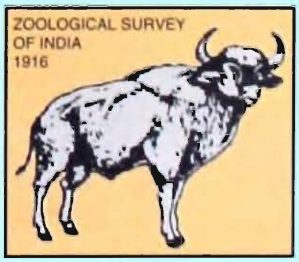
STATE FAUNA SERIES 5

FAUNA OF ANDHRA PRADESH

PART - 4
Invertebrates



ZOOLOGICAL SURVEY OF INDIA

State Fauna Series 5

FAUNA OF ANDHRA PRADESH

Invertebrates

(PART–4)

Edited by
The Director, Zoological Survey of India, Kolkata

Zoological Survey of India
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STATE FAUNA SERIES

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Part-4 **2007** **1-248**

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TREMATODES OF FISHES, AMPHIBIA AND REPTILIA

SHUVAJIT CHAKRABARTI and ANINDITA GHOSH
Zoological Survey of India, 'M' Block, New Alipore, Kolkata–700 053

INTRODUCTION

Andhra Pradesh is the fifth largest state in terms of geographical dimension. It lies between 12°50′ and 19°54′ N and longitudes 76°50′ and 86°50′ E. It lies on the Eastern sea-board of the peninsula and has a coast line of 982 Kms and total land area is 2,76,814 sq.kms. The state is bounded on the north by Madhya Pradesh and Orissa, on the east by the Bay of Bengal, on the South by Tamilnadu and on the West by Maharashtra and Karnataka. It has 23 districts and Hyderabad is the state capital. Two major river systems namely Godavari & Krishna alongwith their several tributaries drain the state. Evergreen, semi-evergreen and moist deciduous forests are found in the state.

About work so far done

Most of the works has been done by R. Madhavi and Hanumantha Rao on trematodes of fishes and reptiles. However, a good number of trematode parasites from reptilian hosts has been described by S.S. Simha. A perusal of the literature shows that a considerable number of trematode fauna of fish, amphibia and reptilia have been found. In the present work 154 species of 108 genera under 26 families have been described. The report is based upon partly on the specimens already present in the Zoological Survey of India and mostly on the species reported in different literatures. It has been our endeavour to include all the trematode species of fish, amphibia and reptilian hosts so far reported. The report provides workable keys for the future workers in this group. This is a comprehensive account and prime introduction of the group reported from Andhra Pradesh.

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72. *O. orbitum* Murugesh *et al.* 1992

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57. Genus ***Hysterorchis*** Durio et. Manter, 1963

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ii. Subfamily METADININAE Yamaguti, 1953

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ii. Subfamily ACANTHOCOLPINAE Luhe, 1906

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149. *S. hyderabadensis* Simha, 1954

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SYSTEMATIC ACCOUNT

I. Family LEPOCREADIIDAE (Odhner, 1905) Nicoll, 1935

Key to the subfamilies of LEPOCREADIIDAE

1. Prostatic complex poorly developed, enclosed in cirrus pouch .... OPISTHOGONOPORINAE

– Pars prostatica otherwise 2

2. Pars prastatica well-developed inside cirrus pouch ..... ACANTHOCOLPIDINAE

– Seminal vesicle winding outside cirrus pouch 3

3. Cirrus pouch small, pre-acetabular ..... AEPHNIDIOGENINAE

– Cirrus pouch well-developed 4

4. Prostatic cells inside cirrus pouch ..... LEPOCREADIINAE

5. Prostatic cells outside cirrus pouch, testes without follicles ..... PHYLLOTREMATINAE

6. Testes divided into a number of follicles, external seminal vesicle present ..... FOLLIORCHIINAE

– External seminal vesicle absent ..... DIPLOPROCTODAEINAE

i. Subfamily LEPOCREADIINAE Odhner, 1905

Key to the genera of Lepocreadiinae

1. Testes symmetrical, cirrus pouch pre-acetabular ..... ***Lepocreadioides***

– Testes diagonal, cirrus pouch post acetabular Cirrus and metraterm aspinose 2

2. Vitelline follicles small ..... ***Preptetos***

– Vitelline follicles comparatively smaller 3

3. Genital pore more or less submedian, between acetabulum and intestinal bifurcation. ..... ***Pseudocreadium***

4. Genital pore anterolateral to acetabulum ..... ***Opechona***

1. Genus *Pseudocreadium* Layman, 1930

1. *Pseudocreadium indicum* Madhavi, 1972

1972. *P. indicum* Madhavi *Parasit* **58**(2) : 217-225

Material : 39 exs.

Host : *Monacanthus chirocephalus*; Loc : Int..

Locality : Waltair Coast., Andhra Pradesh, India

Distribution : India : Andhra Pradesh.

2. Genus ***Opechona*** Looss, 1907

Key to the species of *Opechona*

- Sucker ratio 1 : 1–1.3 ..... *O. waltairensis*
- Sucker ratio 1 : 1–1.5 ..... *O. bacillaris*

2. ***Opechona bacillaris*** Molin, 1859

1858. *O. bacillaris* Molin, *Sitz-ber K. Akad. Wiss. Wein–Naturw.* Cl.; **33**(26) : 287-302.

Materials : 4 numerous exs.

Host : *Rostrelliger canagurta.*

Location : Int.

Locality : Wailtair Coast, Andhra Pradesh.

Distribution : India, Andhra Pradesh.

Elsewhere : Batavii Mediterranean, Atlantic, N. America, Russia.

3. ***Opechona waltairensis*** Madhavi, 1972

1972. *O. waltairensis* Madhavi, *J. Parasit* **58**(2) : 217-225

Material : 4 exs.

Host : *Rastrelliger canagurta.*

Location : Int.

Locality : Waltair Coast, Andhra Pradesh.

Distribution : India : Andhra Pradesh.

3. Genus ***Preptetos*** Pritchard, 1960

4. ***Preptetos chaetodoni*** Madhavi, 1972

1972. *P. chaetodoni* Madhavi, *J. Parasit* **58**(2) : 217-225

Material : 8 exs.,

Host : *Chaetodon pictus.*

Location : Int.

Locality : Waltair Coast, Andhra Pradesh.

Distribution : India : Andhra Pradesh.

4. Genus ***Lepocreadioides*** Yamaguti, 1936

5. ***Lepocreadioides indicum*** Srivastava, 1941

1941. *L. indicum* Srivastava. *Jap. J. Zool.* **5**(1) : 1-134.

Material : 12 exs.

Host : *Cynoglossus lida.*

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

ii. Subfamily OPISTHOGONOPORINAE (Yamaguti, 1937) Yamaguti, 1958

5. Genus ***Opisthogonoporoides*** Madhavi, 1972

6. ***Opisthogonoporoides hanumanthai*** Madhavi, 1972

1972. *O. hanumanthai* Madhavi, *J. Parasit* **58**(2) : 217-225

Materials : 1 ex.

Host : *Siganus oramin.*

Locality : Waltair Coast, Andhra Pradesh.

Distribution : India : Andhra Pradesh.

iii. Subfamily ACANTHOCOLPOIDINAE Yamaguti, 1972

6. Genus ***Echenidocoelium*** Simha et. Pershad, 1964

7. ***Echenidocoelium indicum*** Simha et Pershad, 1964

1964. *E. indicum* Simha et Pershad *Rev. Par* **25**(1) : 21-24

Materials : 1 exs.

Host : *Echeneis naucrates.*

Locality : Waltair Coast, Andhra Pradesh.

Distribution : India : Andhra Pradesh.

iv. Subfamily AEPHNIDIOGENINAE (Yamaguti, 1934) Dollfus, 1946

7. Genus ***Aephnidiogenus*** Nicoll, 1915

8. ***Aephnidiogenus senegalensis*** Dollfus et Caprawn, 1958

1958. *A. senegalensis* Dollfus et Caprawn, *Ball. I.F.A.N. 20, & A.n.* **2** : 308-310

Material : 9 exs.

Host : *Pomadasys maculatus.*

Locality : Waltair Coast, Andhra Pradesh.

Distribution : India : Andhra Pradesh.

Elsewhere : Senegal.

v. Subfamily PHYLLOTREMATINAE Yamaguti, 1954

8. Genus ***Phyllotrema*** Yamaguti, 1954

9. ***Phyllotrema tetracaudum*** Hussain *et al.* 1986

1986. *P. tetracaudum* Hussain *et al. Revista Iber. de. Parasit.* **46**(2) : 137-139

Material : *Host* : *Uroconger lepturus.*

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

9. Genus ***Lobatocreadium*** Madhavi, 1972

10. ***Lobatocreadium manteri*** Madhavi, 1972

1972. *L. manteri* Madhavi *J. Parasit.* **58** (2) : 217-225

Material : 3 exs.

Host : *Sufflamen capistratus, Hemibalistes chrysoptera.*

Location : Intestine.

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

vi. Subfamily FOLIORCHIINAE Yamaguti, 1958

10. Genus ***Multitestis*** Manter, 1931

11. ***Multitestis bengalensis*** Madhavi, 1972

1972. *M. bengalensis* Madhavi *J. Parasit,* **58** (2) : 217-225

Material : 13 exs.; *Host* : *Platax teira*; *Location* : Intestine

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

11. Genus ***Transversocreadium*** Hafeezullah 1970

12. ***Transversocreadium cablei*** Hafeezullah, 1970

1970. *T. cablei* Hafeezullah *Parasit* **16** : 345-356

Material : 18 exs.

Host : *Triacanthus brevirostris.*

Location : Intestine.

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

vii. Subfamily DIPLOPROCTODAEINAE Park, 1939

12. Genus ***Bianium*** Stunkard, 1930

13. ***Bianium plictum*** (Linton, 1928)

1928. *B. plictum* Linton *Proc. U.S. Nat. Mus.* **73** : 1-36.

Material : 76 exs.;

Host : *Gastrophysus lunaris.*

Location : Intestine.

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

Elsewhere : American Atlantic & Pacific.

13. Genus ***Cotylocreadium*** Hafeezullah, 1970.

14. ***Cotylocreadium triacanthi*** Hafeezullah, 1970

1970. *C. triacanthi* Hafeezullah *Parasit.* **61** : 345-356.

Material : 21 exs.

Host : *Triacanthus strigilifer.*

Location : Intestine.

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

II. Family BUCEPHALIDAE Poche, 1907

Key to the subfamilies of BUCEPHALIDAE

1. Rhynchus sucker-like or somewhat plug-shaped, overy usually pre-testicular may be inter-testicular ..... PROSORHYNCHINAE
2. Rhynchus wedge or crown shaped, with tentacular appendages, pentagonal cap-like expansion or crown of spines, ovary pre-testicular ..... BUCEPHALINAE

i. Subfamily BUCEPHALINAE Nicoll, 1914

Key to the genera of Bucephalinae

1. Rhynchus inverted conical, with triple crown of spines, exeretory vesicle long ..... ***Dollfustrema***

– Excretory vesicle variable in length 2

2. Rhynchus sucker like, usually with seven tentacular appendages, excretory vesicle variable in length ..... ***Bucephalus***

– Rhynchus otherwise 3

3. Rhynchus wedge-shaped with seven tentacular appendages, excretory vesicle long .... ***Alcicornis***

4. Rhynclus crown-shaped, with large bowl shaped depression ventroposteriorly. Excretory vesicle rather short ..... ***Rhipidocotyle***

14. Genus *Bucephalus* Baer, 1826

Key the species of *Bucephalus*

1. Host : *Satophagus argus;* Distribution : Bay of Bengal ..... *B. barbariana*

Distribution otherwise 2

2. Distribution : Japan; 4.86 x 0.45 ..... *B. uranoscopi*

3. 0.89–1.46 × 0.127–0.285 ..... *B. varicus*

15. *Bucephalus uranoscopi* Yamaguti, 1934.

1934. *B. uranoscopi* Yamaguti, *Jap. J. Zool.* **5**(3) : 249-541

Material : 19 exs.

Host : *Uronoscopus guttatus.*

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

Elsewhere : Japan.

16. *Bucephalus barina* Srivastava, 1936

1936. *B. barina* Srivastava

Material : 2 exs.;

Host : *Jonius belengeri.*

Locality : Waltair Coast; Date : 2.7.1969.

Distribution : India : Andhra Pradesh.

17. ***Bucephalus varicus*** Manter, 1940

1940. *B. varicus* Manter *Rep. Allan Hance. Pacif. Exped.* **2** (14) : 325-497

Material : 8 exs.;

Host : *Caranx sexfaciatus, Decapterus russelli, Carangoides malabaricus, Carangoides chrysophrys, Polynemus plebeius,*

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

Elsewhere : Atlantic, Pacific, Red sea, Galapagos

15. Genus ***Alcicornis*** MaCullam, 1917

Key to the species of *Alciconuis*

1. Tentacles 15 ..... *A. multidactylus*
2. Tentacles less than 15, cirrus sac extending upto level of Ovary ..... *A. carangis*

18. ***Alcicornis carangis*** MaCullam, 1917

1917. *A. carangis* MaCullam, *Zoopathologica* **1** : 43-75

Material : 4 exs.;

Host : *Carangoides malabaricus;*

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh

Elsewhere : Florida, Cuba, Curacao

19. ***Alcicornis multidactylus*** Madhavi, 1974

1974. *A. multidactylus* Madhavi *Revista di Parasit* **35**(3) : 189-199

Material : *Host* : *Caesia caerulaureus;*

Location : Int.;

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

16. Genus ***Dollfustrema*** Eckmann, 1934

20. ***Dollfustrema bengalense*** Madhavi, 1974

1974. *D. bengalense* Madhavi, *Revista di Parassit* **35**(3) : 189-199

Material : *Host* : *Gymnothorax undulatus;*

Location : Int.

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

17. Genus ***Rhipidocotyle*** Deising, 1858

21. ***Rhipidocotyle ghanensis*** Fischthal et Thomas, 1968

1968. *R. ghanensis* Fischthal et Thomas *Pr. Helm. Soc. Wash.* **35** (2) : 237-247.

Material : 6 exs.

Host : *Psettodes cremnei;*

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

Elsewhere : Ghana

22. ***Rhipidocotyle pentagonum*** (Ozaki, 1924) Eckmann, 1932

1924. *Distomum pentagonum* Ozaki *Zool. Mag.* **36**(4-6) : 173-201

1934. *R. pentagonum* Eckmann *Z. Par.* **5** (1) : 94-111

Material : 11 exs.;

Host : *Thynnus thunniue,Auxis thozard, Euthyrus affinis.*

Location : Int.;

Locality : Waltair Coast, Andhra Pradesh.

Distribution : India : Andhra Pradesh.

Elsewhere : Pacific, Red Sea, Mediterranian

23. ***Rhipidocotyle khalili*** Nagaty, 1937

Material : 12 exs.,

Host : *Sphyraena obtusata*

Locality : Waltair Coast, Andhra Pradesh.

Distribution : India : Andhra Pradesh.

Elsewhere : Red Sea, Macassar Celebes

24. ***Rhipidocotyle sphyraenae*** Yamaguti, 1959

1959. *R. sphyraenae* Yamaguti, *Public. Seto Marine Biol. Lab.* 7(2) : 241-262

Material : *Host* : *Sphyrena obtusata.*

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

Elsewhere : Japan

ii. Subfamily PROSORHYNCHIINAE Nicoll, 1940

18. Genus ***Prosorhynchus*** Odhner, 1905

25. ***Prosorhynchus manteri*** Srivastava, 1938

1937. *P. manteri* Srivastava *Ind.J.Vet.Sci & Anim.Husb.* **8** : 317-340

Material : 6 exs.;

Host : *Trichurus haumela.*

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh, Orissa.

26. ***Prosorhynchus chorinemi*** Yamaguti, 1952

1952. *P. chorinemi* Yamaguti, *Acta. Med. Okayama* 8(2) : 146-198.

Material : 7 exs.;

Host : *Chorinemus* sp.;

Locality : Hyderabad.

Distribution : India : Andhra Pradesh.

Elsewhere : Macassar

27. ***Prosorhynchus pacificus*** Manter, 1940

1940. *P. pacificus* Manter *Rep. Allan Hance Pacific Exped.* **2** (14) : 314-497.

Material : 3 exs.

Host : *Epinephelus taubina.*

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

Elsewhere : Galapagos, Cuba, Bimini (Brit.West Indies), Mexico

28. ***Prosorhynchus indicus*** Madhavi, 1974

1974. *P. indicus* Madhavi, *Revista di Parassit* **35** (3) : 189-199.

Material : *Host* : *Caesia caerulaureus;* Loc. : Int.

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

19. Genus ***Bucephalopsis*** (Dies, 1855)

29. ***Bucephalopsis microcerrus*** Chauhan, 1943

1943. *B. microcerrus* Chauhan *Proc. Ind. Acad. Sci.* **17** : 97-167.

Material : 1 ex.;

Host : *Cybium guttatus, Indocybium guttatum.*

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh, Maharashtra.

III. Family FELLODISTOMIDAE Nicoll, 1958

Key to subfamilies of FELLODISTOMIDAE

1. Ovary post testicular, acetabulum in anterior half of body, testes median to ceca in post acetabular zone. Ovary wel apart from acetabulum ..... BACCIGERINAE

– Ceca not united posteriorly, testes more or less separated from posterior extremity by uterus ..... 2.

2. Acetabulum discoid, usually large ..... DISCOGASTEROIDINAE

– Acetabulum of usual type 3

3. Vitellaria largely or entirely pre acetabular, excretory vesicle 'I' shaped .... PARANTORCHIINAE

– Body without a series of sub-lateral lobes, excretory vesicle 'V' shaped, Vitellaria forming branch like clusters in post-testicular lateral fields ..... LINTONIINAE

i. Subfamily BACCIGERINAE Yamaguti, 1958

Key to the genera of Baccigerinae

– Vitellaria consisting of symmetrical reniform compact masses; Ovary well apart from testes ..... ***Pseudopentagramma***

– Cirrus pouch poorly developed or practically absent, seminal vesicle bi-partite, vitelline follicles closely massed together ..... ***Pseudobacciger***

20. Genus ***Pseudopentagramma*** Yamaguti, 1958

30. ***Pseudopentagramma petrowi*** (Laymann, 1930) Yamaguti, 1971

1930. *Distomum petrowi* Laymann, *Bull. Paciff. Scient. Fish. Res.* **3**(6) : 1-120

1971. *P. petrowi* Yamaguti, *Keijaku pub.,Tokyo*

Material : Numerous exs.

Host : *Sardinella fimbriata, S. gibbosa,*

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

Elsewhere : Peter the Great Bay, Lavrentia Bay

21. Genus ***Pseudobacciger*** Nahhas et. Cable, 1964

31. ***Pseudobacciger cablei*** Madhavi, 1975

1975. *Pseudobacciger cablei* Madhavi *Rivista Parassit* **36**(4) : 267-278

Material : 7 exs.;

Host : *Sardinella fimbriata*; *S.gibbosa, Loc.:Int.*

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

32. ***Pseudobacciger harengulae*** (Yamaguti, 1938) Nahhas et. Cable, 1964

1938. *Bacciger harengulae* Yamaguti Published by Author.

1964. *Pseudobacciger harengulae* Nahhas et Cable *Tulane Stud. Zool.* **11** (5) : 169-228

Material : *Host* : *Sardinella fimbriata, Sardinella gibbosa,* Loc.: Int.

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

Elsewhere : Japan, N. Bimini.

ii. Subfamily DISCOGASTEROIDINAE Srivastava, 1939

22. Genus ***Odontotrema*** Hafeezullah et. Siddiqi, 1970

33. ***Odontotrema arabi*** Hafeezullah et. Siddiqi, 1970

1970. *O. arabi* Hafeezullah et. Siddiqi. *J. Par.* **56** .: 932–940.

Material : 6 exs.

Host : *Drepane punctata.*

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh, Kerala.

23. Genus ***Pseudogasteroides*** Gupta, 1955

34. ***Pseudogasteroides indicum*** (Srivastava, 1939) Gupta, 1955

1939. *Discogasteroides indicum* Srivastava *Ind. J. Vet. Sc. Eg. Anim.* I Husb. **9**(2) : 209-212.

1955. *Pseudogasteroides indicum* Gupta *Ind. J. Helm.* **5**(1) : 1-80

Material : *Host* : *Triacanthus brevirostris.*

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh, Orissa.

iii. Subfamily LINTONIINAE Yamaguti, 1970

24. Genus ***Lintonium*** Stunkard et. Nigrelli, 1930

Key to the species of *Lintonium*

1. Sucker ratio 1 : 2 .3 – 2.7 & eggs 43 – 47 × 32 ..... *L. pulchrun*
2. Sucker ratio 1 : 1.9 – 2.0 and eggs 45 – 59 × 23 – 29 ..... *L.pseudovibex.*

35. ***Lintonium pulchrum*** (Jhonston, 1913) Skrjabin et. Koval, 1957

1913. *Distomum pulchrum* Jhonston *Proc. Linn. Soc. N.S. Wales* **37** (4) : 427-470

1957. *Lintonium pulchrum* Skrjabin et Koval *Trematodes of Anims. Eg. Man.* **13** : 163-452

Material : 12 exs.

Host : *Tetradon lunaris, Gastrophysus lunaris;*

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

Elsewhere : Queensland.

36. ***Lintonium pseudovibex*** Madhavi, 1975

1975. *Lintonium pseudovibex* Madhavi *Rivista di Parassit.* **36** (4) : 267-278

Material : 3 exs.

Host : *Monacanthus chirocephalus.*

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

iv. Subfamily PARANTORCHIINAE Yamaguti, 1958

25. Genus ***Parantorchis*** Yamaguti, 1934

37. ***Parantorchis intermedius*** Madhavi, 1975

1975. *P. intermedius* Madhavi, *Rivista di Parassit* **36** (4) : 267-278

Material : 2 exs.

Host : *Chaetodon pictus.*

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

38. ***Parantorchis pomacanthi*** (Hafeezullah et Siddiqi, 1970) Madhavi, 1975

1975. *Parantorchis pomacanthi* Madhavi *Rivista di Parassit* **36** (4) : 267-278

Material : *Pomacanthus annularis.*

Location : Int.

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

IV. Family OPECOELIDAE Ozaki, 1925

Key to the subfamilies of OPECOELIDAE

- Cirrus pouch more or less well-developed, anus absent, vitellaria extensive ..... PLAGIOPORINAE
- Cirrus pouch generally weakly developed, rudimentary or lacking, anus often present, vitellaria usually extensive but usually confined to hind body..... OPECOELINAE

i. Subfamily OPECOELINAE Stunkard, 1931

Key to the genera of Opecoelinae

1. Neck region expanded laterally and provided with accessory sucker ..... ***Anisoporus***
- Neck region without accessory sucker 2
2. Acetabular tentacles complex, on anterior or posterior borders; Cirrus pouch present ..... ***Paropecoelus***

– Cirrus pouch smaller 3

3. Prostate cells outside cirrus pouch, seminal receptacle absent ..... ***Opegaster***

– Cirrus pouch short, plump, enclosing bipartite seminal vesicle 4

4. Prostate complex enclosed in small cirrus pouch, genital pore sub-marginal, post bifurcal ..... ***Horatrema***

– Seminal receptacle absent, genital pore to left of pharynx or oesophagus ..... ***.Pseudopecoelus***

26. Genus ***Horatrema*** Srivastava, 1942

39. ***Horatrema pristipomatis*** Srivastava, 1942

1942. *H. pristipomatis* Srivastava *Parassit.* **34**(1) : 128-132

Material : 4 exs.

Host : *Leiognathus bindus*

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

27. Genus ***Pseudopecoelus*** Von Wicklen, 1946

40. ***Pseudopecoelus scomberi*** (Hafeezullah, 1971) Madhavi, 1975

1975. *P. scomberi* Madhavi *Revista di Parasit*: **36** : (2/3) : 153-164,

Material : 12 exs.

Host : *Scomberoides tala;* Loc: Intestine.

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

28. Genus ***Anisoporus*** Ozaki, 1928

41. ***Anisoporus orientalis*** Madhavi, 1975

1975. *A. orientalis* Madhavi *Rivista di Parassit* **36** (2/3) : 153 –164.

Material : 8 exs.

Host : *Dactyloptera orientalis;* Loc.: Intestine.

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

29. Genus ***Paropecoelus*** Pritchard, 1966

42. ***Paropecoelus indicus*** Madhavi, 1975

1975. *P. indicus* Madhavi *Rivista di Parassit* **36** (2/3) : 153-164.

Material : 5 exs.;

Host : *Upineus sulphurius*; Loc.: Intestine;

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

30. Genus ***Opegaster*** Ozaki, 1928

43. ***Opegaster ditrematis*** Yamaguti, 1942

1942. *O. ditrematis* Yamaguti *Trans. Biogeograph. Soc. Japan* **3** (4) : 399-407

Material : 1 ex.;

Host : *Pseudorhombus micrognathus*; *Dasyatis imbricatus* Loc : Intestine.

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

ii. Subfamily PLAGIOPORINAE Manter 1947

Key to the genera of Plagioporinae

1. Acetabulum pedunculate ..... *Podocotyloides*
– Acetabulum sessile 2
2. Genital pore prebifurcal ..... *Plagioporus*
– Genital pore otherwise 3
3. Genital pore post bifurcal, eggs non filamented ..... *Hamacreadium.*
– Eggs otherwise 4
4. Eggs filamented, vitellaria more or less extensive, genital pore median ..... *Helicometrina*
– Extension of vitellaria otherwise 5
5. Vitellaria extending from level of pharynx to posterior extremity, ceca united posteriorly ..... *Helicometra*
– Ceca ending blindly ..... *Allopodocotyle*

31. Genus ***Helicometra*** Odhner, 1902

Key to the species of *Helicometra*

1. Ovary submedian, 4 lobed ..... *H. filamentosa*

– Ovary otherwise, egg size is different, 50 – 58 × 23 – 27 ..... *H. fasciata*

44. ***Helicometra fasciata*** (Rud. 1819) Odhner, 1902

1819. *Distomum fasciata* Rudolphi *Berol* 811 pp.

1902. *Helicometra fasciata* Odhner *Centrabl. Bakt.*I **31** : 58-68

Material : 1 ex.;

Host : *Scorpaenopsis cirrhosus*; Loc.: Int.

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

Elsewhere : Naples, Mediterranian, Atlantic, Pacific, Ghana.

45. ***Helicometra filamentosa*** Madhavi, 1975

1975. *H. filamentosa* Madhavi *Rivista di Parassit* **36** (2/3) : 153-164.

Distribution : India : Andhra Pradesh.

32. Genus ***Helicometrina*** Linton, 1910

46. ***Helicometrina nimia*** Linton, 1910

1910. *Helicometrina nimia* Linton *Carneg. Inst. Wash Publ.* No. **133** : 15 – 98pp.

Material : 1 ex.

Host : *Jonius sina.*

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

Elsewhere : Florida, Atlantic, Pacific, Panama.

33. Genus ***Podocotyloides*** Yamaguti, 1934

47. ***Podocotyloides parupenei*** (Manter, 1963)

1963. *Podocotyloides parupenei* Manter *J. Par.* **49**(1) : 99-113.

Material : 2 exs.;

Host : *Therapon jarbua.*

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

34. Genus ***Hamacreadium*** Linton, 1910

48. ***Hamacreadium mutabile*** Linton, 1910

1910. *H. mutabile* Linton *Carneg. Inst. Wash. Publ.* No. 133, 15 98 Pp.

Material : 3 exs.

Host : *Lutianus fulviflamma, L. rivulaltus.*

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

Elsewhere : Atlantic, Galapagos, Australia, New Caledonia, Red Sea.

35. Genus ***Plagioporus*** Stafford, 1904

49. ***Plagioporus cynoglossi*** Madhavi, 1975

1975. *P. cynoglossi* Madhavi *Rivista di Parassit* **36** (2/3) : 153-164

Material : 3 exs;

Host : *Cynoglossus lida,*

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

36. Genus ***Allopodocotyle*** Pritchard, 1966

50. ***Allopodocotyle pritcharae*** Madhavi, 1975

1975. *A. pritcharae* Madhavi *Rivista di Parassit* **36** (2/3) : 153-164.

Material : *Host* : *Lutzanus lunulatus.*

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

51. ***Allopodocotyle argyropsi*** Madhavi, 1975

1975. *Allopodocotyle argyropsi* Madhavi *Rivista di Parassit.* **36** (2/3) : 154-164

Material : *Host* : *Argyrops spinifer.*

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

V. Family DIDYMOZOIDAE Poche, 1970

Key to the subfamilies of DIDYMOZOIDAE

1. Body filiform, cylindrical, encysted or not ..... GONAPODASMIINAE
– Shape of the body otherwise 2
2. Encysted or free in tissue, never fused ..... NEMATOBOTHRIINAE
– Encysted form otherwise 3
3. Encysted, strongly entangled and massed together to form a globular cyst, vitellaria profuse ..... GLOMERITREMATINAE
– Vitellaria otherwise 4
4. Vitellaria single, undivided, body undivided ..... SKRJABINOZOINAE
– Shape of the body otherwise 5
5. Body distinctly divided into two parts, hind body not lobed ..... DIDYMOZOINAE
– Hind body otherwise 6
6. Hind body consisting of multilobulated central and peripheral portions, with well-developed inter-lobular vascular septa of *Host* ..... METADIDYMOZOINAE
7. Fore body attached with fore body, hind body smooth without vascular septa ..... PSEUDOCOLOSYNCHOTREMATINAE

i. Subfamily NEMATOBOTHRINAE Ishii, 1935

Key to the genera of Nematobothrinae

1. Testes juxtaposed ..... ***Angionematobothrium***
– Testes otherwise 2
2. Testes juxtaposed anteriorly but obliquely tandem posteriorly, uterus descending ..... ***Metanematobothroides***
– Uterus otherwise. 3
3. Uterus first ascending forming two loops, pharynx and acetabulum present ..... ***Nematobothrium***
4. Uterus first descending, forming single loop, pharynx absent ..... ***Allonematobothrium***

37. Genus ***Angionematobothrium*** Yamaguti, 1970

52. ***Angionematobothrium epinepheli*** Yamaguti, 1965

1965. *A. epinepheli* Yamaguti *Pacif. Sci.* **19**(4) : 458-481

Material : 1 ex.

Host : *Epinephelus tauvina*

Locality : Waltair Coast; Coll. : R. Madhavi.

Distribution : India : Andhra Pradesh.

38. Genus ***Allonematobothrium*** Yamaguti, 1965

53. ***Allonomatobothrium ganapataii*** Murugesh et Ram, 1991

Material : *Host* : *Lutianus russelli* (Bleeker).

Location : Tissue of the dorsal fin.

Locality : Vishakhapattanam.

Distribution : India : Andhra Pradesh.

54. ***Allenematobothrium epinephali*** Yamaguti, 1965.

1965. *A. epinephali* Yamaguti *Pac.Sci.* **19** : 458-481

Material : 1 ex.

Host : *Epinephelus tauvina.*

Location : Opercular Muscle.

Locality : Vishakhapatnam.

Distribution : India : Andhra Pradesh.

Elsewhere : Hawaii.

39. Genus ***Nematobothrium*** Van Benedeu, 1858

55. ***Nematobothrium megalaspium*** Murugesh *et al.*, 1992

1992. *N. megalaspium* Murugesh. *et al. Revista di Parasit* **9** : 79-86

Material : 6 exs.;

Host : *Megalaspis cordyla.*

Location : Free in body Cavity and viscera.

Locality : Vishakhapatnam.

Distribution : India : Andhra Pradesh.

40. Genus ***Metanematobothoroides*** Yamaguti, 1965

56. ***Metanomatobothroides branchialis*** Madhavi, 1982

1982. *M. branchialis* Madhavi *Syst. Parasit.* **4** (2) : 99-124

Material : *Host* : *Pristipomoides typicus.*

Location : Branchial region.

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

ii. Subfamily PSEUDOCOLOCYNTOTREMATINAE Yamaguti, 1970

41. Genus *Pseudocolocyntotrema* Yamaguti, 1970

57. ***Pseudocolocyntotrema yaito*** Yamaguti, 1970

1970. *P. yaito* Yamaguti *Keigaku Publ. Co. Tokyo* 436 pp.

Material : 3 exs.

Host : *Euthynnus affinis*

Locality : Waltair Coast.

Distribition : India : Andhra Pradesh.

iii. Subfamily DIDYMOZOINAE (Ishii, 1935)

Key to the genera of Didymozoinae

1. Hind body spirally twisted, ovary and vitellaria with several branches ..... ***Allodidymozoon***

– Hind body otherwise 2

2. Hind body not spirally twisted, ovary confined to anterior part of hind body ..... *Didymozoon*

– Position of ovary otherwise 3

3. Ovary and vitelline glands extending throughout length of hind body, hind body not lobed ..... *Nematodidymozoon*

– Hind body two lobed anteriorly, with median ventral longitudinal furrow ..... *Didymocystis*

42. Genus ***Didymocystis*** Ariola, 1902

58. ***Didymocystis wedli*** Ariola, 1902

1902. *D. wedli* Ariola *Arch. Par.* **6** (1) : 1-11

Material : 1 ex.

Host : *Auseis thazara.*

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

Elsewhere : Naples, Genoa, Pacific, Japan.

43. Genus ***Allodidymozoon*** Yamaguti, 1959

59. ***Allodidymozoon opercularare*** Madhavi, 1982

1982. *A. opercularare* Madhavi *Syst. Parasit* **4**(2) : 99-124

Material : 6 exs.

Host : *Sphyraena obtusata*

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

60. ***Allodidymozoon cylindricum*** Madhavi, 1982

1982. *A. cylindricum* Madhavi *Syst. Parasit* **4** (2) : 99-124

Material : 6 exs.

Host : *Sphyrana obtusata*

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

44. Genus ***Neometadidymozoon***, Yamaguti, 1972

61. ***Neometodidymozoon polymorphis*** (Oschmarin et. Mamaev, 1963), Yamaguti, 1972

1963. *Distomum polymorphis* Oschmarin et Mamaev *Helminthologia* **4**(1-4) : 357-365

1972. *N. polymorphis* Yamaguti *Syn. Digen. Trem Vert.* I. 256 pp.

Material : 4 exs.

Host : *Priacanthus harmur.*

Location : Operculum.

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

45. Genus ***Didymozoon*** Taschenberg, 1878

62. ***Didymozoon lobatum*** Madhavi, 1982

1982. *D. lobatum* Madhavi, *Syst. Parasit* 4(2) : 99-124

Material : *Host* : *Euthynnus affinis.*

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

46. Genus ***Indodidymozoon*** Madhavi, 1982

63. ***Indodidymozoon platycephali*** Madhavi, 1982

1982. *I. platycephali* Madhavi *Syst. Parasit* 4(2) : 99-124

Material : *Platycephalus scaber*;

Location : Opercular muscles.

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

47. Genus ***Renodidymocystis*** Madhavi, 1982

64. ***Renodidymocystis yamaguti*** Madhavi, 1982

1982. *R. yamaguti* Madhavi, *Syst. Parasit.* 4(2) : 99-124

Material : *Rastrelliger kanagurta.*

Location : Kidney.

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

48. Genus ***Coelididymocystis*** Yamaguti, 1970

65. ***Coelididymocystis kamagaii*** Yamaguti, 1970

1970. *C. kamagaii* Yamaguti *Publ. Co. Tokyo* 436 pp.

Material : *Host* : *Katsuwonus pelamys.*

Location : Pyloric ceaca;

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

49. Genus ***Lobatocystis*** Yamaguti, 1965

66. ***Lobatocystis yaito*** Yamaguti, 1965

1965. *L yaito* Yamaguti *Specific Sci.* **19**(4) : 458-481.

Material : *Eythynnus affinis.*

Location : Gills.

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

iv. Subfamily Metadidymozoiinae Yamaguti, 1970

50. Genus ***Metadidymozoon*** Yamaguti, 1970

67. ***Metadidymozoon branchiale*** Yamaguti, 1970

1970. *M. branchiale* Yamaguti *keigaku Publ. Comp.* 436 pp.

Material : 1 ex.

Host : *Xiphias gladias.*

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

v. Subfamily GONAPODASMIINAE Ishii, 1935

51. Genus ***Gonapodasmius*** Ishii, 1935

68. ***Gonapodasmius branchialis*** Yamaguti, 1970

1970. *G. branchialis* Yamaguti *Keigaku Publ. Co. Tokyo* 436 pp.

Material : 13 exs.

Host : *Epinephelus latifasciatus.*

Location : Gill

Locality : Vishakhapatnam.

Distribution : India : Andhra Pradesh.

Elsewhere: Hawaii.

69. ***Gonapodaspium spilonotopteri*** Yamaguti, 1970

1970. *G. spilonotopteri* Yamaguti *Keigaku Publ. Co. Tokyo.* 436 pp.

Material : *Host* : *Katsunus pelamys.*

Location : Pyloric ceca.

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

vi. Subfamily SKRJABINOZOINAE Yamaguti, 1972

52. Genus *Skrjabinozoum* Nicolaeva et Parukhen, 1969

70. ***Skrabinozoum waltairensis*** Hussain et Shyamasundari,1987

1987. *S. waltairensis* Hussain et. Shyamasundari *Indian J. Parasit* **8**(1) : 49-51

Material : *Host* : *Psenes indicus.*

Location : connecting tissue of the operculum and orbit.

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

vii. Subfamily GLOMERITREMATINAE Yamaguti, 1958

53. Genus ***Indoglomeritrema*** Madhavi *et al.*, 1983

71. ***Indoglomeritrema epinepheli*** Madhavi *et al.* 1983

1983. *I. epinepheli* Madhavi et *al. Acta Parasit. Polanica* **28** : (25/37) : 261-265

Material : 50 exs..

Host : Epinephelus tauvina.

Location : Gill

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

54. Genus ***Oculonematobothrium*** Murugesh *et al.* 1992

72. ***O. orbitum*** Murugesh *et al.* 1992

1992. *O. orbitum* Murugesh *et al Rivista Parasit* **9** : 79-86

Material : 10 exs.;

Host : *Pampus argentius* Loc : Post-orbital Cavity.

Locality : Vishakhapatnam.

Distribution : India : Andhra Pradesh.

VI. Family MONORCHIIDAE Odhner, 1911

Key to the subfamilies of MONORCHIIDAE

1. Testes in posterior half of body, ovary usually pretesticular; vitellaria in preaetabular and/or acetabular zone ..... MONORCHIINAE

– Vitellaria otherwise 2

2. Vitellaria not clearly divided into symmetrical groups, mostly intercaecal; Genital pore median ..... POSTMONORCHIIDINAE

– Vitellaria largely or entirely pretesticular, occasionally testicular..... LASIOTOCINAE

i. Subfamily LASIOTOCINAE Yamaguti, 1958

Key to the genera of Lasiotocinae

1. Testes symmetrical at posterior extremity ..... ***Hysteriorchis***

– Testes otherwise 2

2. Testes tandem, seminal vesicle tubular ..... ***Timonia***

– Seminal vesicle otherwise 3

3. Seminal vesicle saccular, oral sucker with spines ..... ***Lasiotocus***

– Oral sucker provided with anterodorsally alternating transverse rows of spines..... ..... ***Ametrodaptes***

55. Genus *Lasiotocus* Looss, 1907

Key to species of *Lasiotocus*

– Ovary unlobed ..... *L. hastai*

– Ovary four lobed ..... *L. maculatus*

73. *Lasiotocus maculatus* Madhavi, 1974

1974. *L. maculatus* Madhavi *Rivista di Parassit* **35**(2) : 87-98

Material : Numerous exs.

Host : *Pomadasys maculatus Rhonociscus furcatus.*

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

74. ***Lasiotocus hastai*** Madhavi, 1974

1974. *L. hastai* Madhavi *Rivista di Parassit* **35**(2) : 87-98

Material : Numerous exs.

Host : *Pomadasys hasta* : *Location*:Intestine Hepatic ceca.

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

56. Genus ***Ametrodaptes*** Bravo–Hollis, 1956

75. ***Ametrodaptes secundus*** Madhavi, 1977

1977. *A. secundus* Madhavi *Excreta Parasitologica en Memoria del. Doctor Eduardo Caballeror Y. Caballero,* Mexico, Universed Nacional Autonoma de Mexico : 233-246

Material : Numerous exs.

Host : *Pomadasys maculatus.*

Location : Instestine

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

57. Genus ***Hysterorchis*** Durio et. Manter, 1963

76. ***Hysterorchis pseudovitellosus*** Madhavi, 1974

1974. *H. pseudovitellosus* Madhavi *Rivista di Parassit* **35** (3) : 87-98

Material : 2 exs.

Host : *Lutianus* sp.

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

58. Genus ***Timonia*** Bartoli et. Prevot, 1966

Key to species of *Timonia*

- Ovary 3 lobed ..... *T. indica*
- Ovary otherwise, vitellaria situated at the level of acetabulum ..... *T. caballeroi*

77. ***Timonia indica*** Madhavi, 1977

1977. *T. indica* Madhavi *Excerta Parasitologica en. Memoria del. Doctor Eduardo Caballeror Y. Caballero. Mexico. Universded Nacional Autonoma de Mexico.* 233-246

Material : 14 exs.

Host : *Polynemus indicus.*

Location : Intestine.

Locality : Waltair coast.

Distribution : India : Andhra Pradesh.

78. ***Timonia caballeroi*** Madhavi, 1977

1977. *T. caballeroi* Madhavi *Memoria del. Doctor Eduardo Caballerro Y. Caballero, Extra Parasitologica Mexico Universded Nacional Autonoma de Mexico.* 233-246.

Material : 15 exs.

Host : *Polynemus sextarius.*

Location : Intestine.

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

ii. Subfamily POSTMONORCHIIDINAE Yamaguti, 1958

59. Genus ***Hurleytrematoides*** Yamaguti, 1954

79. ***Hurleytrematoides filiformes*** Madhavi, 1974

1974. *H. filiformes* Madhavi *Revista di Parassit* **35** (2) : 87-98

Material : 13 exs.;

Host : *Chaetodon pictus.*

Locality : Waltair coast.

Distribution : India : Andhra Pradesh.

iii. Subfamily MONORCHIINAE (Odhner, 1911) Nicoll, 1915

60. Genus ***Monorchis*** (Monticelli, 1893) Looss, 1902

80. ***Monorchis minutus*** Madhavi, 1977

1977. *Monorchis minutus* Madhavi *Excerta Parasitologica en. Memoria del. Doctor Eduardo Caballero Y. Caballero, Mexico Universed Nacional Autonoma de Mexico* : 233-246.

Material : Numerous exs.

Host : *Pomadasys maculatus.*

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

61. Genus ***Opisthodiplomonorchis*** Madhavi, 1974

81. ***Opisthodiplomonorchia elongates*** Madhavi, 1974

1974. *O.elongatus* Madhavi *Revist. di Parassit.***35** (2): 87-98

Material : 5 exs.

Host : *Psettodes erumei, Polynemus sextarius.*

Location : Intestine.

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

62. Genus ***Pseudopisthomonorchis*** Madhavi, 1974

82. ***Pseudopisthomonorchis carangi*** Madhavi, 1974

1974. *P. carangi* Madhavi *Revist. di Parassit.* **35**(2) : 87-98

Material : 6 exs.

Host : *Carangoides malabaricus,* Loc : Intestine.

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

63. Genus ***Retractomonorchis*** Madhavi, 1977

83. ***Retractomonorchis delicatus*** Madhavi, 1977

1977. *R. delicatus* Madhavi *Excerta.Parasit.en memoria del doctor. Ed. Caballero Y. Cabellero* **29** : 233-246

Material : Numerous examples.

Host : *Pampus chinensis P. argentius.*

Location : Intestine.

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

64. Genus ***Caballerotrematoides*** Madhavi, 1977

84. ***Caballerotrematoides leiognathi*** Madhavi, 1977

1977. *C. leiognathi* Madhavi *Excerta Parasit. En memoria del Doctor Eduarda Caballero Y. Caballero* **29** : 233-246

Material : 9 exs.

Host Leiognathus daura.

Location : Intestine.

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

VII. Family CRYPTOGONIMIDAE (Ward, 1917) Cirurea, 1933

Key to the subfamilies of CRYPTOGONIMIDAE

1. Ovary compact, lobed or divided into numerous follicles ..... NEOCHASMINAE
– Ovary otherwise 2
2. Ovary follicular, body cylindrical ..... CRYPTOCOLLARITREMATINAE
– Body otherwise 3
3. Body ovoid, vitellaria in bifurcovarian or pharyngacetabular zone .... METADENINAE
– Vitellaria limited within acetabulovarian zone ..... SIPHODERINAE

i. Subfamily NEOCHASMINAE Van Cleave et Mueller, 1932

65. Genus ***Paracryptogonimus*** Yamaguti, 1934

Key to the species of *Paracryptogonimus*

1. 70-72 spines on oral sucker ..... *P. ovatus*
– 84-90 spines on oral sucker ..... *P. hirastrictus.*

85. ***Paracryptogonimus ovatus*** Yamaguti, 1952

1952. *P. ovatus* Yamaguti *Acta. Med. Okayama* **8**(2) : 146-198

Material : 1 ex.

Host : *Pomadasys hasta.*

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh

86. ***Paracryptogonimus herastrictus*** Manter, 1963

1963. *P. herastrictus* Manter *J. Par.* **49**(3) : 443-450

Material : *Host* : *Lutjanus malabaricus.*

Locality : waltair Coast.

Distribution : India : Andhra Pradesh.

ii. Subfamily METADENINAE Yamaguti, 1953

66. Genus ***Allometadena*** Madhavi, 1974

87. ***Allometadena rotundum*** Madhavi, 1974

1974. *A. rotundum* Madhavi *Revista di Parassit.* **35**(3) : 189-199

Material : *Host* : *Lutjanus malabaricus.*

Location : Intestine.

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

iii. Subfamily SIPHODERINAE Manter, 1934

67. Genus ***Acanthosiphodora*** Madhavi, 1974

88. ***Acanthosiphodora bengalense*** Madhavi, 1974

1974. *A. bengalense* Madhavi *Revista di Parassit* **35**(3) : 189-199

Material : *Host* : *Lutjanus malabaricus.*

Location : Intestine.

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

iv. Subfamily CRYPTOCOLLARITREMATINAE Srivastava, 1982

68. Genus ***Cryptocollaritrema*** Madhavi, 1974

89. ***Cryptocollaritrema provesiculatum*** Madhavi, 1974

1974. *C. provesiculatum* Madhavi *Revista di Parassit.* **35**(3) : 189-199

Material : *Host* : *Lutianus* Sp.

Location : Stomach, hepatic caeca;

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

VIII. Family ACANTHOCOLPIDAE Luhe, 1909

Key to the subfamilies of ACANTHOCOLPIDAE

Vitellaria confined to middle region of body ..... STEPHANOSTOMINAE

Vitellaria in greater part of body ..... ACANTHOCOLPINAE

i. Subfamily STEPHANOSTOMINAE

69. Genus *Stephanostomum* Looss, 1899

Key to the species of *Stephanastomum*

1. Sucker ratio 1 : 1.6–2.0 and egg size of 62 × 39-41 ..... *S. casum*

– Sucker ratio otherwise 2

2. Sucker ratio 1 : 1.8–2.8 and egg size of 62 × 42-45, with having 30 coller spines .... *S. ditrematis*

– No. of collar spines otherwise 3

3. No. of collar spines 32, metraterm armed ..... *S. orientalis*

– Metraterm armed 4

4. Metraterm spined having a sperm reservoir in the coarse of vas deferens .... *S. triacanthi*

– Metraterm unspined, posterior vitellaria not extending to the level of acetabulum .... *S. polymemi*

– Posterior vitellaria extending to the level of acetabulum, longer forebody .... *S. microsomum*

5. Smaller forebody, 2 pairs of spines on the midventral side are much smaller than that of remaining spines ..... *S. pseudoditrematis*

– Having 36 spines in two rows by the loss of 1 circlet of spines..... *S. merospinosum.*

90. *Stephanostomum orientalis* Srivastava 1939

1939. *S. orientalis* Srivastava *Ind. J. Vet. Sci. & Anim Husb.* **9** : 213-216

Material : 11 exs.

Host : *Caranx sexfasciatus, Carangoides malabaricus, Caranx chrysophrys.*

Location : Intestine.

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

91. ***Stephanostomum adinterruptum*** Hafeezullah, 1971

1971. *S. adinterruptum* Hafeezullah *J. Helm* **45** : 73-78

Material : Numerous examples.

Host : *Fistularia villosa.*

Location : Intestine.

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

92. ***Stephanostomum casum*** (Linton, 1910) McFarlane, 1934

1910. *Distomum casum* Linton *Carneg. Inst. Wash. Publ.* No. **138** .98 pp.

1934. *Stephanostomum casum* McFarlane *Tr. Am. Micr. Soc.* **53**(2) : 172-173

Material : 3 exs.

Host : Lutianus malabaricus.

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

Elsewhere : Florida, Puerto Rico, Gulf of Manaar, Mexico, Curaco, Jamaica, Phillipines, Bahamas, British Colombia.

93. ***Stephanostomum ditrematis*** (Yamaguti, 1939) Manter, 1947

1939. *Echinostephanus ditrematis* Yamaguti, *Jap. J. Zool.* **8**(2) : 211-230.

1947. *Stephanostomum ditremates* Manter *Amer. Medl. Nat.* **38**(2) : 257-416

Material : 5 exs..

Host : *Megalaspis cordyla.*

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

Elsewhere : Japan, Florida, Curaco, Jamaica, Bimini, Pacific Panama, British W. Indies, Tropical American Pacific.

94. ***Stephanostomum psudoditrematis*** Madhavi, 1976

1976. *S. psudoditrematis* Madhavi *Revista. di. Parassit* **37** (2/3) : 115-128.

Material : 30 exs.

Host : *Rachycentron canadus.*

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

95. ***Stephanostomum triacanthi*** Madhavi, 1976

1976. *S. triacanthi* Madhavi, *Revista. di. Parassit* **37**(2/3) : 115-128

Material : 1 ex.

Host : *Triacanthus striligifer.*

Location : Intestine.

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

96. ***Stephanostomum polynemi*** Madhavi, 1976

1976. *S. polynemi* Madhavi *Revista di. Parassit* **37**(2/3) : 115-128

Material : *Host* : *Polynemus indicus.*

Location : Intestine.

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

97. ***Stephanostomum microsomum*** Madhavi, 1976

1976. *S. microsomum* Madhavi, *Revista di. Parassit* **37**(2/3) : 115-128

Material : *Host* : *Rachycentron canadus.*

Location : Intestine.

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

98. ***Stephanostomum mesospinosum*** Madhavi, 1976

1976. *S. mesospinosum* Madhavi *Revista di Parassit.* **37**(2/3) : 115-128

Material : 12 exs.

Host : *Carangoides malabaricus.*

Location : Intestine.

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh

ii. Subfamily ACANTHOCOLPINAE Luhe, 1906

Key to the genera of Acanthocolpinae

Body unspined, not eye spotted, ovary and testes contiguous ..... ***Acanthocolpus***

Body spined, eye spotted, ovary and testes separate ..... ***Tormopsolus***

70. Genus ***Acanthocolpus*** Luhe, 1906

99. ***Acanthocolpus liodorus*** Luhe, 1906

1906. *A. liodorus* Luhe *Ceyl. Perol. Oyster. Fish Rep.* Pt. **5** : 97-108

Material : *Host* : *Chirocentrus dorab.*

Locality : Waltair Cost.

Distribution : India : Andhra Pradesh.

100. ***Acanthocolpus tenuis*** Manter, 1963

1963. *A. tenuis* Manter *J. Par* **49**(3) : 443-450

Material : *Host* : *Chirocentrus dorab.*

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

71. Genus ***Tormopsolus*** Poche, 1928

101. ***Tormopsolus filiformis Sogandares*** et Hutton, 1959

1959. *T. filiformis Sogandares* et. Hutton *Bull. Mar. Sc. Gulf. Caribbean* **9**(1) : 53-68

Material : *Host* : *Rachycentron canadus.*

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

Elsewhere : Florida.

IX. Family ALLOCREADIIDAE (Looss, 1902) Stossich, 1903

Subfamily ALLOCREADIINAE Looss, 1902

72. Genus ***Allocreadium*** Looss, 1900

102. ***Allocreadium fasciatusi*** Kakaji, 1969

1969. *A. fasciatusi* Kakaji *Ann. Par.* **44** : 131-146

Material : 6 exs.

Host : *Aptochiitus melastigma.*

Location : Stomach.

Locality : Stream of Waltair Coast.

Distribution : India : Andhra Pradesh.

103. ***Allocredium handiai*** Pande, 1937

1937. *A. handiai* Pande *Proc. Nat. Acad. Sci.* India 7(2) : 111-115

Material : *Channa punctatus, Clarias batrachus.*

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

X. Family HEMIURIDAE Luhe, 1901

Key to sub families of HEMIURIDAE

1. Testes and ovary closely massed together in anterior fourth of body ..... STOMACHICOELINAE
– Testes and ovary not confined to anterior fourth of body 2
2. Seminal vesicle in hind body, vitelline lobes usually long and narrow ... DINURINAE
– Harmaphroditic duct present 3
3. Harmaphroditic pouch may be absent; pars prostatica free in parenchyma; genital atrium strongly developed ..... HEMIURINAE
– Genital atrium poorly developed 4
4. Harmaphroditic vesicle not differentiated; vitellaria divided into seven tubular lobes ..... HYSTEROLECITHINAE
– Vitellaria at posterior extremity 5
5. Ovary and vitellaria post testicular; vitellaria anterior to testes...LECITHASTERINAE
– Vitellaria posterior to testes ..... PULMOVERMINAE

i. Subfamily STOMACHICOLINAE Yamaguti, 1958

Key to the genera of Stomachicolinae

1. Seminal vesicle pre acetabular, pars prestatica balbous, Seminal receptacle inconspicuous ..... ***Allostomachicola***
2. Seminal vesicle post acetabular, pars prostatica narrow, Seminal receptacle very large ..... ***Stomachicola***

73. Genus ***Stomachicola*** Yamaguti, 1934

104. ***Stomachicola muraenesosis*** Yamaguti, 1934

1934. *S. muraenesosis* Yamaguti *Jap. J. Zool.* **5**(1) : 1-134

Material : 1 ex.

Host : *Muraenosox talabourides.*

Location : Stomach.

Locality : Machhilipatnam.

Distribution : India : Andhra Pradesh.

74. Genus ***Allostomachicola*** Yamaguti, 1958

105. ***Allostomachicola secendus*** (Srivastava, 1939) Yamaguti, 1958

1939. *Stomachicola secundus* Srivastava *Ind. S. Vet. Sci. Anim. Hus.* **9**(2) : 209-212

1958. *A. secundus* Yamaguti *Inten. Sci. N. York.* **1575** pp.

ii. Subfamily HALIPAGINAE Ejsmont, 1931

75. Genus ***Halipagus*** Lutz. 1899

106. ***Halipegus mehransis*** Srivastava, 1933

1933. *H. mehransis,* Srivastava *Bull. Acad. Sci.* U.P. *Agra Oudh. Allhabad.* **3**(2) : 99-112

Material : *Ptyas (Zamensis) mucosus.*

Location : Intestine.

Locality : Hyderabad.

Distribution : India : Andhra Pradesh.

107. ***Halipegus ovocandatum*** (Vulpian, 1859) Looss, 1899

1859. *Distomum ovocandatum* Vulpian *Compt. Rend. Sci. Biol.* **5** : 150-152.

1899. *Halipegus ovocandatum* Looss *Zool. Jaharb. Syst.* **17** : 521-784.

iii. Subfamily LECITHASTERINAE Odhner, 1905

Key to the genera of Lecithasterinae

1. Vitellaria single compact ..... ***Aphanurus***

– Pars prostatica small 2

2. Pars prostatica not long, ovary lobed ..... ***Lecithaster***

76. Genus ***Lecithaster*** Luhe, 1901

108. ***Lecithaster indicum*** Srivastava, 1935

1935. *Lecithaster indicum* Srivastava *Proc. Acad. Sci. Ind.*, **4**(4) : 381-387.

Material : 1 ex.

Host Unidentified fish.

Location : Stomach.

Locality : Machhilipatnam; Collector : Dr. M. Hafeezullah; Date of Collection : 24.01.1975

Distribution : India : Andhra Pradesh.

77. Genus ***Aphanurus*** Looss, 1907

109. ***Aphanurus dussumieri*** Hussain *et al.* 1984

1984. *A. dussumieri* Hussain *et al. Ind. J. Parasit.* **8**(1) : 89-91

Material : 4 exs.

Host : *Dussumieria hassellii.*

Location : Intestine.

Locality : Waltair Coast; Coll. : Hussain, Rao & Shyamasundari

Distribution : India : Andhra Pradesh.

iv. Subfamily DINURINAE Looss, 1907

78. Genus *Uterovesiculurus* Skrjabin et. Guschanskja, 1954

110. ***Uterovesiculurus lameriensis*** (Tubangui et. Musilungan, 1935)

1935. *U. lameriensis* Tubangui et. Musilungan *Phillipp. J. Sci.* **58**(4) : 435-445

Material : 3 exs.

Host : *Chorinemus lyson.*

Location : Stomach.

Locality : Vishakhapatnam; Coll. : M. Hafeezullah; Date of Collection : 17.10.1964.

Distribution : India : Andhra Pradesh.

v. Subfamily HEMIURINAE Looss, 1899

79. Genus ***Parahemiurus*** Vaz et. Pereira, 1930

111. ***Parahemiurus engraulisi*** Gupta et Jahan, 1977

1977. *P. engraulisi* Gupta et Jahan

Material : 4 exs.

Host : *Ilisha filigera.*

Location : Intestine.

Locality : Vishakhapatnam; Collector : M. Hafeezullah; Date of collection : 30.9.1969.

Distribution : India : Andhra Pradesh.

vi. Subfamily HYSTEROLECITHINAE Yamaguti, 1958

80. Genus *Aponurus waltairensis* Hussain *et al.*, 1987

112. ***Aponurus waltairensis*** Hussian *et al.*, 1987

1987. *A. waltairensis* Hussain *et al. Ind. J. Parasit* **8**(2) : 251-259

Material : *Host* : *Acanthurus bleekeri.*

Locality : Waltair Coast; Collector : Hussain, Rao et Shyamasundari.

Distribution : India : Andhra Pradesh.

vii. Subfamily PULMOVERMINAE Sandars, 1961

81. Genus ***Hydrophitrema*** Sandars, 1960

113. ***Hydrophitrema giganticum*** Sandars, 1960

1960. *Hydrophitrema giganticum* Sandars *Libr. Hom. al. Dr. Caballero* : 263-268

Material : *Enhydrina valakadyen, Microcephalus gracilis.*

Location : Lung.

Locality : Waltair Coast; Collector : R. Madhavi.

Distribution : India : Andhra Pradesh.

XI. Family LECITHODENDRIIDAE Odhner, 1911

Key to the subfamilies of LECITHODENDRIIDAE

1. Body oval to lunguiform, spinulate ..... GANEONINAE
– Shape of the body otherwise 2
2. Body sub-globular to elliptical, oesophagus stout, occasionally moderately long ..... PLEUROGENINAE
– Oesophagus moderate in length 3
3. Testes symmetrical in extracaecal shoulder region ..... PROSTOCINAE

– Testes in post acetabular extracaecal region 4

4. Body tongue-shaped, spinose ..... ANCHITREMATINAE

– Body fusiform, oval to linguiform ..... LECITHODENDRIINAE

i. Subfamily GANEONINAE Yamaguti, 1958

82. Genus ***Ganeo*** Klein, 1905

114. ***Ganeo tigrinum*** Mehra et. Negi, 1928

1928. *G. tigrinum* Mehra et. Negi *Allhabad Univ. Stud.* **4** : 63-118

Material : 1 ex.

Host : *Therapon jarbua*

Location : Intestine.

Locality : Machilipatnam, Andhra Pradesh

Distribution : India : Andhra Pradesh, Meghalaya, Nagaland, West Bengal.

Elsewhere : Burma, China, Ceylon

ii. Subfamily PLEUROGENINAE Looss, 1899

83. Genus ***Pleurogenoides*** Travassos, 1921

115. ***Pleurogenoides gastroporus*** Luhe, 1901

1901. *P. gastroporus* Luhe *Ctbl. Bakt. Abst.* **30** : 166-177

Material : *Host* : Chameleon.

Locality : Hyderabad Coll. : S.S. Simha.

Distribution : India : Andhra Pradesh.

116. ***Pleurogenoides ovatus*** Rao, 1977

1977. *P. ovatus* Rao *Revista di Parasit* **38** (1) : 23-28

Material : *Host* : *Rana tigrina & R. cyanophlyctis.*

Locality : Hyderabad; Coll. : R. Rao.

