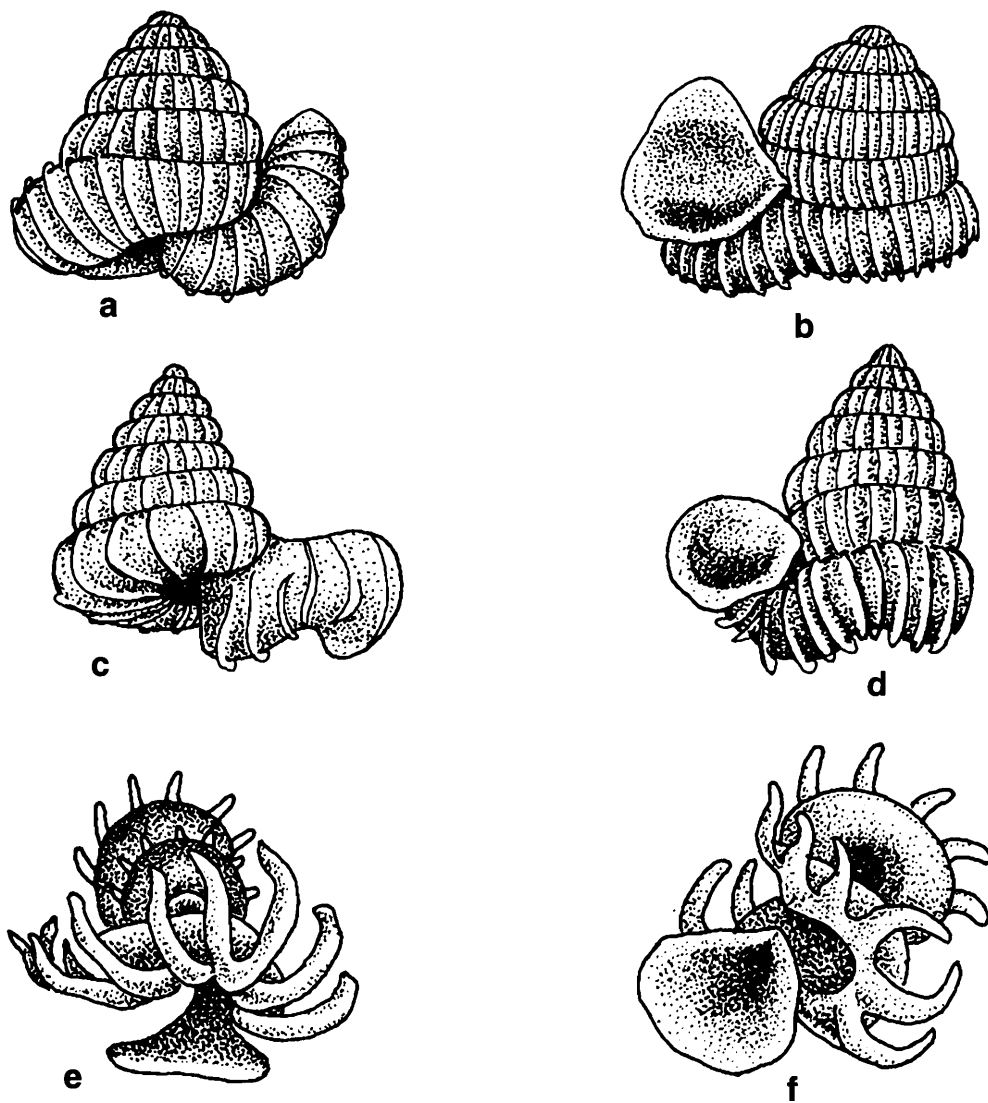


Fig. 12. a,b. *Opisthostoma simplex*; c,d. *O. jucundum*; e,f. *O. grandispinosa*—all from Borneo.

points it is not surprising that our country with about 2% of the total global land area, support 5% of the total world fauna of land molluscs, with around 50% endemism. From the diversity point of view in size, Indian land snail ranges between 1.5 mm *Georissa* of the Andamans to the massive Imperial snail *Hemiplecta basileus* of the Western Ghats, reaching nearly 10 cms in diameter. The tree living forms include some of the beautifully coloured snails found in the northeast or the Andamans. The greenish slug, *Hyalimax* of the Andamans, the transparent fragile shelled *Indosuccinea* and also the tiny snails such as the pupillids, succineids living under the bark of trees. Among the high altitude species in the Himalayas (above 3000 meters) there are the minute vallonids as well as long fleshy slugs *Anadenus*.

How many : Where : Why

If a region-wise analysis is made, the distribution of the land molluscs is not uniform throughout the country, some areas are much richer than the others. The

diverse range of habitats in mountain ranges contributes to the high molluscan diversity in the Himalaya, Western Ghats and also the Eastern Ghats. The eastern Himalaya with higher rainfall and evergreen forests has far more number of species than in the western part. Higher rainfall, more relative humidity, warmer climate, less snowfall and presence of more broad-leaved vegetation make the eastern part more friendly to the land molluscs. The number of species present in the north-east India is between 475 to 500, approximately one third of the total Indian fauna with around 70% endemism. The drier north-western part has just about 100 species with an approximate 50% endemism level. The fauna in the northwest includes a few Palaearctic elements. The percentages of forest area to the total geographical area in the northeast ranges between just below 45% in Meghalaya to nearly 80% in Mizoram. In the northwest, it ranges from 10% in Jammu & Kashmir to nearly 38% in Himachal Pradesh. The evergreen forest in the east also gives way to sub-mountains to temperate vegetations in the west. Above 400 species are known from the Western Ghats and the peninsular India, the endemism level is around 60%. The moist habitat of semi-evergreen forests not only provides congenial situations for the land snails to survive but the varied topography also does enough to encourage speciation. In addition to the four endemic genera, *Hemiplecta*, *Lithotis*, *Indrella* and *Thysanota*, other important families with a number of endemic species each in Western Ghats are Cyclophoridae, Ariophantidae, Endodontidae and Subulinidae. This region shares many of the operculates and ariophantids with Sri Lanka. The Gangetic Plains have fewer than 100 species, many of which are synanthropic being associated with human activities. This, being one of the most densely populated regions of the country, has very little forests left, the undergrowth is also grassy and does not support land snails. Among the fauna here there are a few species from the lower elevations of the Rajmahal. The arid zone with thorny bushes and forest patches records much lower number of species. The desert areas (parts of Gujarat, Rajasthan and Punjab) has 16 species which includes arid zone specialists such as, *Zootecus*, *Boysia*, *Pupoides*, *Ena* and some other buliminids (Subba Rao, 1996). Islands are very important centers for land molluscan diversity and endemism.

The Andaman and Nicobar group have more than 100 species with a moderately high endemism at 74% (Subba Rao and Mitra, 1991). The Andaman group accommodates 56 species, 34 of which are endemic, and the Nicobar group has 57 species with 41 endemic. The mountainous southern part of the Andaman islands with evergreen forests and more than ample rainfall has a comparatively high concentration of the species, 21. The Nicobar group covers a much smaller area (1841 km²) than the Andaman group (7368 km²). But the fauna is almost uniformly shared by the both. Level of endemism is also marginally higher in the Nicobar group.

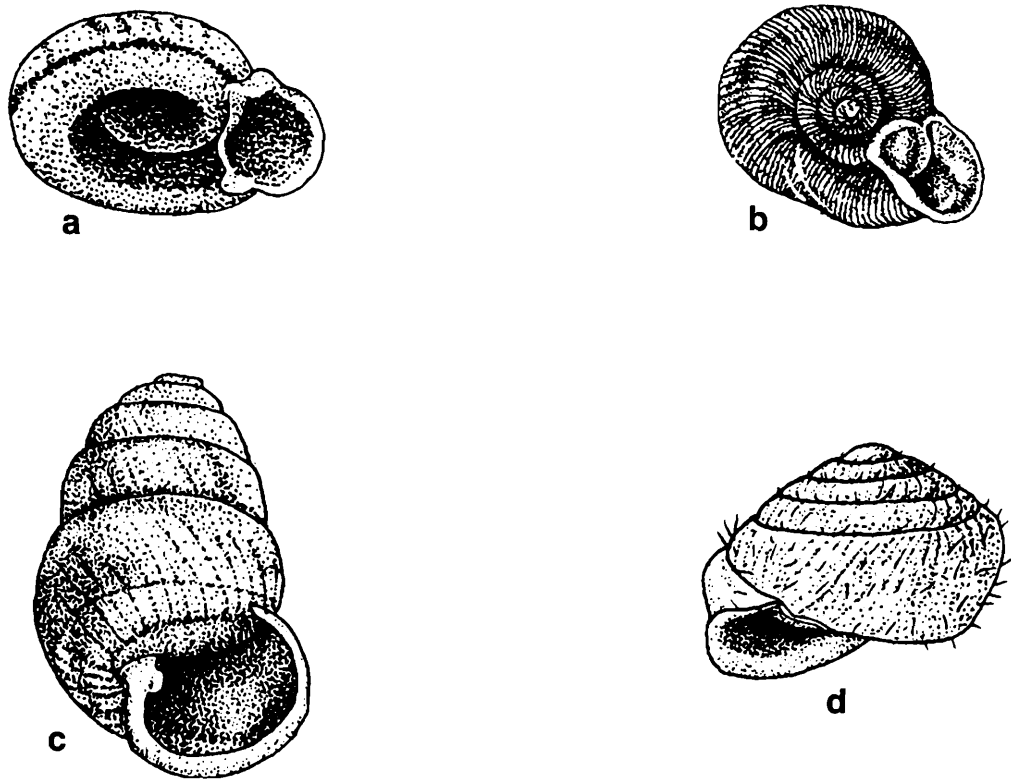


Fig. 13. a. *Pterocyclus fairbanki*—apertural modification; b. *Corilla anax*—armature seen inside aperture and also through shell; c. *Orebba codonodes*—columellar tooth, thickened peristome; d. *Plectopylis plectostoma*—rows of hair and descending body whorl.

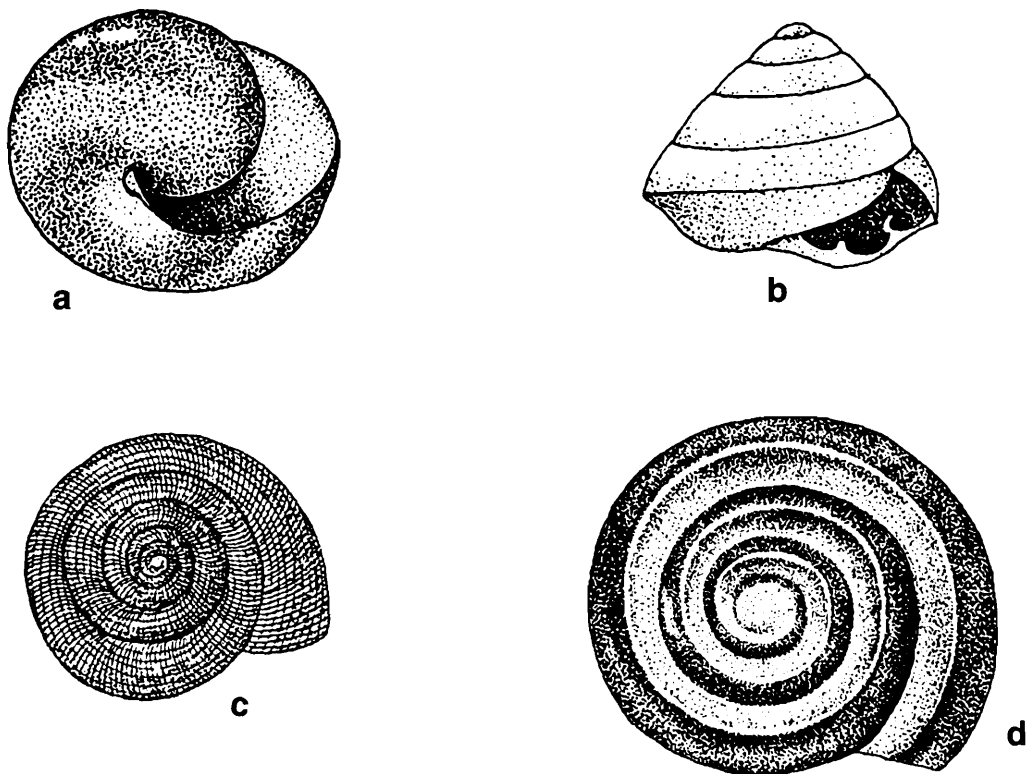


Fig. 14. a. *Microcystina* sp.—columellar process; b. *Sesara diplodon*—teeth on outer lip; c. *Euplecta* sp.—coarse, decussating sculpture; d. *Taphrospira* sp.—canalised suture.

Land snails as friend of Nature

Land snails play a key role to ecosystems as detritivores, feeding on the dead plant material and contributing to the recycling of plant nutrients. The density of the land snails varies enormously. In acid leaf litter snail species diversity may be very high but their density is often very low. In such environments, available calcium carbonate is concentrated in snail shells, which become an important source of calcium carbonate for animals, including other snails, that feed on them. In natural environments snail density is highest in calcium rich soils, in such conditions their biomass can exceed that of all other invertebrate groups combined.

Snails are an important food item in the diet of many small vertebrates, such as frogs, lizards, birds and small mammals. The predator can often be identified from shell remains. For example, the teeth marks left by gnawing rat and other small mammals, the distinctive bore holes made by some predatory beetles and rasping shell damage caused by some predatory snails. Some species of birds lift snails with their beaks and crack them on selected stones, which are surrounded by shell fragments. There are also many invertebrates that eat snails such as carnivorous beetles, ants, centipedes and predatory snails.

As link in food chain and soil fertilizer

Land snails are an important link in the food chain, the cycle between green plants and the animals. Pulmonate land snails alone put the entire molluscs as a group of animals, into third place in bioenergetic term of annual turnover in terrestrial ecosystems, close to annelids (Subba Rao *et. al*, 1995b). This becomes possible because of the activities of land molluscs through which they break down dead plant matters, produce soil, add to its fertility and recycle nutrients. Woodland snails primarily feed on dead vegetative matters. Ingestion and assimilation rates of snails feeding on leaf litters was worked out in the laboratory. This rate was used to make assessment of the ingestion/assimilation rates in the field. The assimilation rates in respect of smaller species did not vary much from that of larger species, so a mean value of assimilation rate was used. Role of direct decomposition of litter by snail is small (0.35-0.7% of total annual litter output). But the importance of the role played by a snail is in the physical and chemical altering of the litters. Large intake, low assimilation and huge amount of mucous coated faecal production promotes fungal growth. Early stages of fragmentation facilitates increase in the population of microorganisms, which in turn complete the decomposition process and release the nutrients, thereby increasing the fertility of the soil. Considering the high abundance of the snails in a favourable area (one litter of plant matter from 0.36 m² area yielding 29 species) the cumulative effect reaches enormous proportion (Mason, 1970, 1974; Subba Rao, Mitra and Srivastava, 1995b). Moreover, land snails being nutritionally flexible play the most dominant role in the community. They also add to the fertility of the soil by turning nitrogen into uric acid. Snails living in limestone rocks and feeding on lichens are directly aiding in soil formation in the rocky desert.

As calcium supplier

Land snails play a very commendable role in supplying calcium to the nature. Molluscan shell consists of 93-97% calcium as calcium carbonate. Slugs also contribute in this because beside the shell, certain percentage of calcium is also contained in different parts of the body, like mantle, foot, stomach glands etc. The process of shell decay takes a little longer in dry areas but is quite fast (approx. 10 days) when soil surface is wet. Because of the fact that molluscs are the dominant invertebrate organisms in a community the total quantity of calcium they supply is enormous, if a quantification is made the figure may reach an astonishing mark. As an instance, if we take the case of the Giant African snail, these robust animals are widely distributed through the major part of the tropic. In India, it is common to abundant almost throughout the country. The population density reaching upto 42/m² (Raut and Ghose, 1984). Now if a calculation is made taking all aspects including the mortality rate into consideration, the total amount of calcium involved will be in term of quintals. Some gigantic species of achatinids in some of the tropical countries ranges between 750-1000 gms. each, in weight. Small land snails also serve as the source of calcium for nesting female birds for production of egg shells.

Survival Threat : How Green was Their Valley

Land snails basically need plants and vegetations to survive. They occupy all types of vegetated surroundings, starting from forests and bushes to cultivated gardens, though the degree of concentration and type of species varies. Forest clad mountain ranges and islands are two most productive repertoires. Land snails are also among the most sensitive and vulnerable group of animals; they are highly susceptible to environmental changes. Rapid urbanization, spread of human habitation and the associated development activities are affecting, disturbing and even destroying the fauna of land snails to a large extent. Huge stretches of forests are being cleared every day in the tropics. Human habitation quite often results in de-habitation for, at least some species of molluscs. Many of the extended townships and high rise buildings in a developing country like ours, stand on what was once the happy home of *Rhachis*, *Amphidromus*, *Ariophanta*, *Cyclophorus* and so on.

The amphibious genus *Lithotis*, endemic to the hill streams at Khandalla, Western Ghat is already affected as a result of the developmental works undergoing in those areas like, establishment of big hotels, building up of roads to attract tourists and so on.

Though we lack the definite information, it is a fact that during the recent surveys of different regions of the country, the number of species of land molluscs collected never reached more than 50% of the total number of species recorded from the respective regions (Subba Rao *et. at*, 1995, Surya Rao *et. al.*, in Press).

No trampling please, we are snails

Since most species of the Indian land snails are represented by small populations, they are more vulnerable. It becomes difficult for them to recover if further depletion is caused and a dwindling population may require a long time to regain its original strength. Land snails usually lay eggs in crevices or under leaves or at the sub surface level of humus. A single trampling, knowing or unknowing, over that particular spot destroys the whole lot, annihilating an entire population of the future.

Other associated activities, which disrupt the fauna of land molluscs, are cattle rearing, setting fires for cultivation and introduction of exotic animals. Cattle grazing usually destroys the host plants and disrupt the associated molluscs. In the event of widespread fires only deep soil aestivating snails survive and the following years the original fauna may be replaced. As has happened in a number of places, introduction of exotic species results in victimization of local species.

Alteration of Habitats and Fauna

Human habitation also causes alteration of natural forests. Cattle raising, agriculture and fires to clear 'undesired' vegetations destroy or alter the malacofauna, native species being the casualties. Some particular species live exclusively in natural forests and are not found in cultivated areas. They are the worst sufferers. Some species invade and flourish in cultivated land and are usually not found in natural forests. Some others generally live in uncultivated areas but have a tendency to invade cultivated lands and increase their populations. When natural forests are cleared for cultivation, or native plants are replaced by fast growing or economically important plants the malacofauna is also replaced by anthropochorous (species dispersed by man), synanthropics (species favoured by human activities) or anthropogenic (altered by man) populations. Such species normally inhabit towns, villages, meadows etc. There are certain more mobile species, which migrate from natural to anthropogenic patches. Usually they get better situations and flourish, some smaller species can not adjust, and they either languish or have reduced populations. Species inhabiting towns and villages freely settle in anthropogenic habitats. Normally malacofauna in a natural habitat can withstand and overcome a single event disruption (man made or spontaneous) like, fire, chemical application or insect-infestation etc., usually the change is more quantitative in nature. The combination of more than one events brings about permanent qualitative changes.

COLLECTION

It may not be difficult to locate and collect larger shells, which can be easily noticed and picked up either by hand or by forceps. But to spot the smaller or minute forms and to collect them is not easy. Suitable shady places with sufficient moisture are to be selected and one has to scratch among fallen leaves/litters. Particularly for smaller forms it is better to gather dry forest debris and shake it through the sieves.

It may also be convenient to carry it to the laboratory and leisurely examine, preferably with the help of a hand lens. Patience is the key word. For live snails one has to search under fallen leaves, bricks, stones, wooden logs etc. Minute shells should be handled with fine forceps or brushes and should immediately be put inside corked tubes.

While collecting live specimens a collector should also pay attention to dry shells, complete and perfect ones. Collecting empty shells is always advantageous, because, shells of all stages of growth are available if properly looked for. Shells of different stages of growth are essential for studying variation of shell characters in relation to age. Post monsoon periods are the most suitable for dry shell collections because many snails get drowned during heavy monsoon showers and the shells left behind are in fresh conditions. Slopes with vegetations, banks of rivers, streams, along the base of walls, around base of large trees are the most likely places where dry shells could be found. Important points to remember while making collections are that vague and purposeless collections are useless. Collection should be methodical and to the minimum. Collection as a passion should not be indulged. Collections without proper data are also useless. Every stone or wooden log upturned must be put back to original position. Natural habitat must not be disturbed.

For population studies

A metallic frame of one square meter size may be used, number of snails (of particular species) present within the area are counted. Seasonal variations can also be studied the same way.

FIXATION AND PRESERVATION

To prevent specimens from shrinking or withdrawing, narcotisation is necessary before fixation.

Land snails are usually narcotised by asphyxiation. Live specimens are put inside a glass bottle or a jar completely filled with water, the lid is tightly closed making it airtight. A few drops of alcohol may be added at intervals to expedite the process. It may take 15-20 hours. Any specimen dying and lying at the bottom should be removed. The specimens thus narcotised should be thoroughly washed to remove mucous, and then treated with ascending grade of spirit (20%, 40%, 60%, 70%). Finally they are preserved in 70% ethyl alcohol.

If the specimens are to be preserved for any special study, then the same should be fixed in Bouin's fluid (Picric acid 70%, Formaldehyde 25% and glacial acetic acid 5%) or in aceto-alcohol (70% alcohol, Formaldehyde 20% and acetic acid 5%).

CLASSIFICATION

The classification is after Vaught (1989).

- Subclass **PROSOBRANCHIA**
- Order **ARCHAEOGASTROPODA**
- Family **HYDROCENIDAE**
- Genus ***Georissa*** Blanford, 1864?
- Family **HELICINIDAE**
- Genus ***Pleuropoma*** Moellendorff, 1893
- Genus ***Sulfurina*** Moellendorff, 1893
- Order **MESOGASTROPODA**
- Family **CYCLOPHORIDAE**
- Subfamily **CYCLOPHORINAE**
- Genus ***Cyclophorus*** Montfort, 1810
- Subgenus ***Salpingophorus*** Kobelt & Moellendorff, 1899
- Litostylus*** Kobelt & Moellendorff, 1899
- Cyclohelix*** Moersch, 1852
- Glossostylus*** Kobelt & Moellendorff, 1897
- Genus ***Craspedotropis*** Blanford, 1864
- Genus ***Cyathopoma*** Blanford, 1861
- Subgenus ***Cyathopoma*** s.st.
- Jerdonia*** Blanford, 1861
- Genus ***Pseudojerdonia*** Kobelt, 1902
- Genus ***Ditropis*** Blanford, 1869
- Genus ***Japonia*** Gould, 1859
- Subgenus ***Lagochilus*** Blanford, 1864
- Genus ***Leptopoma*** Pfeiffer, 1847
- Subgenus ***Trocholeptopoma*** Kobelt & Moellendorff, 1897
- Genus ***Leptopomoides*** G. Nevill, 1878
- Genus ***Micraulax*** Theobald, 1876
- Genus ***Mychopoma*** Blanford, 1869?
- Genus ***Scabrina*** Blanford, 1883
- Genus ***Theobaldius*** G. Nevill, 1878

- Subfamily ALYCAEINAE
 Genus *Alycaeus* Gray, 1850
 Subgenus *Alycaeus* s.st
 Genus *Chamalycaeus* Kobelt & Moellendorff, 1897
 Subgenus *Chamalycaeus* s.st.
Dicharax Kobelt & Moellendorff, 1897
Raptomphalus Godwin-Austen, 1914
 Genus *Cycloryx* Godwin-Austen, 1814?
 Genus *Dioryx* Benson, 1859
 Subfamily PTEROCYCLINAE
 Genus *Pterocyclus* Benson, 1832
 Genus *Pearsonia* Kobelt, 1902
 Subgenus *Pearsonia* s.st.
Pesudospiraculum Kobelt, 1902
 Family DIPLOMMATINIDAE
 Subfamily DIPLOMMATININAE
 Genus *Diplommata* Benson, 1849
 Subgenus *Diplommata* s.st.
Metadiancta Moellendorff, 1898
Sinica Moellendorff, 1885
 Genus *Gastroptychia* Kobelt & Moellendorff, 1900
 Genus *Palaina* Semper, 1885
 Genus *Nicida* W. Blanford, 1868
 Genus *Opisthostoma* W. & H. Blanford, 1860
 Family PUPINIDAE
 Subfamily PUPININAE
 Genus *Pupina* Vignard, 1829
 Subgenus *Tylotoechus* Kobelt & Moellendorff, 1897
 Subfamily PUPINELLINAE
 Genus *Nodopomatias* Gude, 1921
 Genus *Pseudopomatias* Moellendorff, 1885
 Genus *Raphaulus* Pfeiffer, 1856
 Genus *Schistoloma* Kobelt, 1902
 Genus *Tortulosa* Gray, 1847

- Subgenus *Tortulosa* s.st.
Eucataulus Kobelt, 1902
- Family POMATIASIDAE
Subfamily POMATIASINAE
Genus *Otopoma* Gray, 1850
- Subfamily CYCLOTOPSINAE
Genus *Cyclotopsis* Blanford, 1864
- Family ASSIMINEIDAE
Subfamily ASSIMINEINAE
Genus *Acmella* Blanford, 1869
- Subfamily OMPHALOTROPIDINAE
Genus *Omphalotropis* Pfeiffer, 1851
- Subclass PULMONATA
Order STYLOMMATOPHORA
Family PUPILLIDAE
Subfamily PUPILLINAE
Genus *Pupilla* Leach in Fleming, 1828
Genus *Pupoides* L. Pfeiffer, 1854
- Family VALLONIIDAE
Genus *Vallonia* Risso, 1826
- Family VERTIGINIDAE
Subfamily TRUNCATELLININAE
Genus *Boysia* Pfeiffer, 1849
- Subfamily GASTROCOPTINAE
Genus *Gastrocopta* Wollaston, 1878
Genus *Boysidia* Ancey, 1881
- Subfamily NESOPUPINAE
Genus *Pupisoma* Stoliczka, 1873
- Family ORCULIDAE
Genus *Orcula* Held, 1837
Subgenus *Sphyradium* Charpentier, 1837
- Family PYRAMIDULIDAE
Genus *Pyramidula* Fitzinger, 1833

- Family BULIMINIDAE (ENIDAE)
 Subfamily BULIMININAE
 Genus *Mirus* Albers, 1850
 Genus *Serina* Gredler, 1898
 Subfamily CHONDRULINAE
 Genus *Subzebrinus* Westerlund, 1887
 Family CERASTUIDAE
 Genus *Cerastua* Strand, 1928
 Genus *Edouardia* Gude, 1914
 Genus *Rhachis* Albers, 1850
 Family CLAUSILIIDAE
 Subfamily PHAEDUSINAE
 Genus *Euphaedusa* O. Boettger, 1877
 Genus *Hemiphaedusa* O. Boettger, 1877
 Subgenus *Cylindrophaedusa* O. Boettger, 1877
 Genus *Oospira* Blanford, 1872
 Family FERUSSACIIDAE
 Genus *Cecilioides* Ferussac, 1814
 Subgenus *Geostilbia* Crosse, 1867
 Genus *Coilostele* Benson, 1864
 Family SUBULINIDAE
 Subfamily SUBULININAE
 Genus *Subulina* Beck, 1837
 Genus *Bacillum* Theobald, 1870
 Genus *Curvella* Chaper, 1885
 Genus *Glessula* von Martens, 1860
 Genus *Lamellaxis* Strebel and Pfeffer, 1882
 Subgenus *Allopeas* H.B.Baker, 1935
 Genus *Prosopeas* Moerch, 1876
 Subfamily RUMININAE
 Genus *Zootecus* Westerlund, 1887
 Family ACHATINIDAE
 Genus *Achatina* Lamarck, 1799

- Subgenus *Lissachatina* Bequaert, 1850
- Family STREPTAXIDAE
- Subfamily STREPTAXINAE
- Genus *Streptaxis* Gray, 1837
- Genus *Haploptychius* Moellendorff, 1905
- Subfamily ENNEINAE
- Genus *Ennea* H. and A. Adams, 1855
- Genus *Gulella* L. Pfeiffer, 1856
- Subgenus *Huttonella* L. Pfeiffer, 1856
- Genus *Sinoennea* Kobelt, 1904
- Family PLECTOPYLIDIDAE (Corillidae)
- Genus *Plectopylis* Benson, 1899
- Subgenus *Chersaecia* Gude, 1899
- Endothyrella* Zilch, 1960
- Genus *Corilla* H. & A. Adams, 1855
- Family ENDODONTIDAE
- Genus *Philalanka* Godwin-Austen, 1898
- Family CHAROPIDAE
- Genus *Ruthvenia* Gude, 1911
- Genus *Thysanota* Albers, 1880
- Family SUCCINEIDAE
- Subfamily SUCCINEINAE
- Genus *Succinea* Draparnaud, 1801
- Genus *Camptonyx* Benson, 1858
- Subgenus *Lithotis* Blanford, 1863
- Subfamily CATINELLINAE
- Genus *Indosuccinea* Rao, 1924
- Genus *Quickia* Odhner, 1950
- Family HELICARIONIDAE
- Subfamily HELICARIONINAE
- Genus *Nesaecia* Gude, 1911
- Genus *Pseudaustenia* Cockerell, 1891

- Subfamily SESARINAE
- Genus *Sesara* Albers, 1880
- Genus *Kaliella* Blanford, 1883
- Genus *Pseudokaliella* Godwin-Austen, 1910
- Genus *Rasama* Laidlaw, 1932
- Genus *Rahula* Godwin-Austen, 1907
- Genus *Sivella* Blanford, 1883
- Genus *Tadunia* Godwin-Austen, 1918
- Family ARIOPHANTIDAE
- Subfamily ARIOPHANTINAE
- Genus *Ariophanta* Desmoulins, 1829
- Genus *Cryptozona* Moersch, 1872
- Genus *Euplecta* Semper, 1870
- Genus *Hemiplecta* Albers, 1850
- Genus *Indrella* Godwin-Austen, 1901
- Genus *Rhysotopsis* Ancey, 1887
- Subfamily DYAKIINAE
- Genus *Staffordia* Godwin-Austen, 1907
- Subfamily GIRASIINAE
- Genus *Austenia* Nevill, 1878
- Genus *Cryptaustenia* Cockerell, 1898
- Subfamily MACROCHLAMYDINAE
- Genus *Macrochlamys* Benson, 1832
- Subgenus *Euaustenia* Cockerell, 1898
- Parvatella* Blanford & Godwin-Austen,
- Genus *Bapuia* Godwin-Austen, 1918
- Genus *Bensonies* H.B.Baker, 1938
- Genus *Khasiella* Godwin-Austen, 1899
- Genus *Microcystina* Moersch, 1872
- Genus *Oxytesta* Zilch, 1956
- Genus *Rotungia* Godwin-Austen, 1918
- Genus *Syama* Godwin-Austen, 1908
- Genus *Taphrospira* Blanford, 1905

- Subfamily DURGELLINAE
 Genus *Durgella* Blanford, 1883
 Genus *Ibycus* Blanford, 1883
 Genus *Satiella* Godwin-Austen, 1908
 Genus *Sitala* H. Adams, 1885
 Family TROCHOMORPHIDAE
 Genus *Videna* H. and A. Adams, 1855
 Family CAMAENIDAE
 Subfamily CAMAENINAE
 Genus *Camaena* Albers, 1850
 Genus *Amphidromus* Albers, 1850
 Genus *Apatetes* Gude, 1914
 Genus *Beddomea* Nevill, 1878
 Genus *Chloritis* Beck, 1837
 Genus *Ganesella* Blanford, 1863
 Genus *Landouria* Godwin-Austen, 1918
 Genus *Mikiria* Godwin-Austen, 1918
 Genus *Oreobba* Pilsbry, 1894
 Genus *Trachia* Albers, 1860
 Family BRADYBAENIDAE
 Genus *Bradybaena* Beck, 1837
 Genus *Aegista* Albers, 1850
 Subgenus *Plectotropis* von Martens, 1860
 Genus *Cathaica* Moellendorff, 1884

Though a very difficult task, attempt has been made to provide keys to the families and genera basing on shell characters alone, so that persons collecting empty shells may arrive at the respective families and genera.

SYSTEMATIC ACCOUNT

Key to the families

1. Shell with an operculum closing the aperture..... (2)
 Shell without an operculum (8)
2. Shell depressed or conoidly depressed, broader than high..... (3)
 Shell ovate, elongately ovate, higher than broad (5)

3. Shell smaller, usually not exceeding 10mm in diameter, smooth, polished, without distinct sculpture, perforation closed by a callus HELICINIDAE
Shell larger, usually exceeding 10mm in diameter, sculptured, openly perforate (except *Otopoma* in Pomatiasidae) (4)
4. Peristome double, usually expanded and reflected, foot without any groove
..... CYCLOPHORIDAE
Peristome simple, thin, foot with a median groove..... POMATIASIDAE
5. Shell smooth, with peristomal canal PUPINIDAE
Shell sculptured, without peristomal canal (6)
6. Shell with spiral sculpture, operculum with a peg HYDROCENIDAE
Shell without spiral sculpture, operculum without a peg (7)
7. Shell ovately conical, last whorl the widest; perforate ASSIMINEIDAE
Shell cylindrical, last whorl not the widest; imperforate, or narrowly perforate (*Opisthostoma* has a twisted and upturned last whorl)... DIPLOMMATINIDAE
8. Shell elongate-ovate or conoid, longer than broad (17)
Shell depressed, broader than long (9)
9. Shell minute, reaching upto 5mm in diameter (10)
Shell large, reaching above 5mm in diameter (12)
10. Peristome thickened, expanded or reflected (11)
Peristome simple PYRAMIDULIDAE
11. Bodywhorl descending in front VALLONIIDAE
Bodywhorl not descending in front ENDODONTIDAE
12. Shell with thickened and reflected peristome (13)
Shell with simple peristome..... (15)
13. Columella reflected over umbilicus, umbilical opening rather narrow
..... CAMAENIDAE
(*Amphidromus* and *Beddomea* have elongate shells)
Columella not reflected over umbilicus, umbilical opening wide (14)
14. Shell aperture with columellar callus or entering lamella, also a series of teeth/
lamella inside the last whorl PLECTOPYLIDIDAE
Shell aperture simple, no teeth/lamella inside the last whorl
..... BRADYBAENIDAE

15. Shell keeled at periphery, widely umbilicate, columella not reflected over umbilicus (16)
 Shell rounded or angulate at periphery, narrowly perforate, columella reflected over umbilicus ARIOPHANTIDAE/HELICARIONIDAE
16. Shell more broad, height of shell less than half of diameter, without distinct spiral sculpture TROCHOMORPHIDAE
 Shell less broad, height of shell more than half of diameter, with distinct spiral sculpture CHAROPIDAE
17. Shell small, upto 5 mm in length (18)
 Shell larger, above 5 mm in length (21)
18. Columella concave and truncate at base FERUSSACIIDAE
 Columella convex or straight, rounded at base (19)
19. Shell with simple aperture ORCULIDAE
 Shell with denticulate aperture (20)
20. Last whorl scarcely broader than the penultimate whorl, not ascending in front PUPILLIDAE
 Last whorl broader than the penultimate whorl, ascending in front VERTIGINIDAE
21. Shell with denticulate aperture (22)
 Shell with simple aperture (23)
22. Shell sinistral, with internal plicae (visible from outside) CLAUSILIIDAE
 Shell dextral, without internal plicae STREPTAXIDAE
 (*Gulella* and *Ennea* have small narrow shells, below 5mm in length)
23. Shell very large and swollen, seldom below 50 mm in length ..ACHATINIDAE
 Shell small, and narrow, seldom exceeding 30 mm in length (24)
24. Spire equal or shorter than the last whorl in length (25)
 Spire larger than the last whorl in length (26)
25. Shell thin, imperforate, last whorl constituting 75% to 90% of the total length, columella not reflected SUCCINEIDAE
 Shell fairly thick, perforate, last whorl equal or slightly larger than spire, columella reflected CERASTUIDAE

26. Shell usually perforate and with coloured spots and streaks, outer lip reflected
..... BULIMINIDAE

Shell usually imperforate or very narrowly perforate usually without coloured spots and streaks, outer lip simple SUBULINIDAE

(The genus *Curvella* has a shorter spire and a twisted columella)

Subclass **PROSOBRANCHIA**

Order **ARCHAEOGASTROPODA**

Family **HYDROCENIDAE**

Shell very small (not exceeding 2.5 mm in height), conoid, with spiral lirations, umbilicus obliterated by a smooth callus, operculum with a basal nucleus and a peg at the columellar side.

Snout broad and short, eyes on short peduncles. True tentacles absent. Sole of foot oval.

South and east Asia, Pacific Islands.

On ground, at damp situations, among vegetable debris etc. Some found in caves (Bentham Jutting, 1948).

Reference

Bentham Jutting, w.s.s. von, 1948. Systematic studies on the non marine mollusca of the Indo-Australian Archipelago. Critical Revision of the families Hydrocenidae, Helicinidae, Cyclophoridae, Pupinidae & Cochlostomatidae. *Treubia*, **19(3)** : 1-603, figs 1-60.

Thompson, F.G. & Dance, P. 1983. Non marine mollusks of Borneo II Pulmonata : Pupillidae, Clausiliidae. III Prosobranchia : Hydrocenidae, Helicinidae. *Bull. Fla. State Mus., (Biol.Sci.)* **29(3)** : 101-130, 75, figs.

Genus *Georissa* Blanford, 1864.

1864. *Georissa* Blanford, *Ann. Mag. nat. Hist.*, **(3)13** : 463.

Number of Indian species : Two.

Distribution : S.E. Asia.

Size Range (Indian species) : 1.25–2.00 mm in length.

***Georissa pyxis* (Benson)**
(1, 2)

1856. *Hydrocena pyxis* Benson, *Ann. Mag. nat. Hist.* (2)17 : 232.

1991. *Georssia pyxis* : Subba Rao & Mitra, *Rec. zool. Surv. India, Occ. Paper*, 126 : 9, pl.1, fig. 1.

Shell minute, ovate, imperforate, with strong spiral liration; whorls 4, convex; aperture subcircular, oblique, peristome simple, margins joined by a parietal callus; operculum with a short peg on the columellar side.

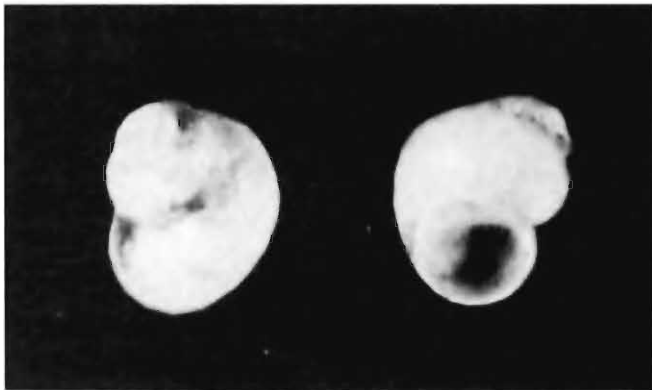
Distribution : India : Andaman Island;

Elsewhere : Myanmar.

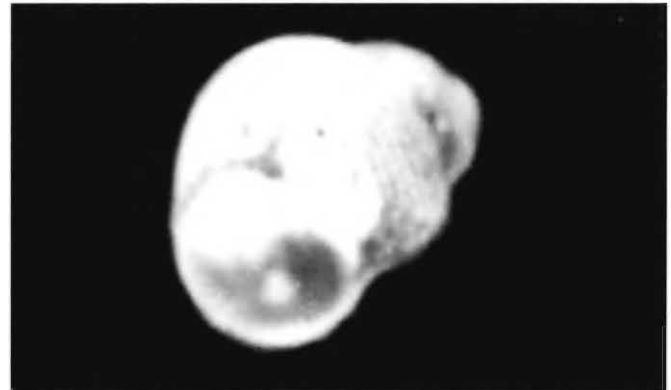
Measurements (in mm) :

Height	Diameter
2.05	1.65

Status : Common.



1. *Georissa pyxis* (Benson)—dorsal and ventral view



2. *Georissa pyxis* (Benson)—ventral view

Family HELICINIDAE

Shell small, not more than 6 mm in height, solid, lenticular, depressed to conically turbinate, broader than high with a flattened base, umbilicus closed by a callus. Aperture triangular or semiovate, peristome usually simple, sometimes reflected and dilated at the base, operculum calcareous, concentric or paucispiral, with a central or lateral nucleus.

Animal with a short snout. Eyes at the base of long tentacles, sole of foot long, undivided or tripartite.

Tropical Asia and America, West Indies, New Guinea, Pacific Islands.

Mostly on ground. Some on trees or plants like fern or limestone rocks.

Reference

- Bentham Jutting, w.s.s. von, 1948. Systematic studies on the non marine mollusca of the Indo-Australian Archipelago. Critical Revision of the families Hydrocenidae, Helicinidae, Cyclophoridae, Pupinidae & Cochlostomatidae. *Treubia*, **19(3)** : 1-603, figs 1-60.
- Gray, J.E. 1824. Monograph of the genus *Helicina*. *Zool. J.*, **1** : 62-71, pl. 6.
- Solem, 1959. Systematics of the land and freshwater mollusca of the New Hebrides. *Fieldiana, Zoology*, **43(1)**.
- Thompson, F.G. & Dance, P. 1983. Non marine mollusks of Borneo II Pulmonata : Pupillidae, Clausiliidae. III Prosobranchia : Hydrocenidae, Helicinidae. *Bull. Fla. State Mus., (Biol. Sci.)* **29(3)** : 101-130, 75, figs.

Key to the genera

Peristome scarcely reflected, operculum acutely angled above *Pleuropoma*

Peristome more reflected, operculum rounded above *Sulfurina*

Genus *Pleuropoma* Moellendorff, 1893

1893. *Pleuropoma* Moellendorff, *Proc. Linn. Soc. N.S. Wales*, **7** : 385.

Number of Indian species : Six.

Distribution : India : Andaman and Nicobar Islands, Meghalaya, West Bengal (Darjeeling).

Elsewhere : Japan, Malaysia, Myannar, New Guinea, Pacific Islands, Philippines, South China.

Size Range (Indian species) : 4.00-10.00 mm in diameter.

***Pleuropoma andamanica* (Benson)**

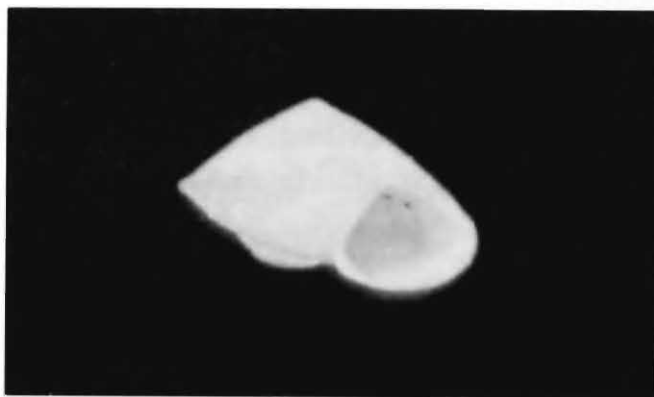
(3)

1860. *Helicina andamanica* Benson, *Ann. Mag. nat. Hist.*, **(3)6** : 194.

1991. *Pleuropoma andamanica* : Subba Rao & Mitra, *Rec. zool. Surv. India, Occ. Paper*, **126** : 10, pl.2, figs. 3 & 4.

Shell small, lens shaped, spire conoid, with microscopically decussating sculpture, yellowish white; whorls 4 4½, edged at suture, keeled at periphery; aperture oblique, triangular, peristome thickened, upper margin curved.

Distribution : India : Andaman & Nicobar Islands.



3. *Pleuropoma andamanica* (Benson)—ventral view

Measurements (in mm) :

Height		Diameter		Height of aperture
2.90	5.86	4.10	9.66	1.86 - 4.00

Status : Common.

Pleuropoma arakanensis (Blanford)
(C1, C2, 4, 5)

1865. *Helicina arakanensis* Blanford, *J. Asiat. Soc. Beng.*, **35** : 85.

1995. *Pleuropoma arakanensis*: Subba Rao *et al.*, *Zool. Surv.India, State Fauna Series, 4* : *Fauna of Meghalaya* : 34, pl.1, figs 5,6.

Shell small, depressedly turbinata, obliquely striate, spiral marks also present, flesh coloured in fresh condition, one reddish band above the periphery and another just below; whorls 4, last whorl compressed and keeled; aperture triangular; peristome slightly expanded; operculum thin, triangularly angled above.

This species is related to *P. merguensis* Pfeiffer and *P. nicobarica* Pfeiffer.

P. arakanensis was for the first time recorded from India (Meghalaya) by Subba Rao *et al.* (1995a). Recently it has been collected from Darjeeling in West Bengal. It is the second report of this genus from mainland India.

Distribution : India : Meghalaya (South Garo Hill), West Bengal (Darjeeling).

Elsewhere : Myanmar.

Measurements (in mm) :

Height		Diameter
4.00	4.50	5.55 - 5.80

Status : Rare.



C1. *Pleuropoma arakanensis* (Blanford)—Apical view



C2. *Pleuropoma arakanensis* (Blanford)—Lateral view



4. *Pleuropoma arakanensis* (Blanford)—dorsal view



5. *Pleuropoma arakanensis* (Blanford)—ventral view

Genus *Sulfurina* Moellendorff, 1893

1893. *Sulfurina* Moellendorff, *Ber. Senck. Naturf. Ges.*, p. 141.

Number of Indian species : Three.

Distribution : India : Andaman and Nicobar Islands.

Elsewhere : Indonesia, Moluccas, New Guinea, Pacific Islands, Philippines.

Size Range (Indian Species) : 2.00-7.00 mm in diameter

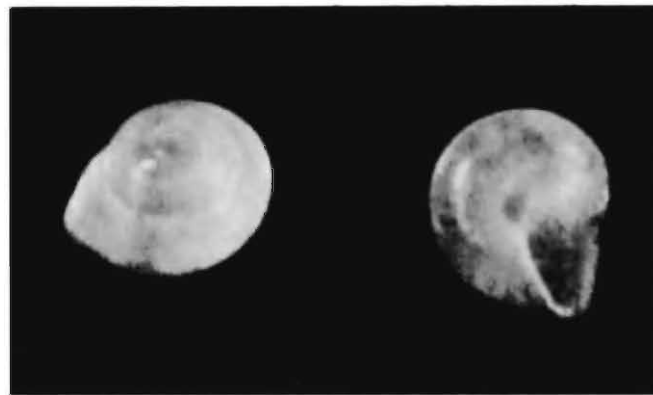
Sulfurina behniana (Pfeiffer)

(6)

1859. *Helicina behniana* Pfeiffer, *Proc. zool. Soc. Lond.*, p.29.

1991. *Sulfurina behniana*: Subba Rao & Mitra, *Rec. zool. Surv. India, Occ. paper*, **126** : 34, pl. 1, fig 2.

Shell conoidly depressed, yellowish, finely striate, whorls $4\frac{1}{2}$, last whorl angulate at periphery; aperture triangular; peristome thickened and reflected.



6. *Sulfurina behniana* (Pfeiffer)—dorsal and ventral view

Distribution : India : Andaman & Nicobar Islands.

Measurements (in mm) :

Height		Diameter	
4.55	7.25	5.00	7.25

Status : Common.

Sulfurina zelevori (Pfeiffer)

(7)

1867. *Helicina zelevori* Pfeiffer, *Verh. K. K. zool. Bot. Ges.*, **17** : 807.

1991. *Sulfurina zelebori*: Subba Rao & Mitra, *Rec. zool. Surv. Occ. Paper*, **126** : 13,pl.1, fig.3.

Shell conoid, thick, white with or without a band; apex blunt; whorls 4, moderately rounded, last whorl bluntly subangulate; aperture oblique, semioval; peristome simple, basal margin forming an obtuse angle with the columellar margin.



7. *Sulfurina zelebori* (Pfeiffer)—dorsal view

Distribution : India : Nicobar Islands.

Measurements (in mm) :

Height	Diameter
1.60 4.75	2.75-5.00

Status : Common.

Order MESOGASTROPODA

Family CYCLOPHORIDAE

Shell medium sized, depressed to turbinate; usually openly umbilicate, sculptured; aperture more or less circular, often variously modified. Operculum calcareous or horny, many whorled, sometimes externally convex.

Warm-temperate parts of Asia, Africa, Australia also Pacific Islands. On grounds, among low vegetations, vegetable gardens etc.

Number of Indian Genera : Seventeen.

Reference

Bentham Jutting, w.s.s. von, 1948. Systematic studies on the non marine mollusca of the Indo-Australian Archipelago. Critical Revision of the families Hydrocenidae, Helicinidae, Cyclophoridae, Pupinidae & Cochlostomatidae. *Treubia*, **19(3)** : 1- 603,figs 1-60.

Zilch, A.1953. Die Typen und Typoide des Natur Museums Senckenberg. 9 Mollusca : Cyclophoridae, Diplommatininae. *Arch. Moll.*, **82(3)**: 1-47, pls.1-13.

Key to the genera

1. Peristome with incision above (2)
 Peristome without incision above (4)
2. Shell small, turbinate, with an angular incision in the peristome near aperture *Japonia*
 Shell larger, depressed, with a wing and or tubes near the peristome (3)
3. With only a 'wing' like formation in the peristome above *Pterocylus*
 With a 'wing' and also tubes a little distance from the aperture *Pearsonia*
4. Shell with a sutural tube (5)
 Shell without a sutural tube (8)
5. Shell more depressed, distinctly broader than high, with a wider umbilicus
 *Chamalycaeus*
 Shell less broad, nearly as broad as high, with a narrower umbilicus (6)
6. Sutural tube long, elongate (7)
 Sutural tube very short, club shaped *Cyclorhynchus*
7. Constriction on last whorl immediately behind peristome, sutural tube close to the aperture *Dioryx*
 Constriction on last whorl at a distance from peristome, sutural tube away from the aperture *Alycaeus*
8. Shell globosely turbinate or conoid (9)
 Shell more or less depressedly coiled (13)
9. Shell much larger, seldom below 20 mm in diameter *Cyclophorus*
 Shell smaller, seldom above 15 mm in diameter (10)
10. Shell with a series of canals within the aperture *Mychopoma*
 Shell without canals within the aperture (11)
11. Shell minute, not exceeding 3 mm in diameter *Cyathopoma*
 Shell larger, above 5 mm in diameter (12)
12. Shell smooth or with faint striae *Leptopoma*
 Shell with raised spiral ribs and also rows of hairs *Craspedotropis*

13. Shell with raised rib around the umbilicus *Micraulax*
 Shell without a rib around the umbilicus (14)
14. Shell more than 10 mm in diameter (15)
 Shell upto 8 mm in diameter (16)
15. Shell without raised spiral lines *Theobaldius*
 Shell with raised spiral lines *Scabrina*
16. Shell more depressed, with a flattened spire and keels on the whorls
 *Ditropis*
 Shell with distinctly raised spire, whorls without keels *Leptopomoides*

Subfamily CYCLOPHORINAE

Genus *Cyclophorus* Montfort, 1810

1810. *Cyclophorus* Montfort, *Conchyl. Syst.*, **2** : 290.

Number of subgenera : Four.

Distribution : India, Africa, South-east Asia, Malaysia, New Guinea, Philippines.

Size Range (Indian species) : 25.00–58.00 mm in diameter

Subgenus *Salpingophorus* Kobelt & Moellendorff, 1897

1897. *Salpingophorus* (Part) Kobelt & Moellendorff, *Nachr. Deuts. Malak. Ges.* **29** : 108.

Number of species : Twelve.

Distribution : India (North-east), Myanmar, Malaysia, Philippines, Sri Lanka.

Size Range (Indian species) : 25.00–58.00 mm in diameter

Cyclophorus (Salpingophorus) pealianus Nevill (C3, C4)

1877. *Cyclophorus sublaevigatus* var. *pealianus* Nevill, *J. Asiat. Soc. Beng.*, **46** : 27.

1881. *Cyclophorus pealianus* Nevill, *J. Asiat. Soc. Beng.*, **50** : 146, pl.6, fig.3.

1921. *Cyclophorus (Salpingophorus) pealianus*: Gude, *Fauna British India, Mollusca*, **3** : 81.

Shell large, thick, deeply umbilicate, depressedly turbinata, whitish with a chocolate brown epidermis, whorls 4½–5, last whorl very large and wide with distinct decussating sculpture, bluntly carinate at the periphery, a white zone above the periphery, chocolate bands below and above, sculpture almost absent or obsolete on



C3. *Cyclophorus pealianus* Nevill—lateral view



C4. *Cyclophorus pealianus* Nevill—lateral view

base and also on apical whorls; aperture oblique, circular, peristome orange red, expanded.

Distribution : India : Nagaland.

Measurements (in mm) :

Height	Diameter	Aperture
40.00	58.00	24.20

Status : Rare.

***Cyclophorus (Salpingophorus) aborensis* Godwin-Austen
(C5, C6)**

1916. *Cyclophorus aborensis* Godwin-Austen *Rec. Indian Mus.*, **8** : 494, pl. 38, fig. 1.

1921. *Cyclophorus (Salpingophorus) aborensis*: Gude, *Fauna British India, Mollusca*, **3** : 69.

Shell large, very thick and solid, openly umbilicate, globosely turbinated, whorls 5, rounded, with distant spiral lirae, raised and distinct, 5 on last whorl including the peripheral, finer lines in between, spiral markings present on apical whorls also, absent on base; aperture suboblique, circular, peristome continuous, thickened and slightly reflected.

Differs in having the raised spiral markings on last whorl, and by lacking the distinct decussating sculpture and the blunt peripheral keel and also in the peristome being white.

Distribution : India : Arunachal Pradesh (2000 ft.)

Measurements (in mm) :

Height		Diameter		Aperture	
38.10	38.50	50.00	51.75	24.50	25.65

Status : Rare.



C5. *Cyclophorus aborensis* Godwin-Austen—dorsal view



C6. *Cyclophorus aborensis* Godwin-Austen—ventral view



C7. *Cyclophorus jerdoni* (Benson)—lateral view



C8. *Cyclophorus jerdoni* (Benson)—lateral view



C9. *Cyclophorus khasiensis* Nevill—lateral view



C10. *Cyclophorus khasiensis* Nevill—lateral view

Subgenus *Litostylus* Kobelt & Moellendorff, 1899

1899. *Litostylus* Kobelt & Moellendorff, *Cat. Pneum.*, p. 16.

Number of Indian species : Nine.

Distribution : India (Bihar, Orissa), Bangladesh, Myanmar, Philippines, Sri Lanka.

Size Range (Indian species) : 11.00 - 50.00 mm in diameter

Cyclophorus (Litostylus) nilagiricus (Benson)

(C11, C12)

1852. *Cyclostoma nilagiricus* Benson, *Ann. Mag. nat. Hist.*, (2)10 : 268.

1921. *Cyclophorus (Litostylus) nilagiricus* : Gude, *Fauna British India, Mollusca*, 3 : 51.

Shell large, very thick and solid, openly and widely umbilicate, depressedly turbinate, whorls 5, with fine spiral striae, some of which are more prominent, radial striae also present, whorls are broadly flattened above the shoulder, last whorl descending in front, chestnut coloured with white striae at the top, peripheral striae broken by minute white streaks; umbilical region excavated and with angulate edge; aperture suboblique, circular, peristome expanded and reflected, distinctly angulate above, lip orange coloured bluish inside (distinct in young shells).

Distribution : India : Western Ghat.

Measurements (in mm) :

Height	Diameter	Aperture
35.00-38.30	48.00-51.30	23.00-24.60

Status : Rare.

Cyclophorus (Litostylus) polynema Pfeiffer

(C13, C14)

1854. *Cyclostoma (Cyclophorus) polynema* Pfeiffer, *Proc zool. Soc. Lond.*, p.126.

1921. *Cyclophorus (Litostylus) polynema* : Gude, *Fauna British India, Mollusca*, 3 : 53.

Shell smaller, fairly thick, turbinate, umbilicate, whitish with brown markings, sculptured by oblique striae, decussated by spiral lines; spiral markings absent on top whorls and obsolete on base; chocolate band below the periphery, finer bands on the base also; whorls 4½-5; aperture oblique, circular, angular above, peristome much expanded; edge of umbilicus subangulate.

Differs by being smaller in size and whorls not being flattened above the shoulders.



C11. *Cyclophorus nilagiricus* (Benson)—lateral view



C12. *Cyclophorus nilagiricus* (Benson)—lateral view



C13. *Cyclophorus polynema* Pfeiffer—lateral view



C14. *Cyclophorus polynema* Pfeiffer—lateral view



C15. *Cyclophorus indicus* Deshayes—lateral view



C16. *Cyclophorus indicus* Deshayes—lateral view

Distribution : India : Andhra Pradesh, Orissa, West Bengal.

Measurements (in mm) :

Height	Diameter	Aperture
23.00-25.00	27.50-29.40	11.70-13.20

Status : Not Common.

Subgenus ***Cyclohelix*** Moerch, 1852

1852. *Cyclohelix* Moerch, *Cat. Conch. Yoldi*, 1 : 41.

Number of Indian species : Five.

Distribution : India (Andaman and Nicobar Islands), West Java.

Size Range (Indian species) : 13.00-31.00 mm in diameter.

Cyclophorus (Cyclohelix) crocatus (Born)
(C9, C10, 8)

1778. *Turbo crocatus* Born, *Index Mus. Vindob.*, p. 343.

1921. *Cyclophorus (Cyclohelix) crocatus*: Gude, *Fauna British India Mollusca*, 3 : 91.

Shell moderately large, conoid, imperforate, thick with chocolate markings, whorls 4½-5, fairly convex, sculptured by weak growth markings and fine spiral lines, last whorl angulate at the periphery and almost flattened on base; aperture oblique, peristome much expanded, margins joined by a thin callus, columella thick, angulate below.

Distribution : India : Nicobar Islands.



8. *Cyclophorus crocatus* (Born)—dorsal and ventral view



C17. *Cyclophorus crocatus* (Born)—lateral view



C18. *Cyclophorus crocatus* (Born)—lateral view



C19. *Cyclophorus theobaldianus* Benson—lateral view



C20. *Cyclophorus theobaldianus* Benson—lateral view

Measurements (in mm) :

Height	Diameter	Aperture
16.80-22.00	19.00-23.90	9.20-13.50

Status : Rare.

Subgenus ***Glossostylus*** Kobelt & Moellendorff, 1899

1899. *Glossostylus* Kobelt & Moellendorff, *Cat. Pneum.*, p. 18.

Number of Indian species : Fifteen.

Distribution : India (North-east, Western Ghat, Maharashtra), China, Malaysia, Myannar, Philippines.

Size Range (Indian species) : 30.00-58.00 mm in diameter

Cyclophorus (Glossostylus) himalayanus (Pfeiffer)
(C21, C22)

1851. *Cyclostoma himalayanus* Pfeiffer, *Proc. zool. Soc. Lond.*, p.242.

1921. *Cyclophorus (Glossostylus) himalayanus*: Gude, *Fauna British India Mollusca*, 3 : 63.

Shell large, thick, solid, globosely turbinata, openly umbilicate, whitish with a brownish deciduous epidermis, whorls 5, rounded, with a sharp apex; sculptured by raised spiral lines, a few of which are more distinctly raised with finer lines in between, last whorl large and inflated, possesses about 12 raised spiral markings, compressed around the umbilicus; aperture circular, subvertical; peristome continuous, expanded and reflected, angulate above, pinkish inside.

Distribution : India : Nicobar Islands.

Measurements (in mm) :

Height	Diameter	Aperture
36.50 43.30	45.00 - 55.30	25.20 - 26.00

Status : Common.

Cyclophorus (Glossostylus) pearsoni (Benson)
(C23, C24)

1851. *Cyclostoma pearsoni* Benson, *Ann. Mag. nat. Hist.Soc.* (2)8 : 185.

1921. *Cyclophorus (Glossostylus) pearsoni*: Gude, *Fauna British India, Mollusca* 3 : 65.

Shell depressedly turbinata, fairly thick, umbilicate, pale white with brownish epidermis, whorls 5, convex, crowded with numerous fine spiral markings, decussated



C21. *Cyclophorus himalayanus* (Pfeiffer)—ventral view



C22. *Cyclophorus himalayanus* (Pfeiffer)—ventral view



C23. *Cyclophorus pearsoni* (Benson)—lateral view



C24. *Cyclophorus pearsoni* (Benson)—lateral view



C25. *Cyclophorus pyrotrema* Benson—lateral view



C26. *Cyclophorus pyrotrema* Benson—lateral view

by vertical striae, spiral sculpture obsolete on apical whorls; brown zig zag markings above, whitish band around periphery, dark narrow band just below, also a number of fine spiral markings on the base; aperture suboblique, circular; peristome orange coloured, continuous, reflected, a little angulate above.

Differs from the above species in being more depressed, having numerous fine spirals and also the brown markings.

Distribution : India : Assam, Arunachal Pradesh, Meghalaya. Elsewhere: Bangladesh.

Measurements (in mm) :

Height	Diameter	Aperture
27.00	43.50	22.40

Status : Rare.

Genus *Craspedotropis* Blanford, 1864

1864. *Craspedotropis* Blanford, *Ann. Mag. nat. Hist.*, (3) 13 : 454 (as subgenus of *Cyclophorus*).

Number of Indian species : Four.

Distribution : India (South and North-east, 6000ft). Endemic.

Size Range (Indian species) : 4.50-6.00 mm in diameter

Craspedotropis biliratus (Beddome)

(Fig. 15)

1875. *Cyclophorus biliratus* Beddome, *Proc. zool. Soc. Lond.*, p.452, pl. 53, fig. 34.

1921 *Craspedotropis bilirata* : Gude, *Fauna British India, Mollusca*, 3 : 15, fig. 6.

Shell conoidly turbinate, umbilicate, with dark brown epidermis, whorls 6, upper whorls without distinct sculpture, last two with raised spiral ribs, a number of ribs on last whorl on the periphery, above it and also below at the base; coarse oblique

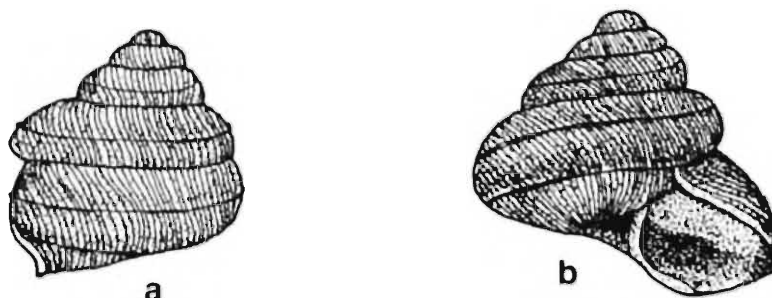


Fig. 15. *Craspedotropis biliratus*, a. dorsal view; b. ventral view.

striae also present on the last whorl, distinct near the suture and at umbilical region; aperture oblique, sub circular, slightly angled at the points where the ribs terminate at the peristome which is single and thin.

Distribution : India : Karnataka, South Canara range of Ghats (2500 ft).

Measurements (in mm) :

Height		Diameter		Aperture	
4.00	5.00	3.80	4.80	2.00	3.00

Status : Rare.

Genus *Cyathopoma* Blanford, 1864

1864. *Cyathopoma* Blanford, *Ann. Mag. nat. Hist.*, (3) 13 : 449.

Number of Indian subgenera : Three.

Subgenus *Cyathopoma* s.st.

Number of Indian species : Sixteen.

Distribution : India : (South, upto 7000 ft); Elsewhere: Belgium, Congo, Japan, Scyelles, Sri Lanka.

Size Range (Indian species) : 1.75 4.00 mm in length

Cyathopoma (Cyathopoma) deccanense Blanford (Fig. 16)

1868. *Cyathopoma deccanense* Blanford, *J. Conchyl.*, 16 : 258.

1921. *Cyathopoma (Cyathopoma) deccanense* : Gude, *Fauna British India, Mollusca*, 3 : 134.

Shell small, turbinate, narrowly umbilicate, pale whitish with a deciduous epidermis, close radial striae and distinct raised spiral ribs present throughout continuing within the umbilicus, whorls 4½, convex, last whorl swollen and cylindrical with 5-6 raised

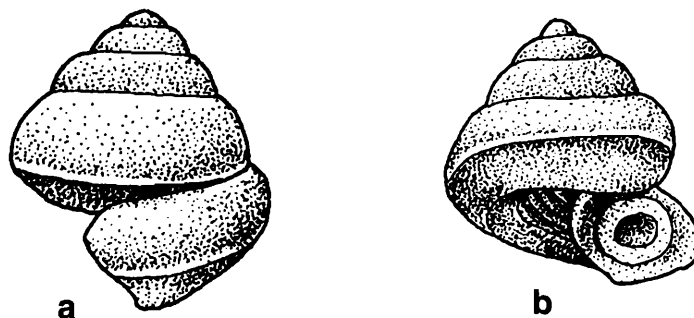


Fig. 16. *Cyathopoma deccanense* a. dorsal view; b. ventral view.

spiral ribs; aperture suboblique, circular, peristome not much expanded, crenulated at the terminations of the raised spiral ribs, operculum with raised edges to the whorls, incurved towards centre.

Distribution : India : Western Ghat: Khandalla, Bhore Ghat (upto 4000ft.).

Measurements (in mm) :

Thickness	Diameter	Aperture
2.50 3.25	2.50 - 3.00	1.50 - 1.80

Status : Not Common.

Subgenus *Jerdonia* Blanford, 1861

1861. *Jerdonia* Blanford, *J. Asiat. Soc. Beng.*, **30** : 348 (as genus)

Number of Indian species : Nine.

Distribution : India (South, Andaman and Nicobar Islands), Sri Lanka.

Size Range (Indian species) : 2.00 - 3.50 mm in length.

Cyathopoma (Jerdonia) trochlea (Benson)

(Fig. 17)

1851. *Cyclostoma trochlea* Benson, *Ann. Mag. nat. Hist.*, (2) **8** : 189

1921. *Cyathopoma (Jerdonia) trochlea* : Gude, *Fauna British India Mollusca*, **3** : 152.

Shell small, pyramidally turreted, narrowly umbilicate, covered with a straw coloured epidermis, with fine close vertical striae and distant prominent spiral ribs, whorls 5, angulately convex with rather straight sides, last whorl with three raised ribs, one above, one below the periphery and another around the umbilicus; aperture circular, oblique, peristome thin, angulate at the joining of the submedian rib.

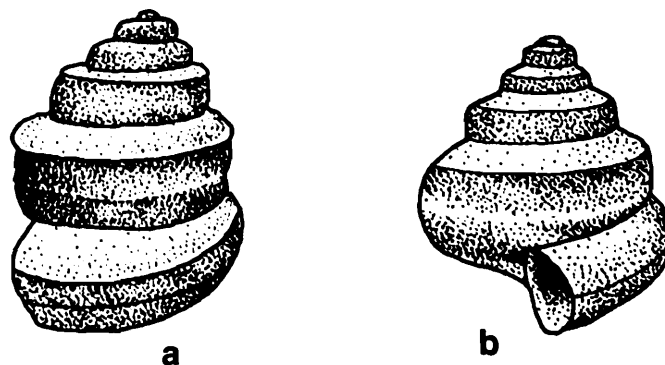


Fig. 17. *Cyathopoma trochlea*, a. dorsal view; b. ventral view.

Distinct for its more elongate form, flat sided whorls and also less number of spiral ribs.

Distribution : India : Karnataka (Nilgiri).

Measurements (in mm) :

Height	Diameter
2.00	3.00

Status : Rare.

Subgenus *Pseudojerdonia* Kobelt, 1902

1902. *Pseudojerdonia* Kobelt, *Das Tierreich Lief*, **16** : 227.

Number of Indian species : Three.

Distribution : India (North-east). Endemic.

Size Range (Indian species) : 1.50 2.00 mm in diameter

Cyathopoma (Pseudojerdonia) garoense Godwin-Austen
(Fig. 18)

1876. *Cyathopoma garoense* Godwin-Austen, *J. Asiat. Soc. Beng.*, **45(2)** : 183.

1921. *Cyathopoma (Pseudojerdonia) garoense* : Gude, *Fauna British India, Mollusca*, **3** : 153.

Shell small, turbinate, openly umbilicate, whitish, whorls 5, well rounded, with raised spiral ribs, last whorl with 6 spiral ribs, 3 lower ones of which are more distant; a number of ribs also present near the umbilicus; aperture subvertical, circular, peristome simple.

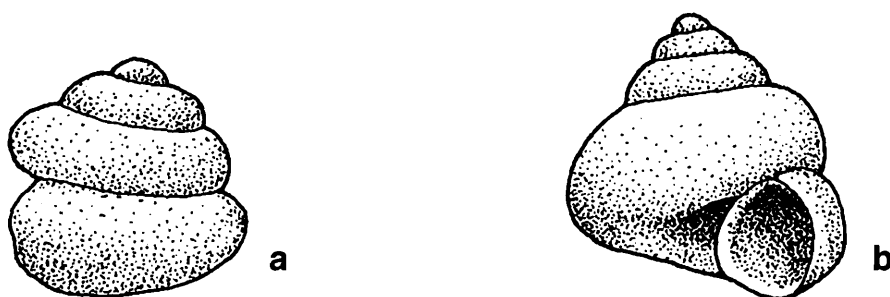


Fig. 18. *Cyathopoma garoense*, a. dorsal view; b. ventral view.

Closer to *C. deccanense*, differs in the ribs on base being less pronounced, lacking the well formed crenulations in the peristome and the operculum being flat in front without raised edges.

Distribution : India : Meghalaya (Garo and Jaintia Hills).

Measurements (in mm) :

Height	Diameter	Aperture
2.00	2.25	1.90

Status : Rare.

Genus *Ditropis* Blanford, 1869

1869. *Ditropis* Blanford, *J. Asiat. Soc. Beng.*, **38(2)**: 126. (as subgenus of *Cyclophorus*).

Number of Indian species : Three.

Distribution : India (Western Ghat, Travancore Hills), Australia, East Africa, Malaysia, New Guinea, Philippines.

Size Range (Indian species) : 6.00 – 8.50 mm in diameter.

Ditropis planorbis Blanford
(C27)

1869. *Cyclophorus (Ditropis) planorbis* Blanford, *J. Asiat. Soc. Beng.*, **38(2)** : 126, pl. 16, fig. 1.

1921. *Ditropis planorbis*: Gude, *Fauna British India, Mollusca*, **3** : 25.

