

MISCELLANEOUS PUBLICATION
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**On the Systematics of the Indian Fishes of the Genus
Lepidocephalus Bleeker with Keys to the Species
of the Genus and Genera of the Subfamilies
Botiinae and Cobitinae
(Cobitidae : Cypriniformes)**

By
RAJ TILAK
And
AKHLAQ HUSAIN

Issued by the Director
Zoological Survey of India, Calcutta

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THE SPECIES OF THE GENUS AND GENERA OF THE
SUBFAMILIES BOTIINAE AND COBITINAE
(COBITIDAE : CYPRINIFORMES)

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Raj Tilak and Akhlaq Husain

Zoological Survey of India, Northern Regional Station, Dehra Dun



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(With 21 Figures)

INTRODUCTION

While studying the material of the genus *Lepidocephalus* (*Lepidocephalichthys*) Bleeker in the collections of Northern Regional Station, Zoological Survey of India, Dehra Dun, we came across interesting material of this genus which enabled us to describe a new species, *Lepidocephalus* (*Lepidocephalichthys*) *caudofurcatus* Tilak & Husain (Tilak and Husain, 1978) and to report the distribution of *Lepidocephalus* (*Lepidocephalichthys*) *annandalei* Chaudhuri in Uttar Pradesh (Tilak and Husain, 1977). Sexual dimorphism in *Lepidocephalus* (*Lepidocephalichthys*) *guntea* (Hamilton) was also studied and additional differences in the sexes were reported (Tilak and Husain, 1976). Recently, Pillai and Yazdani (1976) have described two new species, *Lepidocephalichthys menoni* and *L. goalparensis* and reported the distribution of two other species, *L. irrorata* Hora and *L. annandalei* Chaudhuri from Assam and Meghalaya. Yazdani (1976a, b) also reported the distribution of *L. annandalei* in Kaziranga Wild Life Sanctuary, (Dist. Sibsagar, Assam). Pillai and Yazdani (1976) and Yazdani (1976a, b) appear to have confused with the specific identity of the different species (except *L. irrorata*) of this genus dealt with by them. Therefore, the original material, which formed the basis of the study by these authors has been recently examined in detail and remarks on it are given in the text below.

There appears to be a considerable confusion among the fish taxonomists regarding the identity of the different species of genus *Lepidocephalus* Bleeker (Hora and Gupta, 1941 ; Banarescu and Nalbant, 1968 ; Tilak, 1973 ; Menon, 1974 ; Yazdani, 1976 a, b, 1977 ; Mathur and Mishra, 1976 ; Pillai and Yazdani, 1976, 1977). It has been considered necessary, therefore, to look into the systema-

tics of the known species of the genus *Lepidocephalus* Bleeker from India in this paper.

SUBFAMILIES BOTIINAE AND COBITINAE

The cobitid fishes with a spine below the eye are grouped under two subfamilies viz. Botiinae and Cobitinae. Subfamily Botiinae comprises two genera i. e. *Leptobotia* Bleeker, 1870 and *Botia* Gray, 1831. The subfamily Cobitinae consists of 14 genera viz. *Acanthopsis* van Hasselt, 1824 ; *Acanthopsoides* Fowler, 1934 ; *Acanthopthalmus* van Hasselt, 1823 ; *Cobitis* Linnaeus, 1758 ; *Cobitophis* Myers, 1927 ; *Enobarbichthys* Whitley, 1931 ; *Eucirrichthys* Perugia, 1892 ; *Lepidocephalus* Bleeker, 1858 ; *Misgurnus* Lacépède, 1803 ; *Neoecirrichthys* Banareescu and Nalbant, 1968 ; *Niwaella* Nalbant, 1963 ; *Paralepidocephalus* Tchang, 1935 ; *Sabanejewia* Vladykov, 1928 ; *Somileptes* Swainson, 1839. A key to the identification of the genera of the subfamilies Botiinae and Cobitinae is given in this paper.

The two subfamilies, Botiinae and Cobitinae, can be distinguished in the following characters.

Subfamily BOTIINAE

1. There are two pairs of rostral barbels very close to each other at the base and a pair of maxillo-mandibular barbels placed one each at either corner of the mouth.
2. Caudal fin is well forked.
3. The number of branched rays in the dorsal fin varies between 7-13, more seldom 6-14.
4. The swim-bladder consists of two chambers, the anterior and the posterior. The anterior chamber is not always enclosed in an osseous capsule and may have fibrous walls. The posterior chamber is well developed and is connected with the anterior through a very small tube.

Subfamily COBITINAE

1. There is one pair of rostral, one pair of maxillary and one pair of maxillo-mandibular barbels.
2. The caudal fin is rounded or slightly emarginate (forked in *Acanthopsis*).
3. The number of branched rays of the dorsal fin varies between 6-9 (except *Enobarbichthys* which has 30 rays).
4. The swim-bladder consists of two chambers ; the anterior and the posterior. The anterior chamber is enclosed in a completely osseous capsule. The posterior chamber is reduced to a single diverticulum.

5. The movable suborbital spine, representing the lateral ethmoidal bone, has an elongated and slightly curved body.

5. The suborbital spine is usually small, straight or slightly curved. The body of the spine bears two additional processes viz. lateral process and medial process.

Genus *Lepidocephalus* Bleeker

1858. *Lepidocephalus* Bleeker, *Nat. Tijdschr. Nedr.-Indie*, 15, : 303 (Type-species : *Cobitis macrochir* Bleeker).

Diagnostic features : The fishes of the genus *Lepidocephalus* Bleeker, which have been dealt with in this paper, have the following distinguishing features.

The body is elongated with a laterally compressed caudal peduncle. The mouth is inferior, with 6 barbels, 2 rostral, 2 maxillary and 2 maxillo-mandibular. The mental lobe is well developed and thread-like elongations of this lobe, when present, are not barbels. The suborbital spine is long, straight or slightly curved and with short caudal processes. The medial process of the spine is well developed. The bony capsule of the swim-bladder is globular. The posterior chamber of the swim-bladder is rudimentary. The epiotic bones and subtemporal fossae are absent. The origin of dorsal fin is variable in relation to the tip of snout and base of caudal fin as well as origin of pelvic fins. The caudal fin may be truncated, emarginate or more seldom forked. The scales are imbricated and with eccentric focal area. The sides of the head and sometimes the vertex are covered with small scales. The lateral line is absent. The males have the last two pectoral rays ossified which is a characteristic feature to distinguish the sexes.

The species of this genus in the Indian region have been put under the genus *Lepidocephalichthys* Bleeker by Day (1878, 1889). Subsequently, authors on Indian fish fauna followed Day (1878, 1889) in recognising these fishes under the genus *Lepidocephalichthys* Bleeker (Vinciguerra, 1889 ; Chaudhuri, 1912 ; Hora, 1921a, b, 1922, 1929, 1931, 1934, 1935 a, b, 1936, 1937a-c, 1938, 1940, 1942, 1944, 1953 ; Fowler, 1924 ; Hora and Mukerji, 1934 a, b, 1936 ; Prashad and Hora, 1936 ; Hora and Misra, 1937, 1938 ; Shaw and Shebbeare, 1938 ; Hora and Gupta, 1941 ; Mathur,

1952 ; Menon, 1953, 1963 ; Chauhan and Ramakrishna, 1954 ; Sinha and Shiromany, 1954 ; Dubey and Mehra, 1962 ; Lal and Chatterji, 1963 ; Menon, 1963 ; Singh, 1964 ; Tandon and Sharma, 1965 ; Mahajan, 1966 ; Dhingra and Vasisht, 1967 ; Srivastava, 1968 ; Datta and Majumdar, 1970 ; Grover, 1970 ; Sahgal, 1973 ; Badola 1975 ; Dey, 1975 ; Jhingran, 1975 ; Motwani and Saigal, 1975 ; Venkataswarlu et al. 1975 ; Singh, 1976 ; Yazdani 1976 b ; Pillai and Yazdani, 1976, 1977 ; Datta, 1977 ; Grover and Gupta, 1977 ; Jayaram and Singh, 1977 ; Kundu, 1977 ; Raghunathan and Govindan, 1977.)

The genus *Lepidocephalus* Bleeker has also been recognised by workers on Indian fishes (Annandale, 1909 ; Hora, 1924, 1939, 1941 a, b, 1942, 1949 ; de Beaufort, 1933 ; Herre, 1940 ; Tweedie, 1940 ; Das, 1936 ; Hora and Gupta, 1941 ; Hora and Nair, 1941 ; Hora and Law, 1941, 1942 ; Hora and Misra, 1942 ; Fraser, 1942 ; Smith, 1945 ; Sarkar, 1953 ; Motwani and David, 1957 ; De Witt 1960 ; David, 1963 ; Nalbant, 1963 ; Banarescu and Nalbant, 1968 ; Tilak, 1973 ; Menon, 1974 ; Sehgal 1974 ; Mathur and Mishra, 1976 ; Tilak and Husain, 1975, 1977, 1978 ; Husain, 1975, 1976 ; Mirza, 1976 ; Tilak and Tiwari, 1976 ; Yazdani, 1976 a, 1977 ; Gurm *et al.* 1977 ; Tilak and Juneja 1978).

Nalbant (1963), while revising the genera of the subfamily Cobitinae, recognised two subgenera under the genus *Lepidocephalus* Bleeker *e. g.* *Lepidocephalus* (*Lepidocephalus*) Bleeker and *Lepidocephalus* (*Lepidocephalichthys*) Bleeker. The main differences between the two subgenera, as mentioned by Nalbant (1963), are given below :

1. The scales are present on the vertex in the subgenus *Lepidocephalus* (*Lepidocephalus*) Bleeker while they are absent in the subgenus *Lepidocephalus* (*Lepidocephalichthys*) Bleeker.
2. The dorsal and the ventral fins are situated in the posterior half of the body in the subgenus *Lepidocephalus* (*Lepidocephalus*) Bleeker while these are situated in more advance position in the subgenus *Lepidocephalus* (*Lepidocephalichthys*) Bleeker.

According to Nalbant (1963) all the species of the genus *Lepidocephalus* in India belong to the sub-genus *Lepidocephalus* (*Lepidoce-*

phalichthys) while Banarescu and Nalbant (1968) have ascribed *L. irrorata* to the sub-genus *Lepidocephalus* (*Lepidocephalus*).

The Indian species of this genus, so far described in literature, are :

- (1) *Lepidocephalus* (*Lepidocephalichthys*) *guntea* (Hamilton)
- (2) *Lepidocephalus* (*Lepidocephalichthys*) *thermalis* (Valenciennes)
- (3) *Lepidocephalus* (*Lepidocephalichthys*) *berdmorei* (Blyth)
- (4) *Lepidocephalus* (*Lepidocephalichthys*) *annandalei* Chaudhuri
- (5) *Lepidocephalus* (*Lepidocephalus*) *irrorata* (Hora)
- (6) *Lepidocephalus* (*Lepidocephalichthys*) *birmanicus* Rendahl
- (7) *Lepidocephalus* (*Lepidocephalichthys*) *menoni* Pillai and
Yazdani
- (8) *Lepidocephalus* (*Lepidocephalichthys*) *goalparensis* Pillai and
Yazdani
- (9) *Lepidocephalus* (*Lepidocephalichthys*) *caudofurcatus* Tilak and
Husain

Day (1878, 1889) gave the description of three species viz. *L. guntea*, *L. thermalis* and *L. berdmorei*. Chaudhuri (1912) described *L. annandalei* from Mahananda river at Siliguri and Tista river, near Jalpaiguri, West Bengal. Hora (1921a) added *L. irrorata* from Loktak lake, Manipur. Rendahl (1948) described *birmanicus* as a subspecies of *L. guntea* from Burma and Thailand and Banarescu and Nalbant (1968) have recorded this species from Nishangara, U. P. Terai (Ganges drainage) and Manipur. Pillai and Yazdani (1976) added two new species i. e. *L. menoni* from Garo hills, Meghalaya and *L. goalparensis* from Goalpara, Assam. Tilak and Husain (1978) have described *L. caudofurcatus* as a new species from Uttar Pradesh.

The type or general material of all these species has been examined and we have come to the conclusion that there are only six Indian species of the sub-genus *Lepidocephalus* (*Lepidocephalichthys*) and one of *Lepidocephalus* (*Lepidocephalus*) which could be recognised.

Genus : *Lepidocephalus* Bleeker

Sub-genus : *Lepidocephalus* (*Lepidocephalichthys*) Bleeker

1. *Lepidocephalus* (*Lepidocephalichthys*) *guntea* (Hamilton)
2. *Lepidocephalus* (*Lepidocephalichthys*) *thermalis* (Valenciennes)
3. *Lepidocephalus* (*Lepidocephalichthys*) *berdmorei* (Blyth)

4. *Lepidocephalus* (*Lepidocephalichthys*) *annandalei* Chaudhuri
5. *Lepidocephalus* (*Lepidocephalichthys*) *goalparensis* Pillai and Yazdani
6. *Lepidocephalus* (*Lepidocephalichthys*) *caudofurcatus* Tilak and Husain

Sub-genus : **Lepidocephalus** (**Lepidocephalus**) Bleeker

1. *Lepidocephalus* (*Lepidocephalus*) *irrorata* (Hora)

Through a detailed analysis of the species of the genus *Lepidocephalus* Bleeker, we have come to the conclusion that among the recently described species of the genus, *Lepidocephalus birmanicus* Rendahl and *Lepidocephalichthys menoni* Pillai and Yazdani are not valid species, as reasons, in detail, given later in this work. The specimens with two ocelli at the caudal fin, described by Hora and Gupta (1941), should belong to *Lepidocephalus* (*Lepidocephalichthys*) *annandalei* Chaudhuri and not form part of *Lepidocephalus guntea* (Hamilton). The figures and description of *Lepidocephalus berdmorei* (Blyth), *Lepidocephalus birmanicus* Rendahl and a part of the material of *Lepidocephalus thermalis* (Valenciennes), given by Banarescu and Nalbant (1968), are clear and we believe that they should be *Lepidocephalus* (*Lepidocephalichthys*) *caudofurcatus* Tilak and Husain, *Lepidocephalus* (*Lepidocephalichthys*) *guntea* (Hamilton) and *Lepidocephalus* (*Lepidocephalichthys*) *annandalei* Chaudhuri respectively because of the reasons given later in this work.