Distribution : India : Andhra Pradesh

117. ***Pleurogenoides sitapurii*** Srivastava, 1934

1934. *P. sitapurii* Srivastava *Bull. Acad. Sc. U.P. Agra Eg. Oudh* (1934-1935) **4**(1) : 113-119.

Material : *Host : Rana cyanophlyctis.*

Locality : Hyderabad; Coll. : R. Rao.

Distribution : India : Andhra Pradesh.

iii. Subfamily PROSTOCINAE Yamaguti, 1958

84. Genus ***Mehrarchis*** Simha, 1934

118. ***Mehrarchis chamaeleonis*** Simha, 1958

1958. *M. chamaeleonis* Simha *Z. F. Parasit Bal.* **186** : 161-218

Material : *Host Chamaeleon zeylanicus.*

Location : Gall bladder.

Locality : Hyderabad; Collector : S.S. Simha.

Distribution : India : Andhra Pradesh.

Elsewhere : Burma, Ceylon.

iv. Subfamily ANCHITREMATINAE Mehra, 1935

85. Genus ***Anchitrema*** Looss, 1899

119. ***Anchitrema sanguineum*** (Sonsino, 1894) Looss, 1899

1894. *Distoma sanguineum* Sonsino *Proc. Zool. Soc. London* 496-500

Material : *Host* : *Chamaeleon zeylanicus.*

Location : Stomach & Intestine.

Locality : Hyderabad; Coll. : S.S. Simha.

Distribution : India : Andhra Pradesh.

v. Subfamily LECITHODENDRINAE Looss, 1902

86. Genus ***Prosthodendrium*** Dollfus, 1931

Key to the species of *Prosthodendrium*

– Ovary on left side of the acetabulum ..... *P. ovatum*

– Ovary post-testicular ..... *P. dollfusi*

120. ***Prosthodendrium ovatum*** Simha, 1958

1958. *Prosthodendrium ovatum* Simha *Z. f. Parasit.* Bal. **18**, S161-218

Material : *Host* : *Calotes nemoricola.*

Location : Intestine.

Locality : Hyderabad, Coll. : S.S. Simha.

Distribution : India : Andhra Pradesh.

121. ***Prosthodendrium dollfusi*** Simha, 1958

1958. *P. dollfusi* Simha *Z. f. Parasit,* Bal. **18,** S : 161-218

Material : *Host* : *Calotes versicolor.*

Location : Intestine.

Locality : Hyderabad; Collector : S.S. Simha.

Distribution : India : Andhra Pradesh

XII. Family PLAGIORCHIIDAE (Luhe, 1901) Ward, 1917

Key to the subfamilies of PLAGIORCHIIDAE

1. Parasitic of fishes ..... ANCHITREMATINAE
– Parasitic of snakes 2
2. Testes diagonal or tandem ..... ENCYCLOMETRINAE
– Testes almost symmetrical 3
3. Acetabulum large, at anterior third of body ..... PLAGIORCHIIDAE
– Acetabulum rather small, pre-equatorial ..... LEPTOPHALLINAE

Subfamily PLAGIORCHIINAE Pratt, 1902

Key to the genera of Plagiorchiinae

1. Testes usually diagonal, ovary posterolateral or posterior to acetabulum .... ***Plagiorchis***
ovary a little behind acetabulum, sub-median or median ..... ***Xenopharynx***

87. Genus ***Xenopharynx*** Nicoll, 1912

Key to the species of *Xenopharynx*

1. Parasitic in *Tropidonotus piscator* ..... *X. heterovitellatus*
– Parasitic in otherwise 2
2. Parasitic in *Ptyas mucosa*; 2.733 – 3.96 × 1.287 – 1.921 ..... *X. pyriformes*
– 5.3 × 1.9 ..... *X. solus*

122. ***Xenopharynx heterovitellatus*** Simha, 1958

1958. *X. heterovitellatus* Simha *Z. f. parasitekunde Bd.* **18** S. : 161-218

Material : 4 exs.

Host : Water snake (*Tropidonotus piscator).*

Location : Gall bladder.

Locality : Hyderabad; Coll. : S.S. Simha.

Distribution : India : Andhra Pradesh

123. ***Xenopharynx pyriformes*** Simha, 1958

1958. *X. pyriformes* Simha *Z. f. Parasitekunde Bd.* **18** S : 161-218

Material : 4 exs.

Host : Rat snake. *Ptyas mucosa.*

Location : Intestine.

Locality : Hyderabad; Coll. : S.S. Simha.

Distribution : India : Andhra Pradesh.

124. ***Xenopharynx solus*** Nicoll, 1912

1912. *X. solus* Niçoll *Proc. Zool. Soc. London* II(4) : 767-770

Material : *Host* : *Naja haja.*

Locality : Hyderabad; Coll. : S.S. Simha.

Distribution : India : Andhra Pradesh.

Elsewhere : South Africa

88. Genus ***Plagiorchis*** Luhe, 1899

125. ***Plagiorchis himalayai*** Jordon 1964

1964. *P. himalayai* Jordon *Proc. 17th Ind. Sc. Congr.* 246

Material : 11 exs.

Host Chamaeleon zeylanicus.

Location : Intestine.

Locality : Hyderabad; Coll. : S.S. Simha.

Distribution : India : Andhra Pradesh.

ii. Subfamily ASTIOTREMATINAE Baer, 1924

89. Genus ***Astiotrema*** Looss, 1900

Key to the species of *Astiotrema*

- Parasitic in *Kachuga dhongoka*, 3.5–.81 × .36–2.17 ..... *A. loossi*
- Parasitic in *Lissemys punctata*, 2.8–4.17 × 0.93–1.2 ..... *A. rami*

126. ***Astiotrema rami*** Bhalerao, 1936

1936. *A. rami* Bhalerao *Ind. J. Helm.* **14**(3) : 163-180

Material : 13 exs.

Host : Turtle.

Location : Intestine.

Locality : Hyderabad, Coll. : S.S. Simha.

Distribution : India : Andhra Pradesh.

127. ***Astiotrema loossi*** Mehra, 1931

1931. *A. loossi* Mehra *Parasit.* **23** : 170-190

Material : 1 ex.;

Host : Turtle.

Location : Intestine;

Locality : Hyderabad; Coll. S.S. Simha

Distribution : India : Andhra Pradesh.

iii. Subfamily LEPTOPHALLINAE Dayal, 1938

90. Genus *Neoganada* Dayal, 1938

128. ***Neoganada aspinosa*** Simha, 1958

1958. *N. aspinosa* Simha *Z. f. Parasitekunde Bd.* **18.** S : 161-218

Material : *Host Chamaeleon zeylanicus.*

Location : Intestine.

Locality : Hyderabad; Coll. : S.S. Simha.

Distribution : India : Andhra Pradesh.

iv. Subfamily ENCYCLOMETRINAE (Mehra, 1937)

91. Genus ***Encyclometra*** Baylis et. Cannon, 1924

129. ***Encyclometra colubrimurorum*** Dollfus, 1931

1931. *E. colubrimurorum* Dollfus *Ann. Par* **9**(5) : 483-484.

Material : 45 exs.

Host Water snake, Grass snake.

Location : Oesophagus.

Locality : Hyderabad; Coll.: S.S. Simha.

Distribution : India : Andhra Pradesh.

Elsewhere : Ceylon, Burma, Phillipines, Europe, N. Bornes

XIII. Family ACANTHOSTOMIDAE Poche, 1926

Subfamily ACANTHOSTOMINAE Nicoll, 1914

Key to the genera of Acanthostominae

- Ceca not united posteriorly, usually opening outside ..... ***Haplocaecum***
- Ceca asymmetrical, one ceca may be completely reduced ..... ***Atrophocaecum***

92. Genus ***Atrophocaecum*** Bhalerao, 1940

130. ***Atrophocaecum indicum*** Simha, 1958

1958. *A. indicum* Simha *Z. f. Parasit, Bd.***18** S 161-218

Material : *Host* : *Tropidonotus piscator.*

Location : Intestine.

Locality : Hyderabad; Coll. : S.S. Simha.

Distribution : India : Andhra Pradesh.

93. Genus ***Haplocaecum*** Simha, 1958

131. ***Haplocaecum assymmetricum*** Simha, 1958

1958. *H. assymmetricum* Simha *Z. f. Parasitekunde Bal* **18** S : 161-218

Material : *Host* : *Dryophis myctirizans.*

Location : Intestine.

Locality : Hyderabad; Coll. : S.S. Simha.

Distribution : India : Andhra Pradesh.

XIV. Family HETEROPHYIDAE (Leiper, 1909) Odhner, 1914

Key to the subfamilies of HETEROPHYIDAE

1. Testes tandem, somewhat diagonal in posterior half of body ..... GALACTOSOMINAE
2. Testes single, near posterior extremity ..... HAPLORCHIINAE

i. Subfamily GALASTOSOMINAE Cuirea, 1933

94. Genus ***Galactosomum*** Looss, 1899

132. ***Galactosomum ussuriense*** Oshmarin, 1963

1963. *G. ussuriense* Oshmarin *Akad. Nauk. SSSR* : **322** pp.

Material : 1 ex.

Host Therapon jarbua.

Locality : Waltair Coast; Coll. : R. Madhavi.

Distribution : India : Andhra Pradesh.

ii. Subfamily HAPLORCHIINAE Looss, 1899

95. Genus ***Haplorchis*** Looss, 1899

133. ***Haplorchis solus*** Simha, 1964

1964. *H. solus* Simha *Rev. Biol. Trop.* **12**(1) : 1-5

Material : Green tree snake, *Dryophis nycterizans.*

Location : Instestine.

Locality : Hyderabad.

Distribution : India : Andhra Pradesh

XV. Family HAPLOSPLANCHNIDAE Poche, 1926

Subfamily Schikhobalotrematinae Skrjabin et Guschchanskja, 1955

96. Genus ***Schikhobalotrema*** Skrjabin et Guschanskja, 1955

134. ***Schikhobalotrema acutum*** (Linton, 1910) Skrjabin et Guschanskja, 1955

Material : 6 exs.

Host : *Tylosorus crocodiles.*

Locality : Waltair Coast; Coll. : R. Madhavi.

Distribution : India : Andhra Pradesh.

XVI. Family PLEORCHIIDAE (Poche, 1926)

97. Genus ***Pleorchis*** Railliet, 1896

135. ***Pleorchis sciaenae*** Yamaguti, 1938

1938. *P. sciaenae* Yamaguti *Jap. J. Zool.* **8**(1) : 15-74.

Material : 2 exs.

Host Pomadasys hasta.

Locality : Waltair Coast. Coll : R. Madhavi.

Distribution : India : Andhra Pradesh.

Elsewhere : East China.

XVII. Family DICROCOELIIDAE Odhner, 1910

Subfamily DICROCOELIINAE Looss, 1899.

98. Genus ***Paradistomoides*** Travassos, 1944

Key to the species of *Paradistomoides*

1. Vitellaria lie mostly in the anterior half of the body ..... *P. spatulatus*
– Vitellaria extend equally into the anterior and posterior half ..... *P. orientalis*
– Vitellaria consist mostly of irregularly shaped follicles 2
2. Body elongate, sucker equal on sub equal and very close ..... *P. intestinalis*
– Body lancoelate, ventral sucker smaller than oral sucker ..... *P. spatutatus*

136. ***Paradistomoides intestinalis*** Simha, 1958

1958. *P. intestinalis* Simha *Z. f. Parasitkunde. Bd.* **18** S : 161-218

Material : *Host* : *Ptyas (Zamenis) mucosus; Calotes nemericola.*

Location : Rectum.

Locality : Hyderabad; Coll.: S.S. Simha

Distribution : India : Andhra Pradesh.

137. ***Paradistomoides lancoelatus*** Simha, 1958

1958. *P. lancoelatus* Simha *Z. f. Parasitkunde Bd.* **18** S : 161-218

Material : *Host* : *Chamaeleon zeylènicus.*

Location : Intestine.

Locality : Hyderabad; Coll. : S.S. Simha.

Distribution : India : Andhra Pradesh

138. ***Paradistomoides spatulatus*** Simha, 1958

1958. *P. spatulatus* Simha *Z. f. Parasitekunde Bd.*, **18** S : 161-218

139. ***Paradistomoides orientalis*** (Narain et Das, 1929) Travassos, 1944

1929. *Dicrocoelium orientalis* Narain et Das *J. Bombay. Nat. Hist. Soc.* **33**(2) : 250-261

1944. *Paradistomoides orientalis* Travassos *Monogr. Inst. Osw. Cr.* **2** : 357 pp.

Material : *Host* : *Calotes versicolor, Hemidactylus flaviviridis, H. maculatus.*

Location : Gall bladder.

Locality : Hyderabad ; Coll. : S.S. Simha.

Distribution : India : Andhra Pradesh.

Elsewhere : Singapore.

XVIII. Family OMMATOBREPHIDAE Poche, 1926

Subfamily Ommatobrephinae Dubois et. Molin, 1959

99. Genus ***Ommatobrephus*** Nicoll, 1914

Key to the species of *Ommatobrephus*

1. Caeca long, acetabulum small, ... *O. lobatum*
2. Acetabulum large; caeca short ..... *O. megacetabulus*

140. ***Ommatobrephus megacetabulus*** Simha, 1958

1958. *O. megacetabulus* Simha *Z. f. Parassit Bd.* **18** S : 161-218

Material : 1ex.

Host : Water snake (*Tropidonotus piscator)*

Locality : Hyderabad; Coll. : S.S. Simha.

Distribution : India : Andhra Pradesh.

141. ***Ommatobrephus lobatum*** Mehra, 1928

1928. *O. lobatum* Mehra *Proc. 18th Ind. Sci. Congr.* 199

Material : *Host* : *Tropidonotus piscator.*

Locality : Hyderabad; Coll. : S.S. Simha.

Distribution : India : Andhra Pradesh.

XIX. Family MONASCIDAE Dolffus, 1952

100. Genus ***Monascus*** Looss, 1907

142. ***Monascus typicus*** (Odhner, 1911) Yamaguti, 1954

1911. *Haplocladus typicus* Odhner *Zool. Anz.* **37**(8-9) : 181-191

1954. *Monascus typicus* Yamaguti *Sysr. Helm.* Pt. I. *Digen. Trem. Fishes Publ.* By *Author, Tokyo*

Material : *Host Pampus argenteus.*

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

XX. Family MONODHELMINTHIDAE Dollfus, 1937

Subfamily PROSOGONARIINAE Mehra, 1963

101. Genus ***Prosogonarium*** Yamaguti, 1952

143. ***Prosogonarium plotosi*** Madhavi, 1975

Material : 5 exs.;

Host Plutosus orientalis.

Locality : Waltair Coast; Coll. : R. Madhavi.

Distribution : India : Andhra Pradesh.

XXI. Family SPIRORCHIDAE Stunkard, 1921

Subfamily HAPLOTREMANAE Stunkard, 1921

102. Genus ***Hepatohaemotrema*** Simha, 1958

144. ***Hepatohaemotrema hepaticum*** Simha, 1958

1958. *H. hepaticum* Simha *Z. f. Parasit. Bd.* **18** S : 161-218

Material : *Host* : *Kachuga kachuga.*

Location : Liver.

Locality : Hyderabad; Coll. : S.S. Simha.

Distribution : India : Andhra Pradesh.

XXII. Family BIVESICULIDAE (Yamaguti, 1934) Yamaguti, 1939

Subfamily PAUCIVITELLASINAE Yamaguti, 1965

103. Genus ***Paucivitellosus*** Coil, Reid et Kuntz, 1965

145. ***Paucivitellosus hanumanthai*** Mani, 1990

1990. *P. hanumanthai* Mani *Trans. Amer. Micros. Soc.* (1989) **108**(1) : 21-26

Material : *Host* : *Mugil cephalus.*

Location : intestine.

Locality : Vishakhapatnam; Coll. : G.G. Mani.

Distribution : India : Andhra Pradesh.

XXIII Family SCLERODISTOMATIDAE Dollfus, 1930

104. Genus ***Isoparorchis*** Southwell, 1913

146. ***Isoparorchis hypselobagri*** (Billet, 1898) Odhner, 1927

1898. *Distomum hypselobagre* Billet *Bull. Sci France Belgigue* **28** : 283

1927. *I. Hypselobagri* Odhner *Nil Res. Swedish Zool. Exped* **23** : 1–70

Material : *Host* : *Kachuga kachuga.*

Location : Body Cavity.

Locality : Hyderabad, A.P.

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

Elsewhere : China, Japan, Australia, Siberia

XXIV. Family ECHINOSTOMATIDAE (Looss, 1902), Dietz, 1909

Subfamily ECHINOSTOMATINAE (Looss, 1899) Faust, 1929

105. Genus ***Singhiatrema*** Simha, 1954

Key to the species of *Singhiatrema*

– Testes lobed 1

– Testes smooth ..... *S. hyderabadensis*

– Caeca Short, not extending beyond ventral sucher ..... *S. singhia*

– Caeca long, extending beyond ventral sucker ..... *S. longifurca*

147. ***Singhiatrema singhia*** Simha, 1954

1954. *S. singhia* Simha *Z. F. Parasitekunde. Bd.* **18,** S : 161-218

Material : *Host* : *Ptyas (Zamenis) mucosus.*

Location : Rectum.

Locality : Hyderabad.

Distribution : India : Andhra Pradesh.

148. ***Singhiatrema longifurca*** Simha, 1958

1958. *S. longifurca* Simha *Z.F. Parasitekunde Bd.* **18,** S : 161-218

Material : *Host* : *Tropidonotus piscator.*

Location : Rectum.

Locality : Hyderabad.

Distribution : India : Andhra Pradesh.

149. ***Singhiatrema hyderabadensis*** Simha, 1954

1954. *S. hyderabadensis* Simha *Z.F. Parasitekunde Bd.* **18,** S : 161-218

Material : *Host* : Reptiles.

Location : Rectum & Intestine.

Locality : Hyderabad.

Distribution : India : Andhra Pradesh.

150. ***Singhiatrema najia*** Chattopadhyaya, 1967

1967. *S. najia* Chattopadhyaya *Ind. J. Halm. XVIII. pp.* 45-49

Material : *Host* : *Naja naja.*

Location : Cloaca.

Locality : Hyderabad; Collector : Chattopadhyaya D.R.

Distribution : India : Andhra Pradesh.

151. ***Singhiatrema tropidonoti*** Simha et Kundu, 1970

1970. *S. tropidonoti* Simha et Kundu *Proc. Ind. Sci.Cong. Asson.* **57**(111) : 457

Material : *Host* : *Tropidonotus piscator.*

Location : Intestine.

Locality : Hyderabad.

Distribution : India : Andhra Pradesh.

Subfamily ECHINOCHASMINAE Odhner, 1910

106. Genus ***Echinochasmus*** Dietz 1909

152. ***Echinochasmus bagulai*** Verma, 1935

1935. *E. bagulai* Verma *Proc. Ind. Acad. Sc.* **1**(12) : 837-856

Material : *Host* : *Alocinma travacorica.*

Locality : Waltair Coast.

Distribution : India : Andhra Pradesh.

XXV. Family PROTERODIPLOSTOMIDAE Dubois, 1936

Subfamily OPHIODIPLOSTOMINAE Dubois, 1936

107. Genus ***Proalaroides*** Yamaguti, 1933

153. ***Proalaroides tropidonotus*** Vidyarthi, 1937

1937. *P. tropodinotus* Vidyarthi *J. Helm* **11,** 163-168

Material : *Host* : *Tropidonotus piscator.*

Location : Intestine.

Locality : Hyderabad.

Distribution : India : Andhra Pradesh.

XXVI. Family CYATHOCOTYLIDAE Poche, 1925

Subfamily GOGATINAE Dubois et Mehra, 1935

108. Genus ***Gogatea*** Gogate, 1935

154. ***Gogatea serpentum*** (Gogate, 1932) Lutz. 1935

1932. *Prohemistomum serpentum* Gogate *Parassit* **24**(3) : 318-320

1935. *Gogatea serpentum* Lutz. *Mem Inst. Osw. Cr.* **30**(3) : 157-168

Material : *Host* : *Tropidonotus piscator.*

Location : Intestine.

Locality : Hyderabad.

Distribution : India : Andhra Pradesh.

HOST PARASITE RELATIONSHIP

Sl. No.	Parasite	Family	Host
1.	*Pseudocreadium indicum* Madhavi, 1972	Lepocreadiidae	*Monacanthus chirocephalus*
2.	*Opechona bacillaris* Molin, 1859	-do-	*Rostrelliger canagurta*
3.	*Opechona waltairensis* Madhavi, 1972	-do-	-do-
4.	*Preptetos chaetodoni* Madhavi, 1972	-do-	*Chaetodon pictus*
5.	*Lepocreadioides indicum* Srivastava, 1941	-do-	*Cynoglossus lida*
6.	*Opisthogonoporoides hanumanthai* Madhavi,1972	-do-	*Ciganus oramin*
7.	*Echenidocoelium indicum* Simha et Parshad, 1964	-do-	*Echeneis naucrates*
8.	*Aephinidiogenus senegalensis* Dollfus et Caprawn, 1915	-do-	*Pomadasys maculates*
9.	*Phyllotrema tetracaudatum* Hussain, *et al.* 1986	-do-	*Uroconger lepturus*
10.	*Lobatocreadium manteri* Madhavi, 1972	-do-	*Sufflamen capistratus*
11.	*Multitestis bengalensis* Madhavi, 1972	-do-	*Platax teira*
12.	*Transversocreadium cablei* Hafeezullah, 1970	-do-	*Triacanthus brevirostris*
13.	*Bianium plictum* (Linton,1928)	-do-	*Gastrophysus lunaris*
14.	*Cotylocreadium triacanthi* Hafeezullah, 1970.	-do-	*Triacanthus striligifer*
15.	*Bucephalus uranoscopi* Yamaguti, 1934	Bucephalidae	*Uranoscopus guttatus*
16.	*Bucephalus barina* Srivastava, 1936	-do-	*Jonius belengeri*

Sl. No.	Parasite	Family	Host
17.	*Bucephalus varicus* Manter, 1940	-do-	*Caranx sexfaciatus*
18.	*Alcicornis carangis* McCallum, 1917	-do-	*Carangoides malabaricus*
19.	*Alcicornis multidactylus* Madhavi, 1974	-do-	*Caesia caerulaureus*
20.	*Dollfustrema bengalense* Madhavi, 1974	-do-	*Gymnothorax undulatus*
21.	*Rhipidocotyle ghanensis* Fischthal et Thomas, 1968	-do-	*Psettodes cremnei*
22.	*Rhipidocotyle pentagonum* (Ozaki,1924) Eckmann, 1932	-do-	*Thynnus thunniue*
23.	*Rhipidocotyle khalili* Nagaty, 1937	-do-	*Sphyraena obtusata*
24.	*Rhipidocotyle sphyraenae* Yamaguti, 1959	-do-	*-do-*
25.	*Prosorhynchus menteri* Srivastava, 1938	-do-	*Trichurus haumela*
26.	*Prosorhynchus chorinemi* Yamaguti, 1952	-do-	*Chorinemus sp.*
27.	*Prosorhynchus pacificus* Manter, 1940	-do-	*Epinephelus taubina*
28.	*Prosorhynchus indicus* Madhavi, 1974	-do-	*Caesia caerulaureus*
29.	*Bucephalopsis microcerrus* Chauhan, 1943	-do-	*Cybium guttatus*
30.	*Psudopentagramma petrowi* (Laymann, 1930) Yamaguti, 1971	Fellodistomidae	*Sardinella fimbriata*
31.	*Pseudobacciger cablei* Madhavi, 1975	-do-	*-do-*
32.	*Pseudobacciger harengulae* (Yamaguti, 1938) Nahhas et. Cable, 1964	-do-	-do-

Sl. No.	Parasite	Family	Host
33.	*Odontotrema arabi* Hafeezullah et. Siddiqi, 1970	-do-	*Drepane punctata*
34.	*Pseudodiscogasteriodes indicum* (Srivastava,1939) Gupta 1955	-do-	*Triacanthus brevirostris*
35.	*Lintonium pulchrum* (Jhonston, 1913) Skrijabin et. Koval, 1957	-do-	*Gastrophysus lunaris*
36.	*Lintonium pseudovibex* Madhavi, 1975	Fellodistomidae	*Monacanthus chirocephalus*
37.	*Parantorchis intermedius* Madhavi, 1975	-do-	*Chaetodon pictus*
38.	*Parantorchis pomacanthi* (Hafeezullah et. Siddiqi,1970) Madhavi, 1975	-do-	*Pomacanthus annularis*
39.	*Horatrema pristipomatis* Srivastava, 1942	Opecoelidae	*Leiognathus bindus*
40.	*Pseudopocoelus scomberi* Hafeezullah, 1971	-do-	*Scomberoides tala*
41.	*Anisporus orientalis* Madhavi, 1975	-do-	*Dactyloptera orientalis*
42.	*Paropocoelus indicus* Madhavi, 1975	-do-	*Upineus sulphurius*
43.	*Opegaster ditrematis* Yamaguti, 1942	-do-	*Pseudorhombus micrognathus*
44.	*Helicometra fasciata* (Rud.1819) Odhner, 1902	-do-	*Scorpaenopsis cirrhosum*
45.	*Helicometra filamentosa* Madhavi, 1975	-do-	——
46.	*Helicometra nimia* Linton, 1910	-do-	*Jonius sina*
47.	*Podocotyloides parupenei* (Manter, 1963)	-do-	*Therapon jarbua*
48.	*Hamacreadium mutabile* Linton, 1910	-do-	*Lutianus fulviflamma, L. rivulaltus.*

Sl. No.	Parasite	Family	Host
49.	*Plagioporus cynoglossi* Madhavi, 1975	-do-	*Cynoglossus lida*
50.	*Allopodocotyle pritcharae* Madhavi, 1975	-do-	*Lutzanus lunulatus*
51.	*Allopodocotyle argyropsi* Madhavi, 1975	-do-	*Argyrops spinifer*
52.	*Angionematobothrium epinepheli* Yamaguti, 1965	Didymozoidae	*Epinephelus tauvina*
53.	*Allonematobothrium ganapatii* Murugesh et. Ram, 1991	-do-	*Lutianus russelli*
54.	*Allonematobothrium epinepheli* Yamaguti, 1965	-do-	*Epinephelus tauvina*
55.	*Nematobothrium megalaspium* Muregesh *et al.* 1992	-do-	*Megalaspis cordyla*
56.	*Metanemathriodes branchialis* Madhavi, 1982	-do-	*Pristipomoides typicus*
57.	*Pseudocolocyntotrema yaito* Yamaguti, 1970	-do-	*Euthynnus affinis*
58.	*Didymocystis wedli* Ariola, 1902	-do-	*Auseis thazara*
59.	*Allodidymozoon operculararе* Madhavi, 1982	-do-	*Sphyraena obtusata*
60.	*Allodidymozoon cylindricum* Madhavi, 1982	-do-	*-do-*
61.	*Neometadidymozoon polymorphis* (Oshmarin et. Mamaey, 1963) Yamaguti, 1972	-do-	*Priacanthus harmur*
62.	*Didymozoon lobatum* Madhavi, 1982	-do-	*Euthynnus affinis*
63.	*Indodidymozoon platycephali* Madhavi, 1982	-do-	*Platycephalus scaber*
64.	*Renodidymocystis yamagutii* Madhavi, 1982	-do-	*Rastrelliger kanagurta*

Sl. No.	Parasite	Family	Host
65.	*Coelididymocystis kamagaii* Yamaguti, 1970	-do-	*Katsuwonus pelamys*
66.	*Lobatocystis yaito* Yamaguti, 1965	-do-	*Euthynnus affinis*
67.	*Metadidymozoon branchiale* Yamaguti, 1970	-do-	*Xiphias gladias*
68.	*Gonapodasmius branchialis* Yamaguti, 1970	-do-	*Epinephelus latifasciatus*
69.	*Gonapodasmium spilonotopteri* Yamaguti, 1970	-do-	*Katsuwonus pelamys*
70.	*Skrjabinozoum waltairensis* Hussain et. Shyamasundari, 1987	-do-	*Psenes indicus*
71	*Indoglomeritrema epinepheli* Madhavi, *et al.* 1983	-do-	*Epinephelus tauvina*
72.	*Oculonematobothrium orbitum* Murugesh *et al,* 1992	-do-	*Pampus argentius*
73.	*Lasiotocus maculatus* Madhavi, 1974	Monorchiidae	*Pomadasys maculatus* *Rhonciscus furcatus*
74.	*Lasciotocus hastai* Madhavi, 1974	-do-	*Pomadasys hasta*
75.	*Ametrodaptes secundus* Madhavi, 1977	-do-	*Pomadasys maculatus*
76.	*Hysterorchis pseudovitellosus* Madhavi, 1974	-do-	*Lutianus Sp.*
77.	*Timonia indica* Madhavi, 1977	-do-	*Polynemus indicus*
78.	*Timonia caballeroi* Madhavi,1977	-do-	*Polynemus sextarius*
79.	*Hurleytrematoides filiformes* Madhavi, 1974	-do-	*Chaetodon pictus*
80.	*Monorchis minutus* Madhavi,1977	-do-	*Pomadasys maculatus*
81.	*Opisthodiplomonorchis elongatus*	Monorchidae	*Psettodes erumei*

Sl. No.	Parasite	Family	Host
82.	*Pseudopisthomonorchis carangi*	-do-	*Carangoides malabaricus*
83.	*Retractomonorchis delicatus*	-do-	*Pampus chineusis* *P. argentius*
84.	*Caballerotrematiodes leiognathi*	-do-	*Leiognathus daura*
85.	*Paracryptogonimus ovatus* Yamaguti, 1952	Cryptogonimidae	*Pomadasys hasta*
86.	*Paracryptogonimus hirastricus* Manter, 1963	-do-	*Lutjanus malabaricus*
87.	*Allometadena rotundum* Madhavi, 1974	-do-	*-do-*
88.	*Acanthosiphodora bengalense* Madhavi, 1974	-do-	-do-
89.	*Cryptocallritrema provesiculatum* Madhavi, 1974	-do-	*Lutianus sp.*
90.	*Stephanostomum orientalis* Srivastava, 1989	Acanthocolpidae	*Caranx sexfasciatus* *Carangoides malabaricus*
90.	*Stephanostomum merospinorum* Madhavi, 1976	Acanthocolpidae	*Carangoides malabaricus*
91.	*Stephanostomum adinterruptum* Hafezullah, 1971.	-do-	*Fistularia villosa*
92.	*Stephanostomum casum* Linton, 1910 (McFarlane,1934)	-do-	*Lutianus malabaricus*
93.	*Stephanostomum ditremates* (Yamaguti,1939) Manter, 1947	-do-	*Megalaspis cordyla*
94.	*Stephanostomum psudoditrematis* Madhavi, 1976	-do-	*Rachycentron canadus*
95.	*Stephanostomum triacanthi* Madhavi, 1976	-do-	*Triacanthus strigilifer*
96.	*Stephanostomum polynemi* Madhavi, 1976	Acanthocolpidae	*Polynemus indicus*
97.	*Stephanostomum microsomum* Madhavi, 1976	-do-	*Rachycentron canadus*

Sl. No.	Parasite	Family	Host
98.	*Stephanostomum mesospinosum* Madhavi, 1976	-do-	*Carangoides malabaricus*
99.	*Acanthocolpus liodorus* Luhe, 1906	-do	*Chirocentrus dorab*
100.	*Acanthocolpus tenuis* Manter, 1963	-do-	-do-
101.	*Tormopsolus filiformis* Sogandares et. Hutton,1959	-do-	*Rachycentron canadus*
102.	*Allocreadium fasciatusi* Kakaji, 1969	Allocreadiidae	*Aptochiitus melastigma*
103.	*Allocreadium handiai* Pande, 1937	-do-	*Channa punctatus* *Clarias batrachus*
104.	*Stomachicola muraenesosis* Yamaguti, 1934	Hemiuridae	*Muraenosox talabourides*
105.	*Allostomachicola secundus* (Srivastava,1939) Yamaguti,1958	-do-	—
106.	*Halipegus mehransis* Srivastava, 1933	-do-	*Ptyas (Zamenis) mucosus*
107.	*Halipegus ovocaudatum* (Vulpain,1858) Looss,1899	-do-	—
108.	*Lecithaster indicum* Srivastava, 1935	-do-	Unidentified fish
109.	*Aphanurus dussumieri* Hussain *et al.*, 1984	-do-	*Dussumieria hasselltii*
110.	*Uterovesiculurus lameriensis* (Tubangui et. Musilungan,1935)	-do-	*Chironemus lyson*
111.	*Parahemiurus engraulisi* Gupta et. Jahan, 1977	-do-	*Ilisha filigera*
112.	*Aponurus waltairensis* Hussain *et al.* 1987	-do-	*Acanthurus bleekeri*
113.	*Hydrophitrema giganticum* Sandars, 1960	-do-	*Enhydrina valakadyen* *Microcephalus gracilis*

Sl. No.	Parasite	Family	Host
114.	*Ganeo tigrinum* Mehra et Negi, 1928	Lecithodendriidae	*Therapon jarbua*
115.	*Pleurogenoides gastroporus* Luhe, 1901	-do-	Chamaeleon
116.	*Pleurogenoides ovatus* Rao, 1977	-do-	*Rana tigrina* *Rana cyanophlyctis*
117.	*Pleurogenoides sitapurii* Srivastava, 1934	-do-	*Rana cyanophlyctis*
118.	*Mehrarchis chamaeleonis* Simha, 1958	-do-	*Chamaeleon zeylanicus*
119.	*Anchitrema sanguineum* (Sonsino, 1894) Looss, 1899	-do-	-do-
120.	*Prosthodendrium ovatum* Simha, 1958	-do-	*Calotes nemoricola*
121.	*Prosthodendrium dollfusi* Simha, 1958	-do-	*Calotes versicolor*
122.	*Xenopharynx heterovitellatus* Simha, 1958	Plagiorchiidae	*Tropidonotus piscator*
123.	*Xenopharynx pyriformes* Simha, 1958	-do-	*Ptyas mucosus*
124.	*Xenopharynx solus* Nicoll, 1912	-do-	*Naja naja*
125.	*Plagiorchis himalayai* Luhe, 1899	-do-	*Chamaeleon zeylanicus*
126.	*Astiotrema rami* Bhalerao, 1936	-do-	Turtle
127.	*Astiotrema loossi* Mehra, 1931	-do-	-do-
128.	*Neoganada aspinosa* Simha, 1958	-do-	*Chamaeleon zeylanicus*
129.	*Encyclometra colubrimurorum* Dollfus, 1931	-do-	Water snake, Grass snake
130.	*Atrophocaecum indicum* Simha, 1958	Acanthostomidae	*Tropidonotus piscator*

Sl. No.	Parasite	Family	Host
131.	*Haplocaecum asymmetricum* Simha, 1958	-do-	*Dryophis nictirizans*
132.	*Galactostomum ussuriense* Oshmarin, 1963	Heterophyidae	*Therapon jarbua*
133.	*Haplorchis solus* Simha, 1964	-do-	*Dryophis nicterizans*
134.	*Schikhobalotrema acutum* (Linton,1910) Skrjabin et. Guschanskja, 1953	Haplosplanchnidae	*Tylosorus crocodilus*
135.	*Pleorchis sciaenae* Yamaguti, 1938	Pleorchiidae	*Pomadasys hasta*
136.	*Paradistomoides intestinalis* Simha, 1958	Dicrocoelidae	*Ptyas mucosus* *Calotes nemericola*
137.	*Paradistomoides lancoelatus* Simha, 1958	-do-	*Chamaeleon zeylanicus*
138.	*Paradismoides spatulatus* Simha, 1958	-do-	*Calotes versicolor*
139.	*Paradistomoides orientalis* (Narain et. Das, 1929) Travassos, 1944.	-do-	*-do-*
140.	*Ommatobrephus megacetabulus* Simha, 1958	Ommatobrephidae	*Tropidonotus piscator*
141.	*Ommatobrephus lobatum* Mehra, 1928	-do-	*-do-*
142.	*Monascus typicus* (Odhner,1911) Yamaguti,1954	Monascidae	*Pampus orgenteus*
143.	*Prosogonarium plotosi* Madhavi, 1975	Monodhelminthidae	*Plotoscus orientalis*
144.	*Hepatohaemotrema hepaticum* Simha, 1958	Spirorchidae	*Kachuga kachuga*
145.	*Paucivitellosus hanumanthai* Mani, 1990.	Bivesiculidae	*Mugil cephalus*

Sl. No.	Parasite	Family	Host
146.	*Isoparorchis hypselobagri* (Billet, 1898) Odhner, 1927	Sclerodistomatidae	*Kachuga kachuga*
147.	*Singhiatrema singhia* Simha, 1954	Echinostomatidae	*Ptyaz (Zamenis) mucosus*
148.	*Singhiatrema longifurca* Simha, 1958	-do-	*Tropidonotus piscator*
149.	*Singhiatrema hyderabadensis* Simha, 1954.	-do-	*Rat Snake*
150.	*Singhiatrema najia* Chattopadhyay, 1964	-do-	*Naja naja*
151.	*Singhiatrema tropidonoti* Simha et. Kundu	-do-	*Tropidonotus piscator*
152.	*Echinochasmus bagulai* Verma, 1935.	-do-	*Alcinma travacorica*
153.	*Proalariodes tropidonotus* Vidyarthi, 1937.	Proterodiplostomidae	*Tropidonotus piscator*
154.	*Gogatea serpentum* (Gogate,1932) Lutz, 1935.	Cyathocotylidae	-do-

SUMMERY

The present work is an account of all the species of Digenetic trematodes of Fishes, Amphibia and Reptilia, recorded and studied so far from Andhra Pradesh; Keys for the families and genera, dealt in the present work are mainly for easy identification. Geographical ***Distribution*** of all the species recorded from Andhra Pradesh have been furnished.

In all 154 species under 108 Genera and 26 families have been included in the present work mostly of which have cited from the literature (earlier work from the Scientists of this group).

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PARASITIC NEMATODES OF ARTHROPODS

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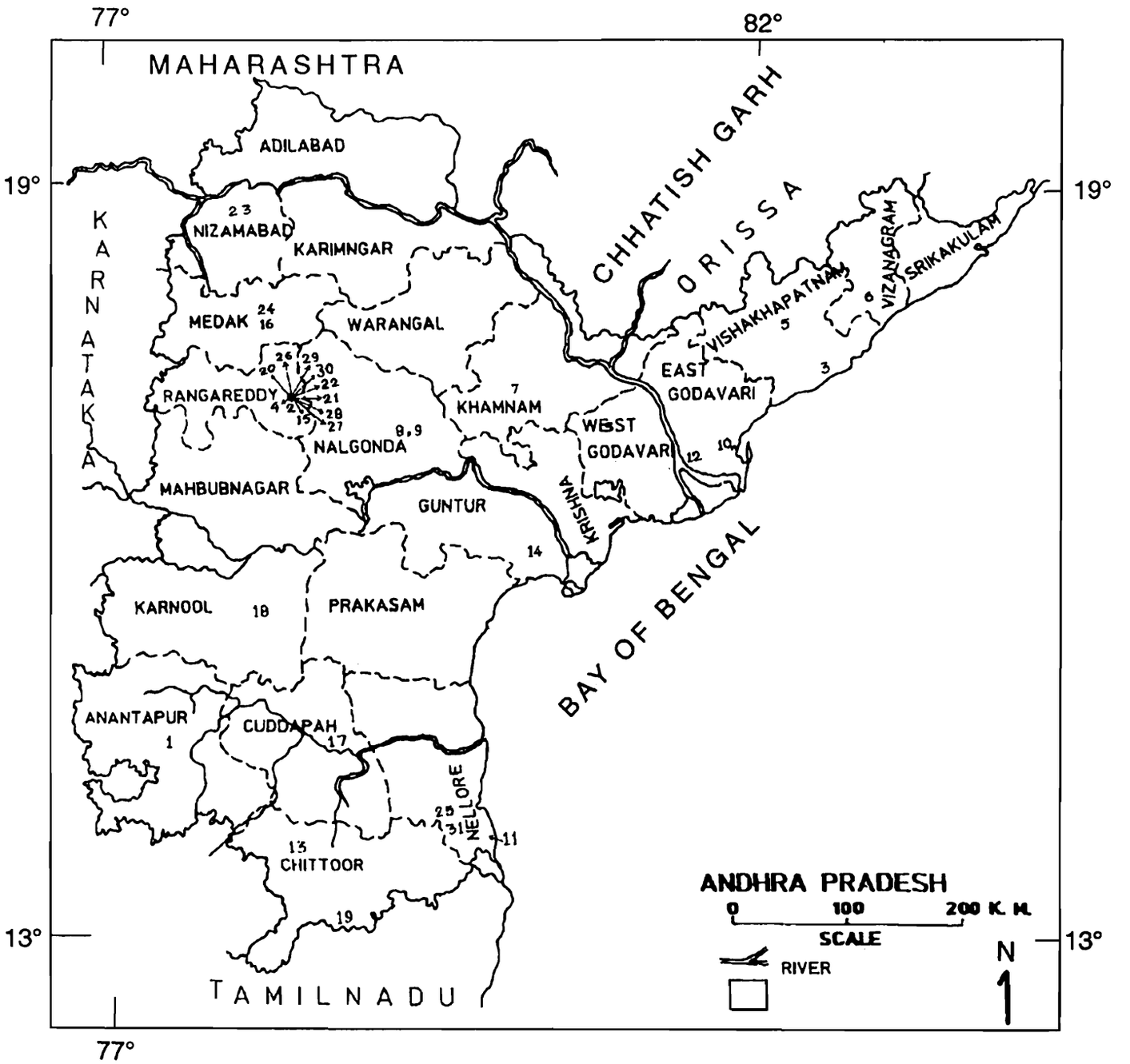
INTRODUCTION

The state of Andhra Pradesh lies on the southern side of India. Geographically, it is located within the sub tropics extending from 12°40' to 19°50' North latitude and 76°45' to 84°40' East longitude. It is the fifth largest state of India in terms of geographical dimension and population. It covers an area of 2,75,280 square kilometres bounded by Orissa and Madhya Pradesh on the North side, by Maharashtra and Karnataka on the West, by Tamil Nadu on the south and on the East side by Bay of Bengal. In Andhra Pradesh there are two major river systems, Godavari and Krishna; covers about 1500 kilometres area of the state. Both the rivers are originated from Western Ghats and meet the Bay of Bengal on east side. The state has a coast line of about 1100 kilometres; lakes and tanks cover the area of about 8,00,000 hectares. About 24% land area of the state is covered by forest in which evergreen, semi evergreen and moist deciduous forest are also found. The Kolleru Lake (C. 250 sq. km.), which partially situated in the two coastal districts, Krishna and Godavari is regarded as one of the largest wetland in India.

The state can be broadly divided into three physiographic divisions :

1. The mountainous region consisting of Nallamalai and Erramalai hills of Rayalseema and Eastern Ghats.
2. Plalean or elevated plains having an altitude of 92–722 meters covering the entire Telengana and a part of Rayalseema.
3. The delta areas among which the Godavari, the Krishna and the Pennar are important.

As because the state is situated within the tropics, the climate is hot almost all round the year. The summer season is from February to May, which is very hot and dry. The atmospheric temperature often rises upto 45°C during this season. The winter season is only for two months, December and January. The temperature may fall only upto 18–19°C during that period. The rainy season is from June to October. The annual rainfall varies from 510–1025 mm. The rains occur mainly due to the South West monsoon.



Map showing district-wise collection localities

Remarkable contribution in the field of nematode parasites of arthropods was made by workers like Leidy (1849–1856), Cobb (1920–1929), Artigas (1925–1930), Christie (1931–1938), Skrjabin (1916–1966), Chitwood & Chitwood (1930–1940), Travassos (1925–1960), Basir (1940–1956), Dollfus (1952–1964), Kloss (1958–1966), Osche (1956–1970), Siddiqi (1960–till date), Poinar Jr. (1970–1995) and few others.

In India work on parasitic nematodes of arthropods was started by M. A. Basir in 1940, which was followed by many others like Singh (1954), Farooqui (1966), Duggal & Aulakh (1989), Singh & Singh (1989), Parveen & Jairajpuri (1980–1990) and more recently Rizvi & Jairajpuri (2000), Rizvi, Jairajpuri & Shah (2002) and many others. They have contributed much to the systematic study of the parasites. In regard of nematode parasites of arthropods in Andhra Pradesh, Meena Kumari (1965–1975), V. Jagannath Rao (1965–1985), T. Rukmeni Devi (1990–1995), P. Narayan Rao (1965–1995), Y. Narsi Reddy (1980–1995) have made their significant contribution and series of reports.

During the period of April 1998–December 2002, seven faunistic field surveys were conducted in Andhra Pradesh, covering 18 districts out of 22 (Map–1). Adilabad, Nizamabad, Karimnagar and Srikakulam have not been covered. The work comprises of 30 species under 14 genera and 6 families. Out of 30 species 18 species have been collected by the first author from the above districts involving in the various survey parties of Zoological Survey of India, which are also new record form the state. Twelve species, already recorded by different scientists from the state at different times have also been incorporated. One new species and two new subgenera have been described and illustrated. Diagnostic characters of all the species alongwith the keys for easy identification of families and genera, have been provided. The figures of all the species have also been furnished to get a comprehensive totality of the scenario. In the present work a trial has been taken to make a consolidated account of nematode parasites of arthropods in Andhra Pradesh so far available.

Amongst the arthropods Diplopoda; the insects of the families Blattidae, Gryllidae, Scarabidae, Passalidae and Hydrophilidae are recorded as important hosts which harbour the nematode parasites. In the present study the parasites were collected from millipedes (Spirobolus sp.) and the insects of the families Blattidae, Gryllidae and Scarabidae. Among these hosts particularly the millipedes and the insects of the family Blattidae, the infection was found to be almost total. The location of the parasites was found to be invariably in the hind gut of the hosts. Though this is an interesting phenomenon *i.e.* the occurrence of severe parasitic infection in any particular taxonomic group, where as in other group the infection become rare; but hopelessly much work has not been done to establish the real reasons behind this.

In the invertebrate hosts, it is a common experience that single host is being infested by more than one parasitic species. In such a situation, confusion may arise about the corresponding male or female, as the case may be. If there is sexual dimorphism in the parasites, the difficulty is further enhanced. It is common practice that, if males and females having the similar features, are considered to belong to the same species. Even then it is fairly difficult

to identify them as is evident by the examples of certain species where they were identified on the basis of only males or females; and for some of them even till the day, their counter parts remain unidentified.

MATERIALS AND METHODS

The hosts were first made inactive by very little amount of chloroform. Then they were dissected and the gut was separated. The alimentary canal was opened in a petri dish with normal saline by means of needles and then was observed under a binocular microscope in lower magnification. The parasites were collected by means of a fine pippet into cavity block. The specimens were fixed in hot (about 60°C) 70% alcohol. After fixation they were preserved under 70% alcohol, containing 5% glycerine. Then the nematodes became ready for study. Rarely a few drops of lactophenol were used for clearing; as because, in case of invertebrate parasitic nematodes the cuticle is very thin and the lactophenol was found to clear not only the body wall but also the internal organs.

SYSTEMATIC INDEX

Class NEMATODA

Order I OXYURIDA

Superfamily I THELASTOMATOIDEA

Family I THELASTOMATIDAE Travassos, 1929

Sub-family I HAMMERSCHMIDTIELLINAE Chitwood, 1932

Genus 1 ***Hammerschmidtiella*** Chitwood, 1932

1. *H. diesingi* (Hammerschmidt, 1838) Chitwood, 1932
2. *H. singhi* Rao & Rao, 1965.

Subfamily II CAMERONIINAE Kloss, 1959

Genus 2 ***Cameronia*** Basir, 1948

3. *C. biovata* Basir, 1948.

Sub-family III BLATTICOLINAE Chitwood, 1932

Genus 3 ***Blatticola*** Schwenk, 1926

4. *B supellaimae* Rao & Rao, 1965.
5. *B. blattae* (Graeffe, 1860) Chitwood, 1932.

Genus 4 ***Johnstonia*** Basir, 1956

Subgenus 1 ***Johnstonia*** Rao, 1970

6. *J.(J.) basiri* Rao, 1970.

Subgenus 2 ***Paronai*** Rao, 1970

7. *J.(P.) indica* Kumari, 1967.

8. *J. (P.) dollfusi* Rao, 1970.

Subfamily IV THELASTOMATINAE Travassos, 1929

Genus 5 ***Leidynema*** Schwenk (in Travassos, 1929)

Subgenus 3 ***Leidynema*** Farooqui, 1967

9. *L. (L.) corydium* Rao, 1970.

Genus 6 ***Gryllophila*** Basir, 1942

10. *G. skrjabini* (Sergiev, 1923) Basir, 1956.
11. *G. basiri* Parveen & Jairajpuri, 1981.

Genus 7 ***Schwenkiella*** Basir, 1956.

12. *S. periplaneticola* Parveen & Jairajpuri, 1981.
13. *S. atheri* Parveen & Jairajpuri, 1983.
14. *S. basiri* Parveen & Jairajpuri, 1980.
15. *S. indica* Rao & Rao, 1966.

Genus 8 ***Thelastoma*** Leidy, 1849

16. *T. guptai* Duggal & Aulakh, 1989.
17. *T. pterygoton* Poinar Jr., 1973.
18. *T. kherai* Duggal & Aulakh, 1989.
19. *T. atheri* (Parveen & Jairajpuri, 1983) Rizvi & Jairajpuri, 1995.

Superfamily II RHIGONEMATOIDEA

Family II CARNOYIDAE Filipjev, 1934

Sub-family V CARNOYINAE Filipjev, 1934

Genus 9 ***Rondonema*** Artigas, 1926

20. *R. spirostreptum* Rao & Kumari, 1967.
21. *B. indica* Rao & Rao, 1965.

Family III BLATOPHILIDAE

Genus 10 ***Blattophila*** Cobb, 1920

Order II RHABDITIDA

Family IV CEPHALOBIDAE, Artigas, 1929

Genus 11 ***Cephalobium*** Cobb, 1920

Subgenus 4 ***Denticum*** Sub-gen. n.

22. *C. (D.) microvata* Rao & Rao, 1965.
23. *C. (D) gryllodes* Rao, 1980.

Subgenus 5 *Adenticum* sub-gen.n.

24. *C. (A.) aodous* Rao, 1982.

25. *C. (A.) caudatum* sp. n.

Order III TYLENCHIDA

Family V ALANTONEMATIDAE Poinar Jr., 1975

Genus 12 *Howardula* Cobb, 1921.

26. *H. marginatis* Reddy & Rao, 1981.
27. *H. multilatus* Devi, Rao & Reddy, 1991.

Genus 13 *Heterotylenchus* Bovien, 1937.

28. *H. crassirostris* Reddy & Rao, 1981.
29. *H. xanthomelas* Reddy & rao, 1987.

Family VI ENTAPHELENCHIDAE Pionar Jr., 1975

Genus 14 *Schistonchus* Cobb, 1927.

30. *Schistonchus racemosa* Reddy & Rao, 1986.

SYSTEMATIC ACCOUNT

Class NEMATODA

Order I OXYURIDA

Key to the super-families

1. Male with one spicule, gubernaculum absent. Female with 8 head papillae ..... TELASTOMATOIDEA

– Male with two spicules (rarely one), gubernaculum present or absent. Female with 4 head papillae ..... RHIGONEMATOIDEA

Superfamily I THELASTOMATOIDEA

Family I THELASTOMATIDAE Travassos, 1929

Key to the subfamilies

1. Corpus of pharynx with distinct metacorpus ..... HAMMERSCHMIDTIELLINAE, Chitwood, 1932

– Corpus of pharynx without distinct metacorpus 2

2. Eggs flattened, stuck together in pairs ..... CAMERONIINAE, Kloss, 1959

– Eggs not flattened or stuck together in pairs 3

3. Female with single ovary ..... BLATTICOLINAE Chitwood, 1932

– Female with double ovaries ..... THELASTOMATINAE Travassos, 1929

Subfamily I HAMMERSCHMIDTIELLINAE Chitwood, 1932

Genus 1 *Hammerschmidtiella* Chitwood, 1932

Key to he available Species

1. Slender female body; oesophagus long with long pseudobulb, short isthmus..... .....*H. diesingi* (Hammerschmidt, 1838), Chitwood, 1932

2. Stouter female body; oesophagus short with distinctly small psendobulb, long isthmus ..... *H. singhi,* Rao & Rao, 1965

1. ***Hammerschmidtiella diesingi*** (Hammerschmidt, 1838) Chitwood, 1932 (Fig. 1)

1838. *Oxyuris diesingi* Hammerschmidt, *Helminthologische Beitrage Isis (Oken), Leipzig,* **5** : 351–368.

1932. *Hammerschmidtiella diesingi* Chitwood; *Z. Parasitenkde.* **5** : 14–50.

Material· : ♀7; Host : *Blatta orientalis*, Hab : Rectum; Loc. : Anantapur, Anantapur, Andhra Pradesh; Coll. V. V. Gantait.

Diagnosis :

Female : Body 2.4–3.1 mm long and 136–224.2μm wide. Cuticle coarsely annulated, annules 14–21μm wide near the head. Oesophagus 261–322 μm long with a posterior, elongate, somewhat ovoid pseudobulb, 82–91 μm long by 58–60 μm wide. Isthumus short, 31–34 μm long by 16–22 μm wide. Nerve ring anterior to pseudobulb, 86 μm from anterior end. Excretory pore posterior to base of oesophagus, 346–452 μm from anterior end. Tail filiform, 624–926 μm in length. Vulva 526–584 μm from anterior end, at about 23–26% of the body. Ovaries two, both anterior, lying coiled in the region of vagina. Eggs 78–82 μm long by 32–34.2 μm wide.

Distribution : India : Andhra Pradesh, Anantapur; North India.

Elsewhere : Europe, North America, South America and Russia.

Remarks : Measurements on the basis of present collection; illustrations: after Chitwood, 1932.

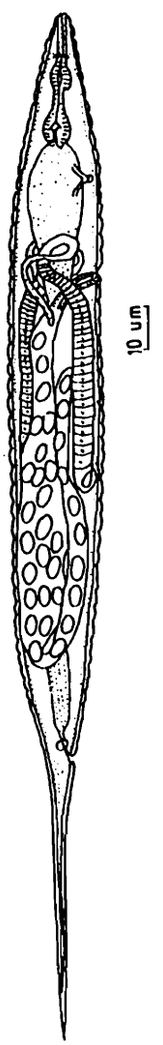


Fig. 1. *Hammerschmidtiella diesingi*; Female entire.

2. ***Hammerschmidtiella singhi*** Rao & Rao, 1965.
(Fig. 2 : A-C)

1965. *Hammerschmidtiella singhi* Rao & Rao; *Rivista di Parassitologia*, **XXVI**(1) : 9-21.

Material : ♀ 1, ♂ 1 Host : *Corydia* sp.; Hab : Intestine; Loc : Secunderabad, Rangareddy, Andhra Preadesh; Coll : V. V. Gantait.

Diagnosis : Female : Body 1.87 mm in length and 0.168 mm in width. Mouth surrounded by 8 labio-papillae. Corpus measures 0.096 mm long by 0.018 mm wide which expands into a pseudobulb measuring 0.048 mm wide and 0.072 mm long. Isthmus 0.038 mm in length and 0.016 mm width, with a slight bulge in the middle. Vulva 0.484 mm from anterior extremity. Tail 0.659 mm in length.

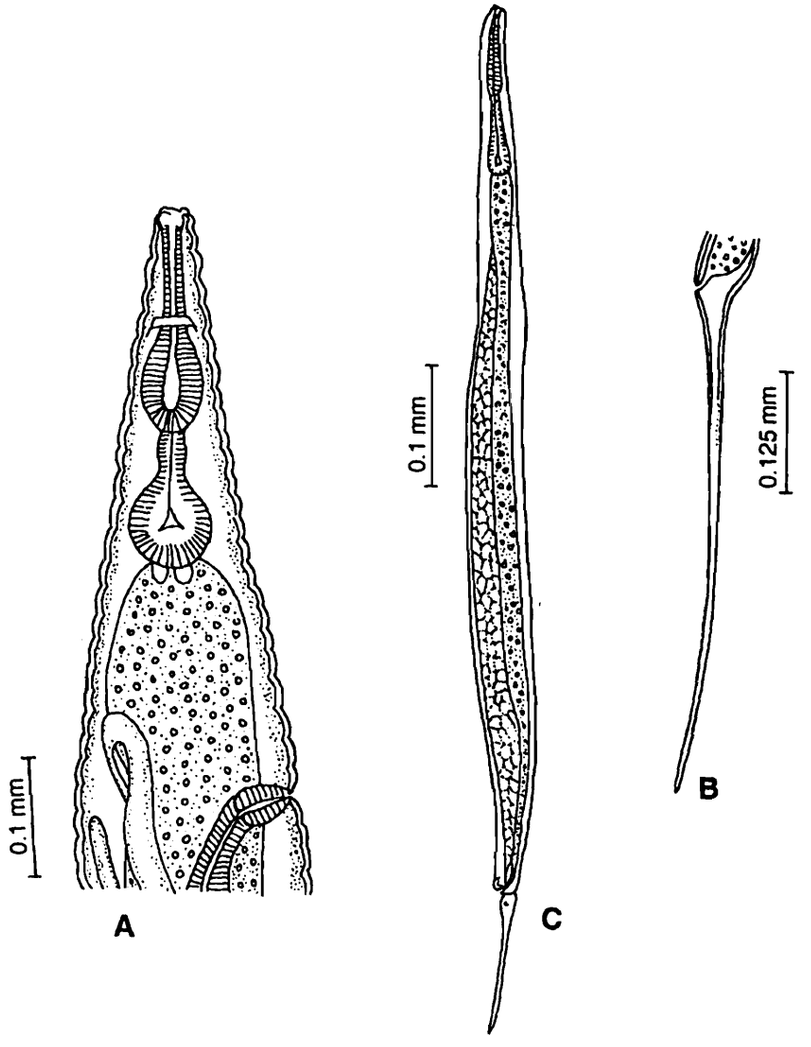


Fig. 2. *Hammerschmidtiella singhi* : A. Female, anterior extremity; B. Female, tail end; C. Male entire.

Male : 0.86 mm in length and 0.048 mm in maximum width. Oesophagus 0.114 mm in length; corpus 0.056 mm long by 0.014 mm, isthmus 0.039 by 0.009 mm and vulvulated bulb 0.023 mm in diameter. Tail set off from the rest of the body, 0.14 mm long. Caudal papillae

comprises of two pairs of preanals, a pair of adanal and an unpaired medium post-anal papillae. Spicule single, 0.03 mm long.

Distribution : India : Andhra Pradesh, Rangareddy.

Remarks : Measurements on the basis of present collection; illustrations; after Rao and Rao, 1965. Secunderabad was under Hyderabad District previously, now it is under Rangareddy District.

Sub-family II CAMERONIINAE Kloss, 1959

Genus 2 *Cameronia* Basir, 1948

3. *Cameronia biovata* Basir, 1948
(Fig. 3)

1948. *Cameronia biovata* Basir; *Canad. J. Res.*, **2** : 201- 203.

Material : ♀11; Host : *Gryllotalpa africana*; Hab : Rectum; Loc : Vishakhapatnam, Vishakhapatnam, Andhra Pradesh; Coll : V. V. Gantait.

Diagnosis : Length 3.268–3.489 mm; width 0.354–0.366 mm; buccal cavity 0.019 mm × 0.02 mm; oesophagus 0.432–0.459 mm; corpus 0.329–0.36 × 0.036–0.038 mm; isthmus 0.012–0.019 mm × 0.034–0.038 mm; bulb 0.096–0.105 × 0.095–0.101 mm; nerve ring 0.196 –0.208 mm from head end; vulva 2.36–2.49 mm from anterior extremity; anus 0.159–0.178 mm from tail end; eggs 0.013–0.134 X 0.044–0.046 mm.

Distribution : India : Andhra Pradesh, Vishakhapatnam; Aligarh.

Remarks : Measurements on the basis of present collection; illustration : after Basir, 1948.

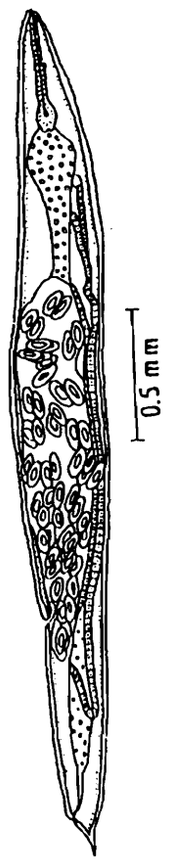


Fig. 3. *Cameronia biovata;* Female entire.