Shell depressed and discoidal, thin, glossy, widely umbilicate, obsolete striate; spire flat, apex not rising above, suture deeply impressed, whorls 4 - 4½, fairly convex above, last whorl almost square in shape, two keels, one at the periphery and the other at the margin of base encircles the last whorl and also reaches inside the umbilicus, aperture oblique, squarish, a white internal lip present, peristome thickened but not expanded.



C27. *Ditropis planorbis* Blanford— dorsal and ventral view.

Distribution : India : Kerala, Tamil Nadu(Western Ghat).

Measurements (in mm) :

Thickness		Diameter		Aperture	
1.75	2.00	5.50	8.60	1.50	2.00

Status : Common.

Genus *Japonia* Gould, 1859

Subgenus *Lagochilus* Blanford, 1864

1864. *Lagocheilus* Blanford, *Ann. Mag. nat. Hist.*, (3) 13 : 452.

Number of Indian species : Ten.

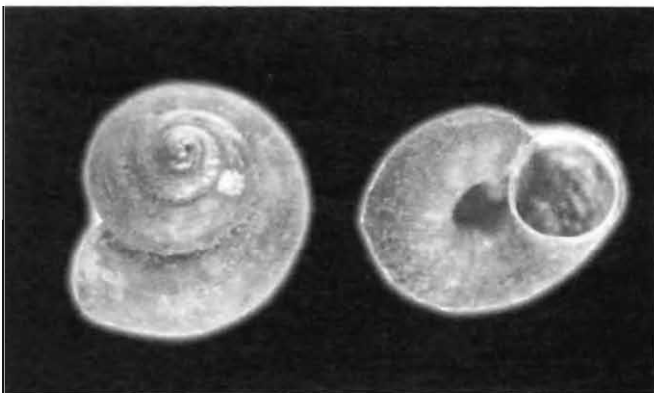
Distribution : India (North-east, South, Andaman and Nicobar Islands), Bangladesh, Myanmar, New Guinea, Philippines, Sri Lanka, Thailand, Vietnam (North and South) and Pacific Islands

Size Range (Indian species) : 4.50 6.00 mm in diameter

Japonia (Lagochilus) roepstorfi (Moerch)
(9, 10)

1876. *Cyclophorus (Craspedotropis) roepstorfi* Moerch, *J. Conchyl.* 24 : 361.

1921. *Japonia (Lagochilus) roepstorfi* : Gude, *Fauna British India, Mollusca*, 3 : 11, fig. 3.



9. *Japonia roepstorfi* (Moerch)—dorsal and ventral view 10. *Japonia roepstorfi* (Moerch)—ventral view

Shell small, depressedly conoid, moderately umbilicate, covered by a thick and rough epidermis and with whitish flammules, whorls 5, convex, sculptured with close radial striae and raised, ciliated distant spiral lirae, both above and below, extending upto the edge of umbilicus, spiral lirae closer on base; aperture oblique, circular, peristome simple, angularly notched above.

Distribution : India : Nicobar Islands.

Measurements (in mm) :

Thickness		Diameter		Aperture	
4.45	5.10	5.00	6.55	3.00	3.60

Status : Common.

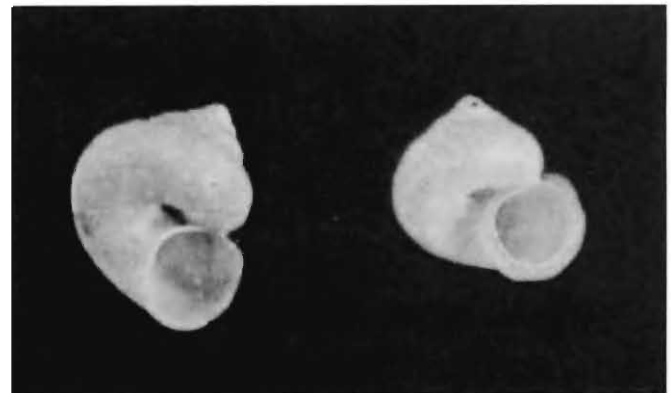
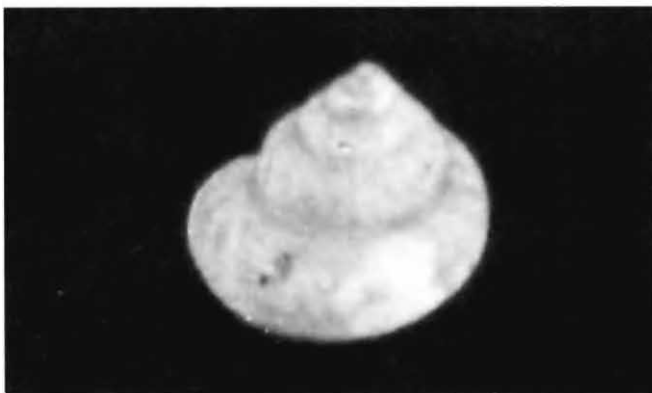
***Japonia (Lagochilus) tomotrema* (Benson)**

(11, 12)

1857. *Cyclophorus ? tomotrema* Benson, *Ann. Mag. nat. Hist.*, (2)19 : 206.

1921. *Japonia (Lagochilus) tomotrema* : Gude, *Fauna British India, Mollusca*, 3 : 12.

Shell turbinately pyramidal, narrowly umbilicate, radiately finely striate and closely spirally lirated, whorls 5, convex, last whorl subcarinate at the periphery; aperture oblique, subcircular, peristome double, expanded, internal continuous, external with a small incision above the suture.



11. *Japonia tomotrema* (Benson)—dorsal view

12. *Japonia tomotrema* (Benson)—ventral view

Differs in being more conical (higher than broad) more closely and finely spirally lirated and also being more narrowly umbilicate.

Distribution : India : Arunachal Pradesh, Meghalaya, Nagaland, West Bengal (Darjeeling).

Measurements (in mm) :

Thickness		Diameter		Aperture	
4.55	7.75	4.30 - 6.75		2.65 - 3.60	

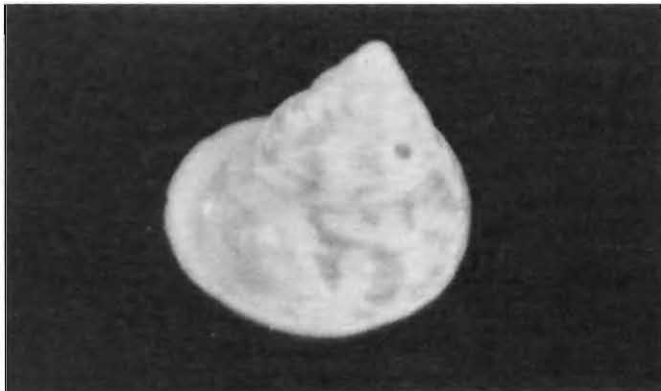
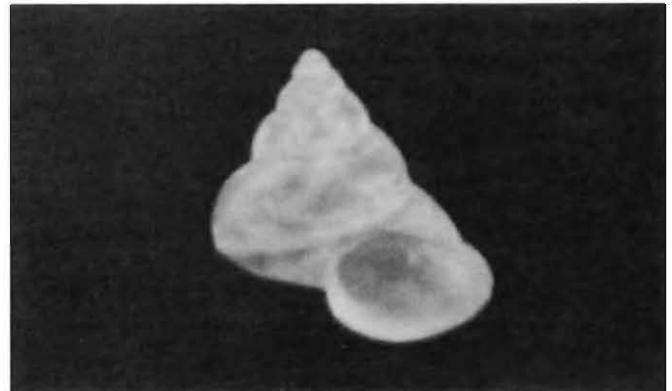
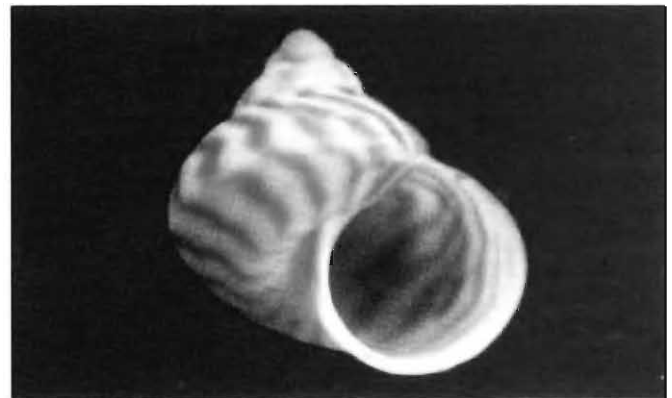
Status : Not Common.

Genus *Leptopoma* Pfeiffer, 18471847. *Leptopoma* Pfeiffer, *Zeits Malak.*, 4 : 108.Subgenus *Trocholeptopoma* Kobelt & Moellendorff, 18971897. *Trocholeptopoma* Kobelt & Moellendorff, *Nachr. Deuts. Malak. Ges.*, 29 : 80.*Number of Indian species* : Three.*Distribution* : India (North-east, Andaman and Nicobar Islands), Malaysia, Mauritius, Myanmar, New Guinea, Sri Lanka.*Size Range (Indian species)* : 11.00 17.00 mm in length.*Leptopoma (Trocholeptopoma) aspirans* Benson

(C28, C29, 13, 14)

1856. *Leptopoma aspirans* Benson, *Ann. Mag. nat. Hist.*, (2)17 : 229.1921. *Leptopoma (Trocholeptopoma) aspirans*: Gude, *Fauna British India, Mollusca*, 3 : 3.

Shell globosely conoid, narrowly umbilicate, pale white with brown narrow flammules in fresh shells; whorls 5½, rounded, sculptured with oblique striae and

13. *Leptopoma aspirans* Benson—dorsal view14. *Leptopoma aspirans* Benson—ventral viewC28. *Leptopoma aspirans* Benson—Lateral viewC29. *Leptopoma aspirans* Benson—Lateral view

raised spiral lines, around 6 on each whorl, the last subcarinate at the periphery, carination strong in young shells, apex acute; aperture oblique circular, peristome expanded, margins joined by a thin callus.

Distribution : India : Meghalaya.

Elsewhere : Myanmar, Perak.

Measurements (in mm) :

Height		Diameter	Aperture
10.70	13.10	10.25 - 12.10	6.40 - 7.80

Status : Common.

Genus *Leptopomoides* G. Nevill, 1878

1878. *Leptopomoides* Nevill, *Hand List. Moll. Indian Mus.*, 1 : 273 (as subgenus of *Cyclophorus*).

Number of Indian species : One.

Distribution : India (South), Maldives, Sri Lanka.

Size Range (Indian species) : 7.00 in diameter

Leptopomoides valvatus Moellendorff

(Fig. 19)

1897. *Leptopomoides valvatus* Moellendorff *Nachr. Deuts. Malak. Ges.*, 29 : 35.

1921. *Leptopomoides valvatus*: Gude, *Fauna British India, Mollusca*, 3 : 21.

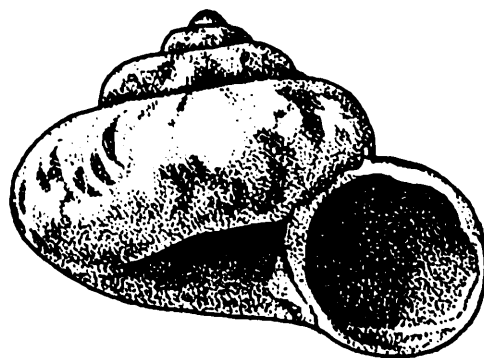


Fig. 19. *Leptopomoides valvatus*, ventral view.

Shell small, depressedly turbinate, finely striate, deeply umbilicate, whorls 5, convex; aperture oblique, peristome simple.

Distribution : India : Karnataka.

Measurements (in mm) :

Height	Diameter
5.00	7.00

Status : Rare.

Genus *Micraulax* Theobald, 1876

1876. *Micraulax* Theobald, *J. Asiat. Soc. Beng.*, 45(2) : 185.

Number of Indian species : Two.

Distribution : India (South, Western Ghat, 2000 ft.), Sri Lanka.

Size Range (Indian species) : 13.00-14.50 mm in diameter.

Micraulax scabra Theobald

(15, 16)

1876. *Micraulax scabra* Theobald, *J. Asiat. Soc. Beng.*, 45(2) : 185, pl.14, fig.4.

1921. *Micraulax scabra*: Gude, *Fauna British India, Mollusca*, 3 : 22.

Shell depressedly coiled, openly and widely umbilicate, brownish, with zig-zag chocolate markings, also covered by a rough epidermis, obliquely striate by close coarse lines of growth; sutures crenulate, whorls 4-4½, convex, the last whorl sub inflated, wide; aperture oblique, sub circular, angulate above at the point of attachment to the last whorl, peristome thin, slightly corrugate above; corresponding to internal groove, a raised rib present along the edge of umbilicus on the base.

Distribution : Kerala.

Measurements (in mm) :

Height		Diameter		Aperture	
11.90	12.50	6.00	7.80	5.00	7.50

Status : Rare.



15. *Micraulax scabra* Theobald—dorsal view



16. *Micraulax scabra* Theobald—ventral view

Genus *Mychopoma* Blanford, 1869?

1869. *Mychopoma* Blanford, *J. Asiat. Soc. Beng.*, **38** : 131.

Number of Indian species : Three.

Distribution : India (South Indian Hills, 7000 ft.), Comoro Islands, New Guinea.

Size Range (Indian species) : 5.00-8.50 mm in diameter.

Mychopoma limbiferum Blanford
(17, 18)

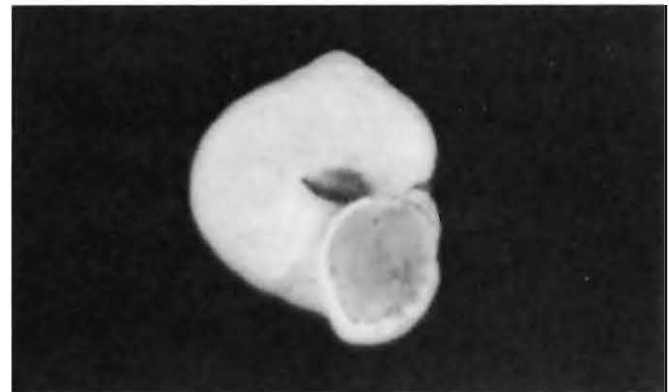
1869. *Mychopoma limbiferum* Blanford, *J. Asiat. Soc. Beng.*, **38** : 133

1921. *Mychopoma limbiferum*: Gude, *Fauna British India, Mollusca*, **3** : 156.

Shell small, conically turbinate, narrowly umbilicate, whitish with a thick hairy epidermis, decussately sculptured by close oblique and distant spiral lines, whorls 5½, convex, apex acute, last whorl very slightly descending near the aperture, shell with



17. *Mychopoma limbiferum* Blanford—dorsal view



18. *Mychopoma limbiferum* Blanford—ventral view

epidermis has rows of short hairs around the umbilicus; raised spiral ribs produce series of canals within the umbilical opening; aperture oblique, sub circular, peristome thin and simple near the umbilicus where it is distinctly curved back, in other portion it is reflected and produced at the penultimate whorl, corresponding to the raised spiral ribs the peristome is corrugated towards the base.

Distribution : India : Pulney Hills (7000 ft).

Measurements (in mm)

Height		Diameter	Aperture
6.20	7.25	5.50 - 7.60	3.00 - 3.85

Status : Rare.

Genus *Scabrina* Blanford, 1883

1863. *Scabrina* Blanford, *J. Asiat. Soc. Beng.*, **32** : 322 (as section of *Cyclophorus*).

Number of Indian species : One.

Distribution : India (North-east), China, Comoro Islands, Myanmar, Sri Lanka.

Size Range (Indian species) : 10.00-17.00 mm in diameter

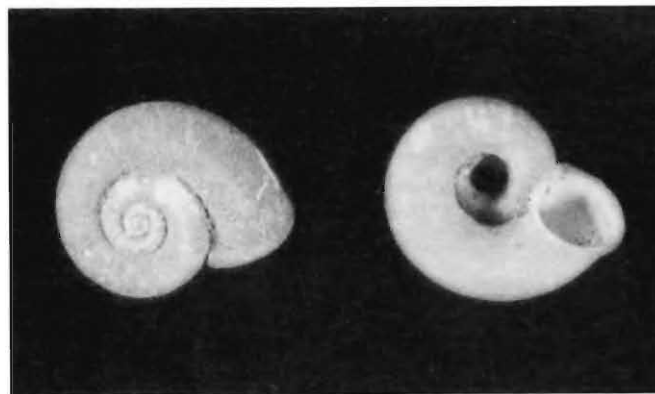
Scabrina pinnulifera (Benson)

(19)

1857. *Cyclophorus pinnulifera* Benson, *Ann. Mag. nat. Hist.*, (2)**19** : 205.

1921. *Scabrina pinnulifera*: Gude, *Fauna British India, Mollusca*, **3** : 30.

Shell orbiculately depressed, widely umbilicate, covered by a thick, rough brown epidermis, with close radial striae, decussated by very fine, microscopic spiral lines; spire slightly raised, whorls 4, rounded, last whorl moderately swollen; aperture slightly oblique, circular, peristome very closely double, inner continuous, outer expanded, triangularly sinuate above.



19. *Scabrina pinnulifera* (Benson)—dorsal and ventral view

Distribution : India : Assam, Meghalaya, Nagaland.

Measurements (in mm) :

Height		Diameter		Aperture	
4.25	8.30	10.50	17.15	4.20	7.00

Status : Not Common.

Genus *Theobaldius* G. Nevill, 1878

1878. *Theobaldius* Nevill, *Hand List. Moll. Indian Mus.*, **1** : 275 (as subgenus of *Cyclophorus*).

Number of Indian species : Twelve.

Distribution : India (South & North-east), Sri Lanka.

Size Range (Indian species) : 7.00 - 30.00 mm in diameter.

Theobaldius deplanatus (Pfeiffer)

(20, 21)

1854. *Cyclostoma (Cyclophorus) deplanatum* Pfeiffer, *Proc. zool. Soc. Lond.*, p. 301.

1921. *Theobaldius deplanatus*: Gude, *Fauna British India, Mollusca*, **3** : 35.

Shell widely umbilicate, depressed, subdiscoidal, covered by a brown epidermis, thick, closely and coarsely marked with oblique striae, sometimes with a peripheral band, spire slightly raised; whorls 5, rounded, last whorl large and slightly descending; aperture oblique, subcircular, peristome continuous, closely double, thickened and expanded, angularly produced above, columella arcuate.



20. *Theobaldius deplanatus* (Pfeiffer)–dorsal view

21. *Theobaldius deplanatus* (Pfeiffer)–ventral view

Distribution : India: Kerala, Tamil Nadu (W. Ghat).

Measurements (in mm) :

Height	Diameter	Aperture
7.20 - 10.65	17.60 - 26.85	6.00 - 9.00

Status : Not Common.

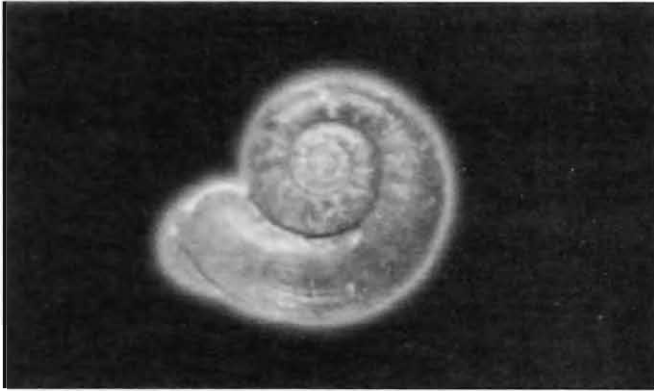
Theobaldius nivicola (Godwin-Austen)

(22, 23)

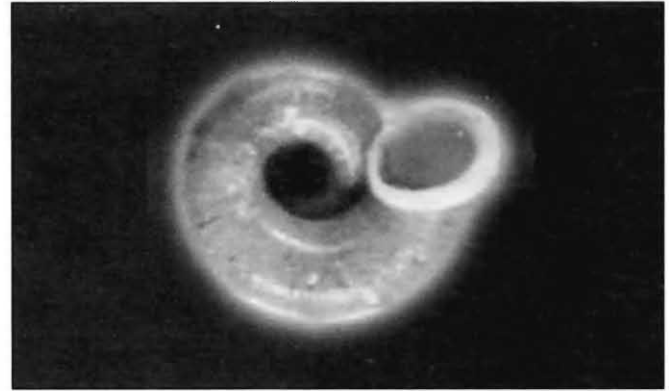
1876. *Cyclophorus (Myxostoma) nivicola* Godwin-Austen, *J. Asiat. Soc. Beng.*, **45(2)** : 173, pl. 7, fig. 1.

1921. *Theobaldius nivicola* : Gude, *Fauna British India, Mollusca*, **3** : 37.

Shell flatly discoidal, openly umbilicate, with distinct spiral markings, deep brownish with pale zig-zag markings, concentrated on top whorls, gradually fading on last, a dark peripheral band and a narrower pale band just above it; whorls 5, the last whorl large and descending; aperture oblique, circular, peristome double, thickened and well reflected with a notch above.



22. *Theobaldius nivicola* (Godwin-Austen)-
dorsal view



23. *Theobaldius nivicola* (Godwin-Austen)-
ventral view

Differs from the other being distinctly spirally marked.

Distribution : India : Arunachal Pradesh (7000 ft.).

Measurements (in mm) :

Height	Diameter	Aperture
10.25	24.55	7.95

Status : Rare.

Theobaldius shiplayi (Pfeiffer)
(24, 25)

1856. *Cyclostoma*(*Cyclophorus*) *shiplayi* Pfeiffer, *Proc. zool. Soc. Lond.*, p. 337.

1921. *Theobaldius shiplayi* : Gude, *Fauna British India, Mollusca*, 3 : 42.

Shell thin, depressed, conoid, rather narrowly and deeply umbilicate, whitish with brown zig-zag markings above, a band of same colour around the periphery; with close oblique striae ; whorls 4, well rounded, the last whorl distinctly descending near aperture, which is oblique, subcircular, peristome thin and simple, angulately produced and attached to the base of the last whorl.

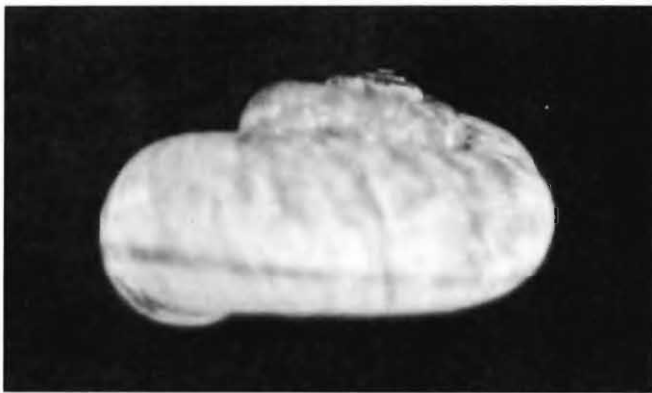
Differs from the other two being more conoid and also in the form of peristome which is attached to the base of last whorl.

Distribution : India : Tamil Nadu (Nilgiri).

Measurements (in mm) :

Height		Diameter		Aperture	
8.90	10.80	16.80	17.30	6.75	7.90

Status : Rare.



24. *Theobaldius shiplayi* (Pfeiffer)—lateral view



25. *Theobaldius shiplayi* (Pfeiffer)—lateral view

Subfamily ALYCAEINAE

Genus *Alycaeus* Gray, 1850

1850. *Alycaeus* Gray, *Nomencl. Moll. Brit. Mus.*, 1 : 27.

Number of Indian species : Twenty three.

Distribution : India (upto 10000 ft.), Malaysia, Myanmar, Greater Sunda Islands.

Size Range (Indian species) : 3.00 7.00 mm in diameter.

Subgenus *Alycaeus s.st.*

Alycaeus(Alycaeus) burti Godwin-Austen

(26, Fig. 20)

1874. *Alycaeus (Alycaeus) burti* Godwin-Austen, *J. Asiat. Soc. Beng.*, 43(2) : 149, pl.3, fig. 9.

1921. *Alycaeus (Alycaeus) burti* : Gude, *Fauna British India, Mollusca*, 3 : 206.

Shell small, turbinate, openly umbilicate, distinctly sculptured with prominent ribbings, finer on upper whorls, coarser on last whorl, particularly the swollen portion; whorls 5, last whorl with a constricted smooth portion just behind the peristome, then swells up for a little distance; a sutural tube running along the suture for a short distance is situated at the beginning of the swell; aperture sub circular, slightly angular on inner upper margin; peristome double, thickened, reflected, inner continuous.

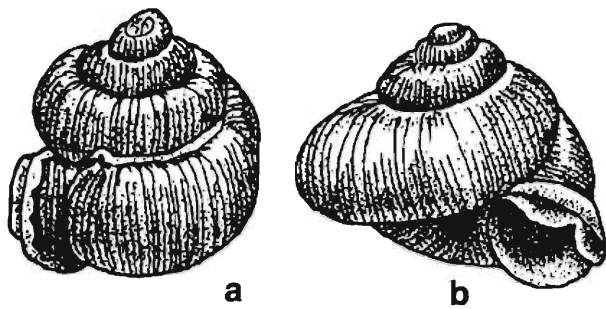
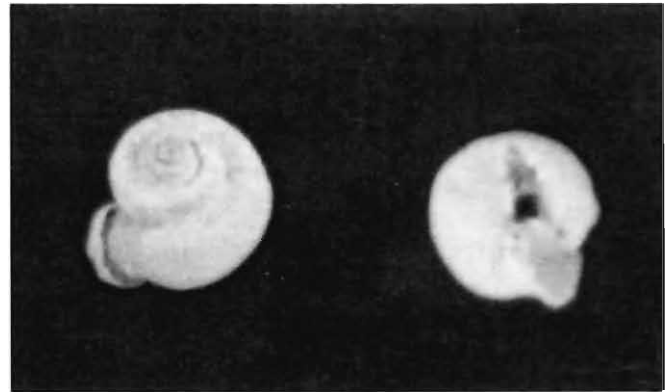


Fig. 20. *Alycaeus burti*, a. dorsal view; b. ventral view.



26. *Alycaeus burti* Godwin-Austen—dorsal and ventral view

Distribution : India : Assam, Arunachal Pradesh.

Elsewhere : Bhutan.

Measurements (in mm) :

Height	Diameter	Aperture
3.75	5.50	1.60

Status : Rare.

***Alycaeus(Alycaeus) conicus* Godwin-Austen**
(27, Fig. 21)

1871. *Alycaeus (Alycaeus) conicus* Godwin-Austen, *J. Asiat. Soc. Beng.*, **40(2)** : 87, pl. 3, figs. 1, 1a, 1b.

1921. *Alycaeus (Alycaeus) conicus* : Gude, *Fauna British India, Mollusca*, **3** : 208.

Shell small, conically turbinata, narrowly perforate, distinctly ribbed on swell of last whorl but almost smooth in other parts, except a few distant markings here and

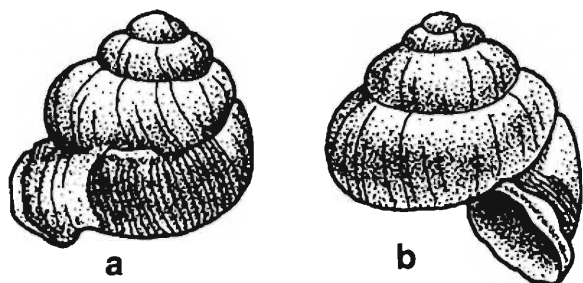
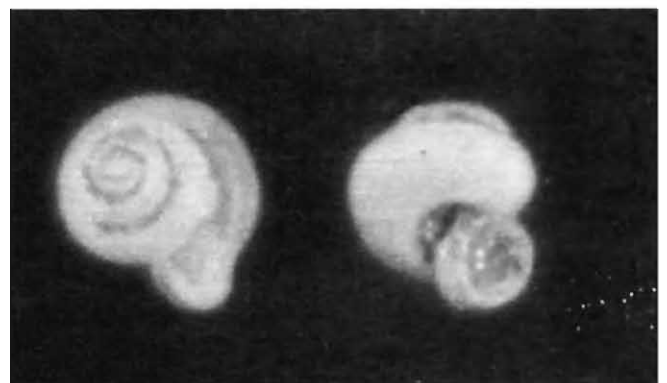


Fig. 21. *Alycaeus conicus*, a. dorsal view; b. ventral view.



27. *Alycaeus conicus* Godwin-Austen—dorsal and ventral view

there; sutures much impressed; whorls 4- 4½, sutural tube narrow and short, aperture circular, peristome double, expanded and reflected.

Differs from the above species in being smaller and more conical (nearly as high as broad) and also being almost sculpture less on apical whorls.

Distribution : India : Assam (Limestone Hills).

Measurements (in mm) :

Height	Diameter	Aperture
2.80	3.00	1.50

Status : Not common.

Genus *Chamalycaeus* Kobelt & Moellendorff, 1897

1897. *Chamalycaeus* Kobelt & Moellendorff, *Nachr, Deuts. Malak. Ges.*, **29** : 151.

Number of Indian species : Sixty seven.

Distribution : India (North-east, single species each from Andaman and Nicobar Islands, upto 11000 ft), China, Japan, Malaysia, Myanmar, Philippines.

Size Range (Indian species) : 3.00 10.00 mm in length.

Subgenus *Chamalycaeus* s.st.

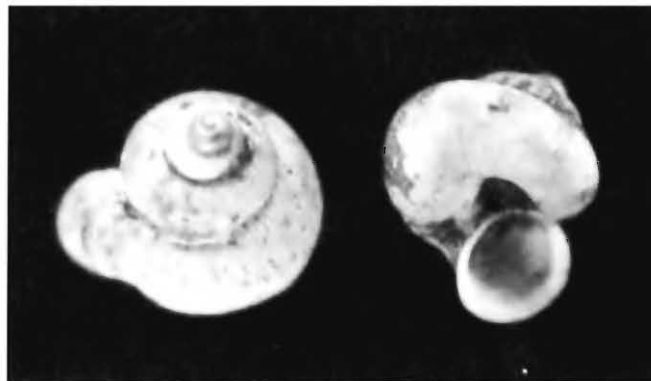
Chamalycaeus (Chamalycaeus) busbyi (Godwin-Austin)

(28)

1893. *Alycaeus busbyi* Godwin-Austen, *Proc. zool. Soc. Lond.*, p. 595.

1921. *Alycaeus (Chamalycaeus) busbyi* : Gude, *Fauna British India, Mollusca*, **3** : 225.

Shell larger, tumid, turbinate, widely umbilicate, with fine close ribbing throughout, spire raised, apex blunt; whorls 4½, well rounded, last whorl much swollen, angulate



28. *Chamalycaeus busbyi* Godwin-Austen—dorsal and ventral view

around the umbilicus; distinctly constricted for a short length behind the aperture, sutural tube of moderate length; thick; aperture circular, peristome double, expanded and reflected.

Distribution : India : Nicobar Islands.

Measurements (in mm) :

Height	Diameter	Aperture
3.00	7.50	1.70

Status : Not common.

***Chamalycaeus (Chamalycaeus) macgregori* (Godwin-Austen)**
(29, 30)

1914. *Alycaeus macgregori* Godwin-Austen, *Land & Freshwater Moll. India*, **2** : 421.

1921. *Alycaeus(Chamalycaeus) macgregori*: Gude, *Fauna British India, Mollusca*, **3** : 229.

Shell globosely turbinate, openly umbilicate, finely ribbed, sculpture on swell slightly stronger and almost absent on constricted portion; spire depressedly conoid; sutural tube moderately long, ; whorls 4, aperture circular, peristome thickened and reflected, plicate inside.



29. *Chamalycaeus macgregori* (Godwin-Austen)—dorsal view



30. *Chamalycaeus macgregori* (Godwin-Austen)—ventral view

Differs from the other species in having a shorter constricted portion on the last whorl, being rounded around the umbilicus and having crenulations within the aperture.

Distribution : India : Arunachal Pradesh (Dafla hills).

Measurements (in mm) :

Height	Diameter	Aperture
2.50	7.00	1.50

Status : Rare (Known by Type only).

Subgenus *Dicharax* Kobelt & Moellendorff, 1900

1900. *Dicharax* Kobelt & Moellendorff, *Nachr. Deuts. Malak. Ges.*, **32** : 186.

Number of Indian species : Forty five.

Distribution : India (North-east, a few in South India, single species in North-west), China, Malaysia, Myanmar.

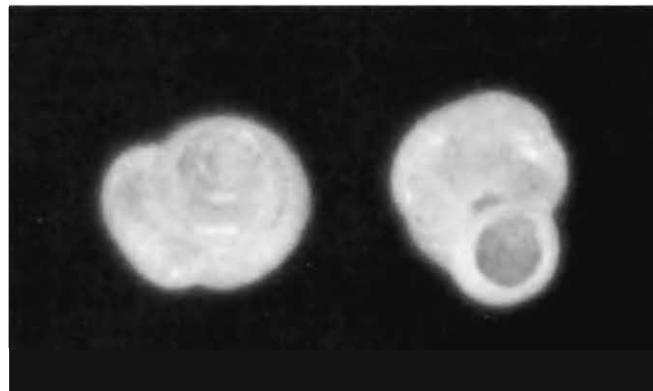
Size Range (Indian species) : 3.00 - 7.00 mm in diameter.

Chamalycaeus (Dicharax) digonius (Godwin-Austen)
(31)

1871. *Alycaeus digonius* Godwin-Austen, *J. Asiat. Soc. Beng.*, **40(2)** : 88, pl. 3, figs., 2, 2a, 2b.

1921. *Alycaeus (Dicharax) digonius*: Gude, *Fauna British India, Mollusca*, **3** : 247.

Shell very narrowly perforate, turbinate, finely and distantly costulate on the last two whorls; sculpture closer on the inflated portion of last whorl and absent on the constriction; spire conoid, apex blunt; whorls 4, rounded, last whorl swollen, and then constricted, near the constriction an internally hollow diagonal ridge present, sutural tube short; aperture circular, peristome double, sinuate above and reflected.



31. *Chamalycaeus digonius* (Godwin-Austen)—dorsal and ventral view

Distribution : India : Assam, Nagaland.

Measurements (in mm) :

Height	Diameter	Aperture
1.85 - 3.00	3.00 - 4.00	1.80 - 2.00

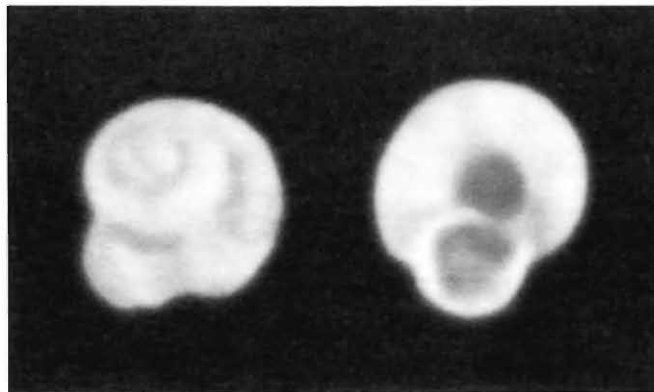
Status : Common.

Chamalycaeus (Dicharax) crenatus (Godwin-Austen)

(32)

1871. *Alycaeus crenatus* Godwin-Austen, *J. Asiat. Soc. Beng.*, **40(2)** : 90, pl. 3, figs., 5, 5b.1921. *Alycaeus (Dicharax) crenatus*: Gude, *Fauna British India, Mollusca*, **3** : 241.

Shell depressedly turbinate, moderately umbilicate, whitish, very finely and indistinctly costulate throughout, sculpture distinct on the swell of last whorl; whorls 4, rounded, last whorl swollen and constricted at the base of sutural tube which is moderately long and thick, constricted portion with a sub vertical ridge just behind the peristome; aperture circular, deeply waved on the outer margin; peristome closely double, expanded and reflected.

**32.** *Chamalycaeus crenatus* (Godwin-Austen)—dorsal and ventral view

Differs from the preceding species being bigger, being deeply waved on the outer margin and also in the form of the hollow ridge on the last whorl which is sub vertical and not diagonal.

Distribution : India : Assam, Meghalaya, Nagaland (upto 5000 ft).*Measurements* (in mm) :

Height	Diameter	Aperture
3.90 - 4.20	4.85 5.25	2.60 2.65

Status : Common.Subgenus ***Raptomphalus*** Godwin-Austen, 19141914. *Raptomphalus* Godwin-Austen, *Land & Freshwater Moll. India*, **2** : 366.*Number of Indian species* : Seven.*Distribution* : India (North-east), Myanmar.*Size Range (Indian species)* : 3.00 7.00 mm in diameter.

***Chamalycaeus (Raptomphalus) magnificus* (Godwin-Austen)**

1914. *Alycaeus (Raptomphalus) magnificus* Godwin-Austen, *Land & Freshwater Moll. India*, **2** : 366, pl. 156, figs. 1, 1a, 16.
 1921. *Alycaeus (Raptomphalus) magnificus*: Gude, *Fauna British India, Mollusca*, **3** : 288.

Shell globosely conoid, openly and widely umbilicate, umbilicus bordered by a sharp keel with fine, close sculpture on swell of last whorl, strong and distant on the other parts; whorls 4½, rounded, starting from the constriction a well raised ridge runs across, broadens and merges with the peristome; aperture ovate, subangulate above and below; peristome broad, expanded and strongly crenulated.

Distribution : India : Arunachal Pradesh (Abor hills).

Measurements (in mm) :

Height	Diameter
1.70	4.25

Status : Not common.

Genus ***Cycloryx*** Godwin-Austen, 1914

1914. *Cycloryx* Godwin-Austen, *Land & Freshwater Mollusca of India*, **2** : 334.

Number of Indian species : Thirteen.

Distribution : India (North-east), upto 10,000 ft. Endemic.

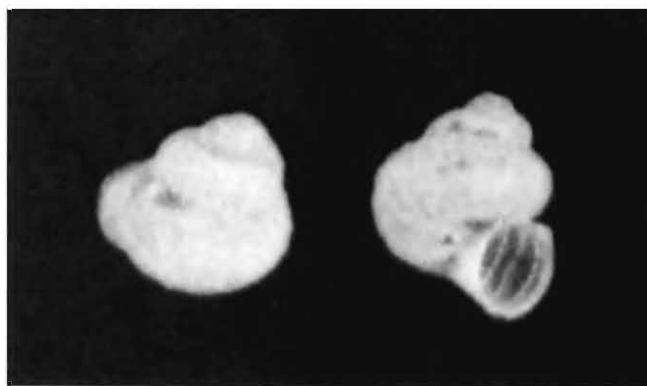
Size Range : 2.00 3.00 mm in diameter.

***Cycloryx constrictus* (Benson)**

(33)

1851. *Cyclostoma constrictus* Benson, *Ann. Mag. nat. Hist.*, (2) **8** : 188.

1921. *Alycaeus (Cycloryx) constrictus* : Gude, *Fauna British India, Mollusca*, **3** : 277.



33. *Cycloryx constrictus* (Benson)—dorsal and ventral view

Shell very small, conoid, perforation blocked by reflected peristome, finely and distinctly costulate throughout, spire elongate, apex obtuse, whorls 4, rounded, last whorl strangulated behind the aperture; aperture vertical, circular, peristome expanded and reflected nearly blocking the perforation; sutural tube short and club shaped.

Differs from other species being more conical (more high than broad) having uniform sculpture throughout including the last whorl, being strangulated behind the aperture and also the aperture being vertical.

Distribution : India : Sikkim, West Bengal (Darjeeling).

Measurements (in mm) :

Height	Diameter	Aperture
3.50	2.00	0.80

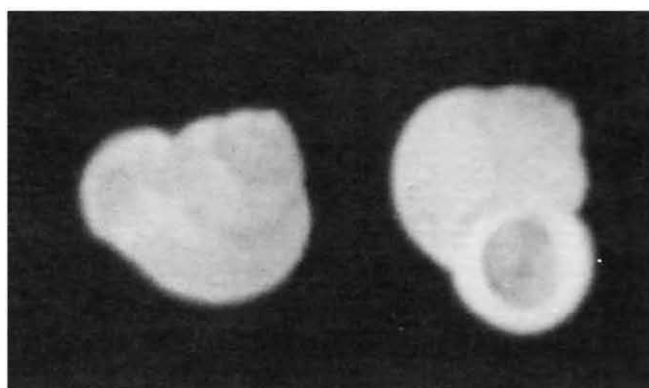
Status : Not Common.

***Cycloryx graphicus* (Blanford)**

(34)

1862. *Alycaeus graphicus* Blanford, *J. Asiat. Soc. Beng.*, **31** : 137.

1921. *Alycaeus (Cycloryx) graphicus* : Gude, *Fauna British India, Mollusca*, **3** : 280.



34. *Cycloryx graphicus* (Blanford)—dorsal and ventral view

Shell perforate, ovately globose, finely and subdistantly costulate throughout; sculpture closer on the tumid portion and irregular behind constriction; whorls 4 rounded, last whorl large and inflated; aperture oblique, circular, peristome double, expanded, umbilicus largely obliterated by reflected left edge of the outer peristome, sutural tube short and club shaped.

Distribution : India : Assam, Arunachal Pradesh, Nagaland.

Measurements (in mm) :

Height	Diameter	Aperture
3.00	3.00	1.50

Status : Common.

Genus *Dioryx* Benson, 1859

1859. *Dioryx* Benson, *Ann. Mag. nat. Hist.*, (3)3 : 177 (as subsection of *Alycaeus*).

Number of Indian species : Four.

Distribution : India (North-east), upto 4700 ft., China, Myanmar.

Size Range (Indian species) : 3.00 4.00 mm in diameter.

Dioryx urnula (Benson)

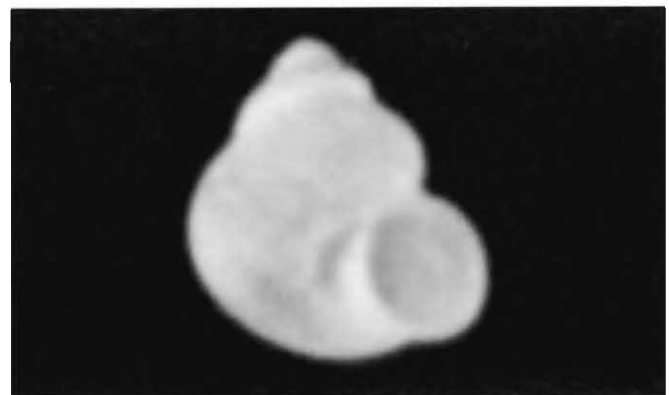
(35, 36)

1853. *Alycaeus urnula* Benson, *Ann. Mag. nat. Hist.*, (2)11 : 284.

1921. *Dioryx urnula* : Gude, *Fauna British India, Mollusca*, 3 : 201.



35. *Dioryx urnula* (Benson)—dorsal view



36. *Dioryx urnula* (Benson)—ventral view

Shell small, globose conical with an acute apex, narrowly perforate, whitish, whorls $3\frac{1}{2}$, well rounded, the last large and tumid, obsolete radially striate, constricted just behind the aperture, constricted portion narrow, sutural tube long and moderately thick; aperture circular, vertical, peristome very closely double a little reflected, attached to the last whorl above.

Distribution : India : Meghalaya, Nagaland, Sikkim, West Bengal (Darjeeling).

Measurements (in mm) :

Height	Diameter	Aperture
3.00 4.50	2.80 3.50	1.00 - 1.50

Status : Common.

Subfamily PTEROCYCLINAE

Genus *Pterocyclus* Benson, 1832

1832. *Pterocyclos* Benson, *J. Asiat. Soc. Beng.*, 1 : 11.

Number of Indian species : Sixteen.

Distribution : India (North-east and South India, one species each in Jharkhand, Orissa, West Bengal), China, Malaysia, Myanmar, Sri Lanka.

Size Range (Indian species) : 10.00 – 32.00 mm in diameter.

Pterocyclus brahmakundensis Godwin-Austen
(37, 38)

1915. *Pterocyclos brahmakundensis* Godwin-Austen, *Rec. Indian Mus.*, 8 : 499, fig. 1.

1921. *Pterocyclus brahmakundensis* : Gude, *Fauna British India, Mollusca*, 3 : 101.

Shell discoid, widely umbilicate, brownish with very close, oblique lines, zig-zag markings on apical whorls, a narrow black band on periphery; whorls 5, apex very slightly raised, rounded, last whorl descending in front; aperture circular, oblique, peristome double, reflected, the inner cut into a sinus below the wing, outer continuous and forming a spout above, attached to last whorl, directed upwards, open below.



37. *Pterocyclus brahmakundensis* Godwin-Austen—dorsal view

38. *Pterocyclus brahmakundensis* Godwin-Austen—ventral view

Distribution : India : East Assam.

Measurements (in mm) :

Height	Diameter	Aperture
8.90-9.00	19.15-20.60	8.00 – 8.70

Status : Rare.

***Pterocylus bilabiatus* Benson**

(39, 40)

1835. *Pterocylus bilabiatus* (Sowerby) Benson, *Zool. Journ.*, **5** : 462.1921. *Pterocylus bilabiatus* : Gude, *Fauna British India, Mollusca*, **3** : 100.

Differs from the preceding species in having a fairly raised apex and the last whorl not distinctly descending near the mouth. It differs from the other species in its shape and form of peristome, the wing is folded and margin of the peristome is distinctly undulated.

Distribution : India : Tamil Nadu (Nilgiri).



39. *Pterocylus bilabiatus* Benson—dorsal view

40. *Pterocylus bilabiatus* Benson—ventral view

Measurements (in mm) :

Height	Diameter	Aperture
6.50-7.45	14.20-16.00	5.15 – 5.80

Status : Not Common.

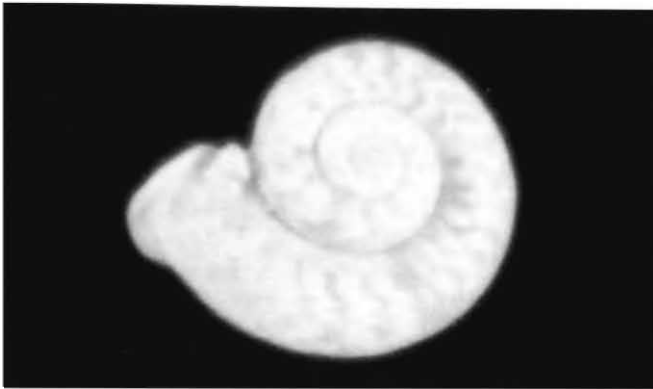
***Pterocylus magnus* Godwin-Austen**

(41, 42)

1876. *Pterocylus magnus* Godwin-Austen, *J. Asiat. Soc. Beng.*, **45(2)** : 174, pl. 7, fig. 3.1921. *Pterocylus magnus* : Gude, *Fauna British India, Mollusca*, **3** : 105.

Shell larger, brown, zig-zag markings extend upto the last whorl above; apex flat; aperture circular, peristome closely double; the wing distinctly differs from that in the other species, it is much more developed and folded into a perfect tube opening just above the penultimate whorl and its internal orifice is just inside the peristome.

Distribution : India : Arunachal Pradesh, Nagaland.

41. *Pterocyclus magnus* Godwin-Austen—dorsal view42. *Pterocyclus magnus* Godwin-Austen—ventral view

Measurements (in mm) :

Height	Diameter	Aperture
7.40-10.10	17.80-25.30	5.90 – 9.50

Status : Not Common.

***Pterocylus rupestris* Benson**
(43, 44)

1832. *Pterocylus rupestris* Benson, *J. Asiat.Soc. Beng.*, 1 : 13, pl. 2, fig. 1.

1921. *Pterocylus rupestris* : Gude, *Fauna British India, Mollusca*, 3 : 110.

Shell whitish with regular angular chocolate markings, both above and below, closely, radially striate; apex scarcely raised, last whorl moderately descending; aperture circular, differs from the other being marked with chocolate streaks both above and below and also in the form of the wing; the inner peristome forms a loop and the outer extends above it producing a broad flap, which terminates a little in front of the margin of the aperture, touching the last whorl.

43. *Pterocylus rupestris* Benson—dorsal view44. *Pterocylus rupestris* Benson—ventral view

Distribution : India : Jharkhand, Orissa, West Bengal.

Measurements (in mm) :

Height	Diameter	Aperture
6.50-9.60	16.20-23.650	5.80 – 7.50

Status : Not Common.

Genus *Pearsonia* Kobelt, 1902

1902. *Pearsonia* Kobelt, *Das Tierreich, Lief.*, **16** : 171 (as subgenus of *Spiraculum*).

Number of Indian subgenera : Two.

Distribution : India : Bihar, Orissa, South and North-east India;

Elsewhere : Myanmar.

Subgenus *Pearsonia* s.st.

Number of Indian species : Fourteen.

Distribution : India : Bihar, Orissa, South and North-east India.

Elsewhere : Myanmar.

Size Range (Indian species) : 6.00 – 30.00 mm in diameter.

Pearsonia (Pearsonia) hispida (Pearson)
(45, 46)

1833. *Spiraculum hispidum* Pearson, *J. Asiat. Soc. Beng.*, **2** : 592

1921. *Pearsonia (Pearsonia) hispida* : Gude, *Fauna British India, Mollusca*, **3** : 118.

Shell depressed, subdiscoid, widely umbilicate, whitish, covered by a dark brown epidermis with rows of short hairs, also marked by radial white patches; conspicuously



45. *Pearsonia hispida* (Pearson)—dorsal view



46. *Pearsonia hispida* (Pearson)—ventral view

sculptured by both oblique and rather wavy spiral striae, a few of which are stronger, three narrow dark lines on last whorl, whorls 5, rounded, last whorl very slightly descending in front, apex flat, tube short, conical, bending backward and inward, situated a little distance from the mouth; aperture circular, oblique, peristome reflected producing a spout above and having an angular incision just below.

Distribution : India : Assam, Arunachal Pradesh.

Measurements (in mm) :

Height	Diameter	Aperture
6.50	16.80	6.50

Status : Rare.

Pearsonia (Pearsonia) mastersi (Hanley & Theobald)
(47, 48)

1870. *Pterocyclos (Spiraculum) mastersi* (Blanford MS) Hanley & Theobald, *Conch. Ind.* p. 3, pl. 5, fig. 1.

1921. *Pearsonia (Pearsonia) mastersi*: Gude, *Fauna British India, Mollusca*, 3 : 120.

Shell depressed, widely umbilicate, with a thick cuticle coarsely sculptured with close oblique and raised spiral striae, every 4th.- 5th. of the spiral striae stronger, whorls 5, rounded, apex flat, last whorl becomes free and extends forward descending considerably, a conical sutural tube at the point where the last whorl becomes free, also a half formed tube like projection at the top of the peristome; aperture circular, oblique, peristome double, outer reflected, inner angularly cut at the subtubular projection.



47. *Pearsonia mastersi* (Hanley and Theobald)
—dorsal view



48. *Pearsonia mastersi* (Hanley and Theobald)
—ventral view

Differs from the other species in its free last whorl and also in the shape, and form of the tubes. It resembles the genus *Rhiostoma* from Myanmar closely.

Distribution : India : Nagaland.

Measurements (in mm) :

Height		Diameter		Aperture	
8.60	9.20	21.70	23.80	7.85	7.90

Status : Rare.

Subgenus *Pseudospiraculum* Kobelt, 1902

1902. *Pseudospiraculum* Kobelt, *Das Tierreich, Lief.*, **16** : 175.

Number of Indian species : One.

Distribution : India (South).

Size Range (Indian species) : 14.00 15.00 mm in diameter.

Pearsonia (Pseudospiraculum) fairbanki (Blanford)
(49)

1869. *Spiraculum fairbanki* Blanford, *J. Asiat. Soc. Beng.*, **38** : 135.

1921. *Pearsonia (Pseudospiraculum) fairbanki*: Gude, *Fauna British India, Mollusca*, **3** : 127

Shell depressed, subdiscoidal, widely umbilicate, pale white irregularly marked with brown spots and patches, two brownish bands, one narrow on the periphery and another broad inside the umbilicus, closely marked by oblique striae; whorls 5, rounded; apex a little raised, last whorl subinflated and slightly descending in front, angulate below at the umbilical edge, a short subvertical, conical tube situated a little distance



49. *Pearsonia fairbanki* (Blanford)—dorsal and ventral view

from the peristome at the suture; aperture oblique, circular, peristome double, inner with a sinus above, the outer expanded, reflected and forms a wing near the suture above, which extends along the last whorl for some distance and descends, in addition the columellar margin at the base forms a small sinus like projection.

Distribution : India : Pulney Hills, S. India.

Measurements (in mm) :

Height	Diameter	Aperture
6.10 - 7.80	14.20 - 17.20	4.75 5.50

Status : Rare.

Family DIPLOMMATINIDAE

Shell small hardly exceeding 6.5 mm in length, dextral or sinistral, ovate or pupoid, imperforate or very narrowly perforate. Usually sculptured, rarely smooth, shining, usually with irregularly coiled whorls, bodywhorl mostly compressed (turned upward and backward in *Opisthostoma* and ascending in *Gastroptychia*); aperture subcircular, sometimes with tooth or ridge; operculum horny.

Distribution : India, Asia, Australia, Borneo, China, Japan, Myanmar, Pacific Islands, Philippines, Sri Lanka.

Some species are arboreal in habit.

Five genera in India.

Reference

Zilch, A. 1953. Die Typen und Typoide des Natur Museums Senckenberg. 9 Mollusca : Cyclophoridae, Diplommatininae. *Arch. Moll.*, **82(3)** : 1-47, pls. 1-13.

Key to the genera

1. Shell with upturned last whorl, apex and aperture in the same direction
..... *Opisthostoma*
Shell without upturned last whorl, apex and aperture in the opposite direction
..... (2)
2. Shell with radial costulation, last whorl constricted (3)
Shell without radial costulation, last whorl not constricted *Nicida*
3. Umbilical region with a surrounding ridge joining the aperture in a notch
..... *Gastroptychia*
Umbilical region without a surrounding ridge (4)
4. Aperture without tooth *Palaina*
Aperture with tooth *Diplommatina*

Subfamily DIPLOMMATININAE

Genus *Diplommatina* Benson, 1849

1849. *Diplommatina* Benson, *Ann. Mag. nat. Hist.*, (2) 4 : 193.

Number of Indian species : Fortyseven Species.

Distribution : India : North-east and South and the Andaman Islands, upto 10,000 ft.;

Elsewhere : Australia, China, Formosa, Japan, Malaysia, Myannar, New Guinea, Pacific Islands.

Size Range (Indian species) : 2.00-6.00 mm in length.

Subgenus *Diplommatina* s.st.

Number of Indian species : Twentyeight.

Diplommatina (Diplommatina) pullula Benson

(Fig. 22)

1859. *Diplommatina pullula* Benson, *Ann. Mag. nat. Hist.*, (3)3 : 182.

1921. *Diplommatina (Diplommatina) pullula* : Gude, *Fauna British India, Mollusca*, 3 : 328.

Shell small, ovately turreted, imperforate, with an obtuse apex, obliquely costulate, suture impressed; whorls 6-7, convex, penultimate tumid, last whorl slightly ascending in front, sculpture on last whorl distant and irregular; aperture sub vertical, peristome double, inner expanded, outer reflected, margins joined by a thick callus, columellar margin vertical, with a single tooth, rounded at the base.

Distribution : India : West Bengal (Darjeeling).

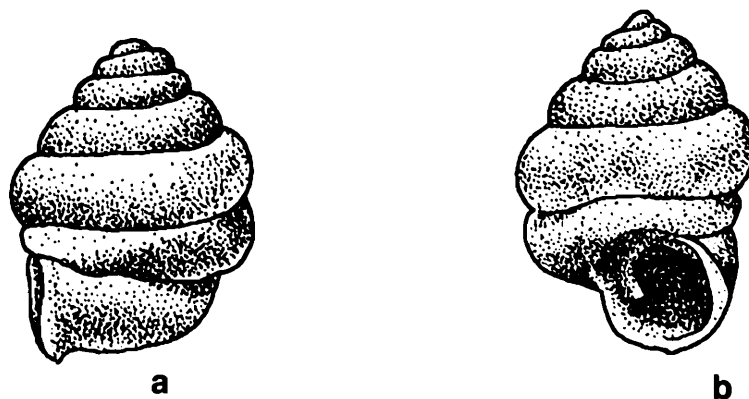


Fig. 22. *Diplommatina pullula*; a. dorsal view; b. ventral view.

Measurements (in mm) :

Length	Diameter
3.00	1.25

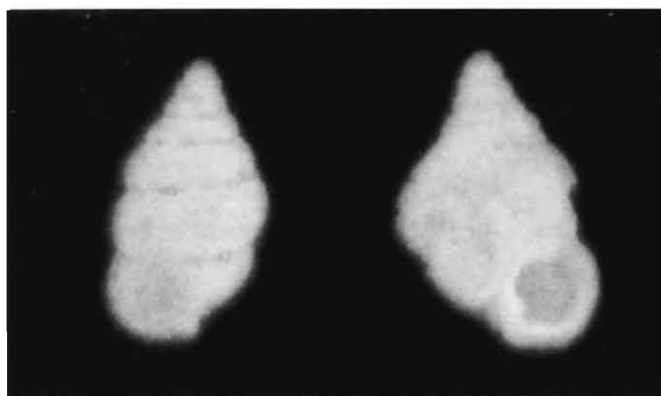
Status : Abundant.

***Diplommatina(Diplommatina) semisculpta* Blanford**
(50)

1868. *Diplommatina semisculpta* Blanford, *J. Asiat. Soc. Beng.*, **37(2)** : 78, pl. 1, fig. 6.

1921. *Diplommatina (Diplommatina) semisculpta* : Gude, *Fauna British India, Mollusca*, **3** : 333.

Shell small, ovately conical, whitish, spire subattenuate, sculpture on apical whorls stronger; whorls 7-8, penultimate widest, last whorl slightly ascending in front, peristome double but the demarcation is not clear, expanded and reflected; aperture subvertical, margins joined by a callus, columellar margin with a single tooth, angular below.



50. *Diplommatina semisculpta* Blanford—dorsal and ventral view

Differs from the other species mainly being larger, having more number of whorls, the penultimate whorl being wide but not much tumid and the columella being sinuate and angulate below.

Distribution : India : Arunachal Pradesh, West Bengal (Darjeeling).

Measurements (in mm) :

Length	Diameter
4.00	2.00

Status : Abundant.

Subgenus *Metadiancta* Moellendorff, 18981898. *Metadiancta* Moellendorff, *Nachr. Deuts. Malak. Ges.*, **30** : 98.*Number of Indian species* : Eleven.*Distribution* : India : Assam, Manipur, Nagaland.*Elsewhere* : Myannar.*Diplommatina (Metadiancta) perobesa* Preston
(51, 52)1915. *Diplommatina perobesa* Preston, *Rec. Indian Mus.*, **8** : 540, text fig. 5.1921. *Diplommatina (Metadiancta) perobesa* : Gude, *Fauna British India, Mollusca*, **3** : 343.51. *Diplommatina perobesa* Preston—dorsal view52. *Diplommatina perobesa* Preston—ventral view

Shell ovate, rather oblique, apex of spire abruptly acute, obliquely and coarsely costulate, obsolete in parts; whorls 7-8, convex, the penultimate outwardly tumid, last whorl distinctly contracted behind aperture and ascending; aperture sub circular, columellar margin vertical with a tooth, angular below; parietal callus thick and obliquely outwardly expanded.

Distribution : India : Arunachal Pradesh, Upper Rotung, Abor Hills.

Measurements (in mm) :

Length	Diameter	Aperture
4.50	2.50	1.25

Status : Not common.Subgenus *Sinica* Moellendorff, 18851885. *Sinica* Moellendorff, *Jahrb. Deuts. Malak. Ges.*, **12** : 369.

Number of Indian species : Eight.

Distribution : India : Andhra Pradesh, Karnataka, Manipur, Nagaland.

Elsewhere : China, Japan, Malay Archipelago, New Guinea.

Diplommatina (Sinica) carneola Stoliczka
(Fig. 23)

1871. *Diplommatina carneola* Stoliczka, *J. Asiat. Soc. Beng.*, **40(2)** : 152, pl. 6, figs. 3, 3a, 3b.

1921. *Diplommatina (Sinica) carneola*: Gude, *Fauna British India, Mollusca*, **3** : 346.

Shell broadly ovate, very narrowly perforate, apex obtuse, whorls 6-7, apical whorl nearly without sculpture, lower whorls rather distinctly and sharply costulate; penultimate whorl tumid and projecting, last whorl contracted at uppermost; aperture sub circular, peristome double, expanded and reflected except at the point where joined by the callus; columellar margin vertical with a small tooth, angular below, a palatal fold also present.

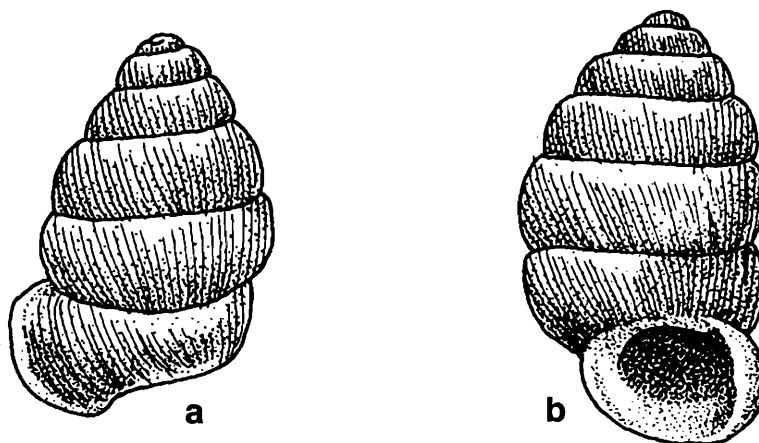


Fig. 23. *Diplommatina carneola*, a. dorsal view; b. ventral view.

Distribution : India : Manipur;

Elsewhere : Myanmar.

Measurements (in mm):

Length	Diameter	Aperture
3.50	2.80	1.50

Status : Common.

Genus 2. ***Gastroptychia*** Kobelt & Moellendorff, 1900

1900. *Gastroptychia* Kobelt & Moellendorff, *Nachr. Deuts. Malak. Ges.*, **32** : 186.

Number of Indian species : One.

Distribution : India : North-east.

Elsewhere : Borneo, China, Philippines.

Size Range : 6.00 7.00 mm in length.

Gastroptychia insignis (Godwin-Austen)
(53, 54)

1870. *Diplommatina insignis* Godwin-Austen, *J. Asiat. Soc. Beng.*, **39(2)** : 6, pl.2, fig.1.

1921. *Gastroptychia insignis* : Gude, *Fauna British India, Mollusca*, **3** : 349.



53. *Gastroptychia insignis* (Godwin-Austen)–
dorsal view

54. *Gastroptychia insignis* (Godwin-Austen)–
ventral view

Shell acuminately oval, sinistral, with a pointed spire; narrowly perforate; whorls 8, upper whorls closely and strongly costulate, lower two weakly sculptured; penultimate whorl widest; aperture oval, peristome double, outer one thickened, parietal callus distinct; columellar margin rounded with a tooth like process, two parietal folds present; umbilical region with a surrounding ridge which joins the aperture.

Distribution : India : Arunachal Pradesh (3000ft), Meghalaya.

Measurements (in mm) :

Height	Diameter	Aperture
6.75	3.25	2.50

Status : Not common.

Genus ***Palaina*** Semper, 1865

1865. *Palaina* Semper, *J. Conch.*, 13.

Number of Indian species : One.

Distribution : India : Nicobar Islands.

Size Range : 2.00 3.00 mm in length.

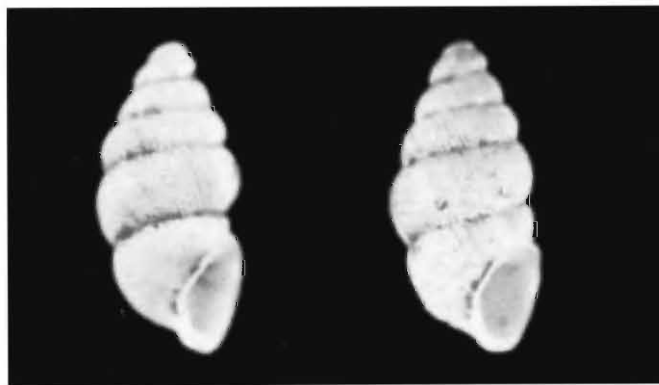
Palaina nicobarica (Godwin-Austen)

(55)

1878. *Diplommatina carneola* var. (distinct species), Nevill, *Hand list Mollusca, Indian Museum.*, 1 : 2-84 (in part).

1886. *Diplommatina nicobarica* Godwin-Austen, *Land & Freshwater Moll. India*, 1 : 185, pl. 46, figs. 7 & 7a.

1991. *Palaina nicobarica*: Subba Rao & Mitra, *Rec. zool. Surv.India, Occ. Paper No.126* : 28, pl. 4, fig.2.



55. *Palaina nicobarica* (Godwin-Austen)—ventral view

Shell small, fusiform, imperforate, closely and lamellosely costulate on last whorl; indistinctly so on apical whorls, apex acuminate; whorls 7, convex, penultimate whorl widest; last whorl constricted above the aperture; aperture circular, peristome closely double, reflected, continuous, without tooth, columellar margin straight.

Distribution : India : Endemic to the Nicobar Islands (Trinket, Nancowri, Car Nicobar).

Measurements (in mm) :

Height		Diameter	
2.65	2.85	1.05	1.20

Status : Common.

Genus *Nicida* W. Blanford, 1868.

1868. *Nicida* Blanford, *Jour. Conchyl.*, 16 : 332 (as subgenus of *Diplommatina*).

Number of Indian species : Eight.

Distribution : South India (upto 7000 ft.), Sri Lanka.

Size Range (Indian species) : 1.00 3.00 mm in length.

***Nicida pulneyana* Blanford**

(Fig. 24)

1868. *Diplommatina (Nicida) pulneyana* Blanford, *J. Conch.*, **16** : 333, pl. 14, fig. 2.

1921. *Nicida pulneyana* : Gude, *Fauna British India, Mollusca*, **3** : 295.

Shell minute, narrowly perforate, elongately ovate, with very fine and minute oblique striae, faint spiral markings are also present; whorls 6, fairly convex, last two whorls almost equal in width, rounded at base, last whorl not ascending in front; aperture oblique, nearly circular, peristome simple.

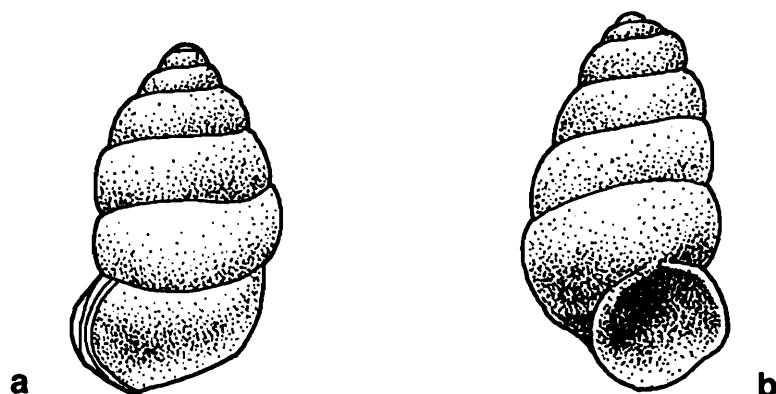


Fig. 24. *Nicida pulneyana*, a. dorsal view, b. ventral view.

Distribution : India : Kerala : Pulney Hills (7000ft).

Measurements (in mm) :

Height	Diameter	Aperture
2.50	1.00	0.50

Status : Common.

***Nicida subovata* Beddome**

(Fig. 25)

1875. *Diplommatina (Nicida) subovata* Beddome, *Proc.zool. Soc. Lond.*, **1875** : 443, pl. 52, fig.7.

1921. *Nicida subovata*: Gude, *Fauna British India, Mollusca*, **3** : 295.

Shell conically ovate, imperforate, almost smooth, with very fine subobsolete striae, whorls 6, convex, four upper whorls gradually tapering; the penultimate widest, last whorl with a prominent basal keel surrounding the umbilical region; aperture oblique, peristome simple.

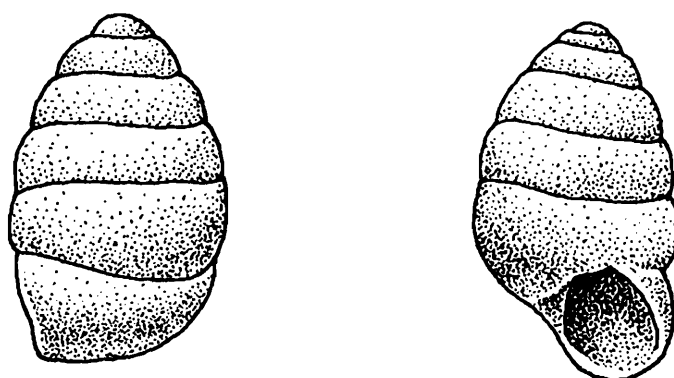


Fig. 25. *Nicida subovata*, a. dorsal view, b. ventral view

Differs from the other species in being imperforate, the penultimate whorl being the widest and the last whorl having a distinct basal keel.

Distribution : India : Karnataka: South Canara.

Measurements (in mm):

Height	Diameter
2.25	1.35

Status : Rare.

Genus *Opisthostoma* Blanford, 1861

1861. *Opisthostoma* Blanford, *J. Asiat. Soc. Beng.*, **29** : 121.

Number of Indian species : Five (all endemic to Peninsular India).

Distribution : South India (upto 3000 ft.), Borneo, Malacca.

Size Range (Indian species) : 1.00 - 3.00 mm in length.

Opisthostoma distortum Beddome

(Fig. 26)

1875. *Opisthostoma distortum* Beddome, *Proc. zool. Soc. Lond.*, p. 445.

1921. *Opisthostoma distortum* : Gude, *Fauna British India, Mollusca*, **3** : 297.

Shell minute, narrowly perforate, rhomboid, very irregularly and distantly costulate, whorls 4, the upper most minute and depressed, penultimate whorl widest, last whorl distinctly constricted and turned upwards; aperture angularly circular and opening upwards; peristome closely double, touching the upper part of the penultimate whorl; aperture and apex facing the same direction.

Distribution : India : Andhra Pradesh : Vishakhapatnam (3000 ft).