Yazdani (1976a, b, 1977) has not been consistent in the use of the generic name ; he has described the species *annandalei* Chaudhuri under *Lepidocephalus* Bleeker in one paper (Yazdani 1976a) and under *Lepidocephalichthys* Bleeker in another (Yazdani 1976b). The species *Lepidocephalus annandalei* Chaudhuri mentioned by Yazdani (1976a) and *Lepidocephalichthys annandalei* Chaudhuri mentioned by Yazdani (1976b) and Pillai and Yazdani (1976, 1977) are clearly *Lepidocephalus* (*Lepidocephalichthys*) *caudofurcatus* Tilak and Husain. In fact *Lepidocephalichthys menoni* Pillai and Yazdani (Pillai and Yazdani, 1976, 1977) conform to *Lepidocephalus* (*Lepidocephalichthys*) *annandalei* Chaudhuri in all details. Similarly, *Lepidocephalus berdmorei* (Blyth) of Yazdani (1977) is only *Lepidocephalus* (*Lepidocephalichthys*) *guntea* (Hamilton). The species *irrorata* Hora has been put under the genus *Lepidocephalichthys* Bleeker by Pillai and Yazdani

(1976); in fact, it should fit under *Lepidocephalus* (*Lepidocephalus*) Bleeker because of the presence of scales on the vertex in this species.

General remarks : The fishes of the genus *Lepidocephalus* Bleeker frequently inhabit muddy localities and are bottom feeders. Under normal conditions, they remain partly buried under sand or mud. Their body is very slippery due to the presence of slime secreted by the skin which is covered with numerous microscopic scales. The scales may be oval or circular in outline.

The mouth is subterminal and they feed chiefly on small crustaceans such as *Daphnia* and ostracods, and also swallow some amount of vegetable debris and algae. The alimentary canal is straight and short tube. The inner wall of the alimentary canal is highly vascular and often contains bubbles of gas, indicating its respiratory function (as accessory air-breathing organ).

The colouration of the body in some species is highly variable.

Breeding in these fishes takes place during rainy season and the fertilised ova (size nearly 0.3 mm. diameter) hatch out in about 3 week's time.

SYSTEMATIC NOTES

***Lepidocephalus* (*Lepidocephalichthys*) *guntea* (Hamilton)** (Figs. 1-4, 20A, 21A)

1822. *Cobitis guntea* Hamilton, *Fish. Ganges* ; 353, 394 (Type-locality : ponds and fresh rivers of Bengal).
1822. *Cobitis balgara* Hamilton *Fish. Ganges* : 356, 394 (Type-locality : Kosi river)
1839. *Canthophrys vittatus* and *olivaceous* Swainson, *Nat. Hist. Fish.* : 310.
1839. *Cobitis maya* Sykes, *Trans. Zool. Soc. Lond.*, 2 : 367.
1839. *Cobitis phoxocheila* McClelland, *Asiat. Res.*, 19 : 305, 439, pl. 52, fig. 4 (Type-locality : Mishmee mountains).
1864. *Misgurnus lateralis* Günther, *Cat. Fish. Brit. Mus* ; 7 : 346.
1878. *Lepidocephalichthys guntea* : Day, *Fish. India*, : 609, pl. CLV, fig. 4, pl. CLVI, fig. 12.
1945. *Lepidocephalus octocirrhus* : Smith (nec. van Hasselt), *Bull. U. S. Nat. Mus.*, 188 :
1968. *Lepidocephalus birmanicus* : Banarescu and Nalbant *Mitt. Hamburg. Zool. Mus., Inst.*, 65 : 345, pl. II, fig. 21.
1976. *Lepidocephalus berdmorei* : Mathur and Mishra (nec Blyth), *Newsl. zool. Surv. India*, 2 (4) : 157.

Diagnostic features : B. III, D. II-III/6-7, P. I/6-7, V. I/6-7, A. II-III/5, C. 16

Head length 5.88-6.80 and body depth 5.66-7.00 in total length. Least height of caudal peduncle 82.00-108.00% of its length. Origin of dorsal fin nearer caudal base than tip of snout, slightly behind origin of ventral fins and equidistant between eye and caudal base. Body covered with imbricated scales. Scales on head in patches below and behind eye, and upper part of operculum (Fig.2). On ventral side of head, scales extend anteriorly beyond isthmus (Fig. 3). 25-30

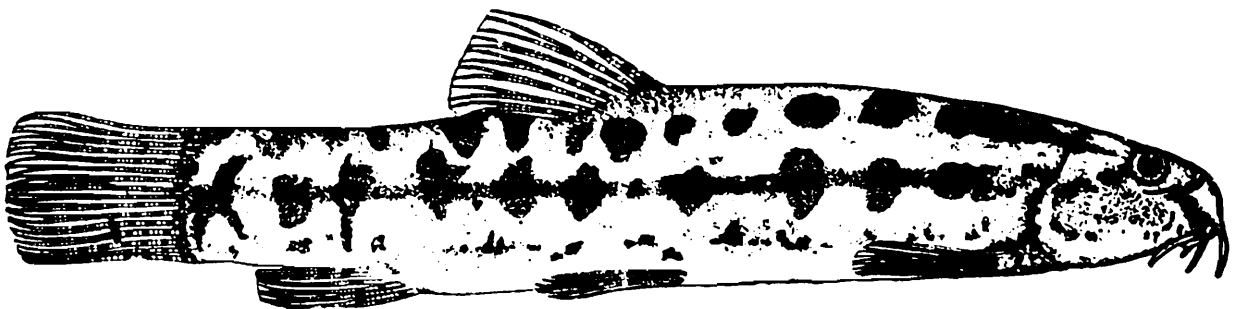


Fig. 1. Lateral view of *Lepidocephalus (Lepidocephalichthys) guntea* (Hamilton)

rows of scales between back of body and base of anal fin. Sub-dorsal scales oval in shape with eccentric focal area (Fig. 21A). Barbels longer than orbit. Mental lobe well developed and produced into one or two projections. Pectoral fin with 7-8 rays. Caudal fin convex or cut square with rounded corners.. Sub-orbital spine (Fig. 20A).

Colouration of body highly variable, differing with age, size and sex (Figs. 1, 4). In young individuals ground colour sandy yellow. A series of nearly 10-12 dark gray spots, connected with one another through a dark band along lateral sides of body. These spots also grow in size and tend to fuse with one another, forming a continuous dark lateral band with growth of fish. In extreme cases, this band is very prominent and bright in colour without any indication of presence of spots. Just above lateral dark spots and band, another thinner dark band, parallel to it and separated from it as well as colouration of back by a band of ground yellowish colour, present. Dorso-lateral dark band, separate from lateral band as well as colouration of back by yellowish ground colour, infuscated with dark spots in female specimens and clear

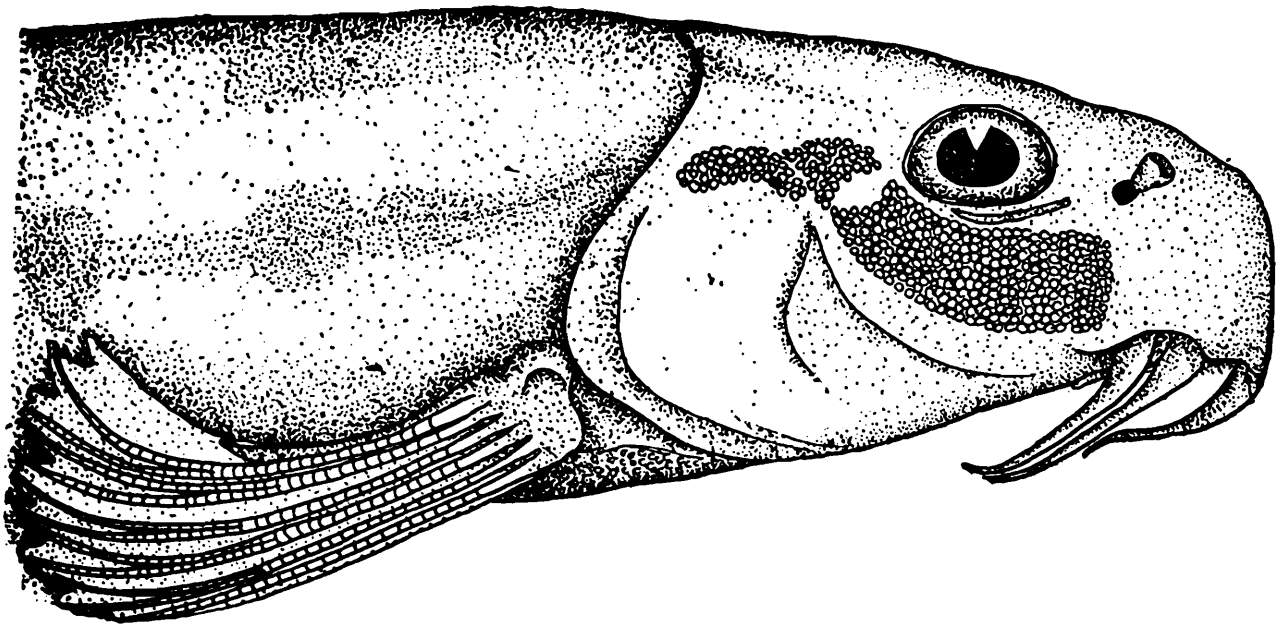


Fig. 2. Lateral view of the anterior region of the body of *L. (Lepidocephalichthys) guntea* (Ham.)

in adult males. As a result of stippling of ground colour in females and its absence in adult males, yellow coloured band in latter very bright and prominent. Correlating this difference with lengthening of pectoral fins (longer than head) and ossification of innermost two rays of this fin in adult males ; pectoral fin in females, comparatively smaller (shorter than head) and without ossification of inner rays of fin. Fins, especially dorsal and caudal, with rows of dark spots. A dark spot on upper part of caudal fin base.

While showing the colour variation in this species, Das (1936) did not mention sexual dimorphism in relation to colouration of the body but it is clear from the above mentioned observation that the colouration shown in Fig. 4E (after Das, 1936) is of adult male while those of Fig. 4C and D are of adult female.

Hora and Gupta (1941) have confused *L. annandalei* Chaudhuri with *L. guntea* (Ham.), considering the former as a synonym of the latter (young stage) while recognising at the same time that there is colour variation in *L. guntea*.

Distribution : North India ; Bangladesh ; Nepal ; Pakistan.

Remarks : Day (1878) differentiated a variety *L. guntea balgara* (Ham.) on the ground that its body is a little more elongated and

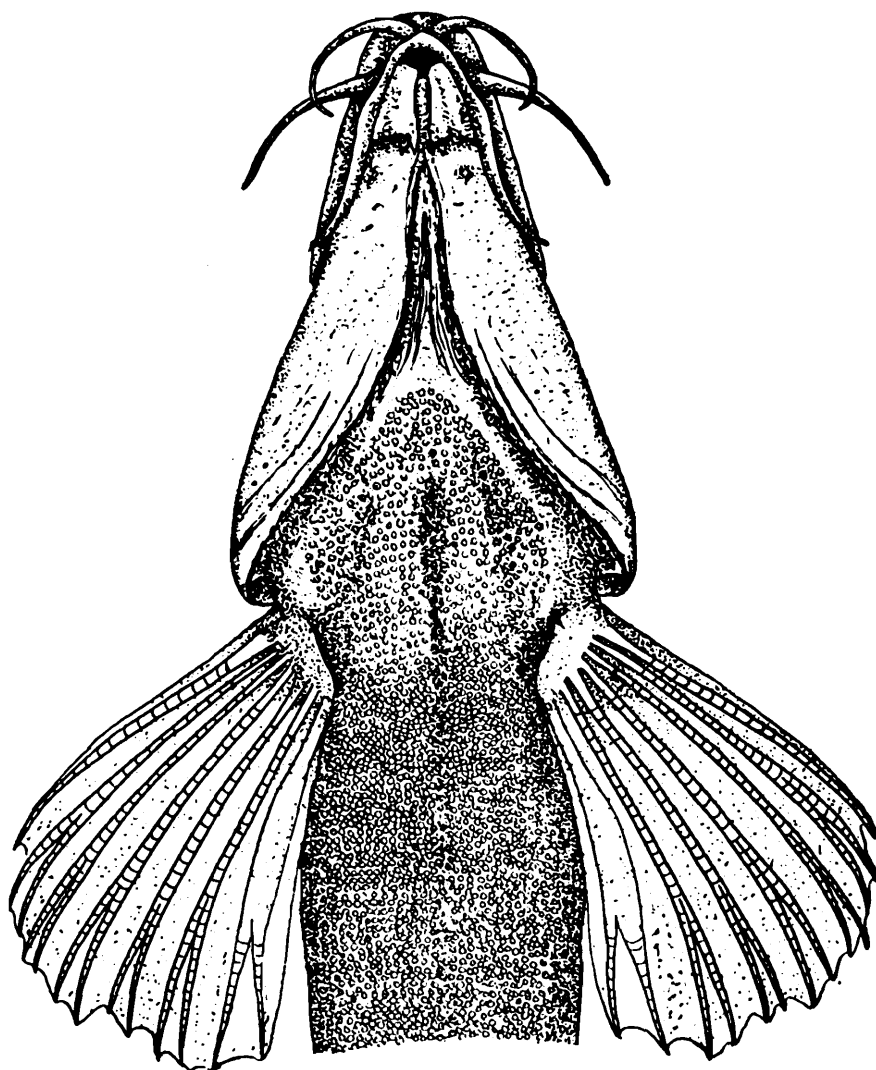


Fig. 3. Ventral view of the anterior region of *L. (Lepidocephalichthys) guntea* (Ham.)

the caudal fin sometimes cut rather more square. The origin of the ventral fin is sometimes in advance of the dorsal fin. The specimen figured by Day (1878, pl. CLVI, fig. 12) is only a colour variant of *L. guntea* (Ham.) and the characters of this variety mentioned by him fall within the range of variation of *L. guntea* (Ham.). Further, Banarescu and Nalbant (1968) and Tilak and Husain (1975) have clearly shown that the specimens named as *balgara* by Day (1878) are actually males.