Sub-family III BLATTICOLINAE Chitwood, 1932

Key to Genera

1. Vulva in posterior fourth of the body; tail of female cone-shaped. ..... *Blatticola* Schwenk, 1926

2. Vulva in middle third of the body; tail of female spicate or thread-like ..... *Johnstonia* Basir, 1956

Genus 3 ***Blatticola*** Schwenk, 1926

Key to Species

1. Distance between vulva and anus equal to tail length, oesophagus long occupies $^1/_8$th of body length, eggs large in size; spicule long .... *Blatticola supellaimae* Rao & Rao, 1965

2. Distance between vulva and anus more than double of tail length, oesophagus short occupies $^1/_{12}$th of body length, eggs small in size; spicule short..... ..... *Blatticola blattae* (Graeffe, 1860) Chitwood, 1932

4. ***Blatticola supellaimae*** Rao & Rao, 1965
(Fig. 4 : A-B)

1965. *Blatticola supellaimae* Rao & Rao; *Annals and Magazine of Natural History*, **viii** : 273–275.

Material : ♀2, ♂2; Host : *Supellaima* sp.; Hab : Rectum; Loc : Hyderabad, Rangareddy, Andhra Pradesh; Coll : Rao & Rao.

Diagnosis : Female : Body 3.235 mm long and 0.301 mm wide. Oesophagus 0.415 mm in length; corpus club-shaped about 0.280 mm × 0.050 mm isthmus 0.027 mm in length and 0.032 mm in width, vulvular bulb 0.108 mm × 0.100 mm. Nerve ring 0.195 mm from head end. Anus 0.175 mm from tail end. Vulva 0.337 mm from posterior end and 0.162 mm anterior to anus. Egg 0.162 mm × 0.072 mm, pointed at both ends.

Male : Body 0.990 mm long, 0.070 mm wide. Oesophagus 0.160mm in length; corpus 0.105 mm × 0.015 mm, isthmus 0.025 mm long, valvular bulb 0.030 × 0.027 mm. Nerve ring 0.042 mm from anterior end. Anus 0.050 mm from posterior end. Testis single. Spicule one, 0.025 mm in length.

Distribution : India : Andhra Pradesh, Rangareddy.

Remarks : Measurements and illustrations made after Rao and Rao, 1965.

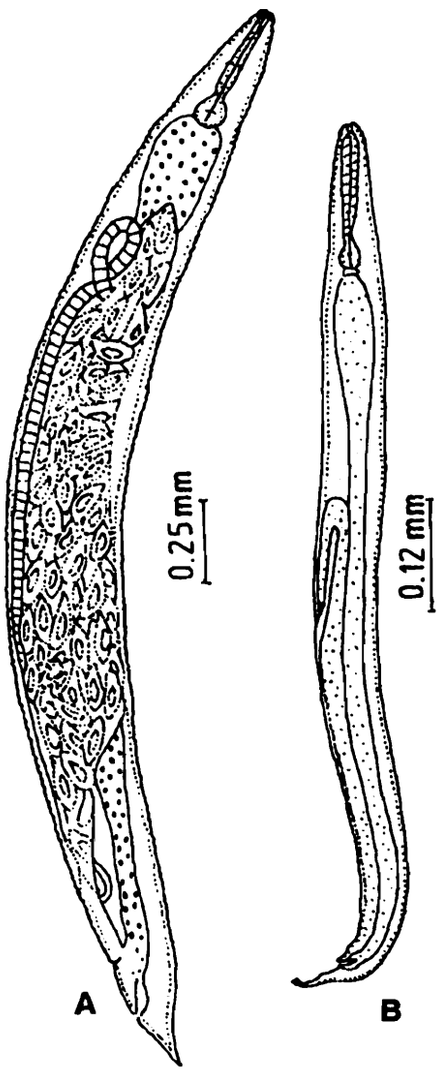


Fig. 4. *Blatticola supellaimae;* A. Female entire, B. Male entire.

5. ***Blatticola blattae*** (Graeffe, 1860) Chitwood, 1932
(Fig. 5)

1880. *Oxyuris blattae* Graefee; *N. Denkschr. allg. Schwiz. Ges. Naturwiss., Zurich,* **17** : 59 pp.

1878. *O. blatticola* Galeb; *Arch. Zool. Exper. et. Gen.*, **7** : 283–390.

1926. *Blatticola blatticola* (Galeb, 1878) Schwenk; *Sci. Medica, Rio de Janeiro,* **4** : 491–504.

1932. *B. blattae* Chitwood; *Z. Parasitenkde,* **5** : 14–50.

Material : ♀12; Host : *Blatta orientalis*; Hab : Rectum; Loc : Araku Valley, Vishakhapatnam, Andhra Pradesh; Coll : V. V. Gantait.

Diagnosis : Female : 2.2–3.1 mm long and 166–169 μm wide. Oesophagus 159–278 μm long; corpus 233–276 μm long; isthmus very short. Nerve ring 111–226 μm from anterior end. Anus 163–241 μm from posterior end. Tail conical. Vulva 1.66–2.52 mm from head end. Ovary directed anteriorly and reflexed. Eggs rectangular or oval, pointed at both ends; 122–127 μm long by 39–42 μm wide.

Distribution : India : Andhra Pradesh, Vishakhapatnam.

Elsewhere : Europe, South America and U.S.S.R.

Remarks : Measurements based on present collection; illustrations : after Chitwood, 1932.

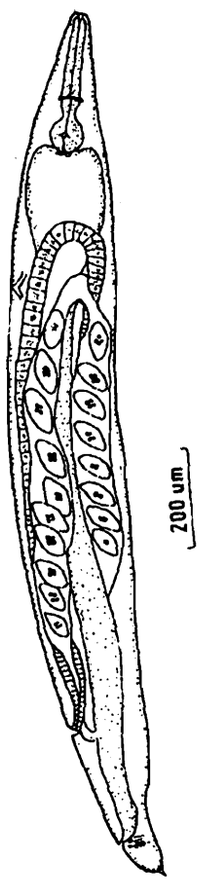


Fig. 5. *Blatticola blattae*; Female entire.

Genus 4 ***Johnstonia*** Basir, 1956

Key to Sub-genus

1. Female with short tail, about $^1/_6$th of the body length ..... *Johnstonia* Rao, 1970
2. Female with long tail, about $^1/_3$rd of the body length..... *Paronai* Rao, 1970

Sungenus 1 ***Johnstonia*** Rao, 1970

6. ***Johnstonia (Johnstonia) basiri*** : Rao, 1970

1970. *Johnstonia (Johnstonia) basiri* Rao; Ph. D. Thesis : 125 pp.

Material : ♀17; Host : *Spirobolus* sp.; Hab : Rectum; Loc : Vijianagram, Vijianagram, Andhra Pradesh; Coll : V. V. Gantait.

Diagnosis : Female : Body 3.24–3.62 mm in length and 0.37–0.44 mm in width. Buccal cavity 0.012–0.015 mm deep and 0.007–0.01 mm wide; a small conical tooth at the base. Corpus 0.34–0.36 mm in length and 0.038–0.04 mm in width, isthmus 0.032–0.037 mm in length and 0.031–0.036 mm in width and posterior valvular bulb 0.12–0.13 mm in diameter. Nerve ring 0.17–0.18 mm from anterior end. Vulva at about 1.65–1.72 mm from anterior extremity. Eggs measure 0.07–0.072 mm × 0.05–0.053 mm. Tail filiform, short, 0.66–0.72 mm in length.

Distribution : India : Andhra Pradesh, Vijianagram.

Remarks : Measurements based on present collection; illustration : after Rao, 1970.

Subgenus 2 ***Paronai*** Rao, 1970

Key to the available species

1. Female tail about $^1/_3$rd of the body length ..... *J.(P.) indica* Kumari, 1957
2. Female tail about $^1/_4$th of the body length ..... *J.(P.) dollfusi* Rao, 1970

7. *Johnstonia (Paronai) indica* Kumari, 1967
(Fig. 7)

1967. *Johnstonia (Paronai) indica* Kumari; *Rivista Di Parassitologia*, **XXVIII(4)** : 279–282.

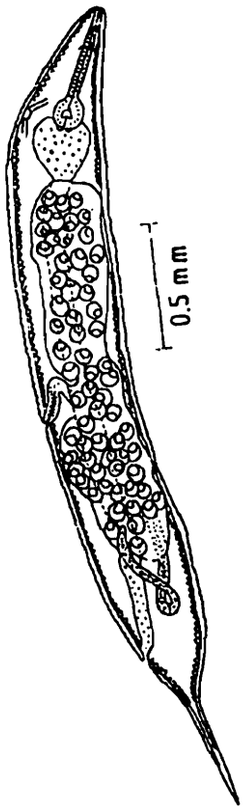


Fig. 6. *Johnstonia (Johnstonia) basiri*; Female entire.

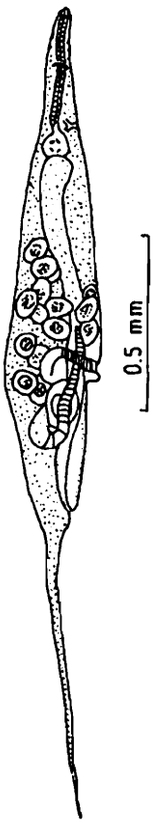


Fig. 7. *Johnstonia (Paronai) indica*; Female entire

Material : ♀17; Host : *Spirostreptus* sp.; Hab : Intestine; Loc : Khammam, Khammam, Andhra Pradesh; Coll : V. V. Gantait.

Diagnosis : Female : Body 2.24–2.28 mm in length 0.25–0.29 mm in width. Oesophagus 0.41–0.44 mm in length. Nerve ring 0.14–0.17 mm from anterior end. Excretory pore 0.32–0.35 mm from head end. Vulva 1.11–1.14 mm from anterior extremity. Anus 0.82 0.86 mm from tail tip. Egg measures 0.11 × 0.07 mm–0.13 × 0.09 mm.

Distribution : India : Andhra Pradesh, Khammam.

Remarks : Measurements on the basis of present collection; illustration : after Kumari, 1967.

8. ***Johnstonia (Paronai) dollfusi*** Rao, 1970
(Fig. 8)

1970. *Johnstonia (Paronai) dollfusi* Rao; *Ph. D.* Thesis : 1–125.

Material : ♀11; Host : *Spirobolus* sp. Hab : Rectum; Loc : Nalgonda, Nalgonda, Andhra Pradesh; Coll. V. V. Gantait.

Diagnosis : Female : Body length 3.26–3.79 mm and width 0.37–0.48 mm. Oesophagus 0.76–0.81 mm long; corpus 0.62–0.64 mm × 0.03–0.04 mm, isthmus 0.03–0.04 mm × 0.02–0.03 mm, valvular bulb 0.12–0.14 mm in diameter. Nerve ring 0.25–0.27 mm and excretory pore 0.58–0.62 mm from anterior end. Vulva 1.66–1.98 mm from head end. Anus about 1.06–1.13 mm from posterior end. Egg measures 0.11–0.12 mm × 0.07–0.08 mm.

Distribution : India : Andhra Pradesh, Nalgonda.

Remarks : Measurements provided on the basis of present collection; illustration : after Rao, 1970.

Subfamily IV THELASTOMATINAE Travassos, 1929

Key to Genus

1. Anterior portion of female intestine with diverticulum ..... *Leidynema* Schwenk, 1929
– Anterior portion of female intestine without diverticulum 2
2. Eggs laid in a chain, enclosed in a mucous tube ..... *Gryllophila* Basir, 1942
– Egg laid singly 3
3. Excretory pore posterior to base of oesophagus, tail of female about $^1/_3$rd or less of body length ..... *Schwenkiella* Basir, 1956
– Excretory pore anterior to base of oesophagus, tail of female more than $^1/_3$rd of body length ..... *Thelastoma* Leidy, 1849

Genus 5 ***Leidynema*** Schwenk (Travassos, 1929)

Subgenus 3 ***Leidynema*** Farooqui, 1967

9. ***Leidynema (Leidynema) corydium*** Rao, 1970
(Fig. 9)

1970. *Leidynema (Leidynema)* corydium Rao, *Ph. D.* Thesis : 1–125.

Material : ♀9; Host : *Corydia* sp. : Hab : Intestine; Loc : Nalgonda, Nalgonda, Andhra Pradesh; Coll : V. V. Gantait.

Diagnosis : Body 2.72–3.8 mm in length and 0.38–0.47 mm in width. Buccal cavity oblong shaped, 0.014–0.02 mm deep and 0.011–0.15 mm wide. Oesophagus 0.36–0.51 mm in length. Corpus measures 0.23–0.37 mm in length, width of narrow region 0.02–0.03 mm and broader region 0.05–0.06 mm. Isthmus 0.02 – 0.03 mm in length and 0.02–0.04 mm in width. Spherical valvular bulb 0.08–0.09 mm in diameter. Intestine much broad in the beginning with a flask-shaped diverticulum, measures 0.36–0.61 mm in length. Vulva 1.24–1.82 mm from head tip. Anus 0.52–0.63 mm from tail end. Eggs measure 0.08–0.11 mm × 0.03–0.04 mm.

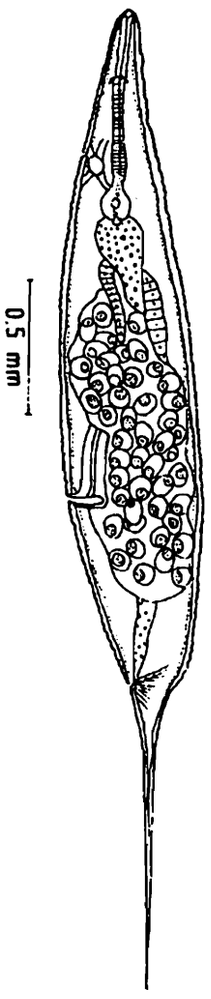


Fig. 8. *Johnstonia (Paronai) dollfusi*; Female entire

Fig. 9. *Leidynema (Leidynema) corydium*: Female entire

Distribution : India : Andhra Pradesh, Nalgonda.

Remarks : Measurements provided on the basis of present collection; illustration : after Rao, 1970.

Genus 6 *Gryllophila* Basir, 1942

Key to the available species

1. Egg shell with spine-like outgrowths ..... *G. skrjabini* (Sergiev, 1923) Basir, 1956
2. Egg shell without spine-like out growths ..... *G. basiri* Parveen & Jairajpuri, 1981

10. *Gryllophila skrjabini* (Sergiev, 1923) Basir, 1956
(Fig. 10)

1923. *Thelastomum skrjabini* Sergiev; *Trans. State Inst. Exp. Vet. Sci. Moscow*, **1** : 183–190.

1942. *Gryllophila gryllophila* Basir; *Rec. Indian Mus.*, **44** : 95–106.

1956. *Gryllophila skrjabini* Basir, *Zoologica Stuttgart*, **38** : 1–79.

Material : ♀13 : Host : *Gryllotalpa africana*; Hab : Rectum; Loc : Kakinada, East Godavari, Andhra Pradesh; Coll : V. V. Gantait.

Diagnosis : 2.24–3.16 mm long, 367–398 μm in maximum width. Buccal cavity 21–27 μm. Oesophagus 417–424 μm long; corpus 287–394 μm × 44–52 μm, isthmus 31–34 μm long by 34–37 μm wide, bulb 97–104 μm long by 110–114 μm wide. Nerve ring 241–246 μm from anterior end. Excretory pore much posterior to base of oesophagus. Anus 325–331 μm from posterior end, tail conically attenuated. Valva 2.24–2.28 mm from head tip. Ovaries double. Eggs ellipsoidal, 170–192 μm × 98–110 μm, with a thick shell bearing spine-like outgrowths.

Distribution : India : Andhra Pradesh, East Godavari, North India.

Elsewhere : U.S.S.R., Spain.

Remarks : Measurements on the basis of present collection; illustration : after Basir, 1965.

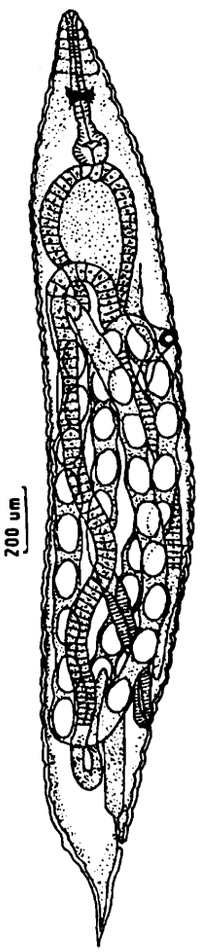


Fig. 10. *Gryllophila skrjabini*; Female entire

11. *Gryllophila basiri* Parveen & Jairajpuri, 1981
(Fig. 11)

1981. *Gryllophila basiri* Parveen & Jairajpuri; *Rivista Di Parassitologia,* **XLII(2)** : 261–266.

Material : ♀7 ♂1; Host : *Gryllotalpa africana*; Hab : Rectum : Loc : Gudur, Nellore, Andhra Pradesh; Coll : V. V. Gantait.

Diagnosis : *Male* : Body 0.88–0.91 mm long and 0.11–0.12 mm wide. Buccal cavity 20–22 μm × 7–8 μm. Nerve ring 0.11 mm from anterior end. Oesophagus 0.17–0.18 mm; corpus 0.105–0.107 mm × 0.017–0.019 mm. Anus 0.117–0.118 mm from tail tip. Spicule single, 51–52 μm long.

Female : Body 1.45–1.68 mm in length and 0.164–0.165 mm width. Buccal cavity 15.1–16.2 μm long and 12–13.4 μm wide. Oesophagus 0.36–0.38 mm long; corpus 0.24–0.26 mm X 0.028–0.029 mm, isthmus 0.041–0.044 mm X 0.024–0.027 mm, bulb 0.084–0.086 mm × 0.081–0.083 mm. Nerve ring 0.196–0.22 mm from anterior end. Excretory pore 0.65–0.71 mm from head tip. Vulva 1.06–1.24 mm from anterior extremity. Anus 0.177–0.18 mm from tail end. Eggs measure 51–64 μm × 28.4–42.8 μm.

Distribution : India : Andhra Pradesh, Nellore.

Remarks : Measurements provided on the basis of present collection; illustrations : after Parveen and Jairajpuri, 1981.

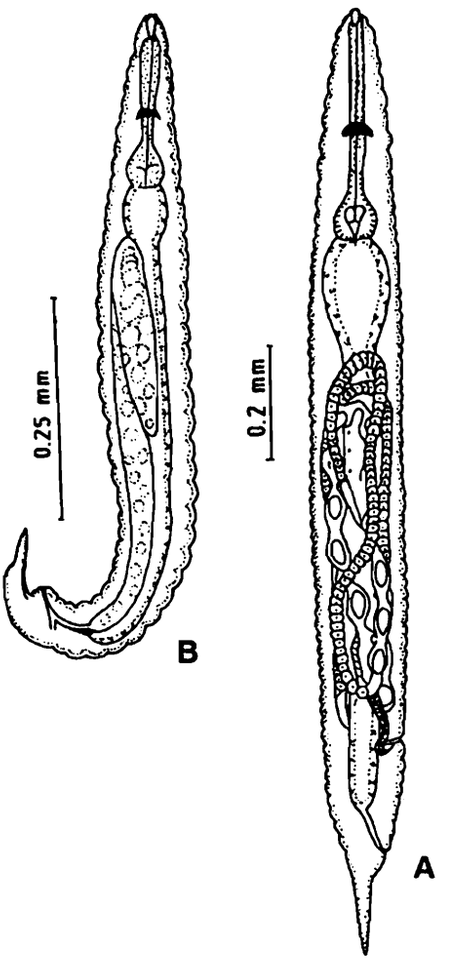


Fig. 11. *Gryllophila basiri*; A. Male entire, B. Female entire

Genus 7 *Schwenkiella* Basir, 1956

Key to the available Species

1. Female tail $^1/_3$rd of the body length 2
– Female tail $^1/_4$th of the body length 3
2. Vulva at the middle of the body ..... *S. periplaneticola* Parveen & Jairajpuri, 1981
– Valva at the body anterior to the middle of the body .... *S. atheri* Parveen & Jairajpuri, 1983

3. Female body more than 2.5 mm in length .....*S. basiri* Parveen & Jairajpuri, 1980

– Female body less than 2.4 mm in length.....*S. indica* Rao & Rao, 1966

12. ***Schwenkiella periplaneticola*** Parveen & Jairajpuri, 1981
(Fig. 12 : A–C)

1981. *Schwenkiella periplaneticola* Parveen & Jairajpuri; *Rivista Di* Parassitologia, **XLII**(2) : 261–266.

Material : ♀4; Host : *Periplaneta americana*; Hab : Rectum; Loc : Rajamundry, East Godavari, Andhra Pradesh; Coll : V. V. Gantait.

Diagnosis : Female : Body 2.5–3.2 mm long, 0.17–0.2 mm wide. Oesophagus 0.42–0.51 mm long; corpus 0.31–0.35 mm by 0.03–0.04 mm, isthmus 0.03–0.04 mm long and 0.04 mm wide, bulb 0.08–0.1 mm × 0.07–0.09 mm. Nerve ring 0.17–0.21 mm from anterior end of the body. Excretory pore 0.48 – 0.55 mm from head tip. vulva equatorial in position, 1.2–1.6 mm from anterior extremity. Ovaries divergent. Tail long, filiform, about $^1/_3$rd of the body length, 0.85–0.93 mm in length. Eggs spherical or oval, 51–84 μm × 49–58 μm.

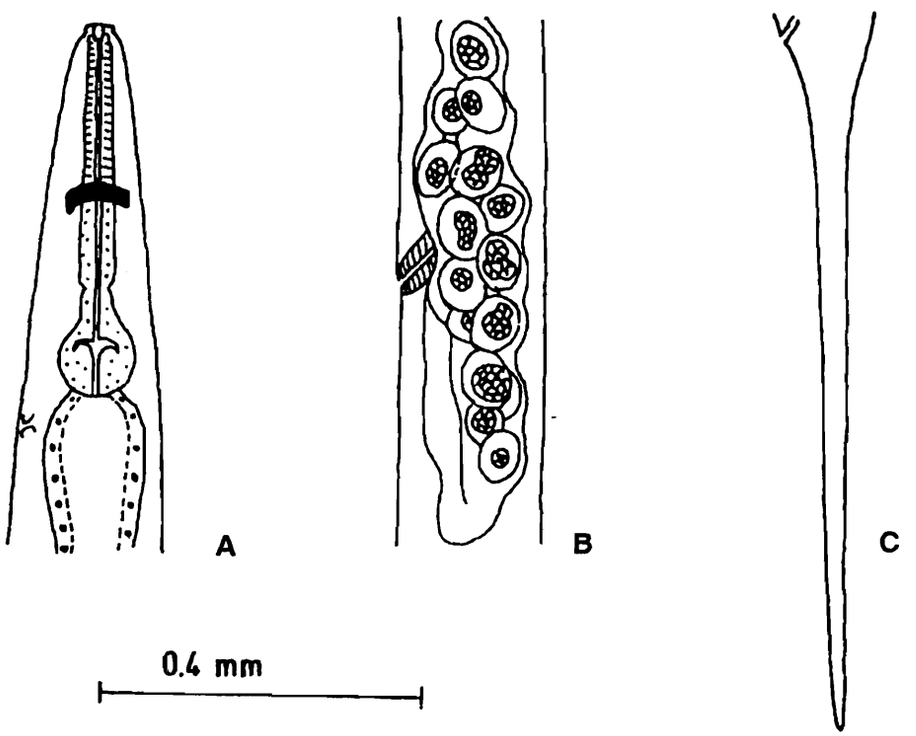


Fig. 12. *Schwenkiella periplaneticola*; A. Female anterior end, B. Vulval region, C. Female tail.

Distribution : India : Andhra Pradesh, East Godavari; Aligarh.

Remarks : Measurements provided on the basis of present collections; illustrations : after Parveen and Jairajpuri, 1981.

13. *Schwenkiella atheri* Parveen & Jairajppuri, 1983
(Fig. 13)

1983. *Schwenkiella atheri* Parveen & Jairajpuri; *Indian J. nematol.*, **13**(2) : 209–212.

Material : ♀17; Host : *Periplaneta americana* : Hab : Rectum; Loc : Bakherpet, Chittoor, Andhra Pradesh; Coll : V. V. Gantait.

Diagnosis : Body 2.7 mm–2.9 mm long and 0.21–0.23 mm wide. Buccal cavity 13–14 μm long and 13 μm wide. Oesophagus 0.42–0.43 mm long; corpus 0.29–0.31 mm in length and 0.03–0.04 mm in width, isthmus 0.03–0.04 mm × 0.03 mm, bulb 0.07–0.09 mm × 0.07–0.08 mm. Nerve ring 0.18–0.19 mm from anterior end. Excretory pore post–oesophageal, 0.45–0.48 mm from head tip. Vulva slightly anterior to middle of the body. Tail about $^1/_3$rd of the body length, 0.58–0.62 mm. Eggs oval, 83–85 μm × 56–63 μm.

Distribution : India : Andhra Pradesh, Chittoor, Aligarh.

Remarks : Measurements on the basis of present collection, illustrations : after Parveen and Jairajpuri, 1983.

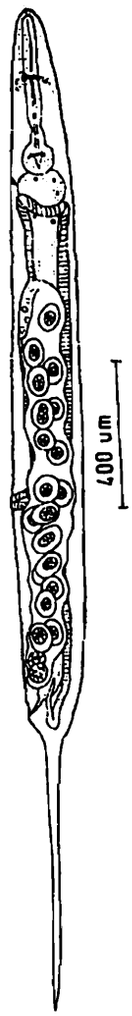


Fig. 13. *Schwenkiella atheri*; Female entire

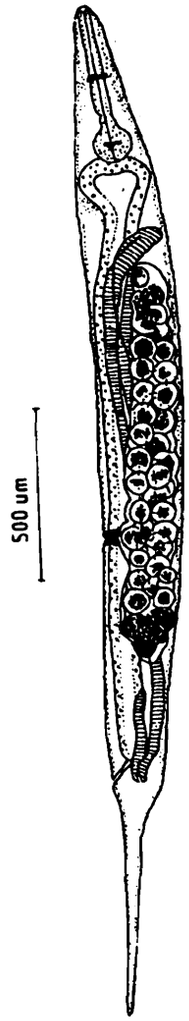


Fig. 14. *Schwenkiella basiri*; Female entire.

14. *Schwenkiella basiri* Parveen & Jairajpuri, 1980
(Fig. 14)

1980. *Schwenkiella basiri* Parveen & Jairajpuri; *Indian J. of Parasitol.* 4(1) : 41–43.

Material : ♀12; Host : *Periplaneta americana* : Hab : Rectum; Loc : Guntur, Guntur, Andhra Pradesh; Coll : V. V. Gantait.

Diagnosis : Female : Body 2.56–3.24 mm long, 0.21–0.24 mm wide. Oesophagus 0.44–0.49 mm long; corpus 0.32–0.37 mm long, 0.03–0.06 mm wide, isthmus 0.03–0.04 mm long and 0.033–0.036 mm wide, bulb 0.11–0.13 mm × 0.11–0.12 mm. Nerve ring 0.23–0.26 mm from head tip. Excretory pore 0.54–0.58 mm from anterior end. Vulva 1.3–1.7 from head end. Tail about $^1/_4$th of the body length, 0.68–0.72 mm in length. Eggs 0.07–0.09 mm × 0.05–0.06 mm.

Distribution : India : Andhra Pradesh, Guntur, North India.

Remarks : Measurements on the basis of present collection, illustrations : after Parveen and Jairajpuri, 1980.

15. *Schwenkiella indica* Rao & Rao, 1966
(Fig. 15 : A-B)

1966. *Schwenkiella indica* Rao & Rao; *Indian J. Helminth*, **XVIII** : 92–96.

Material : Host : *Corydia* sp.; Hab : Intestine : Loc : Osmania University Campus, Hyderabad, Rangareddy, Andhra Pradesh; Coll : Rao and Rao.

Diagnosis : *Female* : 2.33 mm in length and 0.235 mm in maximum width. Buccal cavity 0.009 mm wide and 0.012 mm deep. Oesophagus 0.406 mm in length; corpus 0.29 mm in length with uniform thickness 0.023 mm; isthmus 0.027 mm × 0.03 mm, bulb 0.086 mm in diameter. Nerve ring 0.195 mm from anterior end. Anus 0.588 mm from posterior end, tail about $^1/_4$th of the total length. Vulva 1.19 mm from head tip. Eggs measure 0.081 mm by 0.065 mm.

Male : Measures 1.11 mm long and 0.12 mm wide. Buccal cavity 0.009 mm wide and 0.006 mm deep. Oesophagus 0.198 mm in length; corpus 0.136 mm long 0.025 mm wide, isthmus 0.015 mm in length and 0.012 mm in width, bulb 0.046 mm by 0.035 mm. Testis single. Spicule absent. Caudal papillae three pairs.

Distribution : India : Andhra Pradesh, Rangareddy.

Remarks : Measurements and illustrations provided after Rao and Rao, 1966.

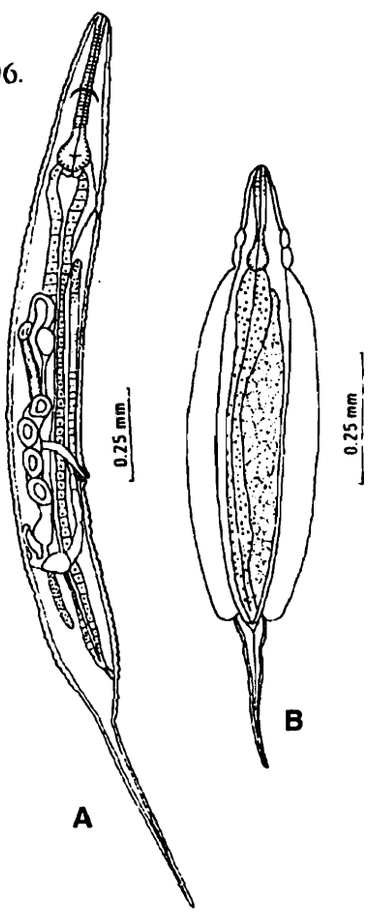


Fig. 15. *Schwenkiella indica*; A. Female entire, B. Male entire.

Genus 8 ***Thelastoma*** Leidy, 1849

Key to the available Species

1. Female body more than 3.5 mm in length ..... *T.guptai* Duggal & Aulakh, 1989
– Female body less than 3 mm in length 2
2. Female tail less than 0.7 mm in length ..... *T. pterygoton* Poinar Jr. 1973
– Female tail more than 0.8 mm in length 3
3. Spicule present ..... *T. kherai* Duggal & Aulakh, 1989
– Speicule absent ..... *T. atheri* Rizvi & Jairajpuri, 1995

16. ***Thelastoma guptai*** Duggal & Aulakh, 1989
(Fig. 16)

1989. *Thelastoma guptai* Duggal & Aulakh; *Research Bulletin Science) of the Punjab* University, **40** : 95–98.

Material : ♀11; Host : *Periplaneta* americana; Hab : Rectum; Loc : Medak, Medak, Andhra Pradesh; Coll: V. V. Gantait.

Diagnosis : Female: Body 3.52–3.67 mm long and 288–327 μm wide. Oesophagus 542–567 μm long; corpus 412–427 μm long, isthmus 25 × 36 μm–28 × 37 μm and bulb 102–105 μm –108 × 112 μm. Excretory pore 537–546 μm from anterior end. Vulva 1.52–1.78 mm from head tip. Tail 862–902 μm long. Eggs measure 78 × 47 μm–82 × 56 μm.

Distribution : India : Andhra Pradesh, Medak; Delhi.

Remarks : Measurement provided on the basis of present collection, illustration: after Duggal and Aulakh, 1989.

17. ***Thelastoma pterygoton*** Poinar Jr., 1973
(Fig. 17)

1973. *Thelastoma pterygoton* Poinar Jr.; *Proceedings of the Helminthelogical Society of Washington,* **40**(1) : 37–42.

Material : ♀4; Host : Scarabaeid beetle (*Hydrophilus* sp); Hab : Intestine; Loc : Cuddaph, Cuddaph, Andhra Pradesh; Coll. V. V. Gantait.

Diagnosis : Female : Body 1.42–2.90 mm in length and 0.12–0.26 mm in width. Buccal cavity 0.011–0.012 mm long and 0.009–0.010 mm wide. Nerve ring 0.18–0.20 mm from anterior extremity. Excretory pore 0.37–0.52 mm from head tip. Vulva (51–54) from anterior end. Tail 0.31–0.59 mm in length.

Distribution : India : Andhra Pradesh, Cuddaph.

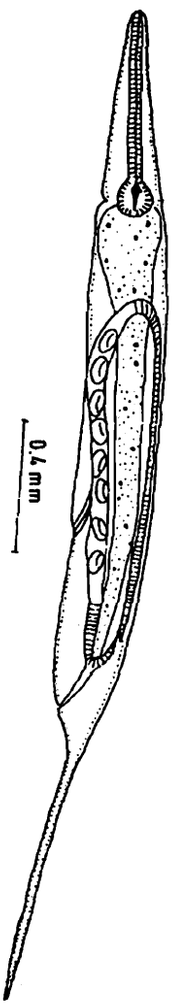


Fig. 16. *Thelastoma guptai*; Female entire

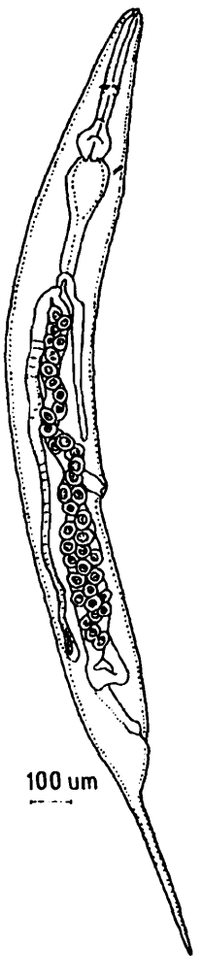


Fig. 17. *Thelastoma pterygoton;* Female entire.

Elsewhere : Abidjan, Ivory Coast, West Africa.

Remarks : Measurements on the basis of present collection, illustration : after Poinar Jr., 1973. This has been recorded first time from India.

18. ***Thelastoma kherai*** Duggal & Aulakh, 1989
(Fig. 18 : A–B)

1989. *Thelastoma kherai* Duggal & Aulakh; *Research Bulletin (Science) of the Punjab* University, **40** : 95–98.

Material : ♀7 ♂1 ; Host : *Periplaneta* americana; Hab: Rectum; Loc : Nandyal, Karnool, Andhra Pradesh; Coll : V. V. Gantait.

Diagnosis : Female : Body 2.81–2.93 mm in length and 190–192 μm in width. Oesophagus 517–540 μm long; corpus 395–422 μm × 34–36 μm, isthmus 27–29 μm × 31–32 μm and bulb 93–95 μm × 93–94 μm. Excretory pore 517–519 μm from anterior end. Vulva 1.40–1.46 mm from head end. Tail 837–856 μm long. Eggs 75 × 52 μm–80 × 53 μm.

Male : 1.06 mm long and 83 μm wide. Oesophagus 231 μm long; Corpus 182 x 24 μm, bulb 47 × 34 μm. Spicule 62 μm. Tail 321 μm in length.

Distribution : India : Andhra Pradesh, Karnool; Delhi.

Remarks : Measurements on the basis of present collection, illustrations : after Duggal and Aulakh, 1989.

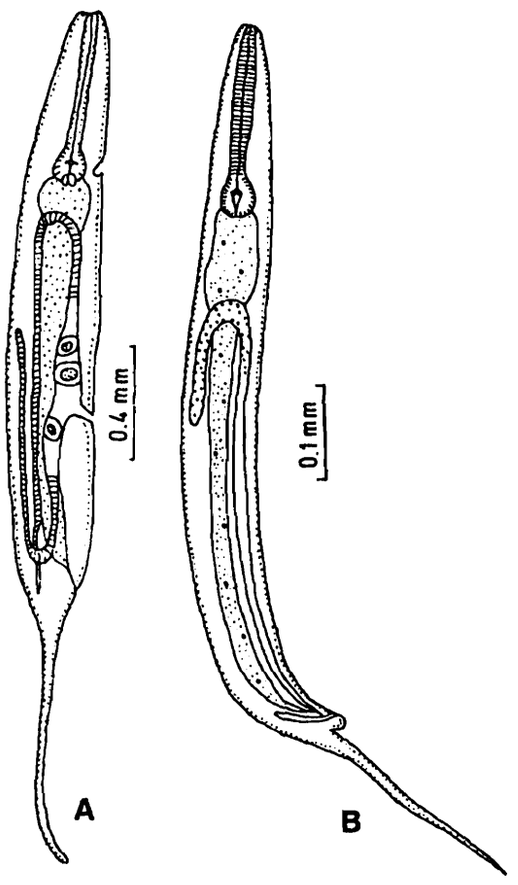


Fig. 18. *Thelastoma kherai*; A. Female entire, B. Male entire

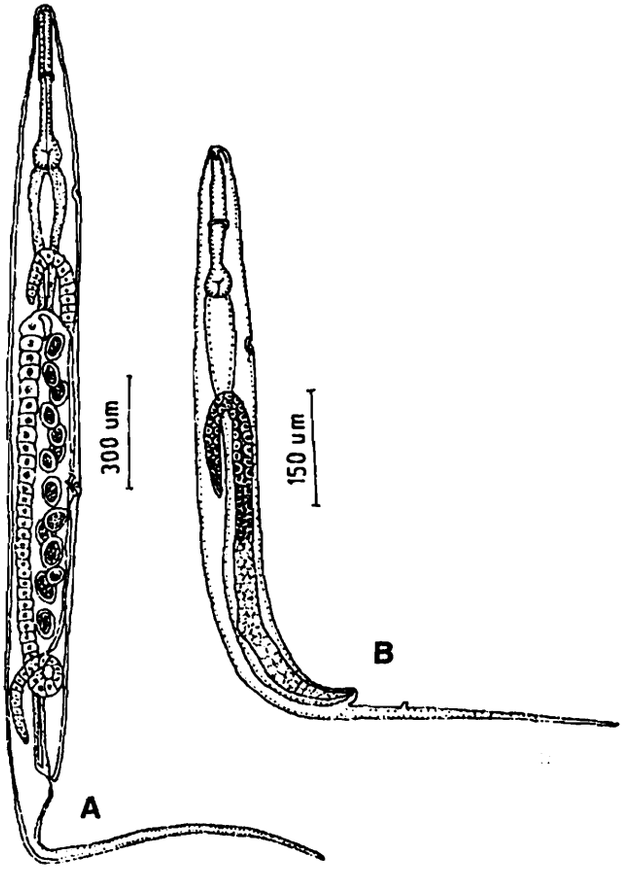


Fig. 19. *Thelastoma atheri*; A. Female entire, B. Male entire

19. ***Thelastoma atheri*** (Parveen & Jairajpuri, 1983) Rizvi & Jairajpuri, 1995 (Fig. 19 : A–B)

1983. *Schwenkiella atheri* Parveen & Jairajpuri; *Indian J. Nematol.* **13** : 209–212.

1995. *Thelastoma atheri* Rizvi & Jairajpuri; *J. Parasit. Appl. Anim. Biol.*, **4** : 9–13.

Material : ♀8 ♂2; Host : *Periplaneta* americana; Hab: Rectum; Loc : Tirupati-Tirumala, Chittoor, Andhra Pradesh; Coll : V. V. Gantait.

Diagnosis : *Female* : Body 2,52–3.02 mm in length and 0.16–0.20 mm in width. Buccal cavity 13–14 μm in diameter. Oesophagus 0. 41–0.42 mm long. Nerve ring 0.17–0.19 mm

from anterior end. Excretory pore 0.47–0.51 mm from head tip. Vulva 1.19–1.32 mm from anterior extremity. Tail 0.72–0.91 mm in length. Eggs measure 73–75 μm × 51–54 μm.

Male : Body 1.20–1.24 mm long and 0.081–0.083 mm wide. Buccal cavity 12–14 μm long, 3.8 μm wide. Oesophagus 0.181–0.186 mm long. Nerve ring and excretory pore 0.092–0.098 mm and 0.27–0.29 mm from anterior extremity. Tail 0.35–0.38 mm long. Testis single, spicule absent.

Distribution : India : Andhra Pradesh, Chittoor; Aligarh.

Material : Measurements on the basis of present collection, illustrations: after Rizvi & Jairajpuri, 1995.

Superfamily II RHIGONEMATOIDEA

Key to the families

1. Specules two, equal in size; gubernaculum present ..... CARNOYIDAE Filipjev, 1934
– Spicules one or two, gubernaculum rudimentary or absent ..... BLATTOPHILIDAE

Family II CARNOYIDAE Filipjev, 1934

Sub-family V CARNOYINAE Filipjev, 1934

Genus 9 ***Rondonema*** Artigas, 1926

20. ***Rondonema spirostreptum*** Rao & Kumari, 1967
(Fig. 20 : A–B)

1967. *Rondonema spirostreptum* Rao & Kumari; *Rivista Di Parassitologia*, **XXVIII**(1) : 11–16.

Material : ♀& ♂15–20 : Host : *Spirostreptus* sp.; Hab : Intestine; Loc : Hyderabad, Andhra Pradesh; Coll : Rao and Kumari.

Diagnosis : *Female* : Body 2.609–2.955 mm in length and 0.258–0.344 mm in width. Buccal cavity 0.062–0.068 mm. Corpus 0.129–0.146 mm × 0.026–0.041 mm, isthmus 0.068 – 0.077 mm × 0.022–0.024 mm and bulb 0.086 mm in diameter. Anus 0.817–0.910 mm from tail tip. Vulva 1.255–1.496 mm from head end. Eggs large in size, measure 0.142–0.160 mm × 0.077–0.090 mm.

Male : 1.885–2.064 mm in length and 0.132–0.172 mm in width. Vestibule 0.030–0.032 mm in length and 0.026–0.030 mm in width. Corpus 0.319–0.430 mm × 0.038–0.042 mm, isthmus 0.059–0.072 mm × 0.020–0.026 mm and bulb 0.069–0.074 mm × 0.070 mm. Spicule sword-like, two in number, measure 0.140–0.152 mm. Gubernaculum 0.066–0.074 mm. Tail 0.187–0.223 mm.

Distribution : India : Andhra Pradesh, Rangareddy.

Remarks : Measurements and illustration made after Rao & Kumari, 1967.

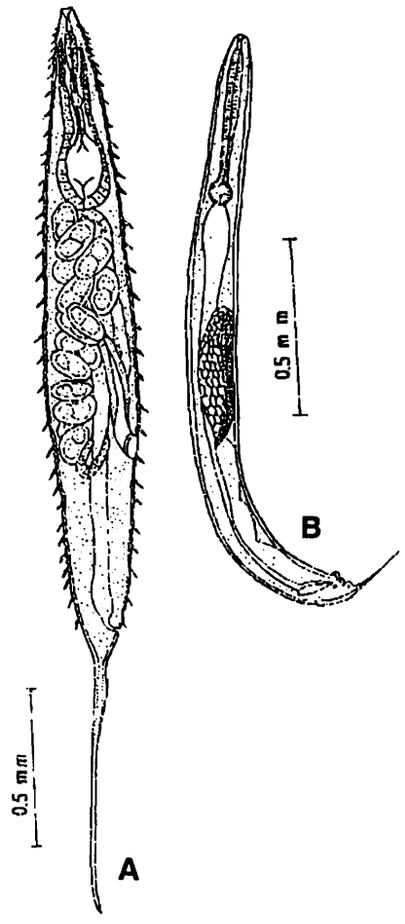


Fig. 20. *Rondonema spirostreptum*; A. Female entire, B. Male entire

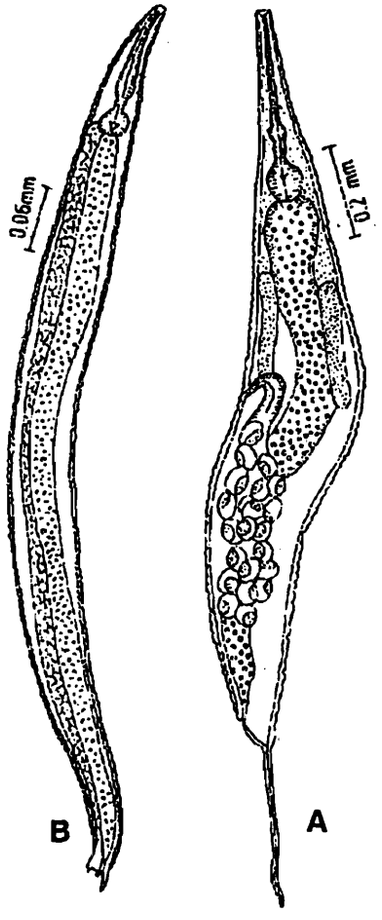


Fig. 21. *Blattophila indica*; A. Female entire, B. Male entire.

Family III BLATTOPHILIDAE

Genus 10 ***Blattophila*** Cobb, 1920

21. ***Blattophila indica*** Rao & Rao, 1965
(Fig. 21 : A-B)

1965. *Blattophila indica* Rao & Rao; *Secretaria Da Agricultura – Sao Paulo,* **18** : 61–63.

Material : ♀3 ♂1; Host : *Corydia* sp.; Hab : Rectum; Loc : Hyderabad, Rangareddy, Andhra Pradesh; Coll : Rao and Rao.

Diagnosis : Female : Body 1.94–1.97 mm in length and 0.23–0.25 mm in width. Nerve ring 0.2–0.208 mm from anterior extremity. Buccal cavity 10 μm deep by 8 μm wide. Oesophagus 0.38–0.40 mm; Corpus 0.24–0.25 mm long by 0.015 mm wide, posterior enlargement 0.039 mm × 0.033 mm. Isthmus 0.039 mm long, bulb 70 μm in diameter. Tail 0.352–0.39 mm long. Vulva 0.87 mm, about 46% from anterior extremity. Egg ellipsoidal, measures 65 × 42 μm.

Male : Measures 1.016 mm long, 0.092 mm wide. Oesophagus 0.18 from anterior end.

Corpus 0.122 mm × 0.014 mm, isthmus 0.021 X 0.012 mm, bulb 0.038 mm in diameter. Tail terminates abruptly with a spike, 20 μm long. Spicule single, 25 μm long.

Distribution : India : Andhra Pradesh, Rangareddy, Hyderabad.

Remarks : Measurements and illustrations made after Rao and Rao, 1965.

Order II RHABDITIDA

Family IV CEPHALOBIDAE Artigas, 1929

Genus 11 ***Cephalobium*** Cobb, 1920

Key to sub-genus (n. sub. gen.)

1. Presence of buccal teeth in both sexes, preanal papilla absent in male .... *Denticum* Sub-gen. n.

– Absence of buccal teeth in both sexes, presence of a pair of preanal papillae in male ..... *Adenticum* sub-gen. n.

Sub-genus 3 ***Denticum*** sub-gen. n.

Key to the available Species

1. Spicules long with short gubernaculum (about 0.114 mm and 0.020 mm respectively ..... *C. (D.)* microvata Rao & Rao, 1965

– Spicules short; with long gubernaculum (about 0.103 mm and 0.025–0.031 mm respectively) ..... *C. (D.) gryllodes* Rao, 1980

22. ***Cephalobium (Denticum) microvata*** Rao & Rao, 1965
(Fig. 22 : A – B)

1965. *Cephalobium (Denticμm) microvata* Rao & Rao; *Annals and Magazine of Natural History*, **VIII** : 360–364.

Material : Host : *Gryllus* sp.; Hab : Rectum; Loc : Hyderabad, Rangadeddy, Andhra Pradesh : Coll : P. N. Rao and V. J. Rao.

Diagnosis : *Female* : Body 4.29–4.45 mm in length and 0.164–0.187 mm in width. Oesophagus 0.397–0.400 mm in length. Corpus 0.252–0.260 mm long by 0.027 mm, isthmus 0.034–0.043 mm in diameter and bulb 0.097–0.105 mm. Anus 0.363–0.375 mm from posterior extremity. Vulva 2.028–2.200 mm from anterior end. Eggs measure 0.050–0.055 by 0.030–0.035 mm.

Male : 2.80–2.98 mm in length and 0.117–0.122 mm in width. Oesophagus 0.298 mm in length; corpus 0.17 mm × 0.02 mm, bulb 0.32 mm in diameter and the post bulbal portion 0.093 mm. Tail 0.298 mm in length. Two equal curved spicules, measure 0.114 mm long, gubernaculum 0.020 mm long.

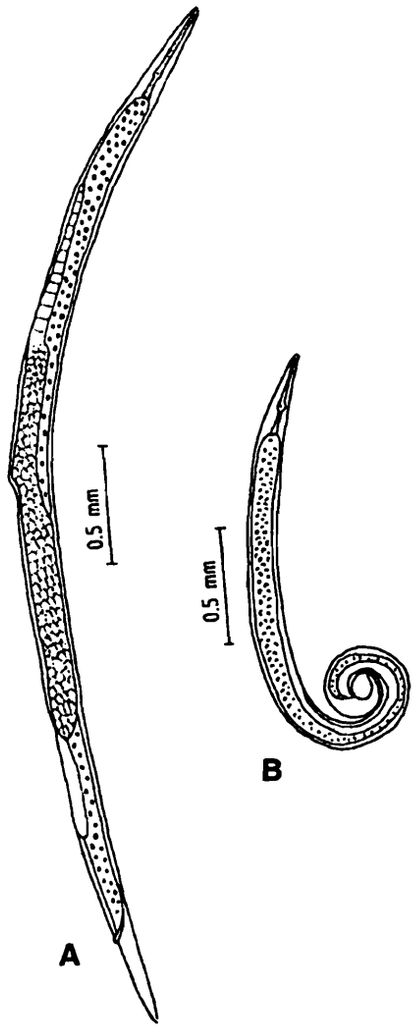


Fig. 22. *Cephalobium (Denticum) microvata*; A. Female entire, B. Male entire

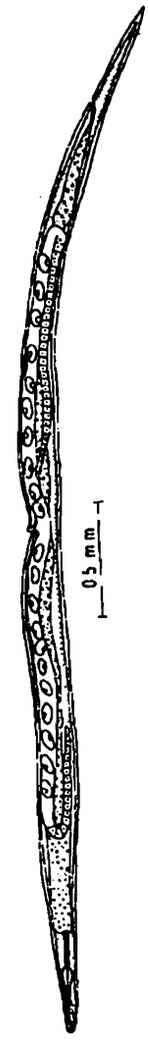


Fig. 23. *Cephalobium (Denticum) gryllodes*; A. Female entire

Distribution : India : Andhra Pradesh, Rangareddy.

Remarks : Measurements and illustrations made after Rao and Rao, 1965.

23. ***Cephalobium (Denticum) gryllodes*** Rao, 1980
(Fig. 23)

1980. *Cephalobium (Denticum) gryllodes* Rao; *Proc. Indian Acad. Parassitol.* **1**(1) : 66–68.

Material : Host: *Gryllodes* sp.; Hab : Intestine; Loc : Nizamabad, Nizamabad, Andhra Pradesh; Coll : V. J. Rao.

Diagnosis : *Female* : 2.43–5.25 mm in length and 0.131–0.164 mm in width. Oesophagus 0.317–0.466 mm in length. Corpus measure 0.216–0.324 mm by 0.029–0.031 mm, median bulb 0.037–0.052mm by 0.024–0.045 mm and cylindrical post bulbal portion 0.074–0.111 mm by 0.016–0.020 mm. Anus 0.305–0.570 mm from tail tip. Ovaries two. Vulva 1.15–2.248 mm from anterior end. Eggs oval in shape, measure 0.059–0.067 mm by 0.043–0.048 mm.

Male : Body 1.5–2.69 mm in length and 0.069–0.117 mm in width. Oesophagus 0.235–0.317 mm long. Corpus 0.137–0.182 mm by 0.012 mm, median bulb 0.03–0.034 mm by 0.025–0.03 mm and post bulbal portion 0.068–0.1 mm by 0.01 mm. Tail 0.208–0.224 mm in length. Spicules two, equal in shape, measure 0.091–0.103 mm in length by 0.01 mm in width at broader end. Gubernaculum 0.022–0.031 mm by 0.007 mm. Eight pairs postanal papillae, no preanal papilla.

Distribution : India : Andhra Pradesh, Nizamabad.

Remarks : Measurements and illustrations made after Rao, 1980.

Subgenus 4. ***Adenticum*** sub-gen. n.

Key to the available Species

1. On fixation, male tail curves into one circle. ..... *C. (A.) aodus* Rao, 1982
– On fixation, male tail curves into two and half circles ..... *C. (A.) caudatum* sp.n.

24. ***Cephalobium (Adenticum) aodus*** Rao, 1982
(Fig. 24 : A–B)

1982. *Cephalobium (Adenticum) aodus* Rao; *India J. Nematol*, **12**(1) 185–188.

Material : ♀20 ♂8; Host : *Gryllus* sp.; Hab : Intestine; Loc : Medak, Medak, Andhra Pradesh; Coll: V. J. Rao.

Diagnosis : All the measurements are given in millimetres.

Female : Length 3.169–3.69; width 0.133–0.146. Buccal cavity 0.025–0.031 × 0.007–0.008. Oesophagus 0.362–0.383; corpus 0.235–0.248 × 0.022–0.027; bulb 0.042–0.046 × 0.039–0.046, post bulbal portion 0.085 – 0.039. Vulva 1.75–1.89 from anterior end. Anus 0.325–0.345 from tail tip. Eggs measure 0.054–0.070 × 0.036–0.050.

Male : Length 2.86–3.2; width 0.117–0.125. Buccal cavity 0.025–0.031 × 0.012–0.018. Oesophagus 0.313–0.364; corpus 0.199–0.218 × 0.015, bulb 0.034–0.047 × 0.034–0.038, post bulbal portion 0.081–0.099. Anus 0.294–0.314 from the posterior end. Spicule 0.124–0.133; gubernaculum 0.025–0.05 × 0.008–0.01.

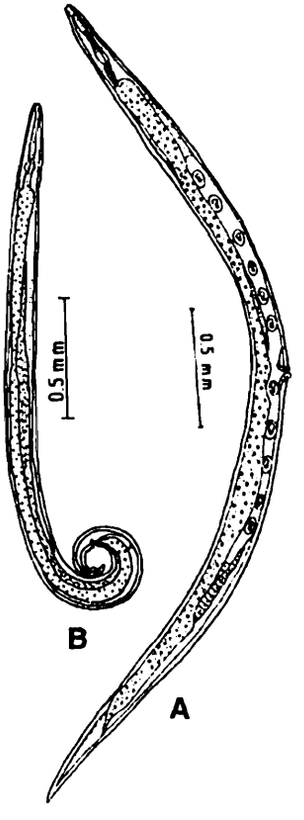


Fig. 24. *Cephalobium (Adenticum) aodus*: A. Female entire, B. Make entire

Distribution : India : Andhra Pradesh, Medak.

Remarks : Measurements and illustrations made after Rao, 1982.

25. ***Cephalobium (Adenticum) caudatum*** sp.n.
(Fig. 25 : A–D)

Material : ♀13 ♂9; Host: *Gryllotalpa africana;* Hab: Rectum; Loc : Garden of Dakili Forest Rest House, Dakili, Nellore, Andhra Pradesh; Coll : V. V. Gantait; Date of Collection : 2nd December 1999.

Measurements : All are given in millimetre.

Male Holotype : Body length = 2.85; Width = 0.096; Oesophageal length = 0.54; Tail length = 0.20; Length of spicule = 0.144.

Male Paratype : Length = 2.64–2.97; width = 0.072–0.106; Oesophageal length = 0.512–0.568; Tail = 0.192–0.227; Spicule length = 0.133–0.152.

Female Allotype : Length = 2.88–3.23; Width = 0.08–0.112; Oesophageal length = 0.560–0.584; Tail = 0.34–0.40; Eggs = 0.064 × 0.032–0.072 × 0.032.

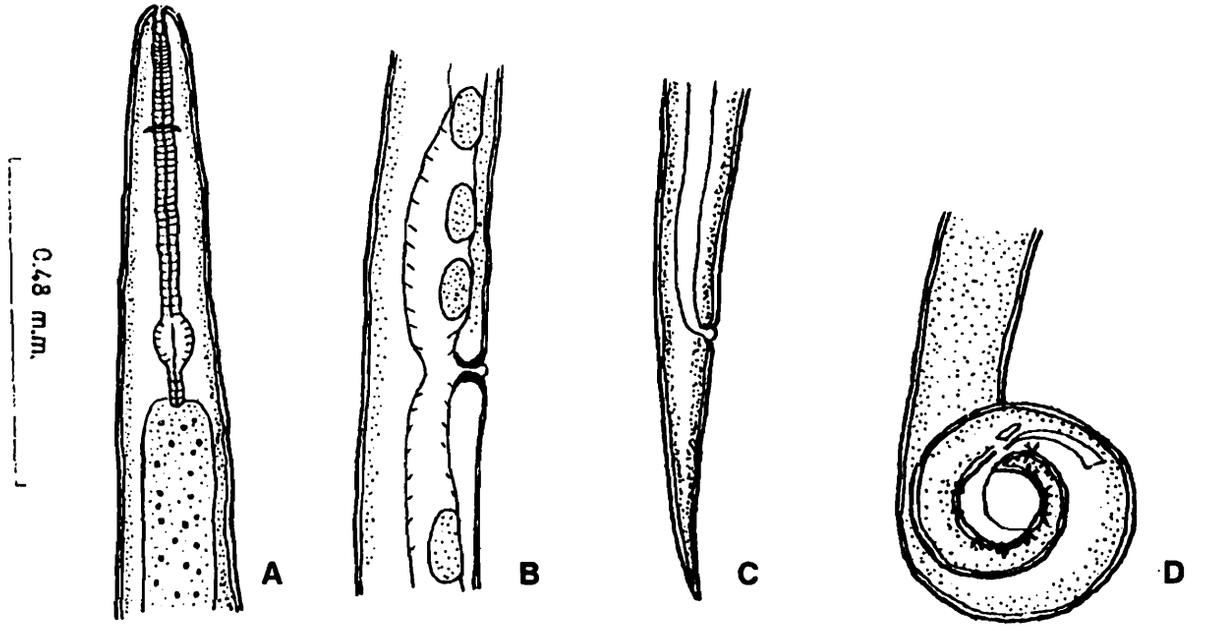


Fig. 25. *Cephalobium (Adenticum) caudatum* sp. n.; A. Anterior end of female, B. Vulval region, C. Posterior end of female, D. Posterior end of male.

Description : *Male* : Cylindrical body, gradually tapering towards both the extremities. Cuticle smooth, without striations. Mouth surrounded by six papillae and opens into the buccal cavity which is divided into two parts, measuring together 0.032 mm in depth (0.03 –0.04 mm). The buccal cavity has no teeth. Oesophagus long, divided into three parts. The anterior corpus measures 0.4 mm in length and 0.02 mm in width (0.04 × 0.02 mm–0.41 ×

0.03 mm), median bulb 0.05 × 0.05 mm (0.04 × 0.02 mm–0.06–0.03 mm) and post bulbal portion is 0.09 × 0.03 mm (0.08 × 0.02 mm–0.11 × 0.03 mm). Nerve ring is at about 0.21 mm (0.18–0.22 mm) from the anterior end. Anus is situated at the distance of about 0.2 mm from the posterior extremity. On fixation, tail forms two and half circles. Spicules two in number and equal in size. Gubernaculum oblong–shaped, 0.03 mm in length. Caudal papillae nine pairs, one preanal and eight post anal.

Female : Body smooth, cylindrical, tapering twoards both the ends. Mouth surrounded by six labio-papillae. Buccal teeth absent. Buccal cavity divided into two parts, measuring together 0.03–0.04 mm in depth. Oesophagus divided into anterior cylindrical corpus (0.41 × 0.02 mm –0.43 × 0.02 mm), the median non-valvular bulb (0.05 × 0.03 mm–0.06 × 0.04 mm) and post cylindrical bulbal portion (0.08 × 0.02 mm–0.09 × 0.02 mm). Nerve ring at a distance of about 0.20–0.22 mm from the anterior end. Anus 0.34–0.40 mm from the tail tip. Ovary didelphic and reflexed. Vulva situated at about 1.44–1.61 mm from the posterior extremity. Eggs few in number, oval in shape and spitted.

Discussion : The proposed new form differs conspicuously from all the known species of the genus *Cephalobium* except only *C. aodus* Rao, 1982; in not having the prominent tooth at the base of the buccal cavity in both the sexes. Further, the collected male nemas show resemblances with *C. aodus* in having a pair preanal papillae which is absent in other known species of the genus; they possess only eight pairs of post anal papillae. On closer study, it reveals that the new forms differ significantly from the aforesaid one. On fixation, the mail tail of the present nemas always curves into two and half circles, whereas in *C. aodus* the tail forms only one circle.