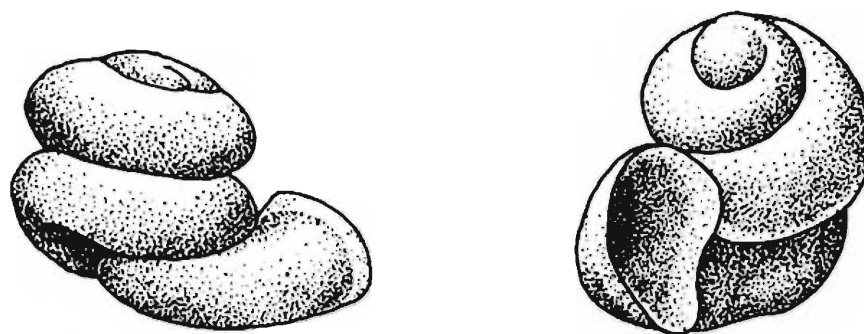


Fig. 26. *Opisthostoma distortum*, a. dorsal view, b. ventral view

Measurements (in mm) :

Height	Diameter
0.90	1.35

Status : Rare.

***Opisthostoma macrostoma* Blanford**

(56, Fig. 11,a)

1869. *Opisthostoma macrostoma* Blanford, *J. Asiat. Soc. Beng.*, **38** : 139, pl. 16, fig. 7.

1921. *Opisthostoma macrostoma* : Gude, *Fauna British India, Mollusca*, **3** : 299.

Shell perforate, conoid-ovate, whitish, with distant oblique striae becoming closer on lower whorl and very fine spiral markings; whorls 5½, penultimate widest, last whorl constricted and steeply ascending touching both the 4th. and 5th. whorls anteriorly; aperture subcircular; peristome double internal continuous, external expanded and interrupted near the attachment.

Differs from the preceding species in being larger (the largest among the Indian species) having more number of whorls and the apex being acute and not depressed. Moreover the upturned last whorl in this touches both the antipenultimate and the penultimate whorls and not just the penultimate whorl as in the other species.



56. *Opisthostoma macrostoma* Blanford—lateral view

Distribution : India : Western Ghat, Wynaad.

Measurements (in mm) :

Length	Diameter	Aperture
3.00	3.00	1.50

Status : Rare.

Family PUPINIDAE

Subfamily PUPININAE

Shell small to medium, ovate-turreted or conoid, deeply umbilicate, calcareous, usually glossy, porcellaneous, sometimes ribbed, bodywhorl sometimes with a basal keel. Aperture circular, peristome thickened, with canals or tubes. Operculum horny or calcareous, multispiral, nucleus central.

Asia and Australia.

On grounds, among low vegetations, decaying wood, etc.

Reference

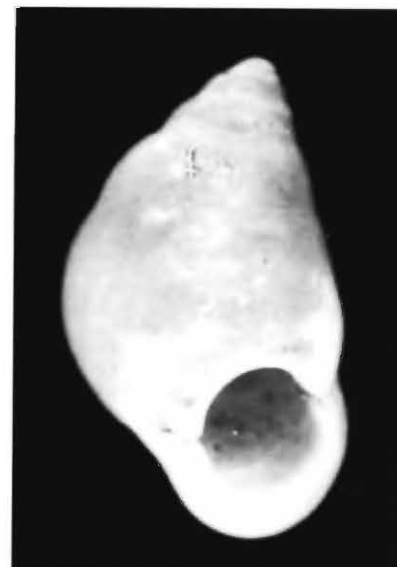
Bentham Jutting, w.s.s. von, 1948. Systematic studies on the non marine mollusca of the Indo-Australian Archipelago. Critical Revision of the families Hydrocenidae, Helicinidae, Cyclophoridae, Pupinidae & Cochlostomatidae. *Treubia*, **19(3)** : 1- 603, figs 1-60.

Key to the genera

- Shell imperforate, smooth, without distinct sculpture *Pupina*
Shell perforate, with distinct sculpture (2)
- Shell without tube or basal keel *Pseudopomatias*
Shell with tube or basal keel (3)
- Shell with outward tube near the peristome, without basal keel *Raphaulus*
Shell without outward tube near the peristome, with basal keel (4)
- Shell with basal canal opening near the peristome, indicated by a small hole...
..... *Tortulosa*
Shell without hole in the peristome (5)
- Shell small, less than 15 mm in length *Nodopomatias*
Shell larger, above 20 mm in length *Schistoloma*

Genus *Pupina* Vignard, 18291829. *Pupina* Vignard, *Ann. Sci. Nat.*, **18** : 439.Subgenus *Tylotoechus* Kobelt & Moellendorff, 18971897. *Tylotoechus* Kobelt & Moellendorff, *Nachr. Deuts. Malak. Ges.* **29** : 145.*Number of Indian species* : Two.*Distribution* : India : Meghalaya, Nicobar Islands.*Elsewhere* : Bangladesh, Myanmar.*Size Range* (Indian species) : 5.00 – 6.50 mm in length.*Pupina (Tylotoechus) imbricifera* Benson
(57, 58)1856. *Pupina imbricifera* Benson, *Ann. Mag. nat. Hist.*, **(2)17** : 230.1921. *Pupina (Tylotoechus) imbricifera* : Gude, *Fauna British India, Mollusca*, **3** : 195.

Shell small, imperforate, smooth, polished, inflated, spire conical, apex acute; whorls 6, aperture circular with two canals, one parietal and the other at the columella; peristome double, expanded; aperture circular, operculum flat, thick, multispiral with 4 whorls and a central nucleus.

Distribution : India : Meghalaya.*Elsewhere* : Bangladesh.57. *Pupina imbricifera* Benson—dorsal view58. *Pupina imbricifera* Benson—ventral view

Measurements (in mm) :

Length		Diameter		Aperture	
8.00	9.25	4.40	4.60	1.80	2.40

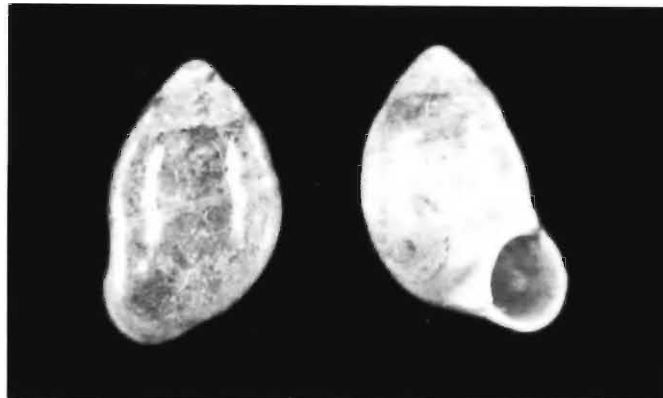
Status : Common.

***Pupina (Tylotoechus) nicobarica* Pfeiffer**
(59)

1852. *Pupina (Registoma) nicobarica* Pfeiffer, *Proc zool. Soc. Lond.*, p.145.

1921. *Pupina (Tylotoechus) nicobarica*: Gude, *Fauna British India, Mollusca*, 3 : 196

Shell smaller, pupaeform, imperforate, polished and shining, whorls 4-5, convex, sutures very shallow, last whorl broad, obliquely descending; aperture circular; peristome single, thickened and a little expanded, interrupted by two canals one at the junction of columellar callus with the peristome, and the other at the middle of columellar margin. Operculum thin, multispiral with raised edges.



59. *Pupina nicobarica* Pfeiffer—dorsal and ventral view

Distribution : India : Nicobar Island.

Measurements (in mm) :

Length		Diameter		Aperture	
5.50	6.85	3.80	4.15	1.90	3.45

Status : Common.

Subfamily PUPINELLINAE

Genus *Nodopomatias* Gude, 1921

1921. *Nodopomatias* Gude, *Fauna of British India, Mollusca*, 3 : 161.

Number of Indian species : Two.

Distribution : India (Abor Hills).

Size Range (Indian species) : 11.00 14.00 mm in length.

Nodopomatias oakesi (Godwin-Austen)

(Fig. 27)

1917. *Eupomatias oakesi* Godwin-Austen, *Rec. Indian Mus.*, **8** : 580.

1921. *Nodopomatias oakesi* : Gude, *Fauna British India, Mollusca*, **3** : 161

Shell elongate-turreted, narrowly perforate, solid, shining, with regular close, fine ribbings, concentrated near the suture on the last whorl, side of spire a little convex, apex blunt; whorls 7, flatly convex; sutures impressed; aperture circular; slightly

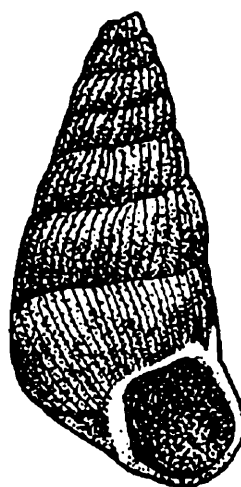


Fig. 27. *Nodopomatias oakesi*, ventral view

angulated above; peristome double, thickened, a very strong umbilical keel with a knotted appearance surrounds the umbilical region and terminates behind the peristome, on the lower left margin; operculum thin, flat externally, multispiral with a central nucleus.

Distribution : India : Arunachal Pradesh : Abor Hills.

Measurements (in mm) :

Length	Diameter
11.00	3.75

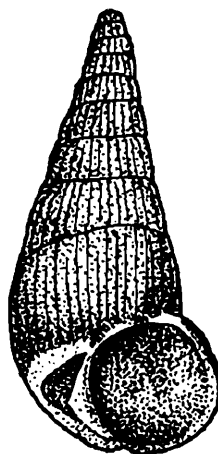
Status : Rare (Known by the Holotype).

Nodopomatias sibbumensis (Godwin-Austen)

(Fig. 28)

1917. *Eupomatias sibbumensis* Godwin-Austen, *Rec. Indian Mus.*, **8** : 579, text fig. 5C, 6A.1921. *Nodopomatias sibbumensis*: Gude, *Fauna British India, Mollusca*, **3** : 162.

Shell elongate-turreted, very narrowly perforate, with strong, regular close costulae, extending ultimately to the umbilical keel on last whorl, spire elongate, apex pointed; whorls 9; aperture subcircular; vertical; peristome double, inner expanded and reflected on the left side; a well marked umbilical keel present around the umbilicus terminating behind the aperture.

**Fig. 28.** *Nodopomatias sibbumensis*, ventral view

Differs from the other species being larger, having more number of whorls and being more strongly sculptured.

Distribution : India : Arunachal Pradesh : Abor Hills.

Measurements (in mm) :

Length	Diameter
14.00	5.80

Status : Rare (Known by the Types).

Genus ***Pseudopomatias*** Moellendorff, 1885

1885. *Pseudopomatias* Moellendorff, *Nachr. Deust. Malak. Ges.*, **17** : 164.

Number of Indian species : Five.

Distribution : North-east India (upto 7000 ft.), Borneo, Malacca.

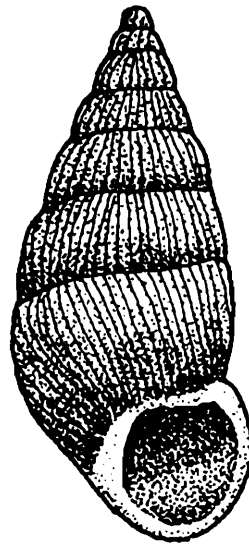
Size Range (Indian species) : 1.00 3.00 mm in length.

Pseudopomatias luyorensis Godwin-Austen

(Fig. 29)

1917. *Pseudopomatias luyorensis* Godwin-Austen, *Rec. Indian Mus.*, **8** : 578, text fig. 5B.1921. *Pseudopomatias luyorensis*: Gude, *Fauna British India, Mollusca*, **3** : 159.

Shell small, elongate, perforate, turreted, thick, with fine regular, close markings, brownish; whorls 7; with convex sides; aperture circular; vertical; peristome closely double, continuous, outer distinctly expanded on the columellar side.

**Fig. 29.** *Pseudopomatias luyorensis*, ventral view

Distribution : India : Arunachal Pradesh : Abor Hills.

Measurements (in mm) :

Length	Diameter
11.25	4.75

Status : Rare (Known by the Holotype).***Pseudopomatias richilaensis*** Godwin-Austen

(60)

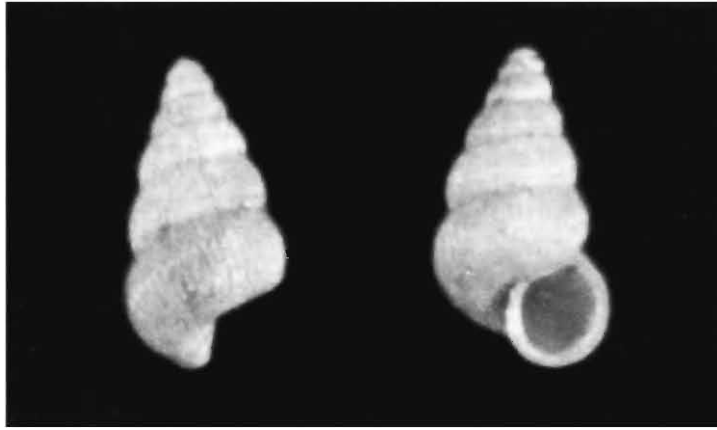
Differs from the other species being smaller in size, the sculpture being finer and the outer peristome being uniformly expanded.

Distribution : India : Sikkim.

Measurements (in mm) :

Length	Diameter
4.75 5.00	2.75 - 2.80

Status : Common



60. *Pseudopomatias richilaensis* Godwin-Austen—dorsal and ventral view

Genus ***Raphaulus*** Pfeiffer, 1856

1856. *Raphaulus* Pfeiffer, *Novit. Conch.* 1(1) : 75.

Number of Indian species : Seven.

Distribution : India : North-east, Eastern Himalaya (Abor Hills & Miri Hills, 4000 ft), Borneo, Myanmar.

Size Range (Indian species) : 7.00 14.00 mm in length.

Raphaulus aborensis Godwin-Austen
(61, 62)

1917. *Raphaulus aborensis* Godwin-Austen, *Rec. Indian Mus.*, 8 : 571, text fig. 2c.

1921. *Raphaulus aborensis* : Gude, *Fauna British India, Mollusca*, 3 : 163.



61. *Raphaulus aborensis* Godwin-Austen—dorsal view

62. *Raphaulus aborensis* Godwin-Austen—ventral view

Shell elongate, cylindrical, thick, deeply perforate, yellowish white, with fine close markings; spire slightly inclined to right; suture impressed, oblique dorsally; whorls 6, the last two large and swollen, a little flattened in front; aperture circular; peristome much expanded, continuous, triangularly expanded on the columellar side; sutural tube at the upper outer margin of peristome short, oblique and open at both ends.

Distribution : India : Arunachal Pradesh : Abor Hills, Miri Hills, Rotung.

Measurements (in mm) :

Length	Diameter	Aperture
11.60	6.70	3.80

Status : Rare.

***Raphaulus assamicus* Godwin-Austen**
(63, 64)

1886. *Rhaphaulus assamica* Godwin-Austen, *Land & Freshwater Moll. India*, 1 : 201, pl. 47, fig. 2.

1921. *Rhaphaulus assamicus*: Gude, *Fauna British India, Mollusca*, 3 : 163.



63. *Raphaulus assamicus* Godwin-Austen—
dorsal view

64. *Raphaulus assamicus* Godwin-Austen—
ventral view

Shell cylindrical, more tumid, perforate, brownish with fine, close sculpture; whorls 6, the last two large, last whorl flattened in front; suture impressed, dorsally oblique; aperture circular; peristome very closely double, thickened and expanded; the external sutural tube steeply extending downwards resting on the body whorl just behind the peristome, broad at the opening, slightly flattened, another inner tube runs backward, the outer end opening at about 3 mm inside the aperture.

Distribution : India : Assam, Arunachal Pradesh: Miri Hills, Sikkim.

Measurements (in mm) :

Length	Diameter	Aperture
16.40	8.50	4.80

Status : Rare.

Genus *Schistoloma* Kobelt, 1902

1902. *Schistoloma* Kobelt, *Das Tierreich Lief.*, **16** : 278.

Number of Indian species : Two.

Distribution : Eastern Himalaya : Arunachal Pradesh, Meghalaya, West Bengal (Darjeeling).

Elsewhere : Bhutan, Borneo, Myanmar, Philippines, Sumatra.

Size Range (Indian species) : 20.00 30.00 mm in length.

Schistoloma funiculatum (Sowerby)
(65, 66)

1850. *Cyclostoma funiculatum* Sowerby, *Thes. Conch.* **1** : 166, pl. 31b, figs. 316, 317.

1921. *Schistoloma funiculatum* : Gude, *Fauna of British India, Mollusca*, **3** : 169.

Shell cylindrical, smooth, umbilicate, brownish in colour with an obtuse spire; whorls 7, finely striate, sutures deep; aperture circular, peristome orange coloured, thickened and reflected, a well marked carina present around the umbilicus.



65. *Schistoloma funiculatum* (Sowerby)—
dorsal view

66. *Schistoloma funiculatum* (Sowerby)—
ventral view

Distribution : India : Meghalaya, West Bengal (Darjeeling).

Measurements (in mm) :

Height	Diameter
24.50	8.50

Status : Common.

Schistoloma tanychilum (Godwin-Austen)
(67, 68)

1876. *Megalomastoma tanychilum* Godwin-Austen, *J. Asiat. Soc. Beng.*, **45(2)** : 180, pl.7, fig.5.

1921. *Schistoloma tanychilum* : Gude, *Fauna of British India, Mollusca*, **3** : 171.

Differs from the other species being greenish in colour, larger in size, and more strongly sculptured and also having more number of whorls (9).



67. *Schistoloma tanychilum* (Godwin-Austen) -dorsal view 68. *Schistoloma tanychilum* (Godwin-Austen) -ventral view

Distribution : India : Arunachal Pradesh (Dafla Hills).

Measurements (in mm) :

Height	Diameter
30.50	9.00

Status : Common.

Genus ***Tortulosa*** Gray, 1847

1847. *Tortulosa* Gray, *Proc. zool. Soc. Lond.*, p. 177.

Number of Subgenera : Two.

Subgenus *Tortulosa* s.st.

Number of Indian species : One.

Distribution : Western Ghat, 2500 ft (Kerala).

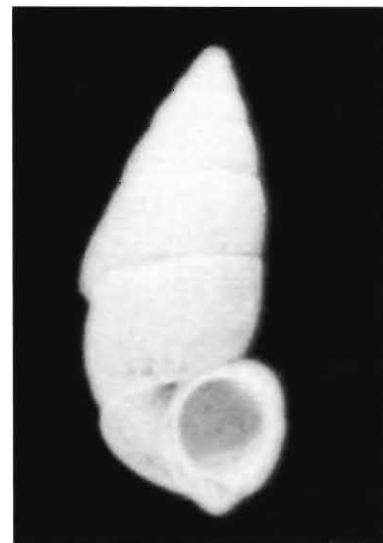
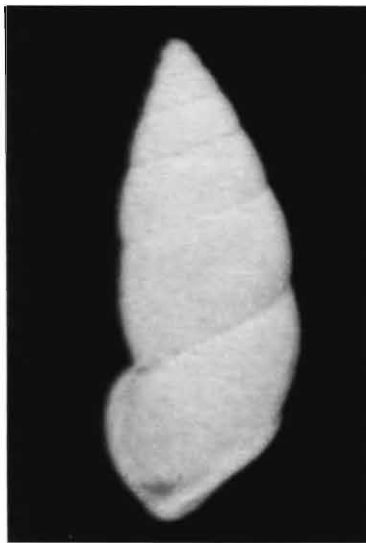
Tortulosa (Tortulosa) tortuosa (Beck)
(69, 70)

1795. *Turbo tortuosus* Chemnitz, *Conch. Cab.*, 11 : 158, pl. 195, figs. 1882, 1883.

1837. *Urocoptis tortuosa* Beck, *Index Moll.*, p. 83.

1921. *Tortulosa (Tortulosa) tortuosa*: Gude, *Fauna of British India, Mollusca*, 3 : 190.

Shell pupiform, white, thin, perforate, finely and obsoletely striate, whorls 7, last whorl a little compressed and contracted near the aperture; suture distinct; aperture circular; peristome continuous, reflected, with a small canal at the base internally; a distinct keel around the umbilicus.



69. *Tortulosa tortuosa* (Beck)—dorsal view

70. *Tortulosa tortuosa* (Beck)—ventral view

Distribution : India : Kerala (2500 ft).

Measurements (in mm) :

Length	Diameter	Aperture
18.50	6.40	6.00

Status : Rare.

Subgenus *Eucataulus* Kobelt, 1902.

1902. *Eucataulus* Kobelt, *Das Tierreich Lief.*, 16 : 281.

Number of Indian species : Four.

Distribution : Western Ghat, 2500 ft (Kerala).

Size Range (Indian species) : 13.00 21.00 mm in length.

***Tortulosa (Eucataulus) albescens* (Blanford)**
(71, 72)

1880. *Cataulus albescens* Blanford, *J. Asiat. Soc. Beng.*, **49** : 214.

1921. *Tortulosa (Eucataulus) albescens* : Gude, *Fauna of British India, Mollusca*, **3** : 172.

Shell subovate, turreted, very narrowly perforate, thin, whitish, costulately striate; whorls 7, rounded; suture impressed; last whorl with a transversely striate keel which revolves round the umbilicus and joins the peristome; aperture subvertical, circular; peristome much thickened and reflected, the basal canal opening to the left of the base; columellar margin narrow.



71. *Tortulosa albescens* (Blanford)—dorsal view



72. *Tortulosa albescens* (Blanford)—ventral view

Distribution : India : Kerala : Travancore.

Measurements (in mm) :

Length	Diameter	Aperture
13.00	5.50	3.00

Status : Rare.

Family POMATIASIDAE

Shell small, subglobose to depressed turbinate, widely umbilicate (in *Otopoma*, umbilicus is closed by a callus), with distinct spiral striae; body whorl descending

slightly in front; whorls 4-5; aperture sub circular; peristome simple or thickened and expanded.

South-Asia, North-East Africa, South Arabia.

It includes two subfamilies.

Key to the genera

Shell perforate *Cyclotopsis*
 Shell imperforate (umbilicus closed by a thick callus) *Otopoma*

Subfamily POMATIASINAE

Genus *Otopoma* Gray, 1850

1850. *Otopoma* Gray, *Nomencl. Moll. Anim. Brit. Mus.*, 1 : 35.

Number of Indian species : One.

Distribution : India : Gujarat.

Elsewhere : N.E.Africa, S. Arabia.

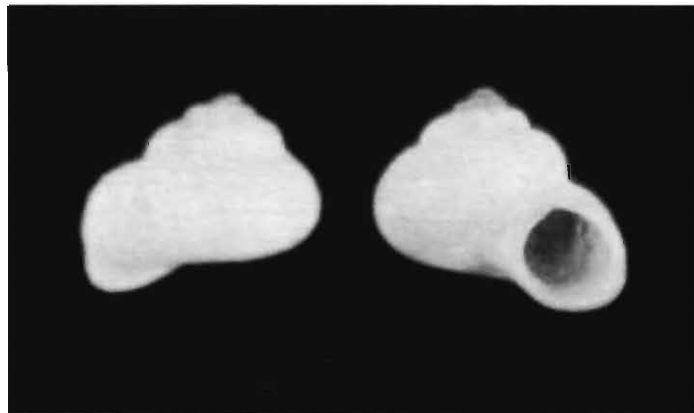
Size Range (Indian species) : 12.00 mm in diameter.

Otopoma hinduorum Blanford (73)

1864. *Otopoma hinduorum* Blanford, *Ann. Mag. nat. Hist*, (3) 13 : 464.

1921. *Otopoma hinduorum*: Gude, *Fauna of British India, Mollusca*, 3 : 351.

Shell globosely turbinate, solid, polished, imperforate, whitish, with some brownish spots and dots; apex black, distinctly spirally marked above, smoother beneath; whorls 4-5, rounded; last whorl slightly descending in front; aperture subvertical, circular;



73. *Otopoma hinduorum* Blanford—dorsal and ventral view

peristome thickened, discontinuous, outer margin arcuate above, a thick columellar callus completely covering the umbilicus, a few imperfectly formed varices present behind peristome.

Distribution : India : Gujarat.

Measurements (in mm) :

Height		Diameter		Aperture	
5.20	8.55	11.90	14.90	6.10	6.80

Status : Not common.

Subfamily CYCLOTOPSINAE

Genus *Cyclotopsis* Blanford, 1864

1864. *Cyclotopsis* Blanford, *Ann. Mag. nat. Hist.*, (3)13 : 447.

Number of Indian species : Five.

Distribution : India : Andhra Pradesh, Maharashtra, Tamil Nadu (Nilgiri).

Elsewhere : Seychelles, Malagasy, Socotra.

Size Range (Indian species) : 12.00 20.00 mm in diameter.

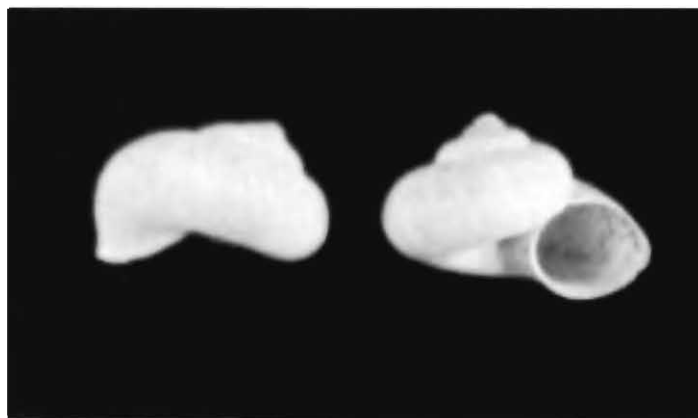
Cyclotopsis semistriata (Sowerby)

(74)

1843. *Cyclostoma semistriatum* Sowerby, *Thes. Conch.*, 1 : 91, pl. 23, fig. 6.

1921. *Cyclotopsis semistriata* : Gude, *Fauna of British India, Mollusca*, 3 : 353.

Shell depressedly orbiculate, rather narrowly umbilicate, thin, whitish with spirally arranged brown spots, finely, spirally striate above; smooth below, spiral striae also



74. *Cyclotopsis semistriata* (Sowerby)—lateral view

present inside the umbilicus; whorls 4, rounded; last whorl large, slightly descending; suture deep; aperture rather oblique, peristome thin, scarcely reflected, continuous, acuminate above.

Distribution : India : Maharashtra.

Measurements (in mm):

Height		Diameter		Aperture	
6.10	11.80	8.25	15.20	4.40	6.85

Status : Common.

***Cyclotopsis subdiscoidea* (Sowerby)**
(75, 76, 77)

1850. *Cyclostoma subdiscoideum* Sowerby, *Thes. Conch.* 1 : 161, pl. 31b, figs. 304, 305.

1921. *Cyclotopsis subdiscoidea*: Gude, *Fauna of British India, Mollusca*, 3 : 354.

Shell larger, broader, differs in being spirally grooved both above and below, decussated by fine microscopic radial striae, whorls 4-5, convex, last whorl descending;



75. *Cyclotopsis subdiscoidea* (Sowerby)—dorsal view



76. *Cyclotopsis subdiscoidea* (Sowerby)—lateral view



76. *Cyclotopsis subdiscoidea* (Sowerby)—lateral view

aperture oblique; peristome thin, reflected, angularly spreading on the base of last whorl above; umbilical opening larger.

Distribution : India : Andhra Pradesh, Orissa.

Measurements (in mm) :

Height	Diameter	Aperture
10.55 - 13.00	16.90 - 19.55	7.90 - 8.80

Status : Common.

Family ASSIMINEIDAE

Shell minute to small, thin, usually cylindrical-turreted, sub perforate, keeled around umbilical region in some, sometimes with spiral striae; aperture ovate, peristome thin or a little thickened, reflected, operculum thin corneous, paucispiral.

Eye at the base of small stumpy tentacle.

Includes marine, estuarine and terrestrial genera.

World wide.

It includes two subfamilies.

Key to the genera

- Shell with a keel around the umbilicus, columellar margin with an incision
 *Omphalotropis*
- Shell without a keel around the umbilicus, columellar margin without incision
 *Acmella*

Subfamily ASSIMINEINAE

Genus *Acmella* Blanford, 1869

1869. *Acmella* Blanford, *Ann. Mag. nat. Hist.*, (4)3 : 178.

Number of Indian species : Five.

Distribution : Andaman and Nicobar Islands, Meghalaya.

Elsewhere : China, Comoro Islands, Myanmar, New Guinea, Philippines, Polynesia.

Some species occur among moss (Gude, 1921).

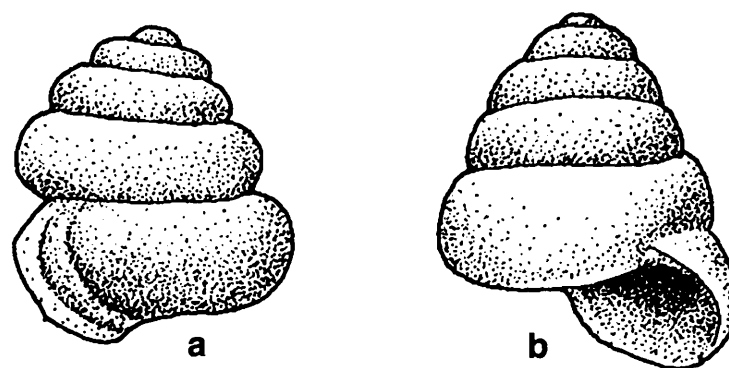
Size Range (Indian species) : 1.00 - 2.00 mm in length.

***Acmella roepstorffiana* Nevill**

(Fig. 30)

1878. *Acmella roepstorffiana* Nevill, *Hand list Moll. Indian Mus.*, 1 : 251.1921. *Acmella roepstorffiana*: Gude, *Fauna of British India, Mollusca*, 3 : 362.

Shell minute, ovately conical, umbilicus nearly closed, closely and obliquely striate throughout; whorls 5, very little convex, the last whorl compressed at the periphery; aperture small almost circular, margins not continuous; peristome much thickened nearly blocking the umbilicus.

**Fig. 30.** *Acmella roepstorffiana*, a. dorsal view; b. ventral view*Distribution* : India : Nicobar Islands.

Measurements (in mm) :

Length	Diameter
1.50	1.00

Status : Rare.***Acmella tersa* (Benson)**

(Fig. 31)

1853. *Cyclostoma tersum* Benson, *Ann. Mag. nat. Hist.*, (2)11 : 285.1921. *Acmella tersa* : Gude, *Fauna of British India, Mollusca*, 3 : 363.

Shell minute, more conical, subperforate, whitish, radiately striate; sculpture less distinct and not as regular as in the preceding species; whorls 5, convex, last whorl not compressed at the periphery; aperture vertical, angulately ovate, peristome simple, slightly thickened, margins joined by a callus.

Distribution : India : Meghalaya.

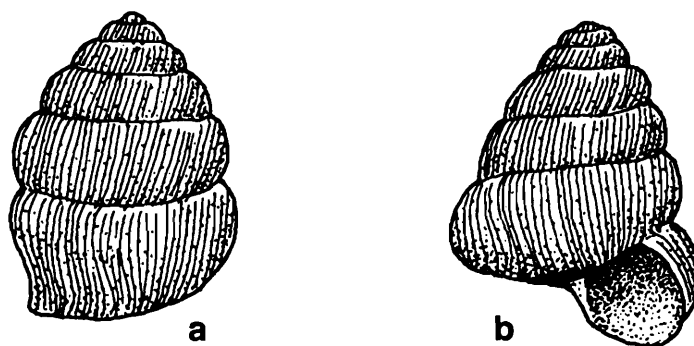


Fig. 31. *Acmezza tersa*, a. dorsal view; b. ventral view

Measurements (in mm) :

Length	Diameter	Aperture
1.65-2.00	1.00-1.25	0.65 - 0.95

Status : Not common.

Subfamily OMPHALOTROPIDINAE

Genus *Omphalotropis* Pfeiffer, 1851

1851. *Omphalotropis* Pfeiffer, *Zeits Malak.*, 8 : 176.

Number of Indian species : Five.

Distribution : Andaman and Nicobar Islands, Pondicherry

Elsewhere : Malaysia, Mascarene Island, Polynesia.

Size Range (Indian species) : 3.00 - 10.00 mm in length.

Omphalotropis andersoni Blanford

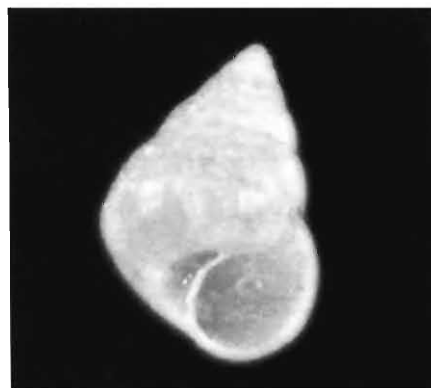
(78, 79)

1850. *Realia (Omphalotropis) andersoni* Blanford, *J. Asiat. Soc. Beng.*, 49(2) : 216, pl. 2, figs 18.

1921. *Omphalotropis andersoni*: Gude, *Fauna of British India, Mollusca*, 3 : 356.

Shell ovately conical, small, perforate, brownish, very finely obliquely striate, whorls 7, flat sided, last whorl with a hair like keel at the periphery; apex acute; aperture ovate, oblique, slightly angular above; peristome thickened, margins joined by a callus; columellar lip with a small cut near the umbilicus, a blunt keel around the edge of umbilicus.

Distribution : India : Andaman Islands.



78. *Omphalotropis andersoni* Blanford—dorsal view 79. *Omphalotropis andersoni* Blanford—ventral view

Measurements (in mm) :

Length	Diameter	Aperture
3.90-7.25	2.55-5.00	2.45 3.40

Status : Common.

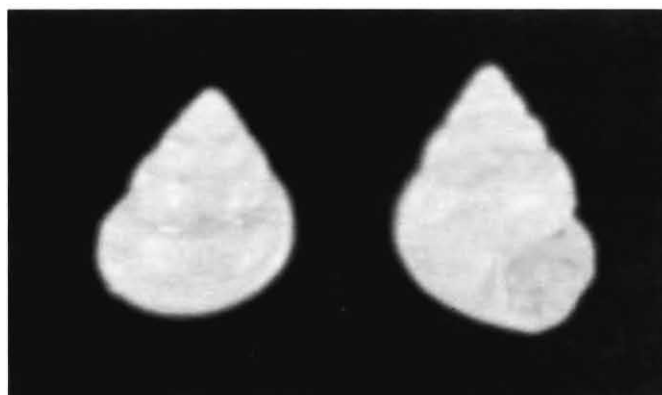
***Omphalotropis decussata* (Blanford)**
(80)

1880. *Realia decussata* Blanford, *J. Asiat. Soc. Beng.*, **49(2)** : 218.

1921. *Realia decussata*: Gude, *Fauna of British India, Mollusca*, **3** : 358.

Shell ovately conical, small, perforate, brownish, with a pale peripheral band with close oblique striae and decussating spiral lines; sculpture stronger on upper whorls and also near the suture on lower whorls; whorls 6, convex, the last whorl rounded both above and below, radiately striate at the base, strongly in the umbilical region; aperture oblique, oval, margins joined by a callus; peristome thin, columellar margin with a cut near the umbilicus, an impressed line around the edge of perforation.

Differs in being decussately sculptured and in lacking the keel around the umbilicus.



80. *Omphalotropis decussata* (Blanford)—dorsal and ventral view

Distribution : India : Andaman Islands.

Measurements (in mm) :

Length	Diameter	Aperture
3.60 - 4.00	2.305 - 2.90	1.80 - 1.95

Status : Rare.

Subclass PULMONATA

Order STYLOMMATOPHORA

Family PUPILLIDAE

Shell small, cylindrically ovate, narrowly and obliquely perforate, without strong sculpture, spire convex, last whorl scarcely wider than the penultimate, aperture ovate, usually with denticles or lamellae.

Animal narrow, posteriorly attenuated, upper pair of tentacles long and rather thickened at the tips, lower pair short.

Africa, Asia, Europe.

Reference

Thompson, F.G. & Dance, P.1983. Non marine mollusks of Borneo II Pulmonata: Pupillidae, Clausiliidae. III Prosobranchia : Hydrocenidae, Helicinidae. *Bull. Fla. State Mus., (Biol.Sci.)* **29(3)** : 101-130, 75, figs.

Key to the genera

Shell with last whorl ascending in front *Pupoides*

Shell with last whorl straight in front *Pupilla*

Subfamily PUPILLINAE

Genus *Pupilla* Leach in Fleming, 1828

1828. *Pupilla* Leach in Fleming, *Brit. Animals*, p. 268.

Number of Indian species : Eight.

Distribution : India : Himachal Pradesh, Madhya Pradesh, Orissa, Tamil Nadu, West Bengal.

Elsewhere : Africa, China, Europe, Myanmar, Nepal, Sri Lanka.

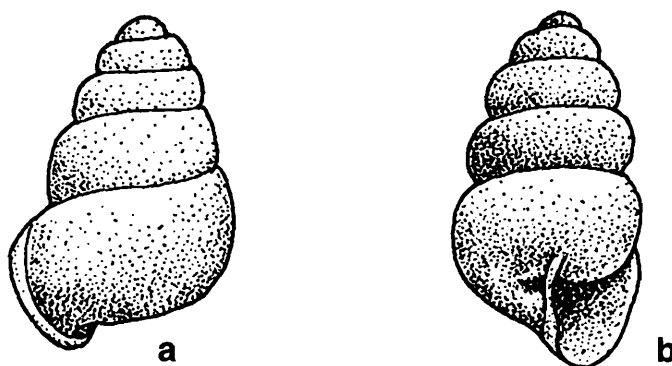
Size Range (Indian species) : 1.50 - 4.00 mm in length.

***Pupilla barrackporensis* Gude**

(Fig. 32)

1914. *Pupilla barrackporensis* Gude, *Fauna of British India, Mollusca*, **2** : 285.

Shell very small, cylindrically ovate, thin, narrowly perforate, faintly striate; apex obtuse, whorls 5, upper whorls convex, last whorl rather flat on sides, much compressed at base; suture deep, aperture nearly vertical, oblong; peristome reflected, margins joined by callus, 4 denticles, one columellar, one parietal and two palatal.

**Fig. 32.** *Pupilla barrackporensis*, a. dorsal view; b. ventral view*Distribution* : India : Andhra Pradesh, West Bengal.

Measurements (in mm) :

Length	Diameter
2.50	1.30

Status : Common.***Pupilla muscorum* (Linnaeus)**

(81)

1758. *Turbo muscorum* Linnaeus, *Syst. Nat.*, **ed 10** p.7671914. *Pupilla muscorum*: Gude, *Fauna of British India, Mollusca*, **2** : 282.

Shell small, subcylindrical, light yellowish, perforate, finely and closely striate, apex obtuse; whorls 6-7, convex, the last rounded below; aperture sub vertical, roundly ovate, truncate above; peristome thickened and reflected with a well formed whitish external rib; margins joined by callus, slightly curved above, rounded below.

Differs from the above species having more number of whorls, being toothless and also by the presence of the white external rib.

Distribution : India : N. Western part.



81. *Pupilla muscorum* (Linnaeus)—dorsal and ventral view

Elsewhere : Central Asia, Europe.

Indian forms lack the parietal tooth and probably belong to the var. *asiatica* Moellendorff.

Measurements (in mm) :

Length		Diameter	
3.25	5.00	1.75	1.90

Status : Common.

Genus *Pupoides* Pfeiffer, 1854

1854. *Pupoides* Pfeiffer, *Malak. Blatt.*, **1** : 192.

Number of Indian species : Three. Common in semi-arid situations.

Distribution : India : Common through hills and plains (Except north-east region).

Elsewhere : Afghanistan, Egypt, Pakistan, Sri Lanka.

Size Range (Indian species) : 4.00 5.50 mm in length.

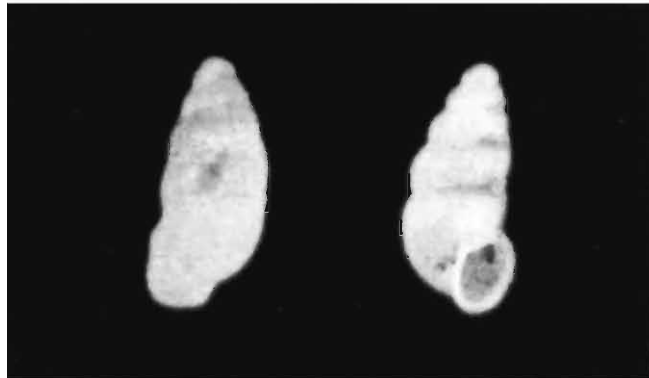
Pupoides coenopictus (Hutton)

(82)

1834. No 7, *Pupa*, Hutton, *J. Asiat. Soc. Beng.*, **3** : 85.

1914. *Pupoides coenopictus* : Gude, *Fauna of British India, Mollusca*, **2** : 259.

Shell small, narrow, cylindrically pyramidal, more than twice as long as broad, perforate, brownish, sometimes with a greenish tinge, finely and closely striate; whorls 6, well rounded, last whorl swollen; slightly compressed at the perforation; aperture sub oblique, ovately lunate; peristome reflected discontinuous, mostly with a blunt tooth on the parietal margin above.



82. *Pupoides coenopictus* (Hutton)—dorsal and ventral view

Distribution : India : Fairly common throughout, from Kashmir in the northwest to Kerala in the south, not recorded from the northeast.

Elsewhere : Afghanistan, Africa (Seddon, 1992), Egypt, Sri Lanka.

Measurements (in mm) :

Length		Diameter	
3.40	4.80	1.65	1.80

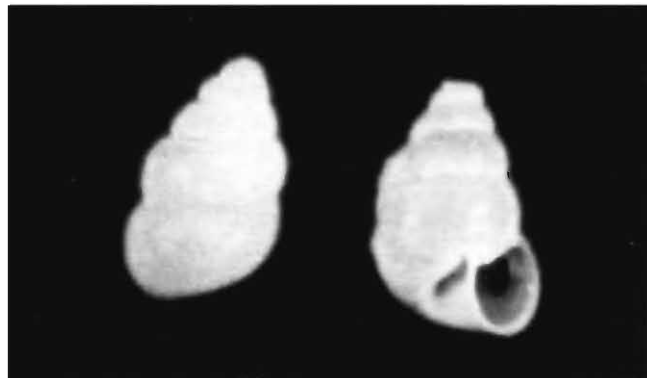
Status : Abundant.

Pupoides tutulus (Reeve)
(83)

1849. *Bulimus tutulus* (Benson) Reeve, *Conch. Icon.*, 5 *Bulimus*, pl. 84, fig. 625.

1914. *Pupoides tutulus*: Gude, *Fauna of British India, Mollusca*, 2 : 261.

Shell small, conical, broad at base, perforate, brownish, closely striate; whorls 6, last whorl compressed at the perforation; aperture vertical, lunately circular; peristome reflected, columella vertically dilated; a small, blunt tooth above on parietal margin.



83. *Pupoides tutulus* (Reeve)—dorsal and ventral view

Differs from the above being more conical and broader, less than twice as long as broad.

Distribution : India : Bihar, Delhi, Gujarat, Madhya Pradesh, Maharashtra, Rajasthan, Uttar Pradesh.

Measurements (in mm) :

Length	Diameter
4.20 - 5.20	2.70 - 3.00

Status : Common.

Family VALLONIIDAE

Shell minute, (usually less than 3 mm in diameter), depressed, openly and widely umbilicate, spire low, 3-4 whorled, surface smooth or ribbed, periphery rounded, last whorl usually descending near mouth; aperture oblique, oval, peristome continuous, expanded or reflected, sometimes thickened within.

Foot short, without pedal grooves, sole of foot crenulated on the edge, undivided, tentacles short, cylindrical.

Asia, Africa, America, Atlantic Islands, Europe.

Reference

Zilch, A.1969. 43. Mollusca, Pupillacea 2 (Valloniidae, Pleurodiscidae). *Arch. Moll.*, **99(3/4)** : 221- 245, pls.2- 5.

Genus *Vallonia* Risso, 1826

1826. *Vallonia* Risso, *Hist. Nat. Europemerid*, **4** : 101.

Number of Indian species : Four.

Distribution : India : Kashmir, one species from South India.

Elsewhere : China, Europe, Japan, N. Africa, N. America.

Size Range (Indian species) : 2.00 - 3.50 mm in diameter.

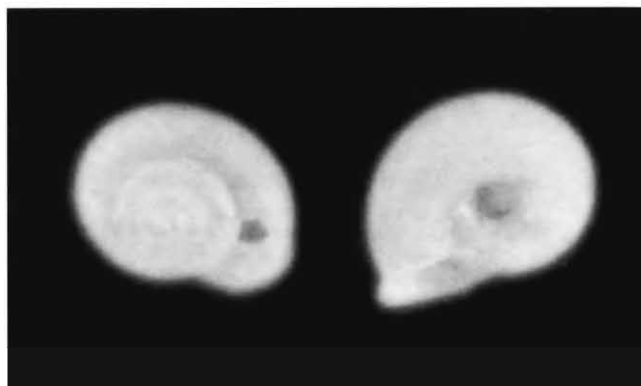
Vallonia ladakensis Nevill

(84)

1878. *Helix (Vallonia) ladacensis* Nevill, *Scient. Results Second Yarkund Mission, Mollusca*, p. 4.

1914. *Vallonia ladakensis* : Gude, *Fauna of British India, Mollusca*, **2** : 226.

Shell minute, depressedly turbinate, spire much depressed, widely umbilicate, finely and closely obliquely striate, whorls 5; suture deep, nearly canalised, last whorl slightly descending near the aperture; subangulate around the umbilicus; aperture nearly circular; peristome slightly thickened, margins not joined.



84. *Vallonia ladakensis* Nevill—dorsal and ventral view

Distribution : India : Kashmir, Punjab.

Elsewhere : Turkey, Tibet.

Measurements (in mm) :

Length	Diameter
1.40	3.55

Status : Rare.

***Vallonia pulchella* (Mueller)**
(85)

1774. *Helix pulchella* Mueller, *Verm. Terr. Fluv. Hist.*, 2 : 30.

1914. *Vallonia pulchella* : Gude, *Fauna of British India, Mollusca*, 2 : 223.

Differs from *V. ladakensis* in being more conoid with a little more raised spire and the sculpture being much more coarse and less close; margins of aperture almost joined together.

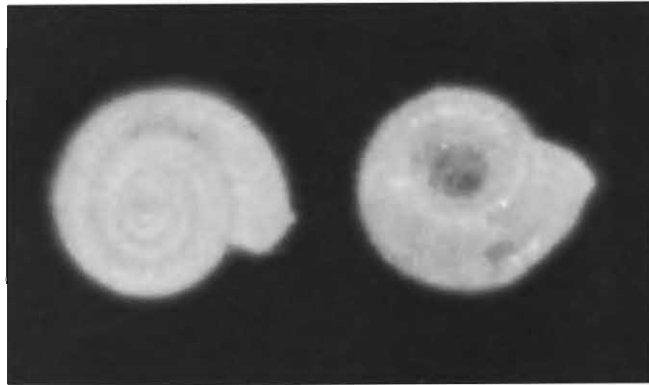
Distribution : India : Kashmir.

Elsewhere : Azores, Europe, Madeira, N. Africa, N. & E. America.

Measurements (in mm) :

Length	Diameter
1.50	3.45

Status : Common.



85. *Vallonia pulchella* (Mueller)—dorsal and ventral view

Family VERTIGINIDAE

Shell minute, mostly upto 3 mm in height, rimate or narrowly perforate, ovately conoid to cylindrical, with fine sculpture, last whorl often ascending in front, aperture oblique, usually with denticulate projections.

In some genera lower pair of tentacles absent or inconspicuous.

North and South America, South Africa, South and East Asia, West Indies, Pacific Islands.

Many species occur on stems and barks of tree trunks.

It includes three subfamilies.

Reference

Bentham Jutting, wss van. 1950. The Malayan species of *Boysidia*, *Paraboysidia*, *Hypselostoma* and *Gyliotrachela* (Gastropods, Pulmonata, Vertiginidae) with a catalogue of all species hitherto described. *Bull. Raffles Mus., Singapore*, **21** : 5-47, 21 figs.

Zilch, A. 1953. Die Typen und Typoide des Natur Museums Senckenberg. 70 Mollusca : Pupillacea (3) : Vertiginidae : Nesopupinae. *Arch. Moll.*, **113(1/6)** : 103-116, 229-230.

Key to the genera

1. Last whorl ascending near the aperture (2)
 - Last whorl straight near the aperture *Pupisoma*
2. Aperture with dentition (3)
 - Aperture without dentition *Boysia*
3. Last whorl compressed behind the peristome; number of denticles less than 5.
 - *Gastrocopta*
 - Last whorl not compressed; number of denticles above 5 *Boysidia*

Subfamily TRUNCATELLININAE

Genus *Boysia* Pfeiffer, 1849

1849. *Boysia* Pfeiffer, *Zeit. Malak.*, **6** :105.

Number of Indian species : One.

Distribution : India : Madhya Pradesh, Rajasthan.

Size Range : 3.20 mm in diameter.

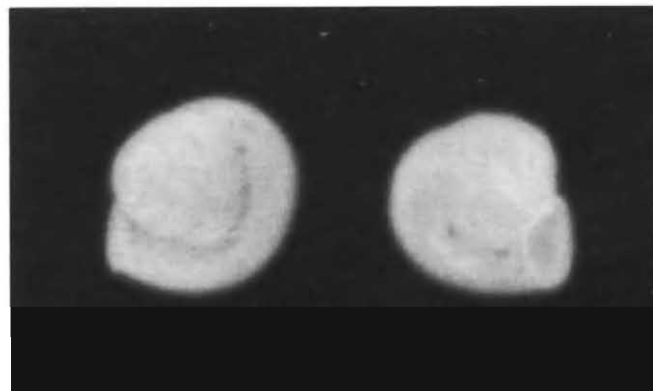
Boysia boysi Pfeiffer

(86)

1846. *Tomogeres boysii* (Benson) Pfeiffer, *Symb. Hist. Helic.*, **3** : 82.

1914. *Boysia boysi*: Gude, *Fauna of British India, Mollusca*, **2** : 297.

Shell small, compressedly conical, narrowly perforate, thin, semi transparent, very finely radially striate, spire obliquely inclined in respect of the eccentric last whorl, obtuse, whorls 5, rounded, last whorl arcuate, steeply ascending overlapping the antipenultimate whorl above, slightly compressed below; aperture subtriangularly rounded, sub vertical, simple, peristome slightly expanded, margins joined by a distinct callus.



86. *Boysia boysi* Pfeiffer—dorsal and ventral view

Distribution : India : Madhya Pradesh, Rajasthan (drier central India).

Measurements (in mm) :

Length	Diameter
3.50	3.20

Status : Common.

Subfamily GASTROCOPTINAE

Number of Indian genera : Two.

Genus *Gastrocopta* Wollaston, 1878

Shell small, conoid or elongate, aperture with a complex parietal lamellar process; columellar lamellae and palatal plicae also present, sometimes with a tooth on the base.

Number of Indian species : Three.

Distribution : India : Himachal Pradesh, Kashmir, Madhya Pradesh, Maharashtra.

Elsewhere : Australia, Myanmar, N. & S. America, Pacific Islands, Sri Lanka, West Indies.

Size Range (Indian species) : 1.50 - 3.60 mm in length.

***Gastrocopta bathyodon* (Benson)**

(Fig. 33)

1863. *Pupa bathyodon* Benson, *Ann. Mag. nat. Hist.*, (3)12 : 426.

1914. *Bifidaria bathyodon* : Gude, *Fauna of British India, Mollusca*, 2 : 290.

Shell very small, ovately conical, perforate, obliquely striate, whorls 5, convex; last whorl slightly ascending in front and considerably compressed behind the aperture forming an excavation at the umbilical region; aperture quadrate-ovate, subvertical, peristome expanded and slightly reflected, continuous, 4 apertural denticles, one large parietal lamella, one columellar and two deep seated smaller palatal.

Distribution : India : Maharashtra.

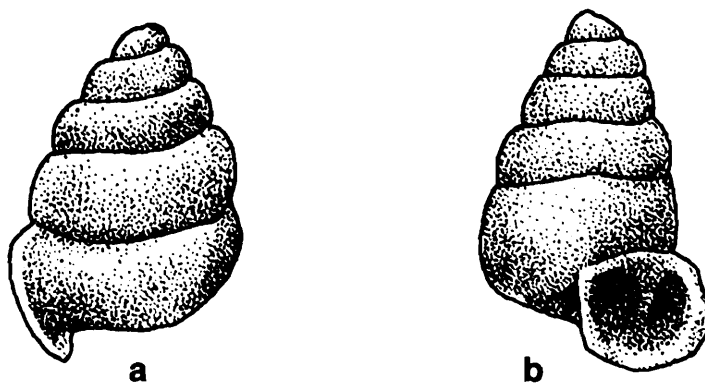


Fig. 33. *Gastrocopta bathyodon*, a. dorsal view, b. ventral view

Measurements (in mm) :

Length	Diameter
3.60	2.00

Status : Rare.

Genus *Boysidia* Ancey, 1881

1881. *Boysidia* Ancey, *Le Naturaliste*, 47 : 373 (as section of *Pupa*).

Number of Indian species : One.

Distribution : India : Meghalaya, Uttaranchal.

Elsewhere : China, Malaysia, Myanmar.

Size Range (Indian species) : 2.00 - 2.50 mm in height

Boysidia plicidens (Benson)

(Fig. 34)

1849. *Pupa plicidens* Benson, *Ann. Mag. nat. Hist.*, (2)4 : 126.

1914. *Boysidia plicidens*: Gude, *Fauna of British India, Mollusca*, 2 : 294.

Shell minute, ovately-conical, subtrochiform, narrowly umbilicate, rather thin, faintly striate, whorls 5, closely coiled, rather convex; last whorl swollen, considerably ascending near the aperture, tumidly flat on base, subangulate around the perforation; suture much impressed; aperture subtriangular, peristome sinuate, continuous, expanded and slightly reflected; 3 parietal lamellae, 2 bigger and one deep seated smaller, 5 palatal, 3 upper bigger and 2 lower smaller. In addition a single compressed tooth on cloumella, and one conical tooth on outer margin of peristome is also present.

Distribution : India : Meghalaya (Cherrapunjee), Uttaranchal (Landour, Moussuri).

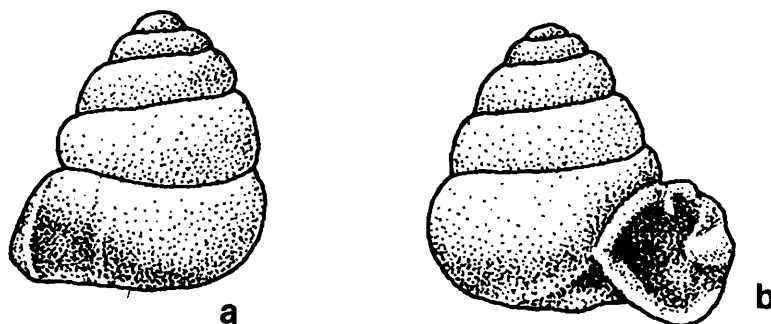


Fig. 34. *Boysidia plicidens*, a. dorsal view, b. ventral view

Measurements (in mm) :

Length	Diameter
2.30	1.60

Status : Common.

Subfamily NESOPUPINAE

Genus *Pupisoma* Stoliczka, 1873

1873. *Pupisoma* Stoliczka, *J. Asiat. Soc. Beng.*, **42** : 32.

Number of Indian species : Five.

Distribution : India : Andaman Islands, Assam, Bihar, Maharashtra, Orissa, Sikkim, Uttar Pradesh.

Elsewhere : Borneo, Japan, Myanmar, Philippines, S. Africa.

Size Range (Indian species) : 1.50 - 2.50 mm in height

Pupisoma cacharicum Godwin-Austen
(Fig. 35)

1910. *Pupisoma cacharica* Godwin-Austen, *Land & Fresh. Moll. India*, **2** : 303, pl.132, fig.4.

1914. *Pupisoma cacharicum* : Gude, *Fauna of British India, Mollusca*, **2** : 39.

Shell minute, globosely conoid, very thin with spiral striae, decussated by fine close oblique markings, whorls $3\frac{1}{2}$, rapidly increasing, well rounded, last whorl large and globose, equalling $\frac{2}{3}$ rd of the total height of shell; aperture nearly circular, oblique, peristome thin and simple, discontinuous, columellar margin vertical, reflected.

Distribution : India : Assam (collected from shallow cavities on branches of tree).

Measurements (in mm) :

Length	Diameter
1.40	1.30

Status : Common.

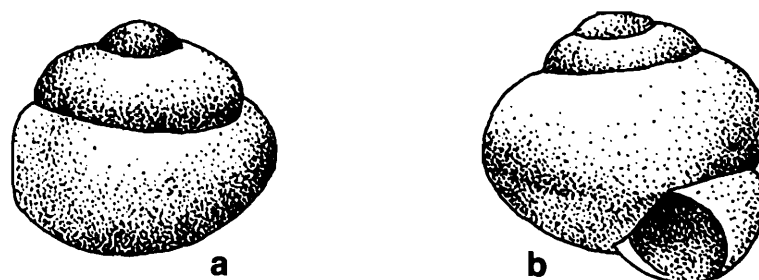


Fig. 35. *Pupisoma cacharicum*, a. dorsal view, b. ventral view

Pupisoma orcula (Benson)

(Fig. 36)

1850. *Helix orcula* Benson, *Ann. Mag. nat. Hist.*, (2)6 : 251.1914. *Pupisoma orcula*: Gude, *Fauna of British India, Mollusca*, 2 : 36.

Shell minute, conoidly globose, scarcely perforate, thin with close fine oblique striae; whorls 3½, rounded; aperture oblique, circular; peristome thin, columellar margin triangularly reflected almost blocking the perforation.



Fig. 36. *Pupisoma orcula*, a. dorsal view, b. ventral view

Differs from the above species being less globose, last whorl equalling half the total height of shell and lacking the spiral striae.

Distribution : India : Widely distributed throughout Eastern India.(mostly on bark of trees)

Elsewhere : Japan, S. Africa.

Measurements (in mm) :

Length	Diameter
2.00	1.80

Status : Common.

Family ORCULIDAE

Shell cylindrical, minute (less than 5 mm in length), rimate, minutely and obliquely costulate, peristome simple with thin margins.

India, Europe, N. America.

Holarctic family, extending to the N.W. Himalaya.

Genus ***Orcula*** Held, 1837

Number of Indian species : One.

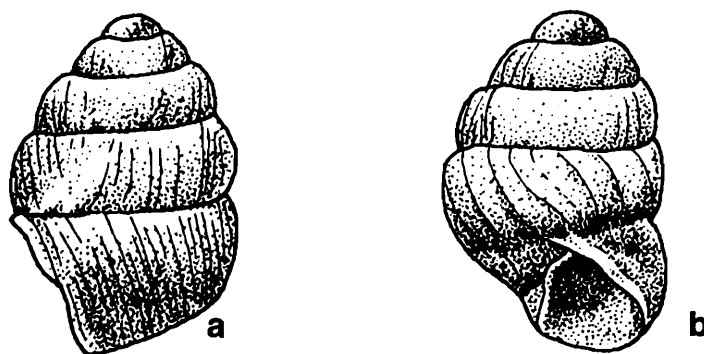


Fig. 37. *Pupisoma evezardi*, a. dorsal view, b. ventral view

Distribution : India : Himachal Pradesh, Kashmir, Uttaranchal.

Elsewhere : Europe, N. America.

Size Range (Indian species) : 2.00 mm in height.

Subgenus *Sphyradium* Charpentier, 1837

1837. *Sphyradium* Charpentier, *Neue Denkschr. Allg. Schweiz. Gesells. Naturw.*, 1 : 15.

Number of Indian Species : One

Orcula (Sphyradium) himalayanum (Benson)

1863. *Pupa himalayana* (Hutton) Benson, *Ann. Mag. nat. Hist.*, (3)12 : 428.

1914. *Sphyradium himalayanum* : Gude, *Fauna of British India, Mollusca*, 2 : 41.

Shell minute, ovate-oblong, subcylindrical, narrowly perforate, finely obliquely striate, thin, apex obtuse, whorls 7, rounded, last whorl ascending in front; aperture ovately rounded, simple, without dentition, peristome thin, margins slightly expanded.

Distribution : India : Himachal Pradesh, Kashmir, Uttaranchal.

Measurements (in mm) :

Length	Diameter
2.00	1.00

Status : Rare.

Family PYRAMIDULIDAE

Shell small, flattened-discoidal to low conoid, often with rib like striae and spiral band, openly and widely umbilicate, with subcylindrical whorls, aperture roundly lunate, simple.

Animal with undivided sole of foot, pedal margin with a distinct groove, caudal gland absent, eye bearing tentacles long and slender.

Europe and Central Asia.

On ground.

Genus *Pyramidula* Fitzinger, 1833

1833. *Pyramidula* Fitzinger, *System Verz. Oesterr. Vork. Weichth.*, p. 95.

Number of Indian species : Two.

Distribution : India : Himachal Pradesh, Punjab, Tamil Nadu (Nilgiri), Uttaranchal.

Elsewhere : Sri Lanka.

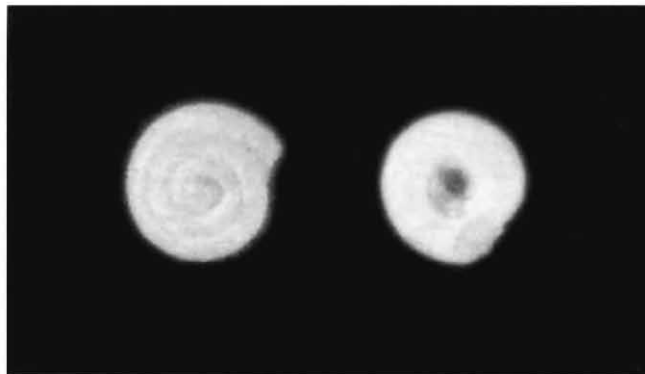
Size Range (Indian species) : 2.00 3.00 mm in diameter.

Pyramidula humilis (Benson)
(87)

1838. *Helix humilis* Benson, *J. Asiat. Soc. Beng.*, **7** : 217.

1914. *Pyramidula humilis* : Gude, *Fauna of British India, Mollusca*, **2** : 43.

Shell minute, convexly depressed, thin, deeply and openly umbilicate, finely, obliquely striate, whorls 5 5½, narrowly coiled, suture deep, apex blunt, last whorl slightly descending, subangulate at periphery and also around the perforation below, aperture suboblique, circular, peristome thin and simple, margin interrupted.



87. *Pyramidula humilis* (Benson)—dorsal and ventral view

Distribution : India : Himachal Pradesh, Punjab, Uttaranchal.

Measurements (in mm) :

Height	Diameter
1.00 1.20	1.85 2.50

Status : Common.

Family BULIMINIDAE (ENIDAE)

Shell ovate to fusiform-cylindrical, usually elongate-ovate, dextral or sinistral, openly perforate or umbilicate, usually smooth, often with pale streaks; body whorl sometimes ascending in front; aperture shortly elongate, peristome thickened or simple, straight, expanded or reflected, margins joined by a thin callus, sometimes with tooth on upper margin; columella straight.

Animal elongate, with a pointed tail; head and tentacles dark, often with two dark stripes along the back.

Africa, Asia, Europe.

It includes two subfamilies.

Reference

Kobelt, W. & Mollendorff, O.F.V. 1903. Catalog der family Buliminidae. *Nachr. Bldtsch malak. Ges.*, **35** : 36 60, 65 - 71.

Hesse, P. 1933. Zur Anatomie und Systematik der family Enidae. *Arch. Naturg.*, **2(2)** : 145-224,

Key to the genera

1. Last whorl ascending near the aperture *Mirus*
 Last whorl not ascending near the aperture (2)
2. Shell usually with brown transverse streaks; oblique striae weak
 *Subzebrinus*
 Shell without transverse streaks; oblique striae strong *Serina*

Subfamily BULIMININAE

Number of Indian genera : Two.

Genus *Mirus* Albers, 1850

1850. *Mirus* Albers, *Die Heliceen*, p. 184.

Number of Indian species : Five.

Distribution : India : Arunachal Pradesh, Meghalaya, Kashmir, Punjab, Uttar Pradesh, Tamil Nadu (Nilgiri, upto 6000 ft.).

Elsewhere : Baluchistan, China, Myanmar, Sri Lanka.

Size Range (Indian species) : 8.00 28.00 mm in length.

Mirus nilagirica (Pfeiffer)

(88, 89)

1846. *Bulimus nilagiricus* Pfeiffer, *Proc. zool. Soc. Lond.*, p. 41.1914. *Ena (Mirus) nilagirica*: Gude, *Fauna of British India, Mollusca*, 2 : 231.

Shell oblong-turreted, dextral, narrowly perforate, pale white, semitransparent with whitish streaks, very closely and finely marked with oblique striae, wavy spiral markings are also present; whorls 8, slightly convex, ascending a little in front, last whorl rather compressed at base; aperture oval, peristome expanded, subangulate above, columella dilated at base.

88. *Mirus nilagirica* (Pfeiffer)—dorsal view88. *Mirus nilagirica* (Pfeiffer)—ventral view*Distribution* : India : Arunachal Pradesh, Kerala, Meghalaya, Tamil Nadu.*Elsewhere* : Myanmar.

Measurements (in mm) :

Length		Diameter		Aperture	
8.90	19.50	4.60	8.00	3.70	6.50

Status : Rare.Genus ***Serina*** Gredler, 18981898. *Serina* Gredler, *Gymnasialprogr Bozen*, p. 10.

Number of Indian species : Five.

Distribution : India : Himachal Pradesh, Punjab, Uttaranchal.

Elsewhere : China.

Size Range (Indian species) : 10.00 20.00 mm in length. On hills, upto 8500 ft.

***Serina beddomeana* (Nevill)**

1878. *Buliminus (Petraeus) beddomeanus* Nevill, *Sci Res. Second Yarkand Miss., Mollusca*, p.20, fig. 29.

1914. *Ena (Serina) beddomeana*: Gude, *Fauna of British India, Mollusca*, 2 : 256.

Shell subcylindrically turreted, narrowly perforate, chalky white with some pale brownish spots, closely obliquely striate, apex obtuse; whorls 10, slightly convex, last whorl compressed; aperture small, peristome reflected and a little arcuate, columella dilated and rounded at base.

Distribution : India : Punjab, N. W. Province.

Measurements (in mm) :

Length	Diameter	Aperture
13.75	4.75	3.50

Subfamily CHONDRULINAE

Number of Indian genera : Two.

Genus ***Subzebrinus*** Westerlund, 1887

1887. *Subzebrinus* Westerlund, *Fauna Palaearct.*, 3 : 66.

Number of Indian species : Twenty.

Distribution : India: Himachal Pradesh, Kashmir, Punjab, Uttaranchal, West Bengal.

Elsewhere : Afghanistan, Tibet.

Size Range (Indian species) : 10.00 35.00 mm in length. On hills upto 14000 ft.

Subzebrinus arcuata (Kuester)

(90, 91)

1845. *Bulimus arcuatus* Kuester, *Conch. Cab., Bulimus*, p. 56, pl.17, figs. 1,2.

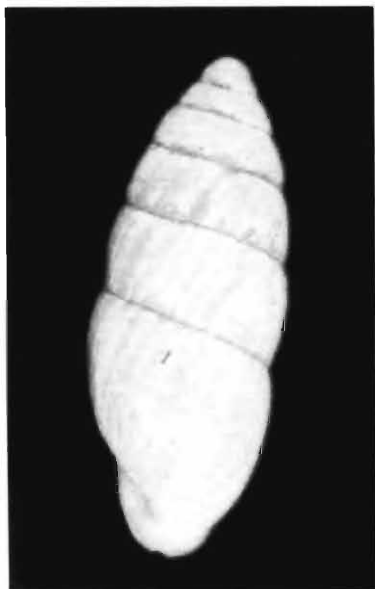
1914. *Ena (Subzebrinus) arcuata* : Gude, *Fauna of British India, Mollusca*, 2 : 239.

Shell moderately large, sinistral, ovately conical, compressedly perforate, whitish with regular brownish, oblique streaks, costulately striate; whorls 7, convex; sutures

deep and very oblique, apex obtuse; aperture oblong-ovate, peristome reflected but not much thickened, upper margin arcuate, columella dilated.

Distinct for its regular close markings.

Distribution : India : Western Himalaya (Himachal Pradesh, Kashmir, Punjab).



90. *Subzebrinus arcuata* (Kuester)—dorsal view

91. *Subzebrinus arcuata* (Kuester)—ventral view

Measurements (in mm) :

Length		Diameter		Aperture	
13.45	20.00	5.50	7.80	4.35	6.60

Status : Abundant.

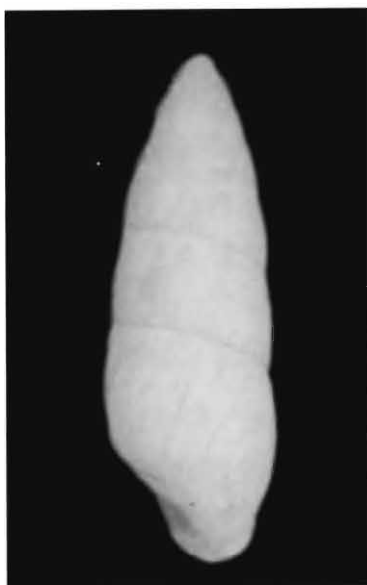
Subzebrinus candellaris (Pfeiffer)
(92)

1846. *Bulimus candellaris* Pfeiffer, *Proc. zool. Soc. Lond.*, p. 40.

1914. *Ena (Subzebrinus) candellaris* : Gude, *Fauna of British India, Mollusca*, 2 : 243.

Shell large, sinistral, cylindrically attenuate, narrowly perforate, subobliquely closely striate, chalky white, sometimes with irregular brownish streaks; whorls 9, not much convex; suture shallow, oblique, last whorl equals 1/3rd of the total length; moderately rounded at base; aperture sub oval, peristome slightly expanded, reflected, margins joined, columella dilated.

Distinguished from the above species by its chalky white appearance without regular brownish streaks.



92. *Subzebrinus candellaris* (Pfeiffer)—dorsal view

Distribution : India : N. W. India (Kashmir, Punjab).

Measurements (in mm) :

Length	Diameter	Aperture
10.90 26.70	7.40 8.45	5.70 7.15

Status : Abundant.

Subzebrinus dextrosinister Annandale and Rao
(93)

1923. *Subzebrinus dextrosinister* Annandale and Rao, *Rec. Indian Mus.*, **25** : 390, pl.9, figs.6-7a.

Shell elongate, cylindrical, spindle shaped, very narrowly perforate, pale white with oblique brown streaks; obliquely and rather arcuately striate; whorls 8, slightly convex; the last slightly compressed, moderately rounded below; aperture subovate, truncated above; peristome reflected, outer lip considerably projecting beyond the outline; columella vertical, dilated, margins joined by a callus.

Both dextral and sinistral forms occur. Distinguished by its spindle shaped forms.