Rendahl (1948) described *L. guntea birmanicus* from Burma and Thailand. Subsequently, Banarescu and Nalbant (1968) reported *Lepidocephalus birmanicus* from Nishangara. U. P. Terai (Ganges drainage) and Manipur although they hinted that *L. birmanicus* does not differ from *L. guntea* in the morphometric characters. The photograph of *L. birmanicus*, given by Banarescu and Nalbant

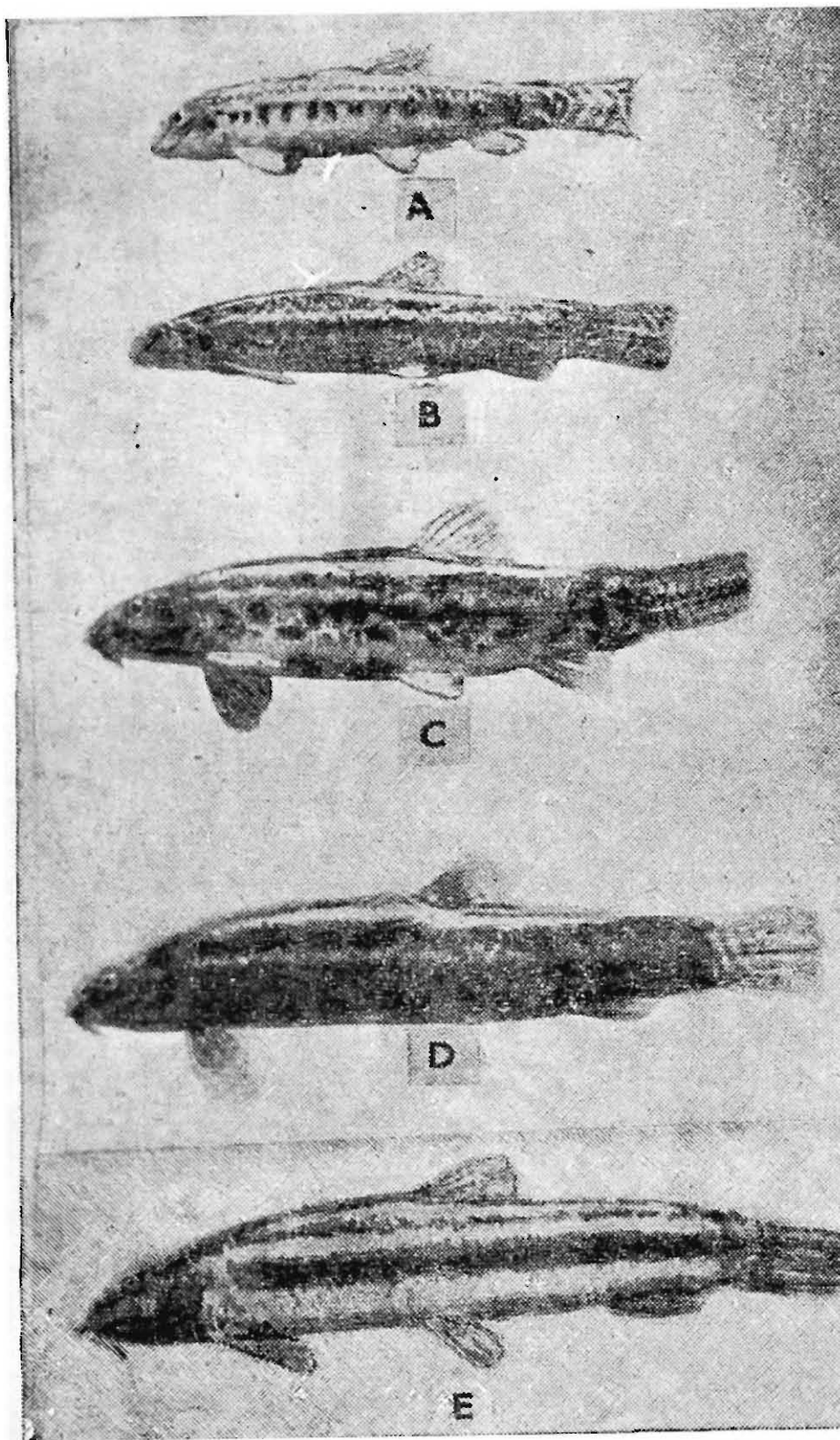


Fig. 4. Photograph of five specimens of *L. (Lepidocephalichthys) guntea* (Ham.) showing colour variation in young (A & B) and adult (C-E) (after Das)

(1968, pl. II, fig. 21) is only a colour variant of *L. guntea*, a fact supported by the study of colour variation in this species by Das (1936) (Fig. 4) and in the present study.

L. guntea octocirrhus, mentioned by Nalbant (1963 : 366) is probably a mistake and not this species because *L. octocirrhus* of van Hasselt is a different species. This is indicated by Banarescu and Nalbant (1968 : 345) that *L. octocirrhus* of Smith (1945) (non van Hasselt) is same as *L. birmanicus* Rendahl although they have not clearly pointed out the mistake committed by Nalbant (1963) for including *L. octocirrhus* van Hasselt as a subspecies of *L. guntea* (Ham.). Mathur and Mishra (1976) reported the presence of *Lepidocephalus berdmorei* (Blyth) from Jabalpur (Madhya Pradesh). The original material on the basis of which these authors based their identification has been examined by Tilak and Sinha (1979) who identified it as *Lepidocephalus guntea* (Ham.). Thus the presence of *L. berdmorei*, which is a Burmese and eastern Indian form, in Madhya Pradesh is not confirmed.

***Lepidocephalus (Lepidocephalichthys) thermalis* (Valenciennes)**

(Figs. 5, 6, 20B, 21B)

1846. *Cobitis thermalis* Valenciennes (In Cuvier and Valenciennes), *Hist. Nat. Poiss.*, **18** : 78 (Type-locality : Malabar)
 1849. *Cobitis carnnaticus*, *Cobitis mysorensis* and *Cobitis rubripinnis* Jerdon, *Madras J. Litt. Sci.*, **15** : 331, 332, 333.
 1875. *Platacanthus agreensis* Day, *Fish. Malabar* : 204, pl. 14, fig. 1
 1878. *Lepidocephalichthys thermalis* : Day, *Fish. India* : 610, pl. CLV, fig. 3.

Diagnostic features : B. III, D. II-III/6, P. I/6-7, V I/6, A. II-III/5, C. 16

Head length 5.57-6.28 (5.50 according to Day, 1878) and body depth 7.46-9.71 (5.50 according to Day, 1878) in total length. Origin of dorsal fin nearer caudal base than tip of snout, equidistant bet-

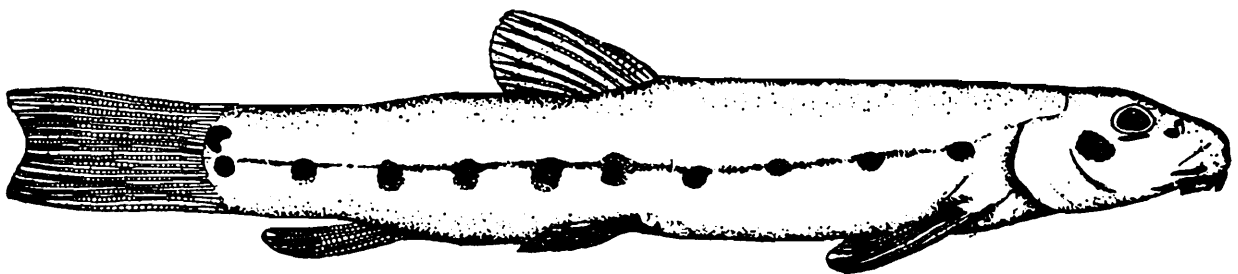


Fig. 5. Lateral view of *L. (Lepidocephalichthys) thermalis* (Val.)

ween front, middle or hind edge of eye and base of caudal fin and slightly in advance or opposite ventral fin. Banarescu and

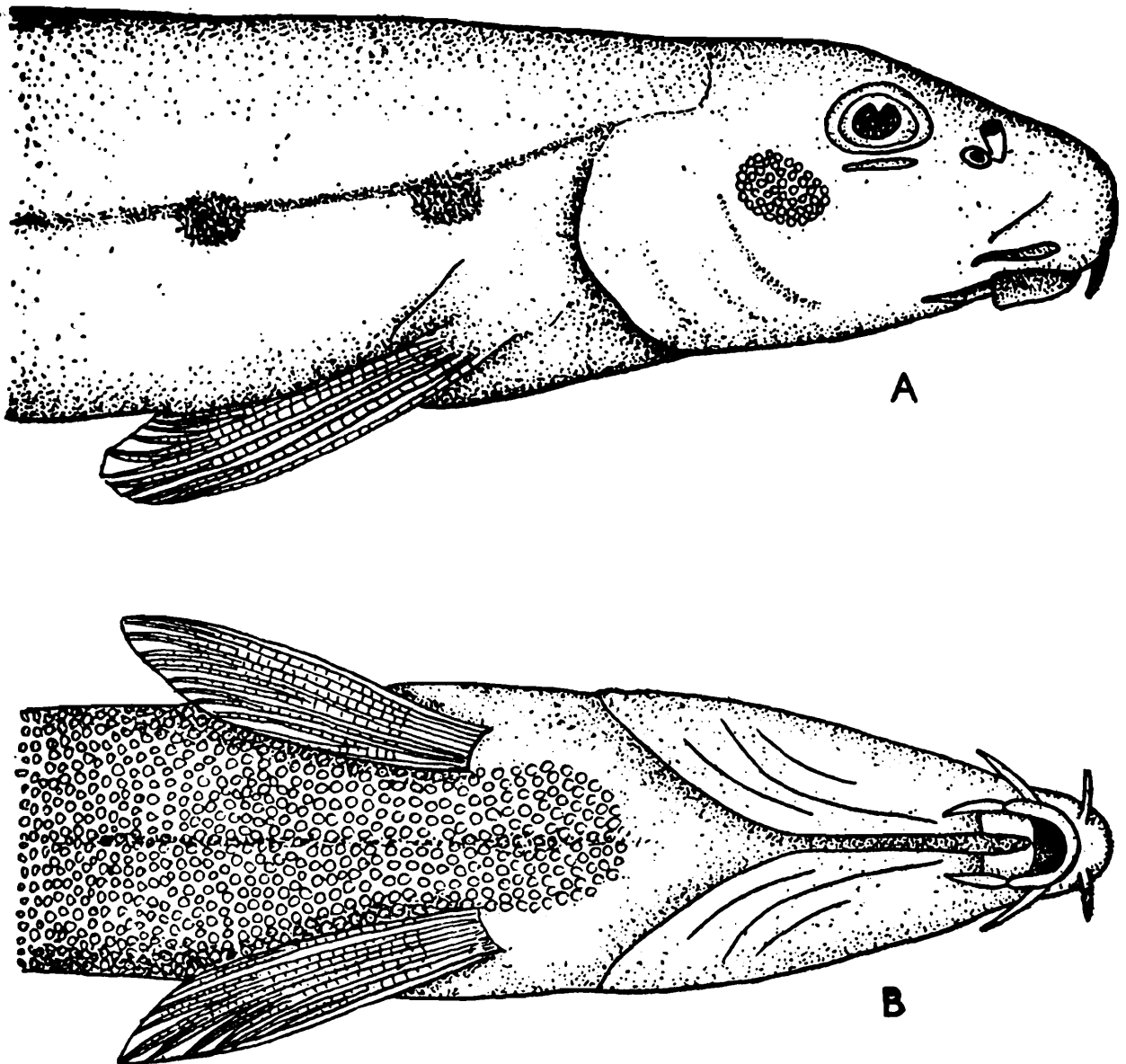


Fig. 6. A-Lateral view of the anterior region of the body of *L. (Lepidocephalichthys) thermalis* (Val.) B-Ventral view of the anterior region of the body of *L. (Lepidocephalichthys) thermalis* (Val.)