Etymology : The species is named as such, depending upon the tail-shape and number of caudal papillae in case of male.

Order III TYLENCHIDA

Key to families

1. Median pharyngeal bulb absent or if present, not containing outlet of dorsal pharyngeal gland ..... ALANTONEMATIDAE Poinar Jr. 1975
2. Median pharyngeal bulb containing outlet of dorsal pharyngeal gland .... ENTAPHELENCHIDAE Poinar. Jr. 1975

Family V ALANTONEMATIDAE Poinar Jr., 1975

Key to Genus

1. Free-living males apparently lacking stylet. .... *Howardula* Cobb, 1972 (Goodey, 1930)
2. Free-living males possessing stylet ..... *Heterotylenchus* Bovein, 1937

Genus 12 ***Howardula*** (Goodey, 1930) Cobb, 1921

Key to Species

1. Oviparous in nature ..... *Howardula marginatis* Reddy & Rao, 1981
– Ovoviviparous in nature ..... *Howardula mutilatus* Devi et al.,1991

26. ***Howardula marginatis*** Reddy & Rao, 1981
(Fig. 26 : A–C)

1981. *Howardula marginatis* Reddy & Rao. *Rivista di Parasitologia*, **XLII**(1) : 127–134.

Materials : Host : *Copromyza marginatis* (Diptera : Sphaeroceridae); Location : Hemocoel; Locality : Dairies in the outskirts of Hyderabad city and in the surrounding villages of Hyderabad district (Rangareddy district at present) on dung heaps; Collector : Readdy & Rao.

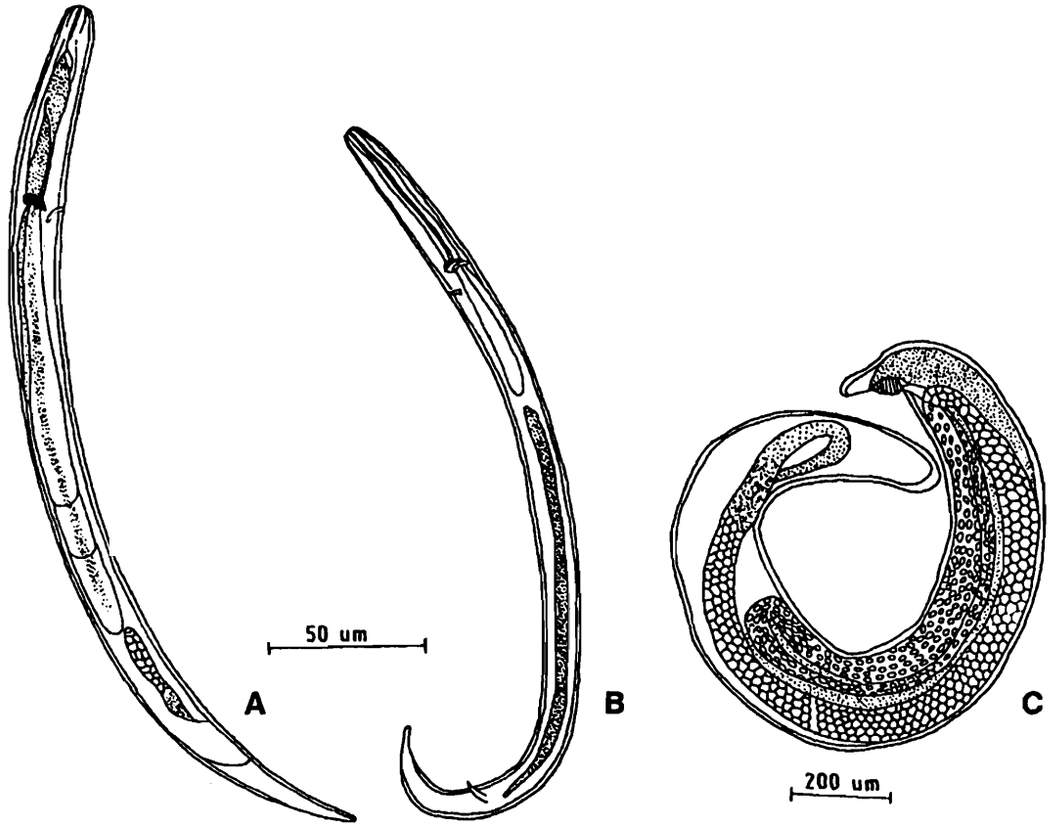


Fig. 26. *Howardula marginatis*; A. Infective stage female, B. Free living male, C. Adult parasitic female.

Diagnosis : Infective stage free living female : Body slightly curved and finely striated. Anterior end broadly rounded and tapers posteriorly from the level of ovary. Tail tapers with a rounded tip. Stylet well developed, robust without basal knobs. Three oesophageal glands are well developed, extended beyond the middle of the body, occupy more than three fourths of the body length. The nuclei are not visible. Dorsal oesophageal gland duct with swollen

ampulla filled with fine granular secretions open within the oesophageal lumen slightly behind the base of stylet. Ovary is behind the ventral oesophageal glands with few cells, a narrow oviduct, a slightly swollen uterus and small receptaculum seminis.

Free living males : The posterior extremity is ventrally curved. The body is finely striated. The head is rounded and fused with the body. Mouth leads into a wide buccal cavity, without a stylet. The oesophageal glands are not differentiated into three. Excretory pore opening is behind the nerve ring. Testis prodelphic, occupies about half of the body length. Spicules paired, equal, sickle shaped.

Adult parasitic female : Body white in colour, spirally coiled and finely striated. Hypodermis thick with prominent nuclei. Lips and stoma are not visible. Stylet is retained but oesophagus and its glands and excretory pore are degenerated. Ovary single having two flextures with numerous hexagonal oogonia arranged on a central rachis, which fills major part of the body. Uterus with two flextures, filled with many eggs. Vagina has thick walls surrounded by Perivaginal cells; - spindle shaped gland cells. Vulva without any external vulval lips. Oviparous in nature. Anal opening situated posteriorly, tail looks like a small protuberance at the posterior extremity.

Measurements : Infective stage female ((n = 30): L = 302 μm (278–321 μm); W = 16 μm (14–17 μm); a = 18.8 (17–20.8); b = 4.6 (4.3–5.3); b_1 = 1.7(1.4–1.8); c = 7.9 (6.5–8.3); G_1 = 12.5% (12–17.9%); V = 81.1% (78.6–81.8%); stylet – 11 μm (10–13 μm); Excretory pore = 64 μm (62–66 μm); Hemizonid = 60 μm (58–64 μm); TL =36 μm (35–44 μm); striae = 0.8 μm (0.8–1 μm).

Free living males (n = 30): L = 285 μm (230–300 μm); W = 12 μm (12–14 μm); a = 23.2 (18.2–24.5); b = 4.5 (4.4–5.2); b_1 = 2.7 (2–2.7); c = 7.2 (7–9.3); excretory pore = 60 μm (58–65 μm); Hemizonid = 56 μm (53–57 μm); spicule = 8.8 μm (8.5–10.6 μm); TL = 31.8 μm (24.8–32 μm); striae = 0.5 μm (0.4–0.5 μm).

Adult parasitic female (n = 30) : L = 2.460 mm (1.42–2.29 mm); W = 210 μm (164–215 μm); a = 11.7 (9.2–12); c = 24.6 (23–28); stylet = 9 μm (8–11 μm); V = 94.3% (92–96.8%); Perivaginal gland cells, L × W = 69 × 37 μm (58 × 70 μm – 36 × 44 μm); Egg L × W = 35–40 μm × 20–27 μm (35–42 μm × 20–27 μm); TL = 69.1 μm (60–72 μm); striae = 1.7 (1.6–1.8 μm).

Distribution : India : Andhra Pradesh, Rangareddy.

Remarks : Measurements and illustrations made after Reddy and Rao, 1981.

27. ***Howardula mutilatus*** Devi *et al.* 1991
(Fig. 27 : A–C)

1991. *Howardula mutilatus* : Devi, Rao & Reddy. *Current Nematology*, **2**(1) : 23–26.

Materials : Host : *Carpophilous mutilatus* (Coleoptera : Nitidulidae); Location : Hemocoel;

Locality : Maize, Research Station, Amberpet, Hyderabad, (Rangareddy at present), Andhra Pradesh, India; Collector : Devi *et al.*

Diagnosis : Forth stage infective inseminated free living female : Stylet long, robust, tylenchoid with well developed basal oesophagus chitinised lumen. Oesophageal glands filled with gland secretions. Ovary six celled. Tail round with a mucronated tip.

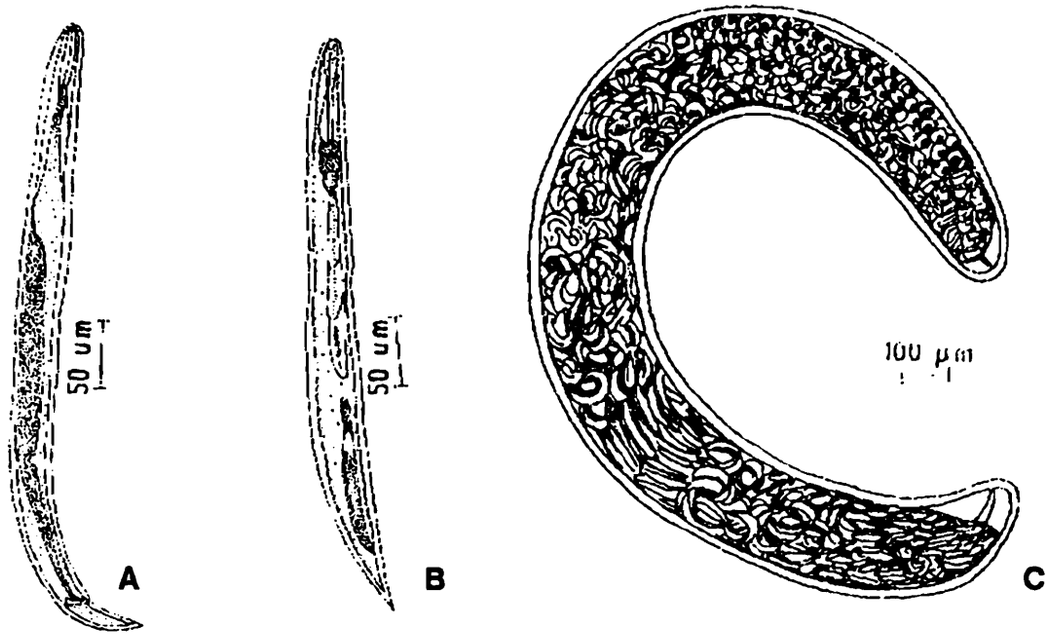


Fig. 27. *Howardula mutilatus*; A. Free living infective stage female, B. Gravid parasitic female.

Free living male : Longer than infective stage female. Oesophagus and gland weekly developed. Tail rounded with caudal alae, with a mucronated tip. Spicules tylenchoid, paired equal, curved distally, articulated with a gubernaculum: testes extended upto oesophageal glands.

Gravid Parasitic female : Body 'C' shaped, stylet very much reduced and deeply situated. Oesophageal glands, intestine atrophied. Ovary single, reflexed thrice at the anterior part. Uterine filled with eggs, embryonated eggs and second stage juveniles.

Measurements : All are given in micrometers.

Fourth stage infective inseminated free living female (n = 38) : L = 398–417 (405 ± 8.4) 404; W = 24–26.9 (25 ± 0.9) 24; a = 16–19.1 (17.8 ± 1.1) 16.8; b = 3.7–4.7(4 ± 0.3) 4.7; b_1 = 0.4–1.8 (1.5 ± 0.8) 1.8; c = 9–12 (10.1 ± 1.2) 11.5; G_1 = 25–32.2 (27 ± 4.19)32.2; V = 82–95.5 (88.75 ± 5.196) 89.

Free living male (n = 38) : L = 422–480 (429 ± 9.2) 479, W = 24–27.5 (25.6 ± 0.6) 27.5; a = 16–18 (17.2 ± 0.4) 17.4; b = 4.8–5.3 (5.2 ± 0.14) 5.02; b_1 = 3.7–4.3 (4.1 ± 0.17) 4.3, C = 33–37 (35.2 ± 1.1) 36; Spicule = 14.2–14.3 (14.25 ± 0.05) 14.2; Gubernaculum = 5 (5 ± 0.1) 5; Testes = 56–68 (60.9 ± 65.3)61.

Gravid Parasitic female (n = 38) : L = 2051–2342 (2256 ± 86) 2256; W = 180 – 249.1 (211 ± 28.6) 212; a = 9.35 –11.39 (10.6 ± 0.87)10.6; c = 56 – 59.1 (57 ± 1.8) 59.1; V = 95–96 (95.8 ± 0.8) 95.8; stylet = 9.6 – 10.2 (9.8 ± 0.3) 9.6; Intrauterine egg length = L × W = 30 × 32.

Distribution : India : Andhra Pradesh; Rangareddy; Amberpet, Hyderabad and Secunderabad.

Remarks : Measurements and illustrations made after Devi *et al.*, 1991.

Genus 13 ***Heterotylenchus*** Bovein, 1937

Key to Species

1. Male and infective stage female large in size; caudal alae and spicule large in length ..... *Heterotylenchus crassirostris* Reddy & Rao, 1981

– Male and infective stage female small in size; caudal alae and spicule small in length ..... *Heterotylenchus xanthomelas* Reddy & Rao, 1987

28. ***Heterotylenchus crassirostris*** Yatham & Rao, 1981
(Fig. 28 : A–D)

1981. *Heterotylenchus crassirostris* : Yatham & Rao. *Indian J. Nematol*, **11** : 19–24.

Materials : Host : *Musca crassirostris* Stein and *Stomyxis calcitrans* L. (Diptera : Muscidae); Location : Hemocoel and ovary; Locality : Upperpally, Rangareddy, Andhra Pradesh; Collector : Yatham and Rao.

Diagnosis : Infective stage female : Straight or slightly curved; head set off, body finely striated. Stylet well developed without basal knobs; oesophageal glands large and extend beyond middle of the body. Dorsal oesophageal gland duct with ampulla overlapping the oesophagus. Excretory pore sclerotized. Hemizonid anterior to excretory pore. Vulva inconspicuous without vulval lips. Anal opening not prominent. Tail long, ending with an obtuse tip.

Male : Body 'L' shaped with a rounded head. Head not set off. Stylet poorly developed without basal knobs. Oesophagus and oesophageal glands less developed. Excretory duct sclerotized. Hemizonid anterior to excretory pore. Spicules paired with a long shaft and a prominent apex. Adanal caudal alae with conspicuous striations. Tail tapers behind the cloaca, ending with a pointed tip.

Gravid parasitic females of gamogenetic generation : Body finely annulated and spirally coiled. Head obtusely rounded. Stylet as in the infection stage female. Excretory pore, oesophageal glands and its ampulla not visible. Tail with a spike like tip. Ovary single, prodelphic occupying $^1/_3$rd of the body length. Vulva with slightly protruded lips.

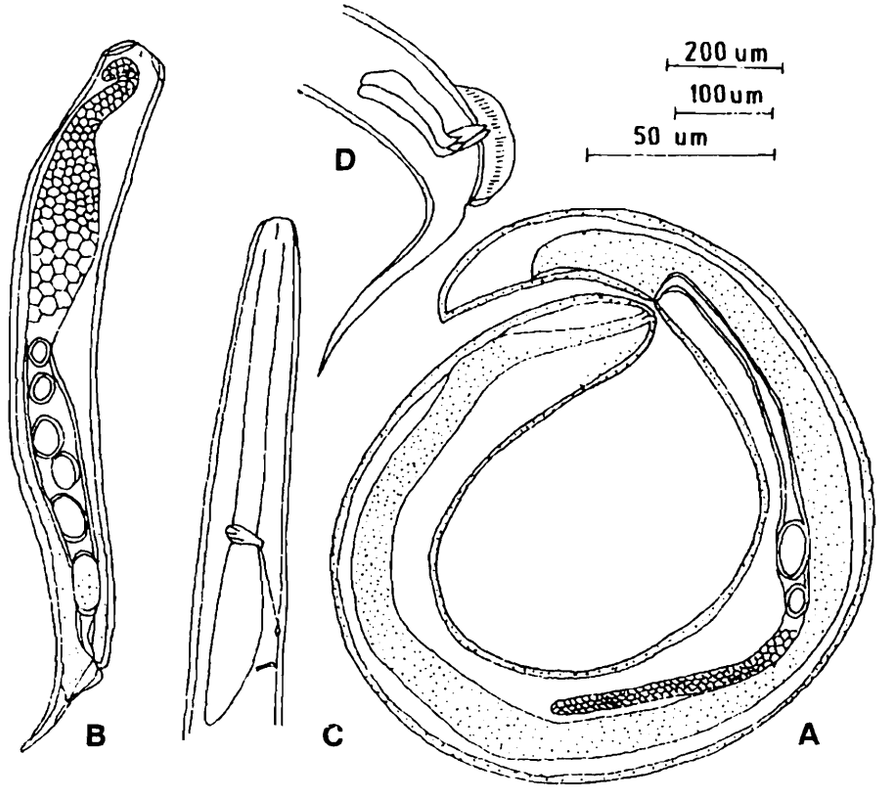


Fig. 28. *Heterotylenchus crassirostris*; A. Entire gamogenetic gravid female, B. Entire mature parthenogenetic female, C. Anterior region of male, D. Posterior region of male.

Adult parthenogenetic female : Body slightly curved with broad anterior end, gradually attenuating posteriorly. Two small cuticular lobes on the head. Stylet without basal knobs. Ovary single, prodelphic, extending over the stylet. Uterus long, thin walled, containing 3–4 eggs at a time. Vulva posterior with protruded vulval lips. Tail with rounded tip.

Measurements : Infective stage female (n = 30) : L = 856 μm (850–954 μm); a = 29.3 (29–36); b = 6 (6–7); b_1 = 1.7 (1.3–1.7); c = 7.4 (6.2–7.5); G_1 = 19.2 (18–19.6); V = 76 (74 –86.6); stylet = 20 μm (18–22 μm).

Males (n = 30) : L = 625 μm (607–717) μm; a = 23 (23–28); b = 6.7 (6.5–7.2; b_1 = 4.8 (4–6); c = 9 (8–9); T = 69 (63–80); Stylet = 5 μm (4–6 μm); spicule = 43 μm 40–45 μm).

Adult gamogenetic female (n = 30) : L = 2.87 mm (1.49–4.5 mm); a = 13 (12–25); c = 9.7 (7–12); G_1 = 46 (45–69); V = 82 (82-85); stylet = 21 μm (18–22 μm): egg, L × W = 119 × 50 μm.

Adult parthenogenetic female (n = 30) : L = 817 μm (683–923 μm); a = 8 (7–9.8); c = 12.8 (11–13); V = 86 (75–93); stylet = 10 μm (10–13 μm); egg, L × W = 67 μm (65–83 μm) × 33 μm (27–34 μm).

Distribution : India : Andhra Pradesh; Rangareddy; Hyderabad, Bhongir, Ghatkesar and Vikarabad.

Remarks : These parasites damage the ovaries of the host and can be used for biological control of insect pests (Nickle, 1967b). Measurements and illustrations made after Reddy and Rao, 1981.

29. ***Heterotylenchus xanthomelas*** Reddy & Rao, 1987
(Fig. 29 : A–C)

1987. *Heterotylenchus xanthomelas*: Reddy & Rao. *Indian J. Nematol.* **17**(2) : 180 – 183.

Materials : Host : *Musca xanthomelas* Wiedemann (Muscidae; Diptera); Location : Haemocoel; Locality : Ghatkesar, Rangareddy, Andhra Pradesh; Collector : Reddy & Rao.

Diagnosis : Infective stage female : Body finely striated, head offset. Stylet without basal knobs. Hemizonid just anterior to excretory pore at 83–106 μm from anterior end. Dorsal oesophageal gland orifice opens into the oesophageal lumen at two stylet lengths from anterior end. Median gland orifice one and half stylet lengths behind dorsal gland opening; oesophageal glands extend more than half of its body length. Ovary 4–5 celled,vulva faintly marked. Tail attenuated ending in a rounded tip.

Hetrosexual Male : Stylet smaller as in the infective stage female. Excretory pore just below the hemizonid, 101–117 μm from anterior end. Oesophagus and oesophageal glands not well developed. Two unequal spicules with scoop like apex. Tail with a small adanal caudal alae ending in a rounded tip.

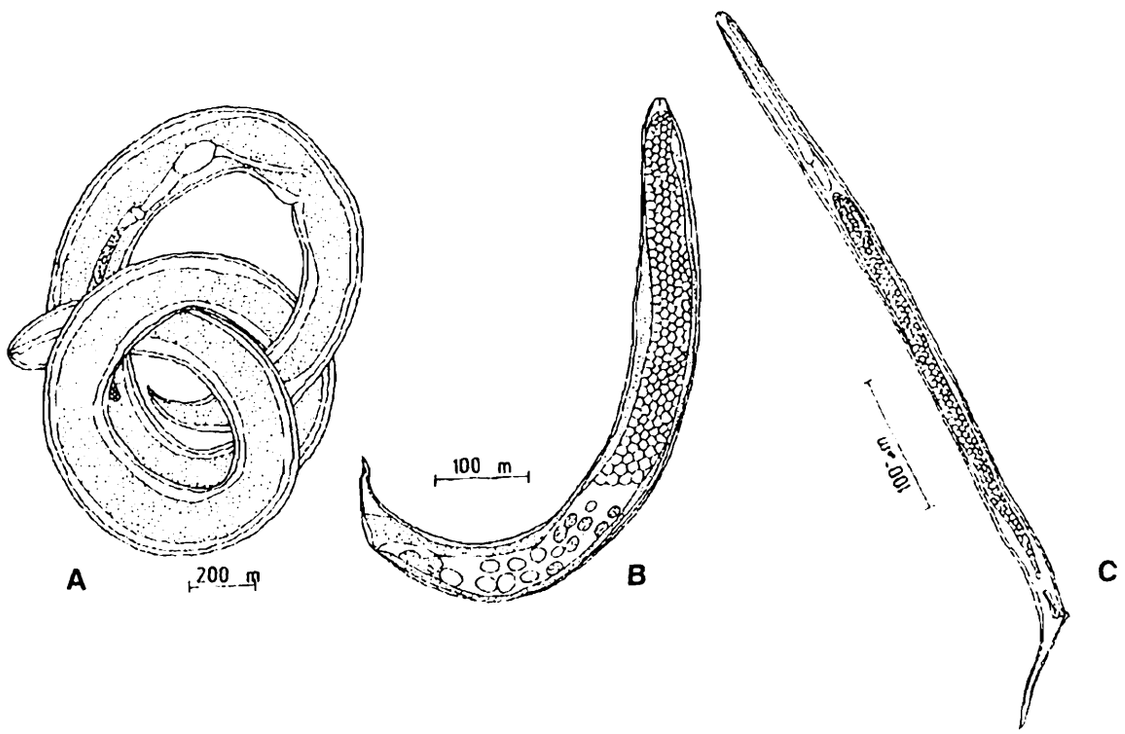


Fig. 29. *Heterotylenchus xanthomelas*; A. Gamogenetic entire adult female, B. Adult parthenogentic entire female, C. Male entire.

Gamogenetic gravid female : Body finely striated and spirally coiled. Head obtusely rounded. Stylet longer than the infective stage female. Excretory pore, oesophageal glands and its ampulla not visible. Ovary prodelphic, uterus containing one to two eggs at a time. Tail with fine mucro at the tip.

Adult Parthenogenetic female: Body 'C' shaped, attenuated at both ends. Stylet small without basal knobs. Ovary single, prodelphic, uterus with 6 to13 embryonated eggs at a time. Vulva slit like without lips. Tail tapering, ending into a rounded tip.

Measurements : (Given in microns and in Deman's Ratio)

Male (n = 36) : L = 530 μm (502–566); a = 28 (25–33); b = 7.3 (6–7.4); c = 7.2 (7–8); T = 67% (66–75%); Stylet = 11 (9–12);Spicule left = 23 (23–26); Spicule right = 20 (19–23).

Infective stage female (n = 35) : L = 527–617; a = 35–47; b = 7.8; b_1 = 1.6–1.9; c = 6–8; G_1 = 15–17%; V = 75–82%; Stylet = 11–15.

Gamogenetic gravid female (n = 35) : L = 2280–6200; a = 21–33; c = 16–22; G_1 = 14 –18%; Stylet = 17–20; Egg L × W = 96–107 × 43–23.

Parthenogenetic gravid female (n = 35) : L = 1120–1520; a = 10–13; c = 16–21; V = 79 –93%; Stylet = 9–11; Egg L × W = 33–41 × 23–28.

Distribution : India : Andhra Pradesh; Rangareddy; Attapur, Vikarabad and Bhongir.

Remarks : According to author's view, this entomophilic nematodes damage the germarium layer of the ovarioles of the female host and could be used for biological control of the pest insect, which feeds on cattle blood and lacrimal secretions and acts as a vector for transmitting bacterial and viral diseases. Measurements and illustrations made after Reddy and Rao, 1987.

Family VI ENTAPHELENCHIDAE Poinar Jr., 1975

Genus 14 ***Schistonchus*** Cobb, 1927

30. ***Schistonchus racemosa*** Reddy & Rao, 1986
(Fig. 30 : A–B)

1986. *Schistonchus racemosa* : Reddy & Rao. *Indian J. Nematol.* **16**(1) : 135–137.

Materials : Host : *Ceratosolen* sp. (pillinating wasp) L.; Location : Abdominal folds; Locality : Garden of Osmania University campus, Hyderabad, Rangareddy, Andhra Pradesh; Collector : Reddy and Rao.

Diagnosis : Female : Body ventrally arcuate 'C' shaped, finely striated, head offset. Stylet long, robust with well developed basal knobs. Anterior two-thirds of the spear surrounded by a fusiform capsule. Ovary few celled, monodelphic outstretched or slightly reflexed. Spermatheca spheroid, filled with flagelated spermatozoa and followed by a bunch of post-

uterine glands. Uterus with a post-uterine sac. Vulva located in the two-thirds of the body length from anterior end. Tail attenuated with mucronated tip.

Male : Body finely striated 'C' shaped, ventrally arcuate. Head Offset. Testis monoarchic, outstretched or slightly reflexed. Spicules paired with wide elongated apex, dorsally hooked, articulated with gubernaculum. Tail strongly arcuate with two pairs of submedian caudal papillae with attenuated and mucronated tip.

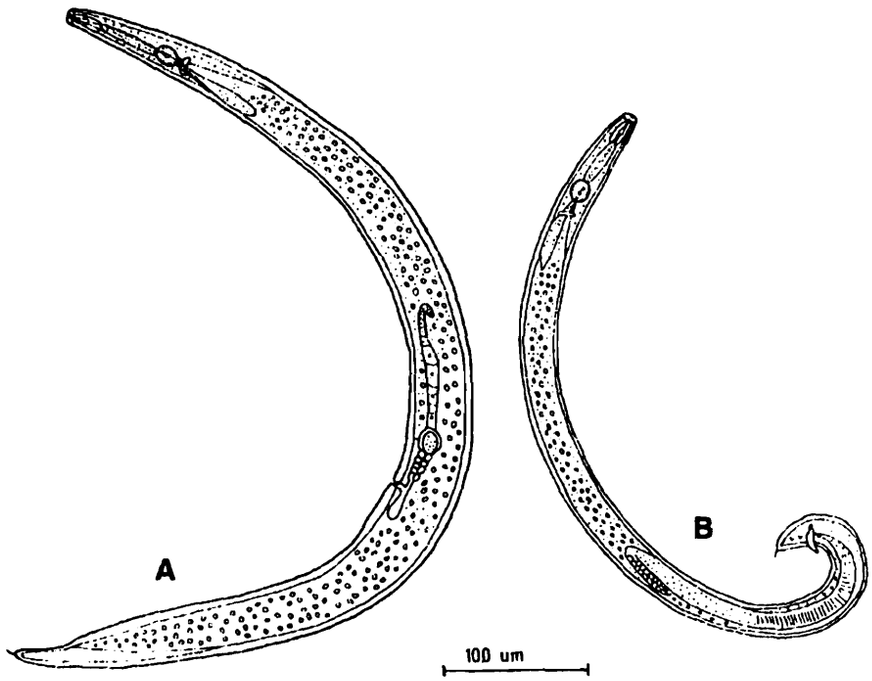


Fig. 30. *Schistonchus racemosa;* A. Female entire, B. Male entire

Measurements : Female (n = 36) : L = 730 μm (600–800 μm), a = 17.2 (14–21), b = 5.8 (5.2–6.2), c = 21.6 (18–22), V = 75 (60–76), G_1 = 19 (18 – 29), Stylet = 23 μm (21–24 μm), Median bulb L × W = 16 μm (13–17 μm) × 13 μm (12–15 μm).

Male (n = 35) : L = 653 μm (500–660 μm), a = 26(24–26), b = 5.4 (5.2–6.2), c = 28 (22 – 28), T = 31 (30 – 48), Stylet = 23 μm (21 – 24 μm), Sp = 18 μm (18–21 μm), G = 5 μm (4–5 μm); Median bulb L × W = 17 μm (13–17 μm) × 13 μm (10–13 μm).

Distribution : India : Andhra Pradesh, Rangareddy.

Remarks : Measurements and illustrations made after Reddy and Rao, 1986.

SUMMARY

The present work deals with an account of all the parasitic nematodes of arthropods, recorded and studied so far from Andhra Pradesh. Thirty species under five sub-genera, fourteen genera, five sub-families, six families and two super-families have been discussed

Distribution list of Species

Sl. No./ Index No.	Species	Host	Habitat/ Location	Locality	District	Collector
1	*Hammerschmidtiella diesingi*	*Blatta orientalis*	Rectum	Anantapur	Anantapur	V. V. Gantait
2	*H. Singhi*	*Corydia* sp.	Intestine	Secunderabad	Rangareddy	-do-
3	*Cameronia biovata*	*Gryllotalpa africana*	Rectum	Vishakhapatnam	Vishakhapatnam	-do-
4	*Blatticola supellaimae*	*Supellaima* sp.	-do-	Hyderabad	Rangareddy	Rao & Rao
5	*B. blattae*	*Blatta orientalis*	-do-	Araku Valley	Vishakhapatnam	V. V. Gantait
6	*Johnstonia (Johnstonia) basiri*	*Spirobolus* sp.	-do-	Vijianagram	Vijianagram	-do-
7	*J.(Paronai) indica*	*Spirostreptus* sp.	Intestine	Khammam	Khammam	-do-
8	*J.(P.) dollfusi*	*Spirobolus* sp.	Rectum	Nalgonda	Nalgonda	-do-
9	*Leidynema (Leidynema) corydium*	*Corydia* sp.	Intestine	-do-	-do-	-do-
10	*Gryllophila skrjabini*	*Gryllotalpa africana*	Rectum	Kakinada	East Godavari	-do-
11	*G. basiri*	*-do-*	-do-	Gudur	Nellore	-do-
12	*Schwenkiella periplaneticola*	*Periplaneta americana*	-do-	Rajamundry	East Godavari	-do-
13	*S. atheri*	*-do-*	-do-	Bakherpet	Chittor	-do-
14	*S. basiri*	*-do-*	-do-	Guntur	Guntur	-do-
15	*S. indica*	*Corydia* sp.	Intestine University Campus	Osmania	Rangareddy	Rao & Rao
16	*Thelastoma guptai*	*Periplaneta americana*	-do-	Medak	Medak	V. V. Gantait
17	*T. pterygoton*	*Hydrophilus* sp	-do-	Cuddaph	Cuddaph	-do-

Distribution list of Species *Contd.*

Sl. No./ Index No.	Species	Host	Habitat/ Location	Locality	District	Collector
18	*T. kherai*	*Periplaneta americana*	Rectum	Nandyal	Karnool	-do-
19	*T.atheri*	*-do-*	-do-	Tirupati-Tirumala	Chittor	-do-
20	*Rondonema spirostreptum*	*Spirostreptus* sp.	Instestine	Hyderabad	Rangareddy	Rao & Kumari
21	*Blattophila indica*	*Corydia* sp.	Rectum	Hyderabad	Rangareddy	Rao & Rao
22	*Cephalobium (Denticum) microvata*	*Gryllus* sp.	-do-	-do-	-do-	-do-
23	*C.(D.) gryllodes*	*Gryllodes* sp.	Intestine	Nizamabad	Nizamabad	V. J. Rao
24	*C. (Adenticum) aodus*	*Gryllus* sp.	Intestine	Medak	Medak	V. J. Rao
25	*C.(A.) caudatum*	*Gryllotalpa africana*	Rectum	Garden of Dakili Forest; Rest House, Dakili	Nellore	V. V. Gantait
26	*Howardula marginatis*	*Copromyza marginatis*	Hemocoel	Hyderabad	Rangareddy	Y. N. Reddy & R. N. Rao
27	*H. mutilatus*	*Caprophilous mutilatus*	-do-	Amberpet	Rangareddy	T. R. Devi, P.N. Rao & Y. N. Reddy
28	*Heterotylenchus crassirostris*	*Musca crassirostris*	-do-	Upperpally	-do-	Y. N. Reddy & P. N. Rao
29	*H. xanthomelas*	*Musca xanthomelas*	-do-	Ghatkeswar	-do-	-do-
30	*Schistonchus racemosa*	*Ceratosolen* sp.	Abdominal folds	Garden of Osmania University Campus	-do-	-do-

** The distribution of the species are shown in the map in accordance with the Index No.

in this paper. Amongst 30 species, 21 belong to the order Oxyurida, 4 under the order Rhabditida and the rest 5 species belong to the order Tylenchida. Diagnostic characters of all the species, keys to the super-families, families, sub-families, genera and species are incorporated in this work. The two new sub-genera *'Adenticum'* and *'Denticum'* and their keys have also been furnished. The description of a new species *Cephalobium (Adenticum) caudatum* is accommodated. A species has been recorded first time from India. The hosts, and the geographical distribution of the species are recorded. Diagrams of all the species have been provided in this paper. A distribution map is also included herewith

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PHYTOPHAGOUS NEMATODES (Order TYLENCHIDA, Suborder TYLENCHINA)

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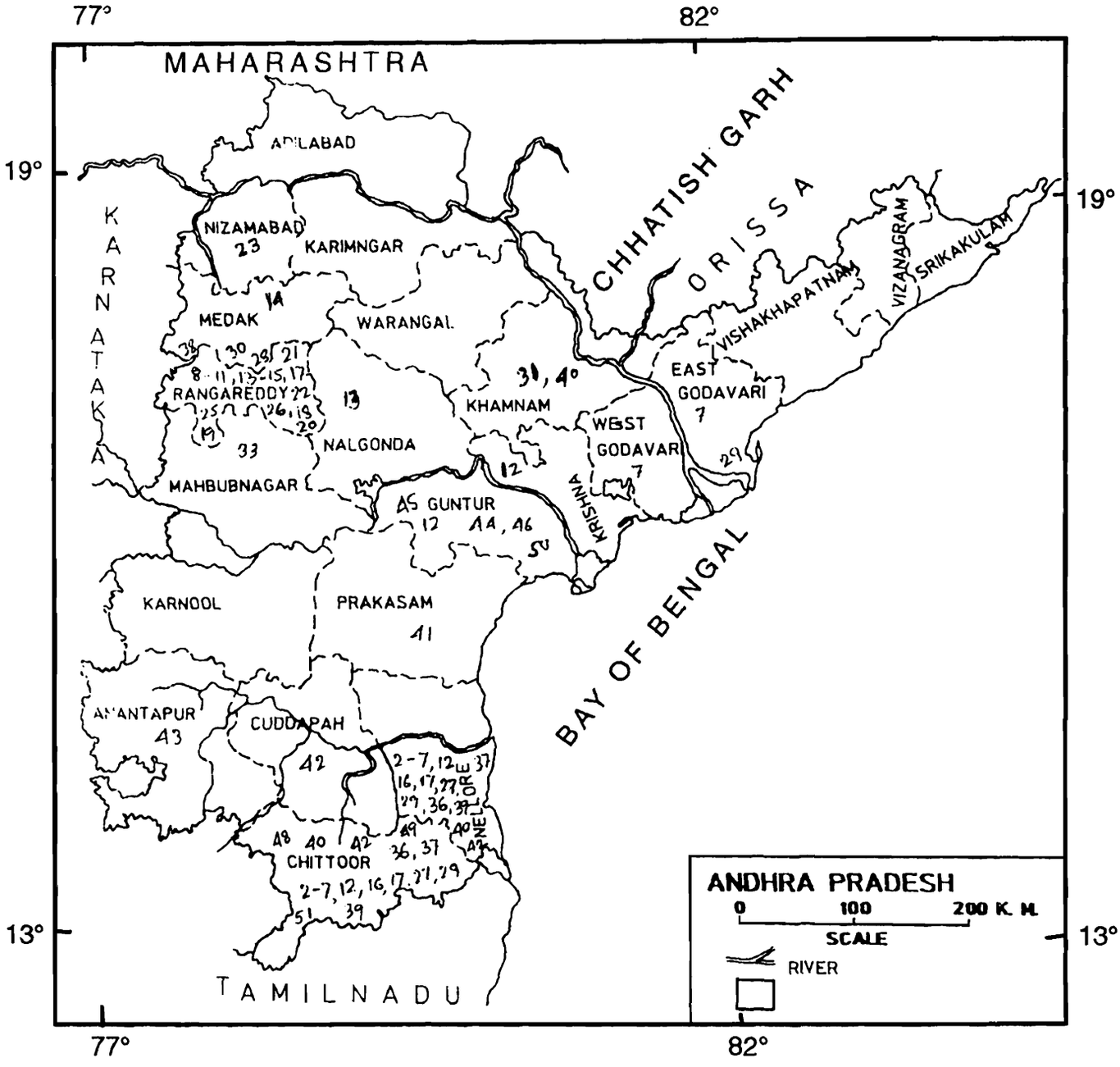
INTRODUCTION

According to Siddiqi (1986) there can be no sufficient reason to doubt that Tylenchida arose on land, but the statement that the Tylenchida originated in the Devonian period is mere conjecture. The time of the origin of Tylenchida is assumed to be about the middle of the Palaeozoic era as because nematodes have a very long history of about 600 million years (Siddiqi, 1986).

The members of the order Tylenchida and some of the order Dorylaimida are plant parasitic in nature. They feed upon the sap of plant body mainly through the tender feeder root system causing significant damage of the agricultural crops. Important crop plants are infested by these microscopic organisms that feed on the roots, buds, stem, crown, leaves and on developing seeds. Thus the tylenchs constitute economically most important group of plant parasitic nematodes. Many important soil borne viral diseases of plants are also transmitted by nematodes. The average annual yield loss is around 10% world wide or even more which is considered very significant by all standards (Ahmad, 1996).

The phytonematodes not only attack the roots of plants in the ectoparasitic forms, they also exist in the aerial portion like seeds (*Anguina tritici*). They may also be endoparasitic, semi-endoparasitic and migratory root endoparasitic in nature. Some of the tylenchids have been proved to be virulant to agricultural crops. These are *Ditylenchus, Anguina, Globodera, Meloidogyne, Radopholus*, etc. which cause Ufra disease in rice, ear-cockles in wheat, damage entire potato cultivation of a large area, incite galls in plant roots and drastically reduce the coconut and banana production respectively.

In India near about 600 species of tylenchids under 70 genera have been recorded (Ahmad, 1996). In the present report, regarding the tylenchid fauna of Andhra Pradesh 51 species under 25 genera have been recorded. Besides taxonomy, many workers studied the occurrence and distribution of different phytonematodes in Andhra Pradesh. Plant parasites associated



Map of Andhra Pradesh showing distribution of Genera / Species

with groundnut and their distribution have been worked out by Maharaju and Das (1984), Mani and Ratna Kumar (1990). Parasitic nematodes of horticultural crops in South India and those associated with citrus in Andhra Pradesh have been recorded by Singh, Rao and Reddy (1979) and by Krishnamurthy, Rao and Thammi Raju (1975) respectively. Occurrence of *Meloidogyne javanica* on citrus, *Heterodera sorghi* on sorghum, distribution of *Tylenchulus semipenetrans* and *Meloidogyne javanica* in commercial citrus nurseries have been studied by Mani (1986), Sharma and Sharma (1988), Mani, Dakshinamurti and Reddy (1988) respectively. Besides these, morphology and taxonomy of Tylenchida of Andhra Pradesh have been studied by Das (1960), Singh (1971), Das and Shivaswami (1977), Sultana (1979), Das and Sultana (1979, 1980), Sultana (1980), Maharaju (1981), Maharaju and Das (1981, 1982), Quraishi (1982), Muthukrishnan and Shariff (1985), Muthukrishnan (1987) and so on. It is worthy to mention that the classification proposed by Maggenti *et al.* (1987) has been followed to arrange the genera and species available from Andhra Pradesh.

MATERIAL AND METHODS

During survey tours, collections were procured and processed though a series of procedures, a short account of which are given below :

Sampling – Samples of soils about 500 cc (in volume) each time, were collected from rhizosphere of different plants and crop, usually upto a depth of about 20 cm. from surface. The samples were teken in polythene bags, tied and labelled with name of collector, date of collection, name of the locality and record of host plants.

Processing – In the process of extraction and isolation of nematodes from soils, only one sample was taken in a plastic bucket, then the soil was mixed with water (about 7 litres) to prepare a uniform suspension. The soil water suspension was throughly shaked and was put to rest (undisturbed) for about 20 seconds to allow the bigger stones, sands, other heavier material to settle down as sediment. The upper suspension was quickly passed through a coarse sieve to remove the floating debries etc. The filtrate then again was passed through a set of sieves of 100, 200, 300 mesh-size. The residue from each of the three sieves were taken into a beaker in fresh water.

The aliquot collected in the above manner was subjected to modified Bearmnn's funnel method (That is aliquot of each sample was put on tissue paper on a aluminium net suspended for 48 hours). Then the debries and sediments on the tissue paper were rejected and the clear water together with nematodes were taken in watch glass, and were examined under a low power binocular miscroscope and all the nematodes were picked up one by one with the help of a very fine needle, and were transferred to a second watch glass.

Killing fixation and dehydration – The nematodes thus collected, were killed by pouring hot water on them. Excess of water was again drawn out with the help of a fine dropper, and the nematodes were fixed in FAA solution. (Formalin (4%) 30 ml., glacial acetic acid 5 ml. absolute alcohol 100 ml. and distilled water 200 ml). The fixed nemadotes (at least after 24 hours) were processed by slow glycerine method of dehydration. The nematodes were transferred to 1% glycerine (ethanol 20 parts glycerine 1 part distilled water 79 parts). For quiker dehydration the watch glass with 1% glycerine were placed in a BOD incubator, where temperature were kept at 40°C. After about 7 days these were passed through 5% glycerine (ethanol 95 parts glycerine 5 parts). The nematodes were kept in the glycerine solution till the other component evaporated, and only the glycerine was left. The nematodes were finally taken into pure and dehydrated glycerine.

Mounting, Sealing – Four to eight nematodes were mounted in a drop of pure and dehydrated glycerine on glass slides. Glass-wool supports of the same seize as that of nematodes were always used under the cover slips to prevent any pressure on the specimens. The cover slips were sealed with nail posish or adhesive.

Measurements – The measurements were taken under stereoscopic miscroscope with the help of stage and oculo-micrometer. De Man's formulas were used for denoting the dimensions of nematodes. The indices viz. L, a, b, b' etc. were adopted from standard works on different group of nematodes.

SYSTEMATIC LIST OF THE GENUS / SPECIES AVAILABLE

(Classification modified after Maggenti *et al.*, 1987)

Suborder TYLENCHINA Throne, 1949

Superfamily TYLENCHOIDEA Orley, 1880

Family TYLENCHIDAE Orley, 1880

Subfamily TYLENCHINAE Orley, 1880

Genus ***Tylenchus*** Bastian, 1865

Genus ***Filenchus*** Andrassy, 1959

Genus ***Malenchus*** Andrassy, 1968

Genus ***Ottolenchus*** Hussain and Khan, 1967

Subfamily ECPHYADOPHORINAE Skarbilovich, 1959

Genus ***Ecphyadophora*** de Man, 1921

Genus ***Tenunemellus*** Siddiqi, 1986

Subfamily ATYLENCHINAE Skarbilovich, 1959

Genus ***Aglenchus*** Andrassy, 1954

Subfamily BOLEODORINAE Khan, 1964

Genus ***Basiria*** Siddiqi, 1959

1. *Basiria binaria* (Sultana, 1980) Hąshim, 198
   Syn. *Basiroides binarius* Sultana, 1980
2. *Basiria brevia* (Sultana, 1980) Hashim, 1985
   Syn. *Basiroides brevius* Sultana, 1980
3. *Basiria macrostriata* (Sultana, 1980) Hashim, 1985
   Syn. *Basiroides macrostriatus* Sultana, 1980
4. *Basiria siddiqi* (Sultana, 1980) Hassim, 1985
   Syn. *Basiroides siddiqi* Sultana, 1980
5. *Basiria raskiensis* Das & Sultana, 1980
6. *Basiria simlai* Das & Sultana, 1980

Family ANGUINIDAE Nicoll, 1935

Genus ***Ditylenchus*** Filipjev, 1936

Family BELONOLAIMIDAE Whitehead, 1960

Subfamily TELOTYLENCHINAE Siddiqi, 1960

Genus ***Tylenchorhynchus*** Cobb, 1913

7. *Tylenchorhynchus varicaudatus* Singh, 1971
8. *T. mashhoodi* Siddiqi & Basir, 1959
   Syn. *T. digitatus* Das, 1960
   T. dactylurus Das, 1960
   T. Zeae Sethi & Swarup, 1968
9. *T. curvus* Williams, 1960
10. *T elegans* Siddiqi, 1961

Genus ***Trichotylenchus*** Whitehead, 1960

11. *Trichotylenchus trilokiae* Singh, 1971

Family PRATYLENCHIDAE Thorne, 1949

Subfamily PRATYLENCHINAE Thorne, 1949

Genus *Pratylenchus* Filipjev, 1936

12. *Pratylenchus brevicercus* Das, 1960
13. *P. brachyurus* (Godfrey, 1929) Filipjev & Schuurmans Stekhoven, 1941.
    Syn. *Tylenchus brachyurus* Godfrey, 1929.
14. *Pratylenchus barkati* Das & Sultana, 1979.
15. *P. indicus* Das, 1960
16. *P. crassi* Das & Sultana, 1979.

17. *P. dasi Fortunar*, 1985.
    Syn. *P. capitatus* Das & Sultana, 1979.
    P. hyderabadensis Das & Sultana, 1979.
18. *P. delattrei* Luc, 1958.
    Syn. *P. singhi* Das & Sultana, 1979.
19. *P. exilis* Das & Sultana, 1979.
20. *P. nizamabadensis* Maharaju & Das, 1981.
21. *P. flakkensis* Seinhorst, 1968.
22. *P. manohari* Quraishi, 1982.
23. *P. thornei* Sher & Allen, 1953.
24. *P. zeae* Graham, 1951.

Genus ***Hirschmanniella*** Luc & Goodey, 1964

25. *Hirschmanniella mucronata* (Das , 1960) Luc & Goodey, 1964
    Syn. *H. mangalorensis* Mathur & Prasad, 1971.
26. *H. indica* Ahmad, 1974
27. *H. oryzae* (Van Breda de Hann, 1902) Luc & Goodey, 1964.
    Syn. *H. nana* Siddiqi, 1966.
28. *H. exigua* Khan, 1972.
29. *H. orycrena* Sultana, 1979.
30. *H. telanganensis* Maharaju, 1981.

Family HOPLOLAIMIDAE Filipjev, 1934.

Subfamily HOPLOLAIMINAE Filipjev, 1934.

Genus ***Hoplolaimus*** Daday, 1905.

31. *Hoplolaimus indicus* Sher, 1963.
    Syn. *H. arachidis* (Maharaju & Das, 1982) Siddiqi, 1986.
32. *H. seinhorsti* Luc, 1958.
33. *H. singhi* Das & Shivaswami, 1976.

Genus ***Helicotylenchus*** steiner, 1945

34. *Helicotylenchus abunaamai* Siddiqi, 1972.
35. *H. indicus* Siddiqi, 1963.
    Syn. *H. microdorus* Prasad *et. al*, 1965.
36. *H. pteraceracus* Singh, 1971.
37. *H. retusus* Siddiqi & Brown, 1964.
    Syn. *H. impar* Prasad *et. al.* 1965.

Subfamily ROTYLENCHULINAE Hussain & Khan, 1967

Genus ***Rotylenchulus*** Linford & Oliveira, 1940

38. *Rotylenchulus reniformis* Linford & Oliveira, 1940.

Family HETERODERIDAE Filipjev & Schuurmans Stekhoven, 1941

Subfamily HETERODERINAE Filipjev & Schuurmans Stekhoven, 1941

Genus ***Heterodera*** Schmidt, 1871

39. *H. sorghi* Jain, Sethi, Swarup & Srivastava, 1982.

Subfamily MELOIDOGYNINAE Skarbilovich, 1959

Genus ***Meloidogyne*** Goeldi, 1982

40. *M. incognita* (Kofoid & White, 1919) Chitwood, 1949.

41. *M. javanica* (Treub, 1885) Chitwood, 1949.

Superfamily CRICONEMATOIDEA Taylor, 1936

Family CRICONEMATIDAE Taylor, 1936

Subfamily CRICONEMATINAE Taylor, 1936

Genus ***Criconema*** Hofmanner & Menzel, 1914

42. *C. lamellatum* (Raski & Golden, 1965) Raski & Luc, 1984.
Syn. *Criconemoides lamellatum* Raski & Golden, 1965.

Genus ***Hemicriconemoides*** Chitwood & Brichfield, 1957

43. *H. brachyurus* (Loos, 1949) Chitwood & Brirchfield, 1957.
Syn. *Creconemoides brachyurus* Loos, 1949.

44. *H. mehdi* Suriyawanshi, 1971.

45. *H. cocophilus* (Loos, 1949) Chitwood & Brichfield, 1957.
Syn. *Criconemoides cocophilus* Loos, 1949.

Subfamily HEMICYCLIOPHORINAE Skarbilovich, 1959

Genus ***Hemicycliophora*** de Man, 1921

46. *H. osmani* Das & Shivaswamy, 1977.

Family TYLENCHULIDAE Skarvilovich, 1947

Subfamily TYLENCHULINAE Skarvilovich, 1947

Genus ***Tylenchulus*** Cobb, 1913

47. *T. semipenetrans* Cobb, 1913

Genus ***Trophotylenchulus*** Raski, 1957

48. *T. andhraensis* Muthukrishnan & Shariff, 1985

Subfamily PARATYLENCHINAE Thorne, 1949

Genus ***Paratylenchus*** Micoletzky, 1922

Key to the suborders of order TYLENCHIDA

1. Parasites of coelome or coelomic tissues of annelida, amphibia; terminal excretory duct and pore sucker like ..... MYENCHINA

– Free living or parasites of plants and arthropods; terminal excretory duct and pore not sucker-like 2

2. Mycetophagus or non-root phyto-parasitic; arthropod-parasitic cycle present; oesophagus intestinal junction at or anterior to nerve ring, if posterior to it, then either oesophageal base with a prominent stem-like extension or two anterior most cells of intestine modified to act as valve. Phasmid absent ..... HEXATYLINA

– Fungus feeding absent, arthropod-parasitic cycle absent, single generation cycle, nonmycetophagus or root-parasitic forms; oesophago-intestinal junction well behind nerve ring, phasmid may be present or absent ..... TYLENCHINA

Key to Superfamilies of suborder TYLENCHINA

1. Oral aperture round or oval, post corpus not massive and not amalgamated, cuticle never retrorse or with scales, spines, appendages or a double cuticle, phasmids or phasmid-like structure present ..... TYLENCHOIDEA

– Oral aperture dorsoventrally or slit like or 'I' shaped, post cropus massive and amalgamated with pre-corpus. Cuticle either thin and finely annulated or thick or coarsely annulated with retrose annules, scales, spines or an extra cuticular body sheath; Phasmids absent ..... CRICONEMATOIDEA

Key to the available families of the superfamily TYLENCHOIDEA

1. Small to medium sized (0.3–1.5 mm) nematodes; lateral fields with 2–6 incisures; ecto- or endoparasites of plants 2

   Small to large sized nematodes; Mature females obese or globose; sedentary root parasites 4

2. Lateral fields with 2–6 incisures; Phasmid-like structure small rounded, covered by cuticle near lateral field or rarely pore-like on tail ..... TYLENCHIDAE

– Lateral filed with 4–6 incisures; Phasmid either small with pore-like apertures near tail or large scutellum-like near anus 3

3. Lateral fields typically with 4 lines; Phasmids pore like near or little anterior to anus or large scutellum-like near anus or much anterior to it anywhere on body behind oesophageal region; Ectoparasites ..... HOPLOLAIMIDAE

– Lateral fields each with 4–6 incisures; Phasmids pore like always on tail; obligate migratory root endoparasites ..... PRATYLENCHIDAE

4. Mature female obese without forming cyst; No marked sexual dimorphism in the anterior region; gonad single ..... ANGUINIDAE

– Mature female globose, rarely sausage shaped with cyst formation; marked sexual dimorphism; two genital branches-amphidelphic or prodelphic ..... HETERODERIDAE

Key to the available subfamilies of family TYLENCHIDAE

1. Small to medium sized nematodes; stylet very small to medium or delicate; stylet with or without knobs 2

– Small sized nematodes (under 1 mm), extremely slender, attenuated and appearing glass-fibre like; stylet short but needle-like and appearing solid tip ..... ECPHYADOPHORINAE

2. Cuticle finely to coarsely striated; stylet small to very small, usually with knobs ..... TYLENCHINAE

– Cuticle finely or distinctly annulated; stylet medium to delicate with or without knobs 3

3. Cuticle distinctly annulated; stylet medium sized with prominent knobs ..... ATYLENCHINAE

– Cuticle finely strriated; stylet delicate, small knobs often flange-like or some times without knobs ..... BOLEODORINAE

Superfamily TYLENCHOIDEA Orley, 1880

Family TYLENCHIDAE Orley, 1880

Syn. ATYLENCHIDAE Skarbilovich, 1959

ECPHYADOPHORIDAE Skarbilovich, 1959

BOLEODORIDAE Khan, 1964

TYLODORIDAE Paramonov, 1967

Diagnosis : Tylenchoidea. Small to medium sized (0.3–1.3 mm), slender, rarely longer, vermiform in shape. Lateral fields each width 2–6 incisures. Lip region usually elevated, rounded, annulated, rarely smooth. Labial framework delicate, weakly developed. Stylet usually small (3–20 mm), delicate with distinct basal knobs, rarely without knobs. Stylet may be very long in few species. oral disc or plate sometimes distinctly elevated, rounded. Deirids present or absent. Phasmid-like structures present in some species, usually advulvar and dorsal near

lateral field, not an aperture, rarely pore-like on tail. Procorpus elongate, median bulb slender, apparently non-muscular. Isthmus long slender, oesophageal gland symmetrically arranged, pyriform. Female reproductive system mono-prodelphic, rarely amphidelphic. Spicules slender in male. Bursa usually adanal never extending to terminus. Tail elognate-conoid, mostly narrowing to long slender, filiform, similar in both sexes.

Subfamily TYLENCHINAE

Diagnosis : Body about 0.3–1.3 mm long. cuticle finely to coarsely striated. Lateral field each with 2, 3 or 4 incisures. Lip region continuous or offset, usually without a distinct oral disc. Stylet small to very small, usually with knobs. Female genital tract short. Tail elongated, tip variously modified.

Key to the available genera of Tylenchinae

1. Lateral fields with single ridge 2
- Lateral fields with two ridge 3
2. Cephalic region elevated; body behind vulva markedly tapering so as to become about half as wide at anus as at vulva ..... ***Malenchus***
- Cephalic region low. Body behind vulva not markedly tapering; post vulval uterine sac present ..... ***Ottolenchus***
3. Stylet with conus equal to the shaft; tail ventrally arcuate or hook-like ..... ***Tylenchus***
- Stylet with conus distinctly shorter than shaft; Tail not ventrally arcuate or hook-like ..... ***Filenchus***

Tylenchus Bastian, 1865

1865. *Tylenchus* sp. Bastian, H. C. *Trans. Linn. Soc. London*, **25** : 73-184.

Female : Body small to medium sized (0.4–1.33 mm), ventrally curved upon relaxation. Cuticle moderately thick (1–2 μm), distinctly annulated. Lateral field each with four incisures. Phasmids dorso-sublateral, postmedian, just behind vulva. Cephalic region continuous, annulated. Stylet 8-21 μm. long with posteriorly slopping basal knobs. Median oesophageal bulb oval, muscular. Basal bulb pyriform. Cardia distinct excretory pore usually opposite to basal bulb. Vulva is transverse slit-like, usually 60–70% of body length, lips not modified, epiptygma and lateral membrane absent. Vagina generally at right angle to body axis. Post vulval uterine sac about a body width or less long. Ovary outstretched. Tail ventrally arcuate, often hooked, regularly tapering to a pointed or minutely rounded terminus.

Male : Not found.

Habitat and distribution : Soil associated with groundnut in Telengana region of Andhra Pradesh.

Remark : This genus has been reported by Singh (1971) from Andhra Pradesh.

Filenchus sp. Andrassy, 1959

1959. *Filenchus* sp. *Andrassy, I. Annls. Univ. Scient Bpest.*, **2** : 3-27.

Female : Body small to medium (0.3–1.3 mm), straight to arcuate when relaxed. Cuticle with fine to moderately coarse annulation. Lateral fields each with 4 incisures. Deirids present. Cephalic region broadly rounded or conoid-rounded, rarely truncate, continuous or slightly offset, finely annulated. Labial disc inconspicuous. Stylet feeble or moderately developed, generally 7-15 μm long, conus sharply pointed, about one-third of total stylet length, knobs distinct, rounded. Median bulb oval to rounded, muscular, valvate. Basal bulb offset from intestine, generally pyriform. Cardia distinct. Vulva at about 55-70%, lips not modified, lateral membranes absent. Vagina directed inward. spermatheca offset. Ovary outstretched. Tails generally filiform and straight, may be elongate conoid but never ventrally curved or hooked.

Male : Not found.

Habitat and distribution : Rhizospheric soil of groundnut in Chittoor and Nellore District of Andhra Pradesh.

Remarks : This genus has been reported by Mani & Ratnakumar (1990) from Andhra Pradesh.

Malenchus sp. Andrassy, 1968

1968. *Malenchus* sp. Andrassy, I., *opusc. Zool., Bpest.*, **8** : 167-315.

Female : Body elongate-fusiform, with strong and regular tapering behind vulva so that, width at anus becomes about half as that at vulva. Annules prominent. Single ridge in lateral field, marked by numerous fine longitudinal lines. Cephalic region flattened dorsoventrally, elevated with 4 or more fine annules. Amphidial slits curved ventrally. Precorpus equal to or shorter than isthmus, post corpus is a muscular bulb with refractive valve plates. Basal bulb pyriiform with flat to indented base. Vulva located in a body cavity. Spermatheca elongate, oval or bilobed, offset, directed forward. Vagina straight, directed inward. Post vulval uterine sac present. Phasmids dorso-sublateral about one body width anterior to vulva. Tail elolngate-conoid to a pointed or hooked tip.

Male : Not found.

Habitat and distribution : Rhizospheric soil of groundnut in Nellore and Chittoor District of Andhra Pradesh.

Remarks : The genus has been reported by Mani & Ratnakumar (1990) from Andhra Pradesh.

Ottolenchus sp. Hussain & Khan, 1967.

1967. *Ottolenchus* sp. Hussain, S. I. & Khan, A. M. *Proc. Helminth. Soc. Wash.*, **34** : 175–186.

Female : Body almost cigar-shaped except for tail. Cuticle thin, transversely striated, lateral field each with two incisures. Lip region low, cephalic framework weak. Slylet very thin, conus about $^1/_3$rd of stylet length, knobs elongated. Median bulb elongated, muscular, with small but distinct thickenings of lumen. Ovary single, outstretched; spermatheca as an offset pouch. Vagina with thin walls.

Male : Not found.

Habitat and distribution : Soils associated with groundnut in Chittoor and Nellore District.

Remarks : This genus has been reported by Mani & Ratnakumar (1990) from Andhra Pradesh.