Distribution : India: N. W. India, Punjab (some collected from barks of large trees).

Measurements (in mm) :

Length	Diameter	Aperture
18.45 22.15	6.15 6.60	5.40 5.55

Status : Abundant.



93. *Subzebrinus dextrosinister* Annandale and Rao—ventral and dorsal view

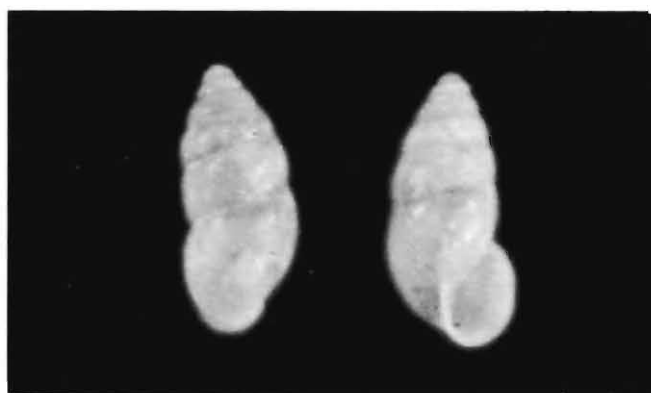
***Subzebrinus mainwaringiana* (Nevill)**

(94)

1878. *Buliminus (Petraeus) mainwaringianus* Nevill, *Sci Res. Second Yarkand Miss., Mollusca*, p.19, fig. 28.

1914. *Ena (Subzebrinus) mainwaringiana* : Gude, *Fauna of British India, Mollusca*, 2 : 251.

Shell small, subcylindrical, dextral, narrowly perforate, rather smooth, finely obliquely striate, whitish or horny brown, with some irregular opaque-white markings here and there; apex obtuse; whorls 7, slightly compressed; aperture small, ovate, peristome thickened, columella reflected, subangulate below.



94. *Subzebrinus mainwaringiana* (Nevill)—dorsal and ventral view

Differs from others being smaller and dextral. Larger forms also occur (Gude, 1914)

Distribution : India : N.W. India (Kashmir, Punjab).

Measurements (in mm) :

Length	Diameter	Aperture
10.15 12.25	4.70 5.00	4.25 4.75

Status : Abundant.

Family CERASTUIDAE

Shell small or medium sized, ovate-oblong, narrowly perforate or deeply umbilicate, with fine sculpture or coarse striae, whorls convex, last whorl equal or less than the spire, aperture ovate, peristome simple or reflected, columellar margin a little reflected over the umbilical opening.

Distribution : India, Africa.

Number of Indian genera : Three.

Key to the genera

1. Last whorl and spire of equal height, sculpture strong*Cerastua*
Last whorl shorter than spire, sculpture weak (2)
2. Shell with coloured bands, upper margin of peristome straight..... *Rhachis*
Shell without coloured bands, upper margin of peristome curved*Edouardia*

Genus *Cerastua* Strand, 1928

1928. *Cerastua* Strand, *Arch. Natur. Berlin*, **92** : 38.

Number of Indian species : Eight.

Distribution : India : Gujarat, Himachal Pradesh, Kashmir, Madhya Pradesh, Maharashtra, also South India.

Elsewhere : Egypt, Persian gulf, Turkey.

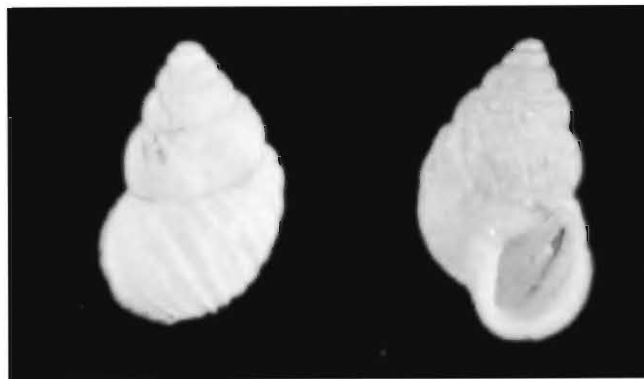
Size Range (Indian species) : 11.00 – 22.00 mm in length.

Cerastua fairbanki (Pfeiffer)

(95)

1857. *Bulimus fairbanki* Pfeiffer, *Proc. zool. Soc. Lond.*, p.109.

1914. *Cerastus fairbanki* : Gude, *Fauna of British India, Mollusca*, **2** : 264.



95. *Cerastua fairbanki* (Pfeiffer)–dorsal and ventral view

Shell ovately conical, narrowly and compressedly umbilicate, distinctly sculptured by widely spaced raised oblique ribs, dull white; whorls 6, convex, apex obtuse, last whorl broad, equalling more than half of the total length; aperture sub-oblique, oval, peristome expanded and reflected, margins joined by a thin callus; columellar margin reflected.

Distribution : India : Maharashtra.

Measurements (in mm) :

Length		Diameter		Aperture	
16.50	18.90	9.25	9.80	8.20	8.50

Status : Not common.

***Cerastua moussonianus* (Petit)**
(96)

1851. *Bulimus moussonianus* Petit, *J. Conchyl.*, **2** : 266, pl .7, fig. 4.

1914. *Cerastua moussonianus*: Gude, *Fauna of British India, Mollusca*, **2** : 267.

Shell ovate and swollen, perforate, rather thin, translucent, very faintly spirally striate also marked by close oblique striae; whorls 7, rounded, last whorl broad, aperture oblique, sub-oval, peristome slightly reflected; columella dilated and reflected.

Differs in being more broad at base and also being very closely obliquely striate.

Distribution : India : Gujarat, Maharashtra.

Measurements (in mm) :

Length		Diameter		Aperture	
14.85	17.70	8.75	-10.00	7.65	9.10

Status : Not common.



96. *Cerastua moussonianus* (Petit)—dorsal and ventral view

Genus *Edouardia* Gude, 1914

1914. *Edouardia* Gude, *Fauna of British India, Mollusca*, **2** : 280.

Number of Indian species : One.

Distribution : India : Andhra Pradesh, Maharashtra, Tamil Nadu.

Elsewhere : East Africa.

Size Range (Indian species) : upto 10.00 mm in length.

Edouardia orbis (Blanford)
(97, 98)

1861. *Bulimus orbis* Blanford, *J. Asiat. Soc. Beng.*, **30** : 361, pl.1, fig. 14.

1914. *Edouardia orbis* : Gude, *Fauna of British India, Mollusca*, **2** : 280.

Shell elongate-turreted, subperforate, thin, almost transparent, very faintly obliquely striate; whorls 7, convex, last whorl about $\frac{1}{3}$ rd of total length; aperture oblique, roundly ovate, peristome simple, margins converging, upper margin of peristome runs along the penultimate whorl for a little distance; columella reflected over the umbilicus.



97. *Edouardia orbis* (Blanford)—dorsal view 98. *Edouardia orbis* (Blanford)—ventral view

Distribution : India : Andhra Pradesh, Maharashtra, Tamil Nadu.

Measurements (in mm) :

Length	Diameter	Aperture
10.00	4.70	4.20

Status : Rare.

Genus *Rhachis* Albers, 1850

1850. *Rhachis* Albers, *Die Heliceen* p. 164. (= *Rachis* auctt. err).

Number of Indian species : Five.

Distribution : India : Common throughout except North-West India.

Elsewhere : Bangladesh, Myanmar, Sri Lanka.

Size Range (Indian species) : 10.00 – 23.00 mm in length.

On plants and shrubs.

Rhachis bengalensis (Lamarck)
(C30)

1822. *Bulimus bengalensis* Lamarck, *Hist. Nat. Anim. Sans. Vert.*, **6(2)** : 124.

1914. *Rachisellus bengalensis* : Gude, *Fauna of British India, Mollusca*, **2** : 274.

Shell ovate, narrowly perforate, thin, nearly transparent, smooth, faintly spirally striate, pale white or yellowish white, with 3-4 chocolate bands, the lower ones of which are more prominent; whorls 6, not much rounded, last whorl swollen; aperture oval, wide, peristome thin a little reflected; columellar margin dilated.

Distribution : India: Fairly common throughout, except north-west.

Elsewhere : Bangladesh.

Measurements (in mm) :

Length	Diameter	Aperture
14.85 22.55	8.00 11.65	8.15 11.60

Status : Common.



C30. *Rhachis bengalensis* (Lamarck)—dorsal and ventral view

***Rhachis punctatus* (Anton)**
(C31)

1839. *Bulimus punctatus* Anton, *Verz. Conch.*, p.42.

1914. *Rachisellus punctatus* : Gude, *Fauna of British India, Mollusca, 2* : 277.

Shell ovately conical, distinctly perforate, marked with transverse streaks throughout and a single narrow chocolate band below the periphery, pale white; whorls 7-8, fairly rounded, last whorl with a single band, rarely an indistinct second band exists, apex acute; aperture ovate, peristome slightly thickened; columella dilated and reflected.

Differs being more conical and narrower, having the transverse streaks throughout and also possessing a single band instead of 3-4.



C31. *Rhachis punctatus* (Anton)—dorsal and ventral view

Distribution : India : Common throughout, Jharkhand, Madhya Pradesh, Maharashtra, Orissa, Uttar Pradesh, West Bengal and the whole of South India.

Elsewhere : Africa, Sri Lanka.

Measurements (in mm) :

Length	Diameter	Aperture
7.80 16.95	4.10 6.90	3.40 6.90

Status : Abundant.

Family CLAUSILIIDAE

Shell small, cylindrical or fusiform, mostly sinistral, rimate, striate or ribbed, spire turreted, sutures shallow; aperture small, pear shaped or ovate with number of folds

or plications. Possess a curved, flexuous elastic lid, called clausilium, resting between the folds, used for closing the aperture.

Animal slender, greyish black with a greenish tinge on posterior part; tentacles short, foot short, posteriorly pointed.

Asia, Europe, Madeira, N. Africa, S. America, West Indies.

Many are mountain dwelling, some are tree climbing also.

Reference

Loosjes, F.E. 1953. Monograph of the Indo-Australian Clausiliidae (Gastropoda, Pulmonata, Clausiliidae, Phaedusinae). *Beaufortia*, (31)3 : 1-226.

Key to the genera

1. Upper parietal lamella vertical..... *Euphaedusa*
 Upper parietal lamella oblique (2)
2. Shell usually light coloured, cylindrical in shape, with stronger sculpture.....
 *Cyclindrophaedusa*
 Shell usually deep coloured, more or less oval, with weak sculpture
 *Oospira*

Subfamily PHAEDUSINAE

Number of Indian genera : Two.

Genus *Euphaedusa* O. Boettger, 1877

1877. *Euphaedusa* Boettger, *Palaeontographica*, 3rd suppl., p. 57.

Number of Indian species : Twelve.

Distribution : India : Arunachal Pradesh, Assam, Himachal Pradesh, Meghalaya, Nagaland, Punjab, Sikkim, Uttaranchal, West Bengal (Darjeeling), 9000 ft..

Elsewhere : Myanmar, Sri Lanka.

Size Range (Indian species) : 10.00 – 21.00 mm in length.

Euphaedusa bacillum (Hanley & Theobald)
 (99, 100)

1870. *Clausilia bacillum* (Benson) Hanley & Theobald, *Conch. Ind.*, pl.24, fig. 1.

1914. *Clausilia (Phaedusa) bacillum* : Gude, *Fauna of British India, Mollusca*, 2 : 305.

Shell fusiformly elongate, sinistral, imperforate, semitransparent, finely obliquely striate, most crowdedly on last whorl; whorls 9, convex, apex obtuse, last whorl somewhat compressed and narrowed in relation to immediately upper whorls, rounded at base; aperture pear shaped, vertical, outer lip arcuate, margins continuous, free and slightly thickened, two small entering lamella, one almost vertical and the other approximating it from columellar side form a groove and continues inside the aperture. In addition, a couple of palatal plicae, upper longer and lower curved, also present inside the aperture (seen through the semitransparent shell from outside). These processes facilitate the movement and positioning of the elastic plate "clausilium" used for closing the aperture.



99. *Euphaedusa bacillum* (Hanley & Theobald)—dorsal view



100. *Euphaedusa bacillum* (Hanley & Theobald)—ventral view

Distribution : India : Assam, Meghalaya, Nagaland.

Elsewhere : Myanmar.

Measurements (in mm) :

Length		Diameter		Aperture	
13.70	16.20	3.15	3.65	3.00	3.15

Status : Common.

Genus *Hemiphaedusa* O. Boettger, 1877

1877. *Hemiphaedusa* O. Boettger, *Clausilienstudien*, Cassel, p. 56.

Number of Indian species : Two.

Distribution : India : Arunachal Pradesh, Assam, Himachal Pradesh, Meghalaya, Punjab, Nagaland, Sikkim, Uttaranchal, West Bengal(Darjeeling, 9000 ft.).

Elsewhere : Bhutan, China, Japan, Malaya Archipelago, Myanmar, Sri Lanka.

Size Range (Indian species) : 10.00 21.00 mm in length.

Subgenus *Cylindrophaedusa* O. Boettger, 1877

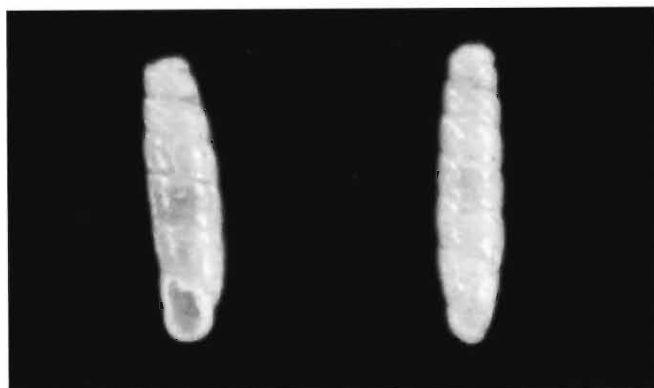
1877. *Cylindrophaedusa* O. Boettger, *Palaeontographica*, 3 rd suppl., p. 64.

***Hemiphaedusa (Cylindrophaedusa) cylindrica* (Pfeiffer)**
(101)

1846. *Clausilia cylindrica* (Gray) Pfeiffer, *Symb. Hist. Helic.*, 3 : 93.

1914. *Clausilia (Cylindrophaedusa) cylindrica* : Gude, *Fauna of British India, Mollusca*, 2 : 337.

Shell subcylindrically elongate, imperforate, obliquely striate throughout, striae stronger and broader on last whorl; whorls 13, (adult shells are almost invariably decollate with only 7-8 whorls) last whorl a little compressed ; aperture subvertical, pyriform, margins continuous, slightly reflected; two parietal lamellae, upper oblique, marginal, lower almost straight, ascending obliquely, bifurcating inside; in addition 3 palatal plicae one long and two shorter, present inside the aperture.



101. *Hemiphaedusa cylindrica* (Pfeiffer)—dorsal and ventral view

Distribution : India : Assam, Himachal Pradesh, Punjab, Uttaranchal.

Measurements (in mm) :

Length		Diameter		Aperture	
9.15	14.70	2.15	2.90	2.00	2.45

Status : Common.

Genus *Oospira* Blanford, 1872

1872. *Oospira* Blanford, *J. Asiat. Soc. Beng.*, 41 : 205.

Number of Indian species : Nine.

Distribution : India: Andaman & Nicobar Islands, Arunachal Pradesh, Assam, Meghalaya, Nagaland.

Elsewhere : Bangladesh, China, Japan, Malaya Archipelago.

Size Range (Indian species) : 19.00 – 36.50 mm in length, upto 7000 ft

***Oospira corticina nicobarica* (Gude)**
(C32, C33)

1914. *Clausilia (Pseudonenia) nicobarica* Gude, *Fauna of British India, Mollusca*, 2 : 328.

1953. *Phaedusa corticina nicobarica* : Loosjes, *Beaufortia*, 3(31) : 25, fig. 3.

Shell sinistral, fusiform, solid, imperforate, brownish with a lighter margin along the sutures, very finely striate, striae stronger and wavy on last whorl; whorls 10-11, convex, sides straight, apex acute, last whorl slightly compressed, narrower than preceding whorls; aperture pyriform, parietal lamellae divergent, upper low, lower more raised almost touching but not exactly reaching the margin of the peristome; palatal plicae two, upper longer and lower shorter; peristome continuous, expanded and reflected, parietal margin not sinuate above.



C32. *Oospira corticina nicobarica* (Gude)–
dorsal view



C33. *Oospira corticina nicobarica* (Gude)–
ventral view

Distribution : India : Nicobar Islands. Endemic.

Measurements (in mm) :

Length	Diameter	Aperture
24.40 26.30	5.35 5.40	5.45 - 5.50

Status : Rare.

***Oospira loxostoma* (Benson)**
(102, 103)

1836. *Clausilia loxostoma* Benson, *J. Asiat. Soc. Beng.*, **5** : 353.

1914. *Clausilia (Pseudonenia) loxostoma*: Gude, *Fauna of British India, Mollusca*, **2** : 324.

Shell fusiform, swollen at the middle, imperforate, light brownish with a whitish margin along the sutures, faintly, almost obsolete striate, distinctly crenulate at the sutures; whorls 9, very little convex, aperture oblique elongately pyriform, parietal lamellae 2, upper thin and sharp, lower bluntly dilated; palatal plicae 5, uppermost longest and parallel to suture, lower ones shorter and slightly curved.



102. *Oospira loxostoma* (Benson)—dorsal view **103.** *Oospira loxostoma* (Benson)—ventral view

Differs in the crenulations at the sutures and also by the more number of palatal plicae

Distribution : India : Assam, Meghalaya, Nagaland.

Elsewhere : Bangladesh.

Measurements (in mm) :

Length	Diameter	Aperture
19.70 25.65	5.00 5.60	5.00 5.50

Status : Common.

***Oospira loosjesiana* (Ray & Roychoudhuri)**
(C34)

1968. *Pseudonenia (Pseudonenia) loosjesiana* Ray & Roychoudhuri, *Arch. Moll.*, **98** : 91-94.

Shell fairly long, sinistral, fusiform, imperforate, brownish, semitransparent with fine, close vertical striae, which are less close on the last whorl, a few distinct spiral striae also present; whorls 13-14, a little convex, apex blunt, last whorl a little longer and narrower than the previous whorl; aperture wide, pyriform, margins continuous, thickened and reflected; upper parietal lamella oblique, lower low but distinct and broad; palatal plicae 5 or rarely 6, uppermost longest, lower one shorter and variously curved.



C34. *Oospira loosjesiana* (Ray & Roychoudhuri)—dorsal and ventral view

Though close to *O loxostoma* in the number of palatal plicae, is much larger and lacks the crenulations.

Distribution : India : Arunachal Pradesh.

Measurements (in mm) :

Length	Diameter	Aperture
36.50	6.00	6.50

Status : Rare (known from types only).

Oospira wuellerstorfi (Zeilebor)
(C35, C36)

1867. *Clausilia wuellerstorfi* Zeilebor, *Verh. K. K. Zool. Bot. Ges.*, **17** : 806.

1914. *Clausilia* (*Pseudonenia*) *wuellerstorfi* : Gude, *Fauna of British India, Mollusca*, **2** : 327.

1953. *Acrophaedusa wuellerstorfi* : Loosjes, *Beaufortia*, **3(31)** : 78, fig. 53.



C35. *Oospira wuellerstorfi* (Zelebor)—dorsal view



C36. *Oospira wuellerstorfi* (Zelebor)—ventral view

Shell sinistral, fusiform, imperforate, yellowish brown, obliquely and very finely striate; whorls 10, little convex, apex obtuse, aperture pyriform, slightly oblique, upper lamellae distinctly raised reaching the margin, lower very low ascending interiorly; palatal plicae 3, upper very low, lower two shorter; margins free, continuous and slightly reflected.

Differs from *O. corticina nicobarica* in being smaller, having 3 palatal plicae and the lower parietal lamella being very little raised. From *O. loxostoma* in lacking the sutural crenulations and also in the number of palatal plicae.

Distribution : India : Nicobar Islands. Endemic.

Measurements (in mm) :

Length		Diameter		Aperture	
18.20	18.70	4.20	4.30	4.10	4.20

Status : Rare.

Family FERUSSACIIDAE

Shell minute, slender, imperforate, cylindrical or narrowly lanceolate, apex obtuse, usually smooth or sculptured on lower whorls, aperture small, oblique, outer lip arched, columella concave and truncate at base, usually thinly calloused, sometimes with low fold on the parietal wall.

Animal blind or without distinct eye.

Major part of the tropical and subtropical regions, also Europe.

Some genera live inside soil.

Number of Indian genera : Two.

Key to the genera

Columella rounded at base, with a fold at the parietal junction*Coilostele*

Columella truncate at base, without a fold at the parietal junction...*Cecilioides*

Genus *Cecilioides* Ferussac, 1807

1807. *Cecilioides* Ferussac, *Essai. d'un Meth. Conch.*, p. 77.

Number of Indian species : Two.

Distribution : India : Gujarat, Kashmir, Madhya Pradesh, Rajasthan, Uttar Pradesh and South India.

Elsewhere : Africa, Comoro Islands, Europe, Hawaiian Islands, Malagasy, New Caledonia, Secyelles, West Indies.

Size Range (Indian species) : upto 5.00 mm in length.

Mostly inside soil.

Subgenus *Geostilbia* Crosse, 1867

1867. *Geostilbia* Crosse, *Journ. Conchyl.*, 15 : 184.

Cecilioides (Geostilbia) balanus (Reeve)

(Fig. 38)

1850. *Achatina balanus* (Benson) Reeve, *Conch. Icon.*, 5, *Achatina*, pl. 20, fig. 109.

1914. *Caecilioides (Geostilbia) balanus* : Gude, *Fauna of British India, Mollusca*, 2 : 374.

Shell very small, narrow and fusiformly elongate, imperforate, smooth, shining, and rapidly increasing in width; whorls 4, moderately convex; apex blunt, sutures rather deep and submarginate, very oblique; aperture pyriform, small, peristome simple, columella arched and roundly truncate at base.

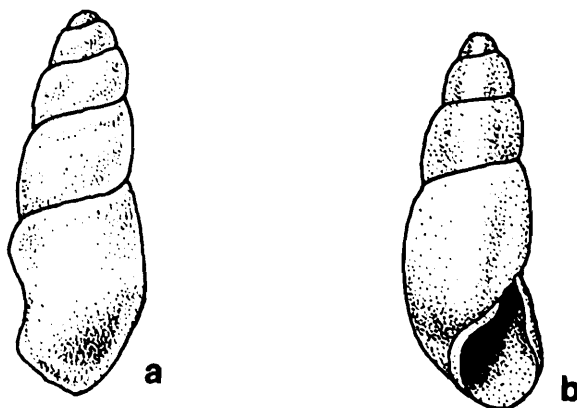


Fig. 38. *Cecilioides balanus*, a. dorsal view; b. ventral view

Distribution : India : Gujarat, Kashmir, Madhya Pradesh, Rajasthan, Uttar Pradesh and South India, drier parts of the country.

Measurements (in mm) :

Length		Diameter
3.10	3.50	0.8 - 1.1

Status : Rare.

***Cecilioides (Geostilbia) bensoni* Gude**
(Fig. 39)

1914. *Caecilioides (Geostilbia) bensoni*: Gude, *Fauna of British India, Mollusca*, 2 : 375.

Shell small, narrow, imperforate, cylindrically conoid, fusiform, dull white, smooth, and glossy; whorls 6, with flattened sides, abruptly increasing in size; apex blunt, sutures marginate, aperture oblique, pyriform, curved at base, peristome slightly thickened, columella truncate below.

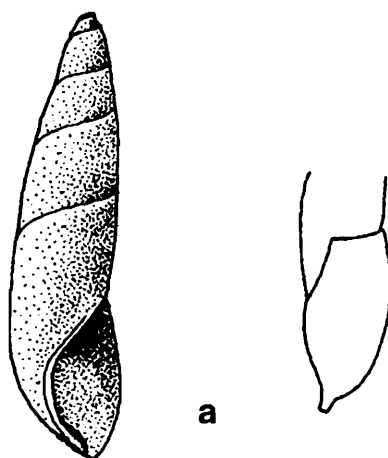


Fig. 39. *Cecilioides bensoni*, a. ventral view

Differs in being a little larger and having more number of whorls.

Distribution : India : Gujarat, Madhya Pradesh, Rajasthan. On plains. Drier parts.

Measurements (in mm) :

Length	Diameter
5.00	1.25

Status : Rare.

Genus ***Coilostele*** Benson, 1864

1864. *Coilostele* Ferussac, *Ann. Mag. nat. Hist.*, (3)8 : 136.

Number of Indian species : One.

Distribution : India : Kashmir, Madhya Pradesh, Rajasthan, Uttaranchal.

Elsewhere : Aden, Middle East, Mexico, Pakistan, Spain.

Size Range (Indian species) : 3.00 mm in length.

Some confusion exists in regard to the systematic position of this genus (Naggs, 1997). Following Vaught (1989) it has been placed under this family.

***Coilostele scalaris* Benson**

(Fig. 40)

1864. *Coilostele scalaris* Benson, *Ann. Mag. nat. Hist.*, (3)13 : 136.

1914. *Coilostele scalaris*: Gude, *Fauna of British India, Mollusca*, 2 : 376.

Shell very small, imperforate, cylindrically elongate, narrow, semitransparent, lower whorls irregularly ribbed; whorls 6, rather convex, apex blunt, sutures deep; aperture semiovate, peristome slightly thickened and expanded, columella with a fold above at the parietal junction, widely rounded at the base.

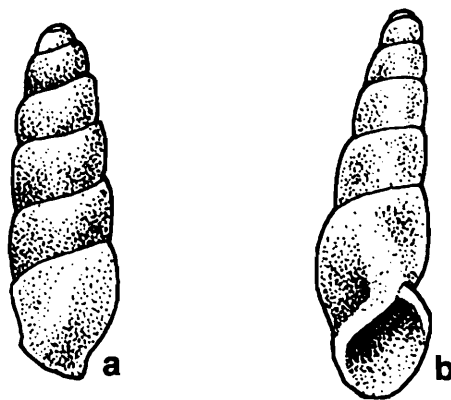


Fig. 40. *Coilostele scalaris* a. dorsal view; b. ventral view

The shell has internal partitions, which are indicated by the internal spiral cords present along the sutures.

Distribution : India : Kashmir, Madhya Pradesh, Rajasthan, Uttar Pradesh.

Elsewhere : Sind.

Measurements (in mm) :

Length

3.55

Diameter

0.85

Status : Rare.

Family SUBULINIDAE

Shell small to moderate in size, elongate, turreted to cylindrical, uniformly coloured, imperforate, apex globosely obtuse, whorls smooth or with indistinct sculpture on apical whorls and in sutural region on lower whorls; aperture simple, ovate, outer lip curved in some, columella straight or curved, truncate or rounded at base.

Foot with undivided sole and without caudal gland.

World wide; mostly on grounds, some on damp walls, some in semi-arid situations.

It includes two subfamilies.

Reference

Pilsbry, H.A. 1909–1910. *Manual of Conchology* (2nd series Pulmonata). (*Caecilliodes*, *Glessula* and Partulidae) **20** : 1-320, pls 1-43.

Key to the genera

1. Columella truncate at base (2)
Columella rounded at base (4)
2. Shell larger, not less than 35 mm in length, obliquely and arcuately striate
..... *Bacillum*
Shell smaller, not more than 25 mm in length, vertically striate (3)
3. Shell distinctly striate, columella obliquely truncate at base *Subulina*
Shell smooth, faintly striate, columella abruptly truncate at base *Glessula*
4. Last whorl more than half of total length, columella curved and twisted
..... *Curvella*
Last whorl less than half of total length, columella simple, usually straight
..... (5)
5. Shell narrowly perforate, with spiral sculpture *Zootecus*
Shell imperforate, without spiral sculpture (6)
6. Shell larger, above 15mm in length, arcuately striate, columella thickened
..... *Prosopeas*
Shell smaller, less than 15mm in length, obliquely striate, columella not thickened
..... *Lamellaxis*

Subfamily SUBULININAE

Number of Indian genera : Six.

Genus *Subulina* Beck, 1837

1837. *Subulina* Beck, *Index Moll.*, p.76.

Number of Indian species : One.

Distribution : India : Andaman & Nicobar Islands, Kerala, Maharashtra, Tamil Nadu.

Elsewhere : Mauritius, New Caledonia, N. & S. America, West Africa, Secyelles, Sri Lanka, Sumatra, West Indies.

Size Range (Indian species) : 7.00 19.35 mm in length.

On ground.

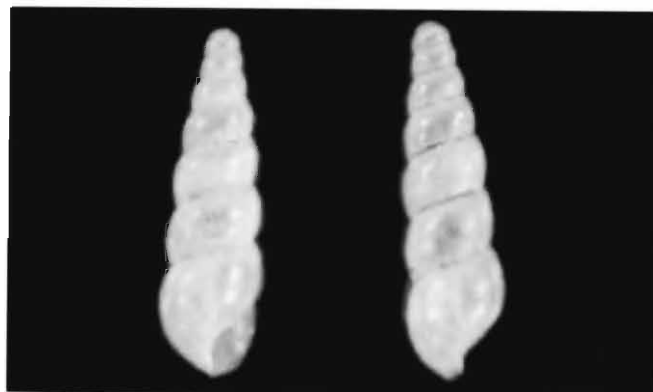
Subulina octona (Bruguiere)

(104)

1789. *Bulimus octona* Bruguiere, *Encycl. Meth. Vers.*, 1 : 325.

1914. *Subulina octona* : Gude, *Fauna of British India, Mollusca*, 2 : 341.

Shell narrow, elongate, thin, imperforate, yellowish, glossy, regularly tapering, irregularly and distinctly striate; whorls 9, convex, apex blunt, sutures deeply impressed and crenulate; aperture oblique, ovate, columella sharply curved and obliquely truncate at base, slightly thickened, outer lip rounded.



104. *Subulina octona* (Bruguiere)—ventral and dorsal view

Distribution : India : Andaman and Nicobar Islands, Kerala (Vipin Island) Maharashtra, Tamil Nadu.

Elsewhere : Widely distributed through America (North and South), Europe; Mauritius, Scyelles, Sri Lanka, West Africa etc.

Measurements (in mm) :

Length	Diameter	Aperture
13.15 19.35	3.50 4.75	3.45 4.45

Status : Abundant.

Genus *Bacillum* Theobald, 18701870. *Bacillum* Theobald in Hanley & Theobald, *Conch. Ind.*, p. 17.

Number of Indian species : Six.

Distribution : India : Eastern Himalaya (Arunachal Pradesh, Assam, Meghalaya, Nagaland, Sikkim, West Bengal (Darjeeling)).*Elsewhere* : Myanmar.*Size Range* (Indian species) : 10.00 66.00 mm in length.*Bacillum erosum* (Blanford)

(105, 106)

1871. *Glessula erosa* Blanford, *J. Asiat. Soc. Beng.*, **40** : 43, pl. 2, fig. 7.1914. *Bacillum erosum* : Gude, *Fauna of British India, Mollusca*, **2** : 344.

Shell elongate, turreted, imperforate, thin, whitish with a straw coloured epidermis, conspicuously marked by close, slightly arcuate striae, very feeble spirals are also present, whorls 11–12, rather flat sided, apex obtuse, aperture oblique, pyriform, columella curved, truncate below, thickened, peristome simple, margins joined by a thin parietal callus.

105. *Bacillum erosum* (Blanford)—dorsal view 106. *Bacillum erosum* (Blanford)—ventral view*Distribution* : India : Sikkim (above 5500 ft), West Bengal (Darjeeling).

Measurements (in mm) :

Length	Diameter	Aperture
10.50 33.40	6.00 7.45	5.50 7.40

Status : Rare.

Bacillum orthoceras (Godwin-Austen)
(107, 108)

1875. *Glessula orthoceras* Godwin-Austen, *J. Asiat. Soc. Beng.*, **44** : 2, pl. 1, fig. 4.

1914. *Bacillum orthoceras* : Gude, *Fauna of British India, Mollusca*, **2** : 348.

Shell long and slender, imperforate, thick, pale white with traces of brownish epidermis, obliquely, finely and closely ribbed throughout, whorls 13-14, rather convex, apex blunt, sutures impressed, aperture oblique, pyriform, rounded below, columella well thickened, shortly truncate below, outer lip simple, thin, continuous with parietal callus.



107. *Bacillum orthoceras* (Godwin-Austen)–
dorsal view

108. *Bacillum orthoceras* (Godwin-Austen)–
ventral view

Differs from the other species being much larger, more strongly sculptured with the whorls being more rounded.

Distribution : India : Arunachal Pradesh, Meghalaya.

Measurements (in mm) :

Length		Diameter		Aperture	
31.30	66.00	7.00	11.10	6.60	12.70

Status : Not common.

Genus *Curvella* Chaper, 1885

1885. *Curvella* Chaper, *Bull. Soc. Zool. France*, **10** : 49.

Number of Indian species : Four.

Distribution : India: Manipur, Meghalaya, Nagaland, Sikkim, West Bengal (Darjeeling).

Elsewhere : China, Myanmar, Philippines, Thailand, Tropical Africa, upto 7000 ft.

Size Range (Indian species) : 6.00-27.50 mm in length.

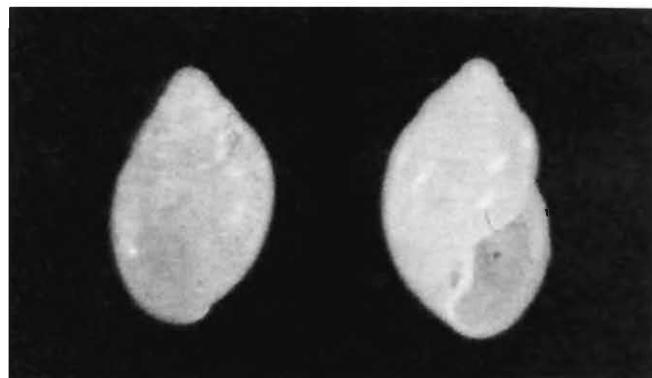
Curvella khasiana (Godwin-Austen)

(109)

1872. *Bulimus (Harpalus) khasianus* Godwin-Austen, *Proc. zool. Soc. Lond.*, p.516, pl.30, fig.7.

1914. *Curvella khasiana* : Gude, *Fauna of British India, Mollusca*, 2 : 353.

Shell ovately conical, very narrowly perforate, thin, semitransparent, glossy, finely arcuately striate, whorls 6-7, convex, apex obtuse, last whorl swollen and very large, equalling about $\frac{2}{3}$ rd of total length; aperture vertical, broadly ovate, columella twisted and curved, margin slightly reflected, peristome thin, strongly arcuate, a thin parietal callus present.



109. *Curvella khasiana* (Godwin-Austen)—dorsal and ventral view

Distribution : India : Arunachal Pradesh, Meghalaya, Nagaland, Sikkim. West Bengal (Darjeeling).

Measurements (in mm) :

Length		Diameter		Aperture	
6.60	10.50	3.90	5.20	4.00	6.40

Status : Common.

Curvella blanfordi Gude

(Fig. 41)

1914. *Curvella blanfordi* Gude, *Fauna of British India, Mollusca*, 2 : 350, fig. 119.

Shell elongately conoid, solid, perforate, closely striate, greenish, whorls 7-8, flat

sided; aperture vertical, elliptical, columella strongly twisted, curved and sinuate below, peristome thin nearly vertical, a thin parietal callus present.

Differs from *C. khasiana* in being longer and narrower and also columella being sinuate below.

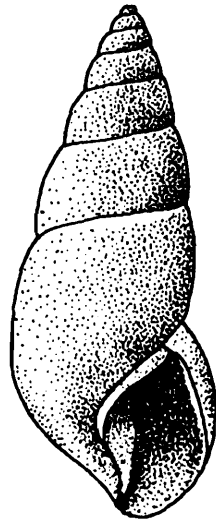


Fig. 41. *Curvella blanfordi*, a. ventral view

Distribution : India : Sikkim, W. Bengal (Darjeeling).

Measurements (in mm) :

Length	Diameter	Aperture
27.50	10.00	11.00

Status : Rare.

Genus *Glessula* von Martens, 1860

1860. *Glessula* von Martens, *Die Heliceen*, ed. 2 : 254.

Number of Indian species : Eighty.

Many of the species are represented by types only. It is difficult to estimate the number of valid species.

Distribution : India : Common throughout, maximum concentration in North-east and the Peninsular part, (W. Ghats) few in the gangetic plains, rare in North-west.

Elsewhere : Bangladesh, China, East & West Africa, Indonesia, Myanmar, Sri Lanka, Thailand.

Size Range (Indian species) : 6.00 - 37.00 mm in length.

On ground, under shade of large trees. Plains and hills, (7000 ft).

***Glessula crassula* (Reeve)**

(110, 111)

1850. *Achatina crassula* (Benson) Reeve, *Conch. Icon.*, 5 *Achatina* pl. 22, fig. 120.1914. *Glessula crassula*: Gude, *Fauna of British India, Mollusca*, 2 : 429.

Shell large, pyramidally conical, imperforate, thin, glossy, straw coloured with a greenish tint, closely vertically striate, sutures deeply impressed, whorls 7, flat sided, apex blunt, aperture vertical, oval, columella concave, truncate below, peristome simple.

110. *Glessula crassula* (Reeve)—dorsal view111. *Glessula crassula* (Reeve)—ventral view

Distribution : India : Arunachal Pradesh, Meghalaya, Mizoram, Nagaland, W. Bengal (Darjeeling).

Measurements (in mm) :

Length		Diameter		Aperture	
16.95	19.90	7.85	8.70	7.20	7.85

Status : Not common.

***Glessula filosa* Blanford**

(112, 113)

1870. *Glessula filosa* Blanford, *J. Asiat. Soc. Beng.*, 39 : 19, pl. 3, fig. 16.1914. *Glessula filosa*: Gude, *Fauna of British India, Mollusca*, 2 : 440, fig. 138.

Shell thin, elongately turreted, imperforate, thin, glossy, coarsely vertically striate, whorls 8, fairly convex, aperture vertical, broadly lunate, columella strongly arcuate, obliquely truncate and sinuate below.

112. *Glessula filosa* Blanord—dorsal view113. *Glessula filosa* Blanord—ventral view

Differs being smaller and narrower and also being more strongly sculptured. In addition some shells have a shallow groove running along the side of columella.

Distribution : India : Andhra Pradesh, Kerala, Tamil Nadu.

Measurements (in mm) :

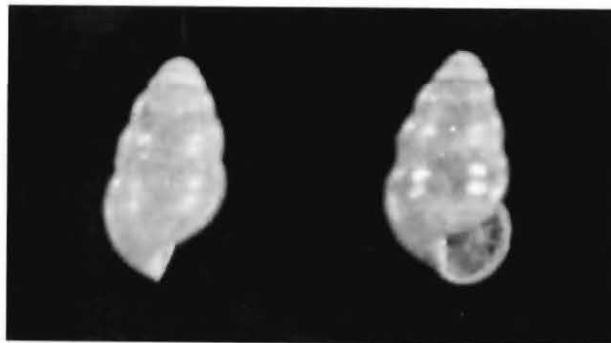
Length	Diameter	Aperture
8.10 15.00	4.80 - 6.65	4.00 - 6.25

Status : Common.

Glessula gemma (Reeve)
(114)

1850. *Achatina gemma* (Benson) Reeve, *Conch. Icon.*, 5 *Achatina* pl. 22, fig. 123.

1914. *Glessula gemma*: Gude, *Fauna of British India, Mollusca*, 2 : 428.

114. *Glessula gemma* (Reeve)—dorsal and ventral view

Shell small, oblong-conical, imperforate, polished and shining, light-chocolate coloured, very finely striate, whorls 6, convex, apex obtuse, aperture suboval, columella slightly arched and truncated below.

Distinguished by its smaller size and chocolate colour.

Distribution : India : Widely distributed through hills and plains. Kerala, Meghalaya, Orissa, W. Bengal.

Elsewhere : Bangladesh, Myanmar.

Measurements (in mm) :

Length		Diameter		Aperture	
7.60	8.20	3.70	3.90	3.30	3.35

Status : Common.

***Glessula subtornensis* Gude**
(115, 116)

1914. *Glessula subtornensis* Gude, *Fauna of British India, Mollusca*, 2 : 390, fig. 122.

Shell large, oblong-conoid, imperforate, thin, very finely and closely striate, smooth, shining, pale translucent, whorls 8, convex, apex obtuse, sutures deep and subcrenulate, last whorl large and inflated, equalling more than half of entire length; aperture subvertical, semioval, columella arcuate and obliquely truncate below, peristome thin and simple, margins joined by a thin callus.

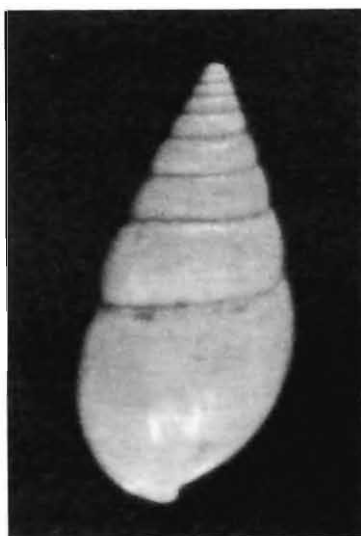
The shell is large and much broader at base.

Distribution : India : Andhra Pradesh, Tamil Nadu.

Measurements (in mm) :

Length		Diameter		Aperture	
18.50	29.60	10.00	13.15	10.30	12.70

Status : Abundant.



115. *Glessula subtornensis* Gude—dorsal view 116. *Glessula subtornensis* Gude—ventral view

***Glessula tenuispira* (Benson)**
(117, 118)

1836. *Achatina tenuispira* Benson, *J. Asiat. Soc. Beng.*, **5** : 353.

1914. *Glessula tenuispira* : Gude, *Fauna of British India, Mollusca*, **2** : 378.

Shell long and rather narrow, gradually tapering, imperforate, thin, closely, obliquely striate, whorls 12–14, gradually increasing in size, apex blunt, sutures subcrenulate; aperture suboval, small, columella strongly curved, truncate below, outer margin thin.



117. *Glessula tenuispira* (Benson)—dorsal view **118.** *Glessula tenuispira* (Benson)—ventral view

Distinguished by its long and gradually tapering form and more number of whorls.

Distribution : India : On hills. Assam, Arunachal Pradesh, Meghalaya, Sikkim, West Bengal (Darjeeling).

Elsewhere : Myanmar.

Measurements (in mm) :

Length	Diameter	Aperture
32.00	7.90	8.00

Status : Not common.

***Glessula textilis* (Blanford)**
(C37, C38)

1866. *Achatina textilis* Blanford, *J. Asiat. Soc. Beng.*, **35** : 41.

1914. *Glessula textilis* : Gude, *Fauna of British India, Mollusca*, **2** : 390.

Shell ovately oblong, imperforate, thick, highly polished and glossy, dark chestnut coloured with a yellowish band encircling the entire length of shell, a few irregular vertical lines of same colour also present; finely vertically striate; whorls 7, convex, the last broad and large; aperture vertical, semioval, large, columella deeply curved, thickened and broad, roundly truncate at base, outer margin thin.

Coloured bands and lines vary in number and forms, may rarely be absent. Distinguished by its thick shell broad and conical shape and also by its colouration.

Distribution : India : Western Ghats (6000ft.) : Karnataka, Kerala, Maharashtra, Tamil Nadu.



C37. *Glessula textilis* (Blanford)—dorsal view **C38.** *Glessula textilis* (Blanford)—ventral view

Measurements (in mm) :

Length		Diameter		Aperture	
19.05	30.80	10.50	14.25	10.00	14.10

Genus *Lamellaxis* Strebel and Pfeffer, 1882

1882. *Lamellaxis* Strebel and Pfeffer, *Mex. Land Conch.*, p. 77.

Distribution : India : Common throughout.

Elsewhere : Tropical and subtropical regions of the world except Australia.

On grounds also on damp walls, trunk of trees.

Subgenus *Allopeas* H.B. Baker, 1935

1935. *Allopeas* H.B. Baker, *Nautilus, Philad.*, 48(3) : 84.

Number of Indian species : Three.

Size Range (Indian species) : 7.00 14.00 mm in length.

***Lamellaxis (Allopeas) gracile* (Hutton)**
(119, 120)

1834. No. 5, *Bulimus?* Hutton, *J. Asiat. Soc. Beng.*, **3** : 84.

1914. *Glessula gracile* : Gude, *Fauna of British India, Mollusca*, **2** : 355.

Shell small, narrow-elongate, thin, imperforate, transparent, spire gradually tapering to a blunt apex, very finely striate; whorls 8-10, convex; aperture semiovate, columellar lip straight and almost parallel to the outer lip; slightly reflected, widely rounded at base.



119. *Lamellaxis gracile* (Hutton)—dorsal view 120. *Lamellaxis gracile* (Hutton)—ventral view

Distribution : India : Widely distributed throughout (a very common garden snail, widely occurring close to the human habitations, in kitchen gardens, potted plants, damp walls of houses etc).

Elsewhere : One of the most common snails in whole of south east Asia.

Measurements (in mm) :

Length	Diameter	Aperture
8.20 12.95	2.85 36.00	2.80 3.70

Status : Abundant.

Genus ***Prosopeas*** Moerch, 1876

1876. *Prosopeas* Moerch, *Jour. Conchyl.*, p. 358.

Number of Indian species : Six.

Distribution : India : Andaman & Nicobar Islands, also Western Ghat (Nilgiri), upto above 3000 ft.

Elsewhere : China, Malaysia, Myanmar, Philippines, Thailand.

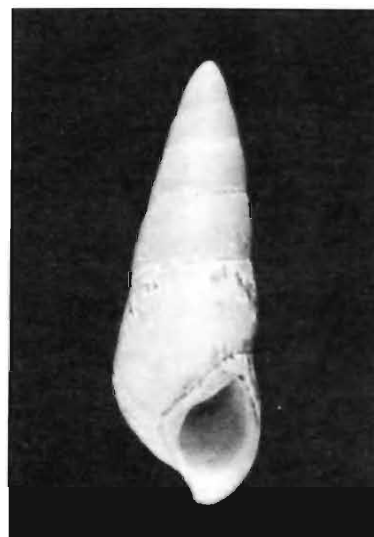
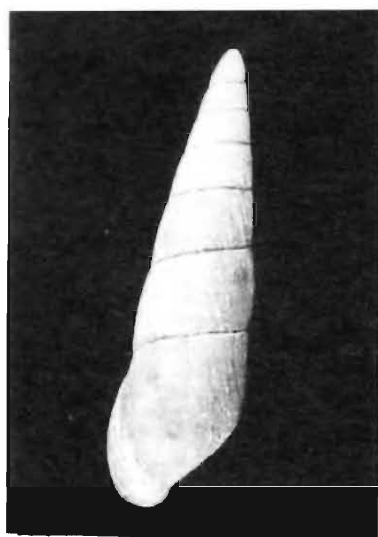
Size Range (Indian species) : 13.00 - 35.00 mm in length.

***Prosopeas haughtoni* (Benson)**
(121, 122)

1863. *Spiraxis haughtoni* Benson, *Ann. Mag. nat. Hist.*, (3)11 : 90.

1914. *Prosopeas haughtoni* Gude, *Fauna of British India, Mollusca*, 2 : 364.

Shell large, conically elongate, imperforate, rather thick, pale whitish with a straw coloured epidermis, finely and arcuately striate, the striae arching forward above and retracting at the suture, sculpture nearly absent on apical whorls; whorls 7, very little convex, last whorl subangulate at the periphery; apex obtuse; aperture ovately elliptical, columella thickened and strongly folded, vertical, forming an obtuse angle at the base, outer lip thin.



121. *Prosopeas haughtoni* (Benson)—dorsal view

122. *Prosopeas haughtoni* (Benson)—ventral view

Distribution : India : Andaman Islands (endemic).

Measurements (in mm) :

Length		Diameter		Aperture	
19.75	34.55	7.80	10.80	7.70	1.00

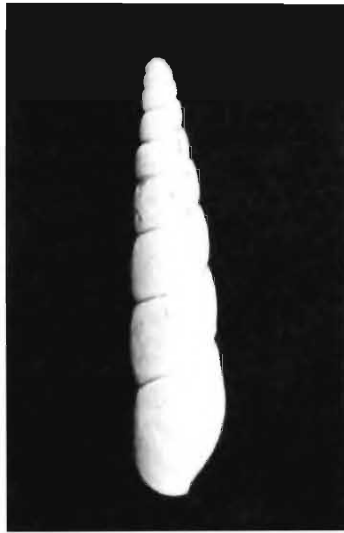
Status : Abundant.

***Prosopeas walkeri* (Benson)**
(123, 124)

1863. *Spiraxis walkeri* Benson, *Ann. Mag. nat. Hist.*, (3)11 : 90.

1914. *Prosopeas walkeri* : Gude, *Fauna of British India, Mollusca*, 2 : 363.

Shell smaller, cylindrically turreted, imperforate, white under the epidermis, densely, arcuately striate throughout, including the apical whorls, sutures impressed; whorls 9, little convex, apex obtuse; aperture elliptical, columella curved, thickened, reflected below, outer margin thin and arcuate above, columellar callus present.



123. *Prosopeas walkeri* (Benson)—dorsal view 124. *Prosopeas walkeri* (Benson)—ventral view

Differs in being much smaller and also being strongly sculptured throughout.

Distribution : India : Andaman Islands.

Elsewhere : Myanmar.

Measurements (in mm) :

Length		Diameter		Aperture	
10.80	17.40	3.00	4.10	3.50	5.00

Status : Common.

Subfamily RUMININAE

Number of Indian genus: One.

Genus *Zootecus* Westerlund, 1887

1887. *Zootecus* Westerlund, *Fauna Palaearct Binnenconchyl*, 3 : 3,75.

Number of Indian species: Seven (the number of species is very tentative because of highly variable nature of the shells, which widely vary within the population Gude, 1914).

Distribution : India : Andhra Pradesh, Bihar, Delhi, Gujarat, Maharashtra, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh.

Elsewhere : Cape Verde Island, Sahara eastward to Arabia, Myanmar, Sri Lanka.

Restricted to arid or dry regions, around thorny bushes on river banks etc.

Size Range (Indian species) : 7.00 46.00 mm in length.

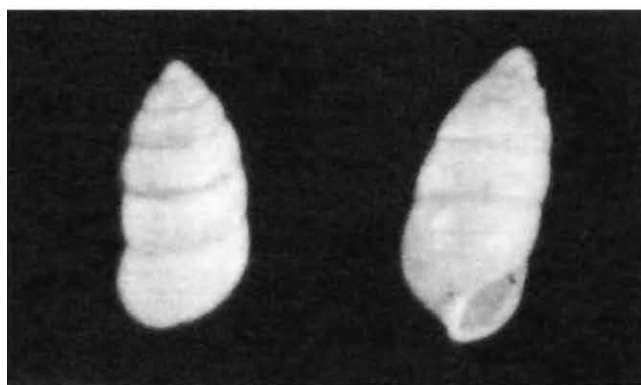
***Zootecus insularis* (Ehrenberg)**

(125)

1831. *Pupa insularis* Ehrenberg, *Symb. Phys. Anim. Evert.*, Series 1, p.3.

1914. *Zootecus insularis*: Gude, *Fauna of British India, Mollusca*, 2 : 367.

Shell subcylindrical, attenuate, small, pale white, thick, very narrowly perforate, finely marked by vertical striae which are bent at the suture, a few faint spiral striae also present; whorls 7- 8, last whorl ascending a little in front, fairly convex; aperture sub-vertical, semiovate, angled above, columella thickened, slightly reflected, outer lip thickened inside.



125. *Zootecus insularis* (Ehrenberg)—dorsal and ventral view

Distribution : India : Drier regions of the country. Andhra Pradesh, Bihar, Delhi, Gujarat, Kashmir, Maharashtra, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh.

Elsewhere : Africa, Arab countries, Myanmar, Sri Lanka.

Measurements (in mm) :

Length		Diameter		Aperture	
9.65	12.75	3.85	5.00	3.30	3.90

Status : Common.

Family ACHATINIDAE

Shell of variable size ranging between 25 mm to above 200 mm in length, ovately conical, imperforate, with convex whorls, aperture ovate, outer lip thin, simple, columella concave or straight, usually truncate below.

One species in India.

Though this family as such is endemic to Africa, a single species *Achatina fulica fulica*, the giant African snail, subsequent to its introduction by man has naturalised and established itself in several tropical countries outside Africa, including India.

Genus *Achatina* Lamarck, 1799

1799. *Achatina* Lamarck, *Mem. Soc. Hist. Nat. Paris*, 7 : 75.

Number of Indian species : One.

Distribution : India : Common throughout except N.W. parts.

Elsewhere : Bangladesh, Bhutan, Malagasy, Mauritius, Nepal, Secyelles, Singapore, Zanzibar.

Size Range : Reaching upto over 200 mm in length.

Subgenus *Lissachatina* Bequaert, 1951

1951. *Lissachatina* Bequaert, *Bull. Mus. Comp. Zool. Harv.*, 105 : 136.

Achatina (Lissachatina) fulica fulica (Bowdich)
(C39, C40, 126, 127)

1822. *Achatina fulica* 'Lamarck' Bowdich, *Elements of Conchology*, 1. pl. 13, fig. 8.

Shell large to very large, ovately conoid, imperforate, thick, pale yellowish with brown streaks and flames, irregularly vertically arranged; rather coarsely sculptured with vertical striae decussated by fine spirals (absent on last whorl); whorls 8, convex, last whorl inflated and large equalling half of total length; aperture ovately elliptical, white to bluish violet inside, columella broad, slightly curved and abruptly truncate below; peristome thin and sharp, margins joined by a thick callus.

Distribution : India : Throughout the country except north-west region.

Elsewhere : Malagasy, Mauritius, Scyelles, Singapore, Zanzibar.

Measurements (in mm) :

Length	Diameter	Aperture
42.75-100.00	24.00-46.90	26.50-51.30

Status : Abundant.



126. *Achatina fulica fulica* (Bowdich)—dorsal view



127. *Achatina fulica fulica* (Bowdich)—ventral view



C39. *Achatina fulica fulica* (Bowdich)—dorsal view



C40. *Achatina fulica fulica* (Bowdich)—ventral view

Family STREPTAXIDAE

Shell depressedly and distortedly helicoid to turreted, usually perforate or imperforate, usually colourless and transparent, smooth or ribbed, often with teeth or lamellae in the aperture.

Animals with undivided sole of foot and long snout, hermaphrodite, mostly carnivorous.

Tropical zones, South Africa, South Arabia, West Indies, Malaysia, Philippines, North & South Vietnam, China, Japan and India.

Mostly occur among leaf litters, under stones, logs of wood or under the exposed roots of trees.

It includes two subfamilies.

Reference

- Dance, S.P. 1970. Non marine molluscs of Borneo. 1. Streptaxacea-Streptaxidae. *J. Conch. Lond.*, **27** : 149- 162, pl 6, text figs. 1-7.
- Van Bruggen, A.C.1972. On a new Streptaxidae (Mollusca, Gastropods, Pulmonata) from Sangita Island, Malay Archipelago, with notes on the distribution of Streptaxids in southeast Asia. *Proc. Koninkl Nederl. Academic van Wetenschappen. Ser. C*, **77(3)** : 392- 401.

Key to the genera

1. Shell depressedly ovate, last whorl eccentric (2)
 Shell elongately ovate, last whorl regular (3)
2. Shell with a single apertural process *Haploptychius*
 Shell with a number of apertural process *Streptaxis*
3. Shell perforate *Sinoennea*
 Shell imperforate (4)
4. Aperture obliquely truncate above *Gulella*
 Aperture not truncate above (a small portion of aperture almost completely cut off by a lamella) *Ennea*

Subfamily STREPTAXINAE

Shell depressedly helicoid, without strong sculpture, perforate, last one or two whorls usually moving away from the axis of upper whorls.

Number of Indian genera : Two.

Genus *Streptaxis* Gray, 1837

1837. *Streptaxis* Gray, Loudon's *Mag. Nat Hist. N. S.* **1** : 485.

Number of Indian species : Thirteen.

Distribution : India : Arunachal Pradesh, Assam, Meghalaya, Nagaland, Western Ghat (4000 ft).

Elsewhere : Bhutan, Myanmar, Sri Lanka.

Size Range (Indian species) : 6.00 13.00 mm in length.

Streptaxis canaricus Blanford
(128)

1869. *Streptaxis canaricus* Blanford, *J. Asiat. Soc. Beng.*, **38** : 142.

1908. *Streptaxis canaricus* : Blanford & Godwin-Austen, *Fauna of British India, Testacellidae and Zonitidae*, p. 15.

Shell larger, depressed, openly perforate, spire very low but conical; apex moderately pointed, finely but distinctly obliquely marked both above and below; whorls 5½, penultimate sharply keeled and considerably projecting beyond the last, last whorl flatly convex below, compressed around perforation, indented in front of aperture; aperture broad, suboval, margins continuous, expanded, a well developed parietal lamella and six teeth, regularly arranged.



128. *Streptaxis canaricus* Blanford—ventral view

Differs in the penultimate whorl being sharply keeled.

Distribution : India : Western Ghats (S. Canara)

Remarks : Immature shells in the subfamily strptaxinae uniformly conform to a definite flattened pattern (von Bruggen, 1972). As such it is difficult to distinguish them from one another.

Measurements (in mm) :

Length	Diameter	Aperture
7.50	6.00	3.40

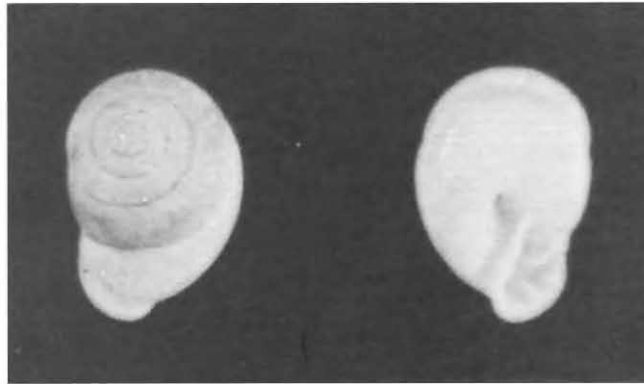
Status : Rare.

***Streptaxis peroteti* (Petit)**
(129)

1841. *Helix peroteti* Petit, *Rev. Zool.*, 1841 : 100.

1908., *Streptaxis peroteti* : Blanford & Godwin-Austen, *Fauna of British India, Testacellidae and Zonitidae*, p. 10.

Shell depressedly ovate, very narrowly perforate, pale whitish, closely and arcuately striate above, smoother beneath, except in umbilical region, apex obtuse, whorls 5½-6, flatly convex above, penultimate whorl rounded and bluntly subangulate, slightly projecting beyond the last when viewed from below; last whorl flattened at base, edged around umbilicus, indented behind peristome; aperture suboval, margins expanded and slightly reflected; parietal lamellae two, one large and one small, usually three more teeth, one each on right margin, the columella and the base.



129. *Streptaxis peroteti* (Petit)—dorsal and ventral view

Distribution : India : Hills of North-east & Western Ghats, upto 4000 ft.

Measurements (in mm) :

Length	Diameter	Aperture
8.80-9.55	6.50-6.85	3.55-3.70

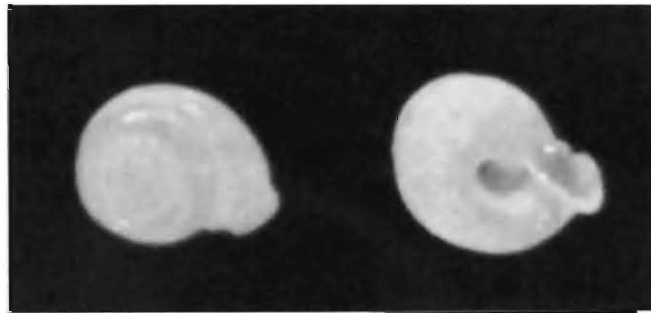
Status : Common.

***Streptaxis personatus* Blanford**
(130)

1880. *Streptaxis personatus* Blanford, *J.Asiat. Soc. Beng.*, 49(2) : 202.

1908. *Streptaxis personatus* : Blanford & Godwin-Austen, *Fauna of British India, Testacellidae and Zonitidae*, p. 14.

Shell small, strongly depressed with a very little raised spire, narrowly perforate, yellowish white, smooth and without any distinct sculpture; whorls 5, slightly convex above, penultimate whorl rounded, scarcely projecting beyond the last when viewed



130. *Streptaxis personatus* Blanford—dorsal and ventral view

from below; last whorl very large in relation to the spire, suture deep and oblique, compressed near the perforation, slightly indented and constricted at the peristome greatly distorting the aperture, which is suboval, peristome thickened and expanded, deeply sinuate above at the right, a thick parietal lamella, two blunt teeth on the outer margin and three on the columella.

Differs in being smaller, more compressed and also in the form of aperture.

Distribution : India : Western Ghats.

Measurements (in mm) :

Length	Diameter	Aperture
5.00	4.20	1.70

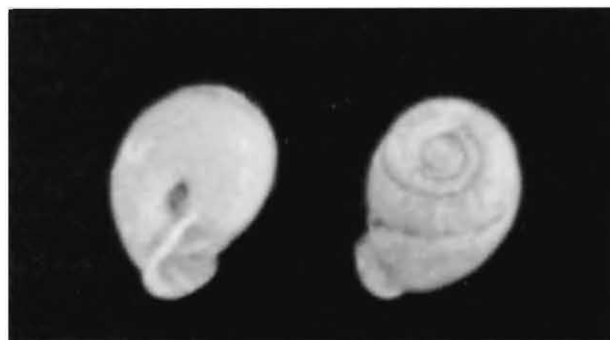
Status : Rare.

***Streptaxis watsoni* W. & H. Blanford**
(131)

1860. *Streptaxis watsoni* W. & H. Blanford, *J. Asiat. Soc. Beng.*, **29** : 126.

1908. *Streptaxis watsoni* : Blanford & Godwin-Austen, *Fauna of British India, Testacellidae and Zonitidae*, p.11.

Shell small, depressedly ovate, narrowly perforate, whitish, closely arcuately striate below, whorls $5\frac{1}{2}$, penultimate whorl rounded marginally and projecting beyond the



131. *Streptaxis watsoni* W. & H. Blanford—ventral and dorsal view

last which is flattened at the base, indented behind the peristome; aperture semioval, margins expanded and reflected, parietal lamellae two, number of teeth varying between 3-5, on outer margin, base and the columella.

Similar to *S. peroteti*, differs in being smaller and having more number of teeth in the aperture.

Distribution : India : Western Ghats.

Measurements (in mm) :

Length	Diameter	Aperture
5.00- 6.00	4.20 4.50	2.50 2.70

Status : Common.

Genus *Haploptychius* Moellendorff, 1906

1906. *Haploptychius* Moellendorff in Martini-Chemnitz, *Conch. Cab.*, 1 : sp. no. 127.

Number of Indian species : Two.

Distribution : India : Andaman & Nicobar Islands.

Elsewhere : China, Celebes, Malay Peninsula, Myanmar, and Sagitie Island.

Size Range (Indian species) : 8.00 10.00 mm in length.

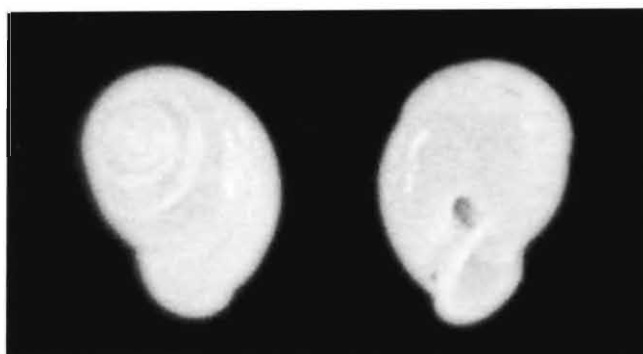
Haploptychius andamanicus (Benson)

(132)

1860. *Streptaxis andamanicus* Benson, *Ann. Mag. nat. Hist.*, (3)6 : 192.

1908. *Streptaxis andamanicus* : Blanford & Godwin-Austen, *Fauna of British India, Testacellidae and Zonitidae*, p. 5.

Shell rather small, depressedly ovate, openly perforate, whitish, arcuately, coarsely sculptured above, smoother beneath; whorls 5½, convex above, penultimate whorl



132. *Haploptychius andamanicus* (Benson)—dorsal and ventral view

rounded and projecting beyond the last when viewed from below; whorl moderately rounded below, edged around umbilicus and slightly compressed near the aperture; aperture almost vertical, rounded, margin reflected but not much thickened, outer margin sharply arcuate, rather concave, single parietal lamella near the right margin.

Distribution : India : Endemic to Andaman Islands.

Remarks : Juvenile shells look different and simple with no eccentricity of the last whorl.

Measurements (in mm) :

Length		Diameter		Aperture	
6.80	8.00	5.00	6.30	2.85	3.40

Status : Common.

***Haploptychius Pfeifferi* (Zelebor)**
(133, 134)

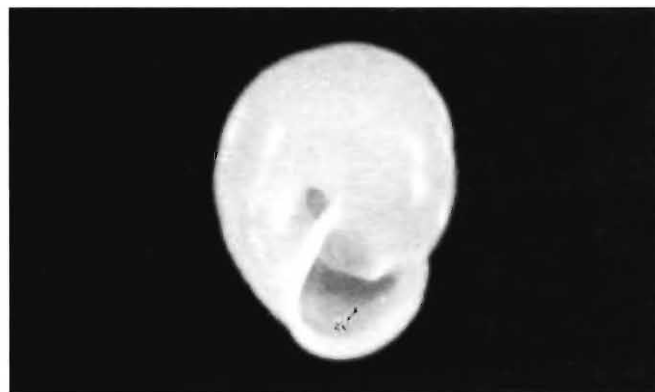
1867. *Streptaxis Pfeifferi* Zelebor, *Verh. Zool.-Bot. Ges. Wien.*, **17** : 806.

1908. *Streptaxis Pfeifferi* : Blanford & Godwin-Austen, *Fauna of British India, Testacellidae and Zonitidae*, p. 6.

Shell slightly bigger, depressedly ovate, narrowly perforate, whitish, finely arcuately sculptured above, smoother below; whorls 6, well rounded, penultimate whorl rounded and scarcely projecting beyond the last when viewed from below; last whorl much broad and rounded, not compressed, aperture nearly vertical, roundish, margins thickened and reflected, outer margin not arcuate, a single parietal lamella.



133. *Haploptychius Pfeifferi* (Zelebor)—dorsal view



134. *Haploptychius Pfeifferi* (Zelebor)—ventral view

Differs being slightly bigger, the penultimate whorl being less projecting beyond the last and the last whorl not being compressed.

Distribution : India : Endemic to the Nicobar Islands.

Measurements (in mm) :

Length		Diameter		Aperture	
8.15	9.30	6.20	6.80	3.65	3.80

Status : Common.

Subfamily ENNEINAE

Shell ovate to elongate-turreted, usually imperforate, with distinct sculpture.

Number of Indian genera : Three.

Genus *Ennea* H. and A. Adams, 1858

1858. *Ennea* H. and A. Adams, *Gen. Rec. Moll.*, **2** : 171.

Number of Indian species : Five.

Distribution : India : Arunachal Pradesh, Assam, Manipur, Meghalaya, Nagaland (7000 ft).

Elsewhere : Malagasy, Mascarene Islands, South & South-east Asia, S. Africa.

Size Range (Indian species) : 4.00 13.00 mm in length.

Ennea stenopylis Benson (135, 136)

1860. *Ennea stenopylis* Benson, *Ann. Mag. nat. Hist.*, (3)**5** : 460.

1908. *Ennea stenopylis* : Blanford & Godwin-Austen, *Fauna of British India, Testacellidae and Zonitidae*, p. 17.



135. *Ennea stenopylis* Benson—dorsal view



136. *Ennea stenopylis* Benson—dorsal view

Shell small, ovate, whitish, imperforate, coarsely obliquely striate, apex obtuse; whorls 6½–7, narrow, slightly convex, antepenultimate whorl widest, last whorl angulate at the base, laterally compressed and deeply indented behind the peristome, aperture vertical, oval, a small circular portion of the aperture is almost completely partitioned by a parietal lamella on the right, margin continuous, much thickened and reflected.

Distribution : India : Hills of north-east (4000 ft). Arunachal Pradesh, Manipur, Meghalaya, Nagaland, Sikkim.

Measurements (in mm) :

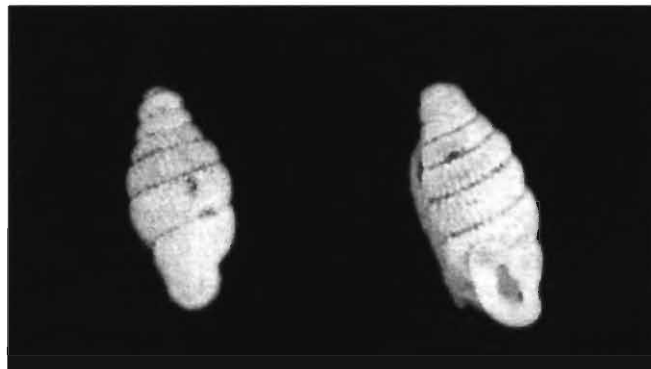
Length	Diameter		Aperture	
3.40	2.00	2.50	1.70	1.50

Status : Not common.

Ennea vara (Benson)
(137)

1859. *Pupa vara* Benson, *Ann. Mag. nat. Hist.*, (3)3 : 188.

1908. *Ennea vara* : Blanford & Godwin-Austen, *Fauna of British India, Testacellidae and Zonitidae*, p. 16.



137. *Ennea vara* (Benson)—dorsal and ventral view

Shell small, elongately ovate, fusiform, whitish, very strongly vertically ribbed, 2 apical whorls smoother, apex obtuse; whorls 8, narrow, convex, last whorl strongly laterally compressed and indented behind the peristome, subangulate at base, slightly ascending in front; aperture vertical, ovate, a small portion at the middle of right side cut off by a strongly developed entering lamella, margin broadly thickened.

Differs being elongate, having strong ribbings and also in the form of aperture.

Distribution : India : Assam, Meghalaya.

Measurements (in mm) :

Length		Diameter		Aperture	
4.30	5.70	1.90	2.40	1.40	1.60

Status : Common.

Genus *Gulella* L. Pfeiffer, 1856

1856. *Gulella* L. Pfeiffer, *Mal. Blatt.*, 3 : 173.

Subgenus *Huttonella* L. Pfeiffer, 1856

1856. *Huttonella* L. Pfeiffer, *Mal. Blatt.*, 3 : 173.

Number of Indian species : Nine.