Nalbant (1968) also found its origin almost equidistant between snout tip and caudal base. Least height of caudal peduncle 66.67-94.00% of its length. Mental lobe well developed and provided with a small barbel-like prolongation. A small patch of scales on head behind suborbital spine. On ventral side of head, scales extend anterior to pectoral base but may not be reaching isthmus (Figs. 6A,B). Subdorsal scale oval with eccentric focal area slightly bigger than that of *Lepidocephalus (Lepidocephalichthys) guntea* (Hamilton) (Fig. 21B), 30-37 rows of scales between body back and anal fin. Caudal fin slightly emarginate or truncated with pointed corners. Sub-orbital spine (Fig. 20B).

Body pale coloured. 8-10 separate spots along sides of body. A small black spot on upper half of caudal base.

Distribution : Peninsular India ; Sri Lanka.

***Lepidocephalus (Lepidocephalichthys) berdmorei* (Blyth)**

(Figs. 7-9)

1860. *Acanthopsis berdmorei* Blyth, *J. Asiat. Soc. Bengal, Sci.*, 29 : 168
(Type-locality : Tennasserim Province, Burma).

1860. *Acanthopsis micropogon* Blyth, *J. Asiat. Soc. Bengal, Sci.*, 29 : 168
(Type. locality : Tenasserim Province, Burma).

1878. *Lepidocephalichthys berdmorei* ; Day, *Fish India* : 610, pl. CLIII,
fig. 3.

Diagnostic features : B. III, D. II-III/6, P. I/7-9., V. I/6-7, A. II/5-6, C. 16-17

Head length 5.80-6.30 and body depth 7.00-7.73 in total length (body depth 5.50-6.00 in total length according to Day, 1878). Nostils close together. Origin of dorsal fin much nearer base of caudal fin than tip of snout and equidistant between caudal base and end of operculum and lie behind ventral fin. Least height of caudal peduncle 66.67-100.00% of its length. Scales on head present in single

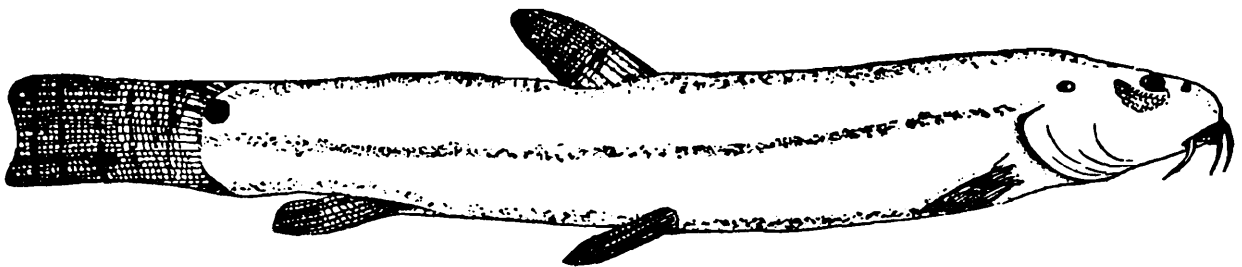


Fig. 7. Lateral view of *L. (Lepidocephalichthys) berdmorei* Blyth (Figure of Holotype)

semicircular patch below and behind eye ; a small patch of scales on upper part of operculum. On ventral side scales extend anteriorly beyond isthmus (Figs. 8A,B), 40 rows of scales between back of body and base of anal fin. Subdorsal scales oval. Mental lobe produced posteriorly into three or more short barbel like projections. Barbels cross anterior margin of eye. Caudal fin slightly emarginate.

The colouration of this species according to Blyth (1860) is “..... of a pale reddish clay colour, thickly freckled over with blackish

except on the abdominal region : about a dozen larger black spots along the lateral line, more or less distinct : the dorsal aspect uniformly dark or nearly so ; head minutely speckled : dorsal and caudal minutely speckled throughout ; the anal less so ; and pectorals and ventrals dark centred.”

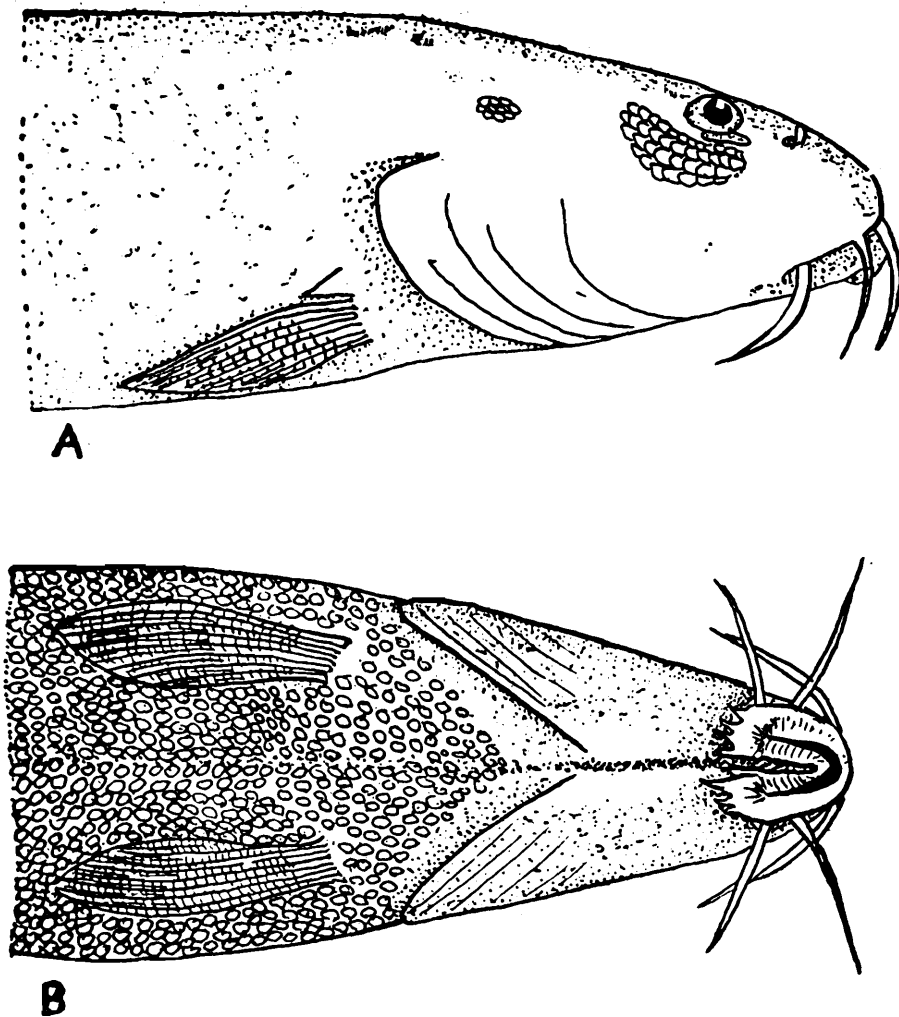


Fig. 8. A. Lateral view of the anterior region of the body of *L. (Lepidocephalichthys) berdmorei* (Blyth) (Figure of Holotype) B. Ventral view of the same

Distribution : Manipur (India) ; Burma.

Remarks : This species is restricted to Manipur (eastern part of India) and Burma. The one described under this name by Banarescu and Nalbant (1968) from Brahmaputra drainage (Assam) is not this species but same as *Lepidocephalus (Lepidocephalichthys) caudofurcatus* Tilak and Husain (Fig. 10C). The type-specimen of this species (Regd. No. ZSI/F. 2646/1) from Burma (Pegu) and collected by Maj. Berdmore is present in Zoological Survey of India, Calcutta and has been figured here (Figs. 7,8). The general colouration of

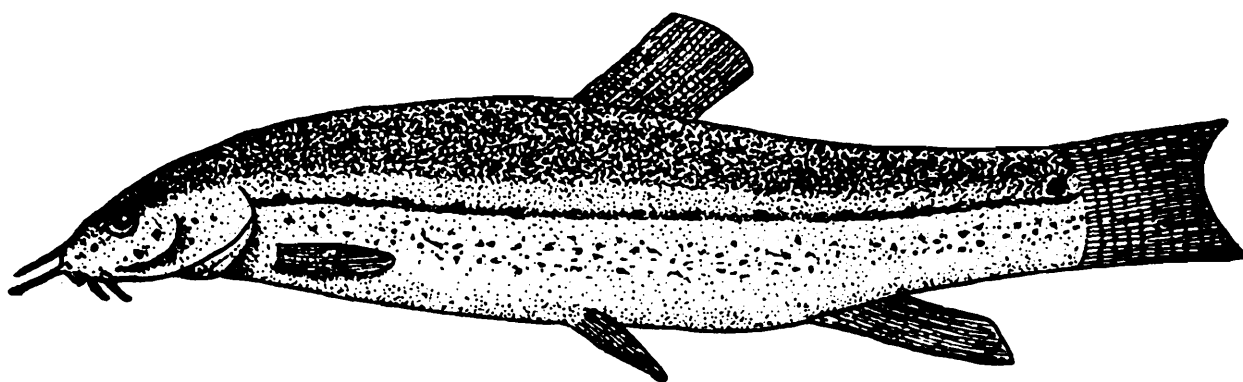


Fig. 9. Lateral view of *L. (Lepidocephalichthys) berdmorei* (Blyth) (after Day)

the type specimen has faded. The height of the body in this specimen is much less than that shown by Day (1878) in the text as well as the figure (Pl. CLIII, fig. 3). The figured specimen of this species by Day (1878) is not available in the collections of Zoological Survey of India, Calcutta. However, the figure of Day (1878, pl. CLIII, fig. 3) is reproduced here for sake of comparison. The height of body is contained 5.50-6.00 times in total length according to Day while the same is 7.00-7.73 times in the type and general material of this species studied here. The head length is contained 5.60-5.80 times in total length in this material. According to Day (1878), it is 6.0-6.25 times in total length. It appears that the material of Day (1878) is not actual *L. berdmorei*. Since the original material studied by Day (1878), is not available, we refrain from making any remark on this.

***Lepidocephalus (Lepidocephalichthys) annandalei* Chaudhuri**

(Figs. 10A, 13, 14A,B, 20C, 21C)

1912. *Lepidocephalichthys annandalei* Chaudhuri, *Rec. Indian Mus.*, 7 : 442, pl. 40, figs. 3, 3a, 3b (Type-locality : Mahananda river at Siliguri and Tista river, near Jalpaiguri, W. Bengal).
1976. *Lepidocephalichthys menoni* Pillai and Yazdani, *J. zool. Soc. India*, 26 (1-2) : 13, Text-fig. 1 (Type-locality : Someswari river at Baghmara, Garo hills, Meghalaya).

Diagnostic features : B. III, D. I-II/6-7, P. I/6-7, V I./6, A. II/5, C. 16-18.

Head length 5.23-5.67 in total length and 4.00-4.67 in standard length. Body depth 6.90-9.00 in total length and 5.50-7.25 in standard length. Least height of caudal peduncle 50.00-75.00% of its

length. Anterior and posterior nostrils separate from each other, former with a tubular extension and nearer tip of snout while latter a simple opening nearer eye. Origin of dorsal fin almost equidistant from anterior margin or middle of eye and base of caudal fin, it lies opposite or posterior or anterior to origin of ventral fins. Barbels very minute. Mental lobe produced into minute barbel-like projection. Caudal fin notched or concavely lunate. A small patch of scales below eye and a few scales above operculum.

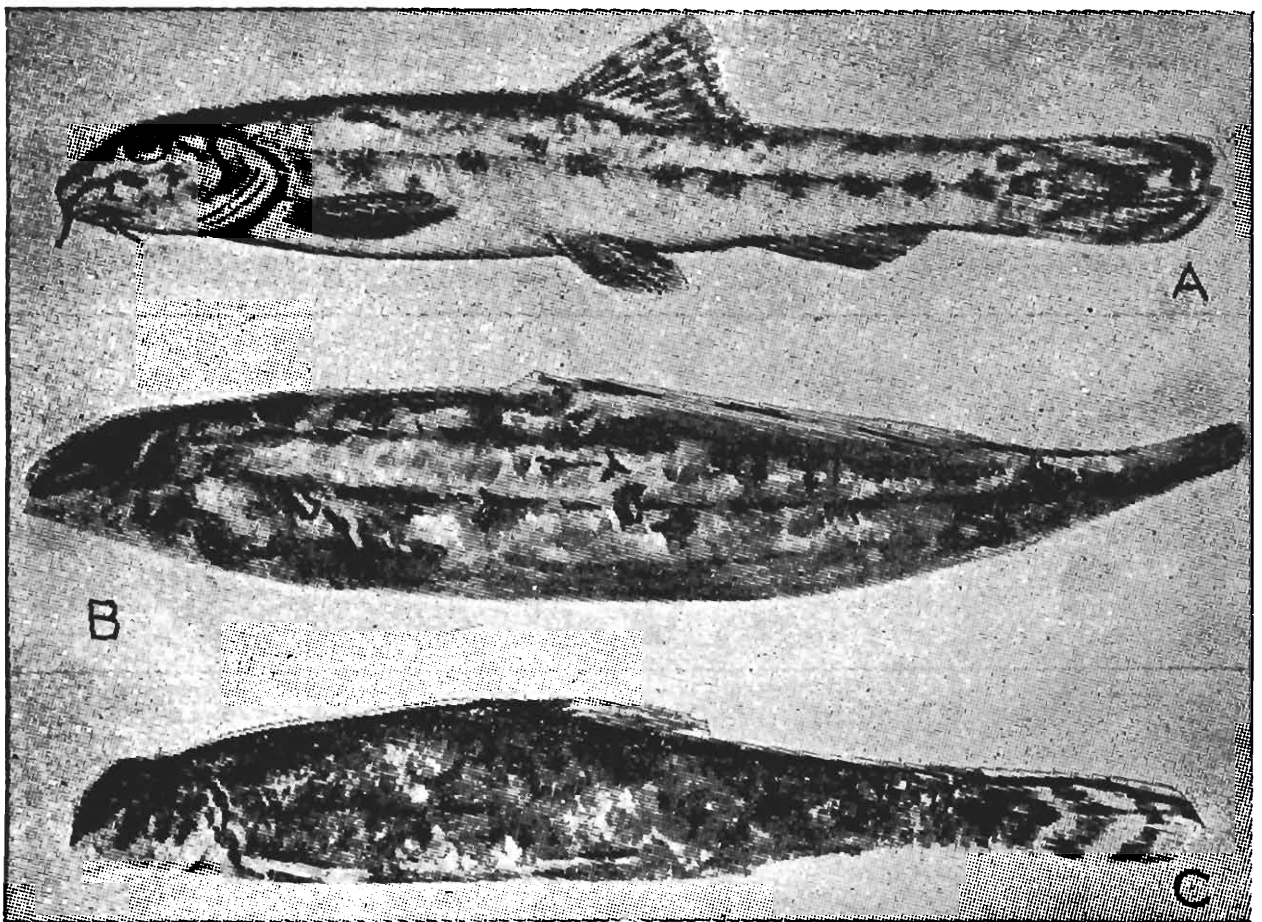


Fig. 10. A-Lateral view of *L. (Lepidocephalichthys) annandalei* Chaudhuri (after Chaudhuri) B-Photograph of the lateral view of *Lepidocephalichthys annandalei* Chaudhuri (after Yazdani) Identified here as *L. (Lepidocephalichthys) caudofurcatus* Tilak and Husain C-Photograph of the lateral view of *Lepidocephalichthys bermorei* (Blyth) (after Banarescu and Nalbant) Identified here as *L. (Lepidocephalichthys) caudofurcatus* Tilak and Husain