Subfamily ECPHYADOPHORINAE Skarbilovich, 1959

Diagnosis : Small sized nematodes (under 1 mm), extremely slender, attenuated and appearing glass fibre-like. Lateral field each with 2-4 incisures or obscure. Lip region with fine annuli present upto labial plate. Phasmids postmedian, dorso-sublateral, in females just anterior to vulva. Stylet short, attenuated, basal knobs round. Corpus cylindroid, non-muscular, lacking a post-corporal bulb. Basal bulb present but dorsal gland may extend as lobe over intestine. Vulva transverse, may be covered with anterior lip flap. Vagina directed inward or forward. Post-vulval uterine sac present. Spermatheca offset. Males with adanal lobed bursa, projecting outward or backward. Spicules needle-like. Gubernaculum fixed. Cloacal lips form a penial tube. Tail long, filiform, markedly narrowing after cloacal opening.

Key to the available genera of Ecphyadophorinae

1. Cephalic region not dorso-ventrally flattened; Body abruptly narrowed behind vulva. ..... ***Ecphyadophora***

– Cephalic region strongly dorso-ventrally flattened; Body not abruptly narrowed behind vulva. ..... ***Tenunemellus***

Ecphyadophora sp. de Man, 1921

1921. *Ecphyadophora* sp. Man, J. G. de, *Capita Zool.* **1** : 3–62.

Female : Body small (under 1 mm), very slender, attenuated and appearing glass fibre-like, abruptly narrowed behind vulva. Cuticle appearing smooth but marked with transverse

striae. Lateral field with four incisures. Amphid small pore-like. Cephalic region continuous, lacking labial disc. Stylet short, upto 12 μm. corpus cylindrical lacking bulb or valve plates. Dorsal gland lobe-like overlapping intestine. Oesophago-intestinal junction obscure. Vulva directed posteriorly with a flap-like anterior lip covering. Post-valval uterine sac short.

Male : Not found.

Habitat and distribution : Soil associated with groundnut and guava in Nellore and Chittoor Districts in Andhra Pradesh.

Remarks : This genus has been reported by Mani & Ratnakumar (1990) from Andhra Pradesh.

Tenunemellus sp. Siddiqi, 1986

1986. *Tenunemellus* sp. Siddiqi, M. R., Tylenchida : Parasites of Plants & Insects, CAB, U. K., pp. 645.

Female : Body small (under 1 mm), extremely slender, attenuated and glass fibre-like. Body not abruptly narrowed behind vulva. Cuticle without longitudinal lines. Lateral field obscure. Cephalic region strongly dorso-ventrally flattened. Labial disc absent. Stylet about 10 μm long with small knobs. Corpus cylindroid, isthmus slender. Basal bulb enclosing oesophaeal glands. Deirids little behind excretory pore. Vulva transverse, flush with body contour with or without lateral membranes. Tail very long and pointed.

Male : Not found.

Habitat and distribution : Rhizospheric soil of coconut, groundnut and other leguminose crops in Nellore and Chittoor districts in Andhra Pradesh.

Remarks : This genus has been reported by Mani & Ratnakumar (1990) from Andhra Pradesh.

Subfamily ATYLENCHINAE Skarbilovich, 1959

Diagnosis : Body small to medium size (0.33–1.29 mm). Cuticle distinctly annulated. Lateral fields each with 2-6 incisures. Lip region continuous or slightly offset. Stylet medium. Conus slightly small or about equal to shaft. Median bulb well developed. Basal bulb short rounded or elongate. Female reproductive system amphidelphic or mono-prodelphic; post-vulval uterine sac present or absent. Spermatheca usually offset. Tail long, attenuated, tip setose, acute or finely rounded.

Aglenchus sp. Andrassy, 1954

1954. *Aglenchus* sp. Andrassy, I., *Acta Zool. Hung.*, **1** : 5–42.

Female : Body small (0.35–0.77 mm.), straight to slightly arcuate, cuiticle coarsely annulated. Lateral fields each with two prominently raised ridges. Stylet less than 15 μm.

long, conus about half of the total length, knobs rounded. Median bulb rounded to oval. Deirids near excretory pore. Phasmids slightly posterior to vulva. Vulva sunk in body. Vagina directed forward. Post vulval uterine sac absent. Tail elongate filiform.

Male : Not found.

Habitat and distribution : Rhizospheric soils of vegetables and groundnut in East and West Godavari, Nellore and Chittoor districts of Andhra Pradesh.

Subfamily BOLEODORINAE Khan, 1964

Diagnosis : Small to medium sized. Cuticle finely striated. Oral aperture surrounded by six papillae; a second circle of four papillae on the edges of anterior surface. Stylet delicate. Conus about half of the shaft, knobs small often flanged, sometimes may be absent. Female reproductive system amphidelphic or mono-prodelphic. Males with small, adanal bursa. Tail elongated, often rounded or clavate at the end, seldom spicate.

Genus ***Basiria*** Siddiqi, 1959

Basiria binaria (Sultana, 1980) Hashim, 1985
Syn. ***Basiroides binarius*** Sultana, 1980.

1980. *Basiroides binarius* Sultana, S. *Geobios*, **7** : 134-139.

1985. *Basiria binaria* Hashim. Z. *Nematologica*, **30**(1984) : 238-241.

Female : Slender and small in size (0.37–0.42 mm.). Body slightly ventrally curved on fixation. Cutide finely striated. Lateral field with four incisures. Head region slightly offset and flattened. Stylet small and slender with rounded basal knobs. Hemizonid large. Basal bulb pyriform. Vulva transverse slit-like, reproductive system mono-prodelphic, ovary outstretched. Tail long, filiform with a bluntly rounded terminus.

Dimensions : L = 0.37–0.42 mm, a = 31–36, b = 4.6–5.4, c = 5.4–6.5, V = 63–70%, stylet = 6.42–7.49 μm.

Male : Not known.

Habitat and distribution : Rizospheric soil of tomato, okra around Begumpet, Secunderabad of Andhra Pradesh.

Basiria brevia (Sultana, 1980) Hashim, 1985
Syn. *Basiroides brevius* Sultana, 1980

1980. *Basiroides brevius* Sultana, S. *Geobios*, **7** : 134–139.

1985. *Basiria brevia* Hashim, Z., *Nematologica*, (1984), **30** : 238–241.

Female : .Body slender and small (0.39–0.42 mm). Almost straight on fixation. Cuticle

finely striated, lateral field with four incisures. Head continuous with body and flattened. Stylet slender, small (7.4–8.5 μm) with rounded knobs. Basal oesophageal bulb pyriform. Cardia present. Vulva transverse, slit-like, reproductive system mono-prodelphic, ovary outstretched. Spermatheca small. Post uterine vulval sac very small. Tail is about 7-9 times of anal body width, filiform with a minutely rounded terminus.

Dimensions : L = 0.39–0.42 mm; a = 33–36; b = 4.8–5.4; c = 5.1–5.9; V = 65–67%; Stylet = 7.4–8.5 μm.

Male : Not found.

Habitat and distribution : Soil associated with ladies finger, bringal in Hyderabad and Secunderabad districts of Andhra Pradesh.

Basiria macrostriata (Sultana, 1980) Hashim, 1985
Syn. *Basiroides macrostriatus* Sultana, 1980

1980. *Basiroides macrostriata* Sultana, S. *Geobios*, **7** : 134–139.

1985. *Basiria macrosriata* Hashim, Z. *Nemtologica* (1984), **30** : 238–241.

Female :Medium sized nematodes (0.43–0.67 mm). Cuticle coarsely striated. Lateral field with four crenate incisures. Head almost continuous, round and slightly sclerotised. Stylet slender, small (9–11 μm) with flanged knobs. Oesophagus with more or less pyriform posterior bulb ovate median bulb with valve. Hemizonid large. Cardia small and discoid. Vulva transverse, slit-like. Reproductive system mono-prodelphic, ovary single and outstretched. Post uterine vulval sac measures half of the body diameter at vulval region. Tail long, filiform 8-10 anal body width long, regularly tapering to a pointed terminus.

Dimensions : L = 0.43–0.67 mm, a = 25–35, b = 5.3–6.3; c = 4.6–7.4; V = 62–66%; stylet = 9–11 μm.

Male : Not found.

Habitat and distribution : Soil around bean, drum-stick, cucurbit plants of Secunderabad.

Basiria siddiqi (Sultana, 1980) Hashim, 1985
Syn. *Basiroides siddiqi* Sultana, 1980

1980. *Basiroides siddiqi* Sultana, S. *Geobios,* **7** : 134–139.

1985. *Basiria siddiqi* Hashim, Z., *Nematologica,* (1984), **30** : 238–241.

Female : Body slender and small sized (0.38–0.45 mm). Body slightly curved ventrally upon fixation. Cuticle coarsely striated. lateral field with two crenate incisures. Head continuous and flattened, unsclerotised. Stylet slender and 7.4–8.6 μm long with rounded basal knobs. Oesophagus with more or less pyriform positerior bulb. Cardia small and discoid. Hemizonid large, just above the excretory pore. Reproductive system mono-prodelphic, ovary outstretched.

Post-uterine vulval sac measures half to one body diameter at the vulval body region. Tail long, slender, filiform with uniformly tapering to a minutely rounded terminus.

Dimension : L = 0.38–0.46 mm; a = 32–39; b = 4.9–5.9, c = 5.1–5.9; V = 65–68%; stylet = 7.49–8.56 μm.

Habitat and distribution : soil around tomato and bean of Secunderabad, A.P.

Remark : All the above species under the genus *Basiria* have been reported by Sultana (1980) from Andhra Pradesh. Besides these, Das and Sultana (1980) reported *Basiria simlai* and *B. raskiensis* from Hydeabad, Andhra Pradesh.

Family ANGUINIDAE Nicoll, 1945

Diagnosis : Small to large sized, vermiform nematodes, mature females may be obese or sedentary. Lateral fields plain or with 4, 6 or more incisures. Deirids and phasmids generally absent. Stylet thin and short (under 15 μm) with small rounded knobs. Oesophageal glands short, pyriform, not overlapping intestine or longer, stopping short of intestine or overlapping it for a short or a long distance. gonad single, anteriorly outstretched, may be reflexed or coiled in swollen adults. Post-vulval uterine sac may be present. Spicules robust, anteriorly expanded, tip furcate or broadly rounded. Tail elongate conoid, similar in sexes.

Genus ***Ditylenchus*** sp. Filipjev, 1936

1936. *Ditylenchus* sp. Filipjev, I. N. *Proc. Helminth. Soc. Wash.* **3** : 80–82.

Female : Body usually under 1.5 mm long, slightly ventrally curved upon fixation. Lateral field with 4 or 6 incisures. Cephalic region low flattened. Stylet small and delicate with small rounded knobs. Median bulb with or without valve plates. Glandular bulb short or long, may overlap intestine. Ovary outstretched with one or two rows of oocytes. Post-vulval unterine sac present or absent. Tail elongate-conoid to sub-cylindrical or filiform. Several species are the parasites of aerial parts of plants.

Male : Not found.

Habitat and distribution : Soils associated with groundnut of Guntur, Krishna, Nellore and Chittoor district.

Family BELONOLAIMIDAE Whitehead, 1960

Subfamily TELOTYLENCHINAE Siddiqi, 1960

Diagnosis : Cuticle prominently annulated, longitudinal striae or groove may be present. Lateral fields each with 3, 4, 5 or 6 incisures. Labial region never bulbous. Stylet 15–40 μm long with equally long conus and shaft. Oesophageal glands enclosed in a basal bulb. Intestinal fasciculi and post-rectal sac present or absent.

Key to the available genera of Telotylenchinae

1. Lateral fields with four incisures; stylet well developed with prominent knobs ..... ***Tylenchorhynchus***

– Lateral fields with three incisures; stylet extremely attenuated and slender with minute knobs ..... ***Trichotylenchus***

Genus *Tylenchorhynchus* Cobb, 1913

Tylenchorhynchus varicaudatus Singh, 1971

1971. *T. varicaudatus* Singh, S. D. *J.Helminth.* **45** : 353–369

Female : Body ventrally arcuate upon fixation. Lateral fields with four incisures, outer ones are crenate in appearance. Labial region continuous with two distinct annules. Stylet 17–18 μm long with well developed anteriorly directed knobs. Median bulb with well developed valvular apparatus, Basal oesophageal bulb large, set off from intestine. Cardia well developed. Vulva a transverse slit, vagina at right angle to body axis. Ovaries paired, spermathecae absent. Tail uniformly tapering, 2.3–2.8 anal body diameter long with bluntly conical tip. Phasmids slightly anterior to middle of tail.

Dimensions : L = 0.50–0.56 mm; a = 28–33; b = 4.3–5.2; c = 16.6–18.6; V = 57–59%, stylet = 17–18 μm.

Habitat and distribution : Soil associated with ferns, fruit trees, paddy in Nalgonda, Hyderabad districts of Andhra Pradesh.

Tylenchorhynchus mashhoodi Siddiqi & Basir, 1959

Syn. *T. digitatus* Das, 1960

T. dactylurus Das, 1960.

T. zeae Sethi & Swarup, 1968

1959. *Tylenchorhynchus mashhoodi* Siddiqi, M. R. & Basir *Proc. 46th Indian Science Congress,* 35.

1961. *T. mashhoodi* Siddiqi, M. R. *Z. Parasitenk.* **21** : 46–64.

1960. *T. digitatus* Das, V. M. *Z. Parasitenk.* **19** : 553–605.

1960. *T. dactylurus* Das, V. M. *Z. Parasitenk.* **19** : 553–605.

1968. *T. zeae* Sethi, C. L. & Swarup, G. *Nematologica* **14** : 77–88.

Female : Body 0.44–0.68 mm. cylindrical, cuticle with transverse striae. Lateral field with four incisures. Lip region continuous with 4 annules. Stylet 16–18 μm long with anteriorly directed basal knobs. Corpus spherical, valvate. Basal bulb elongate, set off from intestine. Cardia hemispherical. Valva transverse, slit-like, ovaries paired, spermathecae absent. Phasmids in the anterior half of tail. Tail 3–4 anal diameter long with bluntly rounded, smooth tail tip.

Dimensions : L = 0.44–0.68 mm; a = 27–33; b = 3.7–5.4; c = 12–14; Stylet = 15–19 μm.

Male : Not found.

Habitat and distribution : Soil associated with paddy in Medak & Hyderabad of Andhra Pradesh.

Remark : Singh (1971), Mani and Ratnakumar (1990) reported *Tylenchorhynchus curvus* Williams, 1960 from Hyderabad and *T. elegans* Siddiqi, 1961 from Nellore and Chittoor districts respectively.

Genus ***Trichotylenchus*** Whitehead, 1960

Trichotylenchus trilokiae singh 1971

1971. *T. trilokiae* Singh, S. D. *J. Helminth.* **45** : 353–369.

Female : Body 0.52–0.68 mm., cylindrical, ventrally arcuate on fixation. Cuticle with distinct transverse striae. Lateral fields with three incisures, outer pair is distinctly crenate. Head rounded, continuous with four annules. Stylet slender, 24–27 μm long with well developed, posteriorly directed knobs. Median oesophageal bulb ovate. Oesophago-intestinal junction distinct. Vulva transverse, slit-like. Ovaries paired, outstretched. Spermatchae absent. Phasmids small, pore-like. Tail gradually tapering to a rounded and striated terminus with 32–42 annules.

Dimensions : L = 0.52 – 0.68 mm; a = 26–33; b = 4.7–5.0; c = 11.8–16.5; V = 53–57%; stylet = 24–26 μm.

Male : Not found.

Habitat and distribution : Soil around fern in Hyderabad district.

Remark : Singh (1971) reported the above species from Andhra Pradesh.

Family PRATYENCHIDAE Thorne, 1949

Subfamily PRATYLENCHINAE Thorne, 1949

Diagnosis : Body remains vermiform in both sexes. Tail elongated, 2–4 anal body diameter (except *Apratylenchoides).* Phasmids located well behind anal or cloacal level (Except *Hoplotylus).*

Key to the available genera of Pratylenchinae

1. Stylet medium (20μm or less) one functional ovary; bursa terminal ..... ***Pratylenchus***

– Stylet reduced or massive; two functional ovaries; bursa subterminal or terminal 2

2. Stylet massive (15–46 μm); two functional ovaries; bursa subterminal ..... ***Hirschmanniella***

Stylet markedly reduced; ovares paired; bursa subterminal or terminal. ....***Radopholus***

Pratylenchus brachyurus (Godfrey, 1929),
Filipjev and Schuurmans Stekhoven, 1941

1929. *Tylenchus brachyurus* Godfrey.

1932. *Anguillulina brachyurus* (Godfrey) Goodey, T., *J. Helminth.* **10** : 75–180.

1941. *P. brachyurus* Filipjev, I. N. & Schuurmans Stekhoven, Jr. J. H., A manual of Agricultural Helminthology. Leiden, E. J. Brill, 878 pp.

1949. *P. leiocephalus* Steiner, G. *Proc. Soil. Sci. Soc. Fla* **4-B** : 72–117.

1954. *P. steineri* Lordello, Zamith and Boock.

Female : Lip region angular in shape marked with two distinct annules and set off from body. Stylet knobs large and round. Lateral field with four incisures. Vulva posterior in position. Ovary with single row of oocytes. Posterior uterine branch short, about one vulval body width in length. Tail subcylindrical with round smooth tail terminus.

Dimensions : L = 0.39–0.75 mm.; a = 15–29, b = 5.0–10.0; c = 13–28; V = 82–89%; stylet = 17.0–22.0 μm.

Habitat and distribution : Soils associated with groundnut in Nellore and Chittoor districts.

Remark : Mani & Ratnakumar (1990) reported the species from Andhra Pradesh.

Pratylenchus barkati Das and Sultana, 1979

1979. *P. barkati* Das, V. M. & Sultana, S. *Indian J. Nematol,* **9** : 5–14.

Female : Head flat, bearing three annules. Stylet knobs anteriorly directed. Lateral field 1/3rd of body width with four crenate incisures. Ovary reflexed, oocytes in a single row. Spermathecae small, oval in shape. Posterior uterine branch one vulval body width in length. Tail conoid, two and half anal body width long. Tail terminus blunt and annulated. Phasmids in middle of the tail.

Dimension : L = 0.49–0.55 mm; a = 25–29; b = 8.3–9.6; c = 17–21; V = 74–79; stylet –18.0–19.0 μm.

Habitat and distribution : Soils associated with groundnut, corn in Hyderabad, Nellore and Chittoor districts.

Partylenchus indicus Das, 1960

1960. *P. indicus* Das V. M., *Z. Parasitenk,* **19** : 553–605.
[Description and measurements given after Singh (1971)]

Female : Cuticle striated. Lateral fields with 4 incisures of which outer one is crenate. Lip region continuous with body, composed of 3 annules. Stylet with massive basal knobs.

Corpus of oesophagus spherical and valvate. Vulva a transverse slit. Ovary monodelphic and prevulvular. Oocyte in single file. Large oblong spermatheca present. Tail 2.5–3.5 anal body diameter in length, consisting of 19–24 annules. Tail tip not annulated, truncate.

Male : Body similar to female. Testis single, spicules crenate and cephalated, 13.4 μm long. Gubernaculum 4.5 μm long. Bursa enveloping tail.

Dimensions : Female : L = 0.4–0.47 mm; a = 26–30; b = 5.8–6.5; c = 13.3–15.8; V = 70.7–74.7%; stylet = 13.8–15 μm.

Male : L = 0.42 mm; a = 27, b = 5.2; c = 19; stylet = 12.6 μm.

Habitat and distribution : Rhizomes of ginger in Hyderabad.

Remarks : Das (1960) & Singh (1971) reported the species from Andhra Pradesh.

Pratylenchus Crassi Das and Sultana, 1979

1979. *P. Crassi* Das V. M & Sultana, S. Ind. J. Nematol, **9** : 5-14.
[Description & dimentions after Das and Sultana, 1979]

Female : Lip region low and flat, with two annules. Stylet knobs cup-shaped, directed anteriorly. Lateral field with four crenate incisures, occupying less than one third of body width. Ovary single, prodelphic, outstretched. Spermathecae oval, filled with sperm. Posterior uterine branch very small (less than one body width in length). Tail cylindrical, with 12–15 annules and about two anal body diameter in length. Tail terminus rounded and smooth. Phasmids in centre of tail.

Dimensions : L = 0.41–0.45 mm; a = 20–26; b = 7.7–8.8; c = 18–24; V = 72–77; stylet = 17.0–18.0 μm.

Male : Not recorded.

Habitat and distribution : Vegetable crops in and around Hyderabad, Andhra Pradesh.

Pratylenchus dasi Fortunar, 1985
Syn. *P. capitatus* Das & Sultana, 1979
P. hyderabadensis Das & Sultana, 1979

1979. *P. capitatus* Das, V. M. and Sultana, S. *Indian J. Nematol.* **9** : 5–14.

1985. *P. dasi* Fortunar, R. *Revue Nematol.* **8** : 77–83.

1979. *P. hyderabadensis* Das, V. M. and Sultana, S.

Female : Lip region rounded with three annules. Stylet knobs rounded. Lateral field marked with four incisures. Ovary outstretched, oocytes in single row. Posterior uterine branch one to one and half of vulval body diameter in length. Tail cylindrical, conoid and

more than two anal body width in length. Tail terminus smooth and bluntly ended. Phasmids in centre of tail.

Dimensions : L = 0.45–0.56 mm; a = 23–31; b = 7.6–9.5; c = 14–21; V = 72–78; stylet = 18.0–19.0 μm.

Male : Not recorded.

Habitat and distribution : Soils associated with vegetable crops in Hyderabad, Andhra Pradesh.

Remarks : Das and Sultana (1979) described two new species as *P. capitatus* and *P. hyderabadensis* from Hyderabad, Andhra Pradesh, both of which were synonimized under *P. dasi* by Fortunar (1985).

Pratylenchus delattrei Luc, 1958
Syn. *P. singhi* Das & Sultana, 1979

1958. *P. delattrei* Luc, M., *Cotton et Fibres Tropicales*, **13** : 1–18.

1979. *P. singhi* Das V. M. & Sultana, S. *Indian J. Nematol.*, **9** : 5–14.

Female : Lip region flattened with three annules. Stylet knobs laterally directed. Lateral field with four crenate incisures. Ovary single, reflexed, oocytes in one row. Spermatheca large spherical, filled with sperm. Posterior uterine branch small. Tail subcylindrical, terminus smooth and sub hemispherical. Phasmids in anterior half of tail.

Dimensions : (After Das & Sultana, 1979) : L = 0.44–0.49 mm; a = 20–25; b=8.1–8.8; c = 18–23; V = 75–77; sytlet = 17.0–18.0 μm.

Male : Not recorded.

Habitat and distribution : Soil associated with vegetable crops in Hyderabad, A.P.

Remarks : Das and Sultana (1979) recorded *P. singhi* as a new species from Hyderabad, Andhra Pradesh, which has been synonimized with *P. delattrei* Luc, 1958.

Pratylenchus exilis Das & Sultana, 1979

1979. *P. exilis* Das, V. M. & Sultana, S., *Ind. J. Nematol.*, **9** : 5–14.

Female : Lip region flat, bearing three annules. Stylet knobs laterally directed. Lateral field with four crenate incisures. Ovary outstretched. Spermatheca spherical and small in size. Posterior uterine branch about one vulval body diameter in length. Tail cylindrical, bearing 17–20 annules and about 2–2½ times of anal body width in length. Tail terminus annulated. Phasmids in posterior half of tail.

Dimensions : Female : L = 0.49–0.56 mm' a = 30–35; b = 8.6–9.2, c = 15–20; V = 73–76; stylet : 17–18 μm.

Male : L = 0.55 mm; a = 47; b = 9.5; c = 17, stylet = 16.0 μm. Spicules = 16.1 μm, gubernaculum = 4.3 μm.

Habitat and distribution : Soils associated with vegetable crops in Hyderabad, A.P.

Pratylenchus nizamabadensis Maharaju & Das, 1981.

1981. *P. nizamabadensis* Maharaju, D & Das, V. M. *Proc. Indian Acad. Parasitol.*, **2** : 24–25.

Female : Lip region flat with four annules. Stylet knobs round, slightly anteriorly projected. Lateral field ¼th of body width makred by four crenate incisures. Ovary outstretched, oocytes in single row. Spermatheca absent. Posterior uterine branch less than one vulval body width in length. Tail with 15–24 annules, two to two and half times of anal body width in length. Tail terminus crenate. Phasmids in anterior half of tail.

Dimensions : (After Maharaju and Das, 1981) L = 0.41–0.52 mm; a = 23.4–27; b = 8.5–9.7; c = 17–27; T/ABW = 1.8–2.5; V = 67–78.7%, stylet = 17.5–18.7 μm.

Male : Not recorded.

Habitat and distribution : Soil around roots of groundnut at Nizamabad district, Andhra Pradesh.

Pratylenchus flakkensis Seinhorst, 1968

1968. *P. flakkensis* Seinhorst J. W., *Nematologica*, **14** : 497–510.

Female : Head with two annules. Spear knobs anteriorly directed. Lateral field with four incisures, band between inner lines plain and outer incisures areolated on posterior third of tail. Ovary outstretched, spermatheca round to angular. Posterior uterine branch extends upto 25–30% distance between vulva and anus and more than one vulval-body width in length. Tail conical with 18–24 annules, tail tip annulated, rounded, truncate or irregularly crenate.

Dimensions : (After Seinhorst, 1968).

Female : L = 0.42–0.57mm; a = 20–17; b = 5.2–7.1; c = 12–18; V = 73–77%; stylet = 17.0 μm.

Male : L = 0.42–0.49 mm; a = 27–33; b = 5.1–6.5; c = 18–21; stylet = 16.0 μm; spicules–15.0 μm.

Habitat and distribution : Maharaju and Das (1984) reported *P. flakkensis* from soils around groundnut in Telengana region of A.P.

Pratylenchus manohari Quraishi, 1982

1982. *P. manohari* Quraishi, M. A. *Indian J. Nematol.*, **12** : 208–210.

Female : Head offset with three distinct annules. Stylet knobs slightly anteriorly directed.

Lateral field covering ¼th body width, marked by four incisures. outer being crenate. Ovary outstrtched, oocytes in single row. Spermatheca without sperm. Posterior uterine branch about one to one and half times of vulval body width long. Tail bearing 13 – 15 annules and about one and half anal-body width in length. Tail tip rounded and smooth. Phasmids inconspicuous and in posterior half of tail.

Dimensions : (After Quraishi, 1982).

L = 0.42–0.51 mm; a = 17–25; b = 5.0–6.0; b = 3.8–4.0; c = 18–20; V = 78–80%; stylet = 15.0–18.0 μm.

Male : Not recorded.

Habitat and distribution : Quraishi (1982) reported the occurance of *P. manohari* from grape vine yard of Hyderabad City, A. P.

Pratylenchus thornei Sher and Allen, 1953.

1953. *P. thornei* Sher, S. A. & Allen, M. W., Univ. *Calif. Publ., Zool.*, **57** : 441–470.

Female : Body open 'C'–shaped on fixation which is unique feature of this species. Lip region continuous, conical, high, marked with three annules. Stylet knobs broadly rounded. Lateral field with four incisures, outer one being smooth or weakly crenate extending beyond phasmids. Oocytes arranged in single row but multiple rows near anterior end. Spermatheca absent. Posterior uterine branch more than one and half body diameter at vulva. Phasmids in posterior half of tail. Tail bluntly rounded with smooth terminus.

Dimensions : (After Sher and Allen, 1953).

Female : L = 0.41–0.77 mm; a = 25–36; b = 5.4–8.3; c = 18–25; V = 73–80%; stylet = 15.0–19.0 μm.

Male : L = 0.48–0.49 mm; a = 29–32; b = 5.6–6.2; c = 20; T = 30; stylet–16.0 μm.

Habitat and distribution : Soil around roots of corn (*Zea mays* L.) in and around Hyderabad, A.P.

Remarks : Singh (1971) reported the species from Andhra Pradesh.

Pratylenchus Zeae Graham., 1951

1951. *P. zeae* Graham, T. W., *South Carolina Agric. Expr. Station Bull.*, **390**, 25 pp.

Female : Lip region continuous, rounded, marked with three annules. Stylet knobs broadly flattened. Lateral field with four incisures. Ovary not extending upto oesophagus. Oocytes in two rows. Spermatheca absent. Posterior uterine branch about one vulval body width in length. Tail tapering into a pointed smooth terminus.

Dimensions : *Female* : L = 0.36–0.58 mm; a = 25–30; b = 5.4–8.0; c = 17–21; V = 68 – 76%, stylet = 15.0–17.0 μm.

Male : Not found.

Habitat and distribution : Rhizospheric soils of corn (*Zea* mays) and groundnut in Chittoor and Nellore districts of Andhra Pradesh.

Remarks : Das (1960) recorded *Pratylenchus brevicercus* and *P. indicus* from Andhra Pradesh but both the species have been placed under species enquirendae.

Genus ***Hirschmanniella*** Luc & Goodey, 1964

H. mucronata (Das, 1960) Luc & Goodey, 1964
Syn. *H. mangalorensis* Mathur & Prasad, 1971
H. indica Ahmad, 1974

1960. *H.* mucronata Das, V. M., *Z. Parasitenk,* **19** : 553–605.

1964. *H. mucronata* Luc, M. & Goodey.

1971. *H. mangalorensis* Mathur, V. K. & Prasad, S. K., *Indian J. Nematol.*, **1** : 220–226.

1974. *H. indica* Ahmad, S., *Indian J. Nematol,* **2** : 117–122.

Dimensions : L = 1.67–2.22 mm; a – 57–60; b = 11–14; b' = 4.6–5.2; c = 18–20; c' = 4.1 = 5.1; V = 49–53%; stylet = 24–29 μm, spicules = 29–36 μm; gubernaculum = 9–14 μm.

Remarks : Das (1960) reported *H. mucronata* from Hyderabad. Maharaju and Das (1984) reported this parasite from groundnut in Telengana region of A.P.

H. oryzae (van Breda de Hann, 1902), Luc & Goodey, 1964

1902. *Tylenchus oryzae* van Breda de Hann.

1932. *Anguilludina oryzae* Goodey, T., *J. Helminth.*, **10** : 75–180.

1962. *Hirschmannia oryzae* Luc, M & Goodey, J. B., *Nematologica,* **7** : 197–202.

1964. *Hirschmanniella oryzae* Luc, M & Goodey, J. B., *nematologica,* **9** : (1963) : 471.

1966. *H. nana Siddiqi,* M. R. Indian J. Helminth. (Seminar suppl.), **18** : 114–123.

1972. *H. exigua* Khan, A. M. *final Tech. Rep.*, Aligarh, India : A. M. U. iv + 238 pp.

Female : Lateral field marked with four incisures, outer one crenate, some times incomplete areolation may occur on tail. Lip region continuous; low flattened with rounded edges, marked by 3–4 annules. Stylet robust with rounded basal knobs. Spermatheca with sperm. Intestine not overlapping rectum. Tail elongate-conoid with mucronate terminus.

Dimensions : Female : L = 1.4–1.63 mm; a = 50–67; b = 8.8–12.1; b' = 4.5–7.2; c = 15 –19; c' = 4.3–5.5; V = 50–55%; stylet = 16–19 μm.

Male : L = 1.01–1.40 mm; a = 52–61; b = 9.1–11.3; b = 4.6–5.7; c = 16–18; spicules = 18–28 μm; gubernaculum = 7–9 μm.

Habitat and distribution : Soil around paddy in most of the coastal districts of Andhra Pradesh. Mani and Ratnakumar (1990) reported the parasite from the soils associated with groundnut in Chittoor and Nellore districts.

Remarks : The species is widely distributed all over India and considered a key pest of paddy.

Hirschmanniella orycrena Sultana, 1979

1979. *H. orycrena* Sultana, S., *Indian J.* Nematol, **8** (1978) : 174–176.

Female : Body striae 3 μm apart on mid body. Lateral field with 4 crenate incisures. Lip region hemispherical with 3 distinct annules. Dorsal oesophageal gland orifice 4-5 μm behind the spear base. Spermatheca small, oval, filled with sperms. Tail 3-4 anal-body width long, conoid, with a bluntly pointed terminus. Tail tip ending in a fine mucro measuring 3 μm in length.

Dimension : L = 1.50–1.72 mm; a = 63–84; b = 11–15; c = 13–19; c' = 3.0–4.0; V = 51–56; style 22–24 μm; spicules = 26–30 μm, gubernaculum = 5–11 μm.

Remarks : *H. orycrena* has been reported from rhizospheric soil of *Mentha arvensis* by Sultana (1979) from Hyderabad, Andhra Pradesh.

H. telanganensis Maharaju, 1981

1981. *H. telanganensis* Maharaju. D. *Indian J. Plant Prot*, **IX**(2)(1982) : 195–197.

Female : Large in size. Cuticle with strong striation. Lateral field non-areolated with four crenate incisures. Head continuous with body with 4 annules. Stylet 25.7 μm long, well developed, knobs rounded. Precorpus slender, metacorpus ovate and valvulated. Posterior esophageal gland lobe-like overlapping intestine ventrally. Vulva transverse, slit-like, posteriorly situated. Gonad amphidelphic, ovaries outstretched. Spermatheca small and oval. Tail conoid, tapering to a blunt terminus with a central mucro.

Dimensions : (After Maharaju, 1981)

Female : L= 1.43–1.95 mm; a = 40.7–59.8; b = 16.3–22; b' = 3–5.9; c = 15.2–20.8; c' = 3.5–5; V = 44.8–61%; stylet = 23.4–25.7 μm.

Male : L = 1.39–1.67mm; a – 45–56; b = 14.3–18.2; b' = 3.8–6.6; c = 16–22.8; c' = 3.6 –5; stylet = 23–25.7 μm; spicules = 31–32.7; Gubernaculum = 8–11.7 μm.

Remark : *H. telanganensis* has been reported by Maharaju (1981) from the soil around the roots of groundnut from Khammam district, Andhra Pradesh.

Genus ***Radopholus*** Thorne, 1949

R. similis (Cobb, 1893) Thorne, 1949

1893. *Tylenchus similis* Cobb, N. A. *Macleay Mem. Vol. Linn. Soc. N. S. W.*, 252–308.

1949. *Radopholus similis* Thorne, G. 1949. *Proc. Helminth. Soc. Wash.*, **16** : 37–73.

Female : Lip region hemispherical, slightly set off or continuous. Six similar lips. Stylet knobs rounded to slightly projected anteriorly. Spermatheca with rod-like sperms. Lateral field with four incisures, sometimes incompletly areolated on tail. Tail tapering, rounded with variable terminus.

Dimensions : Female : L = 0.52–0.88 mm; a = 22–30; b = 4.7–7.4; b' = 3.5–5.1; c = 8–13; c' = 2.9–4.0; p V = 55–61%; stylet = 17–20 μm.

Male : L = 0.59–0.67 mm; a = 31–44; b = 6.1–6.6; b' = 4.1–4.9; c = 8–10; c' = 5.1–6.7; stylet = 12–17 μm; spicules = 19–22 μm; gubernaculum = 8–12 μm.

Habitat and distribution : Rhizospheric soil of banana with wide distribution in different districts of Andhra Pradesh.

Remarks : Singh, Rao & Reddy (1979) reported the species from A. P.

Family HOPLOLAIMIDAE Filipjev, 1934

Diagnosis : Small to moderately large (usually 0.5–1.5 mm). Female vermiform to kidney shaped. Lateral fields typically with four lines. Deirids absent. Phasmids either small pore-like or large scutellum-like. Lip region elevated, high arched. Stylet strong, knobs large, rounded or indented. Oesophageal glands generally overlapping the anterior intestine. Female reproductive system amphidelphic, rarely mono-prodelphic. Epiptygma and vulval flaps generally present but sometimes inconspicuous. Males with large bursa, enveloping the tail. Spicules robust or slender. Tail typically short, rarely longer.

Key to the available subfamilies of family HOPLOPLAIMIDAE

1. Adult female vermiform; Phasmids small or englarged (scutellum); lip region elevated, high arched ..... HOPLOLAIMINAE

– Mature female swollen or kidney-shaped; Phasmid always pore-like; lip region high but not much ..... ROTYLENCHULINAE

Key to the available genera of Hoplolaiminae

1. Phasmids scutellum-like; lip region set off from body. Oesephageal gland overlaps intestine dorsally and laterally ..... ***Hoplolaimus***

– Phasmids small; lip region continuous; Oesophageal glands overlap intestine ventrally ..... ***Helicotylenchus***

Genus ***Hoplolaimus*** Daday, 1905

Hoplolaimus indicus Sher, 1963
Syn. *H. arachidis* Maharaju & Das, 1982

1963. *Hoplolaimus indicus* Sher, S. A. Nematologica, **9** : 267–295.

1982. *H. arachidis* Maharaju D. & Das V. M., *Proc. Indian Acad. Parasitol,* **3**(1&2) : 30-32.

Female : Body ventrally curved on fixation. Lip region set off. Stylet knobs anteriorly, usually with one to three inconspicuous protruberances. Stylet robust. Median oesophageal bulb spheroid. Oesophageal gland overlapping intestine dorsally or laterally, with six nuclei. Gonad amphidelphic. Tail round with 8–13 annules.

Dimensions : Female : L = 0.95–1.4 mm; a =26–36; b = 9.1–12.6; b' = 7–9.1; c = 45–74; v = 50–59%; stylet = 33–40 μm.

Male : L = 0.9–1.3 mm; a = 26–33; b = 9.4–12; b' = 6.2–9; c = 32–38; stylet = 33–37 μm; spicules = 37–42 μm; Gubernaculum = 16–20 μm.

Habitat and distribution : Soil around roots of groundnut in Mehaboobnagar district, Andhra Pradesh.

Remark : Maharaju & Das (1982) reported *H. archidis* as a new species from Andhra Pradesh which has been synonimized with *H. indicus* sher, 1963.

Hoplolaimus seinhorsti Luc, 1958

1958. *H. seinhorsti,* Luc, M. coton et Fibres Tropicales, f. **13** (2); 1–18 c.f. Krall, E. L. (1985), Root Parasitic nematodes, Family Hoplolaimidae, pp. 1–580.

Female : Lip region slightly set off, usually with four circular rings. Stylet knobs anteriorly directed usually with two tapering protrusions, sometimes with two or three smaller 'denticles' between them. Oesophageal glands with six nuclei. Excretory pore usually at level of isthmus of oesophagus. Epiptygma usually unpaired and anteriorly or posteriorly adjacent to vulva. Spermatheca absent. Lateral field reduced, represented by incisures, often poorly defined. Tail terminally rounded with 10–15 cuticular rings on ventral side.

Dimensions : L = 1.06-1.56 mm; a = 25–34; b = 8.8–10.1; b' = 6.0–10.1; c = 38–74; V = 52–60%; stylet = 40–49 μm.

Male : Not detected.

Habitat and distribution : Singh (1971) recorded the species from the soil around the roots of cauliflower and mango from Andhra Pradesh.

Hoplolaimus singhi Das & Shivaswami, 1976

1976. *H. singhi* Das and Shivaswami. *Revista Parasitol.* **37** : 259–264.

Dimensions : L = 1.4–2.1 mm; stylet = 43–56 μm; spicules = 52 μm; Number of oesophageal nuclei three, number of labial annules four; excretory pore anterior to hemizonid, number of tail annules = 7.

Distribution : Das and Shivaswamy (1976) reported *H.* singhi from A. P.

Genus ***Helicotylenchus*** steiner, 1945

Helicotylenchus abunnamai Siddiqi, 1972

1972. *H. abunnamai* Siddiqi, M. R. *Nematologica,* **18** : 74-91

Female : Body spirally curved; Lip region hemispherical, continuous width 4 (rarely 3 and 5) distinct annules. Lateral fields with smooth incisures, about $^{2}/_{9}$th from anterior end. Basal knobs of spear about 4 μ across and by 2 μ high, with flattened to slightly concave anterior surfaces. Median oesophageal bulb rounded to distinctly oval. Oocytes in a single file. Spermathecae empty, dorsally off set. Intestine not extending over rectum. Tail tapers regularly upto distal third, then becomes ventrally convex and dorsally concave with a narrow hemispheriodal terminus.

Dimensions : L = 0.52–0.63mm; a = 25–29; b = 5.5–6.7; b' = 4.5–5.1; c = 33–44; c' = 1.10–1.42; V = 59–65; spear = 21/22 μm.

Habitat and distribution : Soil around groundnut of Nellore and Chittoor districts of Andhra Pradesh.

Remarks : Mani & Ratnakumar (1990) reported the species from Andhra Pradesh.

Helicotylenchus indicus Siddiqi, 1963
Syn. *H. microdorus* Prasad *et al.*, 1965

1963. *H.* indicus Siddiqi M. R., *Z. Parasitenkunde* **23**(3) : 239–244. c.f. Krall, E. L. (1985)., Root Parasitic Nematodes, Family Hoplolaimidae, oxonian Press Pvt. Ltd., New Delhi, pp. 1–580.

1965. *H. microdorus* Prasad, S. K. Khan, E. and Chawla, M. L. *J. Ent.* **27** : 182–184.

Female : Body spiral on relaxation. Lip region high, usually anteriorly blunt with 4–5 annules. Stylet knobs rounded, with backwardly directed anterior margin. Metacorpus ovoid, one-half width of body cavity. Subventral oesophageal gland elongated, ventrally overlap the commencement of intestine. Vulva in form of transverse slit. Both uteri with separate spermatheca at distal ends. Ovaries paired, straight. Tail in form of asymetrical blunt cone, dorsally arcuate, ventrally almost straight, terminus rounded or with negligible outgrowth.

Dimensions : L = 0.45–0.63 mm; a = 23–32; b = 5.5–64; c = 33–47; V = 60–65%; stylet = 21–23 μm.

Habitat and distribution : Soil around the roots of groundnut in Nellore, Chittoor district and Telengana region of Andhra Pradesh.

Remarks : Mani & Ratnakumar (1990) reported the species from Andhra Pradesh.

Helicotylenchus pteraceracus singh, 1971

1971. *H. pteraceracus* Singh, S. D. *Journal of Helminthology*, **45** : 353–369.

Female : Body assuming a spiral form when relaxed. Cuticle coarsely striated Lateral fields completely interrupting transverse striae and marked by four incisures. Lip region continuous with body, hemispherical with five annules. Stylet robust, with well developed, anteriorly directed and somewhat concave basal knobs. Precorpus cylindrical, narrow, median bulb hemispherical with powerful vulvular apparatus. Isthmus slender. Oesophago-intestinal junction valvate. Oesophageal gland overlaps anterior end of intestine mainly ventrally. Vulval flaps present, vagina at right angle to body axis. Ovaries paired outstretched. Spermatheca conspicuous, offset. Tail short with 10–15 annules having pronounced and blunt ventral projection. Tail terminus indented. Phasmids small, pore-like.

Dimensions : Female : L = 0.62–0.73 mm; a = 25–29; b = 5.3–6.6; b' = 4.5–5.3; c = 41–68; c' = 0.60–1.08; V = 57.1–65%; stylet = 23.5 to 25.2 μm.

Male : Not known.

Habitat and distribution : Soil around root of paddy in Hyderabad district, A. P.

Helicotylenchus retusus Siddiqi & Brown, 1964
Syn. *H. impar* Prasad *et. al.*, 1965

1964. *H. retusus* Siddiqi, M. R. & Brown, K. F. *Proc. Helminth. Soc.* Wash **31** : 209–211.

1965. *H. impar* Prasad, S. K., Khan, E., Chawla, M. L. *J. Ent.*, **27** : 182–184.

Female : Body in form of simple spiral on relaxation. Lateral fields with four incisures, areolated only in anterior part. Lip region continuous, high coned. Stylet well developed, knobs taper anteriorly. Procorpus cylindrical, metacorpus spherical, isthmus slender, vulva in form of transverse slit with two lateral membrane. Ovaries paired, straight. Tail with 9–13 annules, terminus obtusely rounded.

Dimensions : L = 0.73–0.77 mm; a = 33–36; b = 5.7–6.0; c = 48–53; V = 61–64; stylet = 26–27 μm.

Male : Not known.

Habitat and distribution : Mani and Ratna Kumar (1990) reported this species from soil around the roots of groundnut in Nellore and Chittoor district of A. P.

Subfamily ROTYLENCHULINAE Husain & Khan, 1967

Diagnosis : Small sized (0.5 mm or less). Body of mature female swollen or kidney shaped. Lateral field with four lines. Phasmids always pore like near anus or on tail. Stylet

and median oesophageal bulb well developed in females and juveniles. Male stylet weak. Young female and male tails similar in being elongated and having a long hyaline terminal portion, tail persists in mature swollen female.

Genus ***Rotylenchulus*** Llinford and Oliveria, 1940

Rotylenchulus reniformis Linford & Oliveira, 1940

1940. *R. reniformis* Linford & Oliveira, *Proc. Helminth. Soc. Wash.* **7**(1) : 35–42.

Mature Female : Obese, kidney-shaped, neck contour irregular. Vulva raised. Body beyond anus hemispherical, with a slender terminal portion 5-9 μm long. Eggs laid in a gelatinous matrix.

Male : Anterior region degenerate, stylet and oesophagous degenerate. Spicules elongate, slender, ventrally arcuate. Gubernaculum linear, bursa reduced, subterminal.

Dimensions : Mature female : L = 0.38–0.52 mm; a = 4–5; V = 68–73; Body width at vulva = 100–140 μm.

Male : L = 0.38–0.43mm, a – 24–29; b' = 2.8–4.8; c = 12–17; T = 35-45; stylet = 12–15 μm. spicules = 19–23 μm, gubernaculum = 7–9 μm.

Habitat and distribution : Rhizospheric soil of groundnut in Nellore and Chittoor districts. Singh (1971) reported this species from grape plants in grape orchards in Khammam district in A.P.

Family HETERODERIDAE Filipjev & Schuurmans. Stekhoven, 1941

Key to the subfamilies of the family Heteroderidae

1. Mature female oval, lemon-shaped or spheroidal with a short neck; may or may not form cyst; tail absent ..... HETERODERINAE

– Mature female round, oval to pear–shaped with a projecting neck; No cyst stage; tail rudimentary or absent ..... MELOIDOGYNINAE

Subfamily HETERODERINAE Filipjev & Sch. Stekhoven, 1941

Genus ***Heterodera*** Schmidt, 1971

H. sorghi Jain, Sethi, Swarup & Srivastava, 1982

1982. *H.* sorghi Jain, K. K., Sethi, C. L., Swarup, G. and Srivastava A. N. *Revue Nematol.* **5** : 201–204.

Female : Cysts are dark brown and black. Adults are lemon shaped with neck. Cysts with posterior protuberance. Stylet length 20–23 μm. with anteriorly directed basal knobs second stage larva. The number of lateral lines three in 2nd stage juvenile.

Dimensions : Cysts : Cyst length = 470–990 μm; cyst width = 350–600 μm; cyst $^{L}/_{W}$ = 1.2–1.9; vulval slit length = 28–51 μm; Fenestral length = 32–65; Fenestral width = 27–56; under bridge length = 100–150 μm; Under bridge with = 28–52 μm; under bridge depth = 24–54 μm; vulval bridge = 4–9 μm.

2nd stage juveniles : L = 400–525 μm; a = 20–28; b = 3.8–6.2; b' = 2.5 = 3.9; c = 7.5 –9.9; c' = 3.1–5.9; stylet = 20–23 μm; Tail length = 42–60 μm.

Habitat and distribution : Roots of groundnut in some districts of Rayalaseema, coastal regions and in Prakasam district.

Remarks : Sharma & Sharma (1988) reported the species from A. P.

Subfamily MELOIDOGYNINAE Skarbilovich, 1959

Genus *Meloidogyne* Goeldi, 1892

Key to available species of Meloidogyne

1. Lateral field with 2 incisures fairly wide in perineal pattern; inter phasmidial distance 25–27 μm; vulval width 24–27 μm ..... *M. javanica*

– Perineal pattern with dorsal arch very high and with irregular striae but without lateral line ..... *M. incognita*

Meloidogyne incognita (Kofoid & white, 1919) Chitwood, 1949

1919. *Oxyuris incognita* Kofoid and white, *J. Am. med. Ass.*, **72**(8) : 567–569.

1923. *Heterodera incognita* (Kofoid & White, 1919) Sandground, *Parasitology*, **10**(2) : 92–94.

1949. *Meloidogyne incognita* Chitwood, B.G. *Proc. Helminth. Soc. Wash.*, **16** : 90–104.

Female : Body spherical with projecting neck, lip region with 2–3 μm behind lip cap. Cuticle thickens abruptly at base of stylet. Stylet knobs rounded. Perineal pattern high variable, typical "incognita type" with striae closely spaced very wavy to zig zag, specially dorsally and laterally. Lateral field not clear, sometimes marked by breaks in striae. Dorsal arch variable. Striae often forked along a lateral line.

Male : Body showing marked sexual dimorphism, slender. Cuticle transversely striated. Lateral field with 4 incisures, outer bands areolated. Lip region almost continuous with body, high, truncate, cone-shaped. Tail bluntly rounded with smooth terminus. Phasmids nearly at cloacal level. spicules slightly curved. Bursa absent.

Dimensions : Female : L = 500–723 μm; width = 331–520 μm; stylet = 13–16 μm; width of stylet base = 3–5 μm.

Male : L = 1.11–195 mm; a = 31–35; stylet = 23–33 μm; width of stylet base = 4.7–6.8 μm; spicules = 29–40 μm; gubernaculum = 9.14 μm.

2nd Stage Larva : L = 0.34–0.40 mm; a = 25–32; b = 2.0–2.1; b' = 6.4–8.84; tail length = 38–55 μm; stylet = 9.6–11.7 μm.

Habitat and distribution : Mani & Sri Hari (1989) reported this species from the roots of turmeric in Chittoor and Cuddapah districts, A. P.

M. javanica (Treub, 1885) Chitwood, 1949

1885. *Heterodera javanica* Treub.

1901. *Anguillula javanica* Lavergne.

1949. *Meloidogyne javanica* Chitwood, B.G. *Proc. Helminth. Soc. Wash*, **16** : 90–104.

Female : Adult body almost spherical with a beak-like neck, posteriorly round. Lip region slightly wider, one annule behind head cap. Spear slender dorsally curved with rounded basal knobs. Perineal pattern oval, striae smooth to wavy with two lateral incisures.

Male : Lip region rounded, not demarcated. Amphid distinct. Lateral field with four incisures. Tail bluntly rounded ventrally. Phasmids at cloacal level. spicules curved slightly.

Dimensions : *Female* : L = 0.35–0.80 mm; width = 3.1–5.0 mm; stylet = 13–17 μm; knobs = 2–4 μm.

Male : L = 0.74–1.1 mm; a = 14.3–16.9; stylet = 18–22 μm; spicules = 20–30 μm.

Habitat and distribution : Mani (1986) reported the occurrence of *M. javanica* in citrus roots. Mani, Dakshinamurti and Reddy (1988) recorded the species from commercial citrus nurseries located at Kadium, Kodur, Palacole, Panyam and Tirupati.

Superfamily CRICONEMATOIDEA Taylor, 1936

Key to the families of super family CRICONEMATOIDEA

1. All stages vermiform, small to large nematodes; Body sausage-shaped to cylindrical; Body annuli either retrorse, provided or not with lobation, crenation, scales or spines ..... CRICONEMATIDAE

– Body slender, swollen or globose, usually small nematodes; cuticle thin except in some swollen or globose forms, without ornamentations or with fine punctations or minute spines ..... TYLENCHULIDAE

Key to the subfamilies of the family CRICONEMATIDAE

1. Mostly small, stout nematodes upto 0.86 mm; annulation strongly developed with smooth or slightly crenate cuticle, or various scales and spine-like projections of posterior margins of annuli, ruffled or platelet-like extracuticular coverings ..... CRICONEMATINAE

– Moderate to large sized (0.60–1.7 mm) nematodes with cylindrical body. Cuticle with round, coarse, nonretrose annules, devoid of lobes, spines, scales but sometimes provided with superficial ornamentation. ..... HEMICYCLIOPHORINAE

Key to the available genus of *Criconematinae*

1. Body small to large (0.24–0.74 mm), body annules 24–134; cuticle smooth or variously ornamented with scale like projection, irregular plate-like covering or ruffled or ribbon-like ornamentation. ..... *Criconema*

– Body small to medium sized (0.29–0.67 mm), body annules 51–164; Annules round and flat or rarely retrorse, lacking scales, spines or other appendages .... *Hemicriconemoides*

Genus ***Criconema*** Hofmanner & Menzel, 1914

Criconema lamellatum (Raski & Golden, 1965) Raski and Luc, 1984

1965. *Criconemoides* lamellatum Raski, D.J. & Golden, A.M. *Nematologica,* **11** : 501-565.

1984. *Criconema lamellatum* Raski, D.J. & Luc, M. *Ravue. Nematol,* **7** : 323–334.

Dimensions : Female : L = 0.27–0.41 mm; a = 10.2–11.3; b = 3.3–4.1; c = 40.0–53.0; V = 91.8–92.5%; VB = 1.0; VL/Vst = 0.4–0.5; Oes = 56.2–58.2; R = 56, Rst = 9–11; Rex = 17–23; Rv = 4, Ran = 1–2; Rvn = 1–2; Stylet = 57 μm.

Male : Not known.

Habitat and distribution : Muthukrishnan (1987) reported the species from the soil associated with citrus in Guntur district, Andhra Pradesh.

Genus ***Hemicriconemoides*** Chitwood & Birchfield, 1957

H. brachyurus (Loos, 1949) Chitwood & Birchfield, 1957

1949. *Criconemoides brachyurus* Loos, C. A., *J. Zool Soc. India,* **1** : 17–22.

1957. *Hemicriconemoides brachyurus* Chitwood, B.G. & Birchfield W. *Proc. Helminth. Soc. Wash,* **24** : 80–86.

Dimensions : Female : L = 0.30–0.54 mm; a = 13–17; b = 3.0–5.2; c = 16–30; V = 93–95; VL/VB = 1.0–1.4; R = 98–119; Rv = 7–10; Ran = 6–7; Rst =10–16; Roes = 19–25; Rex = 21–27; stylet = 48–64 μm.

Stylet knob anchor shaped. Tail shape hemispherical or bluntly conoid.

Male : Not known.

Habitat and distribution : Soil around the roots of groundnut in Telengana region, from coconut palm in Bapatla, Guntur District, Andhra Pradesh.

Remarks : Muthukrishnan (1987) reported the species from Andhra Pradesh.

Hemicriconemoides mehdi Suriyawanshi, 1971

1971. *H. mehdi Suriyawanshi, M.V. Nematologica,* **17** : 393-306.

Female : Circular sheath attatched to body at anterior end and at vulva, not well separated on posterior part of tail. Lip region with three annules, first annule being angular, anteriorly concave. Labial disc not prominent. Spear knobs about 7.5 μ wide. Exeretory pore 36–40 annules behind the anterior end and 8-9 annules behind the oesophago-intestinal junction. Anus indistinct. Tail conical with rounded terminus, narrowing abrutply in posterior part which consists of 4–5 annules. Vulval sheath small. Gonad monodelphic, outstretched. Spermatheca oval.

Dimension : L = 0.41–0.54 mm; a = 13–17; b = 4.2–5.9; V = 91–92%, V' = 35–46; VL/VB = 1.5–2.0; R = 130–150; RV = 12–14; Ran = 10–13; Spear = 48–59 μ; Rex = 36–40.

Male : Not known.

Habitat & Distribution : Soil around groundnut in Telengana region and citrus and turmeric in Guntur District, Andhra Pradesh.

Remark : Muthukrishnan (1987) reported the species from Andhra Pradesh.

Hemicriconemoides cocophilus (Loos, 1949) Chitwood & Brichfield, 1957

1949. *Creconemoides cocophilus* Loos, C. A. 1949. *Ceylon J. Sci., Sect. B. Zool.,* **23** : 119–124.

1957. *H. cocophilus* Chitwood, B. G. & Birchfiled, W. *Proc. Helminth. Soc. Wash.,* **24** : 80-86.

Dimensions : Female : L = 0.35–0.50; a = 11–16; b = 4.1–5.4; c = 11 = 30; V = 90–94; R = 95–130; Rv = 8–11; Ran = 6-8; Rst = 13–19; Roes = 20–33, Rex = 25–36; Stylet = 49 –58 μm.

Stylet knob anchor shaped.

Habitat and Distribution : Soil around the roots of papaya and groundnut in Telegana region, Andhra Pradesh.

Subfamily HEMICYCLIOPHORINAE Skarbilovich, 1959

Genus ***Hemicycliophora*** De Man, 1921

Diagnosis : Female 0.42–2.0 mm in length, covered with an extra cuticular sheath. Body annules coarse, rounded not retrorse. Labial annules two (exceptionally three) not modified or separated. Vulva in form of a transverse slit. Vagina straight or curved but not sigmoid. In males, spicule arcuate, semi circular, 'U' or hook-shaped. Bursa covering less than one third of the tail. Tail longer than that of female.

Habitat and distribution : Mani and Ratnakumar (1990) reported the presence of this genus in the soil around the roots of groundnut in Nellore and Chittoor districts.

Remarks : Das and Shivaswami (1977) described *Hemicycliophora osmani from Andhra Pradesh.*

Family TYLENCHULIDAE Skarbiloich, 1947

Key to the available subfamilies of the Family Tylenchulidae

1. Females obese; stylet short; Males vermiform, with stylet degenerate or absent ..... TYLENCHULINAE

– Females small & slender; stylet length variable (12–119 μm); Males with degenerate or weakly developed stylet ..... PARATYLENCHINAE

Key to the available genera of subfamily Tylenchulinae

1. Adult female elongate obese, post-vulval part elongate tapering; Tail tapering, tip rounded or with a peg ..... ***Tylenchulus***

– Female elongate-saccate, post-vulval body region slender; Tail in all stages elongate to a rounded terminus ..... ***Trophotylenchulus***

Subfamily TYLENCHULINAE Skarbilovich, 1947

Genus ***Tylenchulus*** Cobb, 1913

T. semipenetrans Cobb, 1913

1913. *T. semipenetrans* Cobb, N. A. *J. Wash, Acad. Sci.* **3** : 287–288.

Female : Body translucent, white, 60–70% of body variably saccate, widest at excretory pore, narrowing abruptly at vulva and ending in a digitate terminus. Lip region hemispherical, smooth; labial sclerotization inconspicuous. Stylet knobs rounded. Precorpus cylindroid; metacorpus oval and basal bulb elongate-saccate. Excretory pore located at 78–84% from anterior end. Gonad convoluted, extending anteriorly to basal bulb. Anus and rectum invisible.

Dimensions : Mature Female : L = 0.31–0.46 mm; width = 66–114 μm; a = 3.5–6.4; b = 2.4–4.3; V = 88 – 93; stylet = 11–12 μm; Body width at vulva = 21–31 μm, oesophageal length = 104–159 μm; dorsal oesophageal gland orifice = 4–6 μm.

Males : L = 0.34–0.38 mm; a = 28–35; b = 2.9–3.7; c = 7.7–10.1; T = 25–36, stylet = 9–10 μm; oesophageal length = 97–131 μm; spicules = 15–18 μm; gubernaculum = 3–4 μm; tail = 35–45 μm.

Habitat and distribution : Roots of citrus plants in different places of Andhra Pradesh. Mani and Ratnakumar (1990) reported the association of this species with roots of groundnut in Chittoor and Nellore districts of Andhra Pradesh.

Remark : The females of *T. semipenetrans* are obligate parasites on the roots of various species of citrus.

Genus ***Trophotylenchulus*** Raski, 1957

T. andhraensis Muthukrishnan & Shariff, 1985

1985. *T. andhraensis* Muthukrishnan, T. S. & Shariff, M. *Nematol. Medit.*, **13** : 147–152.

Mature Female : Body considerably enlarged, often tightly coiled, cuticle thick, annulations not distinct. Cephalic region with distinct circum-oral elevation, cephalic frame work slightly sclerotized. Stylet with rounded basal knobs. Precorpus comparatively long and amalgamated posteriorly with ovate median oesophageal bulb; cresentic valve distinct, basal bulb pyriform, rectum and anus not noticable. Ovary single, prodelphic, reflexed twice, oocytes in single column. Spermatheca distinct. Tail elongate conoid with bluntly rounded terminus.

Dimensions : Mature Female : L = 0.28–0.35 mm; a = 6–12; b = 3.8–5.9; c = 10.9–21.2; V – 74–86%; stylet = 9–13 μm; excretory pore = 31–53%.

Young Female : L = 0.29 mm; a = 22, b = 3.0; c = 11.8; V = 81%, stylet = 11 μm; excretory pore = 51%.

Male : Not known.

Habitat and distribution : Reported from rhizosphere of acid lime in Guntur district, Andhra Pradesh by Muthukrishan and Shariff (1985).

Remark : *T. andhraensis* is unique among the species of the genus, where in young and mature females have been encountered freely (without cases) from soil whereas young freely occurring females are unknown for other species (Ahmad, 1996).