Distribution : India : Common throughout plains and hills(4000 ft).

Elsewhere : Alderson Island, Comoro Islands, Malagasy, Seychelles, Sri Lanka, S. & W. Africa, West Indies.

Size Range (Indian species) : 3.50 10.00 mm in length.

Gulella (Huttonella) bicolor (Hutton)
(138, 139)

1834. *Pupa bicolor* Hutton, *J. Asiat. Soc. Beng.*, 3 : 86 & 93.

1908. *Ennea bicolor* : Blanford & Godwin-Austen, *Fauna of British India, Testacellidae and Zonitidae*, p. 19.



138. *Gulella bicolor* (Hutton)—dorsal view



139. *Gulella bicolor* (Hutton)—ventral view

Shell small, elongate, imperforate, subcylindrically-turreted, yellowish white, smooth, faintly vertically striate, apex obtuse; whorls 7, little convex, sutures deep and crenulate, last whorl rounded at base, strongly indented on both sides forming deep pits; aperture vertical, semioval, truncate above, opening obliterated by four teeth, one parietal, one peristomal, one basal and one columellar, one fold obliquely running inward, peristome expanded and reflected, curved into a sinus on the right above.

Distribution : India : Common throughout.

Elsewhere : Myanmar, Scydhelles, Sri Lanka, West Indies.

Measurements (in mm) :

Length		Diameter		Aperture	
5.50	7.00	1.80	1.90	1.60	1.80

Remarks : It is one of those few species of land snails which remain in the vicinity of human habitations.

Status : Common.

Gulella (Huttonella) macrodon (Blanford)

(140)

1880. *Ennea macrodon* Blanford, *J. Asiat. Soc. Beng.*, **49** : 205, pl. 2, fig. 15.

1908. *Ennea macrodon* : Blanford & Godwin-Austen, *Fauna of British India, Testacellidae and Zonitidae*, p. 21.

Shell small, turreted with fine close vertical ribbings, apex obtuse; whorls 7, convex, last whorl ascending at the aperture, not indented but slightly compressed at base;



140. *Gulella macrodon* (Blanford)—ventral view

aperture vertical, suboval, obliquely truncate above. Almost completely filled up with teeth, one broad, sub-bifid parietal lamella and three well developed teeth, one each on columella, peristome and base, another deep lamella inside the basal margin.

Differs in sculpture, shape and dentitions.

Distribution : India : Nilgiri Hills.

Measurements (in mm) :

Length		Diameter		Aperture
4.00	5.60	1.65	1.840	1.60 - 1.80

Status : Rare.

Gulella (Huttonella) sculpta (Blanford)
(141)

1869. *Ennea sculpta* Blanford, *J. Asiat. Soc. Beng.*, **38** : 141, pl. 16, fig. 10.

1908. *Ennea sculpta* : Blanford & Godwin-Austen, *Fauna of British India, Testacellidae and Zonitidae*, p. 22.

Shell elongately turreted, whitish, coarsely sculptured with strong vertical ribbings, 2 apical whorls smooth; apex obtuse; whorls 7, convex, last whorl only slightly compressed behind the peristome but not indented; aperture vertical, semioval, truncate above. A well formed parietal lamella on the right, columellar plait and palatal lamellae present inside but not visible from outside.



141. *Gulella sculpta* (Blanford)—dorsal and ventral view

Differs being larger and broader, more strongly sculptured and also in lacking the externally visible dentitions.

Distribution : India : Kerala : Pulney Hills.

Measurements (in mm) :

Length	Diameter	Aperture
8.00 8.20	2.30 2.50	2.20

Status : Not common.

Genus *Sinoennea* Kobelt, 1904

1904. *Sinoennea* Kobelt, *Nachr. Deuts. Malak. Ges.*, p. 27.

Number of Indian species : Two.

Distribution : India : Arunachal Pradesh, Madhya Pradesh, Orissa.

Elsewhere : China, Japan, Indonesia, Korea, Malaysia, Myanmar, Thailand.

Size Range (Indian species) : 3.50 5.20 mm in length.

Sinoennea moerchiana (Nevill)
(142)

1881. *Ennea moerchiana* Nevill, *J. Asiat. Soc. Beng.*, 1 : 130.

1908. *Ennea moerchiana* : Blanford & Godwin-Austen, *Fauna of British India, Testacellidae and Zonitidae*, p. 24.



142. *Sinoennea moerchiana* (Nevill)—dorsal view

Shell cylindrically ovate, perforate, pale whitish, strongly sculptured by subvertical, distant ribs, apex obtusely conoid, whorls 7, convex, 4 th & 5 th are broadest, last whorl rounded at base, compressed near the perforation and just behind the lip; aperture vertical, subcircular, truncate above, a well developed vertical parietal lamella and a prominent fold just inside outer margin, peristome very broadly reflected and thickened, sinuate above.

Distribution : India : Great Nicobar.

Measurements (in mm) :

Length	Diameter	Aperture
5.20	2.90	1.90

Status : Rare.

***Sinoenna planguncula* (Benson)**

(Fig. 42)

1863. *Pupa planguncula* Benson, *Ann. Mag. nat. Hist.*, (3)12 : 426.

1908. *Ennea planguncula*: Blanford & Godwin-Austen, *Fauna of British India, Testacellidae and Zonitidae*, p. 23.

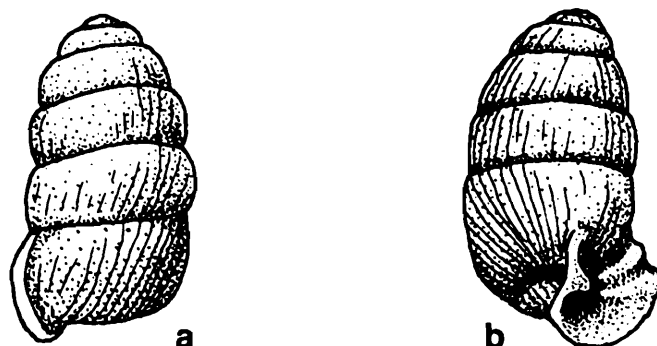


Fig. 42. *Sinoenna planguncula*, a. dorsal view; b. ventral view

Shell cylindrically ovate, narrowly perforate, whitish, very finely microscopically striate, apex obtuse, sutures crenulate; whorls 6-7, slightly convex, lower whorls with straight sides and of equal width, top 2-3 whorls suddenly becoming narrow; last whorl strongly laterally compressed and deeply indented behind the peristome; aperture vertical, oblong, right and left margins concave, thickened and reflected; parietal lamella on the right above, a sub bifid broad tooth on the right margin, two smaller teeth just inside the columella and two small on the base.

Differs in shape, sculpture and also in the form of aperture.

Distribution : India : Andhra Pradesh, Madhya Pradesh, Orissa..

Measurements (in mm) :

Length	Diameter	Aperture
3.65	1.80	1.45

Status : Not common.

Family PLECTOPYLIDIDAE (Corillidae)

Shell moderately large, depressed with a low or flat spire, widely umbilicate, coarsely sculptured above; whorls 5- 5½, the last often deflected in front; aperture oblique, lunate, mostly with callus and or an entering lamella; lip reflected or recurved; interior of last whorl obstructed by a series of plates and denticles.

Animal with short tentacles, foot short with undivided sole, pedal grooves absent.

India, China, Myanmar, Loo Choo Archipelago.

Number of Indian genera : Two.

Key to the genera

Shell larger, above 20 mm in diameter, without hairy growth, margins of aperture not joined *Corilla*

Shell smaller, below 20 mm in diameter, with hairy growth, margins of aperture joined by a callus *Plectopylis*

Genus *Plectopylis* Benson, 1860

1860. *Plectopylis* Benson, *Ann. Mag. nat. Hist.*, (3)5 : 244.

Number of Indian Subgenera : Two.

Subgenus *Chersaecia* Gude, 1899

1899. *Chersaecia* Gude, *Science Gossip, N.S.*, 6 : 148.

Number of Indian species : Eleven.

Distribution : India : Arunachal Pradesh, Assam, Manipur, Nagaland.

Elsewhere : Myanmar, Thailand.

Size Range (Indian species) : 8.00 – 17.50 mm in diameter.

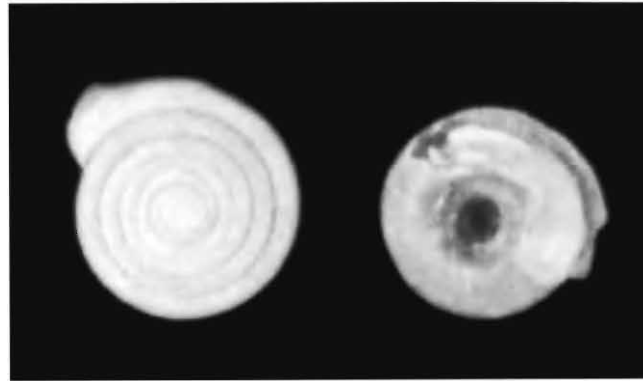
Plectopylis (Chersaecia) brahma Godwin-Austen
(143)

1879. *Helix (Plectopylis) brahma* Godwin-Austen, *J. Asiat. Soc. Beng.*, 48 : 3, pl. 1, fig. 3.

1914. *Plectopylis (Chersaecia) brahma* : Gude, *Fauna of British India, Mollusca*, 2 : 113.

Shell small, sinistral, depressed with a very low conical spire, narrowly but deeply perforate, pale brownish, finely obliquely striate, apex blunt, whorls 8, very closely

wound, last whorl compressed and angulate above, rounded below, slightly descending near aperture which is oblique and lunate, peristome thickened and reflected, margins joined by a callus, with internal plates or the armature; parietal folds consist of a vertical plate and three horizontal plates, parallel to each other, upper two free and the third attached to the vertical, one very thin lower free horizontal lamella reaches upto the peristome and is visible from outside. Two rows of smaller plicae present on the palatal side. One row with slightly larger plicae less in number (4) and another row with smaller plicae more in number (14).



143. *Plectopylis brahma* Godwin-Austen—dorsal and ventral view

Distribution : India : Assam.

Measurements (in mm) :

Height		Diameter		Aperture	
4.00	4.20	8.40	8.60	3.35	3.50

Status : Not common.

***Plectopylis (Chersaecia) muspratti* Gude**

(Fig. 43)

1897. *Plectopylis muspratti* Gude, *Science Gossip.*, N. S.4 : 10, fig. 45.

1914. *Plectopylis (Chersaecia) muspratti* : Gude, *Fauna of British India, Mollusca*, 2 : 89.

Shell larger, sinistral, discoidal, widely umbilicate, spire low, conical, apex blunt, pale yellowish with transverse brownish streaks, finely, obliquely striate, decussated by spiral lines, distinctly on upper surface; whorls 6-7, narrowly wound, the last flattened above, broad and descending near the aperture, slightly constricted behind the peristome; aperture roundly lunate, peristome thickened and reflected, margins joined by a parietal callus, which has a well raised ridge with little notches on both sides, a distinct, short entering lamella on the parietal side; parietal armature consists of two plates, one slightly curved, strong, vertical and one short horizontal below it. Palatal folds 6, short, horizontal.

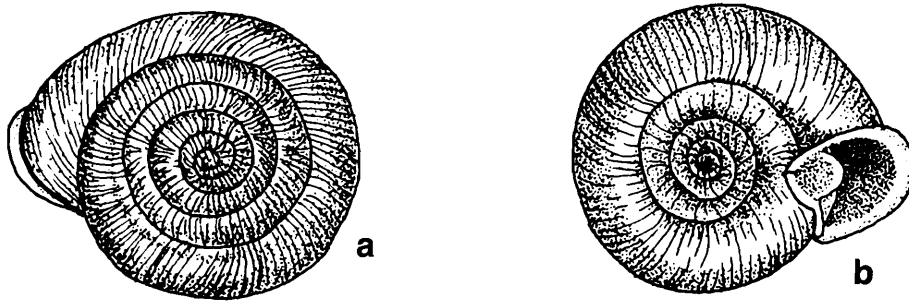


Fig. 43. *Plectopylis muspratti*, a. dorsal; b. ventral

Differs being larger in size, having a raised entering lamella and also in the parietal callus being ridged.

Distribution : India : Nagaland (Naga hills).

Measurements (in mm) :

Height	Diameter	Aperture
6.20	13.00	4.00

Status : Rare.

***Plectopylis (Chersaecia) oglei* Godwin-Austen**

(Fig. 44)

1879. *Helix (Plectopylis) oglei* Godwin-Austen, *J. Asiat. Soc. Beng.*, **48** : 3, pl.1, fig.2.

1914. *Plectopylis (Chersaecia) oglei* : Gude, *Fauna of British India, Mollusca*, **2** : 92.

Shell larger, dextral, depressed, widely umbilicate, spire low conoid, apex blunt and slightly concave, pale brown with lighter oblique markings above, finely, closely

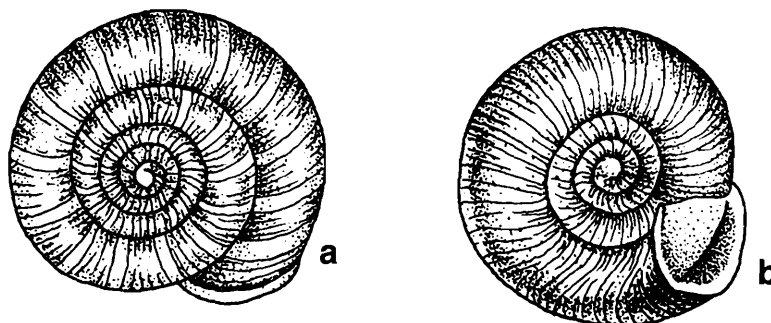


Fig. 44. *Plectopylis oglei*, a. dorsal view; b. ventral view

striate; whorls 8, the last slightly compressed above and descending in front; aperture oblique and ovate; peristome thickened and reflected, parietal callus feebly developed; parietal folds consist of a single, strong, vertical plate with two small horizontal ridges above and below; palatal armature includes 6 small horizontal folds, the first free, remaining 5 joined posteriorly by a vertical ridge.

Differs being dextral and larger in size.

Distribution : India : Assam.

Measurements (in mm) :

Height	Diameter	Aperture
2.70	8.00	5.50

Status : Not Common.

Subgenus *Endothyrella* Zilch, 1960

1960. *Endothyrella* Zilch, *Arch. Molluskenk.*, **89** : 193.

Number of Indian species : Twelve.

Distribution : India : Arunachal Pradesh, Assam, Meghalaya, Manipur, Nagaland, Sikkim, West Bengal (Darjeeling).

Elsewhere : Bhutan, Myanmar.

Size Range (Indian species) : 4.00 14.00 mm in diameter.

Plectopylis (Endothyrella) affinis Gude
(144, 145)

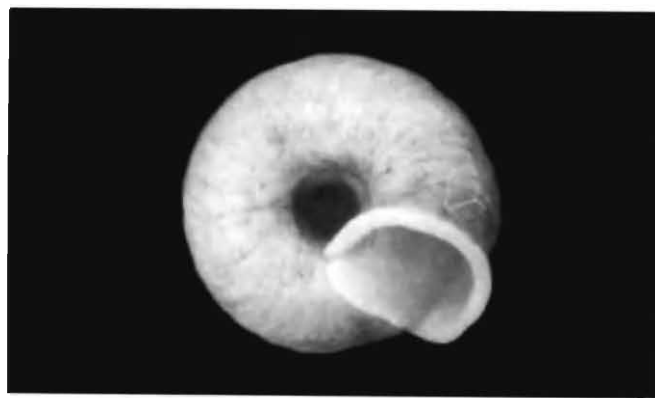
1897. *Plectopylis affinis* Gude, *J. Science Gossip. N.S.*, **3** : 276, fig. 41.

1914. *Plectopylis (Endothyra) affinis* : Gude, *Fauna of British India, Mollusca*, **2** : 84.

Shell sinistral, thick, openly umbilicate, discoid with a low conoid spire, apex obtusely raised, pale yellowish, coarsely sculptured with oblique markings and close decussating spiral lines, both above and below; whorls 7, narrow, the last subangulate above the periphery, rounded below; possesses rows of small hairs (seen in fresh condition); aperture oblique, ear shaped, peristome thickened, slightly reflected; parietal callus with raised arcuate ridge separated from the margins by small notches on both



144. *Plectopylis affinis* Gude—dorsal view



145. *Plectopylis affinis* Gude—ventral view

sides, parietal armature includes one vertical plate with one pair of folds on anterior side and one pair of denticles on posterior side and also another pair of free horizontal folds below it, palatal armature consists of six folds, the first and last of which are shorter and thinner, the rest being larger and broader.

Distribution : India : Meghalaya (Khasi hills).

Measurements (in mm) :

Height		Diameter		Aperture	
5.00	5.50	9.00	9.50	3.70	3.90

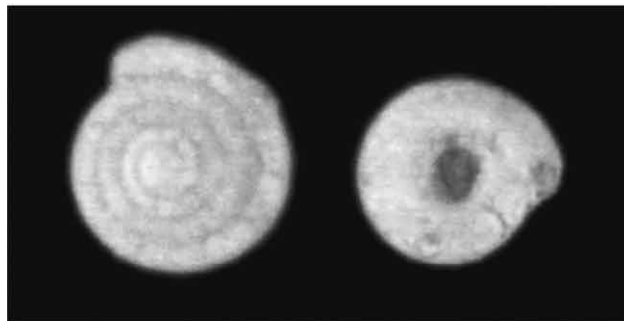
Status : Not common.

Plectopylis (Endothyrella) macromphalus Blanford
(146)

1870. *Helix (Plectopylis) macromphalus* Blanford, *J. Asiat. Soc. Beng.*, **39** : 17, pl. 3, fig. 14.

1914. *Plectopylis (Endothyra) macromphalus* : Gude, *Fauna of British India, Mollusca*, **2** : 79.

Shell small, sinistral, discoid, moderately umbilicate, covered by a large cuticle, spire almost flat, apex blunt, coarsely obliquely striate with regular decussating spiral markings both above and below, suture deep; whorls 5 5½, flat above, narrowly wound, last whorl compressed above periphery, lunate, peristome thickened and reflected. Parietal armature includes one strong vertical plate and a small horizontal denticle attached to its lower end, palatal folds are arranged in two series, one anterior with four and one parietal with six horizontal folds.



146. *Plectopylis macromphalus* Blanford—dorsal and ventral view

Differs being smaller and flatter.

Distribution : India : Hills of north-east, Arunachal Pradesh, Meghalaya, Nagaland.

Measurements (in mm) :

Height		Diameter		Aperture	
2.20	2.60	4.00	5.50	2.40	2.45

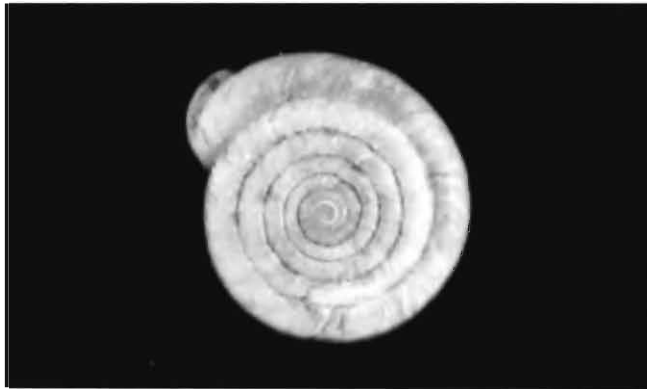
Status : Common.

***Plectopylis (Endothyrella) pinacis* (Benson)**

(147, 148)

1859. *Helix pinacis* Benson, *Ann. Mag. nat. Hist.*, (3)3 : 268.1914. *Plectopylis (Endothyra) pinacis* : Gude, *Fauna of British India, Mollusca*, 2 : 86.

Shell larger, sinistral, widely and openly umbilicate, depressed, spire flattened, apex obtuse very closely sculptured with oblique striae and spiral lines both above and below, whorls 7½, flattened above, the last angulate above the periphery and also around the umbilicus, very slightly descending in front; aperture oblique, lunate, peristome thickened, parietal armature includes a strong vertical plate with a small denticle below the upper posterior support. Also a free horizontal fold below the vertical plate. Palatal armature composed of six horizontal folds of varying shape and size and also two small denticles between the first and second folds.

147. *Plectopylis pinacis* (Benson)–dorsal view 148. *Plectopylis pinacis* (Benson)–ventral view

Differs being larger than the others and also being excavated at the umbilicus.

Distribution : India : Sikkim and West Bengal (Darjeeling).

Measurements (in mm) :

Height		Diameter		Aperture	
4.15	5.20	10.00	14.00	4.20	4.70

Status : Common.

***Plectopylis (Endothyrella) plectostoma* (Benson)**

(149, 150)

1836. *Helix plectostoma* Benson, *J. Asiat. Soc. Beng.*, 5 : 351.1914. *Plectopylis (Endothyra) plectostoma*: Gude, *Fauna of British India, Mollusca*, 2 : 81.

Shell small, sinistral, narrowly umbilicate depressed with a conoid spire, apex obtuse, very coarsely sculptured with oblique striae and spiral plications giving the



149. *Plectopylis plectostoma* (Benson)—dorsal view

150. *Plectopylis plectostoma* (Benson)—ventral view

shell a plaited appearance above, smoother below; whorls 5, last whorl compressed and descending; aperture oblique, broadly lunate, peristome thickened and reflected, raised ridge on parietal callus indistinct; parietal armature includes above vertical plate with two folds one on each end, two small denticles above and a free horizontal fold below the vertical plate. Palatal armature consists of six horizontal folds.

Very close to *P.(E.) affinis*, differs being smoother below and lacking the two notches on both sides of the feebly developed parietal ridge.

Distribution : India : Arunachal Pradesh, Assam, Meghalaya, Mizoram, Nagaland, Sikkim, West Bengal (Darjeeling).

Elsewhere : Myanmar.

Measurements (in mm) :

Height		Diameter		Aperture	
2.60	4.25	4.80	7.90	2.30	3.25

Status : Abundant.

Genus *Corilla* H. & A. Adams, 1855

1855. *Corilla* H.& A. Adams, *Gen. Rec. Moll.*, 2 : 208.

Number of Indian species : One.

Distribution : India : South India.

Elsewhere : Sri Lanka.

Size Range : 20.00 27.00 mm in diameter.

Corilla anax (Benson)
(C41, C42, C43)

1865. *Helix anax* Benson, *Ann. Mag. nat. Hist.*,(3)15 : 12.

1914. *Corilla anax* : Gude, *Fauna of British India, Mollusca*, 2 : 59.

C41. *Corilla anax* (Benson)—dorsal viewC42. *Corilla anax* (Benson)—lateral viewC43. *Corilla anax* (Benson)—ventral view

Shell discoid, subovate, thick, widely umbilicate with a flat or sunken spire, dark chocolate, strongly, obliquely costulate both above and below, suture deep, whorls 5, flattened above, rounded below, last whorl slightly compressed laterally, dilated and descending near the aperture; aperture oblique, oblong, peristome thickened and reflected, nearly straight above; two parietal plates, almost parallel to each other, second one more prominent, reaches upto the margin, the other slightly curved, 3 oblique palatal plates inside the bodywhorl.

Distribution : India : Hills of South India (2000 ft.), under moist wooden logs.

Only species of *Corilla* occurring outside (Sri Lanka).

Measurements (in mm) :

Height		Diameter		Aperture	
7.60	8.10	20.80	27.00	6.50	8.00

Status : Common.

Family ENDODONTIDAE

Shell small, depressed or depressedly conoid, perforate with sculpture, animal without caudal gland at the extremity of foot, radula with squarish plates.

World wide.

Number of Indian genus : One.

Reference

- Solem, A.1957. Philippine snails of the family Endodontidae. *Fieldiana, Zool.* **42** : 1- 12.
- Solem, A.1976. Endodontoid land snails from Pacific Islands. Part I *Field Mus. Nat. Hist., Chicago.* pp 1-508.
- Solem, A.1981. Small land snails : Northern Australia II Westraleystis. *J. Mal. Soc. Aust.*, 5 (3/4) : 175-193.

Genus ***Philalanka*** Godwin-Austen, 1898

1898. *Philalanka* Godwin-Austen, *Proc. malac. Soc. Lond.*, **3** : 11.

Number of Indian species : Three.

Distribution : India : Andaman and Nicobar Islands, South Indian Hills.

Elsewhere : Islands of Indonesian coasts, Sri Lanka.

Size Range (Indian species) : 1.50 6.00 mm in diameter.

Philalanka homfrayi (Godwin-Austen)

(Fig. 45)

1895. *Sitala homfrayi* Godwin-Austen, *Proc. zool. Soc. Lond.*, **1895** : 448, fig. A.

1914. *Philalanka homfrayi* : Gude, *Fauna of British India, Mollusca*, **2** : 16.

Shell minute, pyramidal, flat on base, imperforate, greyish, coarsely sculptured with radial striae and fine spiral ribbings, whorls 4½, with angulate sides, last whorl rather biangulate because of the two strong ribs. one around the periphery and another just above it, suture shallow; aperture subangulate, oblique, peristome very little thickened, columella vertical.

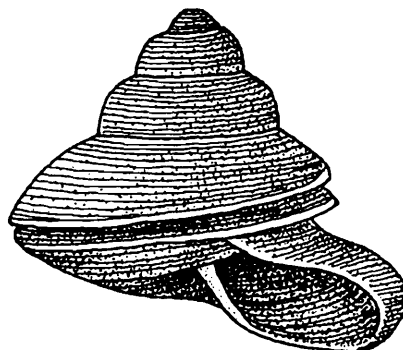


Fig. 45. *Philalanka homfrayi* : ventral view

Angulate whorls, particularly the biangulate last whorl make it distinct from others.

Distribution : India : Endemic to Andaman Islands.

Measurements (in mm) :

Height	Diameter
1.40	1.40

Status : Rare.

***Philalanka quinquelirata* Gude**
(Fig. 46)

1914. *Philalanka quinquelirata* Gude, *Proc. Malac. Soc. Lond.*, **11** : 51, text fig.

1914. *Philalanka quinquelirata*: Gude, *Fauna of British India, Mollusca*, **2** : 17.

Shell slightly bigger, narrowly perforate, pyramidal, pale yellowish, apex blunt, finely and closely striate above, with decussating fine spiral lines on base, suture deep; whorls 6, rounded, last whorl inflated below, with five fine spiral lirae above; aperture vertical, broadly lunate, peristome thin and slightly reflected, columella strongly reflected over the perforation.



Fig. 46. *Philalanka quinquelirata* : ventral view

Differs being bigger and perforate, having more or less rounded whorls and also having five lirae on last whorl.

Distribution : India : Tamil Nadu : Anamullay hills.

Measurements (in mm) :

Height	Diameter
4.25	5.25

Status : Not common.

Philalanka subbilirata (Godwin-Austen)
(Fig. 47)

1882. *Sitala subbilirata* Godwin-Austen, *Moll. India*, 1 : 39, pl.10, fig.11.

1914. *Philalanka subbilirata* : Gude, *Fauna of British India, Mollusca*, 2 : 15.

Shell very small, depressedly conoid, openly perforate, brownish, sculptured by irregular radial striae and fine spiral ribs both above and below, whorls 5, slightly convex above, two fine ribs one around the angulate periphery and another above it on the last whorl which is flat on sides; aperture subvertical, ovate, peristome slightly thickened, columella oblique and simple.

Differs from *P. quinquelirata* in having less number of lirae on the last whorl.

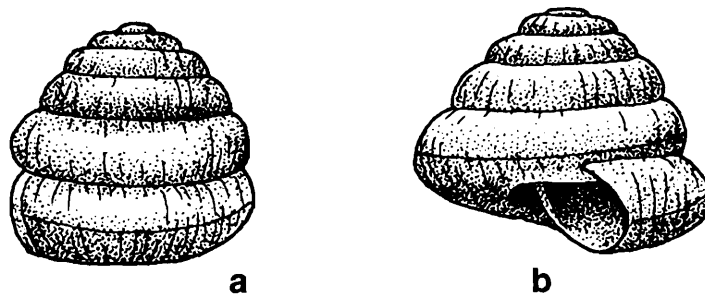


Fig. 47. *Philalanka subbilirata*, a. dorsal view, b. ventral view

Distribution : India : Endemic to Andaman and Nicobar Islands.

Measurements (in mm) :

Height	Diameter
1.60 2.15	2.60 - 3.15

Status : Common.

Family CHAROPIDAE

Shell small, depressedly trochiform, narrowly perforate, acutely keeled, usually with spiral sculpture, fringed with hair like cuticle process. Some with parietal and palatal armature.

India, Sri Lanka.

Number of Indian genera : Two.

Reference

- Solem, A.1976. Endodontoid land snails from Pacific Islands. Part I *Field Mus. Nat. Hist., Chicago*. pp 1-508.
- Solem, A.1981. Small land snails: Northern Australia II Westraleystis. *J. Mal. Soc. Aust.*,5 (3/4) : 175-193.

Key to the genera

Shell smaller, upto 6 mm in diameter, rounded below, with denticles inside the aperture..... *Ruthvenia*

Shell larger, above 6 mm in diameter, flattened below, without denticles inside the aperture..... *Thysanota*

Genus *Ruthvenia* Gude, 1911

1911. *Ruthvenia* Gude, *Proc. malac. Soc. Lond.* **9** : 271.

Number of Indian species : Two.

Distribution : India : South Indian Hills.

Elsewhere : Sri Lanka.

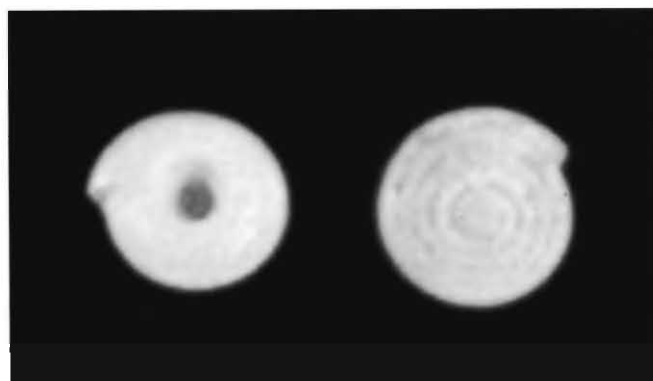
Size Range (Indian species) : 5.00–7.00 mm in diameter.

Ruthvenia clathratuloides (Gude)

(151)

1897. *Plectopylis clathratuloides* Gude, *Science Gossip, N. S.* **3** : 332, fig. 44.

1914. *Ruthvenia clathratuloides* : Gude, *Fauna of British India, Mollusca*, **2** : 27.



151. *Ruthvenia clathratuloides* (Gude)—dorsal and ventral view

Shell small, depressedly conoid, umbilicate, pale brownish, finely sculptured by raised ribs, radial and circular both above and below, whorls 5½, narrow, slightly convex, suture deeply impressed, last whorl rounded below, keeled at the periphery, above which two raised ribs encircle the whorl, rows of hairs can be seen along the lower ribs; aperture subquadrate, peristome a little thickened, not reflected. A series of folds and denticles (armature) present along the interior wall of the whorls. Parietal armature includes two series, in addition two internal horizontal folds corresponding to the peripheral and umbilical angulation present.

Distribution : India : South Indian Hills, Karnataka, Tamil Nadu.

Measurements (in mm) :

Height		Diameter	
3.00	3.50	5.50	6.00

Status : Common.

Genus *Thysanota* Albers & Martens, 1860

1860. *Thysanota* Albers & Martens, *Die Heliceen*, ed. 2, p. 63. (as section of *Trochomorpha*)

Number of Indian species : Four.

Distribution : India : South Indian Hills (Nilgiri).

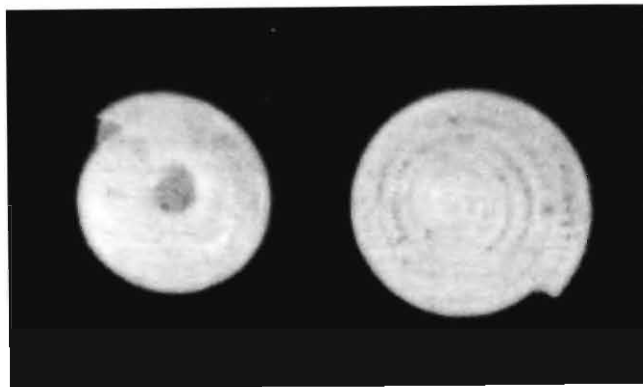
Elsewhere : Sri Lanka.

Size Range (Indian species) : 6.00 17.50 mm in diameter.

***Thysanota crinigera* (Benson)**
(152)

1850. *Helix crinigera* Benson, *Ann. Mag. nat. Hist.*, (2)5 : 214.

1914. *Thysanota crinigera* : Gude, *Fauna of British India, Mollusca*, 2 : 12.



152. *Thysanota crinigera* (Benson)—dorsal and ventral view

Shell depressedly trochiform, perforate, brownish, with a blunt apex, very coarsely sculptured with raised radial plications and very fine spiral markings above, spirals more crowded below; whorls $6\frac{1}{2}$, very little convex, keeled at the periphery, a sharp spiral thread above the keel on each whorl, rows of flattened hairs around the peripheral keel, last whorl flatly convex below, slightly compressed near the perforation; aperture suboblique, angulately lunate, peristome thin and sharp.

Distribution : India : Nilgiris.

Measurements (in mm) :

Height		Diameter		Aperture	
2.90	7.70	6.70	13.25	3.00	4.90

Status : Common.

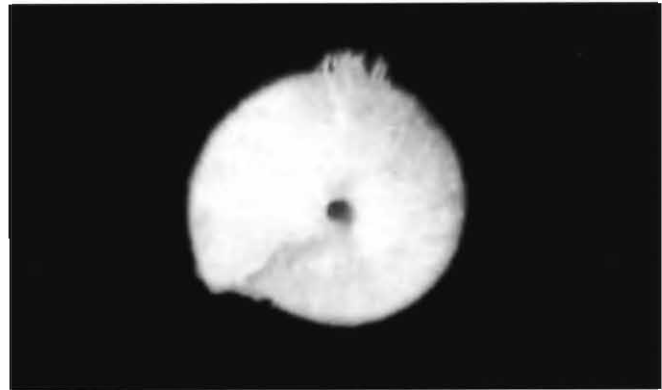
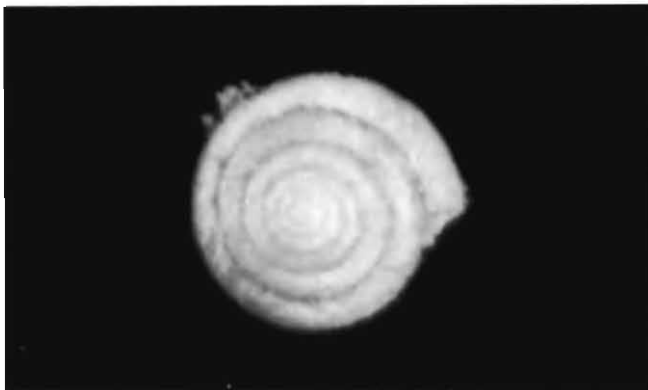
***Thysanota guerini* (Pfeiffer)**

(153, 154)

1842. *Helix guerini* Pfeiffer, *Rev. Zool.*, 1842 : 304.

1914. *Thysanota guerini*: Gude, *Fauna of British India, Mollusca*, 2 : 11.

Shell larger, trochiform, rather flat on base, narrowly perforate, apex obtuse, pale yellowish, roughly sculptured with close raised radial and spiral striae both above and below, whorls 7 – 7½, convex above, last whorl keeled at the periphery, flatly convex below, raised spiral line just above the suture on all the whorls; aperture suboblique, angulately lunate, peristome thin, columella slightly reflected above.



153. *Thysanota guerini* (Pfeiffer)—dorsal view 154. *Thysanota guerini* (Pfeiffer)—ventral view

Differs being large and much more conical above, the spiral keel above the suture is also very feebly developed.

Remarks : Nevill (1878) considered *T. crinigera* to be an immature form of *T. guerini* which is quite likely.

Distribution : India : Western Ghat, Tamil Nadu.

Measurements (in mm) :

Height		Diameter		Aperture	
8.80	11.00	13.40	15.30	5.50	6.20

Status : Common.

Family SUCCINEIDAE

Shell oval or cap like, imperforate, thin and horny, neither smooth nor with distinct sculpture, (the genus *Hyalimax* has an internal shell), translucent, spire conoid, short, whorls few, very rapidly increasing in size; aperture large and wide, columella simple, sometimes with thin columellar fold.

Animal with a large foot, tentacles short, upper pair conoid with swollen base, lower pair absent or poorly developed.

World wide.

Some terrestrial, some amphibious, remaining very close to water, rarely in water, some are aboreal.

It includes two subfamilies.

Reference

- Patterson, C.M. 1971. Taxonomic studies of the land snail family Succineidae. *Mal. Rev.*, **4** : 131.
- Rao, H.S. 1924. Asiatic Succineidae in the Indian Museum. *Rec. Indian Mus.*, **26** : 367-408, pl.28.
- Rao, H.S. 1925. On certain succineid mollusks from the western Ghats, Bombay Presidency. *Rec. Indian Mus.*, **27** : 385-400.

Key to the genera

1. Shell with a keel and corresponding internal furrow, running from the apex to the aperture (2)
 - Shell without such a keel (3)
2. Shell depressed-ovate, with a very short and scarcely raised spire *Lithotis*.
Shell trumpet shaped, with a distinctly raised spire *Camptonyx*
3. Shell thinner, spire very poorly developed, columellar fold thin and minute
Indosuccinea
Shell comparatively thicker, spire better developed, columellar fold with a distinct ridge (4)
4. Penis with a penial sheath *Succinea*
Penis without a penial sheath *Quickia*

Subfamily SUCCINEINAE

Number of Indian genera : Four.

Genus *Succinea* Draparnaud, 1801

1801. *Succinea* Draparnaud, *Tabl. Moll. Terr. Fluv. France*, p. 55.

Number of Indian species : Ten.

Distribution : Widely distributed almost throughout the world. Plains and hills. In moist situations, closer to water bodies some under the bark of trees, some on rocks.

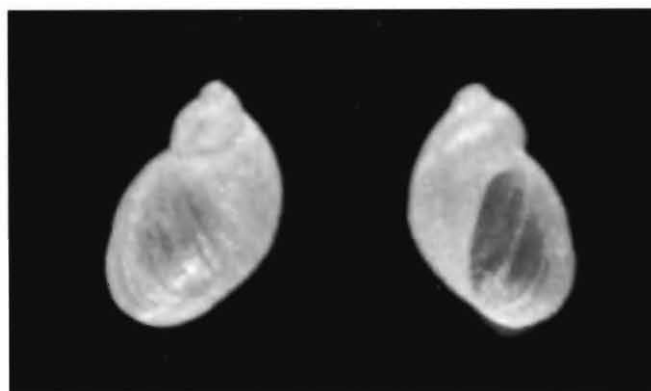
Size Range (Indian species) : 4.00–24.00 mm in length.

Succinea daucina Pfeiffer
(155)

1854. *Succinea daucina* Pfeiffer, *Proc. zool. Soc. Lond.*, **1854** : 298.

1914. *Succinea daucina*: Gude, *Fauna of British India, Mollusca*, **2** : 453.

Shell small, thin, ovately conical, imperforate, flexuously striate, pale white with a reddish tinge, spire conical with a sharp apex; whorls 3, rounded, rapidly increasing in size, last whorl large, angulately oval, peristome simple, columella with a very thin, narrow callus, rounded at the base.



155. *Succinea daucina* Pfeiffer—dorsal and ventral view

Distribution : India : West Bengal.

Elsewhere : Myanmar.

Remarks : Depending on variations in shape of spire infraspecific forms viz. *burmanica*, *hraswasikhara* were described.

Measurements (in mm) :

Length	Diameter	Aperture
7.70 9.80	4.00 5.20	5.00 6.30

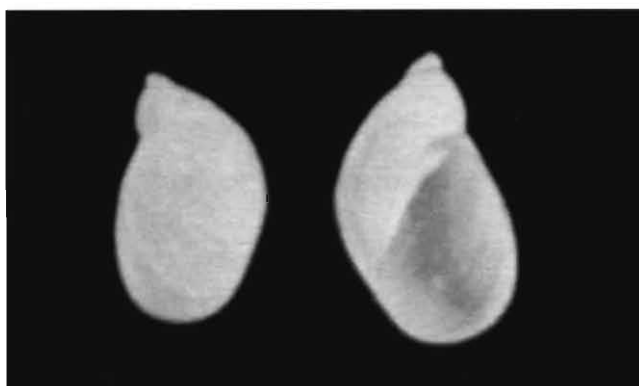
Status : Common.

Succinea girnarica Theobald
(156)

1859. *Succinea girnarica* Theobald, *J. Asiat. Soc. Beng.*, **28** : 309.

1914. *Succinea girnarica*: Gude, *Fauna of British India, Mollusca*, **2** : 451.

Shell rather large, thick, oblong-ovate, imperforate, pale white with a pinkish shade, spire short and conical, roughly sculptured with close raised striae; whorls 2½, rounded, very rapidly increasing in size, last whorl large, elongately inflated, slightly descending in front; aperture very oblique, roundish, peristome thin, columella slightly reflected, with a thin and broad callus.



156. *Succinea girnarica* Theobald—dorsal and ventral view

Differs in being larger, having less number of whorls, having a broad columellar callus and also the last whorl being slightly compressed.

Distribution : India : Endemic to Girnar Hills (on rocks) Kathiawar, Gujarat (2000 3000 ft.).

Measurements (in mm) :

Length	Diameter	Aperture
13.60 24.00	83.00 14.00	10.50 18.00

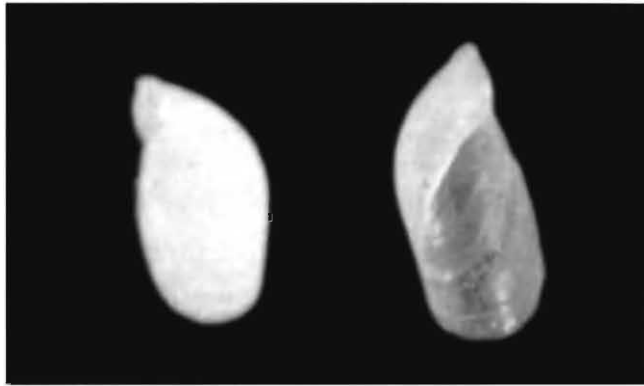
Status : Not common.

Succinea indica Pfeiffer
(157)

1849. *Succinea indica* Pfeiffer, *Proc. zool. Soc. Lond.*, **1849** : 133.

1914. *Succinea indica*: Gude, *Fauna of British India, Mollusca, 2* : 447.

Shell thin, nearly transparent, narrowly elongate, pale yellowish or pale pinkish (Rao, 1924) with close subvertical striae, spire and apex obtusely raised; whorls 3, convex, last whorl large, equalling $\frac{3}{4}$ th of the total length, tapering above, aperture subvertical, ovate, peristome thin, slightly arcuate above, columella with a thin callus.



157. *Succinea indica* Pfeiffer—dorsal and ventral view

Differs being narrowly elongate.

Remarks : Two forms, the long and short spired exist (Rao, 1924).

Distribution : India : Westerm Himalaya, Kashmir, Punjab, Uttaranchal.

Measurements (in mm) :

Length		Diameter		Aperture
10.50	13.20	4.65	6.10	8.10 - 9.60

Status : Not common.

***Succinea raoi* Subba Rao & Mitra**

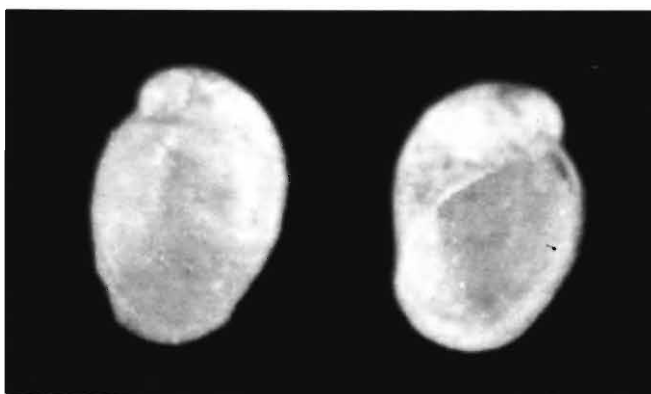
(158)

1925. *Succinea arboricola* Rao, *Rec. Indian Mus.*, **27** : 394, figs.7-10 (Preoccupied).

1976. *Succinea raoi* Subba Rao & Mitra, *Nautilus*, **90(3)** : 125.

Shell small, ovate, fairly thick, pale yellowish to pale brownish, spire very short apex blunt, very obliquely, almost horizontally closely striate, sculpture feeble on spire; whorls $2\frac{1}{2}$, last whorl nearly 5 times as large as the spire; aperture oblique, ovately conical, peristome slightly reflected, columella a little reflected, with a thin callus, a narrow columellar ridge present; surface within the aperture is white irridescent.

Differs in having a very short and blunt spire, having a columellar ridge and also in the form of sculpture.



158. *Succinea raoi* Rao & Mitra—dorsal and ventral view

Remarks : The name *S. arvicola* Rao being preoccupied by *Succinea arvicola* Conolly, a new name was proposed by Subba Rao & Mitra (1976).

Distribution : India : Endemic to the Western Ghat, Lonavala, Maharashtra (under barks of mango trees).

Measurements (in mm) :

Length		Diameter		Aperture	
4.85	6.00	3.90	4.20	4.15	4.85

Status : Common.

Genus *Camptonyx* Benson, 1858

1858. *Camptonyx* Benson, *Ann. Mag. nat. Hist.*, (3) 1 : 336.

Number of Indian species : Three.

Distribution : India : Western Ghats.

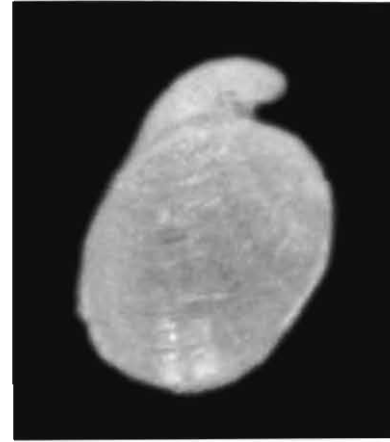
Size Range (Indian species) : 4.00 15.60 mm in length.

Camptonyx theobaldi Benson (159, 160)

1858. *Camptonyx theobaldi* Benson, *Ann. Mag. nat. Hist.*, (3)1 : 336.

1914. *Camptonyx theobaldi* : Gude, *Fauna of British India, Mollusca*, 2 : 465

Shell cap like, depressedly trumpet shaped, fairly thick, pinkish brown, spire conically raised but obliquely curved towards right; whorls 1½–2, last whorl proportionately large and constituting almost the entire shell, concentrically closely marked, an obtuse keel on dorsal side, running from the apex to the right margin; aperture large, ovately circular, margins expanded, slightly reflected.



159. *Camptonyx theobaldi* Benson—dorsal view 160. *Camptonyx theobaldi* Benson—ventral view

Remarks : Remains firmly attached to the rocks just like limpets (Gude, 1914).

Distribution : India : Endemic to the Girnar Hills, Kathiawar, Gujarat (2500 ft.).

Measurements (in mm) :

Length		Diameter		Aperture	
4.45	6.80	3.00	5.15	3.80	5.55

Status : Abundant.

Subgenus *Lithotis* Blanford, 1863

1863. *Lithotis* Blanford, *Ann. Mag. nat. Hist.*, (3) 12 : 186.

Number of Indian species : Two.

Distribution : India : Western Ghats (Maharashtra).

Size Range (Indian species) : 5.00 7.00 mm in diameter.

Camptonyx (Lithotis) rupicola (Blanford) (161)

1863. *Succinea (Lithotis) rupicola* Blanford, *Ann. Mag. nat. Hist.*, (3)12 : 186.

1914. *Lithotis rupicola*: Gude, *Fauna of British India, Mollusca*, 2 : 458.

Shell depressed, ovate, spire very short scarcely raised, tilted to the right, thin, golden brown, marked by irregularly spaced wrinkled raised striae, whorls 1½, last whorl large, occupying 90% of the total shell with a ridge above, running from the apex to the right margin; aperture large, ovate, peristome thin, sinuate at the confluence with the dorsal ridge, columellar callus shining white, elongately triangular, anteriorly tapering forming a distinct area.

Remarks : Abundantly adheres to the exposed vertical face of rocks, having algal growth adjacent to hill streams. The depressed limpet like modification is particularly suitable for its habitat.

Distribution : India : Pune (Maharashtra). Endemic to the Western Ghats.



161. *Camptonyx rupicola* (Blanford)—dorsal view

Measurements (in mm) :

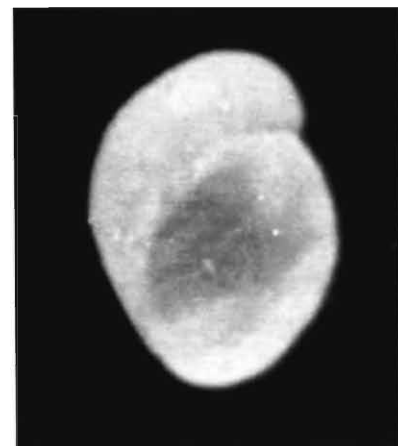
Length		Diameter		Aperture	
6.00	15.60	4.45	10.35	5.50	14.40

One of the figured shells measuring 15.60 mm collected during March-2000, is the largest in this species, recorded so far.

Status : Common.

Camptonyx (Lithotis) tumida Blanford
(162, 163)

1870. *Succinea (Lithotis) tumida* Blanford, *J. Asiat. Soc. Beng.*, **39** : 23, pl. 3, fig. 24.



162. *Camptonyx tumida* Blanford—dorsal view **163.** *Camptonyx tumida* Blanford—ventral view

1914. *Lithotis tumida*: Gude, *Fauna of British India, Mollusca, 2* : 459.

Shell obliquely ovate, thicker with a more developed and conoidly raised spire, brownish with reddish tint, obliquely coarsely striate throughout; whorls 2–2½, rounded, the supra peripheral ridge on the last whorl moderately developed; aperture large, oval, peristome thin, simple, columellar callus distinct but flattened.

The shell with a well raised spire is more like as in *Succinea*, but the dorsal ridge on the last whorl distinct.

Distribution : India : Pune (Maharashtra). Endemic to the Western Ghats.

Measurements (in mm) :

Length		Diameter	Aperture
5.20	8.25	4.50 - 5.50	4.40 - 5.50

Status : Common.

Subfamily CATINELLINAE

Number of Indian genera : Two.

Genus *Indosuccinea* Rao, 1924

1924. *Indosuccinea* Rao, *Rec. Indian Mus.*, **26** : 373.

Number of Indian species :

Distribution : India : Maharashtra, West Bengal.

Elsewhere : Bangladesh, Myanmar.

Size Range (Indian species) : 8.00 - 19.00 mm in length.

Indosuccinea semiserica (Gould)

(164)

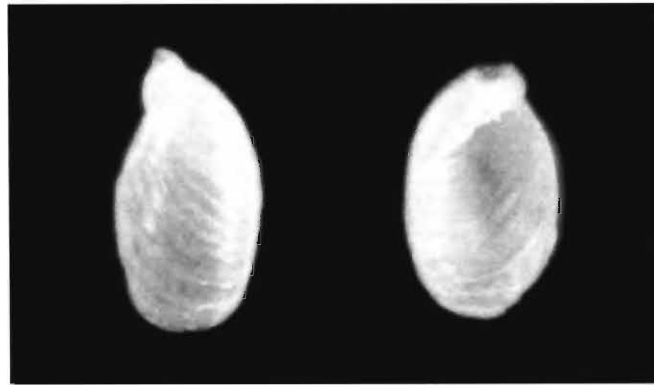
1846. *Succinea semiserica* Gould, *Proc. Boston Soc. Nat. Hist.*, **2** : 100.

1914. *Succinea semiserica*: Gude, *Fauna of British India, Mollusca, 2* : 452.

1924. *Indosuccinea semiserica* Rao, *Rec. Indian Mus.*, **26** : 374.

Shell rather large, elongately ovate, thin, pale yellowish very coarsely sculptured with oblique striae, spire very short, whorls 2½, last whorl very large and constituting almost the entire shell; aperture largely expanded, oval, angulate above, peristome thin and sharp, columellar fold thin.

A smaller form of the species *I. semiserica* f. *sthulasiras* was described by Rao (1924) from Ballygunge, Kolkata.



164. *Indosuccinea semiserica* (Gould)—dorsal and ventral view

Remarks : It is a tree living species, having been collected from the leaves of mango trees at 1700 ft. Its arboreal mode of life was also reported by Raut & Ghose (1984).

Distribution : India : Maharashtra, Manipur, West Bengal.

Elsewhere : Bangladesh, Myanmar.

Measurements (in mm) :

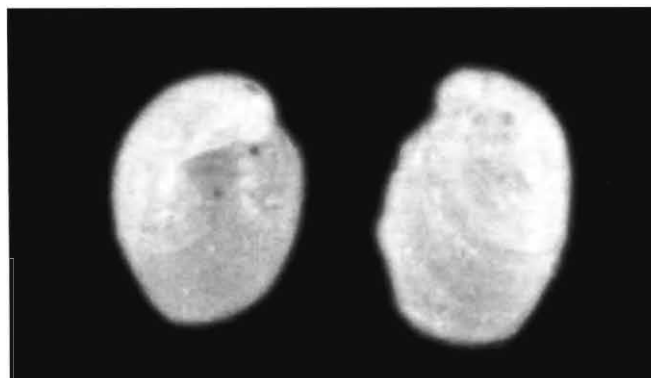
Length	Diameter	Aperture
11.90- 17.40	7.00 10.00	9.70- 14.80

Status : Common.

***Indosuccinea khandalla* Rao**
(165)

1924. *Indosuccinea semiserica* f. *khandalla* Rao, *Rec.Indian Mus.*, **26** : 407.

The shell is almost similar to that in *I. semiserica*, but smaller in size, not exceeding 12.00 mm in length. "Sculpture variable and thickening of upper part of body whorl prominent" Patterson (1971) suggested for its specific rank on the basis of its anatomical differences.



165. *Indosuccinea khandalla* Rao—dorsal and ventral view

Distribution : India : Khandalla (Maharashtra). Known from type locality only.

Measurements (in mm) :

Length	Diameter	Aperture
8.90 - 11.75	4.75 7.90	7.10 - 10.80

Status : Not common.

Genus *Quickia* Odhner, 1950

1950. *Quickia* Odhner, *Proc. Malac. Soc. Lond.*, **28** : 206.

Number of Indian species : Three.

Distribution : India : Andaman & Nicobar Islands, Andhra Pradesh, Gujarat, Madhya Pradesh, Maharashtra, Tamil Nadu, Uttar Pradesh, West Bengal.

Elsewhere : West-Central coastal Africa and its off shore Islands, various Island groups in the Indian Ocean.

On moist shady ground, among leaf litters etc.

Size Range (Indian species) : 4.00 - 9.50 mm in length.

Quickia bensoni (Pfeiffer)

(Fig. 48)

1849. *Succinea bensoni* Pfeiffer, *Proc. zool. Soc. Lond.*, **1849** : 133.

1992. *Quickia bensoni*: Mitra & Dey, *Fauna of West Bengal, State Fauna Series*, **3** : 41.

Shell ovately, conical, thin, nearly transparent, greyish brown, spire considerably raised, apex obtuse finely closely striate, whorls 3, convex, last whorl large equalling nearly $\frac{2}{3}$ rd of total length; aperture oval, peristome thin, convexly rounded, columella with a distinct plait.

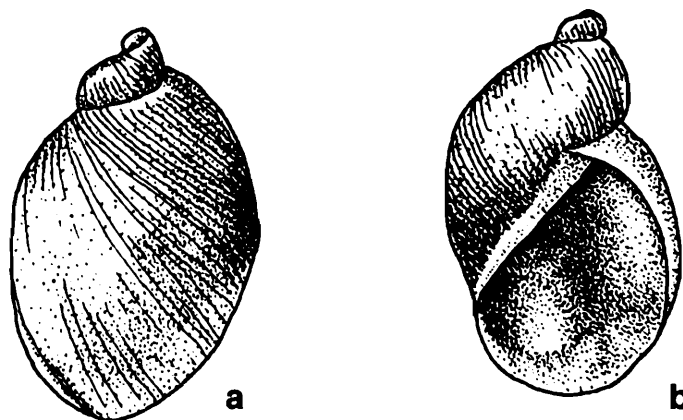


Fig. 48. *Quickia bensoni*, a. dorsal view, b. ventral view

Distribution : India : Gujarat, Maharashtra, Uttar Pradesh, West Bengal.

Measurements (in mm) :

Length		Diameter		Aperture	
4.30	8.00	2.90	4.60	3.50	5.20

Status : Common.

***Quickia gravelyi* (Rao)**
(166, 167)

1924. *Succinea gravelyi* Rao, *Rec. Indian Mus.*, **26** : 401.

1971. *Quickia gravelyi* : Patterson, *Mal. Rev.*, **4** : 171.

Shell small, narrowly ovate, thin, semitransparent, reddish brown, fairly, regularly striate, spire short, conoid, apex blunt; whorls 2½, convex, the last whorl large occupying 2/3rd of the total length; aperture ovate, peristome thin, slightly angulate above, rounded below, columellar fold thin.



166. *Quickia gravelyi* (Rao)—dorsal view



167. *Quickia gravelyi* (Rao)—ventral view

Differs in the outer lip being rather straight and not much rounded and the last whorl being narrower.

It includes several subspecies like *Q. gravely andamanensis*, *Q. gravely bombayensis* and *Q. gravely deccanensis*.

Distribution : India : Andaman Islands, Andhra Pradesh, Maharashtra, Tamil Nadu.

Measurements (in mm) :

Length		Diameter		Aperture	
5.50	6.75	2.35	3.45	4.25	5.15

Status : Common.

Family HELICARIONIDAE

Shell small, depressed, or conically raised, ovate and ear shaped in some, smooth or sculptured, usually perforate and angulate at the periphery; aperture widely lunate, peristome not continuous, thin; sole of foot divided or undivided, caudal gland usually present.

Tropical and temperate regions of the world. Mostly on ground.

It includes three subfamilies.

Reference

Solem, A. 1966. Some non marine mollusks from Thailand with notes on classification of the Helicarionidae. *Spolia zoologica Musei Hauniensis*, **24** : 1-109.

Key to the genera

1. Shell ear shaped, shallow with imperfect whorl formation *Pseudaustenia*
Shell conoid or depressedly conoid, with perfect whorl formation (2)
2. Shell with spiral sculpture above (5)
Shell without spiral sculpture above (3)
3. Shell with fringe of hairs on the periphery *Pseudokaliella*
Shell without fringe of hairs on the periphery (4)
4. Shell narrowly perforate, with microscopic oblique sculpture *Kaliella*
Shell widely perforate, with strong oblique sculpture *Rahula*
5. Shell sharply keeled at periphery (6)
Shell rounded or bluntly angulate at periphery (7)
6. Shell larger, above 10 mm in diameter, convex at base *Sivella*
Shell smaller, less than 10 mm in diameter, flat on base *Sesara*
7. Shell rounded at periphery, convex at base *Rasama*
Shell bluntly angulate at periphery, flat on base *Tadunia*

Subfamily HELICARIONINAE

Number of Indian genera : Two.

Genus *Nesaecia* Gude, 1911

1911. *Nesaecia* Gude, *Proc. malac. Soc. Lond.*, **9** : 270.

Number of Indian species : Three.

Distribution : India : Nicobar Islands.

Represented by 3 species in Nicobar Islands, could not be included because of non availability of materials.

Genus ***Pseudaustenia*** Cockerell, 1891

1891. *Pseudaustenia* Cockerell, *Proc. zool. Soc. Lond.*, p. 225.

Small slug like genus with a partly internal shell.

Number of Indian species : Two.

Distribution : India : Kerala, Tamil Nadu.

Size Range (Indian species) : 7.00 13.40 mm in length.

Pseudaustenia atra Godwin-Austen

1888. *Africarion atra* Godwin-Austen, *Moll. Ind.*, 1 : 244, pl. 57, figs. 1-6.

1908. *Pseudaustenia atra* : Blanford & Godwin-Austen, *Fauna of British India, Mollusca*, (Testacellidae & Zonitidae) p. 207.

Shell very thin, ovate, rather ear-shaped, slightly convex above, concave interiorly, smooth, greenish, the membranaceous epidermis of the shell extends beyond the peristome considerably; whorls 1½, apex almost flat.

Animal long, narrow, shell lobes partly covering the shell, dorsal surface of foot behind the shell flattened and divided anteriorly into two distinct lappets, on both sides of the shell.

Distribution : India : South Indian Hill (Kerala, Tamil Nadu).

Measurements (in mm) :

	Length	Diameter
Shell	7.70	5.00
Animal (Preserved)	31.30	5.50

Status : Not common.

Pseudaustenia auriformis (Blanford)

1866. *Vitrina auriformis* Blanford, *J. Asiat. Soc. Beng.*, 2 : 36.

1908. *Pseudaustenia auriformis*: Blanford & Godwin-Austen, *Fauna of British India, Mollusca*, (Testacellidae & Zonitidae) p. 209.

Shell differs in being slightly thicker and more oblong, covered by a straw coloured epidermis. Animal smaller.

Distribution : India : South Indian Hills (Tamil Nadu).

Measurements (in mm) :

	Length	Diameter
Shell	8.00 - 13.40	5.20 - 7.80
Animal	18.60	5.30

Status : Not common.

Subfamily SESARINAE

Number of Indian genera : Seven.

Genus *Sesara* Albers, 1880

1860. *Sesara* Albers, *Heliceen*, ed. 2, p. 91.

Number of Indian species : Six.

Distribution : India : Arunachal Pradesh, Assam, Meghalaya, Mizoram, Nagaland (On hills, 4000 ft).

Elsewhere : Bangladesh, Myanmar, Thailand.

Size Range (Indian species) : 5.00 - 17.50 mm in diameter.

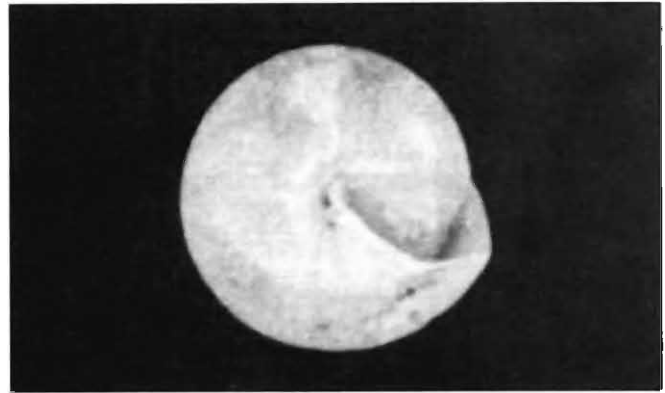
Sesara diplodon (Benson)

(168, 169, 170)

1859. *Helix diplodon* Benson, *Ann. Mag. nat. Hist.*, (3)3 : 187.

1908. *Sesara diplodon* : Blanford & Godwin-Austen, *Fauna of British India, Mollusca*, (Testacellidae & Zonitidae) p. 247.

Shell small, trochiform, flattened at base, minutely perforate, pale whitish, very finely decussately sculptured both above and below, spire conoidly raised (varying in height) apex blunt, suture marginate; whorls 7, convex, the last sharply keeled at the periphery, flattened below, slightly impressed around the perforation, longitudinally compressed behind the peristome producing a small hollow ridge; aperture oblique, trapezoid, peristome thin, sharply angulate at the keel and arcuate at the basal ridge, columella minutely thickened and reflected above. Two teeth in the aperture one small conical inside the columellar edge, another larger, curvedly entering inside the basal margin.

168. *Sesara diplodon* (Benson)—dorsal view169. *Sesara diplodon* (Benson)—ventral view170. *Sesara diplodon* (Benson)—lateral view

Distribution : India : Hills of Noth-east India (Arunachal Pradesh, Assam, Meghalaya, Mizoram, Nagaland).

Elsewhere : Bangladesh, Myanmar.

Measurements (in mm):

Height		Diameter		Aperture	
3.65	5.55	5.25	8.10	2.30	2.35

Status : Abundant.

***Sesara galea* (Benson)**
(171, 172, 173)

1859. *Helix galea* Benson, *Ann. Mag. nat. Hist.*, (3)3 : 388.

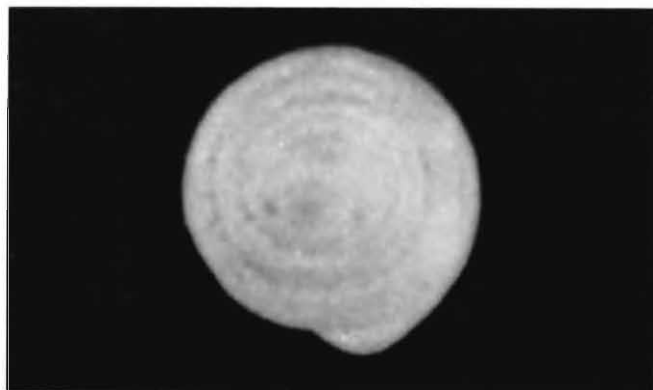
1908. *Sesara galea* : Blanford & Godwin-Austen, *Fauna of British India, Mollusca*, (Testacellidae & Zonitidae) p. 249.

Shell rather small, trochiform, very narrowly perforate, pale whitish, with fine and rather indistinct deccussating sculpture, spire conoid; suture marginate; whorls 7-8, flatly convex, the last sharply keeled at periphery, flattened below, descending a little

near the aperture, basal surface slightly convex behind the aperture; aperture oblique, subquadrate, peristome slightly thickened, angulate at the periphery, columellar margin obliquely curved, no tooth in the aperture.

Differs in having a broader and toothless aperture and also a descending last whorl.

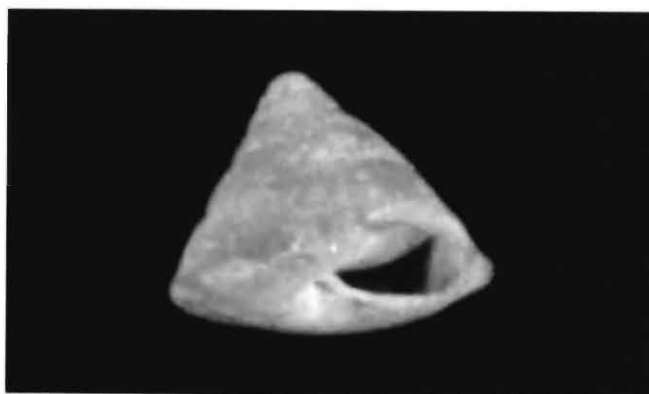
Distribution : India : Meghalaya, Nagaland.



171. *Sesara galea* (Benson)—dorsal view



172. *Sesara galea* (Benson)—lateral view



173. *Sesara galea* (Benson)—lateral view

Measurements (in mm) :

Height		Diameter		Aperture	
5.50	6.00	7.10	7.35	2.35	2.70

Status : Rare.

Genus *Kaliella* Blanford, 1863

1863. *Kaliella* Blanford, *Ann. Mag. nat. Hist.*, (3)11 : 83.

Number of Indian species : Thirty.

Distribution : India : Throughout (Mostly on hills, upto 9000 ft.. Some collected from large trees).

Elsewhere : Bangladesh, Bhutan, Malagasy, Maldives, Myanmar, Pakistan, Sri Lanka.

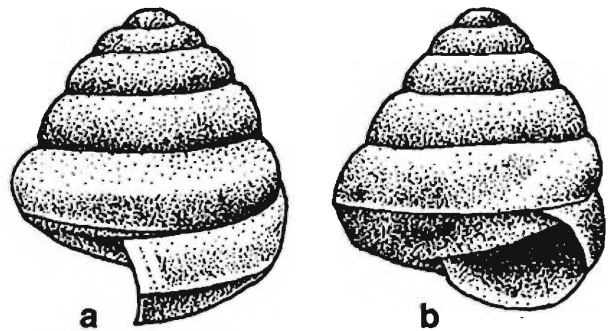
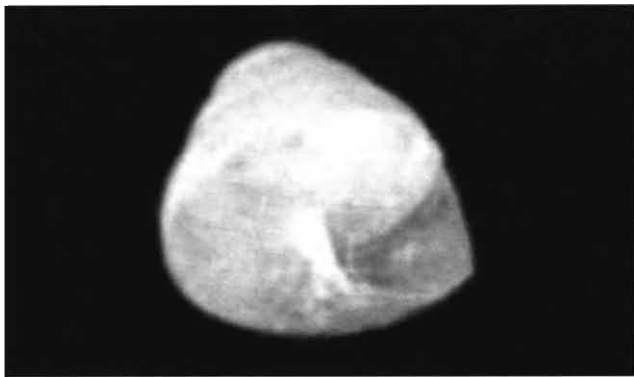
Size Range (Indian species) : 1.50 4.30 mm in height.

***Kaliella barrakporensis* (Pfeiffer)**
(174, Fig. 49)

1852. *Helix barrakporensis* Pfeiffer, *Proc. zool. Soc. Lond.*, 1852 : 156.

1908. *Kaliella barrakporensis*: Blanford & Godwin-Austen, *Fauna of British India, Mollusca*, (Testacellidae & Zonitidae) p.258.

Shell small pyramidally trochiform, very narrowly perforate, brownish, strongly obliquely ribbed above, closely spirally striate below; suture deeply impressed; whorls 6, slightly convex, last whorl keeled at periphery, convex below; aperture oblique, subquadrately lunate, peristome simple, thin, columellar margin oblique, reflected.



174. *Kaliella barrakporensis* (Pfeiffer)—lateral view

Fig. 49. *Kaliella barrakporensis* a. dorsal view; b. ventral view.

Distribution : India : Widely distributed from Kashmir to Kanya Kumari.

Elsewhere : Bangladesh, Malagasy, Myanmar, Pakistan, Sri Lanka.

Measurements (in mm) :

Height		Diameter		Aperture	
2.40	3.60	2.50	3.65	1.45	1.60

Status : Abundant.

***Kaliella bullula* (Hutton)**
(Fig. 50)

1838. *Helix bullula* Hutton, *J. Asiat. Soc. Beng.*, 7 : 218.

1908. *Kaliella bullula* : Blanford & Godwin-Austen, *Fauna of British India, Mollusca*, (Testacellidae & Zonitidae) p. 267.

Shell small, globose conoid, narrowly perforate, pale whitish, faintly sculptured by fine oblique ribbings above, smooth or with a few indistinct spiral striae below; apex obtuse; whorls 5, convex, the last bluntly angulate at the periphery, slightly descending in front, convex at the base; aperture subvertical, lunate, peristome simple, columellar margin oblique, reflected.