On ventral side, body scales extend anteriorly much beyond isthmus (Figs. 11, 12). 28 rows of scales between back of body and anal fin. Sub-dorsal scales almost circular with eccentric and wide focal area (Fig. 21C). Sub-orbital spine (Fig. 20C).

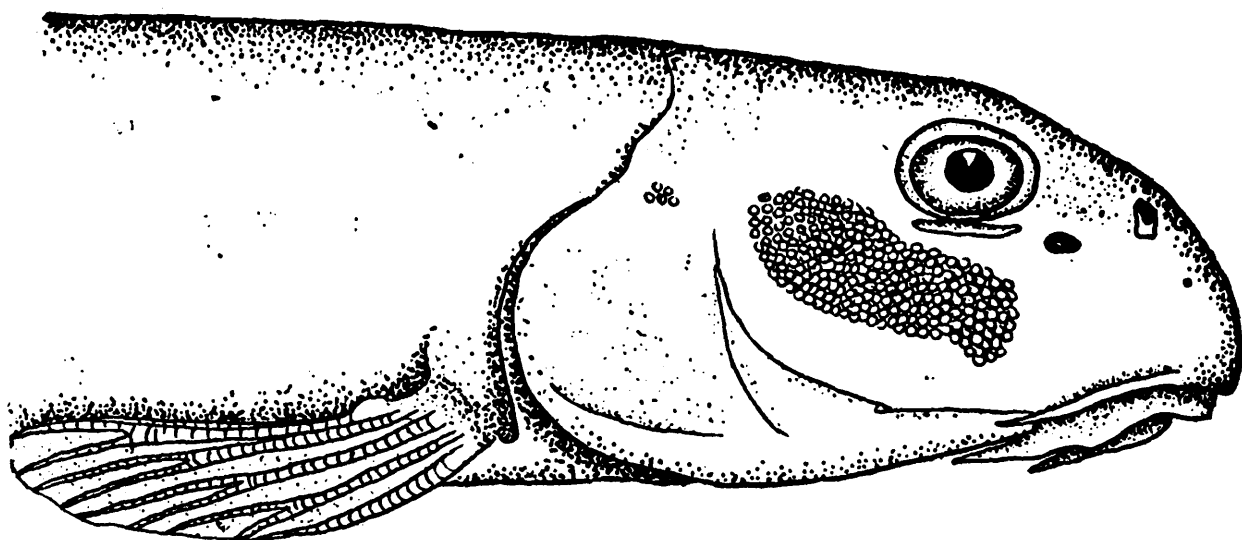


Fig. 11. Lateral view of the anterior region of the body of *L. (Lepidocephalichthys) annandalei* Chaudhuri

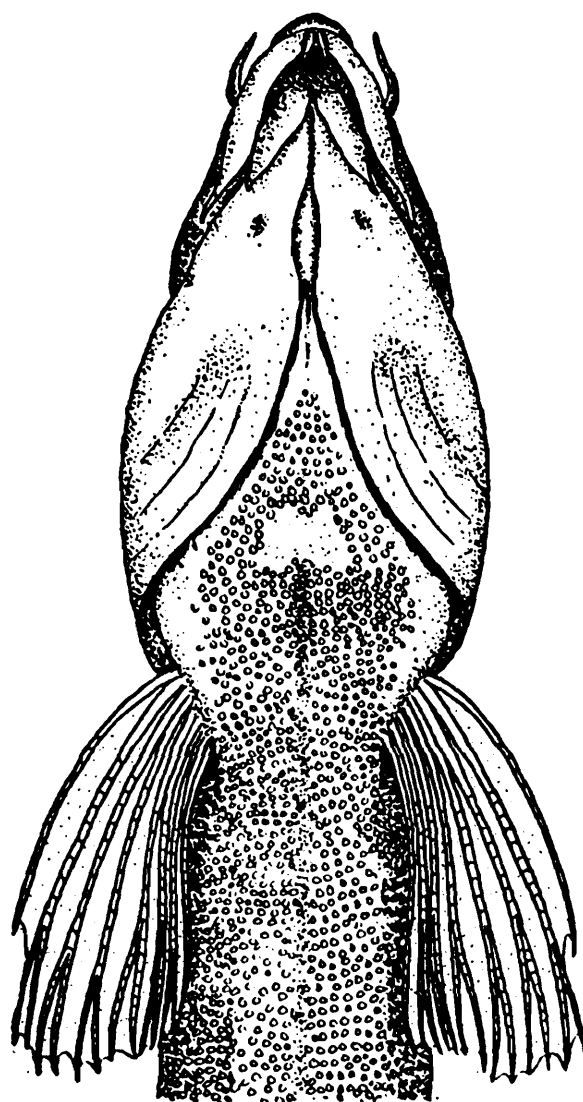


Fig. 12. Ventral view of the anterior region of the body of *L. (Lepidocephalichthys) annandalei* Chaudhuri

Ground colour of body pale. Dorsal side of body variegated with collections of brown and gray patches of spots. 10-12 irregular dark blotches along lateral sides of body. Dorsal side of head and snout stippled with dots. A dark band extending upto anterior margin of eye. Dark spots on suborbital and opercular regions. 4 dark bands on dorsal fin. Paired and anal fins immaculate. Colouration of caudal fin very peculiar and distinctive; oblique bands assuming shape of " \geq " on caudal fin. Two intensely coloured black spots, encircled in white rings, one at caudal base slightly above middle line while other spot, about 2 times in size of first one, near end of caudal just before notch.

Distribution : Northern India.

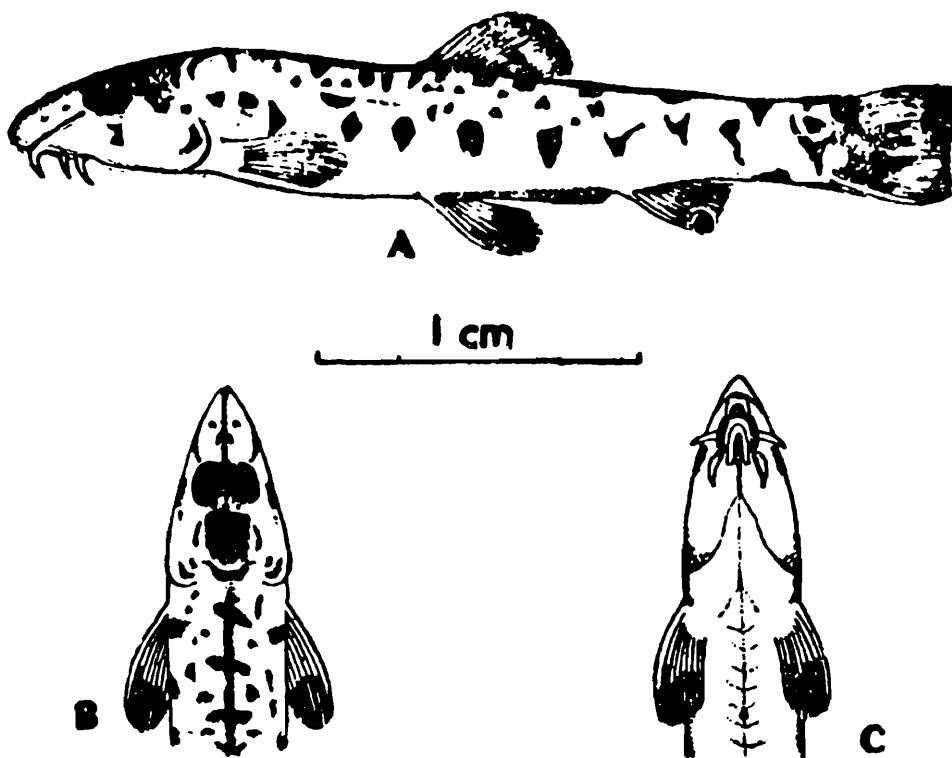


Fig. 13. *Lepidocephalichthys menoni* Pillai and Yazdani A. Lateral view; B. Dorsal view of the anterior region of the body; C. Ventral view of the anterior region of the body (after Pillai and Yazdani). Identified here as *L. (Lepidocephalichthys) annandalei* Chaudhuri.

Remarks : Hora and Gupta (1941) have relegated *L. annandalei* Chaudhuri to the synonymy of *L. guntea* (Ham.) on the ground that in young specimens of *L. guntea*, there are 2 ocelli on the caudal fin, same as described in *L. annandalei* by Chaudhuri (1912). Tilak (1973) also followed these authors. The present authors have examined very long series of *L. guntea* from various parts of India

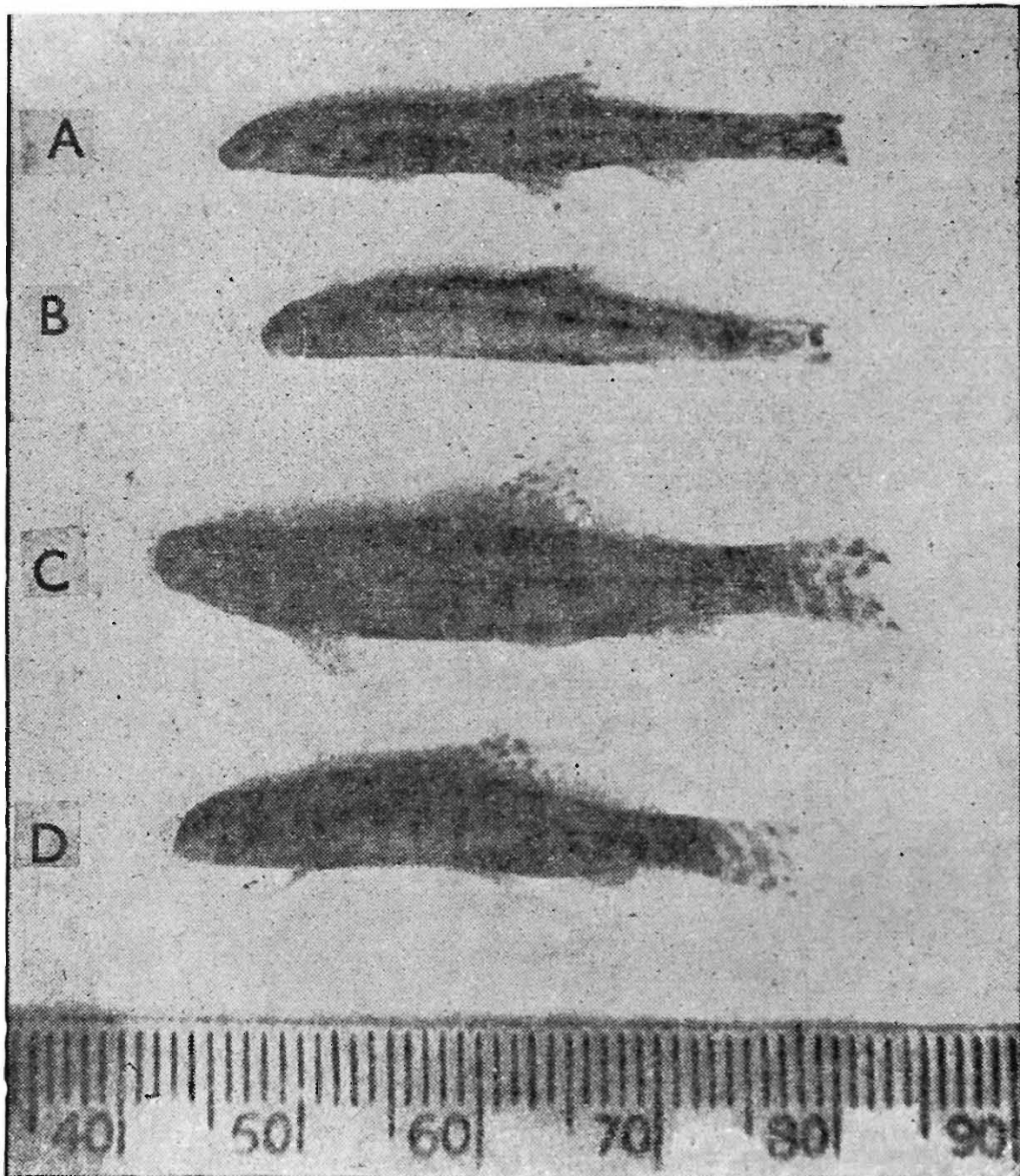


Fig. 14. A & B. Photograph of *L. (Lepidocephalichthys) annandalei* Chaudhuri from Uttar Pradesh; C & D. Photograph of *L. (Lepidocephalichthys) caudofurcatus* Tilak and Husain from Uttar Pradesh.