Subfamily PARATYLENCHINAE Thorne, 1949

Genus ***Paratylenchus*** Micoletzky 1922

1922. *Paratylenchus* sp. Micoletzky, H. *Arch. Naturg. Berlin Abt. A.* **87**(1921) : 1–650.

Diagnosis : Body short (under 0.50 mm), vermiform, elongate, cylindrical, not abnormally swollen. Cuticle finely striated. Labial frame work weakly sclerotized. Stylet small to medium size (12–40 μm), not flexible. Body elongated behind vulva. Males slender, stylet and bursa absent.

Habitat and distribution : Rhizospheric soil of citrus and groundnut in Nellore and Chittoor districts of A. P.

Remarks : Mani and Ratnakumar (1990) reported the genus from Andhra Pradesh.

Distribution list of Genera / Species available in Andhra Pradesh

Family	Index	Name	Host plant	Distribution (District)
1	2	3	4	5
Tylenchidae	1.	*Tylenchus* sp.	Groundnut	Telengana Region
	2.	*Filenchus* sp.	-do-	Chittoor & Nellore
	3.	*Malenchus* sp.	-do-	-do-
	4.	*Ottolenchus* sp.	-do-	-do-
	5.	*Ecphyadophora* sp.	Groundnut & Guava	-do-
	6.	*Tenunemellus* sp.	Coconut, Groundnut & leguminose crops.	Chittoor & Nellore
	7.	*Aglenchus* sp.	Vegetables, groundnut	East and West Godavari, Nellore & Chittoor.
	8.	*Basiria binaria*	Tomato, Ladies finger	Secunderabad
	9.	*B. brevia*	Ladies finger, brinjal.	Hyderabad
	10.	*B. macrostriata*	Bean, drum stick, cucurbit plants.	Secunderabad
	11.	*B. siddiqi*	Tomato & bean	Secunderabad
Anguinidae	12.	*Ditylenchus* sp.	Groundnut	Guntur, Krishna, Nellore, Chittoor.
Belonolaimidae	13.	*Tylenchorhynchus varicaudatus*	Fern, fruit trees, paddy.	Nalgonda, Hyderabad
	14.	*T. mashhoodi*	Paddy	Medak, Hyderabad
	15.	*Trichotylenchus trilokiae*	Fern	Hyderabad
Pratylenchidae	16.	*Pratylenchus brachyurus*	Groundnut	Nellore & Chittoor
	17.	*P. barkati*	Groundnut, corn	Hyderabad, Nellore, Chittoor
	18.	*P. indicus*	Ginger	Hyderabad

1	2	3	4	5
	19.	*P. crassi*	Vegetable crops	In and around Hyderabad
	20.	*P. dasi*	Vegetable crops	Hyderabad
	21.	*P. delattrei*	-do-	-do-
	22.	*P. exilis*	-do-	-do-
	23.	*P. nizamabadensis*	Groundnut	Nizamabad
	24.	*P. flakkensis*	-do-	Telengana Region
	25.	*P. manohari*	Grape vine Yard	Hyderabad
	26.	*P. thornei*	Corn	In and around Hyderabad
	27.	*P. zeae*	Corn & groundnut	Chittoor & Nellore
	28.	*Hirschmanniella mucronata*	Groundnut	Hyderabad, Telengana Region
	29.	*H. oryzae*	Paddy, groundnut	Coastal districts, Nellore, Chittoor
	30.	*H. orycrena*	-	Hyderabad
	31.	*H. telanganensis*	Groundnut	Khammam
	32.	*Radopholus similis*	Banana	Widely distributed
Hoplolaimidae	33.	*Hoplolaimus indicus*	Groundnut	Mahboobnagar
	34.	*H. seinhorsti*	Cauliflower & Mango	-
	35.	*H. singhi*	-	-
	36.	*Helicotylenchus abunnamai*	Groundnut	Nellore & Chittoor
	37.	*H. indicus*	-do-	Nellore, Chittoor & Telengana
	38.	*H. pteraceracus*	Paddy	Hyderabad
	39.	*H. retusus*	Groundnut	Nellore & Chittoor
	40.	*Rotylenchulus reniformis*	Groundnut, Grape plants	Nellore & Chittoor, Khammam.

1	2	3	4	5
Heteroderidae	41.	*Heterodera sorghi*	Groundnut	Some districts of Royalaseema, Prakasam
	42.	*Meloidogyne incognita*	Turmeric	Chittoor and Cuddapah
	43.	*M. javanica*	Citrus	Anantapur & Chittoor
Criconematidae	44.	*Criconema lamellatum*	Citrus	Guntur
	45.	*Hemicriconemoides brachyurus.*	Groundnut, Coconut	Telengana & Guntur
	46.	*H. mehdi*	Groundnut, Citrus, Turmeric	Telengana Region, Guntur
	47.	*H. cocophilus*	Papaya, Groundnut	Telengana Region
	48.	*Hemicycliophora sp.*	Groundnut	Nellore Chittoor
Tylenchulidae	49.	*Tylenchulus semipenetrans*	-do-	-do-
	50.	*Trophotylenchulus andhraensis*	Acid Lime	Guntur
	51.	*Paratylenchus* sp.	Citrus, Groundnut	Nellore& Chittoor

SUMMARY

Citrus, groundnut, different types of oilseeds and paddy are some of the most important crops of Andhra Pradesh. Different nematologists worked on the nematode problems in Andhra Pradesh to evaluate the major pests. Singh, Rao & Reddy (1979) reported the parasites associated with horticultural plants. Mani (1986, 1995) and Mani *et al.* (1988) showed the occurrence of Meloidolgyne javanica and Tylenchulus semipenetrans in commercial citrus nurseries and their distribution. Krishnamurthy Rao and Thammi Raju (1975) also surveyed the phytoparasites of citrus. Sharma and Sharma (1988) recorded the occurance of *Heterodera sorghi* in Andhra Pradesh. Maharaju and Das (1984) surveyed and concluded that the species of *Rotylenchus* spp., *helicotylenchus* spp. and *Hirschmaniella* spp. as the most prominent and widespread parasites in the groundnut fields. Mani and Ratnakumar (1990) also reported *Pratylenchus* spp., *Ditylenchus* spp., *Helicotylenchus* spp. and *tylenchorhynchus* spp. as the most predominant parasitic nematode genera in groundnut. According to them *Rotylenchulus reniformis, Hemicriconemoides* spp., *Paratylenchus* spp., *hirschmanniella oryzae* and

Meloidogyne spp. were the frequently occurring phytoparasites of groundnut in Andhra Pradesh which badly affect the agricultural production in the state.

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NEMATODA : DORYLAIMIDA

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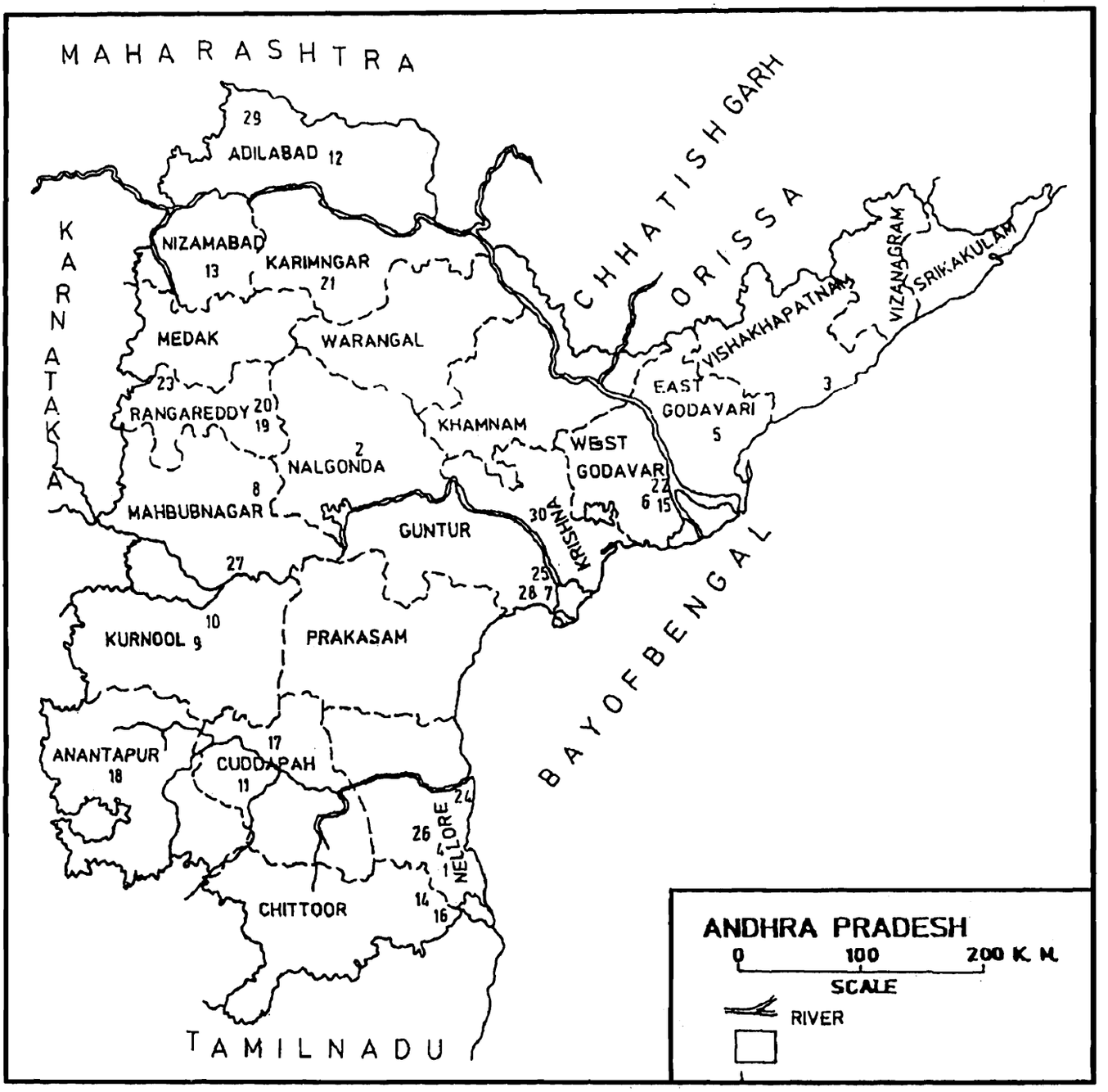
INDRODUCTION

Nematodes are one of the most important groups of multicelluler invertebrate animals, which are commonly known as "round worms" They occur in all kinds of habitat such as bottoms of lakes, rivers, at enormous depth of oceans and in all kinds of soil. Some species of nematodes can survive in temperature below freezing point while others can survive in the rocky soil during hot summers. Even some nematodes can withstand in water of "hot springs. Some nematodes are free-living while some are fungal feeders in soil, salt and fresh water while others live as parasites of plants. Both free-living and plant parasite nematodes are generally microscopic or very small in size ranging between 0.3 to 12 mm in length except *Paralongidorus maximus*, a dorylaim nematode measuring about 1 cm in length.

In soil, the nematodes dominate in numbers as well as in species over most of the soil inhabiting animals collectively. The members of the order Dorylaimida are commonly known as Dorylaims. The Dorylaims are found round the world, in all types of soils, in every conceivable type of habitats and usually dominate both in numbers and in species over all other soil inhabiting nematodes. It is not unusual to find five or six, sometimes more. Dorylaim species representing as many genera in a single soil sample. These nematodes are easily recognised at lower magnifications by their apparently smooth cuticle, usually "dagger shaped" feeding apparatus, bottle shaped oesophagus and the absence of a bursa in the males. These nematodes possess highly diversified types of feeding apparatus and their feeding behaviour is also diversified.

It was probably, Borellus who for the first time found the free-living vinegar eelworm in middle of 17th century. Owing to the magnitude of contribution made to the field of nematology by Bastain (1865), he is known as the father of nematology. He presented for the first time the possibility of obtaining nematodes form soil and plant tissues. In 1873, Butschli, for the first time, included drawing of soil nematodes and worked out keys for identification of nematodes, the principles of which are still used in diagnosis. Micoletzky (1883-1921) wrote a monograph on free living soil nematodes. Goodey (1885-1953) made significant contribution



Distribution of species are shown in the map in accordance with the index number of species in preciding page.

to the science of Nematology. He published an important book entitled "Soil and fresh water nematodes" DeMan (1850–1930) described the nematode fauna of soil and fresh water in Netherlands. Cobb (1859–1932) can be considered the Father of American Nematology. Baker (1962) published a check list of the nematode superfamilies *Dorylaimoidea.* In India, Das (1960) published a valuable paper on the nematodes of Andhra Pradesh. The world fauna of *Dorylaimida* contains approximately 1800 known species grouped in over 215 genera. In India the order *Dorylaimida* comprises of approximately 500 species grouped in over 110 genera.

The state of Andhra Pradesh with an area of 7,500 swq. kms. is located within the tropics extending from 12°40' to 19°50' North latitude and 76°45' to 84°40' East longitude. It lies on the south Eastern side of India and is the 5th largest state of India. It is bounded on the North by Madhya Pradesh and Orissa, on the West by Maharashtra and Karnataka, on the South and East by Tamil Nadu and Bay of Bengal respectively. It has a coast line of 1000 kilometers. The lakes and tanks cover an area of 8,00,000 hectors and the river system of the state is more than 1,500 kilometers. There are two major rivers i.e. Godavari and Krishna, both have originated from the Western Ghat and flow ultimately to meet the Bay of Bengal.

The state of Andhra Pradesh can be broadly divided into three physiographic divisions viz. the mountainous region consisting of Nallamalai and Erramalai hills of Rayalseema and Eastern Ghats; Plateau or elevated plains having an altitude 92 to 722 meters covering the entire Telengana and a part of Royalseema, the delta areas among which the Godavari, the Krishna and the Pennar are important.

Generally, alluvial or sandy soil are found in the coastal region, marshy at the deltaic zones of Krishna and Godavari rivers. Mostly red lateritic and black soils mixed with pebbles are found in Royalseema and Telengana. Evergreen, semi-evergreen and moist deciduous forest are found in the state and occupy about 23.8% of the total area of the state.

There has been more emphasis on the study of phyto-parasitic nematodes belonging to the order Tylenchida while the nematodes belonging to the order Dorylaimida have been neglected, although some Dorylaimid nematodes are very important ectoparasites of agricultural as well as horticultural plants. The dorylaimid nematodes inhibits the root growth, plant growth and are responsible for yield losses. Very recently Siddiqi, Jairajpuri, Khan, Baqri and Jairajpuri, Baqri and Khera, Baqri and Jana and few others have made significant contribution in the filed of dorylaim taxonomy. In the recent years, little advancement has been made on the study of dorylaimid fauna of Andhra Pradesh. There is very little information available on the plant and soil nematodes and their distribution in the soil of Andhra Pradesh state. Considering the little knowledge on the dorylaimid group as well recognizing the importance, the dorylaimid nematode fauna of Andhra Pradesh, the present research work has been taken up. The present study may serve as a preliminary account of the Dorylaimid nematode fauna of Andhra Pradesh.

MORPHOLOGY AND TERMINOLOGY

In general, the nematodes are vermiform circular in transverse section, bilaterally symmetrical with external cuticle and pseudocoel. They have longitudinal muscles for locomotion. The intestine is a simple tube lacking muscular wall. Circulatory and respiratory system are both wanting. The excretory system with a single duct and renette cell and consists mainly of the circumenteric nerve ring. They are phasmidian but also may not have phasmids. The re-productory system consists of one or two tubular gonads, opening separately through a ventrally located vulva in female while in the male the gonads empty into cloaca where copulatory structures known as spicules are situated. The life cycle consists of egg laid by the female followed usually by four larval stages prior to attaining the adult stage.

BODY WALL AND CUTICLE

The body wall consists of external cuticle, hypodermis and somatic muscle layer. The cuticle is the exoskeleton of nematodes. It is non-cellular proteinaceous secretion of the hypodermis. In most of the nematodes, the body is transversely striated. The striations may be prominent or faint. The portion between two consecutive striae is called body annules. The size, shape and number of body annules has great significance in nematode taxonomy. The space between the internal organs and body wall is known as the pseudocoel and is filled with fluid. The cavity is called the pseudocoel because it is not lined by mesoderm.

HEAD

Typical nematode head has hexaradiate symmetry, with the head, centrally located stoma – the mouth opening is bounded by a pair each of subdorsal, lateral and subventral lips. These lips are distinct, distributed in the head region. They are usually labial and cervical papillae which are considered by some to be tactile in function.

ALIMENTARY CANAL

The oral opening is bounded usually by six lips. The lips lead to buccal cavity or the stoma which is highly variable in its morphology, the stoma is divided into three major regions i.e. cheilostome, the anterior region followed by protostome, the central and the posterior region, telostome which joins with the oesophagus. In plant parasitic nametodes, the stoma is modified into a spear like structure known as stylet. In many plant parasitic forms the entire stoma is modified into a spear known as stomato-stylet which is characteristic of the order *Tylenchida.* Among the members of the super-family *Dorylaimoidea,* the spear is formed by one of the teeth-like projections of the rhabdion lining somewhat hollow stoma. Such a spear is known as odontostylet.

The buccal cavity leads into the oesophagus, the structure of which is of taxonomic significance. The lumen of the oesophagus is triradiatic and lined by cuticle. It is composed

of glandular and muscular tissue and primarily aids in pumping food ingested from mouth to intestine. The oesophagus consists of corpus, isthmus and basal bulb.

The glandular tissue of the oesophagus consists of three gland cells, one dorsal and two subventral in position. The dorsal gland opens into the base of the stoma while the subventral glands open into the lumen of the corpus. The glands are variable in shape, size and arrangements. There are different types of oesophagus. The most common types are Rhabditoid, Dorylaimoid, Diplogasteroid, Tylenchoid and Aphelenchoid. The Dorylaimoid type of oesophagus is completely muscular and bottle shaped, posterior enlarged portion bears all the oesophageal glands opening into the lumen of the same.

The basal bulb of the oesophagus is connected with the intestine by a region known as cardia, one cell thick and muscular in function preventing regurgitation of food from intestine. The intestine is an elongated tube comprised of a single layer of cells. The cells of the intestine store food such as glycogen, fats and proteins. The posterior end of the intestine forms the rectum. In male ejaculatory duct opens into the rectum giving rise to cloaca and the opening towards the outside is termed as cloacal opening. The cloaca is a narrow tubular structure serving as the terminal duct for the digestive as well as reproductive organs. The dorsal wall of the cloaca forms invaginations to accommodate the copulatory apparatus. In female the rectum ends in an opening called anus.

EXCRETORY SYSTEM

An excretory system in dorylaims is usually lacking but, if present, rather inconspicuous. In some dorylaims, a faint excretory pore and an excretory duct were found.

NERVOUS SYSTEM

The nervous system is complex, consisting of a nerve ring associated with ganglia, nerve chord, somatic nerves etc. only the nerve ring and ganglia are usually visible under a light microscope. The nerve ring encircles the anterior slender part of the oesophagus; at about mid length, the latter slightly narrowing in this region. Only one nerve ring is found in the dorylaim nematodes. There are a variety of sense organs :

AMPHIDS

These are laterally placed at the anterior end and they are two in number. On the surface they may have circular, spiral, slit like or pore like openings which lead into pouches placed inside known as the amphidial pouches. These structures are known to be chemoreceptive in function. They are of taxonomic importance.

GENITAL PAPILLAE

These occur in proximity to the genital organs and are considered to be sensitive to copulatory action. They vary in number and in forms.

LABIAL PAPILLA

There are two rows of these organs located on the lips and they are said to be tactile in function. Cervical papillae of similar function also occur.

PHASMIDS

These are attached to nerve ganglia and are also said to be chemorecepitve, laterally placed usually towards the posterior end, two in number. They are of taxonomic importance. Based on their presence or absence the nematodes are divided into two classes Secernentea and Adenophorea.

REPRODUCTIVE SYSTEM

The dorylaims are generally dioecious or amphigonus with separate female and male reproductive organs. The males are usually more slender and smaller than the females. There are many records (Jairajpuri *et al.*, 1979) of intersexes in dorylaims. These intersexes are generally well-developed females possessing a functional female reproductive system and the rudiments of male secondary sexual characters are evident towards their posterior extremity. Till now, no male intersex has been found in this group. The primary sex organs, ovary and testis are simple, tubular and in continuity with their gonoducts. Fertilization is internal; the female is oviparous and the eggs develop outside its body. The gonads in both sexes are of the telogonic type with new germ cells originating at the blind end.

FEMALE REPRODUCTIVE SYSTEM

The female reproductive system consists either of two sets of reproductive organs, didelphic or only one set called monodelphic. In the former condition the vulva is equatorial in position, one set lying anterior end and the other posterior to it (amphidelphic). In monodelphic females the sexual branch is either anterior (Prodelphic) or posterior to the vulva (opisthodelfic). In the monoprodelphic condition the vulva is situated post-equatorial while in the mono opisthodelphic condition it lies pre-equatorially. These three conditions are taxonomically importance.

Each sexual branch consists of an ovary, oviduct and uterus; the vagina is common and opens exteriorly through the vulva. The female gonad consists of an ovary with developing eggs and a tubular portion generally differentiated into oviduct and uterus. The latter is somewhat large and connected with the narrow vagina which opens on the ventral surface of the uterus forming the vulva.

OVARY

The ovary is reflected at its junction with the oviduct, its tip pointing towards the vulva. The ovary is enveloped in a sac consisting of a single layer of flattened, elongated and fusiform cells. The sac is extremely thin towards the tip of the ovary and hence rather difficult to discern while its proximal end is much thicker and distinctly visible.

OVIDUCT

The oviduct is sub-terminally connected to the ovary and serves as a constriction between the ovary and the uterus. It consists of two regions – a long narrow distal part and a short saccate proximal part. The narrow part occupies two-thirds to three-forth of the total length of the oviduct and is composed of a single row of disc like cells without a distinct lumen.

SPHINCTER

This organ is located at the junction of the oviduct (Pars dilatata) with the uterus, is surrounded by circular muscles (Sphincter) and partly embedded in the pars dilatata. The size and the development of the sphincter (poorly, moderately or well developed) differ from species to species.

UTERUS

The structure of the ovary and the oviduct is fairly consistent in dorylaims, the uterus is greatly variable in size and differentiation. The uterus has well-developed muscular walls with circular and oblique fibres. The median part of the uterus has a narrow lumen, thick walls and well developed circular muscles. The proximal part of the uterus has a wide lumen and its walls are usually without distinct musculature. The length and nature of this part are greatly variable in different species and genera and it can serve as a good taxonomic importance. In many species the last part of the uterus is greatly enlarged and forms an ovijector with the corresponding region of the other uterus.

VAGINA

The vagina is a small, highly muscular structure with thick walls, surrounded by a sphincter muscle. In many species of dorylaims, the vagina is selerotised at its junction with the vulva. In a lateral view this shows up as selerotised pieces of varying size and shape. the presence or absence of selerotisations and the size and shape of the pieces in a lateral view are useful taxonomic characters. The length of the vagina in relation to corresponding body width and the exact shape of its walls are also useful in identification.

VULVA

In the majority of dorylaims, the vulva is a transverse slit but in some genera it is a longitudinal slit, whereas in some species of Dorylaimus, it is pore like. The vulva is situated in a depression or is flush with the body. The position of the vulva, expressed as a percentage of total body length. The ovijector, vagina and vulva are provided with highly developed specialized muscles. On the ventral side of the body, both anterior and posterior to the vulva, prominent raised structure, called the vulval papillae are sometimes present. These papillae are very rare occurrence in dorylaims.

MALE REPRODUCTIVE SYSTEM

The reproductive system of the male correspond to the general adenophorean pattern of two opposed testis which lead into a common vas deferens. The later joins the ejaculatory duct and posteriorly opens into the rectum to form the cloaca. Ejaculatory glands may also be present at the terminal region of the vas deferens. When gonad is single the male is said to be monorchic, when paired called diorchic. Copulatory organs called the spicules are generally present with guide piece, the gubernaculum. Special sensory papillae may occur in the tail region of male.

TESTIS

The gonad consists of a pair of testes lying opposite to each other. The anterior testis is extended, its tip directed towards the anterior body end while the apex of the posterior testis is directed towards the posterior body end. The testes are almost equally developed and resemble a thin-walled pouch covered with an epithelial layer, which is more prominent at the proximal end and extremely thin towards the distal end (tip of testes). At the tip of the testes, a number of germ cells are present. The epithelial layer of the testes may be covered with prominent oblique muscles. There is every reason to believe that these oblique muscles encircling the testes are present in all species of male dorylaims.

VAS DEFERENS

The proximal ends of the two testes meet at a point form which the vas deferens originate and runs posteriorly. The junction has no valve, sphincter etc. but the oblique muscle of the testes are very strongly developed in this area. The vas deferens is lined with epithelial cells and its walls may be highly granular.

EJACULATORY DUCT

The structure of this duct is almost similar to the vas deferens and it is difficult to differentiate one from the other. Their junction is situated a little above the level of the last

copulatory muscles. At this point the vas deferens usually narrow before leading into the ejaculatory duct. The walls of the ejaculatory duct are thick, made up of epithelial cells and packed with granules. The lumen is narrow but at the time of copulation it is filled with sperm to be transferred to the female gonoduct. The ejaculatory duct lies ventral to the intestine (Prerectum) and narrows gradually as it proceeds posteriorly to join the rectum to form the cloaca.

CLOACA

The cloaca is a narrow tubular structure serving as the terminal duct for the digestive as well as reproductive organs. The dorsal wall of the cloaca forms pouches to accommodate the copulatory apparatus. The cloaca is lined with cuticle.

COPULATORY APPARATUS

The capulatory apparatus of male dorylaims comprises a pair of spicules, lateral guiding piece, gubernaculum, copulatory muscles and capulatory or genital papillae (Supplements).

SPICULES

The spicules are loaded in spicular pouches that are actually invaginations of the dorsal wall of the cloca. A group of cells, spicula primordia, located on the dorsal wall of the cloaca, form the spicular pouch and the spicules. The pouch is lined with cuticle that is in continuity with the cuticle of the cloaca.

The spicules have the same chemical composition as the cuticle. They are supplied with nerves and are supported by well developed musculature that aids in their movement during copulation. The spicules in dorylaims are always paired, well – built and heavily cuticularised. In a resting position the tips of the spicule protrude from their pouches through the cloacal-spicule orifice and lie very near the anal (cloacal) opening.

GUIDING PIECES

On the lateral sides of the spicule longitudinal or lateral guiding pieces are usually present. These are small, lineate, cuticularised pieces situated near the spicular tip. The presence or absence and size and shape of these pieces are important taxonomic characters.

GUBERNACULUM

The gubernaculum is only rarely present in Dorylaims. It is a thickening on the dorsal wall of the cloacal pouch and serves to guide the specules during their extrusion at the time of copulation. The gubernaculum in dorylaims is a simple plate-like structure called the corpus. The presence of a gubernaculum, its size and to some extent, its shape are useful taxonomic features.

COPULATORY PAPILLAE

The copulatory or genital papillae are called supplements. These are a series of well-developed papillae situated in the adanal or pre-cloacal region. The papillae are arranged in two groups such as an adanal pair and a series of ventromedian or ventral supplements. Usually there is a gap between the adanal pair and the ventromedians. The number of ventromedian supplements varies greatly in dorylaims from one or two to over fifty.

COPULATORY MUSCLES

A number of muscle bands run obliquely from the ventral to the laterodorsal sides. These bands are present on both sides and cover the entire area from the level of the adanal supplements to a short distance anterior to the anteriormost ventromedian supplement. The number of these muscle bands varies slightly within as well as between species and may be of some taxonomic significance.

TAIL

The tail is a unique feature of nematodes as it is not found in any other group of invertebrate animals. Although the tail is more useful in aquatic nematodes as an aid in swimming, it is well developed in dorylaims which are predominantly soil inhabitants. The dorylaim nematode exhibits a variety of tails that differ not only in size but also in shape-range from long, filiform to short. In some species, the female has a long, filiform tail while the male tail may be short and bluntly rounded. The tail serves as one of the most important diagnostic characters in the dorylaims. A number of caudal pores are present on the tail, their number and position are also useful in taxonomic studies.

MATERIAL AND METHODS

For the study of Dorylaimid fauna of Andhra Pradesh, seven faunistic field survey work were conducted during the period 1998–2003, covering about 21 districts of Andhra Pradesh. Dorylaimid nematodes associated with agricultural crops and orchards have been collected from different districts of Andhra Pradesh. The methodology comprises with:-

(i) Collection of soil samples from the host plants.

(ii) Extraction of nematodes from the soil sample.

(iii) Fixation and preservation of the nematodes.

(iv) Dehydration of the nematodes.

(v) Preparation of permanent slides of the dehydrated nematodes.

(vi) Measurements.

COLLECTION OF SOIL SAMPLES

From the rhizosphere of agricultural plants and orchards in the moist soil 5 × 5 cm area was taken upto the depth of 15 cm with the help of shovel to make one sub-sample. Five sub-samples were collected from one field. These five sub-samples were mixed thoroughly to form a bulk of soil sample. From that soil sample 500 gm soil was collected from one sample.

In the dry or semidry filed the sampling depths were increased upto 20 cm, because most of the nematodes migrate down to lower depths to avoid high temperature and unfavourable condition during the hot days. The soil was then collected in a polythene bag. The opening end of the polythene bag was closed properly with a rubber band inserting relevant data like host, locality, date, altitude etc. These soil samples were brought to the laboratory and stored in fridge to avoid evaporation.

EXTRACTION OF NEMATODES FROM THE SOIL SAMPLE

The method for the extraction of nematodes is based on modified Bearmann funnel technique (Christic & Perry, 1951). To extract the nematodes from the soil samples, approximately 500 gm soil is placed in a bucket (A) of 15 liters capacity of water. One third volume of the bucket is then filled with water. The soil and water are thoroughly mixed by hand to prepare a uniform or homogeneous suspension. Plant debris and large pebbles are removed from the suspension, the lumps are broken with finger tips. The bucket (A) is then left undisturbed for 20–30 seconds to allow the bigger soil particles to settle at the bottom while the nematodes are floating or moving on the upper surface of the suspension. This suspension is then filtered through a coarse sieve (2mm pore) to remove the plant debris and is collected in another bucket (B). Thus this process is repeated thrice to make the suspension dilute for passing the suspension through fine sieve of 350 mesh.

The suspension of Bucket (B) being free from stone, leaves and organic matter is also made into a homogenous solution by hand and allowed to settle for 20 – 30 seconds. Then the undisturbed homogeneous solution is passed through a fine sieve (350 mesh size). Most of the fine soil particles pass through the sieve while the larger soil particles and the nematodes are retained on this 350 mesh sieve. The entire residue from the sieve is collected in a 250 ml beaker.

The residue collected in the beaker is poured gently on moist double tissue paper placed on a small supporting coarse sieve of 2 mm pores. Air bubbles are avoided between the tissue papers to check the penetration of nematodes through tissue paper. The supporting coarse sieve with residue (aliquot) on the tissue paper is put on a petridish filled with water touching the bottom of the coarse sieve. After 24 hours all the nematodes penetrate and pass into the fresh water kept in the petridish through the tissue paper.

The slow moving nematodes penetrate very slow through the tissue paper. Hence, more than 24 hours are allowed to extract the slow moving nematodes. The residue on the tissue

paper is examined under a stereoscopic binocular for sluggish nematodes and are collected from the soil samples.

FIXATION AND PRESERVATION OF THE NEMATODES

The fresh water containing the nematodes was kept in a big test tube and allowed to settle down at the bottom for two hours. A portion of water from the upper level of the testtube was removed slowly by a glass dropper of suitable length so that the nematodes which settle at the testtube bottom may remain undisturbed. The nematodes were then fixed in F.A. solution (Baqri, 1990) for studying different diagnostic characters of the nematodes. The fixative was prepared as follows :

1. Formalin (40% formaldehyde) – 10 ml.
2. Glacial acetic acid – 4 ml.
3. Distilled water – 86 ml.

For killing the nematodes, the fixative (F.A) was taken in a separate testtube of at least double volume of the nematode suspension kept in another testtube. Then the fixative was heated and the hot fixative was quickly poured into the nematode suspension tube. Thus the nematodes are fixed in their characteristic posture and safely preserved in this solution for a long period. The fixed material was transferred to a specimen tube.

DEHYDRATION OF NEMATODES

The nematodes are transferred from the preservative to a glycerine alcohol solution in a glass cavity block. The glycerine alcohol solution was prepared as follows :

1. 30% alcohol – 95 ml.
2. Glycerinee – 5 ml.

Small amount of Locto-phenol is added in the glycerine-alcohol solution to avoid the growth of fungi. From the preserved nematodes, mature males and females were picked up under a stereoscopic binocular microscope by a fine needle made by a hair of horse neck to prevent the damage of the nematodes and transferred to the solution of glycerine – alcohol in a glass cavity block. This cavity block is placed in a dessicator at room temperature for dehydration of the nematodes. In dry season 20 days are needed and 30 days are need in monsoon period for dehydration.

PERPARATION OF PERMANENT SLIDES

The dehydrated nematodes are finally mounted in pure anhydrous glycerine. A small drop of anhydrous glycerine is kept on the glass slide. The dehydrated nematodes of almost same thickness and size are selected under stercoscopic binocular microscope and are transferred to the glycerine drop kept on the glass slide with the help of a hair needle. Then the

nematodes are arranged in the centre of the drop and kept according to the suitable size and thickness of glass wool to avoid any pressure on the nematodes. After arranging the nematodes and glass wool, a clean round glass cover slip, gently warmed over a small flame, is placed over the glycerine drop. Finally, "Glycecl" or common nail polish is applied on the outer edges of the round cover slip with the help of a brush to make permanent slide for the taxonomic studies.

MEASUREMENTS OF THE NEMATODES

De Man's formula is followed for identification and measurements of nematodes. All the measurements are in mm unless otherwise mentioned.

L = Total body length (mm)

a = Total length ÷ maximum body Width.

b = Total length ÷ oesophagus length.

c = Total length ÷ tail length.

$$V = \frac{\text{Distance of the vulva from anterior end} \times 100}{\text{Total body length}}$$

$$T = \frac{\text{Distance from cloacal apertures to anterior testis} \times 100}{\text{Total body length}}$$

$$G_1 = \frac{\text{Length of anterior gonad} \times 100}{\text{Total body length}}$$

$$G_2 = \frac{\text{Length of posterior gonad} \times 100}{\text{Total body length}}$$

SYSTEMATIC LIST

Suborder DORYLAIMINA Pearse, 1936

Superfamily DORYLAIMOIDEA De Man, 1876

Family DORYLAIMIDAE DE MAN, 1876

Subfamily DORYLAIMINAE De Man, 1876

Genus 1. ***Dorylaimus*** Dujardin, 1845

1. *D. innovatus* Jana & Baqri, 1982

Subfamily Laimydorinae, Andrassy, 1969

Genus 2. ***Laimydorus*** Siddiqui, 1969

2. *L. siddiquii* Baqri & Jana, 1982

3. *L. baldus* Baqri & Jana, 1982
4. *L. minimus* Baqri, 1992

Genus 3 ***Calodorylaimus*** Andrassy, 1969

5. *C. indicus* Ahmad & Jairajpuri, 1982

Subfamily THORNENEMATINAE Siddiqi, 1969

Genus 4 *Thornenema* Andrassy, 1959

6. *T. mauritianum* (Williams, 1959) Baqri & Jairajpuri, 1969
7. *T. baldum* (Thorne, 1939) Andrassy, 1959
8. *T. nodicaudatum* Dey and Baqri, 1986

Genus 5 ***Sicaguttur*** Siddiqi, 1971

9. *S. sartum* Siddiqi, 1971

Genus 6 ***Opisthodorylaimus*** Ahmad & Jairajpuri, 1982

10. *O. Cavalcantii* (Lordello, 1955), Carbonell and Coomans, 1986

Family APORCELAIMIDAE HEYNS, 1965

Subfamily APORCELAIMINAE Heyns, 1965

Genus 7 ***Aporcelaimellus*** Heyns, 1965

11. *A. heynsi* Baqri and Jairajpuri, 1968
12. *A. indicus* Baqri and Jairajpuri, 1968
13. *A. obscurus* (Thorne and Swanger, 1936). Heyns, 1965
14. *A. tropicus* Jana & Baqri, 1981

Family QUDSIANEMATIDAE JAIRAJPURI, 1965

Subfamily Discolaiminae Siddiqi, 1969

Genus 8 *Discolaimium* Thorne, 1939

15. *D. mazhari* Baqri and Jairajpuri, 1968.
16. *D. upum* Baqri and Jairajpuri, 1968

Family NORDIIDAE JAIRAJPURI and A. H. SIDDIQI, 1964

Subfamily Cephalodorylaiminae Jairajpuri, 1967

Genus 9 ***Acephalodorylaimus*** Ahmad & Jairajpuri, 1983

17. *A. attenuatus* Ahmad & Jairajpuri, 1983

Family ACTINOLAIMIDAE THORNE, 1939

Subfamily NEOACTINOLAIMINAE Thorne, 1967

Genus 10 ***Neoactinolaimus*** Thorne, 1967

18. *N. agilis* thorne, 1967.

Superfamily LONGIDOROIDEA Thorne, 1935

Family XIPHINEMATIDAE DALMASSO, 1969

Subfamily XIPHINEMATINAE Dalmasso, 1969

Genus 11. ***Xiphinema*** Cobb, 1913

19. *X. hydrabadiensis* Quraishi & Das, 1984
20. *X. Kosaigudensis* Quraishi & Das, 1984

Superfamily BELONDIROIDEA Thorne, 1939

Family BELONDIRIDAE Thorne, 1939

Subfamily BELONDIRINAE Thorne, 1939

Genus 12. ***Axonchium*** Cobb, 1920

21. *A. (A) phukani* Rahman, Jairajpuri and Ahmad, 1985.

Subfamily DORYLAIMELLINAE Jairajpuri, 1964

Genus 13. ***Dorylaimellus*** Cobb, 1913

22. *D. indicus* Siddiqi, 1964
23. *D. parvulus* Thorne, 1939

Superfamily TYLENCHOLAIMOIDEA Filipjev, 1934

Family TYLENCHOLAIMIDAE Filipjev, 1934

Subfamily TYLENCHOLAIMINAE Filijev, 1934

Genus 14. ***Tylencholaimus*** De Mann, 1876

24. *T. pakistanensis* Timm, 1964
25. *T. obscurus* Jairajpuri, 1965

Family LEPTONCHIDAE Thorne, 1935

subfamily LEPTONCHINAE Thorne, 1935

Genus 15. ***Proleptonchus*** Lordello, 1955

26. *P. clarus* Timm, 1964

Family MYDONOMAINAE Thorne, 1964

Subfamily MYDONOMAINAE Thorne, 1964

Genus 16. ***Dorylaimoides*** Thorne and Swanger, 1936

27. *D. filicaudatus* Jana & Baqri, 1981
28. *D. pakistanensis* Siddiqi, 1964
29. *D. leptura* Siddiqi, 1965

Suborder NYGOLAIMINA Ahmad & Jairajpuri, 1979

Superfamily NYGOLAIMOIDEA Thorne, 1935

Family NYGOLAIMIDAE Thorne, 1935

Subfamily NYGOLAIMINAE Thorne, 1935

Genus 17. ***Laevides*** Heyns, 1968

30. *L. timmi* (Heyns, 1968) Ahmad & Jairajpuri, 1982

SYSTEMATIC ACCOUNT

Phylum NEMATODA Rudolphi (Lankester, 1977)

Class ADENOPHORA

Order DORYLAIMIDA Pearse, 1942

Key to Suborders of order Dorylaimida

1. Feeding apparatus provided with odontostyle ..... DORYLAIMINA
– Feeding apparatus provided with mural tooth 2
2. Mural tooth located on sub-ventral wall of pharyngeal cavity; basal expanded part of oesophagus fairly long and without triquetrous chamber. ..... NYGOLAIMINA

Suborder DORYLAIMINA Pearse, 1936

Key to Superfamilies of DORYLAIMINA

1. Cheilostome strongly sclerotised. provided with plate or basket – like structures, frequently accompained by large onchia with or without denticles ..... ACTINOLAIMOIDEA
– Cheilostome usually thin walled, without onchia or denticles 2
2. Odontostyle long and attenuated; oesophagus with only three glands ..... LONGIDOROIDEA
– Odontostyle comparatively much smaller; oesophagus with five glands 3
3. Expanded part of oesophagus enclosed in spiral muscular sheath ..... BELONDIROIDEA
– Expanded part of oesophagus not enclosed in spiral muscular sheath 4
4. Sub-cuticle coarsely striated, provided with abundant radial striae; expanded part of oesophagus usually a small basal bulb ..... TYLENCHOLAIMOIDEA
– Sub-cuticle not striated, radial striae few, if present; expanded part of oesophagus usually about one-half total oesophagus length ..... DORYLAIMOIDEA

Superfamily DORYLAIMOIDEA De Mann, 1876

Key to families of DORYLAIMOIDEA

1. Odontostyle with wide aperture occupying usually more than one-half its length; guiding ring not sclerotised, plicated ..... APORCELAIMIDAE
– Odontostyle with smaller aperture, usually one-third or less 1/3rd length; guiding ring slerotised 2
2. Odontostyle attenuated, usually longer than width of lip region ..... NORDIIDAE
– Odontostyle not attenuated and usually about as long as width of lip region 3
3. Large and stout nematodes, usually with long filiform tail exhibiting sexual dimorphism ..... DORYLAIMIDAE
– Mediim sized nematodes, with short tail similar in sexes ..... QUDSINEMATIDAE

Family DORYLAIMIDAE De Man, 1876

Key to Subfamilies of DORYLAIMIDAE

1. Cuticle with longitudinal ridges 2
– Cuticle without longitudinal ridges 3
2. Tail dissimilar in sexes, elongate-conoid to filiform in females and short, bluntly conoid in males ..... DORYLAIMINAE
3. Vestibule provided with minute to strongly developed Sclerotised plates; S_2 N located much anterior to oesophageal base ..... THORNENEMATINAE
– Oesophageal base ..... THORNENEMATINAE
– Vestibule not provided with sclerotised plates; S_2 N towards oesophageal base ..... LAIMYDORINAE

Subfamily DORYLAIMINAE De Man, 1876

Genus ***Dorylaimus*** Dujardin, 1845

1. ***Dorylaimus innovatus*** Jana & Baqri, 1982

1982. *Dorylaimus innovatus* Jana & Baqri, *Indian Journal of Nematology* : **12**(2) : 263-271.

Material : 2♂♂, 11.2.99, collected by S.R. Dey Sarkar & Party.

Habitat : Soil around the roots of paddy.

Locality : Nellore, Andhra Pradesh.

Diagnosis : *Male* : Body ventrally curved, tapering at both ends. Cuticle finely striated transversely. Lips amalgamated, marked with a slight depression. Amphids stirrup-shaped. Odontostyle 48–50 μm long. Guiding ring at 24–28 μm from anterior end. Cardia elongated, conoid, measuring 32–36 μm long. Oesophago intestinal disc present. Spicules 108–109 μm long. Lateral guiding pieces rod-shaped, 20.6–22.5 μm long. 43 contiguous ventromedian supplements present. Copulatory muscles in large number, extending upto supplement region. Pre-rectμm 514–517 μm long. Tail short, bluntly rounded, measuring 33–35 μm long.

Female : Not found.

Measurements : Male : L = 4.27 mm–4.30 mm
a = 41.63–41.86
b = 4.67–4.73
c = 122–126

Distribution : India : Andhra Pradesh, West Bengal.

Subfamily LAIMYDORINAE Andrassy, 1969

Key to the genera of LAIMYDORINAE

1. Guiding ring sclerotised, 'double'; prerectum in male beginning well in front of supplements ..... ***Laimydorus***

– Guiding ring not sclerotised, single or weakly 'double'; prerectum in males short, usually beginning within range of supplements 2

2. Male tail with rounded terminus ventromedian supplements in two groups ..... ***Calodorylaimus***

Genus ***Laimydorus*** Siddiqi, 1969

Key to the species of *Laimydorus*

1. More than 2.5 mm long nematodes; Tail length more than 340 μm ..... *L. siddiquii*

– Less than 2.5 mm long nematodes; Tail length less than 250 μm 2

2. Body length less than 2.5 mm but not less than 2.00 mm; tail length more than 200 μm but less than 350 μm. ..... *L. baldus*

3. Body length less than 1.5 mm; Tail length less than 180 μm ..... *L.* minimus

2. ***Laimydorus siddiquii*** Baqri and Jana, 1982.

1982. *Laimydorus siddiquii* Baqri and Jana, *Nematologica* **28** : 192–195.

Material : 2♀♀, 19.2.2002, collected by S. C. Ghosh & party.

Habitat : Soil around the roots of paddy, *Oryza sativa.*

Locality : Nalgonda, Andhra Pradesh.

Diagnosis : *Female* : Body ventrally curved upon fixation, tapering in both ends. Cuticle transversely striated, about 2.6 μm thick at anterior end and 3.32 μm thick at tail. Lip region marked from body by a depression. Amphids stirrup-shaped. Odontostyle 27.4–29.6 μm long; its aperture varies from 11.6–12.5 μm. Odontophore 31.5–33.2 μm long; Nerve ring at 155–158 μm from anterior end. Cardia tongue-shaped, measuring 23.1–28.7 μm long. Vulva at 1200–1240 μm from anterior end. Vagina 23.2–25.7 μm long. Female reproductive system amphidelphic, ovaries reflexed. Anterior genital branch 402–420 μm long and posterior branch 463–490 μm long. Anal body width 26.56 μm long. Prerectum 215–229 μm and rectum 34.8–37.4 μm long. Tail filiform measuring 340–360 μm long.

Male : Not found.

Measurement : *Female* : L = 2.66 mm–2.71 mm,
a = 44.33–45.93, b = 5.32–5.42
c = 7.52–7.82, V = 45.11–45.75
G_1= 15.11–15.78, G_1 = 17.40–18.08.

Distribution : India : Andhra Pradesh, West Bengal.

3. ***Laimydorus baldus*** Baqri and Jana 1982

1982. *Laimydorus baldus* Baqri & Jana, *Nematologica*, **28** : 195–197.

Material : 2♀♀, 20.3.2002, collected by S. C. Ghosh & party.

Habitat : Soil around the roots of tomato plant.

Locality : Vishakhapatnam, Andhra Pradesh.

Diagnosis : *Female* – Large sized nematodes, body more or less straight upon fixation, tapering towards both ends. Cuticle finely striated transversely; 2–3 μm thick. Lip region marked by a depression, amphids stirrup-shaped, 5-6 μm apart from anterior end. Odontostyle 23–24 μm long, their aperture 9–10 μm long and Odentophore 29–30 μm long. Guiding ring at 13–14 μm from anterior end. Cardia elongated, rounded measuring about 18–19 μm long. Oesophago – intestinal disc absent. Length of oesophagus 500–510 μm long, maximum body width 60μm long. Vulva a transverse slit, situated at 890–900 μm long from anterior end, vagina 24–25 μm long. Female reproductive system amphidelphic, anterior and posterior gonads 420–425 μm and 440–450 μm long respectively. Ovary reflexed. Pre-rectum 100–105 μm long, Rectum 33–35 μm long. Tail elongated, filiform measuring about 200–205 μm long.

Male : Not found.

Measurements : Female : L = 2.00–2.10 mm
a = 33–33.35; b = 4–4.11
c = 10–10.24; V= 42.85–44.5
G_1 = 21–21.25, G_2 = 21.42–22.

Distribution : India, Andhra Pradesh.

4. ***Laimydorus minimus*** Baqri, 1991

1991. *Laimydorus minimus* Baqri, *Rec. zool. Surv. India, Occ. Paper No.***128** : 32-34.

Material : 2♀♀, 16.2.99 collected by S. R. Dey Sarkar & party.

Habitat : Soil around the roots of green chilli.

Locality : Dakkili, Nellore Dist., Andhra Pradesh.

Diagnosis : Female–Body ventrally curved upon fixation, tapering slightly towards both extremities. Cuticle finely striated, 3–8 μm thick (thickest near the tail). Lip region marked off by a slight depression, about 1/3rd of body-width at base of oesophagus. Amphids stirrup-shaped; their apertures 6–7 μm from anterior end, 8–10 μm wide. Odontostyle 34–39 μm long. Guiding ring 20.0–20.5 μm from anterior end. Odontophore shorter than odontostyle, 25–30 μm, Rectum 31–42 μm long. Vulva is longitudinal. Vagina thick-walled. Female reproductive system amphidelphic. The uterus and oviduct separated by sphincter. Ovaries reflexed; oocytes arranged first in a single row and in multiple rows at growth region. Tail elongate, tapering gradually with sharp acute terminus, 143-160 μm long.

Male : Not found.

Measurements : Female : L = 1.31–1.35 mm
a = 33–36; b = 3.5–3.7
c = 8.43–9.16; V = 50–53.

Distribution : India : Andhra Pradesh, Sikkim.

Genus ***Calodorylaimus*** Andrassy, 1969

5. ***Calodorylaimus indicus*** Ahmad and Jairajpuri, 1982

1982. *Calodorylaimus indicus* Ahmad and Jairajpuri, *Revue de Nematology*; **5**(2) : 261-275.

Material : 2♂♂.18.12.98, collected by S. C. Ghosh & party.

Habitat : Soil around the roots of Sugarcane.

Locality : East Godavari, Andhra Pradesh.

Diagnosis : *Male* – Body slightly curved ventrally, cuticle finely striated. Lip region more

or less continuous with body contour. Amphids stirrup-shaped. Guiding ring single. Odontostyle measures about 30–32 μm long. Odontophore simple, rod like structure, 31.5–32.9 μm long. Oesophagus muscular, gradually enlarges near middle, measuring about 650–670 μm long. Cardia elongated, conoid. Nerve ring at 140–145 μm from anterior end. Maximum body width 81.5–83.0 μm. Testis measures about 1400–1415 μm long. Spicule 40–42 μm long. Ventromedian supplements present, 20–23 in number. Anal body width 23–25 μm. Prerectum measures about 221–259 μm long. Tail short, measures about 24.3–24.9 μm long.

Female : Not found.

Measurements : Male : L = 2.58 mm–2.59 mm.
a = 32.58–33.03; b = 4.07–4.09,
c = 110.01–110.08; T = 54.26–54.63

Distribution : India; Andhra Pradesh, West Bengal.

Subfamily THORNENEMATINAE Siddiqi, 1969

Key to the genera of THORNENEMATINAE

1. Female reproductive system amphidelphic ..... ***Sicaguttur***
– Female reproductive system monoopisthodelphic 2
2. Odontostyle broad with wide lumen and aperture; labial sclerotisation absent ..... ***Opisthodorylaimus***
– Odontostyle narrow, labial sclerotisation present ..... ***Thornenema***

Genus ***Thornenema*** Andrassy, 1959

1. Female reproductive system amphidelphic ..... *T. nodicaudatum*
– Female reproductive system mono opisthodelphic 2
2. Body length 1.5 mm or more; Tail filiform 204–251 μm. ..... *T. mauritianum*
– Body length less than 1.2 mm; Tail tip-rounded ..... *T. baldum*

6. ***Thornenema mauritianum*** (Williams, 1959) Baqri and Jairajpuri, 1967

1959. Thornenema mauritianum Willams, *Mauritius Sugar Ind. Res. Inst. Occ. Paper.* **3** : 1–28.

1969. *Thornenema mauritianum* Baqri & Jairajpuri, *J. Helminth*, **42** : 243-256.

Material : 2♀♀; 3♂♂.

Habitat : Soil around the roots of paddy.

Locality : Eluru, West Godavari Dist., Andhra Pradesh.

Diagnosis : Female–Body slightly curved ventrally. Cuticle finely striated transversely. Lateral chords 1/5.0–¼. 2 of the body-width near middle. Lip region marked with a slight depression, moderately sclerotized, amalgamated, rounded. Amphids stirrup shaped, 4–5 μm wide and 5–6 μm from anterior extremity. Odontostyle 13–15 μm long. Odontophore 16–20 μm long, guiding ring 6–7 μm from anterior end. Vulva transverse, vagina 15–19 μm long, extending less than half of the corresponding body-width. Female reproductive system mono-opisthodelphic. Tail elongate–filiform with rounded terminus, 204–251 μm long with one to two caudal pores on either side.

Male : is similar to female in general shape and morphology except that the male genital system is more curved in the posterior region. spicules 40–45 μm long. Lateral guiding pieces are rod shaped. Ventromedian supplements present. Tail convex-conoid with bluntly rounded terminus, 25–30 μm long, with one or two caudal pores on each side.

Measurements : Female : L = 1.50–1.65 mm
a = 43–47, b = 5.7–6.3,
c = 6.5–6.8, V = 33–34.

Male : L = 1.16–1.34 mm
a = 30–32, b = 4.9–5.6
c = 45–59, T = 54–64.

Distribution : Andhra Pradesh, West Bengal.

7. ***Thornenema baldum*** (Thorne, 1939) Andrassy, 1959

1939. *Thornenema baldum*. Thorne, *Capita Zool.* **8**, 1–126.

1959. *Thornenema baldum* Andrassy, *Acta. Zool.* Hung. **5** : 191–240.

Material : 2♀♀, 16.2.2002, Coll. S. C. Ghosh & Party.

Habitat : Soil around the roots of millet.

Locality : Bapatla, Guntur Dist., Andhra Pradesh.

Diagnosis : *Female* : Body cylindroid, tapering gradually anterior to slender part of oesophagus. Cuticle smooth, thickness varies between 1–6 μm at various places in the body. Lip region narrow, truncated, amalgamated and strongly sclerotized. Lip offset from the body by a depression. Labial papillae visible. Amphids cup-shaped. Spear cylindrical; 11.5–13 μm long. Guiding ring single. Nerve ring 80–90 μm from anterior end. Cardia rounded and conoid. Vulva a transverse slit. Gonad mono-opisthodelphic. Ovary reflexed. Tail at first slightly convex-conoid then filiform to the terminus. Tail tip acute or finely or smoothly rounded.

Male : Not found.

Measurements : Female : L = 1.01 mm
a = 30, b = 5.1
c = 9, V = 30

Distribution : India : Andhra Pradesh.

8. ***Thornenema nodicadatum*** Dey and Baqri,1986

1986. *Thornenema nodicadatum* Dey and Baqri, *Indian J. Helminth.* (n-s); 3(2) : 44.

Material : 2♀♀, 2♂♂, 25.3.2002 collected by S. C. Ghosh & Party.

Habitat : Soil around the roots of Sugarcane.

Locality : Kalwakurthy, Mehbubnagar Dist., Andhra Pradesh.

Diagnosis : *Female* : Body slightly ventrally curved when fixed, tapering gradually towards both ends. Transverse striations present in cuticle which is 2–3 μm thick. Lip region slightly narrower than adjoining body. Amphids stirrup shaped. Odontostyle 12–13 μm long and Odontophore 14–15 μm long. Guiding ring 5–8 μm apart from anterior end. Nerve ring at 84–86 μm from anterior end. Cardia tongue shaped measuring 13–15 μm long and 4–5 μm wide. Oesophago-intestinal disc present. Vulva a transverse slit situated at 460–470 μm from anterior end, length of vagina 13–16 μm long. Female reproductive system amphidelphic. Combined length of oviduct and uterus for both anterior and posterior gonads are 200–205 μm long and 220–227 μm long respectively. Ovaries with single flexure. Rectum 15–20 μm and Pre-rectum 45–50 μm long. Tail elongated, tapering to a narrow rounded tip, measuring about 38–40 μm long.

Male : Similar to female in general shape and morphology but it differs in tail and reproductive system.

Measurements : Female : L = 0.85–0.87 mm
a = 25–25.75, b = 4.26–4.47
c = 21.87–22.36, V = 54.28–54.41
G_1 = 23.65–24.11, G_2 = 27.05–28.57

Male : L = 0.71–0.85 mm
a = 23.73–26.56, b = 5.27–6.07
c = 39.55–42.5, T = 45.88–53.37

Distribution : India : Andhra Pradesh, West Bengal.

Genus ***Sicaguttur*** Siddiqi, 1971

9. ***Sicaguttur sartum*** Siddiqi, 1971

1971. *Sicaguttur sartum* Siddiqi, *Nematologica* **16**, 483–491.

Material : 2♀♀, 16.2.2003, collected by S. C. Ghosh & Party.

Habitat : Soil around the roots of lemon.

Locality : Kurnool, Andhra Pradesh.

Diagnosis : *Female* – Body slightly curved ventrally upon fixation, tapering at both ends. Cuticle striated transversely, 1.7–2.5 μm thick at anterior end and 2.6–3.4 μm thick at tail region. Amphids stirrup-shaped. Odontostyle about 16.4–17.4 μm long, its aperture 5.8 μm long. Odontophore varies from 24–25 μm long. Guiding ring at 9 μm from anterior end. Cardia tongue-shaped. Oesophagus ranges from 285–295 μm from its length. Vulva or transverse slit, about 647–654 μm long from anterior end. Vagina 16.5–18.0 μm long. Maximum body width 52.2–53.5 μm long. Anal body width 28.2–29.1. Female reproductive system amphidelphic, anterior gonad ranges from 110–112 μm and posterior gonad 140–144 μm long. Rectum ranges from 31.5 to 32.4 μm long. Pre-rectum length varies from 57.1–58.7 μm. Tail elongated, filiform, measuring 140–156 μm long.

Male : Not found.

Measurements : Female : L = 1.74 mm–1.79 mm.
a = 33.33–33.45, b = 6.06–6.10
c = 11.47–12.42, V = 36.53–37.18
G_1 = 6.25–6.32, G_2 = 8.04

Distribution : India, Andhra Pradesh.

Genus ***Opisthodorylaimus*** Ahmad & Jairajpuri 1982

10. ***O. Cavalcantii*** (Lordello, 1955) Carbonell & Coomans, 1985

1955. *Dorylaimus Cavalcantii* Lordello, *Rev. Bras. Biol.* **15** : 211–218.

1959. *Thornenema Cavalcantii* Andrassy, *Acta. Zool. Hung.* **5** : 191–211.

1985. *Opisthodorylaimus Cavalcantii* Carbonell & Coomans, *Nematologica* **31** : 379–408.

Material : 3♀♀, 17.2.2003, collected by S. C. Ghosh & Party.

Habitat : Soil around the roots of lemon

Locality : Kurnool, Andhra Pradesh.

Diagnosis : *Female* : Body slightly curved ventrally. Cuticle finely striated transversely. Lateral chords present. Lip region slightly marked by depression, Sclerotisation absent, amalgamated. Odontostyle broad, lumen wide, aperture also wide, 10–12 μm long. Guiding ring 6–7 μm from anterior end. odontophore 14–17 μm long. Basal expanded part of oesophagus occupies almost 50% of the total length of oesophagus. Vulva is transverse. Vagina is 14–16 μm long. Female reproductive system is mono-opisthodelphic. Pre rectum is 2.2–3 times the anal body width. Tail is elongated, conoid with rounded terminus. There are two caudal pores on each side. Tail is 55–75 μm long.

Male : Not found.

Measurements : Female : L = 1.03 – 1.19 mm
a = 24 – 33, b = 3.9 – 4.4,
c = 11.7 – 16.9, V = 45 – 49.

Distribution : Andhra Pradesh, West Bengal.

Family APORCELAIMIDAE Heyns, 1965

Subfamily APORCELAIMINAE Heyns, 1965

Genus ***Aporcelaimellus*** Heyns, 1965

Key to the species of *Aporcelaimellus*

1. Body length less than 1.3 mm; G_2 – 7.87-8.03 ..... *A. heynsi*
– Body length more than 1.3 mm; G_2 more than 10 2
2. Body length more than 2.3 mm; G_2 = 10.19 ..... *A. obscurus*
– Body length less than 2 mm 3
3. Body length 1.87 mm; G2 = 13.97 ..... *A. indicus*
– Body length 1.62 – 1.78 mm ..... *A. tropicus*

11. ***Aprocelaimellus heynsi*** Baqri & Jairajpuri, 1968

1968. *Aporcelaimellus heynsi* Baqri & Jairajpuri, *Journal of Helminthology* **42** Nos. 3/4, p. 248.

Material : 2♀♀, 9.1.2001, collected by A. Chatterjee & Party.

Habitat : Soil around the roots of cotton.

Locality : Cuddapah, Andhra Pradesh.