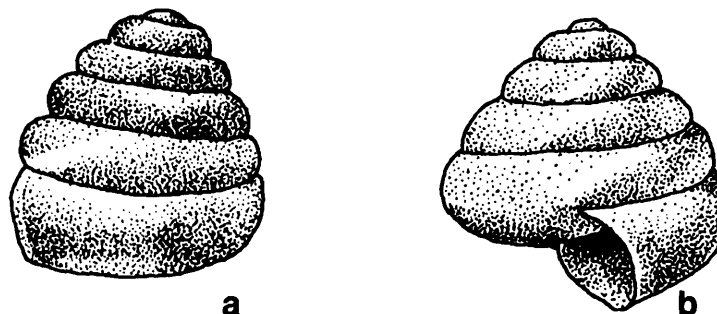


Fig. 50. *Kaliella bullula*, a. dorsal view, b. ventral view

Differs not being keeled at the periphery and also being very faintly ribbed above and almost smooth below. Also differs in the aperture being nearly vertical.

Distribution : India : Western Himalaya (Himachal Pradesh, Uttaranchal).

Measurements (in mm) :

Height	Diameter	Aperture
3.00 3.60	3.40 - 3.90	2.30 - 2.90

Status : Common.

***Kaliella fastigiata* (Hutton)**

(Fig. 51)

1838. *Helix fastigiata* Hutton, *J. Asiat. Soc. Beng.*, **7** : 217.

1908. *Kaliella fastigiata* : Blanford & Godwin-Austen, *Fauna of British India, Mollusca*, (Testacellidae & Zonitidae) p. 263.

Shell small, thin, elongately trochiform, imperforate, pale brownish, very subobliquely striate above, smooth below; suture not much deep; whorls 7-8, flatly convex, last whorl keeled at the periphery, rather flattened at the base; aperture vertical, lunate, peristome simple, margins almost parallel, columella vertical, slightly reflected.

Differs being distinctly higher than broad and also imperforate.

Distribution : India : Eastern and Western Himalaya. Arunachal Pradesh, Himachal Pradesh, Nagaland, Sikkim, Uttaranchal and West Bengal (Darjeeling).

Elsewhere : Myanmar. Collected from moist leaves of plants at 5000 - 7000 ft.

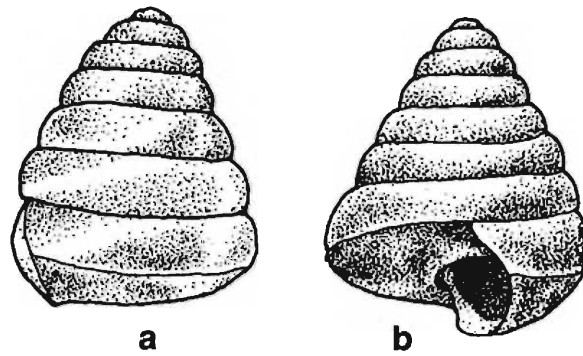


Fig. 51. *Kaliella fastigiata*, a. dorsal view, b. ventral view

Measurements (in mm) :

Height	Diameter	Aperture
2.75 4.30	2.15 3.60	1.40 1.60

Status : Common.

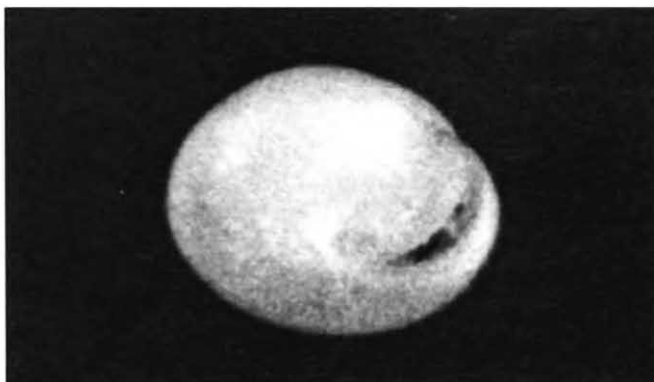
***Kaliella nana* (Hutton)**
(175, Fig. 52)

1838. *Helix nana* Hutton, *J. Asiat. Soc. Beng.*, 7 : 218.

1908. *Kaliella nana* : Blanford & Godwin-Austen, *Fauna of British India, Mollusca*, (Testacellidae & Zonitidae) p. 266.

Shell very small, globosely conoid, imperforate or very narrowly perforate, pale brown, almost smooth with very fine oblique ribs above and faint reddish striae at base; suture impressed; whorls 5-6, convex, narrowly wound, last whorl rounded at the periphery, and below; aperture vertical, lunate, peristome simple, columellar margin oblique, reflected.

Nearer to *K. bullala*, but differs in being smaller in size and also being rounded at periphery.



175. *Kaliella nana* (Hutton)—lateral view

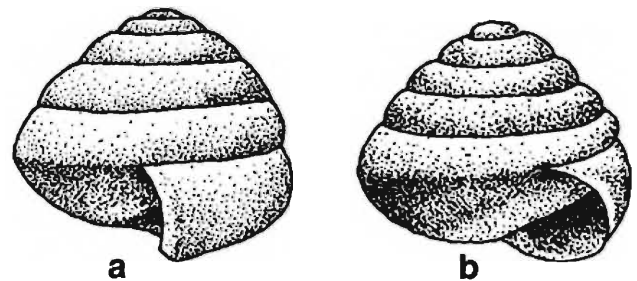


Fig. 52. *Kaliella nana*, a. dorsal view, b. ventral view

Distribution : India : Himachal Pradesh, Sikkim, Uttaranchal and West Bengal (Darjeeling).

Measurements (in mm) :

Height	Diameter	Aperture
1.60-2.50	1.80-2.60	1.00-1.20

Status : Common.

Kaliella ruga Godwin-Austen
(Fig. 53)

1883. *Kaliella ruga* Godwin-Austen, *Moll. Ind.*, 1 : 70, pl. 15, fig. 4.

1908. *Kaliella ruga* : Blanford & Godwin-Austen, *Fauna of British India, Mollusca*, (Testacellidae & Zonitidae) p. 270.

Shell small, sublenticular (height and depth of shell almost equal), narrowly perforate, brownish, decussately sculptured both above and below; suture deeply impressed; whorls 5, convex, last whorl sharply keeled at the periphery, convexly rounded below; aperture nearly vertical, lunate, peristome thin, columellar margin obliquely rounded, not reflected. A small pit just behind the lower margin of peristome and a corresponding shallow rib inside the aperture, present.

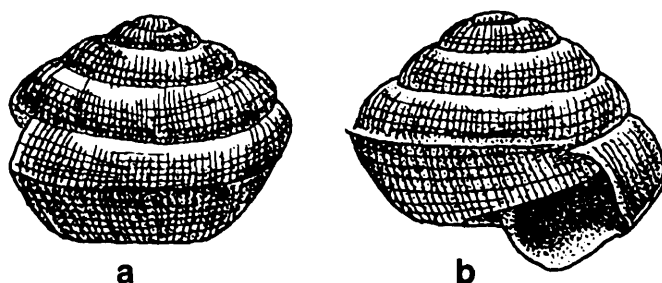


Fig. 53. *Kaliella ruga*, a. dorsal view, b. ventral view.

Differs being lenticular in shape, being decussately sculptured and also being pitted behind the peristome.

Distribution : India : Manipur (9000 ft.), Nagaland.

Measurements (in mm) :

Height	Diameter	Aperture
2.40	3.40	1.85

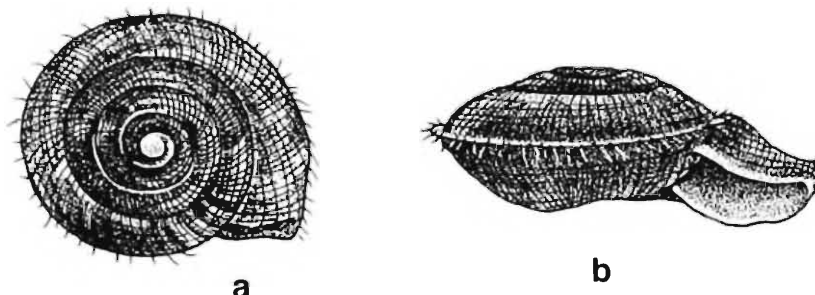
Status : Rare.

Genus *Pseudokaliella* Godwin-Austen, 19111911. *Pseudokaliella* Godwin-Austen, *Land and Freshwater Molluscs of India*, 2 : 296.*Number of Indian species* : Two.*Distribution* : India : Eastern Himalayas.*Size Range (Indian species)* : 4.00 – 17.00 mm in diameter.*Pseudokaliella annandalei* Godwin-Austen

(Fig. 54)

1918. *Pseudokaliella annandalei* Godwin-Austen, *Rec. Indian Mus.*, 8 : 596, pl.52, figs. 5, 5a,5b.

Shell depressedly lenticular, thin, openly umbilicate, spire flatly convex, golden-brownish, decussately sculptured both above and below; whorls 6, flat above, last whorl arcuate near the aperture and sharply keeled at the periphery, the keel fringed with pointed hairs; aperture oblique, widely lunate, peristome thin, upper margin arcuate, lower reflected, columellar margin oblique.

**Fig. 54.** *Pseudokaliella annandalei*, a. apical view, b. ventral view*Distribution* : India : Arunachal Pradesh (Abor Hills).

Measurements (in mm) :

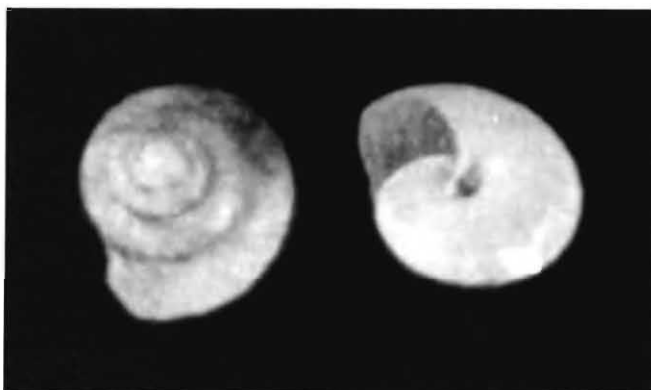
Height	Diameter
4.70	17.00

Status : Rare.*Pseudokaliella nevillei* (Godwin-Austen)

(176)

1883. *Kaliella nevillei* Godwin-Austen, *Moll. Ind.*, 1 : 70, pl.13, fig.6.1908. *Kaliella nevillei*: Blanford & Godwin-Austen, *Fauna of British India, Mollusca*, (Testacellidae & Zonitidae) p.274.

Shell thin, small, depressedly conoid, openly perforate, pale brownish, roughly sculptured with raised oblique ridges above, finely radially striate below; spire conoidly raised, apex pointed, suture deep; whorls 4-5, convex, the last with fringe of hairs on the angulate periphery, convex below; aperture oblique, roundly lunate, peristome simple, columellar margin sub-vertical, reflected above.



176. *Pseudokaliella nevillei* (Godwin-Austen)—dorsal and ventral view

Differs being smaller in size and lacking the decussating sculpture and also being more conoid in shape.

Distribution : India : Eastern Himalaya (West Bengal:Darjeeling).

Measurements (in mm) :

Height	Diameter	Aperture
2.60 - 4.80	4.40 - 6.75	2.40 - 2.90

Status : Common.

Genus *Rasama* Laidlaw, 1932

1932. *Rasama* Laidlaw, *Conch. London*, **19** (8) : 259.

Number of Indian species : One.

Distribution : India : Arunachal Pradesh: Upper Rotung, Abor Hill.

Elsewhere : Bhutan.

Size Range (Indian species) : 13.00-18.60 mm in diameter.

Rasama kempi (Godwin-Austen) (177, 178)

1914. *Sarama kempi* Godwin-Austen, *Rec. Indian Mus.*, **8** : 362, pl. 23, figs. 6, 7, 8, pl. 24, figs 6-7.

Shell moderately large, thin, depressedly globose, very narrowly perforate, glossy, greenish brown, microscopically sculptured with radial growth striae and very close, wavy spiral markings both above and below; spire low, conoid, apex blunt; whorls 5, convex, the last much wider, rounded at the periphery, and also below; aperture nearly vertical, lunate, peristome thin, columella triangularly reflected at the perforation.



177. *Rasama kempii* (Godwin-Austen)—dorsal view



178. *Rasama kempii* (Godwin-Austen)—ventral view

Distribution : India : Arunachal Pradesh (Abor Hill, 2000 ft.).

Measurements (in mm) :

Height	Diameter		Aperture	
6.55 - 9.85	13.60	18.65	6.00	8.00

Status : Common.

Genus *Rahula* Godwin-Austen, 1907

1907. *Rahula* Godwin-Austen, *Moll. Ind.*, 2 : 216.

Number of Indian species : Eleven.

Distribution : India : Arunachal Pradesh, Manipur, Meghalaya, Nagaland, Sikkim, West Bengal (Darjeeling) (On hills, 6500 ft).

Size Range (Indian species) : 2.50 5.60 mm in height.

Rahula aborensis Godwin-Austen

1918. *Rahula aborensis* Godwin-Austen, *Rec. Indian Mus.*, 8 : 597, text figs. 1 A.B.

Shell small, trochiform, flattened at base, deeply perforate, pale yellowish, strongly sculptured by distant raised ribs above, smooth below; spire conoid, apex blunt; whorls 6, convex, the last sharply keeled at the periphery, flattened below; aperture small,

narrowly quadrate, peristome thin, angulate at outer margin; columellar margin almost vertical.

Distribution : India : Arunachal Pradesh.

Measurements (in mm) :

Height	Diameter
2.50	3.50

Status : Rare.

Rahula bascaudula Godwin-Austen
(179, 180)

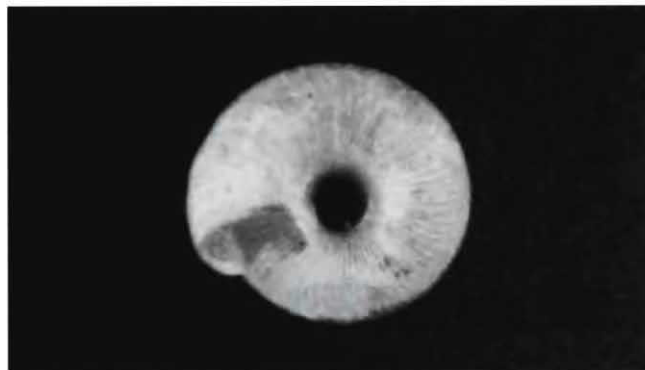
1907. *Rahula bascaudula* Godwin-Austen, *Moll. Ind.*, 2 : 219, pl. 117, fig. 7 (shell).

1908. *Rahula bascaudula* : Blanford & Godwin-Austen, *Fauna of British India, Mollusca*, (Testacellidae & Zonitidae) p. 252.

Shell small, trochiform, flat on base, openly perforate, chestnut brown, spire conoid, apex blunt, closely and finely sculptured with oblique, raised ribs both above and below; suture deep; whorls 6, very little convex, the last sharply keeled at the periphery, flat on base; aperture oblique, quadrate, peristome thin, angulate at outer margin at the peripheral keel, columellar margin nearly straight in adult, reflected and oblique in young.



179. *Rahula bascaudula* Godwin-Austen—dorsal view



180. *Rahula bascaudula* Godwin-Austen—ventral view

Differs being closely sculptured both above and below.

Distribution : India : Sikkim.

Measurements (in mm) :

Height	Diameter	Aperture
2.50 3.80	3.40 4.50	1.60 1.85

Status : Not common.

***Rahula macropleuris* (Benson)**
(181)

1859. *Helix macropleuris* Benson, *Ann. Mag. nat. Hist.*, (3)3 : 265.

1908. *Rahula macropleuris* : Blanford & Godwin-Austen, *Fauna of British India, Mollusca*, (Testacellidae & Zonitidae) p. 249.

Shell small, elongately trochiform, flat on base, openly perforate, pale whitish to brownish, spire conoidly attenuate, apex bluntly pointed, beautifully sculptured with very fine oblique striae and distant arcuate ridge like elevations above, finely, closely striate below; suture deep; whorls 8-9, very little convex, each whorl keeled at suture, the last sharply keeled at periphery, flat on base; angulate around the perforation; aperture oblique, angulate at outer margin, columellar margin oblique, arcuate above, a thin collumellar callus present.



181. *Rahula macropleuris* (Benson)—lateral view

Differs in being elongate, angulate around perforation and also in the columellar margin being oblique.

Distribution : India : Eastern Himalaya (Arunachal Pradesh, West Bengal : Darjeeling).

Measurements (in mm) :

Height		Diameter		Aperture	
4.60	5.60	3.85	4.15	1.50	2.00

Status : Not common.

***Rahula manipurensis* Godwin-Austen**
(182, 183, 184)

1907. *Rahula manipurensis* Godwin-Austen, *Moll. Ind.*, 2 : 220, pl. 117, fig. 4 (shell).

1908. *Rahula manipurensis* : Blanford & Godwin-Austen, *Fauna of British India, Mollusca*, (Testacellidae & Zonitidae) p. 253.

Shell small, globosely conical, deeply perforate, fairly rounded at base, pale whitish or greenish, regularly sculptured with distant oblique raised ribs both above and below; spire conoid, apex blunt; whorls 6, the last keeled at the periphery, rounded below; aperture oblique, subcircular, peristome thickened; columella subvertical, a thin collumellar callus present.



182. *Rahula munipurensis* Godwin-Austen—dorsal view



183. *Rahula munipurensis* Godwin-Austen—ventral view



184. *Rahula munipurensis* Godwin-Austen—lateral view

Nearer to *R. bascaudula*, differs being distantly ribbed and also being rounded at base.

Distribution : India : Manipur, Meghalaya.

Measurements (in mm) :

Length	Diameter	Aperture
3.20	3.50	1.70

Status : Rare.

Genus *Sivella* Blanford, 1883

1863. *Sivella* Blanford, *Ann. Mag. nat. Hist.*, (3)11 : 86.

Number of Indian species : Two.

Distribution : India : Arunachal Pradesh, Assam, Maharashtra, Meghalaya, Mizoram, Nagaland, Sikkim, West Bengal.

Elsewhere : Malaysia, Myanmar, Thailand, Sri Lanka.

Size Range (Indian species) : 3.00 - 12.30 mm in diameter.

***Sivella billeana* (Moerch)**
(185, 186)

1872. *Nanina (Videna) billeana* Moerch, *J. Conchyl.*, 1872 : 310.

1914. *Trochomorpha (Sivella) billeana* : Gude, *Fauna of British India, Mollusca*, 2 : 4.

Shell moderately large, depressed, subdiscoidal, fairly convex at base, rather narrowly umbilicate, brownish, finely obliquely striate above, decussately sculptured below; spire depressedly conoid, apex blunt; whorls 5-6, flat above, slightly excavated along the suture, the last whorl sharply keeled at the periphery, moderately swollen below, angulate around the umbilicus; aperture oblique, subquadrate, peristome sharply arcuate above, obliquely curved below, columellar margin simple, oblique.



185. *Sivella billeana* (Moerch)—dorsal view

186. *Sivella billeana* (Moerch)—ventral view

Differs being more depressed, more convex below and in the umbilicus being narrower.

Remarks : *S. billeana* is one of the very few species of land molluscs (only species under the genus) occurring both on mainland and the Nicobar Islands.

Distribution : India : Maharashtra, Nicobar Islands.

Measurements (in mm) :

Height		Diameter		Aperture	
3.20	5.00	9.90	12.30	2.70	3.85

Status : Common.

Sivella castra (Benson)
(187, 188)

1852. *Helix castra* Benson, *Ann. Mag. nat. Hist.*, (2)10 : 349.

1914. *Trochomorpha (Sivella) castra* : Gude, *Fauna of British India, Mollusca*, 2 : 3.

Shell moderately large, thin, depressedly conoid, openly umbilicate, pale whitish to light brown, conspicuously obliquely striate above, deccussately sculptured below; spire raised, apex obtuse; suture marginate; whorls 5-6, the last sharply keeled at periphery, slightly convex below; aperture oblique, subquadrate, peristome thin; columellar margin oblique, simple.



187. *Sivella castra* (Benson)—dorsal view



188. *Sivella castra* (Benson)—ventral view

Distribution : India : Assam, Arunachal Pradesh, Meghalaya, Mizoram, Sikkim, West Bengal.

Elsewhere : Malaysia, Myanmar, Thailand..

Measurements (in mm) :

Height	Diameter	Aperture
3.80 5.10	9.40 - 12.20	2.85

Status : Abundant.

Genus ***Tadunia*** Godwin-Austen, 1918

1918. *Tadunia* Godwin-Austen, *Rec. Indian Mus.*, 8 : 588.

Number of Indian species : Two.

Distribution : India : Arunachal Pradesh (on hills).

Size Range (Indian species) : 8.00 9.00 mm in diameter.

***Tadunia oakesi* Godwin-Austen**
(Fig. 55)

1918. *Tadunia oakesi* Godwin-Austen, *Rec. Indian Mus.*, 8 : 588, pl. 51, figs. 10, 10a.

Shell of medium size, globosely conoid, very narrowly perforate, rather flat on base, pale brown, very finely spirally striate both above and below, a few of the striae at intervals stronger; spire conoidly raised, suture deep, impressed; whorls 7, narrowly wound, the last angulate at the periphery, flat below; aperture subvertical, semilunate, peristome thin; columellar margin suboblique.

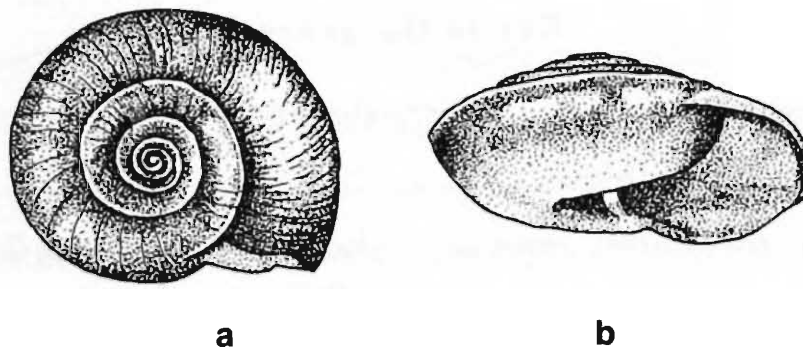


Fig. 55. *Tadunia oakesi*, a. apical view, b. lateral view

Distribution : India : Arunachal Pradesh (Abor Hill).

Measurements (in mm) :

Height	Diameter
5.00	9.00

Status : Rare.

Family ARIOPHANTIDAE

The largest family of Indian land pulmonates, widely varying in shapes and sizes, it includes 22 genera, approximately 230 species under 7 subfamilies.

Shell small to large, dextral or sinistral, thin to fairly thick, narrowly perforate, rarely imperforate, usually depressedly globose, and broader than high, sometimes conoid, a few genera have internal or partly internal shell, usually without strong sculpture; aperture lunate, peristome thin.

Animal with a narrow foot, sole without longitudinal division, caudal gland with an overhanging lobe.

Asia, Africa.

Mostly on ground among litters, some on shrubs and trees, particularly at the time of aestivation.

It includes seven subfamilies.

Reference

- Laidlow, F.F. 1932. Notes of Ariophantidae from the Malay Peninsula, with description of new genera. *Proc. malac. Soc. Lond.*, **20(2)** : 80-94, 9 figs.
- Solem, A. 1966. Some non marine mollusks from Thailand with notes on classification of the Helicarionidae. *Spolia zoologica Musei Hauniensis*, **24** : 1-109.

Key to the genera

1. Shell imperforate, very thin, often membranaceous..... (2)
 Shell perforate, fairly thick (8)
2. Shell shallow, ear shaped, number of whorls not more than 2 *Austenia*
 Shell globose to depressedly globose, number of whorls more than 2 (3)
3. Shell excavated and keeled along the suture *Rotungia*
 Shell with simple suture (4)
4. Shell large, above 30 mm in diameter, globosely inflated..... *Indrella*
 Shell smaller, less than 15 mm in diameter, depressedly globose (5)
5. Last whorl slightly ascending in front *Ibycus*
 Last whorl straight or descending in front (6)
6. Shell membranaceous, whorls less rapidly increasing *Satiella*
 Shell calcareous, whorls more rapidly increasing (7)
7. Shell usually upto 8 mm in diameter, spire slightly elevated *Durgella*
 Shell usually above 8 mm in diameter, spire flattened *Cryptaustenia*
8. Shell sinistral *Ariophanta*
 Shell dextral (9)
9. Shell with a blunt tooth on columella *Rhyssotopsis*
 Shell without tooth on columella (10)
10. Shell subtrochiform to trochiform, nearly as high as broad *Sitala*
 Shell depressed to depressedly globose, distinctly broader than high (11)

11. Columella with a small angular process extending over perforation *Microcystina*
 Columella without any angular process (12)
12. Shell with a deep groove outside the suture along the whorls *Taphrospira*
 Shell without any groove along the suture (13)
13. Shell with only radial sculpture above *Khasiella*
 Shell with both radial and spiral sculpture above (14)
14. Shell usually lenticular, sharply keeled at periphery (15)
 Shell depressedly globose to globose, rounded or angulate at periphery (16)
15. Shell with 6-8 narrowly coiled whorls, sculpture strong *Euplecta*
 Shell with 5-6 widely coiled whorls, sculpture fine *Oxytesta*
16. Peristome distinctly thickened inside, with yellowish white rings (varices) across the whorls *Bensonies*
 Peristome without distinct thickening inside, without rings (varices) across the whorls (17)
17. Shell less depressed, height more than half of diameter (18)
 Shell more depressed, height half or less than half of diameter (19)
18. Shell obliquely grooved, last whorl angulate at periphery, straight in front *Hemiplecta*
 Shell obliquely striate, last whorl rounded and descending in front *Cryptozona*
 (*C. albata* is obliquely grooved but lacks spiral striae,
C. ligulata is angulate at periphery).
19. Whorls rapidly increasing, last whorl equalling or exceeding the rest of the whorls in width (near the aperture) (20)
 Whorls slowly increasing, last whorl not equalling the rest of the whorls in width (21)
20. Spiral sculpture distinct near the suture only *Bapuia*
 Spiral sculpture very fine, but uniform throughout *Staffordia*
21. Whorls narrowly coiled, 7- 8 in number *Syama*
 Whorls widely coiled, 5- 6 in number *Macrochlamys*

Subfamily ARIOPHANTINAE

Number of Indian genera : Six.

Genus *Ariophanta* Desmoulins, 1829

1829. *Ariophanta* Desmoulins, *Bull. Soc. Bordeaux*, 3 : 235.

Number of Indian species : Ten.

Distribution : India : Peninsular region including Orissa and Southern part of West Bengal.

Elsewhere : Bangladesh (One sp.), Sri Lanka.

Endemic to South Asia.

Size Range (Indian species) : 21.00 45.00 mm in diameter.

***Ariophanta bajadera* (Pfeiffer)**

(C44, C45, C46)

1850. *Helix bajadera* Pfeiffer, *Zeitschr. Mal.*, 1850 : 69.

1908. *Ariophanta bajadera* : Blanford and Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 31.



C44. *Ariophanta bajadera* (Pfeiffer)—dorsal view



C45. *Ariophanta bajadera* (Pfeiffer)—lateral view



C46. *Ariophanta bajadera* (Pfeiffer)—lateral view

Shell moderately large, globosely turbinate, sinistral, greenish brown, thin, very narrowly perforate, coarsely, obliquely ribbed above, smoother below, apex obtuse; suture deep; whorls 4-5, rounded, the last swollen and well rounded, (young shells are angulate at the periphery) slightly descending in front; aperture oblique, roundly lunate, peristome thin and simple, columella briefly reflected above.

Remarks : Subsists on leaves of one or two selected shrubs (Blanford & Godwin-Austen, 1908).

Distribution : India : Goa, Maharashtra; common on Western Ghats (W. India).

Measurements (in mm) :

Height		Diameter		Aperture	
18.20	22.15	21.10	24.35	11.95	15.40

Status : Common.

***Ariophanta kadapaensis* Nevill**
(C47, C48)

1878. *Nanina (Ariophanta) kadapaensis* Nevill, *Hand List. Moll. Indian Mus.*, 1878 : 19.

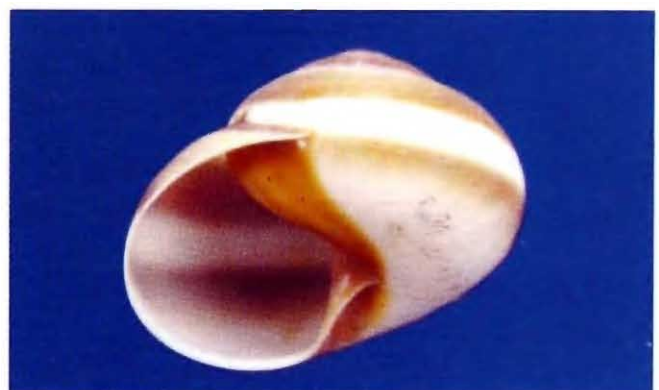
1908. *Ariophanta kadapaensis* : Blanford and Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 30.

Shell large, globose, sinistral, narrowly perforate, thick, deep chocolate with a white spiral band running close to the suture and also a broader one on the periphery, white on base, chocolate near the perforation and also on the inner wall of aperture, decussately sculptured both above and below; whorls 5-6, rounded, the last large and inflated, swollen below, descending near the aperture which is oblique and roundly lunate, columella slightly thickened and reflected above.

Differs by having broad white bands.



C47. *Ariophanta kadapaensis* Nevill—lateral view



C48. *Ariophanta kadapaensis* Nevill—lateral view

Distribution : India : Andhra Pradesh.

Measurements (in mm) :

Height		Diameter		Aperture	
24.30	29.00	31.00	40.20	20.85	23.20

Status : Common.

Ariophanta interrupta (Benson)
(C49, C50)

1834. *Helix interrupta* Benson, *Proc. zool. Soc. Lond.*, 1834 : 90.

1908. *Ariophanta interrupta* : Blanford and Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 31.

Shell large, rather depressedly globose, sinistral, thin, perforate, brownish, slightly darker just below the periphery and becoming lighter again on base, coarsely marked by raised oblique lines and decussating spiral striae above, smoother beneath; whorls 4-5, convex, the last subangulate at the periphery rounded below; aperture oblique, widely lunate, peristome thin, columella reflected at the perforation.



C49. *Ariophanta interrupta* (Benson)–lateral view



C50. *Ariophanta interrupta* (Benson)–lateral view

Distinct for its rather depressedly globose form and uniform brownish colouration.

Distribution : India : Andhra Pradesh, Jharkhand, Orissa, West Bengal.

Elswhere : Bangladesh.

Measurements (in mm) :

Height		Diameter		Aperture	
14.30	21.80	23.10	33.50	13.00 - 15.60	

Status : Abundant.

***Ariophanta laidlayana* (Benson)**
(C51, C52, C53)

1856. *Helix laidlayana* Benson, *Anim. Mag. nat. Hist.*, (2)18 : 253.

1908. *Ariophanta laidlayana* : Blanford and Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 30.

Shell very similar to *A. laevipes*, differs being less depressed and also in colour pattern which is variable, the brown band close to the suture is usually absent. White shells without bands are also present. Also differs in having chocolate patches near the perforation and also on the inner wall of the aperture.



C51. *Ariophanta laidlayana* (Benson)—dorsal view



C52. *Ariophanta laidlayana* (Benson)—lateral view



C53. *Ariophanta laidlayana* (Benson)—lateral view

Distribution : India : Andhra Pradesh, Bihar, Orissa, West Bengal.

Measurements (in mm) :

Height	Diameter	Aperture
14.40 16.60	21.90 27.00	12.70 13.40

Status : Common.

***Ariophanta laevipes* (Mueller)**
(C54, C55)

1856. *Helix laevipes* Mueller, *Hist. Ver.*, 2 : 22.

1908. *Ariophanta laevipes* : Blanford and Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 29.

Shell depressedly globose, sinistral, moderately thick, narrowly perforate, pale white with three chocolate spiral bands, minutely decussately sculptured above, smoother below; spire low, depressedly conoid; whorls 5, very little convex, the last subangulate, becoming rounded near the aperture and also descending, convex below; aperture oblique, lunate, peristome thin.



C54. *Ariophanta laevipes* (Mueller)–dorsal view

C55. *Ariophanta laevipes* (Mueller)–lateral view

Differs in being depressedly globose and also having different colour pattern.

Distribution : India : Andhra Pradesh, Gujarat, Maharashtra; common in gardens.

Measurements (in mm) :

Height	Diameter	Aperture
10.70 17.75	18.45 - 29.70	10.00 13.15

Status : Common.

***Ariophanta thyreus* (Benson)**
(C56, C57)

1852. *Helix thyreus* Benson, *Anim. Mag. nat. Hist.*, (2)9 : 405.

1908. *Ariophanta thyreus* : Blanford and Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 34.

Shell large, depressedly globose, thick, openly perforate, yellowish brown with narrow dark band below the periphery; decussately sculptured above; spire depressedly



C56. *Ariophanta thyreus* (Benson)—dorsal view **C57.** *Ariophanta thyreus* (Benson)—ventral view

conoid, whorls 5- 5½, convex, the last roundly inflated (subangulate in young shells), swollen below; aperture oblique, lunate, peristome thickened, columella blunt not reflected.

Distinct for its yellowish brown colouration, thickened peristome and widely open perforation.

Distribution : India : South Indian Hills : Karnataka, Tamil Nadu.

Measurements (in mm) :

Height		Diameter		Aperture	
16.70	20.00	29.75	37.10	11.85	16.40

Status : Common.

Genus *Cryptozona* Moerch, 1872

1872. *Cryptozona* Moerch, *Jour. De Conch.*, **20** : 334.

Number of Indian species : Twelve.

Distribution : India : Peninsular region (upto 7000 ft.), one species extending to Gangetic plains of Bihar and West Bengal.

Elsewhere : Sri Lanka, Singapore, Thailand.

Size Range (Indian species) : 19.00 50.00 mm in diameter.

Cryptozona albata (Blanford) (189, 190)

1880. *Xestina albata* Blanford, *J. Asiat. Soc. Beng.*, **2** : 189.

1908. *Cryptozona albata* : Blanford and Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 37.

Shell moderately large, dextral, rather depressedly globose, fairly thick, perforate, pale white, coarsely sculptured by oblique, impressed grooves; spire low, convex; whorls 5-6, rounded, the last well rounded, swollen below; aperture oblique, lunate, peristome slightly thickened, columella thickened and reflected.



189. *Cryptozона albata* (Blanford)—dorsal view

190. *Cryptozона albata* (Blanford)—ventral view

Distinct for its coarse sculpture.

Distribution : India : South Indian Hills.

Measurements (in mm) :

Height		Diameter		Aperture
21.75	23.65	30.70	32.60	15.50 - 17.25

Status : Rare.

***Cryptozона basilessa* (Benson)**
(C58, C59)

1856. *Helix basilessa* Benson, *Anim. Mag. nat. Hist.*, (3)15 : 11.

1908. *Cryptozона basilessa* : Blanford and Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 40.

Shell large, depressed, very thick, perforate, whitish to purplish with a narrow white band above the periphery; granulosely sculptured by oblique striae and close, fine spiral markings; spire slightly raised; apex flat; whorls 4½, upper whorl nearly flat, the last convex and rather rounded below, very slightly descending in front; aperture oblique, ovately lunate, peristome thickened, columella angulately pointed at the perforation, basal margin nearly horizontal, a thin columellar callus present in matured shells.

Distinct for its thickness and narrow white band above the periphery.

Distribution : India : Western Ghats (5000 - 7000 ft.).



C58. *Cryptozona basilessa* (Benson)—dorsal view



C59. *Cryptozona basilessa* (Benson)—ventral view

Measurements (in mm) :

Height		Diameter		Aperture	
26.50	27.00	46.15	49.20	19.20	19.75

Status : Not common.

***Cryptozona bistrialis* (Beck)**
(C60, C61)

1837. *Nanina bistrialis* Beck, *Ind. Moll.*, 1 : 2.

1908. *Cryptozona bistrialis* : Blanford and Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 39.



C60. *Cryptozona bistrialis* (Beck)—lateral view



C61. *Cryptozona bistrialis* (Beck)—lateral view

Shell subglobose depressed, perforate, thin, pale whitish to brownish with two narrow chocolate bands around, area between the two bands white, sometimes with a single band, rarely without; decussately sculptured both above and below; spire low; whorls $4\frac{1}{2}$, very little convex, the last large, rounded above and below; aperture oblique, widely lunate, peristome thin, columellar margin slightly reflected.

Distinct for its two brown encircling lines.

Distribution : India : Andhra Pradesh, Orissa, Tamil Nadu.

Elsewhere : Sri Lanka.

Measurements (in mm) :

Height		Diameter		Aperture	
13.00	19.25	22.10	30.50	10.85	15.20

Status : Common.

***Cryptozonia ligulata* (Ferrussac)**
(C62, C63, C64)

1819-21. *Helix ligulata* Ferrussac, *Hist. Nat.*, pl. 31, fig. 2.

1908. *Cryptozonia ligulata* : Blanford and Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 38.

Shell depressedly globose, thick, narrowly perforate, whitish with brown bands running along the suture and also above the periphery; finely sculptured with close,



C62. *Cryptozonia ligulata* (Ferrussac)–dorsal view



C63. *Cryptozonia ligulata* (Ferrussac)–lateral view



C64. *Cryptozonia ligulata* (Ferrussac)–lateral view

C65. *Cryptozonia sisparica* (Blanford)—lateral viewC66. *Cryptozonia sisparica* (Blanford)—lateral view

oblique striae, decussated by impressed spiral lines; spire conoidly raised, apex obtuse; whorls 6- 6½, little convex, the last subangulate at the periphery, rounded below, slightly descending in front; aperture oblique, lunate, peristome very slightly thickened, columellar margin reflected, basal margin nearly horizontal.

Distinct for its brown bands, shows variations in the height of shell.

Distribution : India : Andhra Pradesh, Jharkhand, Orissa, Tamil Nadu, West Bengal.

Measurements (in mm) :

Height		Diameter		Aperture	
17.40	22.00	19.80	26.80	10.80	12.65

Status : Abundant.

***Cryptozonia maderaspatana* (Gray)**
(C67)

1834. *Helix maderaspatana* Gray, *Proc. zool. Soc. Lond.*, 1834 : 67.

1908. *Cryptozonia maderaspatana* : Blanford and Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 45.

Shell depressedly globose, thin, perforate, roughly marked by oblique, raised striae; light brownish above the periphery with pale whitish margin on the inner side of each whorl, usually pale whitish below, commonly with a whitish band round the periphery, uniformly brown coloured shells with the peripheral band are also rarely found; whorls 5- 6, convex, the last rounded above and below, descending near the aperture; aperture oblique, lunate, peristome simple, thin, columellar margin reflected.

Differs from others by its colouration.

Distribution : India : South Indian Hills, from 1500 ft. to 6000 ft.



C67. *Cryptozона maderaspatana* (Gray)–lateral view

Measurements (in mm) :

Height		Diameter		Aperture
16.70	19.25	22.75	29.35	12.20 - 14.15

Status : Abundant.

***Cryptozона semirugata* (Beck)**
(C68, C69)

1837. *Galaxis semirugata* Beck, *Ind.* 1837 : 42.

1908. *Ariophanta semirugata* : Blanford and Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 35.

Shell large, globose to globose conoid, thick, narrowly perforate, purplish to whitish, light purple above and white below in fresh condition, finely decussately sculptured above, smoother below; spire conoid; whorls 5- 6, convex, the last large and inflated equalling $\frac{2}{3}$ rd of total height, often descending in front; aperture oblique, roundly lunate, peristome thin, columella reflected above.

Distinct for its globose inflated shell, shows variation in height of spire.



C68. *Cryptozона semirugata* (Beck)–lateral view



C69. *Cryptozона semirugata* (Beck)–lateral view

Distribution : India : Peninsular part of the country, from Gujarat southwards.

Elsewhere : Sri Lanka.

Measurements (in mm) :

Height		Diameter		Aperture	
22.00	34.45	26.20	38.05	15.60	23.80

Status : Common.

Genus *Euplecta* Semper, 1870

1870. *Euplecta* Semper, *Reise Phil Wiss. Res.*, 3 : 14.

Number of Indian species : Sixteen.

Distribution : India: Confined to Peninsular region, reaching upto Orissa (6000 ft.).

Elsewhere : Sri Lanka.

Endemic to South Asia.

Size Range (Indian species) : 7.00 35.00 mm in diameter.

Euplecta cacuminifera (Benson)
(191, 192)

1850. *Helix cacuminifera* Benson, *Ann. Mag. nat. Hist.*, (2) : 5.

1908. *Euplecta cacuminifera* : Blanford and Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 68.

Shell trochiform-conical, thin, very narrowly perforate, whitish, with a yellowish epidermis finely granulately sculptured above with spiral rows of granules arranged on oblique striae; spire conically raised, apex arcuate; whorls 8, flatly convex, the last sharply keeled at the periphery and compressed below the keel, fairly convex at base;



191. *Euplecta cacuminifera* (Benson)—dorsal view



192. *Euplecta cacuminifera* (Benson)—ventral view

aperture slightly oblique, angularly lunate, peristome simple, thin, columellar margin obliquely descending, briefly reflected at the perforation.

Distinct for its conical shape and granular sculpture.

Distribution : India : South Indian Hills: Kerala, Tamil Nadu.

Measurements (in mm) :

Height		Diameter		Aperture	
9.65	11.35	11.60	12.70	5.20	5.80

Status : Not common.

Euplecta indica (Pfeiffer)
(193, 194)

1846. *Helix indica* Pfeiffer, *Symb.*, 3 : 66.

1908. *Euplecta indica* : Blanford and Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 60.

Shell moderately large, thick, perforate, subturbinate, lenticular, straw coloured, coarsely sculptured above with arcuate raised lines and impressed spiral lines giving the surface a granular appearance, radiately striate below; spire conoid, whorls 5- 6, rounded, the last keeled at the periphery, swollen at base; aperture oblique, angularly lunate, peristome slightly thickened, columellar margin obliquely curved, reflected at the perforation.

Distribution : India : Western Ghats, Karnataka, Kerala, Tamil Nadu.

Elsewhere : Sri Lanka, Maldives.

Measurements (in mm) :

Height		Diameter		Aperture	
13.40	19.40	22.15	29.80	10.50	13.45

Status : Abundant.



193. *Euplecta indica* (Pfeiffer)—dorsal view



194. *Euplecta indica* (Pfeiffer)—ventral view

Euplecta subdecussata (Pfeiffer)
(195)

1859. *Nanina subdecussata* Pfeiffer, *Proc. zool. Soc. Lond.*, 1857 : 107.

1908. *Euplecta subdecussata* : Blanford and Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 55.

Shell rather small, depressedly globose, narrowly perforate, thin, greenish white; obliquely striate, some of the striae thicker, decussated by faint spiral lines above; spire low, conical, whorls 6, slightly convex, the last subangulate at the periphery, convex at base; aperture oblique, widely lunate, peristome simple, thin, columellar margin subvertical, reflected above.



195. *Euplecta subdecussata* (Pfeiffer)—dorsal and ventral view

Differs not being keeled at periphery and also columella being subvertical.

Distribution : India : Maharashtra, Orissa, Tamil Nadu.

Measurements (in mm) :

Height		Diameter		Aperture	
9.40	9.70	12.80	15.40	6.75	7.55

Status : Abundant.

Euplecta subcastor (Beddome)
(C70, C71)

1891. *Nanina subcastor* Beddome, *Proc. zool. Soc. Lond.*, 1891 : 313.

1908. *Euplecta subcastor* : Blanford and Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 58.

Shell large, lenticular, perforate, fairly thick, light brownish, sculptured by very distinct close oblique striae and faint decussating spiral lines, both above and below;



C70. *Euplecta subcastor* (Beddome)—lateral view



C71. *Euplecta subcastor* (Beddome)—lateral view

spire conoidly raised, apex obtuse; whorls 6-7, nearly flat above, the last sharply keeled, rounded below; aperture oblique, angularly lunate, peristome white, slightly thickened, columellar margin obliquely descending, reflected above.

Near to *E. indica* differing in flatness of whorls above and also in sculpture.

Distribution : India : Kerala, on hills, 2500 ft.

Measurements (in mm) :

Height		Diameter		Aperture	
10.00	16.10	19.40	31.20	8.10	13.15

Status : Common.

***Euplecta travancorica* (Benson)**
(C72, C73)

1865. *Helix travancorica* Benson, *Ann. Mag. nat. Hist.*, (3)15 : 13.

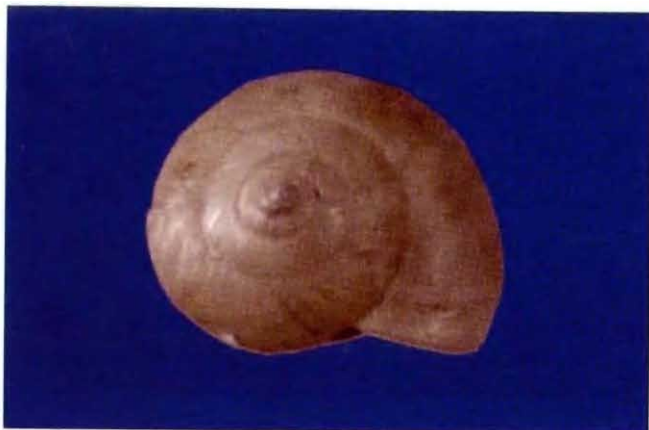
1908. *Euplecta travancorica* : Blanford and Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 59.

Shell large, turbinately depressed, sublenticular, rather thin, perforate, pale whitish to light brownish, finely sculptured with oblique striation and spirally arranged granules above, weakly sculptured below; spire depressedly raised with concave sides, apex acute, whorls 6, little convex, the last sharply keeled at the periphery, swollen below; aperture oblique, roundly lunate angulate at the keel, peristome thin, columellar margin obliquely curved, slightly reflected above.

Differs from others by having spire with concave sides.

Distribution : India : Kerala, on hills.

Elsewhere : Sri Lanka.



C72. *Euplecta travancorica* (Benson)—dorsal view



C73. *Euplecta travancorica* (Benson)—ventral view

Measurements (in mm) :

Height		Diameter		Aperture	
14.15	21.85	24.85	32.85	9.70	16.60

Status : Rare.

Genus *Hemiplecta* Albers, 1850

1850. *Hemiplecta* Albers, *Heliceen*, p. 60.

Number of Indian species : Two.

Distribution : India : Kerala, Tamil Nadu (Teak forest of Anaimalai, 2000–3000 ft).

Elsewhere : Malaysia, Moluccas, Myanmar, Thailand, Sri Lanka, Sunda Island, Vietnam.

Size Range (Indian species) : 29.00–70.00 mm in diameter.

Hemiplecta basileus (Benson) (C74, C75)

1861. *Helix basileus* Benson, *Ann. Mag. nat. Hist.*, (3)7 : 81.

1908. *Ariophanta basileus* : Blanford and Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 41.

Shell large to very large (largest among Indian land snails, in diameter), openly perforate, fairly thick, conoidly depressed, brownish yellow, pinkish towards apex, a broad dark brown band below the periphery; sculptured with oblique striae and shallow grooves, decussated by very fine spiral lines both above and below; spire conoidly raised, apex flatly obtuse, suture superficial; whorls 5-6, almost flat above, the last angulate at the periphery (sharply keeled in young shells); aperture oblique, widely lunate, peristome thin, straight above, deep purple inside the aperture.



C74. *Hemiplecta basileus* (Benson)—lateral view



C75. *Hemiplecta basileus* (Benson)—lateral view

Distinct for its large size and colouration.

Distribution : India : Kerala, Tamil Nadu (Teak forest, 2000–3000 ft.).

Measurements (in mm) :

Height		Diameter		Aperture	
21.80	41.35	38.60	66.60	16.15	29.70

Status : Common.

***Hemiplecta textrina* (Benson)**
(196, 197)

1866. *Helix textrina* Benson, *Ann. Mag. nat. Hist.*, (2)18 : 252.

1908. *Hemiplecta textrina* : Blanford and Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 292.

Shell smaller, depressedly conoid, very narrowly perforate, rather thin, pale brownish, marked with close oblique striae and very fine spiral lines above, smoother below; spire depressedly conoid; whorls 6-7, fairly rounded, the last subangulate at



196. *Hemiplecta textrina* (Benson)—dorsal view



197. *Hemiplecta textrina* (Benson)—ventral view

the periphery, peristome slightly thickened, opaque whitish inside the aperture, columella oblique, slightly reflected above, basal margin almost straight.

Differs being smaller in size, also in sculpture and colouration. The other species *H. beddomei* Blanford is very similar to *H. basileus* differing in being smaller and thinner.

Distribution : India : Kerala, on hills, 2500 ft.

Measurements (in mm) :

Height	Diameter	Aperture
17.70	29.65	12.30

Status : Rare.

Genus *Indrella* Godwin-Austen, 1901

1901. *Indrella* Godwin-Austen, *Proc. malac. Soc. Lond.*, 4 : 187.

Number of Indian species : One.

Distribution : India : Slopes of Wynaad, Nilgiri and Anaimalai ranges (3000 ft.).

Endemic monotypic genus.

Size Range : 38.00 57.00 mm in diameter.

Indrella ampulla (Benson) (C76, C77)

1850. *Helix ampulla* Benson, *Ann. Mag. nat. Hist.*, (2)5 : 213.

1908. *Indrella ampulla* : Blanford and Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 49.

Shell large, obliquely ovate and globose, imperforate, very thin, brownish, varying between light and dark with some dark patches on the base of umbilical region;



C76. *Indrella ampulla* (Benson)—dorsal view

C77. *Indrella ampulla* (Benson)—ventral view

marked by oblique raised ridges and impressed spiral lines, besides, the last whorl is also crowded by a numerous irregular furrows; whorls $3\frac{1}{2}$, rounded and very rapidly increasing, the last large and globose, rounded at periphery and beneath, slightly descending in front; aperture very large, oblique, ovately rounded, peristome very thin, almost membranaceous, arcuate, columella subvertical, deeply curved inside above.

Feeds on large fungi.

Distribution : India : Western Ghat : Kerala, Tamil Nadu at 3000 ft.

Measurements (in mm):

Height		Diameter		Aperture	
26.00	43.50	38.80	57.10	25.15	35.80

Genus *Rhyssotopsis* Ancey, 1888

1888. *Rhyssotopsis* Ancey, *Conch. Exch.*, i : 64.

Number of Indian species : One.

Distribution : India : Andaman Islands.

Endemic monotypic genus.

Size Range : 30.00 35.00 mm in diameter.

Rhyssotopsis conferta (Pfeiffer)
(C78, C79)

1856. *Helix conferta* Pfeiffer, *Proc. zool. Soc. Lond.*, 1856 : 328.

1908. *Haughtonia conferta* : Blanford and Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 295.



C78. *Rhyssotopsis conferta* (Pfeiffer)–dorsal view



C79. *Rhyssotopsis conferta* (Pfeiffer)–ventral view

Shell large, thick, rather depressedly conoid, perforate, yellowish brown, uniformly sculptured with regular oblique striae and close, fine spiral lines, both above and below; spire elevated, apex globosely obtuse; whorls 5, not much convex, the last rather flat above; angulate at the periphery, convex beneath, compressed around the perforation slightly descending in front; aperture oblique, subquadrangular, peristome slightly thickened inside, columella oblique, thickened, reflected above and with a blunt tooth like elevation below; columella simple, thin and vertical in immature shells.

Distribution : India : Andaman Islands, Mount Harriett on ground.

Measurements (in mm) :

Height		Diameter		Aperture	
16.40	22.65	22.90	35.10	13.90	16.85

Status : Abundant.

Subfamily DYAKIINAE

Number of Indian genus : One.

Genus *Staffordia* Godwin-Austen, 1907

1907. *Staffordia* Godwin-Austen, *Moll. Index*, **2** : 184.

Number of Indian species : Three.

Distribution : India : Arunachal Pradesh (Dafla Hill, 7000 ft).

Endemic to India.

Size Range : 9.00 17.00 mm in diameter.

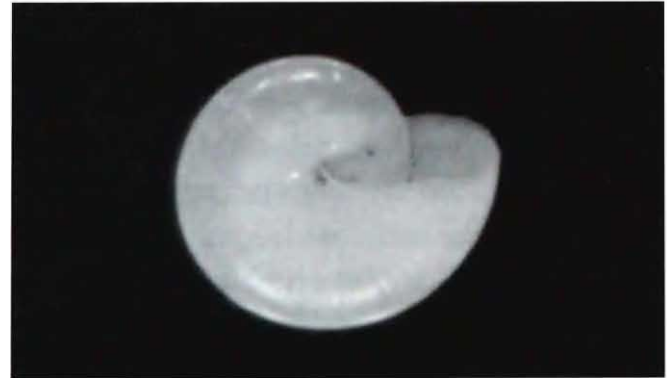
Staffordia daflaensis Godwin-Austen (198, 199)

1883. *Macrochlamys daflaensis* Godwin-Austen, *Moll. India*, **1** : pl. 21, fig.6.

1907. *Staffordia daflaensis* Godwin-Austen, *Moll. India*, **2** : 185, pl. f13, figs. 1-12.

1908. *Staffordia daflaensis* : Blanford and Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 296.

Shell depressedly conoid, perforate, fairly thick, yellowish white with a greenish tint, sculptured with rather broad oblique markings and fine close spiral lines; spire very low, scarcely raised; whorls 6, very little convex, rapidly increasing in width, the last bluntly subangulate, slightly convex below; aperture subvertical, ovately lunate, peristome thin, slightly arcuate above, columella oblique, slightly reflected.



198. *Staffordia daflaensis* Godwin-Austen—
dorsal view

199. *Staffordia daflaensis* Godwin-Austen—
ventral view

Distribution : India : Arunachal Pradesh, Dafla Hills, 7000 ft.

Measurements (in mm) :

Height		Diameter		Aperture	
5.00	8.10	9.50	16.50	4.55	6.70

Status : Common.

Subfamily GIRASIINAE

Number of Indian genera : Seven.

Genus *Austenia* Nevill, 1878

1878. *Austenia* Nevill, *Hand list. Moll. Indian Mus.*, 1 : 16.

Number of Indian species : Nine.

Distribution : India : Arunachal Pradesh, Assam, Meghalaya, Mizoram, Nagaland, Sikkim, West Bengal (Darjeeling), Eastern Himalaya (9500 ft.).

Elsewhere : China, Myanmar, Thailand.

Size Range (Indian species) : 6.00 30.00 mm in diameter.

Austenia alba Godwin-Austen (200, 201)

1916. *Austenia alba* Godwin-Austen, *Rec. Indian Mus.*, 8 : 549, text fig. 1.

Shell small, ovate, thick, shallow, narrower above, gradually broadening downwards, white, marked by close radial striae and concentric line of growth; number of whorl one, elongately oval, apex small, globose, lateral, not projecting beyond peristome; aperture elongate, right margin of peristome straight, columella slightly sinuate.



200. *Austenia alba* Godwin-Austen—dorsal view **201.** *Austenia alba* Godwin-Austen—ventral view

Distinct for its size, white colour and radial striae.

Distribution : India : Arunachal Pradesh (Abor Hill, 1300 ft.).

Measurements (in mm) :

Height		Diameter	
1.80	2.10	6.60	7.50

Status : Rare.

Austenia cacharica (Godwin-Austen)
(202, 203)

1888. *Girasia cacharica* Godwin-Austen, *Moll. Ind.*, 1 : 240, pl. 59, fig. 4, 4a.

1908. *Austenia cacharica* : Blanford and Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 196.



202. *Austenia cacharica* (Godwin-Austen)—dorsal view **203.** *Austenia cacharica* (Godwin-Austen)—ventral view

Shell fairly large and thick, shallow, ear-shaped, smooth and shining, pale olive colour, marked by close curved striae; whorls 1½, spire not projecting beyond the peristome, apex small, whitish, not raised, last whorl very large occupying 90% of the total shell size; aperture large, wide, peristome thin, columella sinuate.

Differs from *A. alba* in being larger, olive in colour and also by lacking the radial striae.

Distribution : India : Assam, Mizoram, Nagaland.

Measurements (in mm) :

Height	Diameter
4.60	12.00

Status : Not common.

***Austenia gigas* (Benson)**
(204, 205)

1836. *Vitrina gigas* Benson, *J. Asiat. Soc. Beng.*, 5 : 350.

1908. *Austenia gigas* : Blanford and Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 192.



204. *Austenia gigas* (Benson)—dorsal view

205. *Austenia gigas* (Benson)—ventral view

Shell large, (largest among Indian species), rather thick shallow, depressedly ovate, yellowish, faintly striate, number of whorl 2, very rapidly increasing, spire projecting beyond the peristome considerably, apex small, flat, last whorl depressedly elongate; aperture very large, oval, peristome thin, columella slightly thickened.

Distinct for its bigger size, more number of whorls and also the spire projecting beyond the peristome.

Distribution : India : Meghalaya.

Elsewhere : Myanmar.

Measurements (in mm) :

Height		Diameter	
12.80	16.90	25.40	30.50

Status : Common.

Austenia rotungensis Godwin-Austen
(206)

1914. *Austenia rotungensis* : Godwin-Austen, *Rec. Indian Mus.*, 8 : 360, pl. 23, figs. 1-5.

Shell fairly large, thick, shallow, spatula shaped, yellowish, marked by concentric lines of growth; number of whorl one, elongate, slightly concave near the upper margin of the peristome, apex not raised; aperture elongately oval, large, peristome thin with membranaceous edge; columella curved and slightly reflected.



206. *Austenia rotungensis* Godwin-Austen—dorsal view

Differs from *A. gigas* by being more depressed, more narrow and having less number of whorls.

Distribution : India : Arunachal Pradesh (Abor Hill).

Measurements (in mm) :

Height		Diameter	
5.20		22.60	

Status : Rare.

Genus *Cryptaustenia* Cockerell, 1898

1898. *Cryptaustenia* Cockerell, *Ann. Mag. nat. Hist.*, (3)7 : 99.

Number of Indian species : Eleven.

Distribution : India : Arunachal Pradesh, Assam, Meghalaya, Sikkim, West Bengal, Eastern India, on hills (4000ft.) and plains.

Elsewhere : Bangladesh, Bhutan, Myanmar, Thailand.

Mostly on decaying wooden logs or shrubs, inside banana petioles etc.

Size Range (Indian species) : 7.00 17.00 mm in diameter.

Cryptaustenia bensoni (Pfeiffer)

(207, 208)

1848. *Vitrina bensoni* Pfeiffer, *Proc. zool. Soc. Lond.*, 1848 : 107.

1908. *Cryptaustenia bensoni* : Blanford and Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 187.

Shell small depressedly globose, thin and fragile, imperforate faintly obliquely striate above, polished, translucent, pale whitish to yellowish; spire very little raised,



207. *Cryptaustenia bensoni* (Pfeiffer)—dorsal view



208. *Cryptaustenia bensoni* (Pfeiffer)—ventral view

apex blunt; whorls 3½, rounded, very rapidly increasing in width, the last rounded above and below; aperture oblique, widely lunate, peristome simple thin, slightly curved above, columella vertically descending, curved upward, margins joined by a thin callus.

Distribution : India : West Bengal.

Elsewhere : Bangladesh.

Measurements (in mm) :

Height		Diameter		Aperture	
5.90	8.20	9.15	12.60	5.45	6.65

Status : Rare.

Cryptaustenia ovata (H.Blanford)
(209, 210)

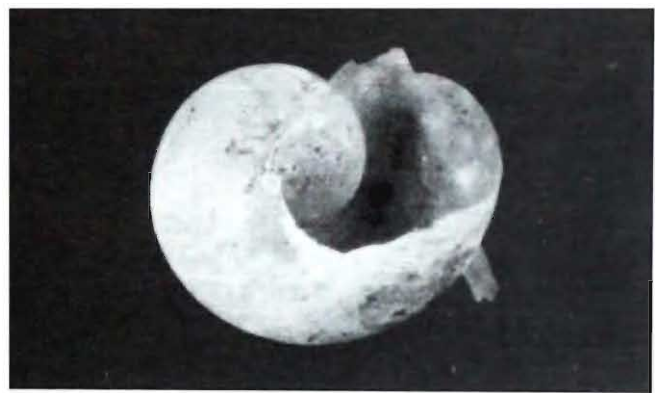
1871. *Helicarion ovata* H. Blanford, *J. Asiat. Soc. Beng.*, 2 : 44, pl. 2, fig. 9.

1908. *Cryptaustenia ovata* : Blanford and Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 182.

Shell depressed, rather thick, imperforate, semitransparent, pale white, smooth, polished, very faintly striate, spire almost flat, suture impressed; whorls 3½, flatly convex above, rapidly increasing in width, the last moderately convex above and below, slightly descending in front; aperture oblique, widely lunate, or subcircular; peristome thin, arcuate above, columella sub vertical, curved above.



209. *Cryptaustenia ovata* (H.Blanford)—dorsal view



210. *Cryptaustenia ovata* (H.Blanford)—ventral view

Differs from *C. bensoni* being thicker and having a descending last whorl.

Distribution : India : West Bengal (Darjeeling).

Measurements (in mm) :

Height		Diameter		Aperture	
4.60	6.35	7.75	11.30	4.55	6.20

Status : Common.

Cryptaustenia succinea (Reeve)
(211, 212)

1862. *Vitrina succinea* Reeve, *Conch. Icon.*, 1862 : pl. 2, fig. 8.

1908. *Cryptaustenia succinea* : Blanford and Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 180.

Shell ovately depressed, very thin, imperforate, nearly transparent, pale yellowish, smooth, faintly obliquely marked; spire and apex flat; whorls 2½, very rapidly increasing in size, the last large, rounded; aperture oblique, ovately lunate, peristome thin, arcuate above, columella deeply curved, vertical.



211. *Cryptaustenia succinea* (Reeve)—dorsal view

212. *Cryptaustenia succinea* (Reeve)—dorsal view

Differs being flat above and having less number of whorls.

Distribution : India : Sikkim.

Elsewhere : Bhutan.

Measurements (in mm) :

Height		Diameter		Aperture
6.00	7.30	11.90	14.45	8.85 - 9.65

Status : Common.

Subfamily MACROCHLAMYDINAE

Number of Indian genera : Eleven.

Genus *Macrochlamys* Benson, 1832

1832. *Macrochlamys* Benson, *J. Asiat. Soc. Beng.*, 1 : 13 & 76.

Number of Indian species : Ninety.

Distribution : India : Throughout, except the dry regions of N.W. India. Hills and plains, upto 10,000 ft..

Elsewhere : Whole of South-east Asia.

Size Range (Indian species) : 2.00–30.00 mm in diameter.

Number of subgenera : Three.

One of the largest and most widely distributed genus of Indian land pulmonates. Inhabits widely varying situations starting from damp concrete wall to forest litters, vegetable debris to kitchen gardens etc. Restricted in drier north western region.

***Macrochlamys atricolor* (Godwin-Austen)**
(213, 214)

1875. *Helix (Nanina) atricolor* Godwin-Austen, *J. Asiat. Soc. Beng.*, 2 : 2, pl. 1, fig. 2.

1908. *Macrochlamys atricolor* : Blanford & Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 99.

Shell moderately large, depressed, perforate, fairly thick, smooth, polished, faintly decussately sculptured above and below, yellowish brown to greenish brown; spire low, very little raised, apex blunt, whorls 6–6½, convex, the last rounded at periphery and at base; aperture oblique, lunate, peristome slightly thickened inside, columella oblique, a little reflected above.



213. *Macrochlamys atricolor* (Godwin-Austen)
–dorsal view

214. *Macrochlamys atricolor* (Godwin-Austen)
–ventral view

Distribution : India : North-east region; Arunachal Pradesh, Assam, Manipur, Meghalaya, Nagaland.

Elsewhere : Myanmar.

Measurements (in mm) :

Height		Diameter		Aperture	
10.20	11.00	19.50	22.00	8.60	8.80

Status : Common.

***Macrochlamys aulopis* (Benson)**
(215, 216)

1863. *Helix aulopis* Benson, *Ann. Mag. nat. Hist.*, (3)11 : 318.

1908. *Macrochlamys aulopis* : Blanford & Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 128.

Shell rather small, depressedly-conoid, lenticular, openly perforate, greyish brown, decussately sculptured both above and below, thin; spire conoidly raised, apex obtusely pointed, suture marginate; whorls 5, rather flat above, the last sharply keeled at the periphery, fairly convex beneath; aperture oblique, quadrately lunate, peristome thin, columella subvertically descending, reflected above.



215. *Macrochlamys aulopis* (Benson)—dorsal view

216. *Macrochlamys aulopis* (Benson)—ventral view

Distinct for its keeled, lenticular shape.

Distribution : India : Andaman Islands.

Measurements (in mm) :

Height	Diameter	Aperture
5.00 9.40	8.80 15.90	2.40 - 7.00

Status : Abundant.

***Macrochlamys glauca* (Pfeiffer)**
(217)

1846. *Helix glauca* Benson MS Pfeiffer, *Symb.*, 3 : 65.

1908. *Macrochlamys glauca* : Blanford & Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 80.

Shell small, conoidly subglobose, narrowly perforate, fairly thick, smooth, polished pale white to white; spire conoidly raised, suture impressed; finely, obliquely striate

both above and below; whorls 5-6, convex, the last rounded at periphery and below, rather flat above; aperture subvertical, roundly lunate, peristome thin, columellar margin vertical, expanded and reflected at the perforation.



217. *Macrochlamys glauca* (Pfeiffer)—dorsal and ventral view

Distinct for its conoid shape, rounded periphery and narrow perforation.

Distribution : India : Western Himalaya : Himachal Pradesh, Kashmir, Uttaranchal.

Measurements (in mm) :

Height		Diameter		Aperture	
4.20	9.30	6.50	15.00	3.80	7.50

Status : Common.

Macrochlamys indica Godwin-Austen
(218, 219, 220)

1908. *Macrochlamys indica* : Blanford & Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 95.

Shell moderately large, depressed, perforate, thick, smooth, pale brownish, faintly decussately sculptured both above and below; spire low, conoid; whorls 5½, convex



218. *Macrochlamys indica* Godwin-Austen—dorsal view



219. *Macrochlamys indica* Godwin-Austen—
ventral view



220. *Macrochlamys indica* Godwin-Austen—
lateral view

above, the last rounded above and below; aperture subvertical, widely lunate, peristome thin, columella curved, a little expanded and reflected above.

Differs from *M. glauca*, being larger thicker, the whorls being more rounded above and also being decussately sculptured.

Distribution : India : Common throughout, except the drier parts of north-west region.

Elsewhere : Bangladesh, Sri Lanka.

Measurements (in mm) :

Height		Diameter		Aperture	
7.15	11.00	12.70	20.	6.00	8.80

Status : Abundant.

***Macrochlamys lubrica* (Benson)**
(221, 222)

1852. *Helix lubrica* Benson, *Ann. Mag. nat. Hist.*, (2)10 : 349.

1908. *Macrochlamys lubrica* : Blanford & Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 89.

Shell large, rather thin, depressed, perforate, smooth, polished, yellowish to brownish white, finely microscopically striate; spire low, almost flat; whorls 5, flatly convex above, the last much broad, rounded at the periphery and below; aperture subvertical, broadly lunate, peristome thin, arcuate above, columella reflected above, basal margin slightly thickened inside.

Distinct for its shining shell with flattened spire and a broad last whorl.

Distribution : India : West Bengal (Darjeeling), Sikkim.



221. *Macrochlamys lubrica* (Benson)—dorsal view



222. *Macrochlamys lubrica* (Benson)—ventral view

Measurements (in mm) :

Height		Diameter		Aperture	
8.60	12.10	15.80	24.35	7.70	10.35.

Status : Common.

Macrochlamys pedina (Benson)
(223, 224)

1865. *Helix pedina* Benson, *Ann. Mag. nat. Hist.*, (3)15 : 13.

1908. *Macrochlamys pedina* : Blanford & Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 132.

Shell similar to *M. lubrica*, differs in being larger in size, having a more raised spire and also having more number of whorls. Besides, the last whorl is bluntly subangulate above the periphery.



223. *Macrochlamys pedina* (Benson)—dorsal view



224. *Macrochlamys pedina* (Benson)—ventral view

Distinct for its largeness, shell in this is one of the largests seen in the genus. Differs from *M. atricolor*, being more tumid (more high) and lacking the decussating sculpture.

Distribution : India : Western India, Gujarat, Maharashtra.

Measurements (in mm) :

Height		Diameter		Aperture
16.30	18.30	29.55	32.00	13.80 - 14.55

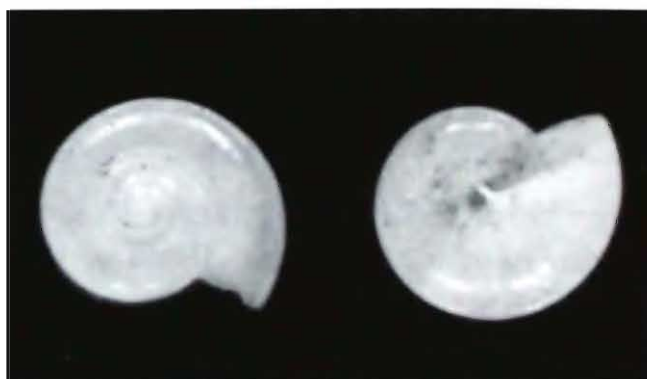
Status : Not common.

***Macrochlamys perplana* Godwin-Austen
(225)**

1883. *Macrochlamys perplana* Godwin-Austen, *Moll. Indica*, 1 : 94.

1908. *Macrochlamys perplana* : Blanford & Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 99.

Shell small, thin, polished, shining, openly perforate, depressed, flat above, brownish with a pinkish tinge, finely microscopically striate; spire flat; whorls 6, flat, the last distinctly broader, moderately rounded below; aperture broadly lunate, subvertical, peristome thin, columella gradually curved, reflected above.



225. *Macrochlamys perplana* Godwin-Austen— dorsal and ventral view

Closer to *M. lubrica*, differing in smaller size, more flattened spire and more number of whorls.

Distribution : India : Andhra Pradesh, Jharkhand (Panchet and Pareshnath hills), Orissa, West Bengal.

Measurements (in mm) :

Height		Diameter		Aperture
3.90	6.30	8.40	13.45	3.600 5.15

Status : Common.

***Macrochlamys rorida* (Benson)**

(226, 227)

1859. *Helix rorida* Benson, *Ann. Mag. nat. Hist.*, (3)3 : 266.1908. *Macrochlamys rorida* : Blanford & Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 94.

Shell very small, conoidly depressed, very narrowly perforate, thin, smooth, polished, nearly transparent, pale brownish to whitish, spire conoidly raised; finely decussately sculptured both above and below; whorls 5, convex, the last rounded at periphery and below; aperture oblique, roundly lunate, rather large, peristome thin, arcuate above, columella roundly curved, broadly reflected.