(both young and adult of both sexes) and have never come across specimens with 2 ocelli on the caudal peduncle. It is clear that Hora and Gupta (1941) had a mixture of *L. guntea* and *L. annandalei* before them and they considered the latter as the young of the former because in almost all the cases, the specimens of *L. annandalei* (adults) are of small size and due to this reason probably, Hora and Gupta (1941) were misled to consider them as the young of *L. guntea*.

The relegation of *L. annandalei* Chaudhuri, which is a characteristic and valid species, to the synonymy of *L. guntea* by Hora and Gupta (1941) is, therefore, unjustified.

Banarescu and Nalbant (1968) have expressed the opinion that *L. annandalei* Chaudhuri is quite probably a synonym of *L. thermalis* without assigning any reasons ; hence we do not agree with this view either. Menon (1963), in his distributional list of fishes of Himalaya, recognised *L. annandalei* Chaudhuri as a valid species but later he (1974) has put this species in the synonymy of *L. guntea* without giving any reasons. Probably, he was influenced by the treatment given to this species by Hora and Gupta (1941).

Yazdani (1976b) and Pillai and Yazdani (1976) have tried to resurrect *L. annandalei* Chaudhuri as a valid species but unfortunately the material on which they have based their contention belongs to *L. caudofurcatus* Tilak and Husain (Fig. 10B). Pillai and Yazdani (1976) have described *L. menoni* as a new species from Garo hills, Meghalaya. The type material of this species (2 exs., Regd. No. 553, E. R. S./Z. S. I., paratypes) from Eastern Regional Station, Zoological Survey of India, Shillong (Meghalaya) has been studied in detail. This material very clearly belongs to *L. annandalei* Chaudhuri in all its morphometric, meristic and other characters including colouration which is very characteristic particularly of the caudal fin. *L. menoni* Pillai and Yazdani (Fig. 13) is therefore, a synonym of *L. annandalei* Chaudhuri.

***Lepidocephalus (Lepidocephalichthys) goalparensis* Pillai and Yazdani
(Figs. 15, 21E)**

1976. *Lepidocephalichthys goalparensis* Pillai and Yazdani *J. zool. Soc. India*, 26 (1-2) : 15, text-fig. 2 (Type-locality : Goalpara, Assam).

Diagnostic features : B. III, D. III/7, P. I/7, V. I/6, A. II/6, C. 16

Head length 5.51 and body depth 5.78 in total length. Least height of caudal peduncle 75.00% of its length. Origin of dorsal fin much nearer tip of snout than base of caudal fin and slightly in advance of ventrals. Origin of ventral fin slightly nearer tip of snout than base of caudal fin. Barbels short. Mental lobe without barbel-like projections. Caudal fin emarginate. Scales on sides of head.

On ventral side of body, scales extend upto a point opposite bases of pectoral fins. 16 rows of scales between back of body and anal fin. Sub-dorsal scale oval in shape with small eccentric focal area (Fig. 21E).

Dorsal side of body darkish in colour. Some extremely faded colour patches along lateral sides of body. Three faded colour bands on caudal fin. A black spot on upper half of caudal base.

Distribution : Assam (India).

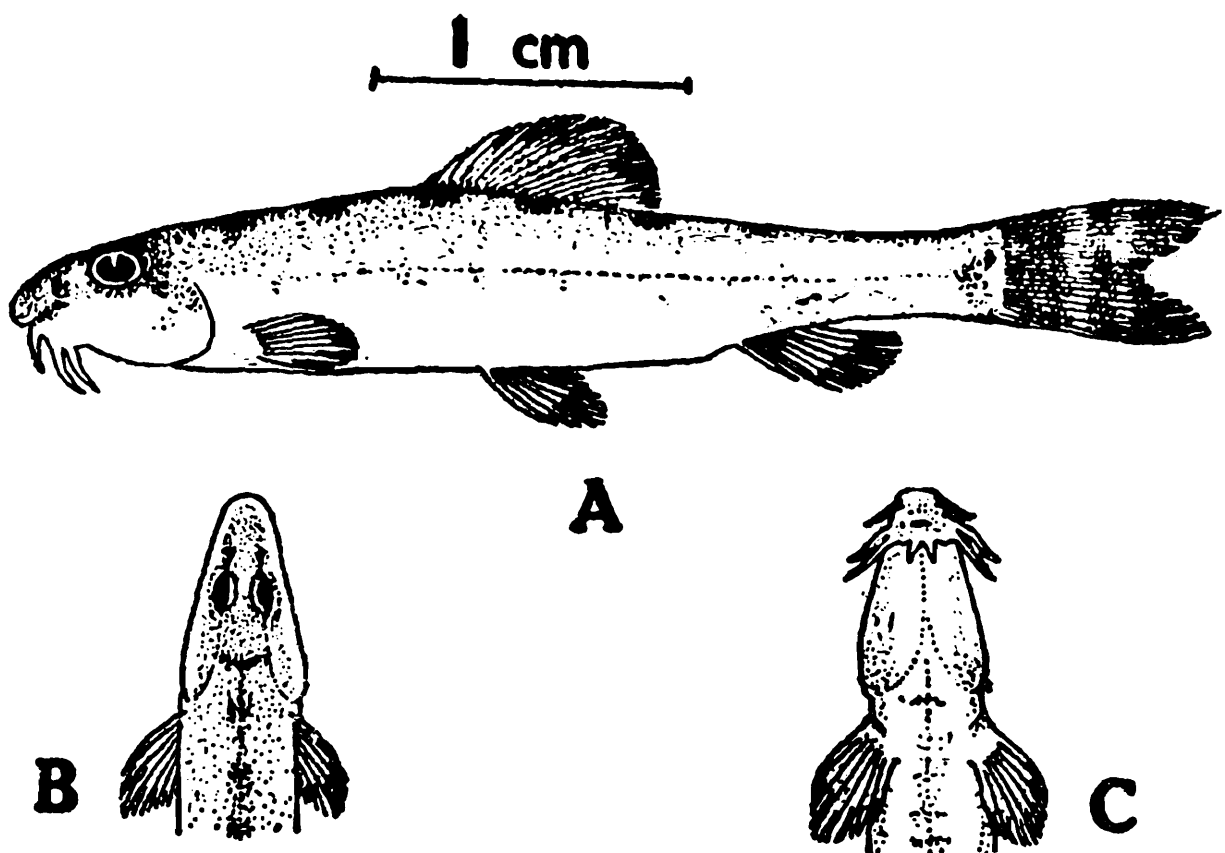


Fig. 15. *Lepidocephalichthys goalparensis* Pillai and Yazdani A. Lateral view ; B. Dorsal view of the anterior region of body and C. Ventral view of the anterior region of body (after Pillai and Yazdani)

Remarks : The holotype (Regd. No. E. R. S./Z. S. I. -519) from Eastern Regional Station, Zoological Survey of India, Shillong (Meghalaya) has been examined and we find that the single example is devoid of colouration described by Pillai and Yazdani (1976). We observe differences in the meristic characters of this specimen from that given by the original authors. The single example was collected on 8th April, 1971. The material of different species of the genus *Lepidocephalus* in our collection, collected during 1971 and

even earlier bears the colouration of the body very clearly. The colouration shown by Pillai and Yazdani (1976, in the text-figs. 2a and 2b) is not consistent (Fig. 15) because they have shown two dark spots on the back before the dorsal fin in fig. 2a (lateral view) while there are three such spots in fig. 2b in the same area. The caudal fin, both in the text as well as in text-fig. 2a, is shown as bifurcated into lobes but in the actual specimen (holotype), the caudal fin is slightly emarginate.

The differences in the meristic and morphometric characters of *L. goalparensis* observed by the present authors by the study of the holotype from those given by Pillai and Yazdani (1976) are given below :

Characters	As mentioned by Pillai and Yazdani (1976)	As studied by the present authors
1) Dorsal fin rays	III/6	III/7
2) Pectoral fin rays	7	I/7
3) Caudal fin rays	18	16
4) Depth of body	17.2%	21.3% of Standard length (S. L.)
5) Length of head	21.9%	22.3% of S. L.
6) Length of caudal peduncle	15.6%	13.1% of S. L.
7) Height of dorsal fin	17.2%	18.0% of S. L.
8) Length of pectoral fin	14.0%	16.4% of S. L.
9) Length of caudal fin	21.9%	24.6% of S. L.
10) Maximum height of caudal peduncle	9.4%	9.8% of S. L.
11) Height at caudal base	11.0%	10.5% of S. L.
12) Length of snout	43.0%	36.8% of head length (H. L.)
13) Eye diameter	21.4%	26.5% of H. L.
14) Interorbital distance	14.3%	14.7% of H. L.

In view of differences in the description of this species observed by the present authors in the single example (holotype), the species is kept here as it is till more material of same is collected for study from the type-locality. It, however, differs from the existing Indian species but due to lack of comparative material it should be immature to make any further comments on this species.

Lepidocephalus (Lepidocephalichthys) caudofurcatus Tilak and Husain
(Figs. 10B, C, 14C, D, 16-18, 20D, 21D)

1968. *Lepidocephalus berdmorei* Banarescu and Nalbant (nec Blyth), *Mitt. Hamburg, Zool. Mus. Inst.*, **65** : 347, 348, pl. II, fig. 23 (Janali river at Raimona, Assam and Kaziranga, Mikir hills Assam.)
1976. *Lepidocephalichthys annandalei* Pillai and Yazdani (nec Chaudhuri), *J. zool. Soc. India*, **26** (1-2) : 12 (a stream at Dainadubi forest, Garo Hills, Meghalaya and Dudhnai river, Goalpara, Assam).
1976. *Lepidocephalichthys annandalei* Yazdani (nec Chaudhuri), *Newsl. zool. Surv. India*, **2** (2) : 55 (Kaziranga Wild Life Sanctuary, Assam).
1976. *Lepidocephalus annandalei* Yazdani (nec Chaudhuri), *J. Bombay nat. Hist. Soc.*, **73** (3) : 535-536 (Kaziranga Wild Life Sanctuary, Assam).
1977. *Lepidocephalichthys annandalei* Pillai and Yazdani (nec, Chaudhuri), *Rec. zool. Surv. India*, **72** (1-4) : 13 (a stream at Dainadubi forest, Garo hills, Meghalaya).
1978. *Lepidocephalus caudofurcatus* Tilak and Husain, *Matsya*, **3** : 60-63, figs. 1-3, (Type-locality : Kalapani nala, Rishikesh, Dist, Dehra Dun Sailani river near Beharigarh, Dist. Saharanpur and Gangan river near Moradabad, Dist. Moradabad, Uttar Pradesh).

Diagnostic features : B. III, D. II/6, P. I/7, V I/6, A. III/5, C.16

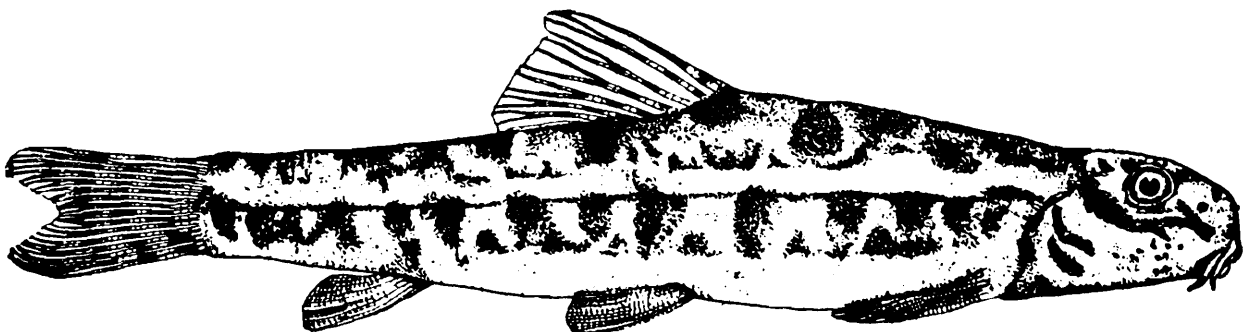


Fig. 16. *L. (Lepidocephalichthys) caudofurcatus* Tilak and Husain, lateral view

Head length 5.10-6.00 and body depth 5.51-7.38 in total length. Least height of caudal peduncle 60.61-87.50% of its length. Barbels short. Mental lobe simple and without barbel-like projections. Origin of dorsal fin equidistant between tip of snout and base of caudal fin and may be nearer tip of snout or base of caudal fin. Origin of dorsal fin opposite or slightly ahead of ventral fins. Caudal fin deeply emarginate or forked. Sub-orbital, post-orbital and upper part of opercular region covered with a single continuous patch of scales. Scales on lateral and ventral sides of head. On ventral side of body, scales extend anterior to isthmus (Figs. 17, 18). Sub-

dorsal scales oval in shape with very small and eccentric focal area (Fig. 21D). 25 rows of scales between back of body and anal fin. Suborbital spine elongated with sub-equal and deeply forked prongs (Fig. 20D).