Diagnosis : *Female* : Body cylindrical, gradually tapering anterior to base of oesophagus and curved in posterior half of its length upon fixation. Cuticle finely striated, its width varies from 1.7 to 2.5 μm (Thickest at tail). Lip region well offset from the body. Odontostyle 11.6–12.4 μm long, its aperture measure about 7.5–8.3 μm. Guiding ring at 5.8–6.6 μm from anterior end. Oesophagus 284–288 μm long, Oesophago-intestinal disc present. Cardia hemispheroid. Vulva pore-like, situated at 620–660 μm from anterior end. Vagina 11.6–13.3 μm long. Female reproductive system amphidelphic; anterior and posterior genital branch 150–160 μm and 90–100 μm long respectively. Anal body width 22–28 μm, pre rectum ranges from 56.1–64.9 μm. Rectum 21.5–23.2 μm long. Tail measures 33.2–35.7 μm, conoid, with rounded terminus.

Male : Not found.

Measurements : Female : L = 1.12 mm–1.27 mm.
a = 26.98–27.82, b = 3.94–4.40
c = 33.73–35.58, V = 51.96–55.35
G_1 = 12.59–13.39, G_2 = 7.87–8.03

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

12. ***Aporcelaimellus indicus*** Baqri & Jairajpuri, 1968

1968. *Aporeclaimellus indicus* Baqri & Jairajpuri, *Journal of Helminthology*, **42**, Nos. ¾ Pg. 250.

Material : 1♀, 25.1.2001, collected by A. Chatterjee & party.

Habitat : Soil around the roots of Sugarcane.

Locality : Adilabad, Andhra Pradesh.

Diagnosis : *Female :* Stout body, cylindroid, cuticle thick mainly towards body ends, smooth. Cuticle thickness varies between 4–7 μm at different places in the body, finely striated. Lip region set off by deep constriction, wider than the adjoining body. Amphids broad and shallow, their apertures 3 μm from anterior end. Spear 17 μm long, its aperture 9 μm long. Spear extension 35 μm long, simple. Guiding ring thick, 8 μm from anterior end. Nerve ring 145 μm from anterior end. Oesophagus length = 470 μm. Oespphago-intestinal disc present. Cardia hemispheroid. Maximum body width = 47 μm. Vulva pore like, situated at 1320 μm from anterior end, its vagina 25 μm long. Gonads amphidelpic. Combined length of oviduct and uterus 357 μm and 362 μm of the anterior and posterior gonads respectively, ovaries with single flexure. Rectum 41 μm long, prerectum measures 125 μm. Tail conoid, ventrally accurate with rounded tip, 55 μm long. anal body width 29 μm long.

Male : Not found.

Measurements : L = 2.31 mm
a = 49.14, b = 4.9
c = 42, V = 57.14
G_1= 15.45, G_2 = 15.67.

Distribution : India, West Bengal, Andhra Pradesh.

13. ***Aporcelaimellus obscurus*** (Thorne and Swanger, 1936) Heyns, 1965

1936. *Aporcelaimellus obscurus* Thorne & Swanger, *Capita Zool.* **6** : 223 pp.

1965. *Aporcelaimellus obscurus* Heyns, *Entomol. Mem., S. Africa;* **10** : 1-51.

Material : 2♀♀, 10.1.2001, collected by A. Chatterjee & Party.

Habitat : Soil around the roots of lemon.

Locality : Nizamabad, Andhra Pradesh.

Diagnosis : *Female* : Medium size with robust body, cuticle thick smooth, its thickness varies between 2–3 μm at different places of the body. Lip region set off by a deep constriction, wider than the adjoining body. Amphids broad and shallow, their apertures 4 μm apart from anterior end. Length of oesophagus 520 μm. Spear 21 μm long, its aperture 7 μm long. Spear extension 52 μm long simple. Guiding ring thick, 5 μm apart from anterior end. Nerve ring 155 μm from anterior end. Oesophago-intestinal disc present. Cardia tongue-shaped 21 μm long and 17 μm wide. Vulva pore-like, 1120 μm long from anterior end, vagina 31 μm long. Gonads amphidelphic, combined length of oviduct and uterus 244 μm and 243 μm of the anterior and posterior gonads respectively, ovaries with single flexure. Maximum body width 70 μm, Rectum 30 μm long and pre-rectum 81 μm long. Tail bluntly conoid 30 μm long.

Male : Not found.

Measurements : L = 2.30 mm
a = 32.85, b = 4.42
c = 76.66, V = 48.69
G_1 = 10.60, G_2 = 10.51

Distribution : Widely distributed in India.

14. ***Aporcelaimellus tropicus*** Jana & Baqri 1981

1981. *Aporcelaimellus tropicus* Jana and Baqri, *Bulletin of Zoological Survey of India*, 3(3) : 221–225.

Material : 3♀♀, 20.1.2003, collected by A. Chatterjee & Party.

Habitat : Soil around the roots of Cotton.

Locality : Bhakarapet, Chitoor Districts, Andhra Pradesh.

Diagnosis : *Female* : Body cylindrical, tapering anterior to slender part of oesophagus, curved in posterior half of its length uponfixation. Cuticle distinctly striated, 2.5–3.3μm thick in different region of the body (thick at tail). Lip region off-set, wider than adjoining body. Amphids 5.8–6.6 μm wide. Odontostyle 11 to 13 μm long, aperture 6.6–7.5 μm long. Odontophore 17.4–19.1 μm long. Nerve ring at 107.9–116.2 μm from anterior end. Cardia tongue shaped. Oesophagus varies from 386 to 394 μm in length. Oesophago-intestinal disc absent. Maximum body width 37.3–41.5 μm. Vulva a transverse slit, situated at 890 μm from anterior end. Vagina 14.9–18.2 μm long. Female reproductive system amphidelphic. Pre-rectum 70.5–116.2 μm long. Rectum 24.9 to 33.2 μm long. Tail bluntly conoid, measuring 23.2–24.9 μm long.

Male : Similar to female in geneal shape and morphology. Spicules 41.5–45.6 μm. Lateral lguiding piece 8.3–9.9 μm long. Copulatory muscles 20–24 μm. Pre-rectum 99.6–161.8 μm long. Tail similar to that of female in shape, measuring 26.5 μm long.

Measurements : Female : L = 1.62 mm–1.78 mm
a = 42.89–43.37, b = 4.19–4.51
c = 69.70–71.78, V = 54.93–55.05

Male : L = 1.69 mm–1.75 mm
a = 45.24–45.83, b = 4.74–4.86
c = 63.62–65.88, T = 52.68–54.43.

Distribution : India : West Bengal, Andhra Pradesh.

Family QUDSIANEMATIDAE Jairajpuri, 1965

Subfamily DISCOLAIMINAE Siddiqi, 1969

Genus ***Discolaimium*** Thorne, 1939

Key to the species of *Discolaimium*

1. Body length less than 1 mm. Pre-rectum and rectum 40–56 μm and 12–15 μm respectively ..... *D. upum*
2. Body length more than 1.5 mm. Prerectum and rectum 15–20 μm and 20–24 μm respectively ..... *D. mazhari*

15. ***Discolaimium mazhari*** Baqri and Jairajpuri, 1968

1968. *Dioscolaimium mazhari* Baqri and Jairajpuri, *Journal of Helminthology*, Vol. XLII, Nos. 3/4, pp. 243-244.

Material : 2♀♀, 18.12.98, collected by S. C. Ghosh & Party.

Habitat : Soil around the roots of cotton.

Locality : Eluru, West Godavari Dist., Andhra Pradesh.

Diagnosis : *Female* : Body cylindroid, tapering gradually anterior to slender part of oesophagus. Cuticle smooth, 2–4 μm thick. Lips distinctly modifying the head contour. Amphids cup-like, their apertures 4–6 μm from anterior end. Spear 10–12 μm long. Guiding ring 5–7 μm from anterior end. Nerve ring 80–85 μm from anterior end. Cardia spatulate, with two lobes at the sides. Vulva transverse. Vagina 10–14 μm, extending to almost ¼th of the body. Gonads amphidelphic. combined length of oviduct and uterus 65–75 μm of the anterior and posterior gonads respectively. Ovaries with single flexure. Pre-rectum 15–20 μm rectum 20–24 μm. Tail hemispheriod and swollen. Two minute caudal pores present.

Male : Not found.

Measurements : *Female* : L = 1.87 mm
a = 32.89, b = 4.05
c = 62, V = 44
G_1 = 13.70, G_2 =13.97

Distribution : India, Uttar Pradesh, Andhra Pradesh.

16. ***Discolaimum upum*** Baqri and Jairajpuri, 1968

1968. *Discolaimum upum* Baqri and Jairajpuri, *Journal of Helminthology*, Vol. XLII, Nos.3/4, pp. 244–247.

Material : 1♀, 12.1.2001, collected by A. Chatterjee & Party.

Habitat : Soil around the roots of cotton.

Locality: Deendarpalli, Chitoor Dist., Andhra Pradesh.

Diagnosis : *Female* : Body cylindroid, cuticle smooth about 1–2 μm thick. Head distinctly set off from the body marked by constriction. Lips conoid, modifying the head region. Amphids cup-like. Sensillar poucher 22-23μ from amphidail slits. Spear 10–12 μ long. guiding ring 5–7 μ from anterior end. Basal expanded portion of oesophagus occupies 45-50% of total oesophageal length. Oesophageal glands present. Nerve ring 73–84 μm from anterior end. Cardia hemispheroid. Vulva or transverse slit. Vagina 7–10 μm in length. Gonads amphidelphic. Ovaries with single flaxure. Pre-rectum 40-56μm long. Rectum 12–15 μm long. Tail tapers slightly to bluntly rounded terminus. Two minute caudal pores present.

Male : Not found.

Measurements : *Female* : L = 0.84 mm
a = 38, b = 4.0, c = 44, V = 47

Distribution : Uttar Pradesh, West Bengal, Andhra Pradesh.

Family NORDIIDAE Jairajpuri and A. H. Siddiqi, 1964

Subfamily CEPHALODORYLAIMINAE Jairajpuri, 1967

Genus ***Acephalodorylaimus*** Ahmad & Jairajpuri, 1983

17. ***Acephalodorylaimus attenuatus*** Ahmad & Jairajpuri, 1983

1983. *Acephalodorylaimus attenuatus* Ahmad & Jairajpuri, *Nematologica*, **28** : 233–246.

Material : 3♀♀, 13.1.2001, collected by A. Chatterjee & Party.

Habitat : Soil around the roots of Ladies Finger.

Locality : Gopalapuram, Cuddapah Dist. Andhra Pradesh.

Diagnosis : *Female* : Body 'C' shaped upon fixation and gradually tapers towards both extremities. Cuticle smooth, 1.5–3 μm thick at various places of the body (on tail region 3 μm thick). Lip region 6–9 μm wide and 4–5 μm high, marked with a slight constriction at the base of lip region. Amphids stirrup-shaped, 4–5 μm from anterior end, their apertures 3 μm long. Odontostycle 12–15 μm long aperture about 5 μm. Odontophore 15–16 μm long. Guiding ring single, 7 μm from anterior end. Cardia rounded. Nerve ring 75-80 μm from anterior end. Female reproductive system mono-prodelphic. Vulva a transverse slit, ovary reflexed. Tail elongated, conoid, ventrally arcuate, with finely rounded tip, 60-65 μm long.

Male : Not found.

Measurements : Female : L = 0.81 – 0.90 mm
a = 32.5 – 34.17, b = 3.99 4.04
c = 13.5-13.84, V = 53.01 – 56.04.

Distribution : Sikkim, Andhra Pradesh.

Superfamily ACTINOLAIMOIDEA Thorne, 1939

Family ACTINOLAIMIDAE Thorne, 1939

Subfamily NEOACTINOLAIMINAE Thorne, 1967

Genus ***Neoactinolaimus*** Thorne, 1967

18. ***Neoactinolaimus agilis*** Thorne, 1967

1967. *Neoactinolaimus agilis* Thorne, *Univ Puerto Rico Agr. Exp. Sta-Tech.* paper No. **43** : 1–48.

Material : 2♀♀, 25.1.2001, collected by A. Chatterjee & Party.

Habitat : Soil around the roots of paddy.

Locality : Anantapur, Andhra Pradesh.

Diagnosis : *Female :* Medium sized nematodes. Body cylindroid except both ends, slightly curved ventrally, cuticle marked with minute transverse striations, 1–3 μm thick, thickest at tail region, 3 μm at tail region. Vestibule armed with four onchia, without denticles. Dorylaimoid type of odontostyle, 35 μm long, its apertures 5 μm long. Guiding ring double, 18 μm long from anterior end. Oesophagus 485–490 μm long, maximum body width 42 μm. Amphidelphic type of female reproductive system, vulva at 1125 μm long from anterior end, length of vagina 18 μm long. Female tail elongated, filiform, measuring about 185 μm long. Anal body width 24 μm long. Rectum 25 μm and pre-rectum 100 μm long.

Male : Not found.

Measurements : L = 2.07 mm
a = 49.28 mm, b = 4.26
c = 11.18, V = 54.34
G_1 = 17.83, G_2 = 18.07

Distribution : Widely distributed in India.

SUPERFAMILY LONGIDOROIDEA Thorne, 1935

FAMILY XIPHINEMATIDAE Dalmasso, 1969

SUBFAMILY XIPHINEMATINAE Dalmasso, 1969

Genus ***Xiphinema*** Cobb, 1913

Key to the species of *Xiphinema*

1. Lip-region expanded, set off by a constriction at its base; fixed guiding ring 100 μm from anterior end; based oesophageal bulb about 89 μm long ..... *X. hydrabadiensis*

– Lip-region semi set off; fixed guiding ring 75 μm from anterior end; basal oesophageal bulb 70 μm long..... *X. kosaigudensis*

19. ***Xiphinema hydrabadiensis*** Quraishi and Das, 1984

1984. *Xiphinema hydrabadiensis Indian J. Nematol.* **14**(1) : 18-21.

Material : 7♀♀,

Habitat : Soil around the roots of grape.

Locality : Hyderabad, Andhra Pradesh.

Diognosis : *Female* : Body ventrally arcuate on relaxation and body tapering regularly at both ends. Cuticle thick, 4 μm, thickest in tail region. Lip region expanded, set off by a constriction at its base. Amphids stirrup-shaped. Aperture broad covering almost the entire lip width. Lateral body pores arranged serially in the neck region, the arrangement is irregular from the body region. Fixed guiding ring present 100 μm from anterior end. Odontophore with moderately developed flanges, measuring 9 μm; hemizonid absent. Basal oesophageal bulb about 89 μm long, set off from the anterior part of the oesophagus. Gonads didelphic, amphidelphic, almost equally developed. Tail dorsally convex-conoid, the terminal part of the tail is conoid, 3 pairs of caudal pores present.

Male : Not found.

Measurements : *Female* : L=1.7–2.5 mm;
a = 41.5–50; b = 6.11;
c = 29.45; V = 33.5–42

Remarks : *Measurements* after Quraishi M. A. and Das, V. M., 1984.

Distribution : Andhra Pradesh.

20. ***Xiphinema Kosaigudensis*** Quraishi and Das, 1984

1984. *Xiphinema kosaigudensis Indian J. Nematol.* **14**(1) : 18-21.

Material : 5♀♀

Habitat : Soil around the roots of grape, *Vitis vinifera.*

Locality : Hyderabad, Andhra Pradesh.

Diagnosis : *Female* : Body 'C' shaped when relaxed. Cuticle thick measuring about 3-4 μm in the tail region. Lip region semi set off. Amphids stirrup-shaped with aperture measuring 1/3rd of the body with at the base of lip. Flanges 10 μm across. Fixed spear guiding ring located 75 μm from anterior end. Basal oesophageal bulb 70 μm long. Gonads didelphic, amphidelphic symmetrically developed. Tail dorsally-convex, ending with obtusely conoid terminus.

Male : Not found.

Measurements : Female : L = 1.2 – 1.5 mm

a = 41.52; b = 6.12; c = 36-40; V = 39-48

Remarks : (*Measurements* after Quraishi, M. A. & Das, V. M., 1984).

Distribution : Andhra Pradesh.

SUPERFAMILY BELONDIROIDEA Thorne, 1939

FAMILY BELONDIRIDAE Thorne, 1939

Key to Subfamilies of BELONDIRIDAE

1. Cuticularised species present around oral aperature; odontophore flanged..... ..... DORYLAIMELLINAE

   Cuticularised pieces not present around oral aperture; odontophore rod-like..... 2

2. Female tail short, digitate, conoid or rounded..... BELONDIRINAE

SUBFAMILY BELONDIRINAE Thorne, 1939

Genus ***Axonchium*** Cobb, 1920

21. ***Axonchium (Axonchium) phukani*** Rahaman, Jairajpuri and Ahmad, 1985

1985. *Axonchium (Axonchium) phukani* Rehman, Jairajpuri and Ahmad, *Nematologica*, **31** : 13-25.

Material : 3♀♀, 31.3.2001, collected by S. C. Ghosh & Party.

Habitat : Soil around the roots of Lemon.

Locality : Hasanabad, Karimnagar Dist., Andhra Pradesh, Collector.

Diagnosis : *Female* : Body slightly curved ventrally upon fixation. Cuticle 2–4 μm thick at various places of body Lip region offset by a constriction. Amphids cup-shaped. Odontostyle fusiform, 9–11 μm long. Guiding ring 8-9 μm from anterior end. Odontophore 12–14 μm long. Anterior slender part of oesophagus separated from basal expanded portion by a typical constriction. Nerve ring 117–125 μm long from anterior end. Pre-rectum 223–296 μm and Rectum 26–31 μm long. Vulva a transverse slit. Tail broadly rounded, with two caudal pores on each side.

Male : Not found.

Measurements : *Female* : L = 1.44–1.85
a = 39–46, b = 2.7–3.0
c = 58–83, V = 55–58.6

Distribution : India, West Bengal, Andhra Pradesh.

Subfamily DORYLAIMELLINAE Jairajpuri, 1964

Genus ***Dorylaimellus*** Cobb, 1913

22. ***Dorylaimellus indicus*** Siddiqi, 1964

1964. *Dorylaimellus indicus Siddiqi, Labdev, J. Sci. Tech.*, **2** : 37–41.

Material : 2♀♀, 18.12.1998, Collector : S. C. Ghosh & Party.

Habitat : Soil around the roots of Tomato.

Locality : Eluru, Andhra Pradesh.

Description : *Female* – Body ventrally arcuate, Cuticle finely striated transversely. Lateral chords about 1/3rd of the corresponding body-width near middle. Lip region distinctly offset. Amphid stirrup shaped. Odontostyle 6–7 μm long. Guiding ring 6–7 μm from anterior end. Odontophore 12–13 μm long. Vulva longitudinal. vagina 14–16 μm long. Female reproductive system amphidelphic. Pre-rectum 2–4 μm long. Tail cylindrical with bluntly rounded terminus, 30–35 μm long.

Male : Not found.

Distribution : India : West Bengal, Andhra Pradesh.

Measurements : Female : L = 1.34–1.51 mm
a = 42–48, b = 7.1–8.13
c = 43.14–44.66, V = 48–50.

23. ***Dorylaimellus parvulus*** Thorne, 1939

1939. *Derylaimellus parvulus* Thorne, *Capita Zool.* **8** : 1-261.

Material : 2♀♀, 20.2.2003, Collector : S. C. Ghosh & Party.

Habitat : Soil around the roots of Sugarcane.

Locality : Rajampet, Sangareddi Dist., Andhra Pradesh.

Diagnosis : *Female* : Body slightly curved ventrally. Cuticle striated. Lip region marked by a slight depression. Anphids stirrup-shaped, aperture about 3 μm wide. Odontostyle 8 μm long. Guiding ring about 4 μm from anterior end. Odontophore 8-9 μm long. Vulva a transverse slit, vagina 6-7 μm long. Female reproductive system amphidelphic. Tail hemispheriod, 15-17 μm long.

Male : Not found.

Measurements : Female : L = 0.49 – 0.53mm
a = 25 – 34, b = 2.9 – 3.2
c = 31-32, V = 56 – 58.

Distribution : India : Andhra Pradesh, West Bengal.

Superfamily TYLENCHULAIMOIDEA Filipjev, 1934

Key to families of TYLENCHOLAIMOIDEA

1. Oesophagus consisting of two sections, Odontostyle usually well developed; expanded part of oesophagus about one-half oesophageal length ..... TYLENCHOLAIMIDAE

– Odontostyle usually slender; expanded part of oesophagus short, cylindroid or pyriform bulb 2

2. Odontostyle asymmetrical with distinct aperture; Oesophageal bulb cylindroid. ..... MYDONOMIDAE

– Odontostyle symmetrical, attenuated, often solid, needle-like; Oesophageal bulb usually pyriform ..... LEPTONCHIDAE

Family TYLENCHOLAIMIDAE Filipjev, 1934

Subfamily TYLENCHOLAIMINAE Filipjev, 1934

Genus ***Tylencholaimus*** De Mann, 1876

Key to the species of *Tylencholaimus*

1. Body length less than 0.5 mm. Tail hemispherical ..... *T. pakistanensis*

– Body length more than 0.7 mm. Tail with bluntly rounded terminus ..... *T.obscurus*

24. ***Tylencholaimus pakistanensis*** Timm, 1964

1964. *Tylencholaimus pakistanensis* Timm, *Proc. Helminth. Soc. Wash,* **31** : 144–153.

Material : 3♀♀, Coll. : S. R. Dey Sarkar & Party.

Habitat : Soil around the roots of paddy.

Locality : Nellore, Andhra Pradesh.

Diagnosis : *Female* : Body ventrally curved upon fixation, tapering slightly towards both ends. Cuticle distinctly striated, 2–3 μm in thickness. Lip region slightly offset from body. Amphids stirrup-shaped. Guiding ring 5–5.5 μm from anterior end. Odontophore with small basal knobs. Cardia rounded. Nerve ring present, 53–56 μm long from anterior end. Female reproductive system mono-opisthodelphic. Ovaries reflexed. Tail hemispherical 11–12 μm long with one caudal pore on each side.

Measurements : Female : L = 0.37–0.41 mm
a = 24.66–25.62, b = 3.77–4.14
c = 33.63–34.16, V = 45–47.

Distribution : India : Andhra Pradesh.

25. ***Tylencholaimus obscurus*** Jairajpuri, 1965

1965. *Tylencholaimus obscurus* Jairajpuri, *Nematologica,* **10** : 512-518.

Material : 2♀♀, 13.12.98, Coll : S. C. Ghosh & Party.

Habitat : Soil around the roots of groundnut.

Locality : Repalle, Guntur Dist., Andhra Pradesh.

Diagnosis :*Female* : Body ventrally curved in posterior half upon fixation, tapering towards both ends. Cuticle 2–3 μm thick. Cuticle smooth in the outer but inner layer transversely striated. Lip region offset by a constriction, its inner portion slightly projected. Amphids stirrup-shaped, their apertures 3.5 μm wide from anterior end. Odontostyle 6 μm. Guiding ring 4.5 μm from anterior end. Odontophore with basal knobs. The nerve ring about 71–85 μm from anterior end. Female reproductive system mono-prodelphic. Tail short with bluntly rounded terminus.

Male : Not found.

Measurements : L = 0.75–0.78 mm.
a = 35–38, b = 3.7–3.9
c = 45.88–46.87, V = 70–73.

Distribution : India : Andhra Pradesh, Sikkim.

Family LEPTONCHIDAE Thorne, 1935

SUBFAMILY LEPTONCHINAE Thorne, 1935

Genus ***Proleptonchus*** Lordello, 1955

26. ***Proleptonchus clarus*** Timm, 1964

1964. *Proleptonchus clarus* Timm, *Proc. Helminth. Soc. Wash* **31** : 144–153.

Material : 3♀♀, 13.2.1999, Coll. : S. C. Ghosh & Party.

Habitat : Soil around the roots of Orange.

Locality : Dakkili, Nellore Dist., Andhra Pradesh.

Diagnosis : *Female* : Body slightly curved in the posterior half of its length on fixation. Cuticle 2–4 μm thick. Lip region slightly offset from body, lips amalgamated. Amphids 5 μm from anterior end and 7-8.5 μm wide. Odontostyle slender 8–9 μm long. Guiding ring 8–9 μm from anterior end. odontophore 11–12 μm long. Nerve ring 84–90 μm from anterior end. Vulva a transverse slit. Female reproductive system mono-prodelphic. Tail rounded, 12–15 μm long.

Male : Not found.

Measurements : L = 1.25–1.39 mm

a = 30.39, b = 6.2–7.4

c = 92.66–104.16, V = 55–59.

Distribution : India : Sikkim, Andhra Pradesh.

Family MYDONOMIDAE Thorne, 1964

Subfamily MYDONOMINAE Thorne, 1964

Genus ***Dorylaimoides*** Thorne & Swanger, 1936

Key to the species of *Dorylaimoides*

1. Body length less than 1mm. Tail elongated, conoid measuring about 50μm ..... *D. pakistanensis*

– Body length more than 1 mm; Tail filiform. 2

2. Body length more than 1.7 mm. Tail extremely filiform (about 250–300 μm) with finely rounded terminus ..... *D. leptura*

– Body length more than 1 mm but less than 1.2 mm. Tail filiform (measuring about 225-230 μm) ..... *D. filicaudatus*

27. ***Dorylaimoides filicaudatus*** Jana & Baqri 1981

1981. *Dorylaimoides filicaudatus* Jana & Baqri.

Material : 2♀♀, 15.12.1998, Coll.- S. C. Ghosh & Party.

Habitat : Soil around the roots of paddy.

Locality : Mehbubnagar, Wanaparthy Dist. Andhra Pradesh.

Diagnosis : *Female* : Body ventrally curved upon fixation, tapering slightly toward both ends. Cuticle finely striated transversely, its thickness 2 μm at mid body and 3 μm at tail region. Lateral, ventral and dorsal body pores indistinct. Lip region continous. Amphids stirrup-shaped. Odontostyle 7–8 μm long and its aperture about 2 μm long. Guiding ring 4–5 μm apart from the anterior end. Odontophore curved, 16–17 μm long. Anterior slender part of oesophagus non-muscular whereas basal expanded part of oesophagus muscular and separated from the former by a deep constriction. Oesophageal gland nuclei and their orifices are not distinct. Nerve ring 80–85 μm from anterior end. Oesophago-intestinal disc absent. Cardia rounded 7–8 μm long. Pre-rectum and rectum 140 μm and 22 μm long respectively. Vulva transverse, 470 μm long from anterior end; Vagina 13 μm long. Female reproductive system amphidelphic. Tail elongate-filiform 225–230 μm long with three caudal pores on each side.

Male : Not found.

Measurements : L = 1.10 mm
a = 40.74, b = 6.11
c = 4.88, V = 42.72

Distribution : India : Andhra Pradesh

28. ***Dorylaimoides pakistanensis*** Siddiqi, 1964

1964. *Dorylaimoides pakistanensis* Siddiqi, *Nematologica*, **9** : 626–634.

Material : 3♀♀, 13.12.1998, Collector : S. C. Ghosh & Party.

Habitat : Soil around the roots of paddy.

Locality : Bapatla, Guntur Dist., Andhra Pradesh.

Diagnosis : *Female* : Body slightly ventrally curved, 'C' shaped when fixed, tapering gradually towards both ends. Cuticle finely striated, 2–3 μm thick (thickest on tail region). Lip region rounded, slightly set off from the body by a constriction. Amphids stirrup-shaped. Odontostyle measures about 10 μm long, odontophore curve 18 μm long. Guiding ring simple, 6 μm apart from anterior end. Basal expanded part of oesophagus occupying 25% of the neck region. Nerve ring at 105 μm from anterior end. Cardia rounded. Vulva a transverse slit. Vagina 15 μm long. Female reproductive system amphidelphic, reflexed. Rectum a little

longer than anal body width, 22 μm long and pre-rectum 115 μm long. Tail elongated, conoid to rounded terminus, dorsally bent, 50 μm long.

Male : Not found.

Measurements : L = 0.90 mm
a = 36, b = 5.62
c = 18, V = 40.

Distribution : Widely distributed in India. Also found in West Pakistan.

29. ***Dorylaimoides leptura*** Siddiqi, 1965

1965. *Dorylaimoides leptura Nematologica*; **11** : 104–105.

Material : 3♀♀, collected by S. R. Dey Sarkar & party.

Habitat : Soil associated with Paddy.

Locality : Adilabad, Andhra Pradesh.

Diagnosis : *Female* : Body ventrally curved, "C" shaped upon fixation. Cuticle double layered, finely striated transversely. Lip region off set by an constriction. Amphids cup-shaped about 3–4 μm wide. Odontostyle 7-8 μm long. Guiding ring 6–8 μm from anterior end. Odontophore 14–16 μm long. Female reproductive system amphidelphic. Vulva a transverse slit. Prerectum 240–260 μm long. Tail elongated filiform tapering to a finely rounded terminus about 80 μm long with two caudal pores on each side.

Male : Not found.

Measurements : L = 1.77–1.81 mm
a = 44–48, b = 7.3–7.8
c = 9.83, V = 37–38.

Distribution : Widely distributed in India.

Suborder NYGOLAIMINA Ahmad & Jairajpuri, 1979

Superfamily NYGOLAIMOIDEA Thorne, 1935

Family NYGOLAIMIDAE Thorne, 1935

Subfamily NYGOLAIMINAE Thorne, 1935

Genus ***Laevides*** Heyns, 1968

30. ***Laevides timmi*** (Heyns, 1968) Ahmad & Jairajpuri, 1982

1968. *Nygolaimus* (Laevides) *timmi* Heyns, *Ent. Mem. No.19, Pl. Protect. Res. Inst. Pretoria S. Africa* : 1–144.

1982. *Laevides timmi* Ahmad and Jairajpuri, *Rec. Zool. Surv. India Occ. Paper* No. 34. P. 33.

Material : 2♀♀ 9.12.1998, collected by S. C. Ghosh & Party.

Habitat : Soil around the roots of Paddy.

Locality : Krishna Dist. Andhra Pradesh.

Diagnosis : *Male* : Large sized nematodes, Body ventrally curved, more curved at posterior end. Cuticle 2-4 μm thick, 3–4 μm on tail region with fine transverse striations. Lip region continuous with body contour, slightly wider than adjoining body. Amphidial apertures slit like. Tooth slender, 10–12 μm long. Nerve ring at 165–175 μm from anterior end. Cardia hemispherical. Cardiac glands are well-developed. Supplements consist of an adanal pair, 5–6 ventromedians which are irregularly spaced. Spicule massive, arcuate 62–65 μm long. Gubernaculum 10–12 μm long. pre-rectum about 130–140 μm long and rectum 40–45 μm long.

Female : Not found.

Measurements : *Male* : L = 3.15 – 3.75 mm

a = 71.59 – 75, b = 5.04 – 5.17,

c = 93.74 – 98.43, T = 54.76 – 58.66

Distribution : Widely distributed in India.

The list of the species, *Distribution* and host plants

Family	Index No.	Name of the Species	Host Plant	Distribution (District)
Dorylaimidae	1	*Dorylaimus innovatus*	Paddy (*oryza sativa)*	Nellore
	2	*Laimydorus siddiquii*	Paddy (*oryza sativa)*	Nalgonda
	3	*Laimydorus baldus*	Tomato Plant	Vishakhapatnam
	4	*Laimydorus minimus*	Green Chilli	Nellore, Dakkili
	5	*Calodorylaimus indicus*	Sugarcane	East Godavari
	6	*Thornenema mauriatianum*	Paddy	West Godavari Eluru
	7	*Thornenema baldum*	Millet	Guntur Bapatla
	8	*Thornenema nadicaudatum*	Sugarcane	Mehbubnagar Kalwakurthy
	9	*Sicaguttur sartum*	Lemon	Karnool
	10	*Opisthodorylaimus cavalcantii*	Lemon	Karnool

Family	Index No.	Name of the Species	Host Plant	Distribution (District)
Aporcelaimidae	11	*Aporcelaimellus heynsi*	Cotton	Cuddapah
	12	*A. indicus*	Sugarcane	Adilabad
	13	*A. obscurus*	Lemon	Nizamabad
	14	*A. tropicus*	Cotton	Chitoor Bhakarapet
Qudsianematidae	15	*Discolaimium mazhari*	Cotton	West Godavari Eluru
Qudsianematidae	16	*D. upum*	Cotton	Chitoor Deendarpalli
Nordiidae	17	*Acephalodorylaimus attenuatus*	Ladies Finger	Cuddapah Gopalapuram
Actinolaimidae	18	*Neoactinolaimus agilis*	Paddy	Anantapur
Xiphinematidae	19	*Xiphinema hydrabadiensis*	Grape	Hydrabad
-do-	20	*X. kosaigudensis*	Grape	Hydrabad
Belondiridae	21	*Axonchium (Axonchium) Phukani*	Lemon	Karimnagar Hasanabad
-do-	22	*Dorylaimellus indicus*	Tomato	West Godavari, Eluru
-do-	23	*D. parvulus*	Sugarcane	Sangareddi Rajampet
Tylencholaimidae	24	*Tylencholaimus pakistanensis*	Paddy	Nellore
-do-	25	*T. obscurus*	Ground Nut	Guntur, Repalle
Leptonchidae	26	*Proleptonchus clarus*	Orange	Nellore, Dakkili
Mydonomidae	27	*Dorylaimoides filicaudatus*	Paddy	Mehbubnagar Wanparthy
-do-	28	*D. pakistanensis*	Paddy	Guntur, Bapatla
-do-	29	*D. leptura*	Paddy	Adilabad
Nygolaimidae	30	*Laevides timmi*	Paddy	Krishna Vijaywada

* Disribution of species are shown in the following map in accordance with the index number of the Species.

SUMMARY

The nematodes included in the present study were collected from the following districts of Andhra Pradesh, such as Nellore; Nalgonda, East Godavari, West Godavari, Guntur, Mehbubnagar, Karnool, Cuddapah, Adilabad, Nizamabad, Chitoor, Anantapur, karimnagar, Medak, Krishna, etc. After investigation, it has been found that the order Dorylaimida is represented by nine families in the areas surveyed. Systematic studies of thirty species belonging to seventeen genera have seen reported alongwith diagnostic characters of each species. General morphology and taxonomy, techniques of collection and preservation with key to the order, families, subfamilies, genera and species are dealt in this work. Species *Distribution* map of Andhra Pradesh has also been included.

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CRUSTACEA : OSTRACODA

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The taxonomy of recent ostracods had its inception in 1772 with the publication by O.F. Muller entitled "Observations of some bivalve insects found in common water" Laetrile, who used both the carapace and the appendages, with emphasis on the latter, originally described the ostracoda in 1806. Sars (1866) divided the order into 4 suborders Myodocopa, Cladocopa, Platycopa and Podocopa- on the basis of the soft parts, especially on the structure of the second antenna.

The ostracoda are small crustaceans possessing a bivalved carapace of calcareous material living in marine, brackish and freshwater environments. Majority of them are microscopic (0.5–1.5 mm). Some freshwater and marine forms are macroscopic, free swimming (5–30 mm). The shell may be smooth or highly ornamented.

In the oceans ostracods inhabit from the shoreline up to depths of 3000 meters or more. They extend their distribution far inland i.e. in estuaries, lagoons, backwaters and such other brackish water environments, which establish connection with sea either temporarily or permanently. Ostracod carapaces known from strata of Upper Cambrian age onwards. At present they are of very common occurrence in almost every aquatic environment. The author collected the material from the Gosthani estuary, Balacheruvu tidal stream and Vasishta Godavari estuary during 1976 to 1978, Dr. K.U. Varma and V.V. Shyam Sunder collected samples from Tekkali creek and Goguleru creek during the period from 1985 to 1989.

In this report the author presents a brief account of the study carried out in estuaries in Andhra Pradesh till the present date. The study was mainly review of the systematics of podocopan ostracods on marine and brackish water species in the coastal belt of Andhra Pradesh.

This review includes studies on ostracoda from Gosthani estuary, Balacheruvu tidal stream, Vasishta Godavari estuary, Pudimadaka stream, Tekkali creeks, Goguleru creek, and phytal fauna of coastal battery and Ramakrishna Mission beach of Visakhapatnam coast. (Fig. 1)

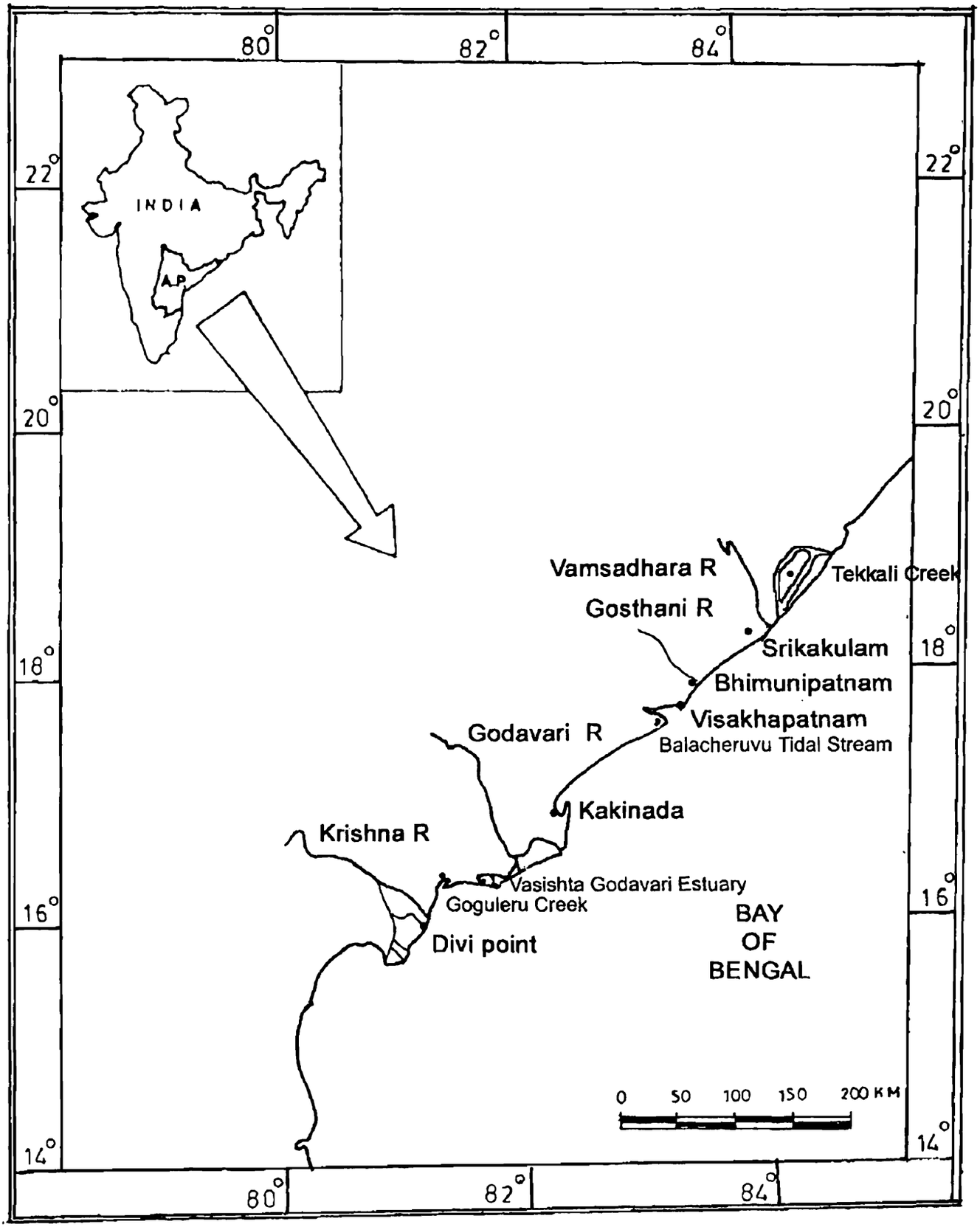

Fig. 1. Study Area

SYSTEMATIC LIST

Phylum ARTHROPODA

Class CRUSTACEA

Subclass OSTRACODA

Order PODOCOPIDA

Suborder PLATYCOPA

Family CYTHERELLIDAE Sars, 1866

1. *Cytherella punctata* Brady, 1866
2. *Cytherella pulchara* Brady, 1866
3. *Cytherelloidea leroyi* Keij, 1964
4. *Cytherelloidea subreticulata* Keij, 1964

Suborder PODOCOPA

Family BAIRDIDAE Sars, 1888

5. *Neonesidea villosa* (Brady, 1880)

Family CYTHERIDAE Baird, 1850

6. *Keijella oertlii* Jain, 1976
7. *Hemicytheridea reticulata* (Brady, 1868)
8. *H. andhraensis* (Annapurna and Rama Sarma, 1984)
9. *H bhatiai.* Varma *et al.*, 1993
10. *Neomonoceratina indica* Annapurna and Rama Sarma, 1978
11. *N. spinosa* Annapurna and Rama Sarma, 1978
12. *N. jaini* Varma *et al.*, 1993
13. *Paijenborchella (Eopaijenborchella) subcaudatum* Annapurna and Rama Sarma, 1978
14. *Paijenborchella(Eopaijenborchella) keiji* Shyam Sunder *et al.*, 1995
15. *Neosinocythere mckenzii* (Annapurna and Rama Sarma, 1985)

Family LEPTOCYTHERIDAE Hanai 1957

16. *Callistocythere sp. aff. C. crispata* (Brady, 1868)
17. *Tanella gracilis* Kingma 1948
18. *T. estuarii* Annapurna and Rama Sarma, 1984
19. *T. kingmaii* Annapurna and Rama Sarma, 1984
20. *T. vasishta* Annapurna and Rama Sarma, 1979
21. *T. indica* Annapurna and Rama Sarma, 1979

Family LIMNOCYTHERIDAE Klie, 1938

22. *Limnocythere sanct-patricii* Brady and Robertson, 1869
23. *Pontocythere fabacea* (Brady, 1868)

Family TRACHYLEBERIDIDAE Sylvester–Bradley, 1948

24. *Costa quadricostatum* Annapurna and Rama Sarma, 1978
25. *Carinocytheris stimpsoni* (Brady, 1868)
26. *Neocytheromorpha goguleruensis* Shyam Sunder *et al.*, 1995
27. *Basslerites liebaui* Jain, 1978
28. *Chrysocythere keiji* Jain, 1978
29. *Ambostracon* sp. cf. *C. packardi* (Brady, 1868)
30. *Caudites rectangularis* (Brady, 1869)

Family LOXOCONCHIDAE Sars, 1925

31. *Loxoconcha sinensis* Brady, 1867
32. *L. sculpta* Brady, 1869
33. *L. lilljeborgii* Brady, 1868
34. *L. guhai* Shyam Sunder *et al.*, 1995
35. *L. tekkaliensis* Varma *et al.*, 1993
36. *Loxoconchella honoluliensis* Brady, 1868

Family CYTHERURIDAE GW. Mueller, 1894

37. *Paijenborchellina caudatum* Annapurna and Rama Sarma, 1987
38. *P. reticulatum* Annapurna and Rama Sarma, 1987
39. *Cytheropteron alatum* Sars, 1866

Family ILYOCYPRIDIDAE Kaufmann, 1900

40. *Ilyocypris gibba,* (Ramdohr, 1808)

Family CYPRIDIDAE Baird, 1845

41. *Phlyctenophora zealandica* Brady, 1880
42. *P. indica* Annapurna and Rama Sarma, 1988

Family CYPRIDOPSIDAE Kaufmann, 1960

43. *Cypridopsis obesa* Brady and Robertson, 1889

Family NEOCYTHERIDEIDAE Kaufmann, 1960

44. *Copytus coramandalensis* Shyam Sunder *et al.*, 1995

Family PARADOXOSTOMATIDAE Brady and Norman, 1889

45. *Paradoxostoma bhatiai* Shyam Sunder *et al.*, 1995
46. *Sclerochilus contortus* (Norman, 1862)

Key to the suborders

1. Inner lamella of the valves calcified only in the outermost, peripheral parts, or not Calcified at all 3
2. Inner lamella of the valves with a more or less broad calcified zone and true marginal Pore canals 4
3. True marginal pore canals missing; those occurring near the margin are false marginal Pore canals. Contact furrow of the larger valve along the complete margin continuously present ..... PLATYCOPA
4. The calcified zone mostly broad. Marginal pore canals frequent. Muscle scars arranged in different patterns and numbers ..... PODOCOPA

Key to families

1. The dorsal margins of the valves are slightly convex, and the ventral margins are Straight or slightly concave 3, 4
2. Dorsal margin straight or weakly concave, in inner view always concave in mouth region. 6
3. The muscle field is elliptical, consisting in living forms of two slightly backward curved vertical rows of scars. The number of scars is small 7
4. Muscle field consists of at least eight scars, which are not arranged in groups, but many form a circle around a central lying one 8
5. The central muscle field with four scars in a vertical row and a fifth V-shaped in front ..... LEPTOCYTHRIDAE
6. 6 muscle scars are present ..... CYPRIDIDAE
7. The surface is more or less sculptured and never completely smooth .... CYTHERELLIDAE
8. Surface smooth or sculptured. Margin frequently with teeth. Hinge with or without teeth 13
9. Valves often heavily calcified and ornamented, ... 10,17,19
10. Ventrally and dorsally flattened and often with wings or caudal Process .... CYTHERURIDAE
11. Valves are thin, carapace very much compressed (laterally) 14
12. Valves thin and elongated 25
13. Valves mostly trapezoid in outline (bairdiod type) ..... BAIRDIDAE

14. Pore canals on margins and surface sparse ..... PARADOXISOMATIDAE
15. Small cypridinae with a reniform to triangular shell 20
16. Dorsal margin mostly strongly arched. Ventral margin flat concve .... CYPRIDOPSIDAE
17. Calcification of the inner lamella is also distinct. The fused zone is more or less broad 18
18. Radial pore canals mostly simple or sieve type ..... CYTHERIDAE
19. Hinge merodont amphidont or merodont ..... TRACHYLEBERIDIDAE
20. Shell mostly rhomboid to sub rhomboid, rarely elongated, sometimes with a caudal Process ..... LOXOCONCHIDAE
22. Shell elongated to ovate 23
23. Anterior and posterior margin equally broadly rounded. Dorsal margin straight or weakly concave, in inner view always concave in mouth region 24
24. Surface mostly pitted and with vertical folds caused by contractions of the adductor Muscle on the freshly moulted, soft carapace. Valves strongly calcified. Anterior Margin with a conspicuous list ..... ILYOCYPRIDIDAE
25. Marginal pore canals sparse. Vestibulum large always present at posterior end .... NEOCYTHERIDEIDAE

Family CYTHERELLIDAE Sars, 1866

1. Carapace thick-shelled, ovate 3
2. Carapace elongate-ovate 4
3. Surface of carapace smooth or finely punctuate ..... *Cytherella*
4. Carapace consists of strong ridges and occasionally with antero marginal denticulations ..... *Cytherelloidea*

Genus *Cytherella Jones*, 1849

Key to the species

1. Carapace small, oblong, ovate in shape 3
2. Carapace elliptic oblong, extremities rounded 4
3. Surface of the valve with closely spaced punctuate ..... *Cytherella punctata*
4. Surface smooth with white lucid spots ..... *Cytherella pulchara*

SYSTEMATIC ACCOUNT

1. *Cytherlla punctata* Brady, 1866

1866. *Cytherlla punctata* Brady, P. 362, pl. 57, fig. 2a, b.

1880. *Cytherella punctata* Brady, P. 174.

1948. *Cytherella punctata* Kingma, PL VI, Fig. VI

1963. *Cytherella punctata* Benson & Coleman, p. 14.

Diagnosis : Carapace small, oblong, ovate in shape, surface finely punctate, straight dorsal and ventral margins. Surface of the valve with numerous closely spaced small punctate and with a shallow depression just anterior to dorsomedian region of carapace. The muscle scar pattern is normal platycopine-pinnate.

Length : 0.55 mm.

Height : 0.27 mm.

Material examined : 2 specimens collected from the Gosthani estuary in 1976.

Distribution : India : Andhra Pradesh–Gosthani estuary, east coast of India.

Elsewhere : Indonesia to South of Tasmania.

Remarks : This species is reported first time from Andhra Pradesh

2. *Cytherella pulchara* Brady, 1866

1978. *Cytherella pulchara* Annapurna, Pl. 7, fig.1.

Diagnosis : Carapace elliptic oblong, extremities rounded, surface smooth, white lucid spots near the middle of the ventral half of the carapace consisting of about 16 linear ovate spots arranged in a pinnate manner along a central curved line, the larger spots nearest to the ventral margin, the whole group is situated in a slight depression of the valves, and is also on the inner surface.

Length : 0.52 mm.

Height : 0.27mm

Material examined : Single specimen collected from the Gosthani estuary and Balacheruvu tidal strea.

Distribution : India : Andhra Pradesh : Visakhapatnam, Gosthani estuary and Balacheruvu tidal stream.

Elsewhere : Indonesia to South of Tasmania.

Remarks : This species is reported first time from Andhra Pradesh

Genus *Cytherelloidea* Alexander, 1969

Key for identification of species

1. Carapace ovate, widest posteriorly 2, 3
2. Ventral margin of the surface there is heavy marginal ridge ..... *Cytherelloidea leroyi*
3. Presence of marginal and horizontal ridge ..... *C. subreticulata*

3. *Cytherelloidea leroyi* Keij, 1964

1985. *Cytherelloidea leroyi* Zhao *et al.*, P. 199, Fig. 11, Pl. 19, Fig. 1.

1987. *Cytherelloidea leroyi* Whatley and Zhao, P. 334, Pl. 1, Figs. 15-18.

Diagnosis : Carapace ovate, widest posteriorly. Anterior end evenly rounded, posterior end more angular. Along the anterior and ventral margin there is heavy marginal ridge, which continues as a curved ridge separating the posterior and lateral surfaces of the valve.

Length : 0.57mm.

Height : 0.34 mm.

Material examined : 6 numbers from Gosthani estuary in 1976, 1977 and single specimen from Balacheruvu tidal stream, 1976.

Distribution : India : Andhra Pradesh–Gosthani estuary and Balacheruvu tidal stream, Goguleru and Tekkali creek, east coast of India.

Elsewhere : Brunei and Sabah.

Remarks : This species is reported first time from Andhra Pradesh

4. *Cytherelloidea subreticulata* Keij, 1964

1978. *Cytherelloidea subreticulata* Annapurna, Pl. 7, Fig, 3

Diagnosis : The ornamentation is basically similar to that of *Cytherelloidea leroyi, with* a marginal ridge and a horizontal ridge take the shape of a question mark from which 16 ridges emerge in all directions.

Length : 0.59 mm.

Height : 0.33 mm.

Material examined : 2 individuals reported from Gosthani estuary in 1977.

Distribution : India : Andhra Pradesh, Gosthani estuary, Tekkali and Goguleru creek, east coast of India.

Elsewhere : Borneo.

Remarks : This species is reported first time from Andhra Pradesh.

Suborder PODOCOPA

Family BAIRDIDAE Sars, 1888

Genus *Neonesidea* Maddocks, 1969

Generic diagnosis : Carapace very large, smooth or finely punctate, left valve larger than right and overlapping it dorsally and ventrally. Duplicature wide, broad vestibule present around free margin. Muscle scar pattern composed of many discrete scars arranged variously in a rosette pattern and aggregate.

5. *Neonesidea villosa* (Brady, 1880)

1978. *Neonesidea villosa* Annapurna, Pl. 3, Fig. A, Pl. 7, Fig. 5.

1880. *Bairdia villosa* Brady, pl. 3a, b, Pl. 5, Fig. 2a-g, Pl. 8, Fig. 4a-f.

1908. *Nesidea villosa* (Brady), G.W. Muller, p. 100.

Diagnosis : Carapace moderately large, typically, bairdian in shape. Dorsal margin very highly arched. Dorsal margin very highly arched. Dorsal margin almost straight. Surface smooth marginal area fairly broad with wide vestibule. Muscle scar pattern consists of eight large scars and one or two smaller scars arranged in a rosette near the center of the carapace. Living material with numerous coarse brown bristles.

Distribution : India : Gosthani estuary, Andhra Pradesh.

Elsewhere : Northwestern Europe, North America, Japan, Andaman and Nicobar Islands. Leisure Island, Tristand' Acunha Islsnd, Prince Edward Island, Bass Strait.

Length : 0.88 mm.

Height : 0.49 mm.

Material examined : 5 valves collected in 1976 and 1977 from the Gosthani estuary, east coast of India.

Remarks : This species is reported first time from Andhra Pradesh.

Family CYTHERIDAE Baird, 1850

1. Carapace with a strongly reticulate 2
2. Ridges in the dorsal half radiating from near the center of the dorsal margin and Longitudinal in the ventral half ..... KEIJELLA
3. Carapace ornamented with dense pits 4
4. Medium sized ostracoda with a more heterodont than taxodont hingement ..... HEMICYTHERIDEA

5. The valve ornamentation may be smooth, ridged, pitted or reticulate 6

6. Single stout spine occurs in the postero-ventral region of both valves .... NEOMONOCERATINA

7. Ovate to wedge shaped to pear shaped carapace 8

8. Very pronounced caudal process in the ventral half of the posterior end 9

10. Anterior end broadly rounded. Dorsal margin with well-marked posterior cardinal angle ..... EOPAIJENBORCHELLA

11. Valve trapezoid to triangular in lateral view, thick shelled, posterior end triangular..... 12

12. Surface of valve with two sulci anterodorsally, reticulation, nodes and depression .... NEOSINOCYTHERE

Genus ***Keijella*** Ruggieri, 1967

Diagnosis : carapace with a strongly reticulate surface ornament. Ridges in the dorsal half radiating from near the center of the dorsal margin and longitudinal in the ventral half.

Length : 0.74 mm.

Height : 0.45 mm

6. ***Keijella oertlii*** Jain 1978

1978. *Keijella oertlii* Jain, Plate 2, G-H

Diagnosis : Carapace large elongate greatest at the anterior cardinal angle, valves equal in size. Anterior margin well pronounced. The carapace being smooth and lack of ridges, presence of small caudal process, marginal reticulation at anterior and posterior margins, marginal pore canals being simple and straight.

Distribution : India : Gosthani estuary, Goguleru and Tekkali creek-Andhra Pradesh, Chilka lake–Orissa, east coast of India.

Material Examined : 5 valves collected from the Gosthani estuary, east coast of India in 1976.

Remarks : This species is reported first time from Andhra Pradesh.

Genus ***Hemicytheridea*** Kingma 1948

Diagnosis : Medium sized ostracoda with a more heterodont than taxodont hingement. Except for the surface ornamentation the outline of the carapace is similar to Cytheridea.

Key to the species

1. Carapace oblong and elongated 3,4
2. The valves are elongated and inflated carapace 5
3. Carapace ornamented with dense pits ..... *Hemicytheridea andhraensis*
4. Ornamentation is heavily reticulate ..... *H. reticulata*
5. Moderately reticulate ornamentation ..... *H. bhatiai*

7. *Hemicytheridea reticulata* Kingma, 1948

1948. *Hemicytheridea reticulata* Kingma, p. 71, Pl. 7, Fig. 7a-c.

Diagnosis : Taxodont to heterodont .The valves are nearly equal in size and rather thick. Ornamentation heavily reticulates throughout, in the ventral region the meshes arranged in rows, which run sub parallel to the ventral margin. Valves moderately heavily calcified.

Length : 0.57 mm.

Height : 0.30 mm.

Distribution : India : Andhra Pradesh : Gosthani estuary, Balacheruvu tidal stream and and Vasishta Godavari estuary, east coast of India.

Elsewhere : Indo Pacific region.

Material examined : 26 individuals collected from Gosthani estuary, 41 individuals collected from Vasishta Godavari estuary and single specimen from Balacheruvu tidal stream in 1977.

Remarks : This species is reported first time from Andhra Pradesh.

8. *Hemicytheridea andhraensis* (Annapurna and Rama Sarma) 1984

1984. *Hemicytheridea andhraensis* Annapurna and Rama Sarma, plate 1, A; plate 2, A&B, plate 3, 1-9

Diagnosis : Carapace oblong and elongate shape and densely pitted ornamentation. In the antennule each claw like seta is divided into 2.

Length : 0.57mm; Height : 0.27 mm.

Material examined : 6 individuals collected from Gosthani estuary, 2 individuals from Balacheruvutidal stream and 6 individuals from Vasishta Godavari estuary in 1976and 1977.

Distribution : India : Andhra Pradesh- Gosthani estuary, Balacheruvu tidal stream, Vasishta Godavari estuary and Tekkali creek, east coast of India.

Remarks : This form occurred abundantly in the coarse grained sand with high salinities. This species is named after Andhra Pradesh. This species is new to science, reported by Annapurna and Rama Sarma in 1984.

9. ***Hemicytheridea bhatiai*** Varma *et al.*, 1993

1993. *Hemicytheridea bhatiai* Varma *et al.*, Pl. I, Figs. 1-4

Diagnosis : By virtue of its moderately reticulate ornamentation and its inflated carapace it is to distinguish this species from others species of *Hemicytheridea.*

Material : 79 Specimens including valves and carapaces encountered in Tekkali creek by Varma *et al.*, in 1985.

Length : 0.57 mm.

Height : 0.30 mm.

Width : 0.23 mm.

Distribution : India : Andhra Pradesh Abundant and most widely distributed in Tekkali and Goguleru creek, east coast of India.

Remarks : The species is named in honour of Professor .S.B.Bhatia, Punjab University, Chandigarh, in recognition of his pioneering work and notable contributions to the micropaleontology and stratigraphy of India. This species is new to science, reported by Varma *et al.*, in 1993.

Genus *Neomonoceratina* Kingma, 1948

Key to identification of species

1. Carapace sub rhomboidal in lateral view, the height generally equals more than half the Length 2
2. Posterior end with clear caudal process 3,4,5
3. Presence of 2 prominent vertical ridges on the surface of the Carapace .... *Neomonoceratina indica*
4. Presence of prominent spinose structures on the carapace ..... *N. spinosa*
5. Surface ornamented with 4 to 6 faint longitudinal ribs ..... *N. jaini*

10. ***Neomonoceratina indica*** Annapurna and Rama Sarma, 1984

1984. *Neomonoceratina indica* Annapurna and Rama Sarma, Pl. 1, Fig., Pl. 2, Figs. 2, 3, Pl. 4 Fig. 1-10.

Diagnosis : Straight and simple marginal pore canals and presence of 2 prominent vertical ridges on the surface of the carapace.

Type locality : Vasishta Godavari estuary.

Length : 0.76 mm.

Height : 0.37 mm

Material examined : 6 individuals collected from Gosthani estuary, 2 from Balacheruvu tidal stream and 3 from Vasishta Godavari estuary, east coast of India in 1977.

Distribution : India, Andhra Pradesh–Vasishta Godavari estuary, Balacheruvu tidal stream and Gosthani estuary.

Remarks : This is new species to science and reported by.Annapurna and Rama Sarma in 1987. The species is named after the country where it is recorded.

11. *Neomonoceratina spinosa* Annapurna and Rama Sarma, 1984

1984. *Neomonoceratina spinosa* Annapurna and Rama Sarma, Pl. 1, Fig. : pl. 2, Figs. 4, 5.

Diagnosis : Straight and simple marginal pore canals and presence of spinose structures.

Length : 0.59 mm.

Height : 0.30 mm.

Material Examined : 2 valves collected from the Gosthani estuary in 1977.

Distribution : India : Andhra Pradesh–Gosthani estuary.

Remarks : This is new species to science reported by Annapurna and Rama Sarma in 1984. This species is named basing on presence of spinose stuctures characteristically on the carapace.

12. *N. jaini* Varma *et al.*, 1993

1993. Neomonoceratina jaini *Varma et al.*, 1993, Pl. 1, Figs. 5-8.

Material : 21 specimens including valves and carapaces collected from Tekkali creek in 1985 and 1986.

Diagnosis : Based on the shape and ornamentation of the carapace and subdorsal caudal process, the present species is assigned to genus Neomonoceratina. Surface ornamentation and pronounced overlapping.

Distribution : India : Andhra Pradesh–Tekkali creek, East coast of India. N. jaini is only of common occurrence and has limited sucess of adaptation in the middle segment of the Tekkali creek and Goguleru creek.

Remarks : This species is new to science. This species is named in honour of Dr.S.P. Jain, the original author of the species.

Genus *Eopaijenborchella* Keij, 1967

1. Ovate to wedge shaped to pear shaped carapace 3

2. Carapace sub quadrate in shape 4

3. Pronounced caudal process ..... *Paijenborchella (Eopaijenborchella) subcaudatum*

4. Short caudal process ..... *Paijenborchella (Eopaijenborchella) keiji*

13. ***Eopaijenborchella subcaudatum*** Annapurna and Rama Sarma 1984

1984. *Eopaijenborchella subcaudatum* Annapurna and Rama Sarma, Pl. 1, Fig. F, Pl. 2, Figs. 6, 7.