226. *Macrochlamys rorida* (Benson)—dorsal view227. *Macrochlamys rorida* (Benson)—ventral view

Differs from *M. glauca*, being smaller and also being decussately sculptured.

Distribution : India : West Bengal (Darjeeling, 7000–8000 ft.).

Measurements (in mm) :

Height		Diameter		Aperture	
3.00	5.00	4.30	5.50	2.75	3.00

Status : Not Common.

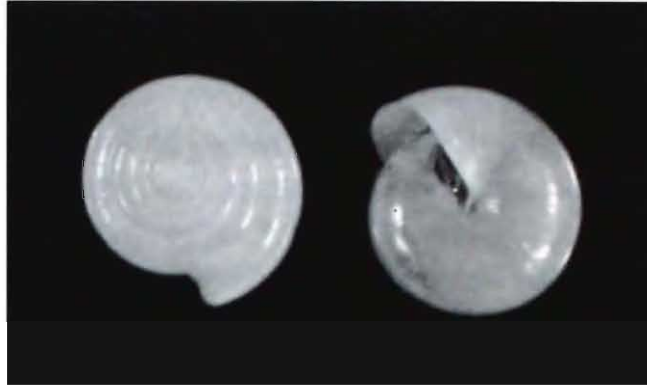
***Macrochlamys stephus* (Benson)**

(228)

1861. *Helix stephus* Benson, *Ann. Mag. nat. Hist.*, (3)7 : 84.1908. *Macrochlamys stephus* : Blanford & Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 127.

Shell moderate in size, depressed, very narrowly perforate, fairly thick, smooth, polished, pale yellowish to brownish, faintly decussately sculptured both above and

below; spire low, conoid; whorls 7, narrowly wound, convex, the last bluntly subangulate above the periphery, distinctly so in immature shells, fairly convex beneath; aperture vertical, lunate, peristome thin, almost straight above, columellar margin slightly expanded.



228. *Macrochlamys stephus* (Benson)—dorsal and ventral view

Distinct for its smooth shining, thick shell and more number of narrowly wound whorls and also for its vertical aperture.

Distribution : India : Andaman Islands only.

Measurements (in mm) :

Height		Diameter		Aperture	
6.70	7.55	12.40	13.70	5.00	5.50

Status : Not common.

***Macrochlamys tugurium* (Benson)**

(229)

1852. *Helix tugurium* Benson, *Ann. Mag. nat. Hist.*, (2)10 : 348.

1908. *Macrochlamys tugurium* : Blanford & Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 81.

Shell thin, depressedly conoid, sublenticular, perforate, pale whitish to greyish, coarsely sculptured by close radial striae, with thicker ones at regular intervals, and fine spiral lines above and below; spire conical; whorls 6, rather flat above, the last angulate at the periphery, convex below; aperture oblique, broadly lunate, peristome with a rib like thickening inside, columellar margin slightly expanded and reflected above.

Distinct for its conical shape and coarse sculpture. Differs from *M. aulopis* from Andaman Islands being larger and more coarsely sculptured.



229. *Macrochlamys tugurium* (Benson)—dorsal and ventral view

Distribution : India : Sikkim, West Bengal (Darjeeling).

Measurements (in mm) :

Height		Diameter		Aperture	
9.10	12.60	13.00	18.65	5.50	8.15

Status : Abundant.

Subgenus *Euaustenia* Cockerell, 1891

1891. *Euaustenia* Cockerell, *Ann. Mag. nat. Hist.*, (6)7 : 98.

Number of Indian species : Five.

Distribution : India : West & North-west Himalaya.

Size Range (Indian species) : 12.00 - 40.00 mm in diameter.

***Macrochlamys (Euaustenia) cassida* (Hutton)**
(230, 231)

1838. *Euaustenia cassida* Hutton, *J. Asiat. Soc. Beng.*, 7 : 214.

1908. *Euaustenia cassida* : Blanford & Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 150.

Shell large, ovately depressed, very thin and fragile, imperforate, yellowish brown; decussately sculptured by raised oblique striae and very fine, close spiral lines both above and below; spire slightly convex, very slightly raised; whorls 4–4½, convex, rapidly increasing in size, the last very broad and large, well rounded above and below; aperture strongly oblique, ovately lunate, peristome thin, upper margin remarkably arcuate, columellar margin curved, sinuate and reflected above forming a false perforation like opening.

Distribution : India : Western Himalaya: Himachal Pradesh, Kashmir, Punjab, Uttaranchal.



230. *Macrochlamys cassida* (Hutton)—dorsal view



231. *Macrochlamys cassida* (Hutton)—ventral view

Measurements (in mm) :

Height		Diameter		Aperture	
12.00	20.55	19.30	40.10	2.40	11.30

Status : Common.

***Macrochlamys (Euaustenia) monticola* (Pfeiffer)**
(232)

1848. *Vitrina monticola* Pfeiffer, *Proc. zool. Soc. Lond.*, 1848 : 107.

1908. *Euaustenia monticola* : Blanford & Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 149.



232. *Macrochlamys monticola* (Benson)—dorsal and ventral view

Shell small, depressed, thin imperforate, brownish; faintly, obliquely striate; spire flat, whorls 4, rapidly increasing in size, flat above, the last moderately rounded above and below; aperture oblique, lunate, peristome thin, upper margin arcuate, columellar margin vertical, sinuate above, not much reflected.

Differs in being smaller, having a more depressed spire and also being only faintly striate.

Distribution : India : North-West Himalaya: Himachal Pradesh, Kashmir, Punjab, Uttaranchal.

Measurements (in mm) :

Height		Diameter		Aperture	
6.10	8.10	12.15	16.80	6.00	8.20

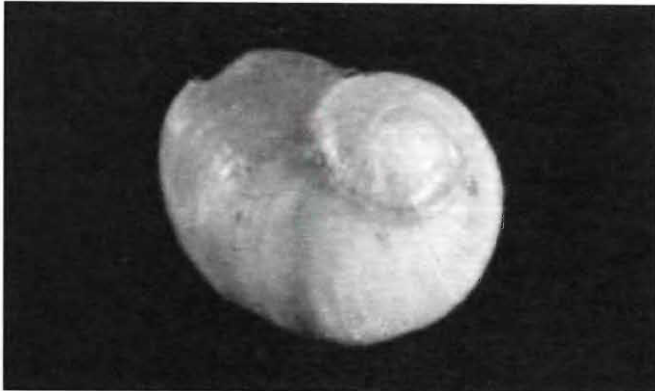
Status : Common.

Macrochlamys (Euaustenia) theobaldi (Godwin-Austen)
(233, 234)

1888. *Austenia theobaldi* Godwin-Austen, *Moll. Ind.*, 1 : 236, pl. 52, fig.5.

1908. *Euaustenia theobaldi* : Blanford & Godwin-Austen *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 152.

Shell much similar to *M. (E.) cassida*, differs being thinner and more globose (more high in proportion to the diameter); greenish brown in colour and has a subcircular aperture.



233. *Macrochlamys theobaldi* (Godwin-Austen)—dorsal view

234. *Macrochlamys theobaldi* (Godwin-Austen)—ventral view

Distribution : India : Western Himalaya: Himachal Pradesh, Kashmir.

Measurements (in mm) :

Height		Diameter		Aperture	
13.65	21.35	18.40	33.00	12.20 - 20.80	

Status : Not common.

Subgenus ***Parvatella*** Blanford & Godwin-Austen, 1908

1908. *Parvatella* Blanford & Godwin-Austen, *Fauna of British India, Mollusca*, p. 145.

Number of Indian species : Four.

Distribution : India : Kashmir, N. Punjab (Western Himalayas).

Size Range (Indian species) : 30.00 32.00 mm in diameter.

***Macrochlamys (Parvatella) austeniana* (Nevill)**

1878. *Helicarion austeniana* Nevill, *Yark Miss. Mol.*, 1878 : 14, figs. 22, & 24.

1908. *Parvatella austeniana*: Blanford & Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 148.

Shell depressedly globose, thin, imperforate, dark olive, coarsely marked by raised oblique striae; spire conoidly raised; whorls 5, convex, rapidly increasing in size, the last rounded at the periphery and below, large but not much broad, slightly descending in front; aperture large, semicircular, peristome thin with a membranaceous margin, arcuate above, columellar lip regularly curved, sinuate above and with a thin callus.

Distribution : India : Western Himalaya : Kashmir, Punjab.

Measurements : Could not be given as the shell examined was a damaged one.

Status : Rare.

Genus *Bapuia* Godwin-Austen, 1918

1918. *Bapuia* Godwin-Austen, *Rec. Indian Mus.*, 8 : 589.

Number of Indian species : One.

Distribution : India : Abor Hill.

Size Range : 12.60 12.80 mm in diameter.

***Bapuia rengineensis* Godwin-Austen
(235)**

1918. *Bapuia rengineensis* Godwin-Austen, *Rec. Indian Mus.*, 8 : 489, pl. 51, figs. 8, 8A..



235. *Bapuia rengineensis* Godwin-Austen—dorsal and ventral view

Shell of moderate size, depressedly globose, perforate, yellowish brown; coarsely sculptured by strong regular radial striae and very fine spiral lines which are more distinct below the suture; spire low, apex flatly convex; whorls 5, convex, rapidly increasing in size, the last broad and rounded; aperture broadly lunate, peristome thin, columellar margin vertical, slightly reflected above.

Distribution : India : Arunachal Pradesh (Abor Hills, Bapu Peak, 6290 ft.).

Measurements (in mm) :

Height		Diameter		Aperture	
6.30	6.40	12.60	12.80	5.30	5.50

Status : Rare.

Genus *Bensonies* H.B. Baker, 1938

1938. *Bensonies* H.B. Baker, *Nautilus*, **52**(1) : 33.

Number of Indian species : Eight.

Distribution : India : Arunachal Pradesh, Himachal Pradesh, Kashmir, Punjab, Sikkim, Uttaranchal.

Elsewhere : Afghanistan, Nepal.

Size Range (Indian species) : 11.00 - 41.45 mm in diameter.

Bensonies angelica (Pfeiffer)
(236, 237)

1856. *Helix angelica* Pfeiffer, *Proc. zool. Soc. Lond.*, **1856** : 33.

1908. *Bensonia angelica* : Blanford & Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 172.

Shell of moderate size, depressedly globose, thin, openly perforate, olivaceous brown; finely decussately sculptured, oblique striae strong; spiral markings very fine; spire



236. *Bensonies angelica* (Pfeiffer)—dorsal view



237. *Bensonies angelica* (Pfeiffer)—ventral view

depressedly conoid, very little raised; whorls 6–6½, rounded, the last convex below, rounded at the periphery with 3-4 varices appearing as yellowish white rings across the whorl indicating the periods of stoppage of growth; aperture roundly lunate, oblique, peristome thickened inside as a white rib, columellar margin briefly but broadly reflected above.

Distribution : India : Kashmir (upto 8000 ft.).

Measurements (in mm) :

Height		Diameter		Aperture	
10.00	13.80	17.00	24.65	8.35	11.85

Status : Not common.

Bensonies jacquemonti (von Martens)
(C80)

1869. *Nanina jacquemonti* von Martens, *Moll. Blatt.*, **16** : 75.

1908. *Bensonia jacquemonti* : Blanford & Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 174.

Shell small, depressed, perforate, thick, whitish, often with a narrow reddish brown band, running along the suture extending to the last whorl above the periphery;



C80. *Bensonies jacquemonti* (von Martens)—dorsal and ventral view

finely, obliquely striate; spire very low but conoid, whorls 5½, very little convex, the last subangulate at the periphery, fairly convex below; aperture a little oblique, lunate, peristome thickened inside, columellar margin slightly reflected above, obliquely descending.

Differs being more depressed and thicker and also lacking the coloured varices.

Distribution : India : Punjab.

Measurements (in mm) :

Height		Diameter		Aperture	
5.80	10.30	11.95	18.75	5.15	7.15

Status : Abundant.

Bensonies mainwaringi (Godwin-Austen)
(238, 239)

1882. *Bensonia mainwaringi* Godwin-Austen (MS Nevill), *J. Asiat. Soc. Beng.*, 1882 : 69, pl. 5, fig. 3.

1908. *Macrochlamys mainwaringi* : Blanford & Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 83.

Shell of moderate size, depressedly conoid, thick, perforate, greenish brown with one or rarely two yellowish, ring like varices; very finely decussately sculptured, above and below; spire conoidly raised; whorls 6- 7, rounded, the last broad and well rounded, aperture very little oblique, broadly lunate, peristome broadly thickened, the thickening appearing as a yellowish white rib, a thin columellar callus of the same colour is also present.



238. *Bensonies mainwaringi* (Godwin-Austen)—dorsal view

239. *Bensonies mainwaringi* (Godwin-Austen)—ventral view

Nearer to *B. angelica*, differs being more conoid and also possessing less number of varices.

Distribution : India : Sikkim, West Bengal (Darjeeling, upto 7000 ft.).

Measurements (in mm) :

Height		Diameter		Aperture	
12.80	17.65	20.55	28.50	10.15	11.80

Status : Not common.

***Bensonies monticola* (Hutton)**
(C81, C82)

1838. *Nanina monticola* Hutton, *J. Asiat. Soc. Beng.*, 7(1) : 213.

1908. *Bensonia monticola* : Blanford & Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 171.

Shell large, depressed, fairly thick, openly perforate, yellowish white to brownish, sometimes with rufous band above the periphery, also with one or two coloured varices across the whorls; marked with oblique raised lines, and very fine, close spiral sculpture; spire depressedly raised; whorls 6-7, convex, the last rounded at the periphery, convex below, slightly descending in front; aperture oblique, ovately lunate, peristome chestnut, distinctly thickened inside, columellar margin strongly oblique and slightly reflected above.



C81. *Bensonies monticola* (Hutton)—dorsal view



C82. *Bensonies monticola* (Hutton)—lateral view

Distinct for its large size and slightly descending last whorl.

Distribution : India : Kashmir, Uttaranchal.

Measurements (in mm) :

Height		Diameter		Aperture	
16.40	24.15	27.45	41.45	11.00	17.65

Status : Abundant.

Genus ***Khasiella*** Godwin-Austen, 1899

1899. *Khasiella* Godwin-Austen, *Moll. Index*, 2 : 129.

Number of Indian species : Ten.

Distribution : India : Arunachal Pradesh, Himachal Pradesh, Kashmir, Meghalaya, Mizoram, Nagaland, Punjab, Sikkim, Uttaranchal.

Elsewhere : Bangladesh, Myanmar, Nepal.

Size Range (Indian species) : 6.00 - 20.00 mm in diameter.

***Khasiella climacterica* (Benson)**

(240, 241)

1836. *Helix climacterica* Benson, *J. Asiat. Soc. Beng.*, 5 : 352.

1908. *Khasiella climacterica* : Blanford & Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 160.

Shell of moderate size, depressedly conoid, sublenticular, keeled, imperforate, pale whitish to brown; very coarsely sculptured with close radial raised lines, both above and below; spire very low, only slightly raised; apex fairly acute; whorls 7- 8, narrowly wound, flat above each whorl, rising slightly above the next at the suture, the last keeled at the periphery, convex below; aperture subvertical, narrow and angulately lunate, peristome blunt, slightly thickened inside, columellar margin oblique, slightly expanded but not reflected, basal margin arcuate, a thin callus present.



240. *Khasiella climacterica* (Benson)—dorsal view



241. *Khasiella climacterica* (Benson)—ventral view

Distribution : India : Arunachal Pradesh, Assam, Meghalaya, Mizoram.

Measurements (in mm) :

Height		Diameter		Aperture
7.25	11.10	13.35	21.30	4.75 - 8.00

Status : Common.

***Khasiella hyba* (Benson)**

(242, 243)

1861. *Helix hyba* Benson, *Ann. Mag. nat. Hist.*, (3)7 : 83.

1908. *Khasiella hyba* : Blanford & Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 162.

242. *Khasiella hyba* (Benson)—dorsal view243. *Khasiella hyba* (Benson)—ventral view

Shell moderately large, openly perforate, convexly conoid, keeled, flat on base, brownish, thin, very coarsely, obliquely marked with close raised striae, faint spiral markings also present above, finely striate below; spire convexly conoid, apex blunt; whorls 7- 8, flatly convex above, the last sharply keeled at the periphery, rather flat on base, depressed around the perforation; aperture oblique, angulately lunate, peristome thin, columellar margin oblique, a little expanded above.

Distinct for its convexly conoid shell, flat on base.

Distribution : India : Western Himalaya, Kashmir.

Measurements (in mm) :

Height		Diameter	Aperture	
6.00	10.40	10.50 - 16.30	4.50	6.00

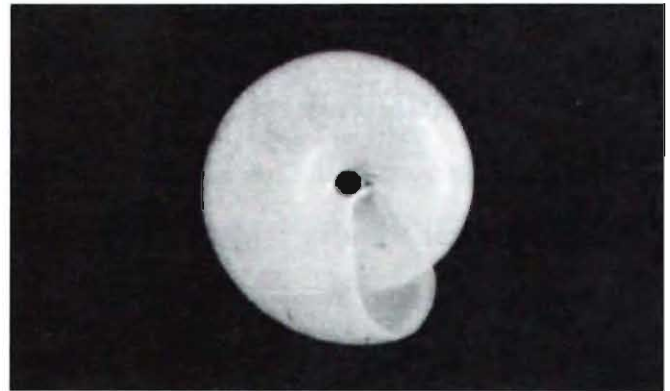
Status : Not common.

***Khasiella falcata* Blanford**
(244, 245)

1870. *Helix falcata* Blanford, *J. Asiat. Soc. Beng.* **39(2)** : 15, pl. 3, fig. 11.

1908. *Khasiella falcata* : Blanford & Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 161.

Shell rather small, depressedly conoid, thin, openly perforate, pale white; distinctly marked by fine, arcuate, raised ribs extending to below the periphery; finely radiately striate at base; spire low conoid; whorls 6, rather closely wound, convex, the last subangulate at the periphery, convex below, concave around the perforation; aperture very little oblique, roundly lunate, peristome thin, very slightly thickened in adult shell, columellar margin a little oblique, expanded but not reflected above, basal margin arcuate.



244. *Khasiella falcata* Blanford—dorsal view 245. *Khasiella falcata* Blanford—ventral view

Differs from others being openly perforate and convex at base and also by not being keeled at the periphery.

Distribution : India : Meghalaya.

Measurements (in mm) :

Height		Diameter	Aperture	
5.75	8.75	8.80 - 14.25	3.45	5.65

Status : Not common.

***Khasiella serrula* (Benson)**
(246, 247)

1836. *Helix serrula* Benson, *J. Asiat. Soc. Beng.*, 5 : 352.

1908. *Khasiella serrula* : Blanford & Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 162.



246. *Khasiella serrula* (Benson)—dorsal view 247. *Khasiella serrula* (Benson)—ventral view

Shell rather small, depressedly conoid, thin, perforate, sharply keeled, pale white, very coarsely and distinctly sculptured with close, arcuate, sharply raised ribs above, which extend to just below the peripheral keel, finely striate below; spire conoidly raised; apex arcuate; whorls 6-7, very little convex, each whorl compressedly keeled,

projecting above the suture and serrated by the transverse ribs, the last fairly rounded at the base; aperture slightly oblique, angulately lunate, peristome thin, columellar margin very little reflected, basal margin arcuate.

Distinct among all the species for its unique sculpture and serrated periphery.

Distribution : India : Meghalaya.

Measurements (in mm) :

Height		Diameter		Aperture
4.85	8.65	8.90	14.75	3.15 - 5.00

Status : Common.

Khasiella vidua (Hanley and Theobald)
(248)

1876. *Helix vidua* Hanley and Theobald (Blanford Mss), *Conch. Indica.*, **1876** : 130.

1908. *Khasiella vidua* : Blanford & Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 158.

Shell rather large, depressedly conoid, fairly thick, imperforate, brownish; closely obliquely and coarsely striate above; finely sculptured below; spire low conoid; whorls 8, narrowly wound, the last subangulate or angulate at the periphery, moderately convex below; aperture oblique, lunate; peristome blunt and slightly thickened inside, columellar margin sharply oblique, a little reflected, basal margin arcuate.



248. *Khasiella vidua* (Hanley and Theobald)—dorsal and ventral view

Differs from *K. climacterica* in having a more raised spire and also not being keeled at the periphery.

Distribution : India : Arunachal Pradesh, Assam, Meghalaya, Mizoram, Nagaland.

Elsewhere : Bangladesh.

Measurements (in mm) :

Height		Diameter		Aperture	
8.65	12.30	15.45	18.35	5.50	7.25

Status : Common.

Genus *Microcystina* Moerch, 1876

1876. *Microcystina* Moerch, *Jour. Conchyl.*, **24** : 357.

Number of Indian species : Seven.

Distribution : India : Andaman and Nicobar Islands, Arunachal Pradesh, Jharkhand(Pareshnath Hill, 4800 ft.), Tamil Nadu(Sheveroy Hill).

Elsewhere : Greater parts of Indo-Malayan region.

Size Range (Indian species) : 3.00 - 8.50 mm in diameter.

Microcystina brunii (Moerch)

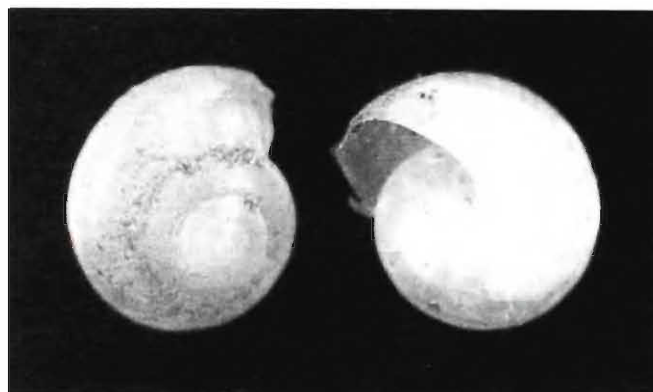
(249)

1872. *Nanina (Liocystis) brunii* Moerch, *J. Conch.*, *Paris*, **20** : 311.

1991. *Microcystina brunii* : Subba Rao and Mitra, *Rec. zool. Surv. India, Occ. Paper*, **126**, 65, pl. 6, fig. 9.

Shell small, depressedly globose, thin, narrowly perforate, polished, shining brown, paler below; almost smooth, with very fine radial striae and microscopic spirals both above and below; spire low conoid; whorls 5, convex, suture impressed, last whorl rounded at the periphery and below; aperture subvertical, lunate, peristome thin, columellar margin oblique, reflected above and provided with a small angular process which extends over the perforation.

Distribution : India : Nicobar Islands.



249. *Microcystina brunii* (Moerch)—dorsal and ventral view

Measurements (in mm) :

Height		Diameter		Aperture	
3.95	4.60	4.45	7.60	3.00	3.75

Status : Rare.

Microcystina rinki (Moerch)
(250)

1872. *Nanina rinki* Moerch, *Jour. Conchyl.*, **20** : 311.

1908. *Microcystina rinki* : Blanford & Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 254.

Shell very small, convexly depressed, thin, very narrowly perforate, smooth, polished, whitish to greyish brown; finely sculptured, with close radial and spiral markings both above and below; spire slightly raised; whorls 5, convex, the last rounded and slightly descending in front; aperture oblique, lunate, peristome thin, columellar margin oblique, slightly thickened and reflected above, rather sinuate and produced into a small angular process fitting into the perforation.



250. *Microcystina rinki* (Moerch)—dorsal and ventral view

Differs being smaller in size, having a descending last whorl and also in the angular process being concave outside.

Distribution : India : Nicobar Islands.

Measurements (in mm) :

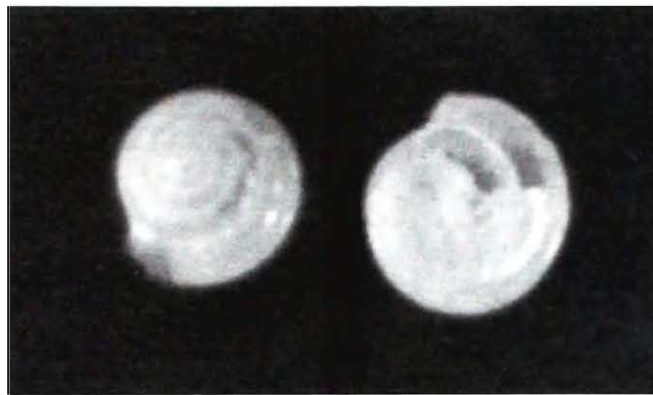
Height		Diameter		Aperture	
2.70	3.55	4.20 - 5.00		1.90 - 2.60	

Status : Abundant.

Microcystina warnefordi Godwin-Austen
(251)

1882. *Microcystina warnefordi* Godwin-Austen (Nevill MSS), *Moll. Ind.*, 1, 1882 : 13, pl. 3, figs. 8, 8a.
1908. *Microcystina warnefordi* : Blanford & Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 255.

Shell small, depressedly conoid, very narrowly perforate (almost imperforate), thin, smooth, polished, umber brown; very finely, microscopically marked by radial and spiral striae above and below; spire conoidly raised; whorls 5, rounded, the last rounded at periphery and convex beneath; aperture subvertical, lunate, peristome thin, columellar margin oblique, not sinuate above, reflected over the perforation forming a small wing like process.



251. *Microcystina warnefordi* Godwin-Austen—dorsal and ventral view

Differs from *M. rinki* in the last whorl not being descending in front and from *M. brunii* being almost imperforate.

Distribution : India : Andaman Islands.

Measurements (in mm) :

Height		Diameter		Aperture	
3.00	3.40	4.60	5.00	2.35	2.80

Status : Not common.

Genus ***Oxytesta*** Zilch, 1956

1956. *Oxytesta* Zilch,

Number of Indian species : Ten.

Distribution : India : Eastern Himalaya : Arunachal Pradesh, Assam, Meghalaya, Nagaland, Sikkim, West Bengal (Darjeeling, 8000 ft.).

Size Range (Indian species) : 18.00 45.00 mm in diameter.

Oxytesta blanfordi (Theobald)
(252, 253)

1859. *Helix blanfordi* Theobald, *J. Asiat. Soc. Beng.*, **28** : 308.

1908. *Oxytes blanfordi* : Blanford & Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 168.

Shell medium sized, depressed, thin, lenticular, narrowly umbilicate, (2 mm in diameter), chestnut brown; finely decussately sculptured both above and below; spire low, conoid; whorls 5-6, flat above, the last compressed and sharply keeled at the periphery, swollen below, subangulate around umbilicus; aperture oblique, angulately lunate, peristome thin, basal margin arcuate, columellar margin reflected.



252. *Oxytesta blanfordi* (Theobald)—dorsal view



253. *Oxytesta blanfordi* (Theobald)—ventral view

Distinct for its compressed keel and reticulate sculpture.

Distribution : India : Sikkim, 3000 ft.

Measurements (in mm) :

Height	Diameter	Aperture
7.75 13.10	18.35 28.85	5.65 10.50

Status : Not common.

Oxytesta orobia (Benson)
(C83, C84)

1848. *Helix orobia* Benson, *Ann. Mag. nat. Hist.*, **(2)2** : 158.

1908. *Oxytes orobia* : Blanford & Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 169.

Shell large, rather depressedly globose, fairly thick, narrowly perforate, yellowish with a narrow chocolate band around the periphery; faintly decussately sculptured

C83. *Oxytesta orobia* (Benson)—dorsal viewC84. *Oxytesta orobia* (Benson)—ventral view

both above and below; spire low, convex; whorls 5- 5½, convex, the last broad, rounded at the periphery and also beneath; aperture slightly oblique, ovately lunate, peristome slightly thickened inside, basal and columellar margins reflected.

Differs from others in being rounded at the periphery and also being of bright yellowish colouration. This shell is very similar to that of *Bensonies convexa*. It resembles that shell by its coloured margin of aperture with one or two similar markings also occurring on the last whorl. However it differs from that in being larger in size and having less number of whorls and also the last whorl being proportionately much broad.

Distribution : India : Sikkim, West Bengal (Darjeeling, 7000–8000 ft.).

Measurements (in mm) :

Height		Diameter		Aperture	
16.75	24.00	26.40	39.80	12.80	17.60

Status : Not common.

***Oxytesta oxytes* (Benson)**
(254, 255)

1836. *Helix oxytes* Benson, *J. Asiat. Soc. Beng.*, 5 : 351.

1908. *Oxytes oxytes* : Blanford & Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 167.

Shell large, depressed, thin, very openly umbilicate (above 5 mm in diameter), brownish, sometimes with a narrow chocolate band below the periphery; closely obliquely striate above, finely deccussate below; spire very low, convex, apex blunt; whorls 5-6, flat above, the last sharply keeled, swollen below, angulate around the umbilical opening; aperture oblique, angularly lunate, peristome slightly thickened in mature shells, basal margin arcuate and slightly reflected, columellar margin almost vertical, reflected above.

254. *Oxytesta oxytes* (Benson)—dorsal view255. *Oxytesta oxytes* (Benson)—ventral view

Differs from others for its large size and broad umbilicus.

Distribution : India : Arunachal Pradesh, Assam, Meghalaya.

Measurements (in mm) :

Height		Diameter		Aperture	
10.75	21.00	25.85	44.10	8.55	17.15

Status : Common.

***Oxytesta pollux* (Theobald)**
(256, 257)

1858. *Helix pollux* Theobald, *J. Asiat. Soc. Beng.*, **27** : 319.

1908. *Oxytes pollux* : Blanford & Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 169.

256. *Oxytesta pollux* (Theobald)—dorsal view257. *Oxytesta pollux* (Theobald)—ventral view

Shell large, depressed, thin, lenticular, narrowly perforate, pale white to light brownish; very closely, finely, obliquely striate, deccussated by faint spiral markings both above and below; spire low, conical, apex rather acute; whorls 5- 6, flat above, the last compressedly keeled at the periphery, fairly rounded below; aperture oblique,

angulately lunate, peristome thin and sharp, basal margin arcuate, columellar margin subvertical, only slightly reflected.

Resembles *O. blanfordi* in general appearance, differs being narrowly perforate (pin hole perforation) and also lacks the reticulate sculpture.

Distribution : India : Meghalaya.

Measurements (in mm) :

Height		Diameter		Aperture	
8.45	16.25	21.15	37.00	6.80	11.95

Status : Not common.

Genus *Rotungia* Godwin-Austen, 1918

1918. *Rotungia* Godwin-Austen, *Rec. Indian Mus.*, 8 : 590.

Number of Indian species : Single.

Distribution : India : Arunachal Pradesh : Upper Rotung, Abor Hill.

Endemic monotypic genus.

Size Range : 7.25 13.10 mm in diameter.

Rotungia williamsoni Godwin-Austen
(258, 259)

1918. *Rotungia williamsoni* Godwin-Austen, *Rec. Indian Mus.*, 8 : 590, pl. 51, figs 5, 5a, pl. 53, figs. 1-5.

Shell moderately large, very thin, almost membranaceous, flatly globose, imperforate, yellowish brown (golden in fresh condition); indistinctly marked by radial growth striae; spire flat, apex scarcely raised; whorls 5, flat above, increasing very rapidly, suture very much impressed, being almost excavated, last whorl broadly



258. *Rotungia williamsoni* Godwin-Austen—dorsal view



259. *Rotungia williamsoni* Godwin-Austen—ventral view

flattened above forming a platform then keeled, fairly rounded at periphery and below, descending in front; aperture vertical, broadly ovate, peristome thin, columellar margin vertical, and then oblique, slightly reflected above.

Distribution : India : Arunachal Pradesh (Abor hill).

Measurements (in mm) :

Height		Diameter	Aperture
4.00	7.00	7.25 - 13.10	3.80 - 6.90

Status : Rare.

Remarks : Shells of this interesting species, have recently been collected from Nepal, which besides extending its range of distribution westwards happens to be its first subsequent report after Godwin-Austen (1918).

This species was named after Mr. Noel Williamson of the British Indian Civil Service who along with his party was killed by the tribes in the Abor country in 1911.

Genus *Syama* Godwin-Austen, 1908

1908. *Syama* Godwin-Austen, *Fauna of British India, Mollusca*, p. 152.

Number of Indian species : Six.

Distribution : India : West and North West Himalayas: Himachal Pradesh, Punjab, Uttaranchal (upto 10,600 ft.).

Size Range (Indian species) : 12.00 - 20.50 mm in diameter.

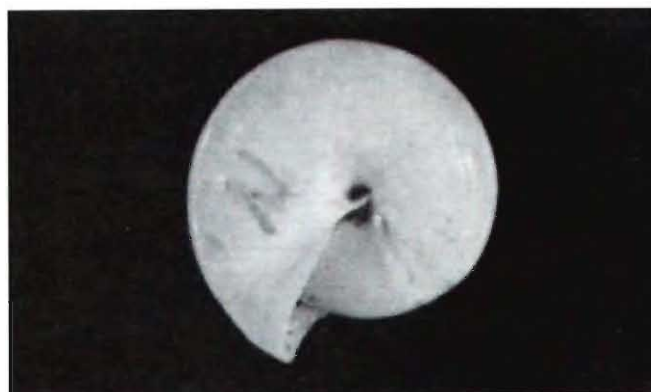
Syama splendens (Hutton) (260, 261)

1838. *Nanina splendens* Hutton, *J. Asiat. Soc. Beng.*, **7(1)** : 215.

1908. *Syama splendens* : Blanford & Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 153.

Shell thin, subdiscoid, narrowly perforate, yellowish brown above, whitish below, finely sculptured with radial and spiral markings; spire low conoid; whorls 7-8, narrowly coiled, moderately convex, the last broad, rounded; aperture slightly oblique, lunate, peristome thin outside but slightly thickened (labiate) a short distance inside; columellar margin slightly reflected.

The shell is very similar to *Macrochlamys* sp. Differs in having more number of whorls. Sometimes pale bands are also present on the body whorl indicating the positions of earlier aperture, as in the genus *Bensonies*. Different species under the genus are all very similar to each other.

260. *Syama splendens* (Hutton)—dorsal view261. *Syama splendens* (Hutton)—ventral view

Distribution : India : Kashmir, Punjab, Uttaranchal.

Measurements (in mm) :

Height		Diameter		Aperture	
7.20	11.00	13.80	20.50	5.70	8.45

Status : Abundant.

Genus *Taphrospira* Blanford, 1905

1905. *Taphrospira* Blanford, *Proc. zool. Soc. Lond.*, p. 441.

Number of Indian species : Two.

Distribution : India : Andaman Islands, Assam, Meghalaya.

Elsewhere : Myanmar; On hills.

Size Range (Indian species) : 8.00 - 15.00 mm in diameter.

Taphrospira bathycharax (Godwin-Austen)

(262)

1888. *Macrochlamys bathycharax* Godwin-Austen (Benson MS), *Ann. Mag. nat. Hist.*, (6)2 : 56.

1908. *Taphrospira bathycharax* : Blanford & Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 280.

Shell small, subglobose depressed, thin, narrowly perforate, brownish, smooth, polished; very finely deccussately sculptured both above and below; spire very low, scarcely raised, suture with a broad canal all along; whorls 5-5½, angulate above along the edge of sutural canal, the last slightly convex on the periphery and also below; aperture oblique, lunate, angulate above, peristome thin, columellar margin oblique only slightly reflected.



262. *Taphrospira bathycharax* (Godwin-Austen)—dorsal view

The shell is very distinct from all other similar genus for its beautiful sutural canal.

Distribution : India : South Andamans.

Measurements (in mm) :

Height		Diameter		Aperture	
4.35	5.90	8.00	11.40	3.50	5.00

Status : Rare.

***Taphrospira compluvialis* (Blanford)**

(263, 264)

1865. *Nanina compluvialis* Blanford, *J. Asiat. Soc. Beng.*, **2** : 66.

1908. *Taphrospira compluvialis* : Blanford & Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 280.

Shell subglobose, moderately large, thin, very narrowly perforate, olivaceous, faintly marked by close radial and spiral striae; spire slightly raised, depressedly conoid; suture broadly canaliculate; whorls $4\frac{1}{2}$ 5, angulate above, the last rounded at the



263. *Taphrospira compluvialis* (Blanford)—dorsal view



264. *Taphrospira compluvialis* (Blanford)—ventral view

periphery, fairly convex below, very slightly descending in front; aperture oblique, roundly lunate, peristome thin, columellar margin vertical, reflected above.

Differs from the other being larger and more globose and also by descending last whorl.

Distribution : India : Meghalaya, Nagaland.

Elsewhere : Myanmar.

Measurements (in mm) :

Height	Diameter	Aperture
6.85 - 10.75	9.60 13.90	5.15 7.35

Status : Not common.

Subfamily DURGELLINAE

Number of Indian genera : Seven.

Genus *Durgella* Blanford, 1863

1863. *Durgella* Blanford, *Ann. Mag. nat. Hist.*, (3) 11 : 81.

Number of Indian species : Seven.

Distribution : India : Andaman Islands, Andhra Pradesh, Arunachal Pradesh, Assam, Meghalaya, Orissa, Sikkim, West Bengal (Darjeeling).

Elsewhere : Myanmar.

Size Range (Indian species) : 5.00 9.50 mm in diameter.

Durgella aborensis Godwin-Austen (265)

1916. *Durgella aborensis* Godwin-Austen, *Rec. Indian Mus.*, 8 : 555, pl. 47, figs. 1-1d.

Shell small, globose, very thin, imperforate, transparent, shining, finely obliquely striate; light yellowish brown, whitish on apex; spire almost flat; whorls 3½, rounded, very rapidly increasing, the last broad and convex; aperture widely lunate, peristome thin, almost membranaceous, columellar margin oblique.

Differs from the others being more depressed with an almost flattened spire.

Distribution : India : Arunachal Pradesh (Upper Rotung, 2000 ft), Abor Hill. (Under plantain leaf stem).



265. *Durgella aborensis* Godwin-Austen—dorsal and ventral view

Measurements (in mm) :

Height	Diameter	Aperture
4.40	8.00	4.40

Status : Common.

Durgella levicula (Benson)
(266, 267)

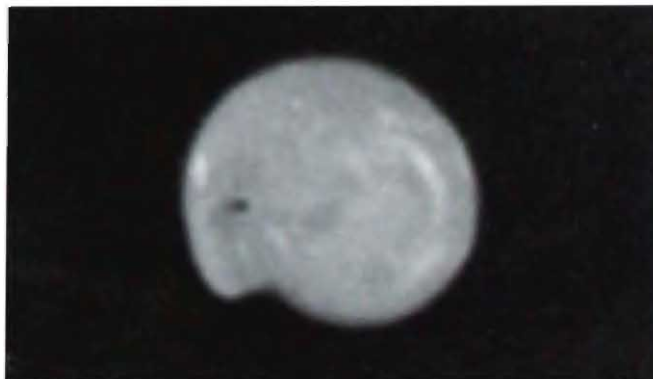
1859. *Helix levicula* Benson, *Ann. Mag. nat. Hist.*, (3)3 : 391.

1908. *Durgella levicula* : Blanford & Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 213.

Shell small, globosely depressed, fairly thick, very narrowly perforate, pale white to light brownish, smooth, polished, very faintly, obliquely striate; spire very low, just raised above the last whorl; suture impressed; whorls $3\frac{1}{2}$, rapidly increasing, rounded, the last convex, slightly descending near the mouth; aperture oblique, proportionately large, roundly lunate, peristome rather thin, slightly arcuate above, columellar margin gently curved, triangularly reflected almost covering the perforation.



266. *Durgella levicula* (Benson)—dorsal view



267. *Durgella levicula* (Benson)—ventral view

Differs being more globose and narrowly perforate and also the columella being triangularly reflected.

Distribution : India : Andhra Pradesh, Orissa (Eastern Ghat).

Elsewhere : Myanmar.

Measurements (in mm) :

Height		Diameter		Aperture	
3.20	3.45	5.30	6.00	2.70	3.45

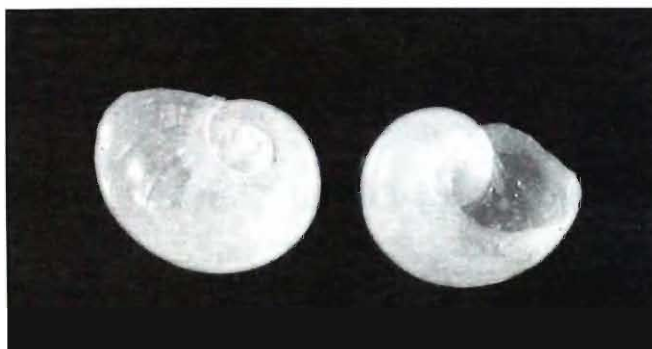
Status : Common.

***Durgella salius* (Benson)**
(268)

1859. *Vitrina salius* Benson, *Ann. Mag. nat. Hist.*, (3)3 : 189.

1908. *Durgella salius* : Blanford & Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 217.

Shell small, globosely depressed, rather thin, imperforate, pale yellowish white, smooth, very faintly striate; spire low, conoid; whorls 3½, fairly convex, the last broad and globose, rounded at the periphery and below, slightly descending in front; aperture oblique, roundly lunate, peristome thin, slightly arcuate above, columella a little sinuate above, rounded, not reflected.



268. *Durgella salius* (Benson)—dorsal and ventral view

Differs from *D. levicula* being imperforate and the columella not being reflected and from *D. aborensis* being more conoid with a distinctly raised spire.

Distribution : India : Meghalaya, Sikkim, West Bengal (Darjeeling).

Measurements (in mm) :

Height		Diameter		Aperture	
3.90	5.10	5.70	7.75	3.70	4.85

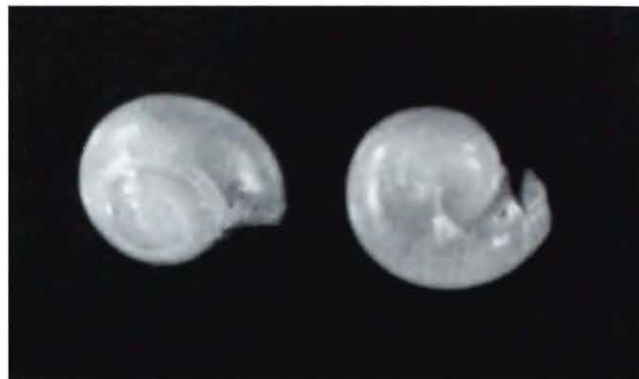
Status : Common.

***Durgella seposita* (Benson)**
(259)

1859. *Helix seposita* Benson, *Ann. Mag. nat. Hist.*, (3)3 : 267.

1908. *Durgella seposita* : Gude, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 217.

Shell larger, subglobose conoid, thin, imperforate or very narrowly perforate, translucent, straw coloured, faintly obliquely striate; spire low, conoid; suture moderately impressed; whorls 3½- 4, rapidly increasing, fairly rounded, the last large, swollen; aperture large, oblique, roundly lunate, peristome thin, columellar margin curved, only slightly reflected above.



269. *Durgella seposita* (Benson)—dorsal and ventral view

Differs from the others being globose conoid and large. Closer to *D. salius* but last whorl is straight and not descending.

Distribution : India : Assam, West Bengal (Darjeeling).

Measurements (in mm) :

Height	Diameter	Aperture
6.00 7.10	8.70 9.50	5.20 5.45

Status : Common.

Genus ***Ibycus*** Heynemann, 1862

1862. *Ibycus* Heynemann, *Moll. Blatt.*, 10 : 142.

Number of Indian species : Two.

Distribution : India : Sikkim (5600 ft.).

Size Range (Indian species) : 7.00 14.25 mm in diameter.

***Ibycus fissidens* Heynemann**
(270, 271)

1862. *Ibycus fissidens* Heynemann, *Mal. Blatt.*, 10 : 142, pl.1, fig. 3 (radula).

1908. *Ibycus fissidens* : Blanford and Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 219.

Shell of moderate size, ovately depressed, imperforate, very thin, olivaceous brown with close fine oblique markings; spire flat, not projecting above the last whorl; suture impressed; whorls 2½, rapidly increasing, the last very broad and well rounded, slightly ascending in front, aperture very large, oblique, roundly lunate, peristome very thin, columellar margin simple, roundly curved.



270. *Ibycus fissidens* Heynemann—dorsal view **271.** *Ibycus fissidens* Heynemann—ventral view

The other species *I. minuta* is much smaller in size.

Distribution : India : Sikkim.

Measurements (in mm) :

Height	Diameter	Aperture
6.80 7.75	13.00 14.25	6.80 7.75

Status : Not common.

Genus ***Satiella*** Godwin-Austen, 1908

1908. *Satiella* Godwin-Austen, *Fauna of British India, Mollusca*, p. 221.

Number of Indian species : Six.

Distribution : India : Andaman Islands, South Indian hills.

Elsewhere : Sri Lanka.

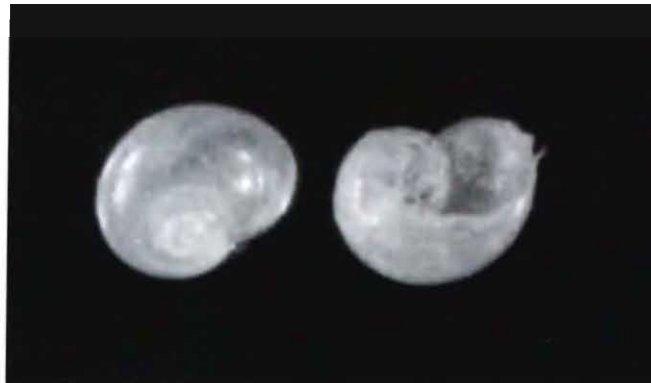
Size Range (Indian species) : 6.00 18.00 mm in diameter.

Satiella christiana (Theobald)

(272)

1864. *Vitrina christiana* Theobald, *J. Asiat. Soc. Beng.*, **33** : 245.1908. *Satiella christina* : Blanford & Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 223.

Shell rather small, depressedly globose, imperforate, thin, smooth, polished, pale yellowish; spire flat, not projecting above the last whorl; suture impressed; whorls 3½, convex, the last rounded; aperture oblique, roundly lunate, peristome thin, arcuate above, columellar margin subvertical.

272. *Satiella christiana* (Theobald)—dorsal and ventral view

Other species of the genus are also allied to *S. christiana* differing in size or elevation of spire etc.

Distribution : India : Andman Islands (also collected from branches of trees).

Measurements (in mm) :

Height		Diameter		Aperture
3.90	6.30	6.71	10.10	3.90 - 6.30

Status : Not common.

Genus ***Sitala*** H. Adams, 18651865. *Sitala* H. Adams, *Proc. zool. Soc. Lond.*, p. 408.

Number of Indian species : Fifteen.

Distribution : India : Andaman & Nicobar Islands, Assam, Bihar, Karnataka, Kerala, Manipur, Maharashtra, Meghalaya, Nagaland, Orissa, Tamil Nadu, Uttaranchal, West Bengal (4000ft.).

Elsewhere : Bangladesh, Myanmar, Sri Lanka.

Size Range (Indian species) : 2.00 14.50 mm in diameter.

Sitala apicata (Blanford)

(273, 274)

1870. *Nanina (Trochomorpha) apicata* Blanford, *J. Asiat. Soc. Beng.*, 2 : 16, pl. 3, fig. 13.1908. *Euplecta apicata* : Blanford & Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 72.

Shell conical, trochiform, very narrowly perforate, thin, pale white or straw coloured; sculptured by close oblique striae and distant spiral markings both above and below; spire conically raised, apex fairly pointed; whorls 6–6½, gradually increasing, slightly convex above, the last sharply keeled at periphery, rather flattened on base and slightly descending; aperture oblique, subquadrate, peristome thin, columellar margin vertical, narrowly reflected.

273. *Sitala apicata* (Blanford)—dorsal view274. *Sitala apicata* (Blanford)—ventral view

Differs from others being more sharply keeled and flattened on base and also in having distant spiral sculpture.

Distribution : India : Tamil Nadu (Nilgiri hills).

Measurements (in mm) :

Height	Diameter	Aperture
8.70 - 10.60	10.30 13.10	4.80 6.00

Status : Rare.

Sitala arx (Benson)

(275, 276)

1859. *Helix arx* Benson, *Ann. Mag. nat. Hist.*, (3)3 : 184.1908. *Sitala arx* : Blanford & Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 229.

Shell rather small, conical, subtrochiform, very narrowly perforate, thin, pale brownish, closely obliquely striate, deccussated by raised thread like spiral markings, 4 on each whorl, almost smooth beneath; spire conoid with concave sides, apex pointed; whorls 7-7½, flat on sides, the last very strongly keeled at periphery, rather convex at base, descending in front, aperture oblique, subquadrate, peristome thin, straight, columellar margin subvertical, reflected above.



275. *Sitala arx* (Benson)—dorsal view



276. *Sitala arx* (Benson)—ventral view

Differs from all others by its concave sides of the spire and acutely pointed apex.

Distribution : India : Manipur.

Elsewhere : Myanmar.

Measurements (in mm) :

Height		Diameter		Aperture	
6.80	9.45	7.50	9.70	3.05	3.80

Status : Not common.

Sitala attegia (Benson)
(277)

1859. *Helix attegia* Benson, *Ann. Mag. nat. Hist.*, (3)3 : 184.

1908. *Sitala attegia* : Blanford & Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 227.

Shell rather small, conoid, subtrochiform, very narrowly perforate, thin, pale yellowish, translucent; decussately sculptured by oblique striae and raised spiral lines, both above and below, some of the spiral lines more prominent; spire conoidly raised, apex pointed; whorls 7 7½, convex, gradually increasing, the last keeled at the periphery, rounded beneath; aperture oblique, subquadrately lunate, peristome thin, slightly arcuate above, columellar margin vertical, broadly reflected above.



277. *Sitala attega* (Benson)—lateral view

Differs being bigger in size than others.

Distribution : India : Andman Islands.

Elsewhere : Myanmar.

Measurements (in mm) :

Height		Diameter		Aperture
9.25	12.50	9.90	12.20	4.80 - 6.25

Status : Abundant.

***Sitala denselirata* Preston**
(278)

1908. *Sitala denselirata* Preston, *Rec. Indian Mus.*, **2** : 187.

1979. *Sitala denselirata* : Subba Rao and Mitra, *Rec. zool. Surv. India*, **75** : 17.



278. *Sitala denselirata* Preston—lateral view

Shell small, conical, subtrochiform, perforate, fairly thick, pale yellowish, sculptured by faint oblique striae and distinctly raised subdistant spiral markings, about 5-6 on each whorl, spiral markings more distinct on upper whorls, rather finer and closer on

base; spire conical, apex obtuse; whorls $6\frac{1}{2}$, slightly convex, the last bluntly keeled at periphery, fairly convex beneath; aperture subvertical, subquadrate, peristome thin, columellar margin vertical, reflected over the perforation.

Differs having distinctly raised spiral striae.

Distribution : India : Andaman Islands, Maharashtra.

Measurements (in mm) :

Height	Diameter	Aperture
3.75 6.30	4.25 6.50	2.40 - 2.85

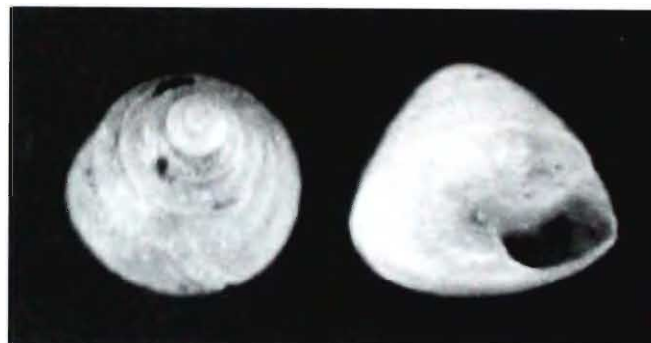
Status : Not common.

Sitala haroldi Godwin-Austen
(279)

1882. *Sitala haroldi* Godwin-Austen, *Moll. Ind.*, i : 1882 : 33, pl. 10, fig. 7.

1908. *Sitala haroldi* : Blanford & Godwin-Austen, *Fauna of British India, Mollusca, Testacellidae & Zonitidae* : 231.

Shell minute, conical, trochiform, very narrowly perforate, brownish, decussately marked with fine radial striae and close spiral lines both above and below, about 10 spiral lines on the last whorl; spire conical, apex fairly acute; whorls 7-7½, flatly convex above, the last sharply keeled at periphery, rather flattened below; aperture oblique, subquadrate, peristome thin, columellar margin oblique, reflected above.



279. *Sitala haroldi* Godwin-Austen—dorsal and lateral view

Differs from others being very small with numerous, fine spiral lines.

Distribution : India : Nicobar Islands.

Measurements (in mm) :

Height	Diameter	Aperture
1.30 2.55	1.80 2.35	0.80 - 1.00

Status : Rare.

Family TROCHOMORPHIDAE

Shell depressedly trochiform, widely umbilicate, strongly keeled, flat or slightly elevated above, last whorl a little deflected in front, aperture subangulate, peristome simple, acute or slightly marginate.

Animal with a long narrow foot, sole of foot without longitudinal division, peripodial groove distinct, caudal gland indistinct, without overhanging lobe.

India, China, Japan, Malaysia, Myanmar, New Guinea, Pacific Islands, Philippines.

Number of Indian genus : One.

Genus *Videna* H. and A. Adams, 1858

1858. *Videna* H. and A. Adams, *Gen. Rec. Moll.*, **2** : 15.

Number of Indian species : Nine.

Distribution : India : Andaman and Nicobar Islands.

Elsewhere : China, Japan, Malaysia, New Guinea, Philippines.

Size Range (Indian species) : 7.00 16.00 mm in diameter

Videna andamanica (Godwin-Austen)
(280)

1895. *Discus andamanica* Godwin-Austen, *Proc. zool. Soc. Lond.*, **1895** : 448.

1914. *Trochomorpha (Videna) andamanica* : Gude, *Fauna of British India, Mollusca*, **2** : 6.

Shell subdiscoidal, widely umbilicate, width of umbilicus more than 3 mm, nearly flattened at base, light yellowish, closely obliquely striate above, arcuately striate below; spire depressedly raised; whorls 6-7, flat above, narrow, the last sharply keeled at the periphery and around the umbilicus below; slightly compressed near the peristome, suture with a narrow margin, aperture oblique, subquadrate, peristome slightly thickened and arcuate above; columella roundly curved.



280. *Videna andamanica* (Godwin-Austen)—dorsal and ventral view

Distribution : India : Andaman Islands.

Measurements (in mm) :

Height		Diameter		Aperture
3.70	5.60	10.20	13.80	3.00-4.48

Status : Abundant.

Videna sanis (Benson)
(281)

1861. *Helix sanis* Benson, *Ann. Mag. nat. Hist.*, (3)7 : 84.

1914. *Trochomorpha (Videna) sanis* Gude, *Fauna of British India, Mollusca*, 2 : 8.

Differs from the preceding species having narrower umbilical opening, less than 3 mm in width, being convex at base and brownish in colour and also not being keeled around the umbilicus.



281. *Videna sanis* (Benson)—dorsal and ventral view

Distribution : India : Andaman and Nicobar Islands.

Measurements (in mm) :

Height		Diameter		Aperture
3.70	5.80	7.50	15.20	1.70 - 5.00

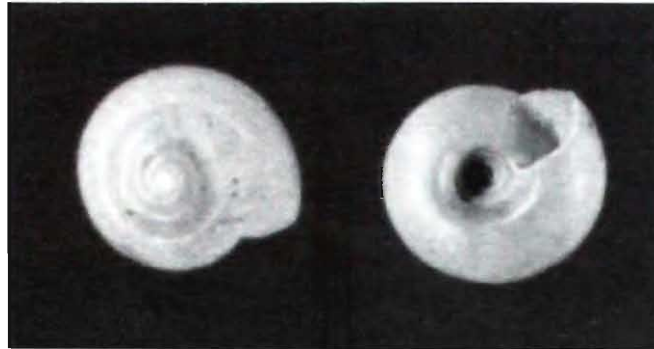
Status : Abundant.

Videna sulcipes Moerch
(282)

1872. *Nanina (Videna) sulcipes* Moerch, *J. Conchyl.*, 1872 : 309.

1914. *Trochomorpha (Videna) sulcipes* : Gude, *Fauna of British India, Mollusca*, 2 : 9.

Shell depressed subdiscoidal, widely umbilicate (width exceeding 3 mm), reddish brown, decussately sculptured by oblique striae and spiral markings both above and below; spire very little raised, apex obtusely blunt; suture marginate; whorls 5-6, scarcely convex, the last sharply keeled at periphery, convex below, slightly descending in front; aperture oblique, broad, peristome very little thickened, columella gradually curving



282. *Videna sulcipes* Moersch—dorsal and ventral view

Differs being reddish brown in colour and also being decussately sculptured.

Distribution : India : Nicobar Islands. Abundant among rubber plantations at Katchal (Nicobar).

Measurements (in mm) :

Height		Diameter		Aperture	
4.60	5.20	14.60	16.50	1.80	5.50

Status : Abundant.

Videna trilineata Moersch

(283)

1876. *Nanina (Videna) sulcipes* var. *trilineata* Moersch, *J. Conchyl.*, **1876** : 355.

1914. *Trochomorpha (Videna) trilineata* : Gude, *Fauna of British India, Mollusca*, **2** : 10.

Shell depressedly conoid, widely umbilicate, pale whitish with narrow brownish markings along the suture and below the periphery on the base, very finely obliquely striate above and minutely decussated below; spire conoidly raised; whorls 6, convex, suture deep, marginate, last whorl carinate, slightly descending in front and convex below; aperture oblique, wide, peristome thin, arcuate.

Distinct for its brownish markings and decussate sculpture at base.

Distribution : India : Nicobar Islands.



283. *Videna trilineata* Moersch—dorsal and ventral view

Measurements (in mm) :

Height		Diameter		Aperture	
5.75	6.50	13.30	14.75	4.50	5.00

Status : Common.

Family CAMAENIDAE

Shells of varying shape and size, small to fairly large, many with coloured bands or patches, depressed-globose or trochoid to elongate, ovate, usually umbilicate, dextral or sinistral, body whorl rounded or carinated; aperture lunate or ovate, usually oblique, columellar margin often reflected over umbilicus; peristome usually thickened and reflected.

Animal with a long tail over which there is a dorsal groove, sole of foot very faintly divided, foot margin absent.

Sout-east Asia, Australia, N. & S. America, Pacific Islands.

Reference

- Laidlow, F.F. & Solem, A. 1961. The land snail genus *Amphidromus*. A synoptic catalogue. *Fieldiana, Zool.*, 41 : 505-677, 38 figs.
- Zilch, A. 1966. 34. & 35 Mollusca, Camaenidae (4) & (5) *Arch. Zool.*, 95(3/4 & 5/6) : 197-223, pls 3-6; 293-319, pls. 7-11.

Key to the genera

- Shell elongate, longer than broad (2)
Shell depressed, broader than long (3)
- Shell rounded at periphery *Amphidromous*
Shell angulate or keeled at periphery *Beddomea*

3. Shell large, above 30 mm in diameter *Camaena*
 Shell smaller, below 30 mm in diameter (4)
4. Shell with a blunt tooth on columellar margin *Oreobba*
 Shell without tooth on columellar margin..... (5)
5. Usually constricted behind the peristome, last whorl angulate around the umbilicus
 (6)
 Rounded behind the peristome, and also around the umbilicus (7)
6. Shell microscopically granulated above, lip of the aperture expanded.. *Trachia*
 Shell striate or decussate, not granulated, lip of the aperture not expanded ...
 *Chloritis*
7. Shell subtrochiform to trochiform, conoid, nearly as long as broad ... *Ganesella*
 Shell depressedly conoid, much broader than high (8)
8. Shell very narrowly perforate, last whorl straight in front *Apatetes*
 Shell openly umbilicate, last whorl descending in front *Landouria*

Subfamily CAMAENINAE

Number of Indian genera : Eleven.

Genus *Camaena* Albers, 1850

1850. *Camaena* Albers, *Die Heliceen*, p. 85.

Number of Indian species : One.

Distribution : India : Arunachal Pradesh, Assam, Meghalaya.

Elsewhere : China, Myanmar.

Size Range : 50.00 55.00 mm in diameter.

Camaena ochthoplax (Benson)
 (C85, C86, 284, 285)

1860. *Helix ochthoplax* Benson, *Ann. Mag. nat. Hist.*, (3)6 : 190.

1914. *Camaena ochthoplax* : Gude, *Fauna of British India, Mollusca*, 2 : 150.

Shell very large, rather depressedly globose, narrowly umbilicate, thick, yellowish white, sculptured by close, oblique raised striae and rather irregular spiral markings, which are closer and regular on upper whorls; spire convex, apex roundly obtuse;



C85. *Camaena ochthoplax* (Benson)—lateral view



C86. *Camaena ochthoplax* (Benson)—lateral view



284. *Camaena ochthoplax* (Benson)—dorsal view



285. *Camaena ochthoplax* (Benson)—ventral view

whorls 5, rounded, the last subangulate at periphery, rounded beneath, very slightly descending; aperture oblique, quadrately lunate, peristome much expanded; columellar margin very much thickened and sinuate at the perforation; bluish white inside the aperture.

Distribution : India : Assam, Arunachal Pradesh, Meghalaya.

Elsewhere : Myanmar.

Measurements (in mm) :

Height		Diameter	Aperture	
32.80	35.00	56.35 - 59.55	23.00	25.00

Status : Common.

Genus *Amphidromus* Albers, 1850

1850. *Amphidromus* Albers, *Die Heliceen*, p. 138.

Number of Indian species : Four. Mostly occurring on shrubs and trees.

Distribution : India : Andaman & Nicobar Islands, Arunachal Pradesh, Assam, Meghalaya, Tripura.

Elsewhere : Bangladesh, Indonesia, Malaysia, Myanmar, New guinea, Philippines, South China, Vietnam.

Size Range (Indian species) : 23.00 35.00 mm in length.

***Amphidromus andamanicus* (Hanley and Theobald)**
(C87, C88)

1875. *Bulimus andamanicus* (Thorp Ms), Hanley and Theobald, *Conch, Ind.*, 1875 : 59, pl.148, fig. 10.

1914. *Amphidromus andamanicus* : Gude, *Fauna of British India, Mollusca*, 2 : 184.



C87. *Amphidromus andamanicus* (Hanley and Theobald)—dorsal view

C88. *Amphidromus andamanicus* (Hanley and Theobald)—ventral view



C89. *Amphidromus atricallosus* (Gould)—dorsal view

C90. *Amphidromus atricallosus* (Gould)—ventral view

Shell sinistral, rather large, elongately conoid, imperforate, thick, pale yellowish white, lower half with transverse or oblique broad dark brown bars, some of which are forked at upper end, last whorl with 1-2 broad spiral bands of same colour, apical whorls are comparatively darker, finely decussately sculptured; spire elongate, apex blunt; whorls 6-6½, convex, the last rounded; aperture subvertical, semioval, peristome expanded; columellar margin white, slightly expanded, vertical, forming an angle with the basal margin, reflected above at the perforation leaving a slit like opening; a thin columellar callus present.

Distribution : India : Andaman and Nicobar Islands.

Measurements (in mm) :

Length	Diameter	Aperture
26.50 - 35.85	13.35 16.55	12.15 - 15.50

Status : Common.

Amphidromus masoni (Godwin-Austen)
(C93, C94)

1876. *Bulimus masoni* Godwin-Austen, *J. Asiat. Soc. Beng.*, **45** : 316.

1914. *Amphidromus masoni* : Gude, *Fauna of British India, Mollusca*, **2** : 181.

Shell large, sinistral, acuminate elongate, thick, imperforate smooth, polished, white with a yellowish green tinge, a narrow band of dark purple runs along the suture on every whorl, a patch of same colour in columella; very finely decussately sculptured; whorls 7, with rather flat sides, the last subangulate at periphery, aperture oval, angulate above, peristome slightly reflected; columellar margin vertical, reflected above.

Differs in colouration.

Distribution : India : Arunachal Pradesh.

Measurements (in mm) :

Length	Diameter	Aperture
33.15	16.90	15.40

Status : Rare.

Amphidromus sinensis (Benson)
(C95, C96)

1851. *Bulimus sinensis* Benson, *Ann. Mag. nat. Hist.*, (2)**7** : 264.

1914. *Amphidromus sinensis* : Gude, *Fauna of British India, Mollusca*, **2** : 182.



C91. *Amphidromus janus* (Pfeiffer)—dorsal view



C92. *Amphidromus janus* (Pfeiffer)—ventral view



C93. *Amphidromus masoni* (Godwin-Austen)—dorsal view



C94. *Amphidromus masoni* (Godwin-Austen)—ventral view



C95. *Amphidromus sinensis* (Benson)—dorsal view



C96. *Amphidromus sinensis* (Benson)—ventral view

Shell sinistral, ovately conical, narrowly perforate, thick, yellowish white with two narrow deep chocolate bands on the lower half of the last whorl; very finely decussately sculptured; spire elongately conical, apex pointed; whorls 5½, flatly rounded, the last convex and globose at base; aperture slightly oblique, ovate, peristome white, thin, reflected; columellar margin vertical, reflected, with an oblique groove at the root (junction with the last whorl), a thin columellar callus present.

Differs being perforate and also in colouration.

Distribution : India : Meghalaya (Khasi hills).

Elsewhere : Bangladesh, China, Myanmar, Vietnam.

Measurements (in mm) :

Length		Diameter		Aperture	
27.30	28.60	15.00	15.40	12.70	12.80

Status : Common.

***Amphidromus sylheticus* (Reeve)**
(C97, C98, 286, 287)

1849. *Bulimus sylheticus* Reeve, *Conch. Icon.*, 1849 : pl. 77, fig. 564.

1914. *Amphidromus sylheticus* : Gude, *Fauna of British India, Mollusca*, 2 : 180.

Shell ovately conical, sinistral, perforate, thin, greenish yellow, apical whorls rather whitish, obliquely striate decussated by microscopic spirals; spire elongately conoid, apex fairly pointed; whorls 5½, convex, the last fairly convex above, globose below;



C97. *Amphidromus sylheticus* (Reeve)—dorsal view

C98. *Amphidromus sylheticus* (Reeve)—dorsal view



C99. *Beddomea intermedia* (Pfeiffer)—dorsal and ventral view



286. *Amphidromus sylheticus* (Benson)—dorsal view

287. *Amphidromus sylheticus* (Benson)—ventral view

aperture oblique, ovate, peristome white reflected; columellar margin dilated with a convex inner edge and an oblique shallow groove above, reflected, a thin parietal callus present.

Nearer to *A. sinensis* differs in lacking the two chocolate bands.

Distribution : India : Meghalaya, Mizoram, Tripura.

Elsewhere : Bangladesh.

Measurements (in mm) :

Length		Diameter		Aperture	
17.80	17.40	10.00	13.85	9.65	12.85

Status : Common.

Genus *Apatetes* Gude, 1914

1914. *Apatetes* Gude, *Fauna of British India*, **2** : 193.

Number of Indian species : One.

Distribution : India : Kerala.

Size Range : 13.00 21.00 mm in diameter.

Apatetes bourdilloni (Theobald)

(288, 289)

1876. *Corasia bourdillonii* Theobald, *J. Asiat. Soc. Beng.*, **45** : 185, pl. 15, fig. 3.

1914. *Apatetes bourdilloni* : Gude, *Fauna of British India, Mollusca*, **2** : 193.

Shell depressedly conoid, sublenticular, very narrowly perforate, thin, brownish white with greenish tinge on the base, rather coarsely sculptured above by raised, oblique close striae and small granules arranged in regular spiral rows, finely decussately marked below; spire conoid, apex pointed; suture impressed; whorls 5-5½, not much convex, the last fairly convex above and below, sharply keeled at the periphery; aperture oblique, large, subquadrate, margin thin and simple; columella briefly reflected, subvertical.



288. *Apatetes bourdilloni* (Theobald)—dorsal view



289. *Apatetes bourdilloni* (Theobald)—ventral view

Distribution : India : Kerala.

Measurements (in mm) :

Height		Diameter		Aperture	
7.25	14.70	13.65	21.40	5.90	11.00

Status : Rare.

Genus *Beddomea* Nevill, 1878

1878. *Beddomea* Nevill, *Hand List. Moll. Indian Mus.*, **1** : 127.

Number of Indian species : Four.

Distribution : India : Kerala, Tamil Nadu (Western Ghat).

Elsewhere : Sri Lanka.

Size Range (Indian species) : 21.00 28.00 mm in length.

***Beddomea physalis* (Benson)**

(290, 291)

1857. *Bulimus physalis* Benson, *Ann. Mag. nat. Hist.*, (2)19 : 328.

1914. *Amphidromus physalis* : Gude, *Fauna of British India, Mollusca*, 2 : 189.

Shell ovately conical, narrowly perforate, thin, greenish white, closely obliquely striate and finely granulate above, minutely decussate below; spire conical, apex rather obtuse; whorls 5½, flat above, the last flatly convex above, slightly tumid on base, keeled at the periphery; aperture strongly oblique, truncately rounded; peristome thin, expanded and reflected; columella with an inside edge, reflected above.



290. *Beddomea physalis* (Benson)—lateral view

291. *Beddomea physalis* (Benson)—lateral view

Distribution : India : Kerala, Tamil Nadu (South Indian hills)

Measurements (in mm) :

Length		Diameter		Aperture	
21.50	22.75	14.15	14.45	11.65	11.70

Status : Not common.

***Beddomea trifasciata* (Gmelin)**

(292, 293)

1790. *Helix trifasciata* Gmelin, *Syst. Nat.*, 1(6) : 3642.

1914. *Amphidromus trifasciata* : Gude, *Fauna of British India, Mollusca*, 2 : 187.

Shell ovately oblong, perforate, thick, white with 3 narrow brown bands on lower half of last whorl, 2 of which extend inside the aperture, also some irregular brown dots on the rest of the shell and threads of same colour running along suture; spire elongate-conical; whorls 6, slightly convex, the last fairly rounded; aperture oblique, ovate, peristome expanded and reflected; columellar margin expanded, slightly reflected above.



292. *Beddomea trifasciata* (Gmelin)—dorsal view 293. *Beddomea trifasciata* (Gmelin)—ventral view

Differs being narrower, rounded at the periphery and having brown bands. The species varies in size and also in form of bands.

Distribution : India : Tamil Nadu.

Elsewhere : Sri Lanka.

Measurements (in mm) :

Length	Diameter	Aperture
23.25	12.10	8.50

Status : Rare.

Genus *Chloritis* Beck, 1837

1837. *Chloritis* Beck, *Moll. Index*, p. 29.

Number of Indian species : Eight.

Distribution : India : Andaman Islands, Arunachal Pradesh, Assam, Kerela, Maharashtra, Meghalaya, Nagaland, Orissa, Tripura, W. Bengal (Darjeeling) above 3500 ft..