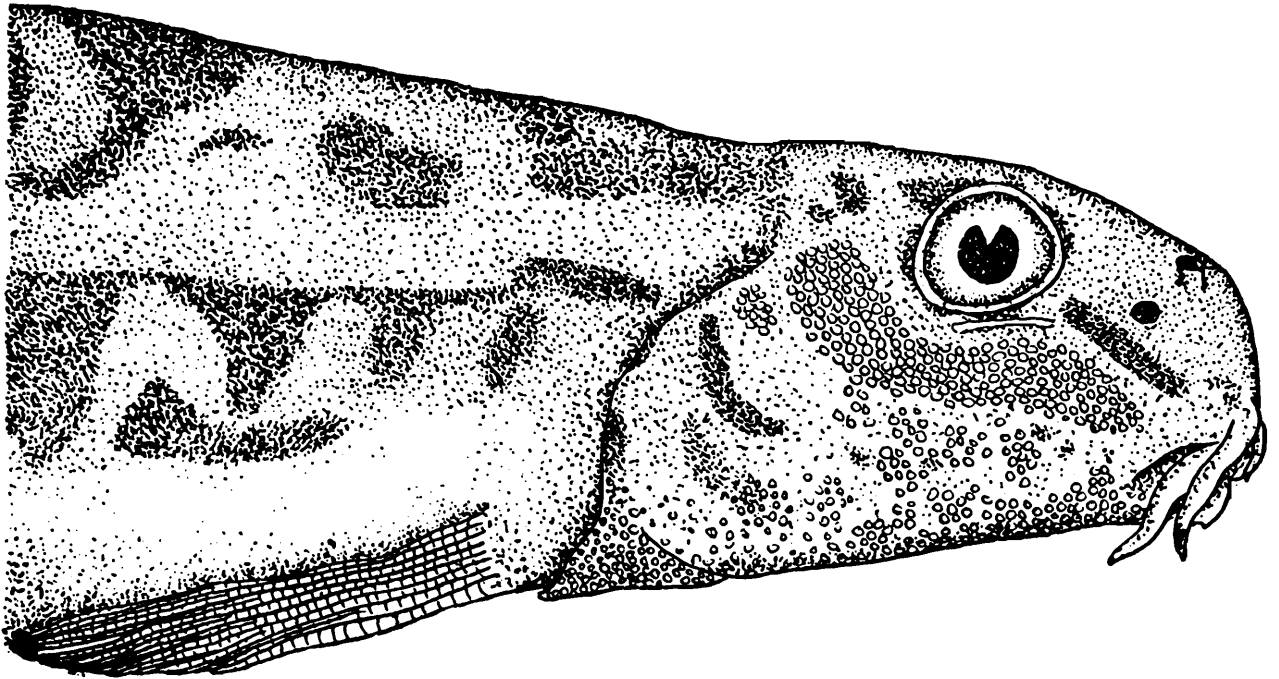


Fig. 17. *L. (Lepidocephalichthys) caudofurcatus* Tilak and Husain, anterior region of the body from lateral aspect

Colouration of body peculiar and uniform in all examples studied. Ground colour pale, back marked with 7-10 saddle-shaped dark bands. A thin dark band along side of body between tip of snout and middle of caudal base. This band slightly faded near upper edge of operculum. Cheek and operculum with irregular dark spots. Extending downwards from lateral band, 7-14 large vertically rectangular blotches, separate from each other by a distance almost equal to their own width. Area between lateral band and back irregularly speckled with black dots. Dorsal and caudal fins with 4-5 vertical bands. Pectoral, ventral and anal fins usually with a few bands on each of them. A black spot on upper part of caudal base.

Distribution : Northern India.

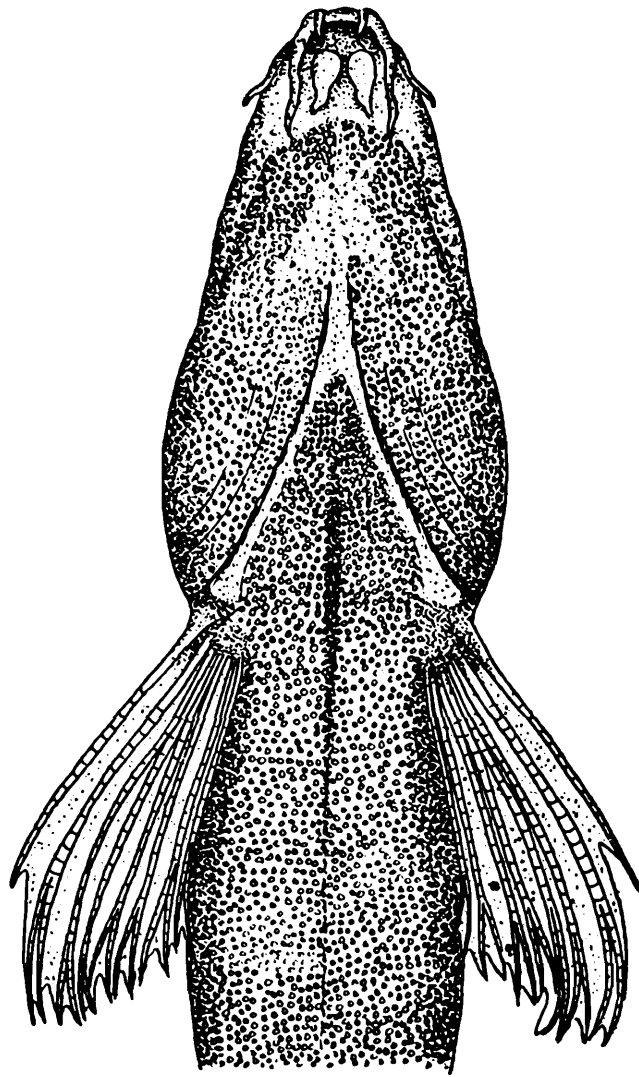


Fig. 18. *L. (Lepidocephalichthys) caudofurcatus* Tilak and Husáin, ventral view of the anterior region of body

Remarks : Three examples (one female and two males). Regd. No. ZIMNR 3612, Janali river at Raimona, Assam (Brahmputra drainage), collected by G. A. Frhr. V Maydell during Indo-German Expedition, 1955/58 which were identified as *Lepidocephalus berdmorei* by Banarescu and Nalbant (1968), have been studied in detail by the present authors, and found them to be the same as *L. caudofurcatus* Tilak and Husain. The material of *Lepidocephalus annandalei*, reported by Pillai and Yazdani (1976), has also been examined in detail and compared with a similar material from Dehra Dun, Saharanpur and Moradabad districts of Uttar Pradesh. It has been observed that this material belongs to *L. caudofurcatus*. *L. annandalei*, reported by Yazdani (1976b) from Kaziranga Wild life Sanctuary, Assam (Fig. 10B) and *L. berdmorei*, reported by Banarescu and Nalbant (1968), (Fig. 10C) are same as *L. caudofurcatus* Tilak and Husain.

***Lepidocephalus (Lepidocephalus) irrorata* (Hora)**
(Figs. 19, 21F)

1921. *Lepidocephalichthys irrorata* Hora, *Rec. Indian Mus.*, 22 : 196, pl. 9, figs. 5, 5a, 5b (Type-locality : Loktak lake, Manipur).

Diagnostic features : B.III, D. II-III/6-7, P.I/6-7, V I/6, A-I. III/5, C. 15-16.

Head length 6.40-7.60 and body depth 6.33-7.33 in total length. Least height of caudal peduncle 65.00% of its length. Origin of dorsal fin much nearer caudal base than tip of snout and considerably behind ventral fin. Origin of ventral fin equidistant from tip of snout and base of caudal fin. On head, scales on vertex, sides of head and ventrally extending anterior to isthmus. 21 rows of scales between back and anal fin. Bases of mandibular barbels broadened outwards meeting those of maxillary barbels resulting in a membranous stretch of

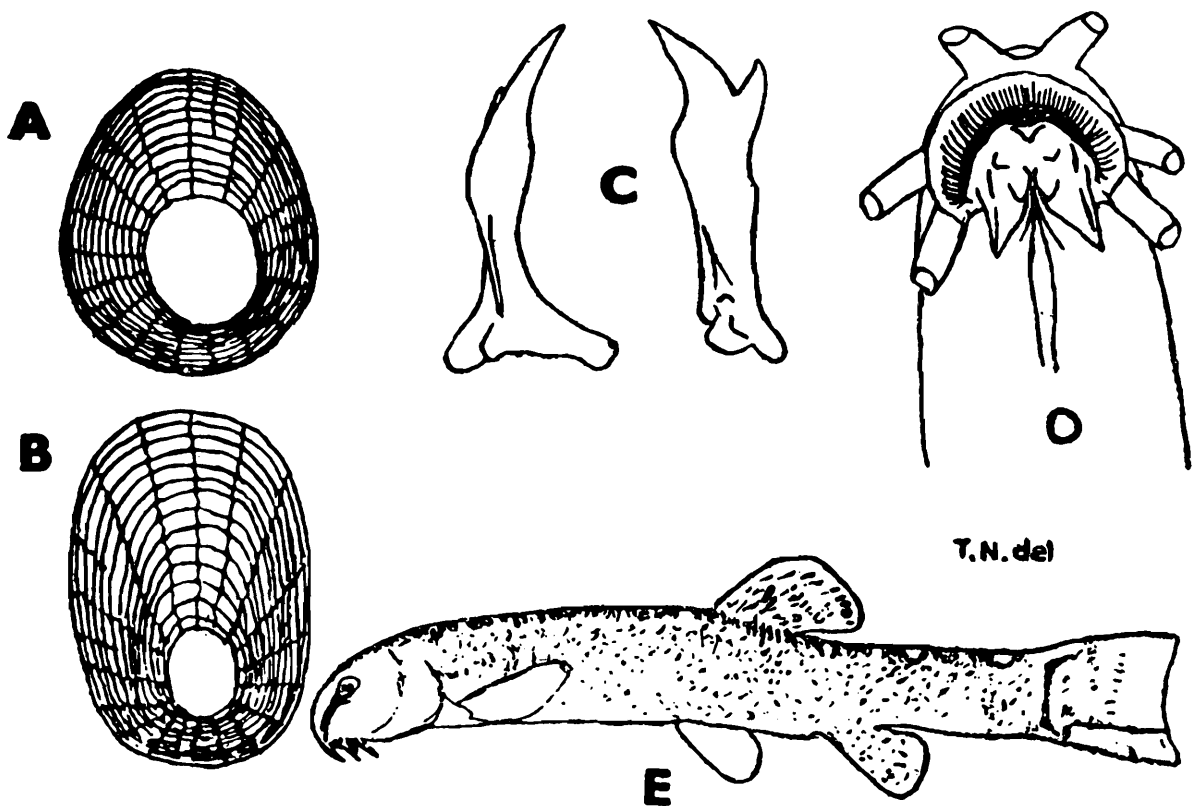


Fig. 19. *L. (Lepidocephalus) irrorata* (Hora) A & B. Scales, C. Suborbital spine in different views D. Ventral view of the anterior region of the body, E. Lateral view. (after Banarescu and Nalbant).

flap between their bases ; in some examples, membranous flap absent and barbels free. Caudal fin concave. Sub-dorsal scales oval in shape with large and eccentric focal area (Figs. 19A, B). Sub-orbital spine elongated and forked (Fig. 19C).

Ground colour of body pale with minute dark spots all over. Fins profusely spotted; spots arranged in bands. No spots on caudal base.

Distribution : Assam, Manipur (India)

Remarks : Hora (1921) described this species under the genus *Lepidocephalichthys* but due to the presence of scales on the vertex, Banarascu and Nalbant (1968) put it under the subgenus *Lepidocephalus*. It is close to *L. macrochir* Bleeker which is not found in India. *L. irrorata* is the only Indian species representing *L. (Lepidocephalus)* Bleeker.