Elsewhere : Bangladesh, China, Japan, Malaysia, Myanmar, N. Australia, Philippines, Papua Island, Thailand.

Size Range (Indian species) : 10.00 22.00 mm in diameter.

***Chloritis delibrata* (Benson)**

(294, 295)

1836. *Helix delibratus* Benson, *J. Asiat. Soc. Beng.*, **5** : 352.

1914. *Chloritis delibrata* : Gude, *Fauna of British India, Mollusca*, **2** : 172.

Shell depressed, widely umbilicate, rather thin, semitransparent, brownish to pale yellowish white, often with a single brown band on last whorl, closely obliquely striate above, finely decussate below; with close set stiff hairs and bristles arranged in several rows (seen in the fresh condition); spire much depressed, apex flat; whorls 3-4, convex, increasing rapidly, the last much broad, subangulate around the umbilicus, dilated and distinctly descending in front, aperture oblique, subcircular, margins joined by a thin callus, peiristome thin, reflected, columellar margin oblique, reflected.



294. *Chloritis delibrata* (Benson)—dorsal view **295.** *Chloritis delibrata* (Benson)—ventral view

Varies in relation to height of spire and presence or absence of the brown band.

Distribution : India : Whole of N.E. region. Assam, Arunachal Pradesh, Meghalaya, Mizoram, Tripura, West Bengal (northern part).

Elsewhere : Myanmar.

Measurements (in mm) :

Height		Diameter		Aperture	
8.60	10.80	17.00	19.30	6.85	8.25

Status : Abundant.

Chloritis helferi (Benson)
(296, 297)

1860. *Helix helferi* Benson, *Ann. Mag. nat. Hist.*, (3)6 : 191.

1914. *Chloritis helferi* : Gude, *Fauna of British India, Mollusca*, 2 : 170.

Shell rather small, subdepressely globose, narrowly but deeply umbilicate, fairly thick, brownish with a narrow yellowish band encircling the last whorl above the periphery and extending upward along the suture, sparsely distributed hairs can be seen on the last whorl in fresh condition; closely, obliquely striate above, finely deccussate below; spire low, conoid, suture deep; whorls 4½, fairly convex, the last rounded above and at the periphery, angulate around the umbilicus; peristome thin but widely reflected, columellar margin uniformly reflected, thin parietal callus present.



296. *Chloritis helferi* (Benson)—dorsal view **297.** *Chloritis helferi* (Benson)—ventral view

Close to *C. delibrata*, differs being more narrowly umbilicate and the last whorl having a groove like constriction just behind the peristome at the point where it descends.

Distribution : India : Andaman Islands.

Measurements (in mm) :

Height	Diameter	Aperture
7.05 8.60	12.30 14.80	5.20 6.30

Status : Not common.

Chloritis hemiopta (Benson)
(298)

1863. *Helix hemiopta* Benson, *Ann. Mag. nat. Hist.*, (3)11 : 318.

1914. *Chloritis hemiopta* : Gude, *Fauna of British India, Mollusca*, 2 : 174.

Shell rather small, subdepressedly conoid, thick, very narrowly perforate, whitish with a narrow dark brown band around the last whorl, shell having the two last whorls of reddish brown colour are also recorded; closely obliquely striate and finely granulate, spiral markings more distinct on base; spire considerably raised, suture deep; whorls $4\frac{1}{2}$, fairly convex, the last with a girdle like swelling around the periphery and a corresponding depression just above it, convex below, slightly descending in front; aperture oblique, subquadrately lunate, peristome reflected, arcuate at the upper margin; columellar margin widely, triangularly reflected, above.



298. *Chloritis hemiopta* (Benson)—lateral view

Differs from others being conoid with a higher spire, being very narrowly perforate and also having a girdle like swelling on the last whorl.

Distribution : India : Andaman Islands.

Measurements (in mm) :

Height		Diameter		Aperture	
9.20	13.15	14.60	16.85	6.35	7.75

Status : Common.

Genus *Ganesella* Blanford, 1863

1863. *Ganesella* Blanford, *Ann. Mag. nat. Hist.*, (3)11 : 86.

Number of Indian species : Three.

Distribution : India : Arunachal Pradesh, Bihar, Meghalaya, Nagaland, West Bengal (Jalpaiguri) (above 3000 ft).

Elsewhere : China, Combia, Japan, Malaysia, Myanmar, Philippines, Thailand.

Size Range (Indian species) : 8.00 16.40 mm in diameter.

***Ganesella acris* (Benson)**
(299, 300)

1859. *Helix acris* Benson, *Ann. Mag. nat. Hist.*, (3)3 : 387.

1914. *Ganesella acris* : Gude, *Fauna of British India, Mollusca*, 2 : 194.

Shell rather small, conically elongate, trochiform, perforate, fairly thick, white with slight yellowish tinge and a brownish tint along the keel; obliquely, rather distinctly marked above and below; spire elongately conical, apex pointed; whorls $6\frac{1}{2}$ - 7, flattened on sides, the last keeled at periphery, flattened on base, slightly descending in front; aperture oblique, quadrately lunate, peristome thin, slightly expanded and reflected, basal margin reflected.



299. *Ganesella acris* (Benson)—dorsal view

300. *Ganesella acris* (Benson)—ventral view

Distribution : India : Arunachal Pradesh, Meghalaya, Nagaland, West Bengal (Jalpaiguri).

Measurements (in mm) :

Height	Diameter	Aperture
8.50-10.15	8.25-9.55	3.55-4.70

Status : Common.

***Ganesella capitium* (Benson)**
(301, 302)

1848. *Helix capitium* Benson, *Ann. Mag. nat. Hist.*, (2)2 : 160.

1914. *Ganesella capitium* : Gude, *Fauna of British India, Mollusca*, 2 : 196.

Shell of moderate size, globosely conical, subtrochiform, narrowly perforate, rather thin, bright dark brownish with irregularly arranged creamy white streaks; very finely and closely deccussate above and below; spire conical, suture impressed and marginate; whorls $5\frac{1}{2}$, convex, the last compressedly keeled at the periphery,



301. *Ganesella capitium* (Benson)—dorsal view **302.** *Ganesella capitium* (Benson)—lateral view
 descending in front and convex at base; aperture strongly oblique, roundly quadrate, peristome thin, slightly expanded above, reflected on lower margin; columellar margin triangularly reflected, vertical.

Differs being less elongate and convex on base, also differs in colouration.

Distribution : India : Bihar, West Bengal and South India.

Elsewhere : Myanmar.

Measurements (in mm) :

Length	Diameter	Aperture
12.50-15.55	13.10-16.40	7.40-8.80

Status : Common.

Genus *Landouria* Godwin-Austen, 1918

1918. *Landouria* Godwin-Austen, *Rec. Indian Mus.*, **8** : 604.

Number of Indian species : Four.

Distribution : India : Arunachal Pradesh, Himachal Pradesh, Kashmir, Nagaland, Tamil Nadu, West Bengal.

Elsewhere : China, Indonesia, Japan, Korea, Malaysia, Myanmar, Thailand.

Size Range (Indian species) : 10.00 12.25 mm in diameter.

Landouria huttoni (Pfeiffer)

(303)

1842. *Helix huttoni* Pfeiffer, *Symb. Hist. Helic.*, **2** : 82.

1914. *Plectotropis huttoni* : Gude, *Fauna of British India, Mollusca*, **2** : 211.

Shell rather small, depressedly convex, widely umbilicate, thin, brownish, roughly sculptured with close oblique striae above and below, a row of hairs on the periphery

(seen in fresh condition); spire conoidly raised; whorls 6, convex, narrowly coiled, the last keeled or angulate at the periphery, descending near the aperture, rounded below and angulate around the umbilicus; aperture roundly lunate, peristome thin and sharp; columellar margin slightly expanded, basal margin reflected.



303. *Landouria huttoni* (Pfeifer)—dorsal and ventral view

Distribution : India : On hills (8000ft.). Arunachal Pradesh, Himachal Pradesh, Nagaland, Kashmir, Tamil Nadu, West Bengal(Darjeeling).

Elsewhere : China, Myanmar, Sri Lanka.

Measurements (in mm) :

Height	Diameter	Aperture
6.90-7.70	10.30-12.25	4.55-5.00

Status : Common.

***Landouria hengdanensis* Godwin-Austen**
(Fig. 56)

1918. *Landouria hengdanensis* Godwin-Austen, *Rec. Indian Mus.*, 8 : 608, text fig. 2 E.

Shell small, globosely conoid, openly umbilicate, pale brownish, obliquely striate, with faint spiral markings; spire conoid, suture shallow; whorls 5, convex, narrowly coiled, the last whorl rounded, slightly descending, flat on base; aperture semilunate, peristome thin, columellar margin oblique, slightly reflected.

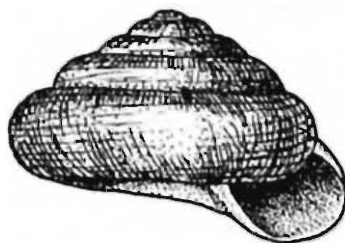


Fig. 56. *Landouria hengdanensis* : lateral view

Differs from the other being rounded on the periphery, flatter on base, having spiral sculpture near the umbilicus and also the columellar margin being oblique.

Distribution : India : Arunachal Pradesh, Madhya Pradesh, Maharashtra.

Measurements (in mm) :

Height	Diameter
4.50	10.00

Status : Abundant.

Genus *Mikiria* Godwin-Austen, 1918

1918. *Mikiria* Godwin-Austen, *Rec. Indian Mus.*, **8** : 604.

Number of Indian species : One.

Distribution : India : Assam (Diyung valley, Nowgong).

Size Range : 16.00 mm in diameter.

Represented by single species from Abor hills, has not been included since it could not be studied.

Genus *Oreobba* Pilsbry, 1894

1894. *Oreobba* Pilsbry, *Man. Conch.*, (2)**9** : 109.

Number of Indian species : One, Monotypic genus.

Distribution : India : Nicobar Islands.

Size Range : 9.00 20.00 mm in diameter.

Oreobba codonodes (Pfeiffer) (C100)

1846. *Helix codonodes* Pfeiffer, *Proc. zool. Soc. Lond.*, **1846** : 112.

1914. *Oreobba codonodes* : Gude, *Fauna of British India, Mollusca*, **2** : 152.

Shell fairly large, globosely conoid, narrowly perforate thick and solid, variously coloured, yellowish white to whitish with a deep chocolate band on the periphery rising round the entire shell, some have reddish brown last whorl and in some the band is absent; obliquely striate, decussated by close spiral lines both above and below; spire globosely conoid, apex roundly blunt; whorls 5½-6, convex, last whorl rather rounded at periphery, constricted just behind the aperture, descending in front; aperture oblique, roundly subquadrangle, peristome thickened and reflected, columellar margin thickened, broadly reflected above, with a blunt tooth on the inside margin, parietal callus fairly developed.



C100. *Oreobba codonodes* (Pfeiffer)—ventral and dorsal view

Shows variation in length diameter ratio.

Distribution : India : Endemic to Nicobar Islands.

Measurements: (in mm) :

Height	Diameter	Aperture
6.35-21.20	9.65-19.15	5.00-9.80

Status : Common.

Genus *Trachia* Albers, 1860

1860. *Trachia* Albers, *Die Heliceen*, ed. 2, p. 160.

Number of Indian species : Fourteen.

Distribution : India : Andaman Islands, Bihar, Delhi, Kerala, Madhya Pradesh, Maharashtra, Orissa, Pondicherry, Tamil Nadu.

Elsewhere : Bangladesh, Sri Lanka.

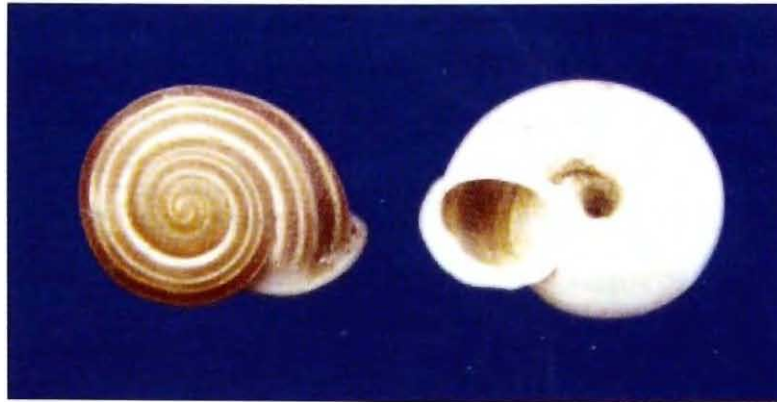
Size Range (Indian species) : 4.00 - 28.00 mm in diameter.

Trachia asperella (Pfeiffer) (C101)

1846. *Helix asperella* Pfeiffer, *Symb. Hist. Helic.*, 3 : 78.

1914. *Planispira (Trachia) asperella* : Gude, *Fauna of British India, Mollusca*, 2 : 155.

Shell small, depressed, broadly perforate, thick, pale yellowish to whitish with deep chocolate bands of variable formations, commonly with one broad band above the periphery and a few narrow ones on both sides often with a very broad one on the base. Shells without bands are also reported; roughly sculptured with close oblique striae crowded with microscopic granules throughout; spire very low, almost flattened,



C101. *Trachia asperella* (Pfeiffer)—dorsal and ventral view

whorls 4, flattened above, last whorl bluntly angulate above the periphery, slightly compressed and tapering below, descending in front; aperture oblique, semicircular, margins strongly reflected throughout, columella slowly curving.

Distribution : India : Andhra Pradesh, Madhya Pradesh, Maharashtra.

Measurements: (in mm) :

Length	Diameter	Aperture
4.25-6.00	4.35-12.40	3.30-4.60

Status : Abundant.

***Trachia crassicostata* (Benson)**

(304)

1848. *Helix crassicostata* Benson, *Ann. Mag. nat. Hist.*, (2)2 : 159.

1914. *Planispira (Trachia) crassicostata* : Gude, *Fauna of British India, Mollusca*, 2 : 158.

Shell small, depressed, openly perforate, fairly thick, white, very coarsely sculptured with rather distant, oblique raised ribs above, sculpture is closer below; spire very



304. *Trachia crassicostata* (Benson)—dorsal and ventral view

low, convex, suture deep; whorls 4, narrow, flattened above, the last keeled at the periphery with a groove like depression just below, fairly convex at base, angulate around perforation, descending in front; aperture oblique, subcircular, peristome continuous, margin slightly reflected.

Differs being without bands and having very coarse sculpture.

Distribution : India : Peninsular India.

Measurements: (in mm) :

Length	Diameter	Aperture
4.30-5.35	7.15-10.30	3.00-4.20

Status : Abundant.

***Trachia fallaciosa* (Ferussac)**
(305, 306)

1832. *Helix (Helicella) fallaciosa* Ferussac, *Hist. Nat. Moll.*, 1832, pl. 71, figs. 1-3.

1914. *Planispira (Trachia) fallaciosa* : Gude, *Fauna of British India, Mollusca*, 2 : 157.

Shell larger, depressedly globose, openly umbilicate, pale whitish to yellow with or without bands, usually with one or two brown bands above and below the periphery; finely and closely striate both above and below; spire low, conoid; whorls 4½–5, rather flattened above, last whorl well rounded above and below, angulate around umbilicus, dilated and descending in front, slightly constricted behind the peristome below; aperture oblique, ovately rounded, peristome thin, reflected, basal margin almost straight, columellar margin curved and reflected.

Closer to *T. asperella* bigger with less number of bands, also differs in the last whorl being rounded and not tapering below.

Distribution : India : Kerala, Tamil, Nadu.



305. *Trachia fallaciosa* (Ferrussac)–dorsal view

306. *Trachia fallaciosa* (Ferrussac)–ventral view

Elsewhere : Sri Lanka.

Measurements: (in mm) :

Length	Diameter	Aperture
5.00-5.25	20.00-20.15	7.55-7.56

Status : Not common.

Trachia ruginosa (Ferussac)
(307, 308)

1832. *Helix (Helicella) ruginosa* Ferussac, *Hist. Nat. Moll.*, 1832 : pl. 71, fig. 4.

1914. *Planispira (Trachia) ruginosa* : Gude, *Fauna of British India, Mollusca*, 2 : 161.

Shell small, subdiscoidal, umbilicate, thick, whitish with a number of narrow brown bands, a prominent one on the periphery and few feeble ones above and below it; densely sculptured by close oblique, raised ribs throughout; spire low, conoid, suture shallow; whorls 4½, flattened above, last whorl rather subangulate above the periphery, slightly compressed below, descending and angulate around umbilicus; aperture ovately rounded, peristome thin, basal and columellar margins reflected.



307. *Trachia ruginosa* (Ferrussac)—dorsal view 308. *Trachia ruginosa* (Ferrussac)—ventral view

Approaches *T. asperella* in general, differs being coarsely sculptured and also having a more raised spire, and differs from *T. crassicostata* having coloured bands and lacking the circular groove on the last whorl.

Distribution : India : Tamil Nadu.

Measurements (in mm) :

Length	Diameter	Aperture
7.00-7.30	13.50-13.60	4.70-4.75

Status : Not common.

***Trachia trochalia* (Benson)**
(C102, C103, 309)

1861. *Helix trochalia* Benson, *Ann. Mag. nat. Hist.*, (3)7 : 82.

1914. *Planispira (Trachia) trochalia* : Gude, *Fauna of British India, Mollusca*, 2 : 164.

Shell large, sublenticular, orbiculately conoid, narrowly perforate thick, chestnut or reddish brown, apical whorls paler, closely obliquely striate with very close microscopic spiral markings, more distinct on the last whorl and on the base; spire conically raised; whorls 5, flattened above, the last strongly keeled at the periphery, the keel extending upto the penultimate whorl to a certain distance, slightly compressed below the keel, contracted behind the peristome, fairly convex below, descending in front; aperture oblique, elliptically lunate, peristome expanded and reflected, upper margin almost straight, basal margin curved, columellar margin oblique, dilated and broadly reflected above, a thin parietal callus present.

Distinct for its bright reddish brown colour, larger size and trochoid spire.

Distribution : India : Andaman Islands.

Measurements (in mm) :

Length	Diameter	Aperture
13.20-15.00	20.35-22.80	8.75-9.70

Status : Common.



C102. *Trachia trochalia* (Benson)—lateral view **C103.** *Trachia trochalia* (Benson)—lateral view



309. *Trachia trochalia* (Benson)—dorsal and ventral view

Trachia vittata (Mueller)
(C104, C105)

1774. *Helix vittata* Mueller, *Verm. Terr. Fluv.*, 2 : 76.

1914. *Planispira (Trachia) vittata*: Gude, *Fauna of British India, Mollusca*, 2 : 164.

Shell fairly large, globosely conoid, thick, perforate, yellowish to whitish, usually with yellowish or brownish bands of variable numbers (1 to 10), deep chocolate inside the aperture, including peristome and columella; apical whorls often blackish brown; closely obliquely striate; spire convex, suture fairly impressed; whorls 4½–5, convex above, last whorl broad and globosely rounded, dilated and steeply descending in front; aperture oblique, subovate, peristome broadly expanded and reflected, basal margin nearly straight, columella strongly reflected concealing the perforation.



C104. *Trachia vittata* (Mueller)—lateral view

C105. *Trachia vittata* (Mueller)—lateral view

Completely white shells without bands also occur.

Distinct for its globose shape and deep chocolate aperture.

T. vittata is one of those species which like the salty environment and inhabit the bushy patches in the vicinity of coastal areas climbing over the thorny plants. The empty shells remain strewn on the dry sandy stretches.

Distribution : India : South India : Kerala, Tamil, Nadu.

Elsewhere : Sri Lanka.

Measurements: (in mm) :

Length	Diameter	Aperture
15.70-17.60	21.95-26.25	9.40-10.65

Status : Abundant.

Family BRADYBAENIDAE

Shell depressed, widely umbilicate, rounded or carinate, usually with a shaggy cuticle, often with rows of hairs, whorls narrow, body whorl usually descending in front, aperture oblique, roundly lunate, peristome narrowly thickened.

India, China, Japan, Malaysia, Myanmar.

On grounds also on trees.

Reference

Richardson, L. 1983. Bradybaenidae : Catalog of species. *Tryonia*, **9** : 1-253.

Key to the genera

Shell weakly sculptured, last whorl straight in front *Bradybaena*

Shell strongly sculptured, last whorl descending in front *Aegista*

Subfamily BRADYBAENINAE

Number of Indian genera : Three.

Genus *Bradybaena* Beck, 1837

Number of Indian species : Eight.

Distribution : India : Throughout.

Elsewhere : Widely distributed through Asia, S. Africa and Pacific Islands, Argentina, Brazil.

Size Range (Indian species) : 13.00 - 16.40 mm in diameter

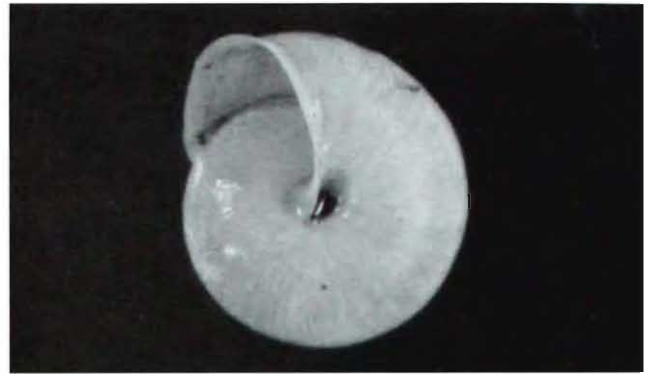
***Bradybaena cestus* (Benson)**

(310, 311)

1836. *Helix cestus* Benson, *J. Asiat. Soc. Beng.*, **5** : 353.

1914. *Eulota cestus* : Gude, *Fauna of British India, Mollusca*, **2** : 200.

Shell subdepressedly conoid, thin, narrowly perforate, uniformly reddish brown or pale white with a narrow rufous band on the periphery, finely obliquely striate, minutely granulated, indistinct spiral markings on base; spire conoid, apex obtuse; whorls 5, slightly convex above, the last subangulate at the periphery, fairly convex below; aperture oblique, roundly lunate, peristome thin, slightly expanded and reflected, upper and basal margin rounded, columellar margin obliquely descending, reflected over the perforation.



310. *Bradybaena cestus* (Benson)—dorsal view 311. *Bradybaena cestus* (Benson)—ventral view

Distribution : India : Arunachal Pradesh, Assam.

Elsewhere : Kampuchia.

Measurements (in mm) :

Length	Diameter	Aperture
9.70-10.90	14.55-16.00	6.95-7.65

Status : Not common.

***Bradybaena radiculicola* (Benson)**
(312, 313)

1848. *Helix radiculicola* Benson, *Ann. Mag. nat. Hist.*, (2)2 : 161.

1914. *Eulota radiculicola* : Gude, *Fauna of British India, Mollusca*, 2 : 205.



312. *Bradybaena radiculicola* (Benson)—dorsal view 313. *Bradybaena radiculicola* (Benson)—lateral view

Shell rather small, subglobose conoid, very minutely perforate, thin, light brownish with fine but distinct decussate sculpture both above and below; spire conoidly raised, apex rather pointed; whorls $4\frac{1}{2}$, convex, the last whorl obtusely angulate at the periphery, convex beneath; aperture oblique, subquadrately rounded, peristome thin, slightly reflected, upper margin arcuate, basal margin evenly curved, columellar margin

vertical and reflected above, almost covering the perforation, a thin parietal callus present.

Differs being more high, being distinctly spirally marked and also being almost imperforate.

Distribution : India : Himachal Pradesh, Sikkim, Uttaranchal, West Bengal (Darjeeling).

Measurements (in mm) :

Length	Diameter	Aperture
13.50	15.60	8.85

Status : Rare.

Bradybaena similaris (Ferussac)
(314, 315)

1822. *Helix (Helicogena) similaris* Ferussac, *Hist. Nat. Moll.*, **15**, pl. 25, fig. 1.

1914. *Eulota similaris* : Gude, *Fauna of British India, Mollusca*, **2** : 200.

Shell rather small, depressedly globose, openly perforate, thin, semitransparent, pale whitish to brownish, sometimes with a narrow brown band on the periphery; very finely decussately sculptured above and below; spire convexly raised, apex rather pointed; whorls 5-6, fairly convex, the last whorl rounded or subangulate at the periphery, convex at base, subangulate around the perforation; aperture roundly lunate, peristome thin, slightly reflected, columellar margin subvertical, dilated and reflected.



314. *Bradybaena similaris* (Ferrussac)—dorsal view



315. *Bradybaena similaris* (Ferrussac)—ventral view

Shell in this species shows some variation as regards its height of spire and angulation on last whorl, is usually sublenticular with rounded last whorl. Differs from others in being rounded at periphery and openly perforate.

Distribution : India : Arunachal Pradesh, Assam, Manipur, Mizoram.

Elsewhere : Argentina, Brazil, China, Cuba, Japan, Indonesia, Malaysia, Myanmar, Sri Lanka, West Indies and various Pacific Islands.

Measurements: (in mm) :

Length	Diameter	Aperture
8.70-12.00	13.65-16.40	7.05-7.90

Status : Abundant.

Genus *Aegista* von Martens, 1860

1860. *Aegista* (Albers) von Martens, *Die Heliceen*, ed. 2 : 121.

Number of Indian species : Twelve.

Distribution : India : Assam, Manipur, Meghalaya, Mizoram, Nagaland, West Bengal.

Elsewhere : China, Myanmar.

Size Range (Indian Species) : 4.00-18.00 mm in diameter

Subgenus *Aegista* s.st.

Aegista (*Aegista*) *mitanensis* Godwin-Austen
(316)

1889. *Helix* (*Aegista*) *mitanensis* Godwin-Austen, *Ann. Mag. nat. Hist.*, (6)3 : 108.

1914. *Aegista mitanensis* : Gude, *Fauna of British India, Mollusca*, 2 : 221.



316. *Aegista mitanensis* Godwin-Austen—dorsal and ventral view

Shell small, globosely conical, openly perforate, thin, greenish brown, finely sculptured by close oblique striae and faint spiral markings above and below; spire conoid; whorls 6, convex, narrowly coiled; the last whorl subangulate at periphery, rounded below, dilated and descending in front; aperture subcircular, peristome thin, upper margin sinuate, columellar margin oblique and reflected above.

Distribution : India : Manipur.

Elsewhere : Myanmar.

Measurements: (in mm) :

Length	Diameter	Aperture
6.65-8.35	4.25-10.65	4.00-4.40

Status : Not common.

Subgenus *Plectotropis* von Martens, 1860

1860. *Plectotropis* von Martens, *Die Heliceen.*, 2 : 121.

Number of Indian species : Eight.

Distribution : India : Assam, Meghalaya, Mizoram, Nagaland.

Elsewhere : China, Myanmar.

Size Range (Indian species) : 9.00 18.00 mm in diameter

Aegista(Plectotropis) oldhami (Benson)
(317, 318)

1857. *Helix oldhami* (Benson) Theobald, *J.Asiat. Soc. Beng.*, 26 : 248.

1914. *Plectotropis oldhami* : Gude, *Fauna of British India, Mollusca*, 2 : 212.



317. *Aegista oldhami* (Benson)—dorsal view

318. *Aegista oldhami* (Benson)—ventral view

Shell fairly large, orbiculate depressed, very widely umbilicate, rather thin, greenish brown, roughly sculptured by close raised striae and fine decussating spiral lines both above and below; spire depressedly conoid, apex obtuse; whorls 6-7, very little convex above, narrow, last whorl obtusely angulate above the periphery, descending in front, slightly compressed below and angulate around the umbilicus; aperture oblique, lunately rounded, peristome thin, expanded and slightly reflected.

Distribution : India : Assam, Mizoram.

Elsewhere : Myanmar.

Measurements (in mm) :

Length	Diameter	Aperture
6.90	14.60	5.00

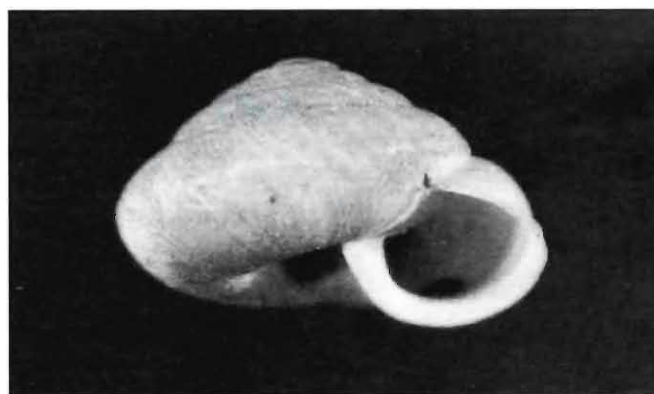
Status : Rare.

Aegista (Plectotropis) tapeina (Benson)
(319)

1836. *Helix tapeina* Benson, *J. Asiat. Soc. Beng.*, **5** : 352.

1914. *Plectotropis tapeina* : Gude, *Fauna of British India, Mollusca*, **2** : 214.

Shell fairly large, subdepressedly conoid, rather lenticular, thick, widely umbilicate, greenish, obliquely striate, spiral sculpture indistinct; spire low, conoid; whorls 6-7, rather flattened above, last whorl bluntly angulate at periphery, rounded below, subangulate around umbilicus, descending in front, aperture oblique, semicircular, peristome thin, slightly reflected, columellar margin simple very slightly reflected.



319. *Aegista tapeina* (Benson)—lateral view

Varies in height of spire and angulation of the last whorl, differs from above being less widely umbilicate (less than 5 mm in width) a little high and more sharply angulate.

Distribution : India : Arunachal Pradesh, Assam, Meghalaya, Mizoram and West Bengal.

Elsewhere : Myanmar

Measurements (in mm) :

Length	Diameter	Aperture
7.70 8.10	14.35 16.00	5.50 6.00

Status : Abundant.

Genus *Cathaica* Moellendorff, 1884

1884. *Cathaica* Moellendorff, *Jahrb. Deuts. Malak. Ges.*, 11 : 339.

Number of Indian species : Two.

Distribution : India : Kashmir.

Elsewhere : Afghanistan, Myanmar, Turkey.

Size Range (Indian species) : 13.00 – 17.00 mm in diameter

Represented by two species in Kashmir (above 11000 ft.) could not be included since no specimen was available for study.

BIBLIOGRAPHY

- Abbott, T.1989. Compendium of land shells with colour plates.1-240. American Malacologists, Melbourne, Florida.
- Annandale, N. and Rao, H.S. 1923a. The fauna of the Salt Range, Punjab. *Mollusca. Rec. Indian Mus.*, **25** : 387-397.
- Annandale, N. and Rao, H.S. 1923b. Further observation on the Mollusca of the Punjab, Salt Range. *Rec. Indian Mus.*, **25** : 601-602.
- Beddome, R.H. 1875. Description of some new operculated land shells from southern India and Ceylon. *Proc. zool. Soc. Lond.*, **1875** : 442-953, pls. 52-53.
- Beddome, R.H. 1891. Description of some new land shells from the Indian region. *Proc. zool. Soc. Lond.*, **1891** : 313-315, pl. 29.
- Beddome, R.H. 1906. Notes on Indian and Ceylonese species of *Glessula*. *Proc. malac. Soc. Lond.*, **7** : 160-172, pl. 15.
- Benson, W.H. 1832. Conchological notes, chiefly relating to the land and freshwater shells of the Doab and the Gangetic Provinces of Hindostan. *J. Asiat. Soc. Beng.* **1** : 75-77.
- Benson, W.H. 1836. Descriptive catalogue of a collection of land and freshwater shells chiefly in the Museum of Asiatic Society. *J. Asiat. Soc. Beng.* **1** : 75-77.
- Benson, W.H. 1851. Geographical notices and characters of fourteen new species of Cyclostomacea from the East Indies. *Ann. Mag.nat. Hist.*, **(2)8** : 184-195.
- Benson, W.H. 1852a. Notes on the genus *Cyclostoma* and characters of some new species from India, Borneo and Natal. *Ann. Mag. nat. Hist.*, **(2)10** : 268-272.
- Benson, W.H. 1852b. Notice of an Australian *Diplommatina* and characters of new East Indian Helicinidae from Darjeeling and Singapore. *Ann. Mag. nat. Hist.*, **(2)10** : 268-272.
- Benson, W.H.1854. Characters of four Indian species of *Cyclophorus* Montfort, followed by notes on the geographical distribution of the genera of the Cyclostomacea with remarks on its affinities and notes on several opercula. *Ann. Mag. nat. Hist.*, **(2)14** : 411-418.
- Benson, W.H.1857. Characters of *Streptaulus* a new genus and several species of the Cyclostomacea from Sikkim, the Khasi Hills Ava and Pegu. *Ann. Mag. nat. Hist.*, **19(2)** : 201-211.
- Benson, W.H. 1859a. Description of new species of *Helix*, *Streptaxis*, *Vitrina*, collected by W. Theobald, Jun in Burmah, the Khasi Hills and Hindustan. *Ann. Mag. nat. Hist.*, **(3)3** : 184-189.

- Benson, W.H.1859b. New Helicidae collected by W.Theobald Esq. Jun in Burmah and the Khasi Hills and characters of a new Burmese *Streptaxis* described by W.H.Benson Esq. *Ann. Mag. nat. Hist.*, (3)3 : 387-392.
- Benson, W.H.1859c. Characters of a new Burmese *Streptaxis* and two forms belonging to a peculiar section of *Helix*, collected by Captain Richard H. Sankey from Madras Egmore. *Ann. Mag. nat. Hist.*, (3) 3 : 71-474.
- Benson, W.H.1859d. Observations on the shell and animal of *Hybocystis*, a new genus of Cyclostomidae based on *Megalomastoma gravidum* and *Otopoma blenus* with notes on other living shells from India and Burmah. *Ann. Mag. nat. Hist.*, (3)4 : 90-93.
- Benson, W.H.1860a. Characters of new land shells from Burma and the Andamans. *Ann. Mag. nat. Hist.*, (3)6 : 190-195.
- Benson, W.H. 1860b. Notes on *Plectopylis*, a group of Helicidae distinguished by several internal plicate ephiphragms; with the characters of a new species. *Ann. Mag. nat. Hist.*, (3)5 : 243-247.
- Benson, W.H. 1863a. Characters of new land shells of the genus *Helix*, *Clausilia*, *Spiraxis* from Andaman, Moulmein, Northern India and Ceylon. *Ann. Mag. nat. Hist.*, (3)11 : 87-91.
- Benson, W.H. 1863b. Characters of new land shells from the Andaman island, Burma and Ceylon and of the animal of *Sophina*. *Ann. Mag. nat. Hist.*, (3)11 : 318-323.
- Benson, W.H. 1863c. Characters of new operculate land shells from the Andamans and of Indo Burmese species of *Pupa*. *Ann. Mag. nat. Hist.*, (3)12 : 425-429.
- Benson, W.H. 1864. Characters of *Coilostele* an undescribed genus of Auriculacea and of species of *Helix*, *Pupa* and *Ancylus* from India, West Africa and Ceylon. *Ann. Mag. nat. Hist.*, (3)11 : 87-91.
- Bentham Jutting, w.s.s. van,1948. Systematic studies on the non marine mollusca of the Indo-Australian Archipelago I. Critical Revision of the families Hydrocenidae, Helicinidae, Cyclophoridae, Pupinidae and Cochlostomatidae. *Treubia*, 19(3) : 1-603, figs.1-60.
- Bentham Jutting, w.s.s. van, 1950a. Systematic studies on the non marine mollusca of the Indo-Australian Archipelago II. Critical Revision of the Javanese Pulmonate land shells of the family Helicarionidae, Pleurodontidae, Fruticicolidae and Streptaxidae. *Treubia*, 20 : 381-505., figs. 1-107.
- Bentham Jutting, w.s.s. van,1950b. The Malayan species of *Boysidia*, *Paraboysidia*, *Hypselostoma* and *Gyliotrachela* (Gastropoda, Pulmonata, Vertiginidae) with a catalogue of all species hitherto described. *Bull. Raffles Mus., Singapore*, 21 : 5-47, 21 figs.

- Bhalla, O.P. & Pawar, A.D. 1977. A survey of insect and non-insect pests of economic importance in Himachal Pradesh. *Monograph, Dept. of Entomology-Zoology, College of Agriculture Chambaghat, Solan*, pp. 1-80.
- Bharadwaj, A.K. & Thakur, J.R. 1973. Record of snail *Bensonia monticola* Hutton as a pest of beans. *Curr. Sci.*, **42(21)** : 769.
- Blanford, W.T. 1862. Contribution to Indian Malacology No III. Description of new Operculated land shells from Pegu, Arakan and the Khasi Hills. *J. Asiat. Soc. Beng.*, **31(2)** : 135-144.
- Blanford, W.T. 1865. Notes on the variation of some Indian and Burmese Helicidae with an attempt at the rearrangement together with descriptions of new Burmese gastropoda. *J. Asiat. Soc. Beng.*, **38** : 230-250.
- Blanford, W.T. 1870. Contribution to Indian Malacology No. XI, description of new species of *Paludomus*, *Cremnoconchus*, *Cyclostoma* and of Helicidae from various parts of India. *J. Asiat. Soc. Beng.*, **39** : 9-25.
- Blanford, W.T. 1880. Contribution to Indian Malacology No. XII. Description of new land and freshwater shells from southern and Western India, Burma the Andaman Islands. *J. Asiat. Soc. Beng.*, **49(2)** : 181-222.
- Blanford, W.T. 1889. On some species of shells of the genera *Streptaxis* and *Ennea* from India, Ceylon and Burma. *Proc. zool. Soc. Lond.*, 1899 : 764-770.
- Blanford, W.T. & Blanford, H. 1860. Contribution to Indian Malacology. *J. Asiat. Soc. Beng.*, **29** : 117-127.
- Blanford, W.T. & Blanford, H. 1861. Contribution to Indian Malacology. *J. Asiat. Soc. Beng.*, **30** : 347-366.
- Cain, A. J. 1977. Variation in the spire index of some coiled gastropod shells and its evolutionary significance. *Philos. Trans. R. Soc. London*, ser. B **277** : 377-428.
- Dey, A., Barua, S. & Mitra, S.C. 1985. Mollusca of Proposed Namdapha Biosphere Reserve. *Rec. zool. Surv. India*, **82(1-4)** : 263-274.
- Dey, A., Barua, S. & Mitra, S.C. 2003. Mollusca Fauna of Sikkim. *Rec. zool. Surv. India, State Fauna Series*, **9(5)** : 129-144.
- Dey, A. & Mitra, S.C. 2000. Molluscs of the Himalaya. *Rec. zool. Surv. India*, **98(2)** : 5-50.
- Godwin-Austen, H.H. 1876. On the Cyclostomacea of the Dafla Hills, Assam. *J. Asiat. Soc. Beng.*, **45(2)** : 171-184, pls.7-8.
- Godwin-Austen, H.H. 1879. Description of shells from Perak and the Nicobar Islands. *Proc. zool. Soc. Lond.*, 1879 : 732-740.

- Godwin-Austen, H.H. 1882-1920. Land and freshwater mollusca of India, including South Arabia, Baluchistan, Afghanistan, Kashmir, Nepal, Burma, Pegu, Tenasserim, Malaya Peninsula, Ceylon and other islands of the Indian Ocean; Supplementary to Messers Theobald and Hanley's *Conch. Indica*. Taylor and Francis London in 3 volumes : 1-432, 1-65.
- Godwin-Austen, H.H. 1893. On some new species of the land molluscan genus *Alycaeus* from the Khasi and Naga hill country, Assam, Manipur and the Ruby Mine district, upper Burma and on one species from the Nicobars. *Proc. zool. Soc. Lond.*, 1895 : 438-457.
- Godwin-Austen, H.H. 1895. List and distribution of the land mollusca of the Andaman and Nicobar islands with descriptions of some supposed new species. *Proc. zool. Soc. Lond.*, 1895 : 438-457.
- Godwin-Austen, H.H. 1914. Zoological Results of the Abor Expedition Mollusca 2 : Zonitidae & Helicidae. *Rec. Indian Mus.* **8** : 359-363.
- Godwin-Austen, H.H. 1915. Zoological Results of the Abor Expedition Mollusca 3 : Cyclophoridae (part). *Rec. Indian Mus.* **8** : 393-503.
- Godwin-Austen, H.H. 1916. Zoological Results of the Abor Expedition Mollusca 6. *Rec. Indian Mus.* **8** : 547-559.
- Godwin-Austen, H.H. 1917a. Zoological Results of the Abor Expedition Mollusca 7, Cyclophoridae (part). *Rec. Indian Mus.* **8** : 547-559.
- Godwin-Austen, H.H. 1917b. The land mollusca collected on the island of Barkuda in the Chilka lake, Ganjam. *Rec. Indian Mus.* **13** : 345-351.
- Godwin-Austen, H.H. 1918. Zoological Results of the Abor Expedition Mollusca 8, Macrochlamydiae (part). *Rec. Indian Mus.* **8** : 581-650.
- Godwin-Austen, H.H. 1918. Zoological Results of the Abor Expedition Mollusca 9. *Rec. Indian Mus.* **8** : 601-621.
- Gude, G.K. 1906. Further remarks on the genus *Chloritis* with description of eleven new species. *Proc. malac. Soc. Lond.*, **7** : 105-118.
- Gude, G.K. 1915. Zoological Results of the Abor Expedition, 1911-12. *Rec. Indian Mus.*, **8** : 505-513.
- Hanley, S. & Theobald, W. 1876. *Conchologia Indica*, London, 1-65, pls 1-160.
- Hutton, T. 1834. On the land shells of India. *J. Asiat. Soc. Beng.*, **3** : 81-93.
- Hyman, L.H. 1967. The Invertebrates Volume **6(1)** Mollusca. pp. 792. McGraw Hill Book Company.
- Limaya, L.S., Pradhan, V.R., Bhopale, M.K., Ranapurkar, D.M. & Sharma, K.D. 1988.

- Angiostrongylus cantonensis* : Study of intermediate paratenic and definite host in Greater Bombay. *Helminthologia (Bratisl)* : **25**(1) : 31-39.
- Mason, C.F 1970. Snail populations, beach litter population and the role of snails in litter decomposition. *Oecologia (Berl.)* **5** : 215-239.
- Mitra, S.C. & Dey, A. 1990. Land molluscs of Teirei River Valley Project, Darlak (Mizoram : India). *Rec. zool. Surv. India*, **86** : 47-67.
- Mitra, S.C. & Dey, A. 1992. Land and freshwater molluscs (Part 1). Fauna of West Bengal. Part 9 : 1-51. State Fauna series : **3 Pub** : *Zoological Survey of India, Calcutta*.
- Mookherjee, H.P., Thakur, D.K, Mitra, S.C. & Barua, S., 2000. Mollusca : Fauna of Tripura. *Rec. zool. Surv. India*, State Fauna Series, **7(4)** : 323-355.
- Naggs, Fred. 1997. William Benson and the early study of land snails in British India and Ceylon. *Archv. Nat. Hist.*, **24(1)** : 37-88.
- Nevill, G. 1878. Hand list of Mollusca in the Indian Museum, **1** : 1-338.
- Nevill, G. 1881. New or little known Mollusca of the Indo-Malyan Fauna. *J. Asiat. Soc. Beng.*, **50(2)** : 125-167, pls. 5-8.
- Pilsbry, H. A. 1909-10. Manual of Conchology, (2nd series Pulmonata). *Caecilliids, Glessula* and Partulidae) : 1-320, pls.1-43.
- Preston, H.B. 1908. Description of new land, marine and freshwater shells from the Andaman islands. *Rec. Indian Mus.*, **2(1)** : 187-210, pl. 20, text figs. 1-17.
- Preston, H.B. 1915. Zoological Results of the Abor Expedition (1911-12) Mollusca V. *Rec. Indian Mus.*, **8** : 537 - 541.
- Rajagopal, A.S. and Subba Rao, N.V., 1972. Some land molluscs of Kashmir, India. *Rec. zool. Surv. India*, **66(1-4)** : 197-212.
- Ramakrishna & Mitra, S.C. 2002. Endemic land molluscs of India. *Rec. zool. Surv. India, Occ. Paper No* **196** : 1-65, pls. 1-13.
- Rao, H.S. 1924. Asiatic Succineidae in the Indian Museum. *Rec. Indian Mus.*, **26** : 367-408, pl.28.
- Rao, H.S. 1925. On certain succineid molluscs from the Western Ghats, Bombay Presidency. *Rec. Indian Mus.*, **27** : 385-400.
- Rao, V.T. & Ramadoss, P., 1953. Damage to vegetable crops by slugs observed in the Krishna District and the experiments on their control. *J. zool. Soc. Lond.*, **5** : 211-216.
- Raut, S.K. & Ghose, K.C. 1979. Natural enemies of pestiferous snails in West Bengal, India. *Bull. Entomology*, **20** : 153-155.

- Raut, S.K. & Ghose, K.C. 1984. Pestiferous land snails of India. *Tech. Monogr.zool. Surv. India* No 11 : 1-151, pls.1-17.
- Ray, H.C. 1951. Land shells of the genus *Ena* Turton from Swagn Maidan, Parbathi Valley, Punjab with description of new species (Mollusca : Gastropoda : Family Enidae). *Rec. Indian Mus.*, 49 : 31-36.
- Seddon, M.B. 1992. The description of *Pupoides coenopictus* (Hutton, 1834) in N.W. Africa (Gastropods: Pupillidae). *J. Conch. Lond.*, 34 : 149-158.
- Solem, A. 1984. World model of land snail diversity and abundance. In : Worldwide snails. Biogeographical studies on non-marine molluscs (ed. A. Solem & A.C. Van Bruggen).
- Subba Rao, N.V. 1975. Notes on some pestiferous snails (Mollusca : Gastropoda: Ariophantidae). Dr. B.S. Chouhan vol. *Zool. Soc. India, Calcutta* : 165-170.
- Subba Rao, N.V. 1986. Handbook : Freshwater mollusca of India. *Zool. Surv. India*, XIII-289 pp, 636 figs.
- Subba Rao, N.V. 1996. Molluscs in the Thar desert in : Faunal diversity in the Thar Desert : Gaps in research. Scientific Publishers: XI + 410 (Mollusca) pp. 277-283, 3 tabs.
- Subba Rao, N.V. & Mitra, S.C. 1976. *Succinea raoi* new name for *Succinea arboricola* Rao, 1925 (Stylommatophora: Succineidae). *Nautilus*, 90(3) : 125.
- Subba Rao, N.V. & Mitra, S.C. 1979. On land and freshwater molluscs of Pune and adjacent districts. *Newsl. Zool. Surv. India*, 1(4) : 77-99.
- Subba Rao, N.V. & Mitra, S.C. 1991. Land Molluscs of Andaman and Nicobar Islands. *Rec. zool. Surv. India, Occ. Paper* 126 : 1-88, pls 1-8.
- Subba Rao, N.V. & Mitra, S.C. 1995. Mollusca : Fauna of Western Himalayas (U.P). *Zool. Surv. India, Himalayan Ecosystems Series*, 1 : 11-15.
- Subba Rao, N.V., Mitra, S.C., Dey, A. & Maitra, S. 1995a. Fauna of Meghalaya (Mollusca). *Zool. Surv. India, State Fauna Series* 4 : *Fauna of Meghalaya*, Part 8 : 1-88.
- Subba Rao, N.V., Mitra, S.C., & Srivastava, P.D. 1995b. Mollusca:in Soil organisms and litter decomposition in the tropis. (ed.M. VikramReddy). Oxford & IBH Publishing, Delhi & Calcutta. 141-152.
- Subba Rao, N.V. Raut, S.K. & Mitra, S.C. 1981. Observation on the growth rate of the common garden snail *Opeas gracile*(Hutton) (Stylommatophora : Subulinidae). *Bull. zool. Surv. India*, 4(2) : 205-207.
- Subba Rao, N.V., Thakur, D.K. & Mitra S.C. 1989. Mollusca (Terrestrial) in Fauna of Orissa, *State Fauna series, Zool. Sur. India*, 1(2) : 253-275, 6 figs.

- Surya Rao, K.V., Mitra, S.C. 1997. Mollusca in Fauna of Conservation Areas **9** : *Fauna of Nanda Devi Biosphere Reserve* : 25-28.
- Surya Rao, K.V., Mitra, S.C. (in Press). Mollusca : Fauna of Western Himalayas(H.P). *Zool.Surv. India,Himalayan Ecosystems Series*, **2**.
- Surya Rao, K.V., Mitra, S.C., Maitra, S. & Biswas, T. 1997. Mollusca : Fauna of Delhi. *State Fauna Series, Zool. Surv. India*, **6** : 109-134.
- Surya Rao, K.V., Mitra, S.C. & Manna, R.N. (in press). Molluscs of Desert National Park, Rajasthan.
- Surya Rao, K.V., Mitra, S.C. & Dey, A. (in press). Molluscs of Mizoram. *Rec. zool. Surv.* (in press).
- Surya Rao, K.V., Mookherjee, H.P., Mitra, S.C., Manna, R.N. and Barua, S. (in press). Mollusca of Manipur. *Rec. zool. Surv. India*, (in press).
- Thakur, D.K., Mitra, S.C. & Maitra, S. 1992. Molluscs of North Bengal. *Rec. zool. Surv. State Fauna Series*, **9(2)** : 53-127.
- Theobald, W. 1860. Catalogue of the Recent shells in the Asiatic Society of Bengal, Calcutta.
- Theobald, W. 1875. Descriptions of some new land and freshwater shells from India and Burmah. *J. Asiat. Soc. Beng.*, **5** : 184-189.
- Theobald, W. 1876. Catalogue of the land and freshwater shells of British India. pp 1-65.
- Theobald, W. 1878. Notes on the land and freshwater shells of Kashmir, more particularly of the Jhelum valley below Srinagar and the hills north of Jammu. *J. Asiat. Soc. Beng.*, **47(2)** : 141-149.
- Tryon, G.W. 1869. Description of new species of terrestrial molluscs from Andaman islands, Indian Archipelago. *Am. J. Conch.*, **5** : 109-111.
- Van Bruggen, A. C. 1972. On a new streptaxidae (Mollusca : Gastropods : Pulmonata) from Sargita Island, Malay Archipelago, with notes on the distribution of Streptaxids in Southeast Asia. *Proc. Koninkl. Nederl. Akadamic van Wetenschappen*, Ser. 3, **77(3)** : 392-401.
- Woodward, J. P., 1856. Manual of the mollusca; on rudimentary treatise of Recent and fossil shells, part 3. John. Weale, London.

GLOSSARY

Acuminate : pointed.

Angular : cornered, two surfaces meeting at an angle.

Angulate : with angular profile.

Aperture : the opening at the front end of gastropod shell.

Apex : starting point of shell growth/top of a gastropod shell.

Arcuate : curved or arched.

Attenuate : slenderly tapering, often to a point.

Axial : longitudinal, following the direction of the axis of the shell.

Base : the last formed part of the shell of a gastropod.

Biconic : tapering at both ends.

Bilateral symmetry : when the left side is an exact counter part of the right.

Body whorl : last whorl of the spiral shell.

Calcareous : made of lime.

Callus : a thick/thin layer of shelly substance, usually smooth and glossy, often transparent.

Cancellate : lattice like ornament formed when ridges or threads meet at right angles.

Carina : keel or ridge.

Carinate : with a carina.

Columella : lower part of inner lip of shell along central axis.

Columellar fold : fold or projection on columella.

Concave : inside curvature.

Convex : outside curvature.

Cord : a ridge, usually spiral, thicker than a thread.

Corneous : made of chitin, a non-calcareous substance.

Crenulate : regularly notched or beaded.

Denticle : small, usually rounded tooth.

Decussate : sculpture converging at acute angles.

Denticulate : with small teeth.

Depressed : low.

Dextral : coiling in right handed.

Discoidal : disc like.

Dorsum : rear side (i.e. behind aperture) of gastropod shell.

Endemic : restricted to a particular geographic area.

Flammule : small flame like marking.

Fusiform : spindle shaped.

Globose : tending to be inflated, like a ball.

Granulose : covered with small raised pimples.

Growth line and ridge : a fine or coarse, raised line defining a temporary pause in the growth of the shell.

Helicoid : depressedly globose with a raised spire.

Imperforate : non umbilicate.

Impressed : indented or sunken.

Incised : finely scratched.

Incision : grooved.

Inflated : swollen, ventricose.

Keel : more or less sharp edge.

Knob : tubercle.

Lamellose/Lamellate : covered with scales or thin plates.

Lenticular : shaped like a convex-sided disc, or biconvex lens.

Lip : inside or outside edge of the aperture of gastropod shell.

Lirate(sculpture) : with lirae

Liration : sculpture with fine lines or grooves.

Mantle : a fleshy lobe, which secretes the mollusc's shell and lines the inside of the shell wall.

Margin : shell edge.

Node : a lumpy protuberance, smaller than tubercle.

Nodule : a knob, smaller than node.

Notch : the end part of the tube or gutter at the front end of the aperture to hold the front siphon of gastropod shell.

Nucleus : initial growth of molluscan shell or of an operculum.

Obsolete : weak or almost absent.

Operculum : a calcareous or corneous structure attached to gastropod foot, used to close the shell aperture.

Orifice : a cavity or opening.

Ovate : egg shaped.

Papillae : nipple like extensions on mantle.

Parietal : region of the shell above columella.

Parietal margin : margin of shell above columella.

Pedal retractors : muscle, which withdraws foot.

Periostracum : the external often fibrous coating of corneous material covering many shells in fresh condition.

Peristome : edge of aperture.

Plicae : fold or plait.

Plicate : folded or plaited.

Punctate : dotted or spotted.

Reflected : turned backward.

Rib : a continuous elevation of the shell surface.

Riblet : continuous elevations of the shell surface, subordinate to rib.

Septum/Septa : partition of shell.

Sinuuous : gently waved.

Sinistral : coiling in a left handed direction when the aperture is on the observer's left facing.

Siphon : tubular or trough like extension of mantle through which water enters or leaves mantle cavity.

Siphonal canal or notch : the tube or gutter at the front (lower) end of aperture, to hold the front siphon of gastropods.

Spine : a blunt or sharp projection.

Spinose : ornamented with spines.

Spiral : coiling about a central axis.

Spiral line : line coiling about a central axis.

Spiral thread : thickened area on spiral zone.

Spire : the coiled part of a gastropod shell except bodywhorl.

Stria/Striae : scratch like furrow on the surface of the shell.

Sulcus : a furrow or groove.

Sutural coronation : bead or thickened area on suture.

Suture : the line on gastropod shell where the whorls connect.

Tooth/Teeth : pointed or blunt structure(s) inside the outer or inner lip of gastropod shell.

Transverse : right angle to the axis or length of shell.

Trigonal : triangular in form.

Truncate : cut off and generally squared.

Tubercle : a large rounded protuberance.

Tumid : swollen, enlarge.

Umbilicate : navel like; with depressed cavity.

Umbilicus : hole, often within a crater like depression, at basal end of central axis of shell.

Varices : thickened vertical cords on whorls of gastropods.

Vertical : going in the direction of the apex to the base of gastropod shells.

Whorl : one complete turn of the tube of a gastropod shell about its imaginary axis.

INDEX

- aborensis, Cyclophorus* 50
aborensis, Rahula 217
aborensis, Raphaulus 103
aborensis, Durgella 283, 285
Achatina 148, 158, 160, 166
Acmella 112
acris, Ganesella 310
Aegista 320, 323
affinis, Plectopylis 184
alba, Austenia 246, 248
albata, Cryptozonia 231
albescens, Tortulosa 108
Allopeas 161
Alycaeus 48, 72
Amphidromus 296, 298
ampula, Indrella 243
anax, Corilla 187
andamanica, Pleuropoma 43
andamanica, Videna 293
andamanicus, Amphidromus 299
andamanicus, Haploptychius 172
andersoni, Omphalotropis 114
angelica, Bensonies 265, 267
annandalei, Pseudokaliella 215
Apatetes 297, 304
apicata, Sitala 289
arakanensis, Pleuropoma 44
arboricola Succinea 198, 199
arcuata, Subzebrinus 132
Ariophanta 224, 226
arx, Sitala 289
asperella, Trachia 314
aspirans, Leptopoma 65
assamicus, Raphaulus 104
atra, Pseudaustenia 207
atricolor, Macrochlamys 253, 257
attegaia, Sitala 290
aulopis, Macrochlamys 254
auriformis, Pseudaustenia 207
austeniana, Macrochlamys 264
Austenia 224, 246
Bacillum 151, 153
bacillum, Euphaedusa 141
bajadera, Ariophanta 8, 226
balanus, Cecilioides 148
Bapuia 225, 264
barrackporensis, Pupilla 117
barrakporensis, Kaliella 211
bascaudula, Rahula 218
basilessa, Cryptozonia 232
basileus, Hemiplecta 241, 243
bathycharax, Taphrospira 281
bathyodon, Gastrocopta 124
beddomei, Hemiplecta 243
Beddomea 296, 304
beddomeana, Serina 132
behniana, Sulfurina 46
bengalensis, Rhachis 139
bensoni, Cecilioides 149
bensoni, Cryptaustenia 250
bensoni, Quickia 204
Bensonies 225, 265
bicolor, Gulella 176
Bifidaria 124
bilabiatus, Pterocyclus 82
biliratus, Craspedotropis 58

- billeana*, *Sivella* 221
bistrialis, *Cryptozona* 233
blanfordi, *Curvella* 155
blanfordi, *Oxytesta* 276, 279
bourdilloni, *Apatetes* 304
Boysia 122, 123
boysi, *Boysia* 123
Boysidia 122, 125
Bradybaena 320
brahma, *Plectopylis* 181
brahmakundensis, *Pterocyclus* 81
brunii, *Microcystina* 273
bullula, *Kaliella* 211, 213
Buliminus 132
Bulimus 119, 132, 136, 137, 138, 139, 162
Bulinus 131, 155
burti, *Alycaeus* 72
busbyi, *Chamalycaeus* 74
cacharica, *Austenia* 247
cacharicum, *Pupisoma* 126
cacuminifera, *Euplecta* 237
Camaena 297
Camptonyx 195, 199
canaricus, *Streptaxis* 169
candelaris, *Subzebrinus* 133
capitium, *Ganesella* 310
carneola, *Diplommatina* 91, 93
cassida, *Macrochlamys* 261
castra, *Sivella* 222
Cataulus 108
Cathaica 326
Cecilioides 148
Cerastua 136
cestus, *Bradybaena* 320
Chamalycaeus 48, 74
Chersaecia 181
Chloritis 297, 306
christianae, *Satiella* 288
Clausilia 141, 144
clathratuloides *Ruthvenia* 192
climacterica, *Khasiella* 269, 272
codonodes, *Oreobba* 313
coenopictus, *Pupoides* 118
Coilostele 149
compluvialis, *Taphrospira* 282
conferta, *Rhysstopsis* 244
conicus, *Alycaeus* 73
constrictus, *Cyclorix* 78
Coracia 304
Corilla 181, 187
Craspedotropis 48, 58
crassicostata, *Trachia* 315
crassula, *Glessula* 157
crenatus, *Chamalycaeus* 77
crinigera, *Thysanota* 193, 194
crocatus, *Cyclophorus* 54
Cryptaustenia 224, 250
Cryptozona 225, 231
Curvella 151, 154
Cyathopoma 48, 59
cylindrica, *Hemiphaedusa* 143
Cyclohelix 54
Cyclophorus 49, 48
Cyclorix 48, 78
Cyclostoma 110, 111, 113
Cyclotopsis 110
Cylindrophaedusa 141, 143
daflaensis, *Staffordia* 245
daucina, *Succinea* 196
deccanense, *Cyathopoma* 59, 61

- decussata, Omphalotropis* 115
delibrata, Chloritis 307, 308
denselirata, Sitala 291
deplanatus, Theobaldius 70
dextrosinister, Subzebrinus 134
 Dicharax 76
digonius, Chamalycaeus 76
 Dioryx 48, 80
diplodon, Sesara 208
 Diplommatina 87, 88
 Discus 293
distortum, Opisthostoma 95
 Ditropis 62, 49
 Durgella 224, 283
 Edouardia 136
 Ena 133
 Endothyrella 184
 Ennea 174
erosum, Bacillum 153
 Euaustenia 261
 Eucataulus 107
 Eulota 320, 321
 Euplecta 225, 237, 289
 Euphaedusa 141
 Eupomatias 100
falcata, Khasiella 270
fairbranki, Cerastua 136
fairbranki, Pearsonia 86
fallaciosa, Trachia 316
fastigiata, Kaliella 212
filosa, Glessula 157
fissidens, Ibycus 287
fulica, Achatina 166
funiculatum, Schistoloma 105
galea, Sesara 209
 Galaxis 236
 Ganesella 287, 309
garoense, Cyathopoma 61
 Gastrocopta 124
 Gastroptychia 91, 87
gemma, Glessula 158
 Georissa 41
 Geostilbia 148
 Girasia 13, 247
gigas, Austenia 248, 249
girnarica, Succinea 197
glauca, Macrochlamys 254, 256
 Glessula 151, 153, 156,
 Glossostylus 56
gracile, Lamellaxis 162
graphicus, Cycloryx 79
gravelyi, Quickia 205
guerini, Thysanota 194
 Gulella 168, 176
 Haploptychius 168, 172
haroldi, Sitala 292
 Harpalus 155
haughtoni, Prosopeas 163
 Haughtonia 244
helpferi, Chloritis 308
 Helicarion 251, 264
 Helicella 316, 317.
 Helicina 43, 44, 46
 Helix 120, 121, 127, 170, 186
hemiopta, Chloritis 308
 Hemiphaedusa 142
 Hemiplecta 225, 241
hengdanensis, Landouria 312
himalayana, Cyclophorus 56
himalayanum, Orcula 128

- hinduorum*, *Otopoma* 109
hispidus, *Pearsonia* 84
homfrayi, *Philalanka* 189
humilis, *Pyramidula* 129
Huttonella 176
huttoni, *Landouria* 34
hyba, *Khasiella* 269
Hydrocena 42
Ibycus 224, 286
imbricifera, *Pupina* 98
indica, *Euplecta* 238
indica, *Macrochlamys* 255
indica, *Succinea* 197
Indosuccinea 202
Indrella 224, 243
insignis, *Gastroptychia* 92
insularis, *Zootecus* 165
interrupta, *Ariophanta* 228
jacquemonti, *Bensonies* 266
Japonia 48, 63
Jerdonia 60
kadapaensis, *Ariophanta* 227
Kaliella 206, 210
kempi, *Rasama* 216
khandalla, *Indosuccinea* 203
khasiana, *Curvella* 155
Khasiella 268
ladakensis, *Vallonia* 120
laevipes, *Ariophanta* 230
Lagochilus 63
Lamellaxis 151, 161
Landouria 299, 311
laidlayana, *Ariophanta* 229
Leptopomoides 49, 66
Leptopoma 48, 65
levicula, *Durgella* 284, 285
ligulata, *Cryptozona* 234
limbiferum, *Mychopoma* 68
Liocystis 273
Lissachatina 166
Lithotis 195, 200
Litostylus 52
loosjesiana, *Oospira* 145
loxostoma, *Oospira* 145, 146
lubrica, *Macrochlamys* 256, 258
luyorensis, *Pseudopomatias* 102
Macrochlamys 225, 252
macgregori, *Chamalycaeus* 75
macrodon, *Gulella* 177
macromphalus, *Plectopylis* 185
macropleuris, *Rahula* 219
macrostoma, *Opisthostoma* 96
maderaspatana, *Cryptozona* 235
magnificus, *Chamalycaeus* 78
magnus, *Pterocyclus* 82
mainwaringi, *Bensonies* 267
mainwaringiana, *Subzebrinus* 135
masoni, *Amphidromus* 300
mastersi, *Pearsonia* 85
Megalomastoma 106
merguiensis, *Pleuropoma* 44
Metadiancta 90
Micraulax 49, 67
Microcystina 225, 273
Mikiria 313
Mirus 130
mitanensis, *Aegista* 323
moerchiana, *Sinoennea* 179
monticola, *Bensonies* 268
monticola, *Macrochlamys* 262

- moussonianus*, *Cerastua* 137
munipurensis, *Rahula* 219
muscorum, *Pupilla* 117
muspratti, *Plectopylis* 182
Mychopoma 48, 68
Myxostoma 70
nana, *Kaliella* 213
Nanina 221, 227, 233
Nesaecia 206
nevilli, *Pseudokaliella* 215
Nicida 87, 93
nicobarica, *Oospira* 144, 147
nicobarica, *Palaina* 93
nicobarica, *Pleuropoma* 44
nicobarica, *Pupina* 99
nilagiricus, *Cyclophorus* 52
nilagirica *Mirus* 131
nivicola, *Theobaldius* 70
Nodopomatias 97, 99
oakesi, *Nodopomatias* 100
oakesi, *Tadunia* 223
ochthoplax, *Camaena* 297
octona, *Subulina* 152
oglei, *Plectopylis* 183
oldhami, *Aegista* 324
Omphalotropis 112, 114
Oospira 141, 143
Opisthostoma 87, 95
orbis, *Edouardia* 138
Orcula 127
orcula, *Pupisoma* 127
Oreobba 297, 313
orobia, *Oxytesta* 276
orthoceras, *Bacillum* 154
Otopoma 109
ovata, *Cryptaustenia* 251
Oxytes 276
oxytes, *Oxytesta* 277
Oxytesta 225, 275
Palaina 87, 92
Parvatella 263, 264
pealianus, *Cyclophorus* 49
pearsoni, *Cyclophorus* 56
Pearsonia 48, 84
pedina, *Macrochlamys* 257
perobesa, *Diplommatina* 90
personatus, *Streptaxis* 170
peroteti, *Streptaxis* 170, 172
perplana, *Macrochlamys* 258
Petraeus 135
Pfeiffer, *Haploptychius* 173
Philalanka 189
physalis, *Beddomea* 305
pinacis, *Plectopylis* 186
pinnulifera, *Scabrina* 69
planguncula, *Sinoennea* 180
Planispira 314
planorbis, *Ditropis* 62
Plectopylis 181
plectostoma, *Plectopylis* 186
Plectotropis 324
Pleuropoma 43
plicidens, *Boysidia* 125
pollux, *Oxytesta* 278
polynema, *Cyclophorus* 52
Prosopeas 151, 162
Pseudaustenia 207, 206
Pseudojerdonia 61
Pseudokaliella 206, 215
Pseudonenia 144, 145, 146

- Pseudopomatias 97, 101
 Pseudospiraculum 86
 Pterocyclus 48, 81
pulchella, *Vallonia* 121
pullula, *Diplommatina* 88
pulneyana, *Nicida* 94
punctatus, *Rhachis* 140
 Pupa 118, 124, 125, 176
 Pupilla 116
 Pupina 97, 98
 Papisoma 122, 126
 Pupoides 116, 118
 Pyramidula 129
pyxis, *Georissa* 42
 Quickia 195, 204
quinelirata, *Philalanka* 190
 Rachisellus 139, 140
radicicola, *Bradybaena* 321
 Rahula 206, 217
 Raphaulus 97, 103
raoi, *Succinea* 198
 Raptomphalus 77
 Rasama 206, 216
 Realia 114, 115
 Registoma 99
rengingensis, *Bapuia* 264
 Rhachis 136, 139
 Rhiostoma 85
 Rhysotopsis 224, 244
richilaensis, *Pseudopomatias* 102
rinki, *Microcystina* 274, 275
roepstorfi, *Japonia* 63
roepstorfiana, *Acmella* 113
rorida, *Macrochlamys* 259
rotungensis, *Austenia* 249
 Rotungia 224, 279
ruga, *Kaliella* 214
ruginosa, *Trachia* 317
rupestris, *Pterocyclus* 83
rupicola, *Camptonyx* 200
 Ruthvenia 192
salius, *Durgella* 285
 Salpingophorus 49
sanis, *Videna* 294
 Satiella 224, 287
scabra, *Micraulax* 67
 Scabrina 49, 69
scalaris, *Coilostele* 150
 Schistoloma 97, 105
sculpta, *Gulella* 178
semirugata, *Cryptozona* 236
semisculpta, *Diplommatina* 89
semiserica, *Indosuccinea* 202
semistriata, *Cyclotopsis* 110
seposita, *Durgella* 286
 Serina 130, 131
serrula, *Khasiella* 271
 Sesara 206, 208
shiplayi, *Theobaldius* 71
sibbumensis, *Nodopomatias* 101
similaris, *Bradybaena* 322
sinensis, *Amphidromus* 300, 303
 Sinica 90
 Sinoennea 168, 179
 Sitala 189, 288, 224
 Sivella 206, 220
 Sphyradium 128
 Spiraculum 86
 Spiraxis 163
splendens, *Syama* 280

- Staffordia* 225, 245
stenopylis, Ennea 174
stephus, Macrochlamys 259
Streptaxis 168
subcastor, Euplecta 239
subdecussata, Euplecta 239
subdiscoidea, Cyclotopsis 111
sublaevigatus, Cyclophorus 49
subbilirata, Philalanka 191
subovata, Nicida 94
subtornensis, Glessula 159
Subulina 151, 152
Subzebrinus 130, 132
Succinea 195, 196, 200, 202 204
succinea, Cryptaustenia 251
sulcipes, Videna 294
Sulfurina 43, 46
Syama 225, 280
Sylheticus, Amphidromus 302
Tadunia 206, 222
tanychilum, Schistoloma 106
tapeina, Aegista 325
Taphrospira 225, 281
tenuispira Glessula 160
tersa, Acmella 113
textilis, Glessula 160
textrina, Hemiplecta 242
theobaldi, Camptonyx 199
theobaldi, Macrochlamys 263
Theobaldius 49, 69
thyreus, Ariophanta 230
Thysanota 192, 193
Tomogeres 123
tomotrema, Japonia 64
Tortulosa 97, 106
tortuosa Tortulosa 107
Trachia 297, 314
travancorica, Euplecta 240
trifasciata, Beddomea 305
trilineata, Videna 295
trochlea, Cyathopoma 60
trochalia, Trachia 318
Trocholeptopoma 65
Trochomorpha 293, 294, 295
tugurium, Macrochlamys 260
tumida, Camptonyx 201
Turbo 54, 107, 117
tutulus, Pupoides 119
Tylotoechus 98
Urocoptis 107
urnula, Dioryx 80
Vallonia 120
valvatus, Leptopomoides 66
vara, Ennea 175
Videna 221, 293
vidua, Khasiella 272
Vitrina 207, 248, 251
vittata, Trachia 319
walkeri, Prosopeas 164
warnefordi, Microcystina 275
watsoni, Streptaxis 171
williamsoni, Rotungia 279
wuellerstorfi, Oospira 146
Xestina 231
zelebori, Sulfurina 46
Zootecus 151, 164



Photo courtesy : M. Aravind