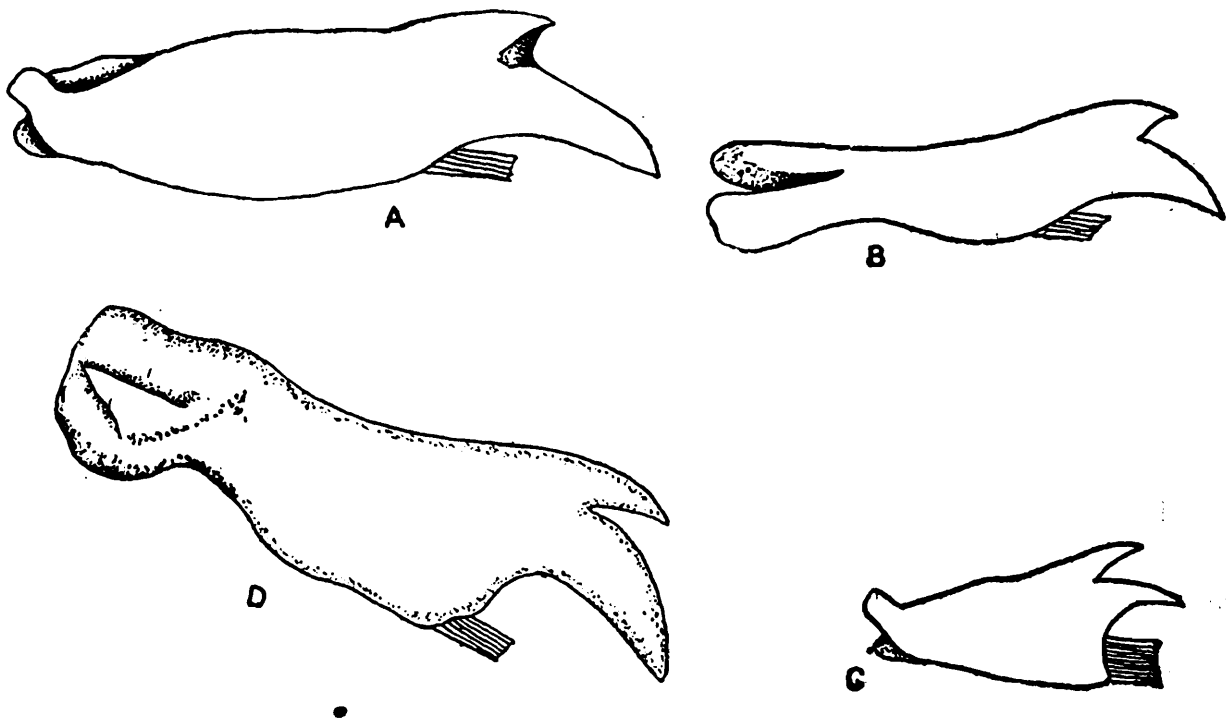


Fig. 20. *L. (Lepidocephalichthys) guntea* (Ham.)—Suborbital spine-inner aspect
 B. *L. (Lepidocephalichthys) thermalis* (Val.)—Suborbital spine-inner aspect
 C. *L. (Lepidocephalichthys) annandalei* Chaudhuri—Suborbital spine-inner aspect
 D. *L. (Lepidocephalichthys) caudofurcatus* Tillak and Husain—spine-inner aspect

I. KEY TO THE GENERA OF THE COBITID FISHES WITH A SUBORBITAL SPINE (SUBFAMILIES BOTIINAE AND COBITINAE)

- Two pairs of rostral and one pair of maxillo-mandibular barbels present; caudal fin deeply forked; anterior chamber of swim-bladder not always enclosed in osseous capsule

Subfamily BOTIINAE (2)

One pair of rostral, a pair of maxillary and a pair of maxillo-mandibular barbels present; caudal fin rounded or

- slightly emerginate (except in *Acanthopsis* van Hasselt); anterior chamber of swim-bladder enclosed completely in an osseous capsule ... Subfamily COBITINAE (3)
2. Sides of head covered with small rounded scales; subdorsal scale with a small focal area, close to the base ... Genus *Leptobotia* Bleeker
- Sides of head always naked; subdorsal scale with a small central or eccentric focal area ... Genus *Botia* Gray
3. Barbels absent ... Genus *Neoecirrhichthys* Banarescu and Nalbant
- Three pairs of barbels present ... (4)
4. Body much elongated and anguilliform ... (5)
- Body elongated but not anguilliform ... (6)
5. Dorsal fin extending over first ray of anal fin Genus *Cobitophis* Myers
- Dorsal fin not extending over the anal fin ... Genus *Eucirrhichthys* Perugia
6. Dorsal fin much elongated (27 branched rays) Genus *Enobarbichthys* Whitley
- Dorsal fin short ... (7)
7. Scales on head and body absent ... Genus *Paralepidocephalus* Tchang
- Body and sometimes the head with scales ... (8)
8. A strong carina between dorsal and caudal as well as between anal and caudal fins present (9)
- Carina before the caudal fin absent ... (10)
9. Scales with small eccentric focal area and suborbital spine nonfunctional ... Genus *Misgurnus* Lacépede
- Scales with large central focal area; suborbital spine functional ... Genus *Niwaella* Nalbant
10. Scales on the sides of head present ... Genus *Lepidocephalus* Bleeker
- Scales on the sides of head absent ... (11)
11. Lateral line complete ... (12)
- Lateral line incomplete ... (13)
12. Caudal well forked; origin of dorsal slightly in front of ventral or on same line with them Genus *Acanthopsis* van Hasselt
- Caudal entire; dorsal origin behind the ventrals ... Genus *Somileptes* Swainson
13. Origin of dorsal behind the ventrals and sometimes extending over the anal ... Genus *Acanthophthalmus* van Hasselt
- Origin of dorsal on same line of insertion as the ventrals and not extending over the anal ... (14)

14. Scales on the body small and unimbricated ;
radial grooves on the scales 15 Genus *Acanthopsoides* Fowler
- Scales on the body small and usually imbricated ;
radial grooves on the scales 19-37
(usually 22-25) (15)
15. Mental lobe small or developed and without
barbel-like extensions Genus *Cobitis* Linnaeus
- Mental lobe developed and with barbel-like
extensions Genus *Sabanejewia* Vladykov

II. KEY TO THE IDENTIFICATION OF INDIAN SPECIES OF THE GENUS *LEPIDOCEPHALUS* BLEEKER

1. The dorsal side of head (vertex) scaled Subgenus : *Lepidocephalus*
(*Lepidocephalus*) Bleeker
L. (Lepidocephalus) irrorata
(Hora)
- Dorsal side of head naked Subgenus *Lepidocephalus*
(*Lepidocephalichthys*) Bleeker
(2)
2. Caudal forked or deeply emarginate ; whole
of the lateral and ventral sides of head scaled (3)
Caudal convex, cut square, slightly emarginate
or notched ; lateral and ventral sides of
head naked (4)
3. Origin of dorsal almost equidistant between
snout tip and caudal base ; the focal area of
subdorsal scale eccentric and very small ;
body scales on ventral side extend anteriorly
much beyond the isthmus ; rectangular blotches
along the lateral sides of the body present ;
25 scales between the back and the base of
anal fin *L. (Lepidocephalichthys)*
caudofurcatus Tilak & Husain
- Origin of dorsal much nearer the tip of snout
than the caudal base ; the focal area of sub-
dorsal scale eccentric and somewhat bigger
in size ; body scales on the ventral side do
not extend anteriorly beyond the bases of
pectoral fins ; dark blotches along the lateral
side of the body absent ; 16 scales between
the back and the base of anal fin *L. (Lepidocephalichthys)*
goalparensis Pillai and
Yazdani

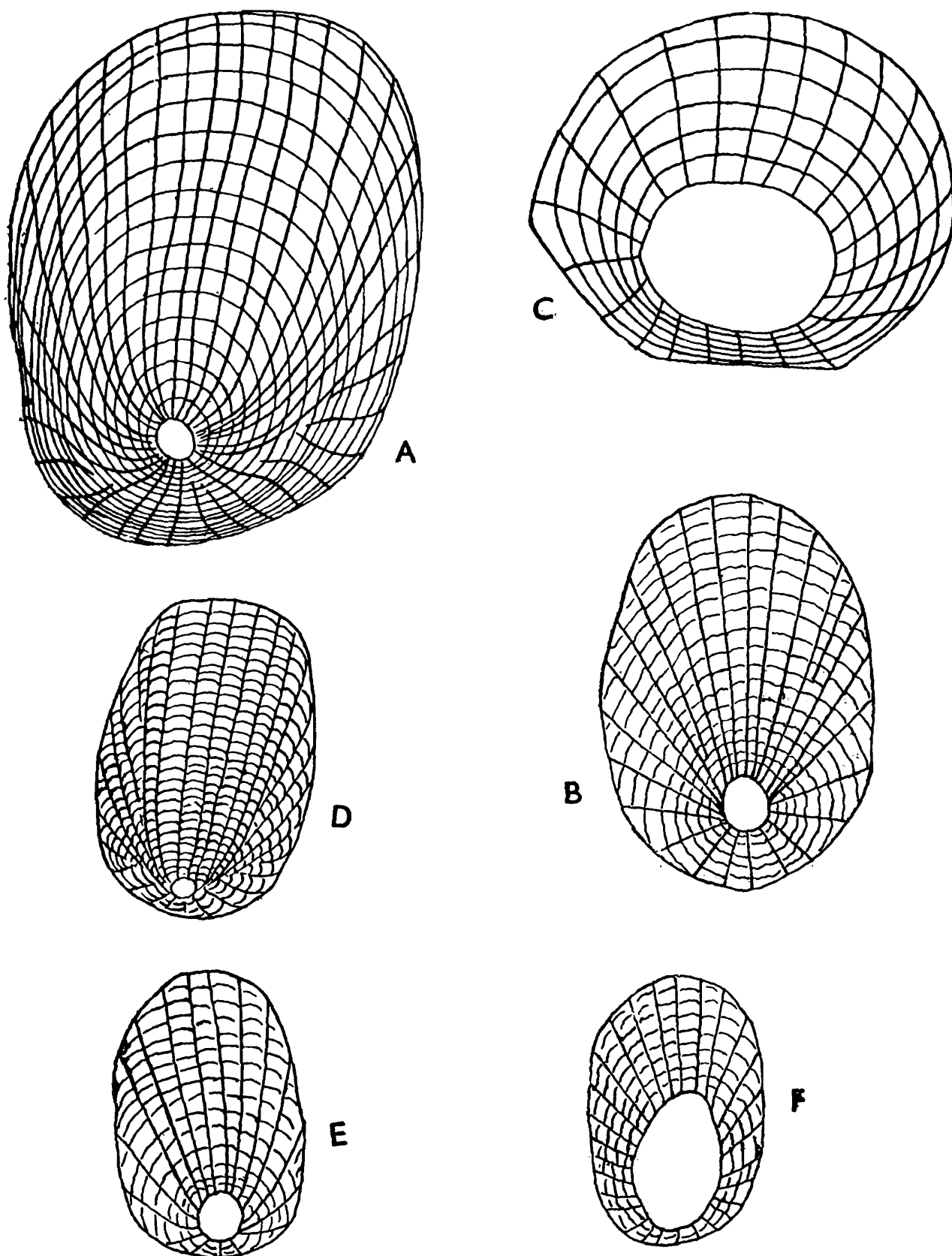


Fig. 21. *Lepidocephalus* (*Lepidocephalichthys*) *guntea* (Ham.)—Subdorsal scale B. *L.* (*Lepidocephalichthys*) *thermalis* (Val.)—Subdorsal scale C. *L.* (*Lepidocephalichthys*) *annandalei* Chaudhuri—Subdorsal scale D. *L.* (*Lepidocephalichthys*) *caudofurcatus* Tilak and Husain—Subdorsal scale E. *L.* (*Lepidocephalichthys*) *goalparensis* Pillai and Yazdani—F. *L.* (*Lepidocephalus*) *irrorata* Hora—Subdorsal scale

4. Scales between back of body and base of anal fin 40 ; mandibular flap produced posteriorly into 3 or more short barbel-like extensions ; pectoral fin with 8-10 rays L. (*Lepidocephalichthys*) *berdmorei* (Blyth)
- Scales between back and base of anal fin 25-37 ; mandibular flap not produced posteriorly into barbel-like extensions ; pectoral with 7-8 rays (5)
5. Caudal fin notched or concavely lunate ; caudal fin obliquely banded with three faint gray bands on each side of the middle line ; two intensely dark spots encircled in white rings, one slightly above the middle of the base of caudal fin and the other at the notch present L. (*Lepidocephalichthys*) *annandalei* Chaudhuri
- Caudal convex, cut square or slightly emarginate ; bands on caudal not oblique ; only one dark spot slightly above the middle of the base of caudal fin present (6)
6. Length of head 5.57-6.28 times in total length ; only a small patch of scales present behind the suborbital spine ; origin of ventral fin behind that of dorsal fin ; depth of body 7.46-9.71 times in total length L. (*Lepidocephalichthys*) *thermalis* (Valenciennes)
- Length of head 5.88-6.80 times in total length ; a patch of scales extends from below the eye to upper part of operculum ; depth of body 5.66-7.00 times in total length L. (*Lepidocephalichthys*) *guntea* (Hamilton)

SUMMARY

The taxonomy of the fishes of the genus *Lepidocephalus* Bleeker has so far been in confusion particularly because of the high rate of variability of their characters. The fishes of this genus are bottom feeders and quiet in nature. The taxonomic treatment given to these fishes by a few workers in the near past, prompted us to make a detailed study of this group of fishes in India. As a result of this study, we have made an attempt to straighten the systematics of the fishes of the genus *Lepidocephalus* in this paper. The present

authors have also reidentified the material of this genus reported from different regions in India by many workers on fish taxonomy (Hora and Gupta, 1941 ; Banarescu and Nalbant, 1968 ; Yazdani, 1976 a, b, 1977 ; Pillai and Yazdani, 1976, 1977 etc.) and given the diagnostic features of 7 species of the genus *Lepidocephalus* Bleeker found in India. The differentiating characters of the sub-families Botiinae and Cobitinae with keys to the identification of all the genera falling under these sub-families have been provided. Under the genus *Lepidocephalus* Bleeker, two sub-genera viz. *Lepidocephalus* (*Lepidocephalichthys*) Bleeker and *Lepidocephalus* (*Lepidocephalus*) Bleeker have also been recognised. The differentiation of the two subgenera of *Lepidocephalus* together with a key to the identification of the seven Indian species falling under these subgenera has been given. Six species from India fall under the subgenus *L. (Lepidocephalichthys)* Bleeker and one under *L. (Lepidocephalus)*. The distribution pattern of scales in the head region has been found to be of great taxonomic value in differentiating species of the genus *Lepidocephalus* for the first time. The scalation on the head is important in distinguishing the genera of the sub-families Botiinae and Cobitinae and the subgenera of the genus *Lepidocephalus*. In all 21 figures and photographs of different aspects of the body, the scales and the suborbital spine have been given. This paper should act as an aid to the identification of the Indian species of the genus *Lepidocephalus* Bleeker.

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