Diagnosis : Ovate to wedge shaped to pear shaped carapace. There is a very pronounced caudal process in the ventral half of the posterior end. Anterior end broadly rounded. Dorsal margin with well-marked posterior cardinal angle.

Length : 0.52 mm.

Height : 0.34 mm.

Material examined : Two individuals encountered at Gosthani estuary in 1976

Distribution : India : Andhra Pradesh : Gosthani estuary.

Remarks : This is new species to science. Reported by Annapurna and Rama Sarma in 1984. The species is named after the pronounced caudal process.

14. ***Paijenborchella (Eopaijenborchella) keiji*** Shyam sunder *et al.*, 1995

1995. *Paijenborchella (Eopaijenborchella) keiji* Shyam Sunder, *et al.*, Figs. 3-5

Diagnosis : Carapace sub quadrate in shape, posterior margin drawn out into a short caudal process, surface ornamented with coarse reticulation and four ridges, deep, vertical sulcus and typical schizodont hingement.

Material : Ninety seven specimens including carapaces and valves from Goguleru creek in 1985.

Length : 0.55 mm.

Height : 0.28 mm.

Remarks : The present species is similar in ornamentation to *Schnederina koenigswaldi* (Keij) 1954 but it differs from it in having typical schizodont hingement.

Distribution : India : Andhra Pradesh–Goguleru creek. This speces is new to science reported by Shyam sunder *et al., 1995*. The species is named in honour of Dr. A.J. Keij, for his contribution to the Indo Pacific Ostracoda.

Genus ***Neosinocythere*** Huang 1985

15. *Neosinocythere mckenzii* (Annapurna and Rama Sarma) 1985

1985. *Palmenella mckenzii* Annapurna and Rama Sarma, p. 141-144, Figs. 1-7.

Diagnosis : Ovate to sub quadrate carapace with a slight upturning at posterior end; surface ornamented with ventral knobs, very limited vestibule or none, moderately wide duplicature, particularly wide in anterior; hinge holamphidont with serrate groove.

Length : 0.67 mm.

Height : 0.30 mm.

Material examined : 25 specimens from Gosthani estuary, 5 from Balacheruvu tidal stream and 4 from Vasishta Godavari estuary.

Distribution : India; Gosthani estuary, Balacheruvu tidal stream, Vasishta Godavari Estuary, Tekkali creek and Goguleru creek.

Remarks : This species is new to science and named after Dr. K.G. Mckenzie.

Family LEPTOCYTHERIDAE Hanai, 1957

Key to genera

1. Carapace less elongate, ornamented and more heavily calcified 2
2. Anterior vestibulum poorly developed 3
3. Antromedian hinge element consists of single tooth and subdivided in to 2 to 3 tooth lets ..... ***Callistocythere***
4. In side view the carapace has its greatest height in the middle 5
5. Dorsal and ventral margins convex, anterior and posterior ends rounded except at the poster cardinal angle in the left valve ..... ***Tanella***

16. ***Callistocythere* sp. aff. *C.crispata*** (Brady, 1868)

1868. *Callistocythere* sp. aff. *C. crispata* Brady, pp 72-73, pl. XIV, Fig.8a-d.

1984. *Callistocythere* sp. aff. *C. crispata* Brady Annapurna and Rama Sarma, plate 1.B

Diagnosis : Carapace elongated to sub quadrangular, compressed laterally. Ornamentation strongly reticulates. Antero-ventral marginal and poster ventral denticulations clear.

Length : 0.51 mm.

Height : 0.34 mm.

Distribution : India : Andhra Pradesh–Gosthani estuary and Balacheruvu tidal stream, east coast of India.

Elsewhere : World wide.

Material examined : 5 individuals collected from Gosthani estuary in and single individual from Balacheruvu tidal stream in 1976.

Remarks : This species is reported first time from Andhra Pradesh.

Genus ***Tanella*** Kingma, 1948

Key to the species

1. Shape of carapace elongate and narrow 2
2. Hexagonal network with a prominent ridge 5
3. Reticulated, longitudinal ridges strong and arched 9
4. Pits separate and limited in number ..... *Tanella estuarii*
5. Pits in clusters and innumerable ..... *T. kingmaii*
6. Posterior reticulation obscure with 3 to 6 pits arranged in groups 11
7. Socket in right valve crenulate 10
8. Socket in right valve smooth 9, 11
9. Marginal pore canals poyfurcate ..... *T. gracilis*
10. Marginal pore canals bifurcate ..... *T. vasishta*
11. Marginal pore canals intermediate between polyfurcate and bifurcate branching ..... *T. indica*

17. ***Tanella gracilis*** Kingma 1948

1948. *Tanella gracilis*, Kingma p. 88, pl. 10, fig. 7a-d.

1948. *Tanella gracilis* Kingma, p. 209

1948. *Tanella gracilis* Kingma, p. 120

Length : 0.42 mm.

Height : 0.18 mm.

Diagnosis : Carapace elongate and narrow. Surface ornamented with reticulations and ridges. Radial pore canals typically proliferate.

Material examined : 3 individuals collected from Gosthani estuary and 4 from Balacheruvutidal stream in 1976 and 1977.

Distribution : India : Gosthani estuary, Balacheruvu tidal stream, Goguleru and Tekkali creek. Andhra Pradesh, Krusadai Islands, Gulf of Mannar, Chilka lake.

Elsewhere : Indo Pacific region, Japan, Malayan region.

Remarks : This species is reported first time from Andhra Pradesh.

18. ***Tanella estuarii*** Annapurna and Rama Sarma, 1984

1984. *Tanella estuarii* Annapurna and Rama Sarma, 1984, plate 1, C; plate 2, C&D; plate 4, 1-10

Diagnosis : Carapace oblong and tumid in outline. Pits separate and limited in number. Sexual dimorphism is very strong.

Length : 0.33 mm.

Height : 0.17 mm.

Material examined : 320 individuals collected from, Gosthani estuary 80 from Balacheruvutidal stream and 109 from Vasishta Godavari estuary.

Distribution : India : Andhra Pradesh–Gosthani estuary, Balacheruvu tidal stream and Vasishta Godavari estuary.

Remarks : This species is new to science and named after estuary

19. ***Tanella kingmaii*** Annapurna and Rama Sarma, 1984

1984. *Tanella kingmaii* Annapurna and Rama Sarma, plate 1, D; plate 2, E&F; plate 5, 1-9

Diagnosis : Carapace elongate and narrow. Pits in clusters and innumerable. Sexual dimorphism is clear.

Length : 0.42 mm.

Height : 0.18 mm.

Material examined : 67 individuals collected from Gosthani estuary, 28 individuals from Balacheruvu tidal stream in 1976 and 1977 and single from Vasishta Godavari estuary in 1977.

Distribution : India : Andhra Pradesh–Gosthani estuary and Balacheruvu tidal stream, east coast of India.

Remarks : This species is new to science and named after Dr. J.Th. Kingma.

20. ***Tanella vasishta*** Annapurna and Rama Sarma, 1979

1979. *Tanella vasishta* Annapurna and Rama Sarma, **48**(1), 42-43, Figs 1-2

Diagnosis : Carapace narrow and elongate shape, hexagonal network ornamentation with a single median ridge, and bifurcate nature of marginal pore canals.

Length : 0.54 mm; *Height* : 0.26 mm.

Distribution : India : Andhra Pradesh–Vasishta Godavari estuary, Gosthani estuary and Balacheruvutidal stream, east coast of India.

Material examined : 64 individuals from Gosthani estuary, 26 from Balacheruvu tidal stream and 8 from Vasishta Godavari estuary in 1976 and 1977.

Remarks : This species is new to science and named after Vasishta Godavari estuary.

21. ***Tanella indica*** Annapurna and Rama Sarma, 1979

1979. *Tanella indica* Annapurna and Rama Sarma, 117-118, Fig 1A-C, Fig. 2, a-j

Diagnosis : Oblong and tumid shape of carapace, strongly arched marginal ridges, pits ranging 3to 6 arranged in groups in the obscure reticulation and intermediate condition of marginal pore canals between bifurcate and polyfurcate branching and the occurrence of additional 'v' shaped frontal scar.

Male : *Length* : 0.50 mm; *Height* : 0.20 mm.

Female : *Length* : 0.55 mm; *Height* : 0.25 mm.

Distribution : India : Andhra Pradesh–Gosthani estuary, Vasishta Godavari estuary and Balacheruvu tidal stream.

Material examined : 50 specimens collected from the Gosthani estuary, 97 from Balacheruvu tidal stream and 44 from Vasishta Godavari estuary.

Remarks : This species is new to science and named after country India where the species is reported first time.

Family LIMNOCYHERIEDAE Klie, 1938

1. Carapace outline in lateral view elongate–subreniform; greatest height in front of middle near anterior cardinal angle 3
2. Carapace much elongated, both ends rounded 4
3. Ornamentation moderately strong reticulate pattern covering exterior surface of valve; several nodes present ..... *Limnocythere*
4. Surface ornamented with strong pits 5
5. Anterior marginal denticulations present 6
6. Marginal area with small narrow vestibules ..... *Pontocythere*

22. ***Limnocythere sanct-patricii,*** Brady and Robertson, 1869

1869. *Limnocythere sanct-patricii* Brady and Robertson, p. 17

1970. *Limnocythere sanct-patricii* King and Kornicker, p. 39

Diagnosis : Carapace outline in lateral view elongate–subreniform; greatest height in front of middle near anterior cardinal angle. Ornamentation moderately strong reticulate pattern covering exterior surface of valve; several nodes present. Two sulci present, both in anterior half.

Length : 0.63 mm.

Height : 0.28 mm.

Distribution : India : Andhra Pradesh–Gosthani estuary.

Elsewhere : Sweden, British Isles, Bohemia, Hungary, Switzerland, Laguna Madre, and Copan Bay.

Material examined : Single specimen collected from the Gosthani estuary in 1976.

Remarks : This species is reported first time from Andhra Pradesh

23. ***Pontocythere fabacea*** (Brady, 1868)

1978. *Pontocythere fabacea* Annapurna and Rama Sarma Plate 13. Fig. B

Diagnosis Carapace much elongated, both ends rounded. Surface ornamented with strong pits. Anterior marginal denticulations present. Central muscle scars in a vertical row of 4 and 1 frontal scar. Left valve larger than right, overlapping it mainly ventrally.

Length : 0.67 mm.

Height : 0.27 mm.

Distribution : India : Andhra Pradesh–Gosthani estuary.

Elsewhere : World wide.

Material Examined : Single specimen from Gosthani estuary in 1977.

Remarks : This species is reported first time from Andhra Pradesh.

Family TRACHYLEBERIDIDAE Sylvester–Bradley, 1948

Key to genera

1. Carapace elongate, sub rectangular in lateral view 7, 13
2. Carapace elongate–ovate, somewhat bean shaped in lateral view 8
3. Carapace sub quadrangular in lateral view 9
4. Elongate, sub triangular, laterally compressed 10
5. Suquadrangular outline, highest near anterior end 11

6. Carapace sub cylindrical in shape 12
7. Ornamented with four longitudinal ridges 14
8. Valves smooth and shiny 15
9. Anterior marginal ridge prominent. Surface ornamented with three longitudinal ridges 16
10. Ornamentation usually with ridges running mainly longitudinally 17
11. Coarsely reticulate surface 18
12. Surfaces ornamented with transverse ribs and pits, deep dorsal anteromedian sulcus present ..... ***Neocytheromorpha***
13. Ornamented with longitudinal ribs and reticules ..... ***Chrysocythere***
14. Eye spot is very prominent ..... ***Carinocythereis***
15. Eye spot very faint ..... ***Basslerites***
16. Eyespot clearly present, prominent and glassy ..... ***Costa***
17. Clearly glassy eye spots are present at the anterodorsal cardinal angle ..... ***Caudites***
18. Prominent eye tubercle ..... ***Ambostracon***

Genus ***Costa*** Neviani, 1928

24. ***Costa quadricostatum*** Annapurna and Rama Sarma, 1988

1988. *Costa quadricostatum* Annapurna and Rama Sarma, Fig.1A

Diagnosis : In the general shape, arrangement of radial pore canals and muscle scars it resembles Costa species. But it differs from the other *Costa* species in the surface of the carapace ornamented with 4 longitudinal ridges, intercostal reticulation in between the ridges, hinge holamphidont type.

Length : 0.57 mm.

Height : 0.37 mm.

Material Examined : One valve encountered in Gosthani estuary and one from Balacheruvu tidal stream in 1976.

Distribution : India; Andhra Pradesh Gosthani estuary and Balacheruvu tidal stream, east coast of India.

Remarks : This species is new to science and this species is named basing on the important character of systematic importance namely surface of the carapace ornamented with 4 longitudinal ridges, intercostals reticulation in between the prominent ridge.

Genus ***Carinocytheeris*** Ruggieri, 1956

25. ***Carinocytheris stimpsoni*** (Brady, 1868)

1988. *Carinocytheris stimpsoni*, Annapurna, Fig. 1, B.

Diagnosis : Shell quadrangular from side some what higher in front than behind, height equal to more than half the length, anterior extremity obliquely rounded and bearing numerous small teeth, posterior end rectangular truncated, produced abruptly below the middle.

Length : 0.52 mm; Height : 0.31 mm.

Distribution : India; Andhra Pradesh–Gosthani estuary.

Material Examined : 5 individuals from Gosthani estuary in 1977.

Remarks : This species is reported first time from Andhra Pradesh

Genus ***Basslerites*** Howe, 1937

26. ***Basslerites liebaui***, Jain, 1978

1978. *Basslerites liebau*, Jain, Fig. 4A-3; 6L

Diagnosis : Lateral outline elongate to ovate, in dorsal view wedge shaped. Carapace smooth anteriorly and longitudinal ridges present towards the posterior end, pits arranged in rows in between longitudinal ridges and bifurcate branching of the marginal pore canals at the posterior end.

Length : 0.58 mm. *Height* : 0.25 mm.

Distribution : India : Andhra Pradesh–Gosthani estuary,Balacheruvu tidal stream, Goguleru and Tekkali creek, east coast of India, Gujarat : Mandavi Beach, west coast of India.

Material examined : 7 individuals encountered from Gosthani estuary and single specimen from Balacheruvu tidal stream 1977.

Remarks : This species is reported first time from Andhra Pradesh.

Genus ***Chrysocythere***, Ruggieri 1961

27. ***Chrysocythere keiji*** Jain, 1978

1978. *Chrysocythere keiji* Jain, Fig. 3L1-2.

1976. *Chrysocythere* sp. A Palk, p. 61. pl. 4, fig. 65-67.

Diagnosis : An elongate sub rectangular *Chrysocythere* ornamented with longitudinal ribs and reticules. The median rib forked, another short longitudinal rib present posterior in between the forked dorsal and ventral parts of the median rib.

Length : 0.60 mm.

Height : 0.29 mm.

Material examined : Single specimen from Balacheruvu tidal stream in 1977.

Distribution : India : Andhra Pradesh–Balacheruvu tidal stream, Goguleru and Tekkali creek, east coast of India, Gujarat : Mandavi Beach, west coast of India.

Remarks : This species is reported first time from Andhra Pradesh.

Genus ***Ambostracon*** Hazel, 1962

28. ***Ambostracon* sp. cf. *C. packardi*** (Brady, 1868)

1868. *Ambostracon* sp.cf.*C. packardi* Brady, Fig. 12.

1978. *Ambostracon* sp.cf.*C. packardi* Annapurna, Plate 15, Fig. 8.

Length : 0.39 mm.

Height : 0.18 mm.

Diagnosis : Subquadrangular outline, highest near anterior end, coarsely reticulate surface, prominent eye tubercle, anterior median node, oblique median longitudinal ridge that curves poster dorsally and continues forwards dorsally, projecting beyond dorsal margin.

Material examined : Single specimen from Gosthani estuary and single specimen from Balacheruvu tidal stream in 1976.

Distribution : India : Andhra Pradesh–Gosthani estuary and Balacheruvu tidal stream, east coast of India.

Elsewhere : Pacific coast of North and Central America.

Remarks : This species is reported first time from Andhra Pradesh.

Genus ***Caudites*** Coryell and Fields, 1937

29. ***Caudites rectangularis*** (Brady, 1869)

1869. *Caudites rectangularis* Brady, p. 163.

1886. *Caudites rectangularis* Brady, pl. 9.

Length : 0.52 mm.

Height : 0.22 mm.

Diagnosis : Carapace elongates and sub triangular, laterally compressed, anterior end rounded, posterior end drawn out ventrally, and cardinal angle prominent. A true caudal process is not present, although in lateral view posterior end is drawn out. Carapace ornamented with ridges longitudinally.

Material examined : 5 individuals collected from Gosthani estuary and single specimen from Balacheruvu tidal stream in 1977.

Distribution : India : Andhra Pradesh – Gosthani estuary, Balacheruvu tidal stream, Goguleru and Tekkali creek, east coast of India.

Remarks : This species is reported first time from Andhra Pradesh.

Genus ***Neocytheromorpha*** Guan Shaozeng *et al.*, 1978

30. ***Neocytheromorpha goguleruensis*** Shyam Sunder *et. al.*, 1995

1995. *Neocytheromorpha goguleruensis* Shyam Sunder *et al.*, Pl. II, Figs. 6-8.

Material examined : Two hundred and nine specimens including carapaces and valves were encountered from Goguleru creek in 1985.

Diagnosis : Carapace sub cylindrical in shape, surface ornamented with transverse ribs and pits, deep dorsal antero median sulcus present Sieve type normal pore canals and amphidont hinge.

Length : 0.56 mm.

Height : 0.25 mm.

Distribution : India : Andhra Pradesh–Goguleru creek.

Remarks : This is new species reported by Shyam Sunder *et al.*, and named after the type locality of the species, the Goguleru creek, east coast of India.

Family **LOXOCONCHIDAE** Sars, 1925

Key to genera

1. Carapace sub rhomboidal in lateral view 3
2. Carapace high ovate to sub rhomboidal, ... 4
3. Thick shelled, it is clearly punctuate ..... ***Loxoconchella***
4. Surface smooth to coarsely pitted ..... ***Loxoconcha***

Loxoconchella Triebel, 1954

31. ***Loxoconchella honoluliensis*** (Brady, 1868)

1968. *Loxoconchella honoluliensis* Guha, p. 61, Pl. IV, fig. 4.

1999. *Loxoconchella honoluliensis* Annapurna and Rama Sarma, Fig. 1

Length : 0.70 mm.

Height : 0.50 mm

Diagnosis : Sub rhomboidal in shape. The anterior end is rounded posterior end is oblique and drawn out into a blunt truncated caudal processes situated above the middle of the body. Surface of the valve faintly to strongly pitted. Marginal pore canals are typically branched and spaced more or less evenly spaced through the anterior, ventral and posterior marginal zone.

Material Examined : Single specimen collected from Gosthani and Vasishta Godavari estuary in 1976.

Distribution : India : Andhra Pradesh – Gosthani estuary and Vasishta Godavari estuary, east coast of India.

Elsewhere : Epinertic, warm, Pacific and Indian ocean.

Remarks : This species is reported first time from India.

Loxoconcha Sars, 1866

Key to species

1. Carapace rhomboidal, anterior end rounded, posterior end upwardly rounded 5
2. Carapace ovate, anterior end rounded, posterior end upwardly rounded 6
3. Carapace sub rhomboidal, highest in the middle, maximum height at nearly 2/3 of the length 8
4. Carapace Rhomboidal in shape, ovate to elongate, mostly with rather inflated valves 5
5. Surface ornamented with reticulations ..... *Loxoconcha sinensis*
6. Surface ornamented with sculpta ..... *L. sculpta*
8. Carapace marked with large pittings arranged in concentric rows, tending to form furrows ..... *L. lilligiborgii*
9. Coarse and irregular reticulation, large, circular normal sieve pores, pointed ala in the ventromedian region ..... *L. guhai*
10. Surface ornamented with reticulations and pits ..... *L. tekkaliensis*

32. ***Loxoconcha sinensis*** Brady, 1867

1867. *L. sinensis* Brady, p. 158, pl. XVI, Fig. 17, 18.

1880. *L. sinensis* Brady, p. 120, pl. XXIX, fig. 2.

1999. *L. sinensis* Annapurna and Rama Sarma, pl. 2 figs. 1-14.

Length : 0.51 mm.

Height : 0.34 mm

Diagnosis : Carapace rhomboidal, anterior end rounded, posterior end upwardly rounded, surface ornamented with reticulations.

Material Examined : 223 specimens collected from Gosthani estuary, 37 from Balacheruvu tidal stream and 8 from Vasishta Godavari estuary.

Distribution : India : Andhra Pradesh–Gosthani estuary, Balacheruvu tidal stream and Vasishta Godavari estuary.

Elsewhere : Mesohaline to littoral, world wide, shallow waters of Hong Kong, Sea of Japan.

Remarks : This species is reported first time from India

33. ***Loxoconcha sculpta*** Brady, 1869

1999. *Loxoconcha sculpta* Annapurna, Fig 2.

Length : 0.46 mm.

Height : 0.25 mm.

Diagnosis : Carapace ovate, anterior end rounded, posterior end upwardly rounded, surface ornamented with sculpta.

Distribution : India : Andhra Pradesh–Gosthani estuary, Bala cheruvu tidal stream and Vasishta Godavari estuary, east coast of India.

Elsewhere : Booby Island, Australia.

Material Examined : 55 specimens collected from Gosthani estuary; 11 specimens from Balacheruvu tidal stream and single specimen from Vasishta Godavari estuary in 1976 and 1977.

Remarks : This species is reported first time from India.

34. ***Loxoconcha lilljeborgii*** Brady, 1868

1954. *Loxoconcha lilljeborchi* Brady, Keij, P. 358 Pl. 3, Fig. 4.

1968. *Loxoconcha lilljeborchi* Brady, Guha, P. 61, pl. 4, fig. 2.

1975. *Loxoconcha lilljeborchi* Brady, Grahmann; p. 29, pl. 5, figs 6-8 1975.

1988. *Loxoconcha lilljeborchi* Brady, Zhao *et al.*, p. 206, pl. 20, fig. 12.

1999. *Loxoconcha lilljeborgii* Annapurna, Fig. 3.

Length : 0.42 mm.

Height : 0.21 mm.

Diagnosis : Carapace sub rhomboidal, highest in the middle, maximum height at nearly 2/3 of the length. Carapace marked with large pittings arranged in concentric rows, tending to form furrows.

Distribution : 2 individuals from Gosthani estuary and single from Gosthani Balacheruvu tidal stream, east coast of India.

Elsewhere : Indo-Pacific region. This species was originally found from the South China and Andaman Seas.

Material examined : 2 individuals collected from Gosthani estuary and single from Bala cheruvu tidal stream in 1976.

Remarks : This species is reported first time from India

35. ***L. guhai*** Shayam Sunder *et al.*, 1995

1995. *Loxoconcha guhai* Shayam Sunder, Plate I, Figs. 1-3.

Diagnosis : Carapce subrhomboidal, coarse and irregular reticulation, large, circular normal sieve pores, pointed ala in the ventromedian region.

Length : 0.48 mm.

Height : 0.35 mm.

Material examined : Forty specimens including carapaces and valves encountered from Goguleru creek in 1988.

Distribution : India : Andhra Pradesh–Goguleru creek.

Remarks : This species is new to species reported by Shyam Sunder *et al.*, 1995 in the Goguleru creek. The species is named after D.K.Guha, Deputy General Manager (SRG), ONGC, KDMIPE, and Dehradun, who did pioneering workon Neogene Ostracoda of India.

36. ***L. tekkaliensis*** Varma *et al.*, 1993

1993. *Loxoconcha tekkaliensis* Varma *et al.*, Pl I, Figs. 9-13

Length : 0.55 mm.

Height : 0.35 mm.

Material examined : One hundred and three specimens including valves and carapaces are encountered from Tekkali creek. in 1985.

Remarks : This species is new to science and reported by Varma *et al.*, in 1993 and named after type locality.

Distribution : India : Andhra Pradesh–Tekkali and Goguleru creek, east coast of India.

Family CYTHERURIDAE G. W. Mueller, 1894

1. Valves elongate sub triangular, somewhat tumid, dorsal margin straight 3
2. In lateral view the carapace is ovate to sub rhomboidal in outline.....4
3. Presence of flattish tubercle like elevation in the right valve..... *Paijenborchellina*
4. The valves are more or less strongly inflated ventrolaterally and more or less well-developed lateral wing like expansions are generally present 5
5. The carapace ends in an obtuse caudal process at or above the middle, which is often turned upwards ..... *Cytheropteron*

Genus ***Paijenborchellina*** Kuznetsova, 1957

Key to the species

1. Surface ornamented with reticulations pits lie between the reticulations 2
2. Four hollow tubercles present pits arranged in rows at posterior margin..... 3, 4
3. Amphidont type of hingement, median hinge element divided into short anteromedian and longer poster median elements ..... *P. caudatum*
4. Amphidont type of hingement, all elements crenulated ..... *P. reticulatum*

37. ***Paijenborchellina caudatum*** Annapurna and Rama Sarma, 1987

1987. *Paijenborchellina caudatum* Annapurna and Rama Sarma, 628-631 pl. 1, Fig. A, pl. 2 Figs. 1-7.

Diagnosis : Presence of hollow tubercles in the anterior 2/3rds of the body. Posterior marginal pits present in rows. Pits uncommon on the extreme part of the body.

Length : 0.49 mm.

Height : 0.25 mm.

Material examined : 33 individuals encountered from Gosthani estuary, 290 from Balacheruvu tidal stream and single individual from Vasishta Godavari estuaryin 1976 and 1977.

Distribution : India : Andhra Pradesh Gosthani estuary, Balacheruvu tidal Stream, Vasishta Godavari estuary and Tekkali creek, east coast of India.

Remarks : This species is new to science reported by Annapurna and Rama Sarma and named basing on the pronounced nature of caudal process at the posterior side.

38. ***Paijenborchellina reticulatum*** Annapurna and Rama Sarma, 1987

1987. *Paijenborchellina reticulatum* Annapurna and Rama Sarma, 628-631, pl. 1, Fig. B, pl. 3, Figs. 1-7

Diagnosis : Ovate to wedge shaped carapace, surface of the carapace ornamented With reticulations, pits arranged between reticulations.

Length : 0.61 mm.

Height : 0.37 mm.

Material examined : 60 individuals encountered from Gosthani estuary, 159 from Balacheruvu tidal stream in 1976 and 1977.

Distribution : India : Andhra Pradesh–Gosthani estuary, Balacheruvu tidal stream and Goguleru creek, east coast of India.

Remarks : This species is new to science reported by Annapurna and Rama Sarma and naming based on the important character of systematic importance namely carapace sculptured with reticulations.

Genus ***Cytheropteron*** Sars, 1865

39. ***Cytheropteron alatum*** Sars, 1866.

1866. *Cytheropteron alatum* G.O. Sars, pl. CIV

1912. *Cytheropteron alatum* G.W. Muller, 274.

1929. *Cytheropteron alatum*, Klie 26.

Diagnosis : Carapace smooth thinly calcified, usually fragmentary, never articulated. Ventral margin gently undulatory, dorsal margin strongly arched terminating in a prominent mid posterior caudal process.

Length : 0.72 mm.

Height : 0.40 mm.

Distribution : India : Andhra Pradesh–Gosthani estuary.

Elsewhere : Scandinavia off the British Isles, the north Atlantic and Mediterranean-worldwide.

Material examined : Single valve obtained from Gosthani estuary in 1976.

Remarks : This species is reported first time from Andhra Pradesh.

Family ILYOCYPRIDIDAE Kaufmann, 1900

Genus ***Ilyocypris*** Brady and Norman, 1889

Generic diagnosis : Valves sub quadrate, laterally compressed, dorsum straight or sulcate surface pitted, pustulose, tuberculate, or smooth.

40. ***Ilyocypris gibba*** (Ramdohr, 1808)

1803. *Cypris gibba* Ramdhor, p. 91.

1889. *Ilyocypris gibba* (Ramdohr), Brady and Norman, p. 107.

Diagnosis : Carapace sub quadrate in outline, anterior end broadly rounded. Posterior end truncate, dorsal margin straight, ventral margin concave. The prominent sulci in anterodorsal part of the shell commonly with one or more hollow tubercles.

Length : 0.60 mm.

Height : 0.32 mm.

Distribution : India : Andhra Pradesh : Gosthani estuary, and Vasishta Godavari estuary, east coast of India.

Elsewhere : World wide.

Remarks : This species is reported first time from Andhra Pradesh.

Family CYPRIDIDAE Baird, 1845

Genus ***Phlyctenophora*** Brady, 1880

Diagnosis : Carapace elongate, moderately laterally compressed. Greatest height situated in the middle and equal to less than half the length. Anterior end broadly rounded. Posterior end narrowed and ventrally sub angular. Dorsal margin arched, ventral margin somewhat sinuate the middle

Key to the species

1. Carapace smooth 3
2. Carapace sculptured with a few pits and dark brown patches in live condition 6
3. Antero dorsal pronounced ..... *Phlyctenophora bhatiai*
4. Antero dorsal not pronounced 5
5. Marginal pore canals conspicuously branching ..... *P. zealandica*
6. Bifurcate branching in marginal pore canals ..... *Phlyctenophora indica*

41. ***Phlyctenophora zealandica*** Brady, 1880

1880. *Phlyctenophora zealandica* Brady, p. 33, pl. III, fig.I

1988. *Phlyctenophora zealandica* Annapurna and Rama Sarma, Pl.I, fig. A Pl. 2 fig 1-8

Diagnosis : Carapace elongate, moderately compressed laterally. Marginal pore canals many conspicuously branched, especially anteriorly anteroventrally.

Length : 0.94 mm.

Height : 0.45 mm.

Material Examined : 26 individuals from Gosthani estuary in 1976 and 1977and 4 from Vasishta Godavari estuary in 1976.

Distribution : India : Andhra Pradesh–Gosthani and Vasishta Godavari estuary, east coast of India.

Elsewhere : Indopacific and Mediterranean.

Remarks : This species is reported first time from Andhra Pradesh.

42. ***Phlyctenophora indica*** Annapurna and Rama Sarma 1988

1988. *Phlyctenophora indica* Annapurna and Rama Sarma, Pl. 1, fig., Pl. 3, fig.1-8.

Diagnosis : Carapace sculptured with a few pits and dark brown patches in live condition. Bifurcate branching in marginal pore canals.

Length : 0.67 mm.

Height : 0.64 mm.

Material Examined : 223 individuals from Gosthani and 1576 from Balacheruvu tidal stream and 33 from Vasishta Godavari estuary from 1976 and 1977.

Distribution : India : Andhra Pradesh : Gosthani estuary, Balacheruvu tidal stream, lowers reaches of Vasishta Godavari estuary, east coast of India.

Remarks : This species is new to science, reported by Annapurna Rama Sarma and named after India.

Family CYPRIDOPSIDAE Kaufmann, 1960

Genus ***Cypridopsis*** Brady 1867

Generic diagnosis : Valves reniform, sub triangular to subovate, strongly arched dorsum, enter concave or straight, right valve larger than the left, surface pitted, hairy or spinose. Furca reduced to a flagellum.

43. ***Cypridopsis obesa*** Brady and Robertson, 1889

1870. *Cypridopsis obesa* Brady and Robertson, p. 15.

Diagnosis : Carapace tumid as seen from the side sub rectangular, surface smooth, highest in the middle, greatest height equal to nearly 2/3rd of the length, extremities rounded. Shell surface closely and largely punctate.

Distribution : *India* : Andhra Pradesh–Vasishta Godavari estuary, Goguleru and Tekkali creek, east coast of India.

Elsewhere : Worldwide.

Material examined : 4 individuals encountered from Vasishta Godavari estuary in 1977.

Remarks : This species is reported first time from Andhra Pradesh.

Family NEOCYTHERIDEIDAE Puri, 1957

Genus ***Copytus*** Skogsberg, 1939

Diagnosis : Carapace elongate–oblong in lateral view, sub equal in height nearly throughout. Both ends rounded and surface smooth.

44. ***C. coramandalensis*** Shyam Sunder *et al.*, 1995

1978. *Copytus* sp. cf. *C. rara* Mckenzie, Jain, p. 105, Figs. 3D, 1-2.

1995. *Copytus* sp. cf. *C. rara* Shyam Sunder, Plate I, Figs. 4-6

Diagnosis : Narrow, elongate carapace, acuminate anterior margin, rounded posterior margin, surface ornamented ventrally with longitudinal striations.

Length : 0.80 mm.

Height : 0.22 mm.

Material examined : Ninety seven specimens including carapaces and valves encountered in 1988.

Distribution : India : Andhra Pradesh-Tekkali creek.

Remarks : This is new to science reported by Shyam Sunder *et al.*, 1995 and named after its occurrence along the Coromondel coast.

Family PARADOXOSTOMATIDAE Brady and Norman, 1889

Genus ***Paradoxostoma*** Fischer, 1855

Diagnosis : In side –view the valves are elongate –ovate, in dorsal view they are strongly compressed laterally.Anterior end acitely rounded below; posterior end with a more or less pronounced caudla process situated normally above the middle.

45. ***Paradoxostoma bhatiai*** Shyam Sunder *et al.*, 1995

1995. *Paradoxostoma bhatiai* Shyam Sunder *et al.*, Plate II, Figs. 1-2.

1978. *Paradaxostoma* sp Jain, pl. 131

Diagnosis : Carapace lenticular in shape, posterior margin pointed at mid height as a short caudal process, broad vestibulum along the anterior, ventral and posterior margins.

Length : 0.55 mm.

Height : 0.22 mm.

Distribution : India : Mandvi beach, west coast of India and Goguleru creek, east coast of India.

Material examined : Two hundred and fifteen specimens including carapaces and valves encountered from Goguleru creek in 1988.

Remarks : This is new to science reported by Shyam Sunder *et al.,* 1995 and named in honour of Prof. Bhatia.

Genus ***Sclerochilus*** Sars, 1866

Generic diagnosis : In side view typically reniform, both ends rounded, posterior end without any trace of caudal process. Dorsal margin strongly convex, ventral margin sinuous.

46. ***Sclerochilus contortus*** (Norman)

1889. *Sclerochilus contortus* Brady & Norman, P. 225.

1928. *Sclerochilus contortus* Sars, p. 247.

1957. *Sclerochilus contortus* Wagner, p. 101.

2001. *Sclerochilus contortus* Annapurna, Figs 1-9.

Diagnosis : Viewed laterally, the shell is oblong, bean shaped, anterior extremity evenly rounded while the posterior is obtuse.

Length : 0.68.

Height : 0.28.

Material examined : 70 specimens of *S. contortus*, juveniles inclusive, were collected from seaweed *Caulerpa racemosa* from the rocky strip of Palm beach, near Visakhapatnam in 2001.

Distribution : *India* : Andhra Pradesh–Palm Beach (rocky coast), Visakhapatnam, east coast of India.

Elsewhere : Norwegian coast, Ireland Channel Islands, Franz Joseph Islands, spit Bergen, Holstenborg Harbor, and east coast of Davis, Skagerak.

Remarks : This species is reported first time from Andhra Pradesh.

SUMMARY AND GENERAL DISCUSSION

Al together 35 species were represented at Gosthani estuary *Cytherella pulchara, Paijenborchella (Eopaijenborchella) subcaudatum, Loxoconchella honoluliensis, Limnocythere sanctipatricii, Pontocythere fabacea, Cytheropteron alatum* were encountered exclusively at this area. Altogether 28 species were encountered at Goguleru creek. Among them *Paijenborchella (Eopaijenborchella) keij, Loxoconcha guhai, Copytus coramandalensis, Paradoxostoma bhatiai, Neocytheromorpha goguleruensis* were encountered exclusively at this area.

Altogether 28 species was encountered at Balacheruvutidal stream. Among them only two species namely *Cytherella punctata, Neomonoceratina spinosa* exclusively encountered at this area. Altogether 21 species encountered at Tekkali creek and 17 species were encountered at Vasishta Godavari estuary. None of the exclusively occurring species was found at Vasishta Godavari estuary and Tekkali creek. At Palm Beach lone species namely *Schlerochilus contortus* was encountered in large numbers.

ACKNOWLEDGEMENT

I express my deep gratitude to Dr. D.V. Rama Sarma for his valuable suggestions and constant encouragement and also to the Andhra University for the facilities provided.

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PLATE - I

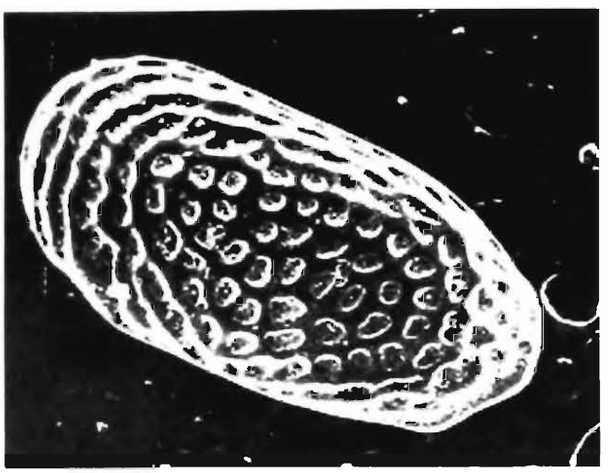

Fig. 1. *Hemicytheridea andhraensis*

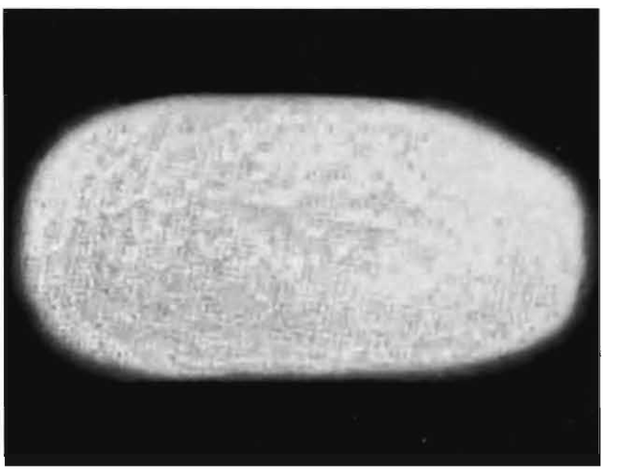

Fig. 2. *Hemicytheridea bhatiai*

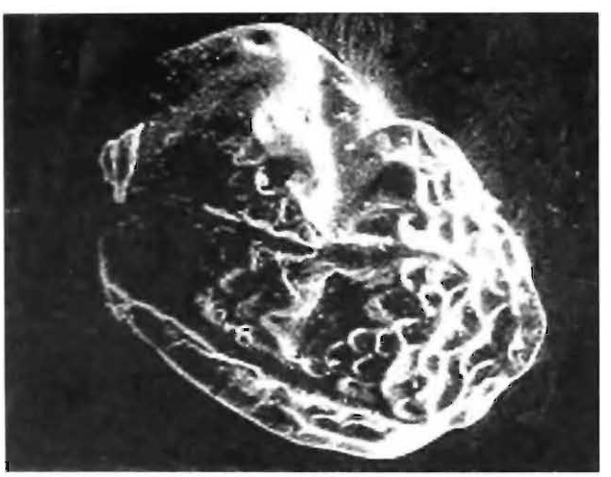

Fig. 3. *Neomonoceratina indica*

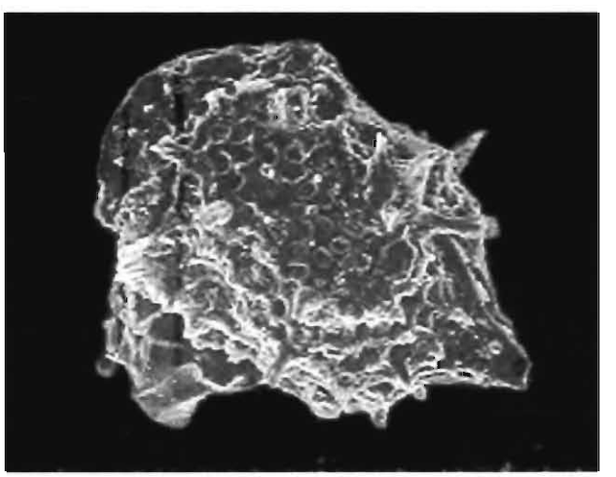

Fig. 4. *Neomonoceratina spinosa*

Fig. 5. *Neomonoceratina jaini*

PLATE - II

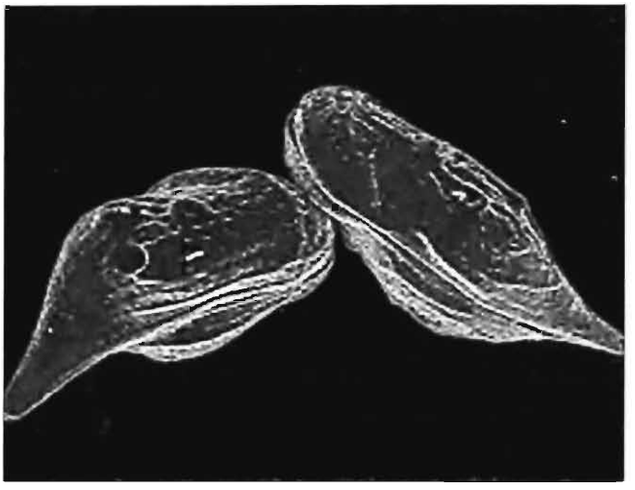

Fig. 6. *Paijenborchella (E) subcaudatum*

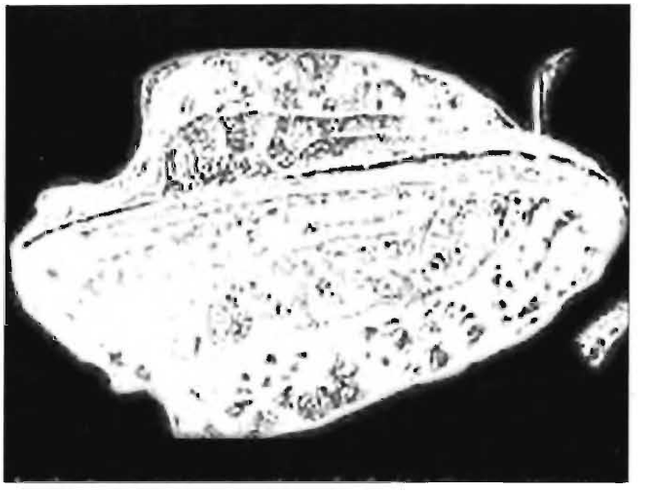

Fig. 7. *Paijenborchella (E) keiji*

Fig. 8. *Neosinocythere mchenzii*

Fig. 9. *Tanella estuarii*

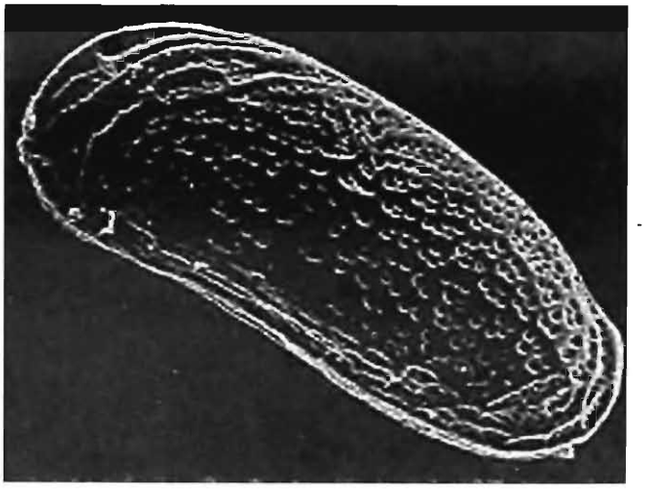

Fig. 10. *Tanella kingmai*

PLATE - III

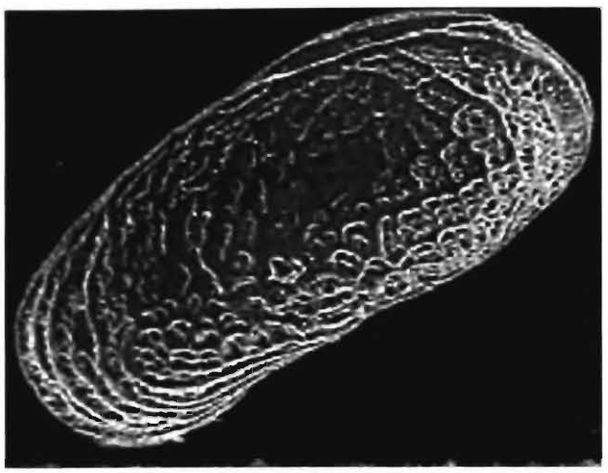

Fig. 11. *Tanella indica*

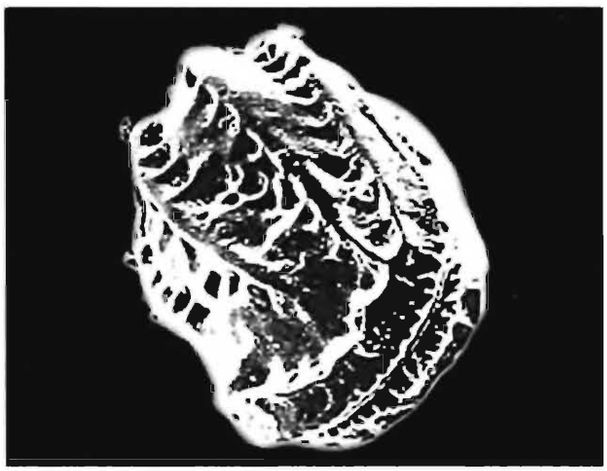

Fig. 12. *Costa quadricostatum*

Fig. 13. *Neocytheromorpha goguleruensis*

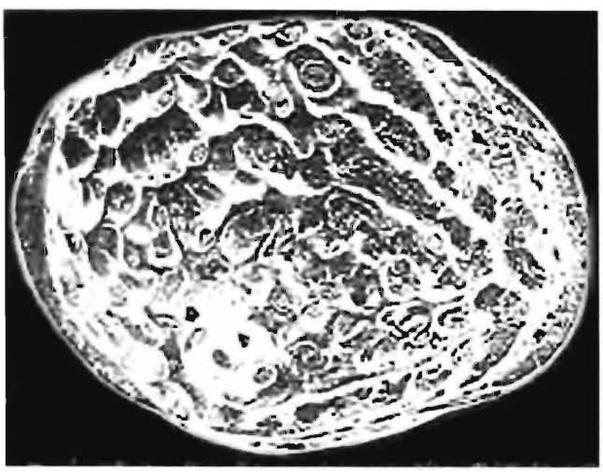

Fig. 14. *Loxoconcha guhai*

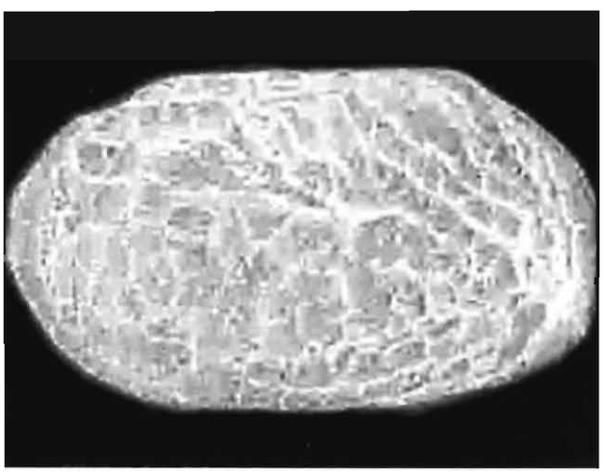

Fig. 15. *Loxoconcha tekkaliensis*

PLATE - IV

Fig. 16. *Paijenborchellina caudatum*

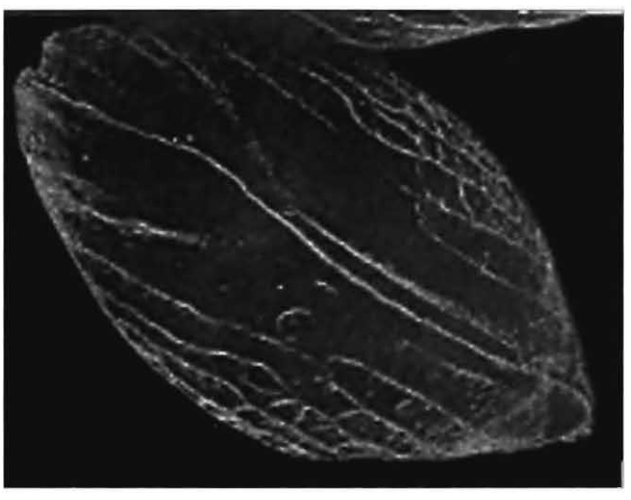

Fig. 17. *Paijenborchellina reticulatum*

Fig. 18. *Phlyctenophora indica*

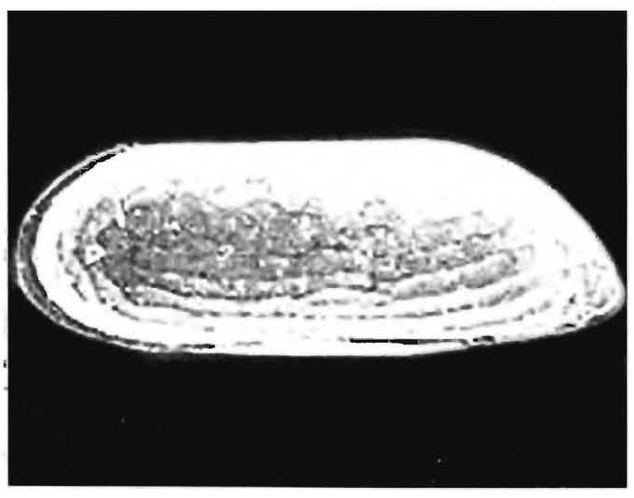

Fig. 19. *Copytus coromandalensis*

Fig. 20. *Paijenborchellina bhatiai*

Zool. Surv. India
Fauna of Andhra Pradesh, State Fauna Series, **5**(Part-4) : 245-248, 2007

DECAPODA : BRACHYURA
BRACHYURAN (GECARCINUCIDAE) CRABS

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INTRODUCTION

As a part of annual plan of research work of S.R.S., ZSI., Chennai five districts i.e. Chittor, Nellore, Cuddapah, Karnool and Anantpur of the state of Andhra Pradesh (Text fig. 1&2) were surveyed by various parties in different seasons spread over in last three years between 2002-2005. These districts belonging to southern part of Andhra Pradesh and quite a good number of fresh water crabs have been collected from the districts under study.

The state of Andhra Pradesh lies between 12°37′ and 19°54′ N latitude and 76°46′ and 84°46′ E longitude. Among the district surveyed the district Chittor lies between 12°37′ and 14°08′ N latitude and 78°03′ and 79°55′ E longitude. Though there is no perennial river in the district but some minor rivers and reservoirs are flowing and passing through the broad vallies of Chandragiri hills found rich habitats for collecting crabs.

The district Nellore known for extensive paddy cultivation endowed with a large number of fresh water land crabs, lies between 13°30′ and 16°00′ N latitude and 70°05′ and 80°15′ E longitude. Pennar is the most important river in the district supporting good habitat for crabs.

Cuddapah is one of the most hilly and biggest district of Andhra Pradesh, lies between 14°27′ and 57°05′ N latitude and 78°49′ and 32°06′ E longitudes. Almost the entire district is drained by Penneru River with its numerous affluent.

Karnool district is situated between 14°54′ and 16°18′ N latitude and 76°58′ and 79°54′E longitude. The principal rivers Tungabhadra with some other important streams are flowing through the forest areas, supports availability of varieties of fresh water crabs.

Anantpur district situated southwest of Andhra Pradesh, between 13°41′ and 15°14′ N latitude and 76°47′ and 78°26′ E longitude. The Chitravati,Hagari and Papaghni are the minor rivers flow into the district. The brachyuran fauna with reference to Gecarcinucid crabs from the state is however very poorly documented. Date back to Wood-Mason (1871) and Alcock (1910) recorded one species *Barytelphusa (Barytelphusa) cunicularis* (Westwood) from the

state. In recent studies Deb (1998) and Ghosh *et al.* (2005) recorded another one species *Oziotelphusa senex senex* (Herbst).

Therefore the present work is an attempt to inventories the fresh water Crab (true brachyurans) fauna based on the collection made by the author and other members of SRS. ZSI, Chennai during the period of under study. Altogether 380 examples of fresh water crabs from different niches of these five districts of southern Andhra Pradesh have been examined and accounted four species under three genera belonging to two families which are dealt hereunder with details such as locality, date of collection, collector name, sex and number of examples. The author followed the classification of Bott (1970).

SYSTEMATIC LIST

Order DECAPODA

Infra order BRACHYURA

Family GECARCINUCIDAE

1. *Barytelphusa (Barytelphusa) cunicularis* (Westwood)
2. *Barytelphusa (Barytelphusa)guerini* (Milne-Edwards)

Family PARATHELPHUSIDAE

3. *Oziotelphusa senex senex* (Fabricius)
4. *Spiralothelphusa hydrodroma* (Herbst)

SYSTEMATIC ACCOUNTS

1. ***Barytelphusa (Barytelphusa) cunicularis*** (Westwood)
(Fig. 1)

1836. *Thelphusa cunicularis* Westwood, in Sykes & Westwood, *Trans. Entom. Soc.* London, **1** : 183,T.19.

1910. *Paratelphusa (Barytelphusa) jacquemonti* Alcock, *Cat. Ind. Decap.Crust. Ind. Mus.* **1**(2) : 79 fig. 55.

1910. *Paratelphusa (Barytelphusa) pulvinata* Alcock, *Cat. Ind. Decap. Crust. Ind. Mus.*, **1**(2) : 86, fig.21.

1970. *Barytelphusa (Barytelphusa) cunicularis* Bott., *Abh, Senckenb. Nature. Ges.* No. **526** : 31

Material Examined : 8M, 3F, Talakona waterfall, Chittor, 13.ix.2002, O.P. Srivastava; 1M, 7F, Naynargardikey, Chittor, 14.ix.2002, O.P.Srivastava; 1M, 1F,Kadivedu, Nellore, O.P. Srivastava; 12M, 6F, Kalalabugga, Karnool, 24.iii.2005, O.P. Srivastava; 5M, Pennadam, Anantpur, 27.iii.2005, O.P.Srivastava.

Distribution : India : Assam, Andhra Pradesh, Bihar (undivided), Gujarat, Karnataka, Kerala, Maharashtra,Rajasthan, Tamil Nadu, Uttar Pradesh (undivided) West Bengal (Bürger)

Elsewhere : Sri Lanka (Doflein).

Remarks : The species attain larger size of about 4 inches in width and 3 inches in length with dark brown colour.

2. ***Barytelphusa (Barytelphusa) guerini*** (Milne-Edwards)
(Fig. 2)

1853. *Thelphusa guerini* Milne-Edwards, *Ann. Sci. Nat. Zool.*, **20**(3) : 210

1910. *Paratelphusa (Barytelphusa)guerini* Alcock,*Cat.Ind.Decap.Crust.Ind.Mus.*, **1**(2) : 87, fig. 57.

1970. *Barytelphusa (Barytelphusa) guerini* Bott, *Abh, Senckenb. Nature.* Ges. No. **526** : 33.

Material Examined : 8M, Talakona water fall, Chittor, 13.ix.2002, O.P.Srivastava; 7M, Akkuriti, Srikalahasti, Chittor, 25.ii.2004, O.P. Srivastava; 3M, Neelghat Cuddapah, 17.iii.2005, R.Angel.

Distribution : India : Andhra Pradesh; Karnataka; Tamil Nadu.

Remarks : This is the first record of occurrence from Andhra Pradesh.

3. ***Oziotelphusa senex senex*** (Fabricius)
(Fig. 3)

1798. *Cancer senex* Fabricius, *Entom. syst (suppl.)*, 340.

1904. *Potamon (*Potamon*) bouvieri* Rathbun, *Nouv. Arch. Du Museum*, (4)**6** : 293, pl .12, fig., 5.

1910. *Paratelphusa (Oziotelphusa) hydrodromus* Alcock, *Cat. Ind. Decap. Crust. Ind. Mus.*, **1**(2) : 97, fig 60.

1910. *Paratelphusa (Oziotelphusa) bouvieri* Alcock, *Cat. Ind. Decap. Crust. Ind. Mus.* **1**(2) : 100, fig. 61.

1970. *Oziotelphusa senex senex* Bott., *Abh, Senckenb. Natur, Ges.* No. **526** : 100

Material Examined : 4M, Mallapalle, Chittor, 9.ix.2002, O.P. Srivastava; 1M, Vayalpad, Chittor, 10.ix.2002, O.P.Srivastava; 1M, 3F, GunthaGodanki, Chittor, 5.ix.2002, O.P. Srivastava 2F, Kadivedu, Nellore, 18.ix.2002, O.P. Srivastava; 2M, 2F, Dakkili, Chittor, 20.i.2003, M.B. Raghunathan; 17M, 6F, Vadatala, Nellore, 24.i.2003, M.B. Raghunathan; 1M, 1F, Yempadu, Nellor, 14.x.2003, M.B. Raghunathan; 1M, 1F, Penmetti, Nellore, 22.ii.2004, O.P. Srivastava; 24M, 16F, Empedu Chittor, 25.ii.2004, O.P. Srivastava; 1M, 1F, Kamalapuram, Cuddapah, 25.xi.2004, D. Prabhakar; 5M, Kondapuram, Cuddapah, 27.xi.2004, D. Prabhakar; 3M, Rollapadu, Karnool, 30.xi.2004, D. Prabhakar; 2F, Pudicheru, Karnool, 3.xii.2004, D. Prabhakar; 2M,1F, Paramanchala, Karnool, 5.xii.2004, D. Prabhakar; 1M, Singanamala Road, Anantpur, 7.xii.2004, D. Prabhakar.

Distribution : India: Andhra Pradesh, Karnataka, and Tamil Nadu.

Elsewhere : Sri Lanka.

Remarks : This species is predominantly distributed in Andhra Pradesh.

4. ***Spiralothelphusa hydrodroma*** (Herbst)
(Fig. 4)

1794. Cancer *hydrodromus* Herbst, *Naturgesch Krabben und Krebse*, **2** : 164, T. 41, F. 2.

1910. *Paratelphusa (Oziotelphusa) hydrodromus* Alcock, *Cat. Ind. Decap. Crust. Ind. Mus.*, **1**(2) : 97, fig 60.

1970. *Spiralothelphusa Hydrodroma* Bott., *Abh, Senckenb. Natur, Ges.* No. **526** : 97.

Material Examined : 1M, 3F, Malapalle, Chittor, 9.ix.2002, O.P. Srivastava; 11M, 6F, Tada Road, Chittor, 13.i.2003, M.B. Raghunathan; 1M, 3F, Nalpattu, Chittor, 14.i.2003, M.B. Raghunathan; 7M, 8F, S.R. Puram, Chittor, 16.i.2003, M.B.Raghunathan; 4M, 1F, Kanigiri, Nellor, 17.i.2003, M.B. Raghunathan; 57M, 18F, Kavalitank, 17.i.2003, M.B. Raghunathan; 8M, 12F, Rapur, Chittor, 20.i.2003, M.B. Raghunathan; 2M, 2F, Erupudu, Chittor, 21.i.2003, M.B. Raghunathan; 7M, 1F, Pettekuru, Chittor, 23.i.2003, M.B. Raghunathan; 1M, 11F, Kadivedu, Nellore, 18.ix.2003, O.P. Srivastava; 1M, 1F, Nellapatti, Chittor, 13.i.2003, M.B. Raghunathan; 9M, 3F, Buchinaydu kandriga, Nellore, 16.x.2003, M.B. Raghunathan; 6M, 2F, Manawdur R.F, Chittor, 19.x.2003, M.B. Raghunathan; 2M, 3F, Ginginagar, Srikalahasti, Chittor, 26.ii.2004, O.P. Srivastava; 4M, 4F, Enahanuree, Cuddapah, 26 xi.2004, D. Prabhakar; 7M, 12F, Agaduru, Cuddapah, 26.xi.2004, D.Prabhakar.

Distribution : India : Andhra Pradesh, Kerala, Pondicherry, Tamil Nadu, Uttar Pradesh (Allahabad), and West Bengal (Kolkata).

Elsewhere : Sri Lanka.

Remarks : This is the first record of occurrence from southern Andhra Pradesh.

SUMMARY

The present study is based on the collection of Gecarcinucids crabs collected during four surveys, undertaken for southern part of Andhra Pradesh. About 380 specimens accounted for identification which comprises 4 species belonging to 3 genera, under 2 families. *Barytelphusa (Barytelphusa) guirine* and *spiralothelphusa hydrodroma* are the first record from the state of Andhra Pradesh

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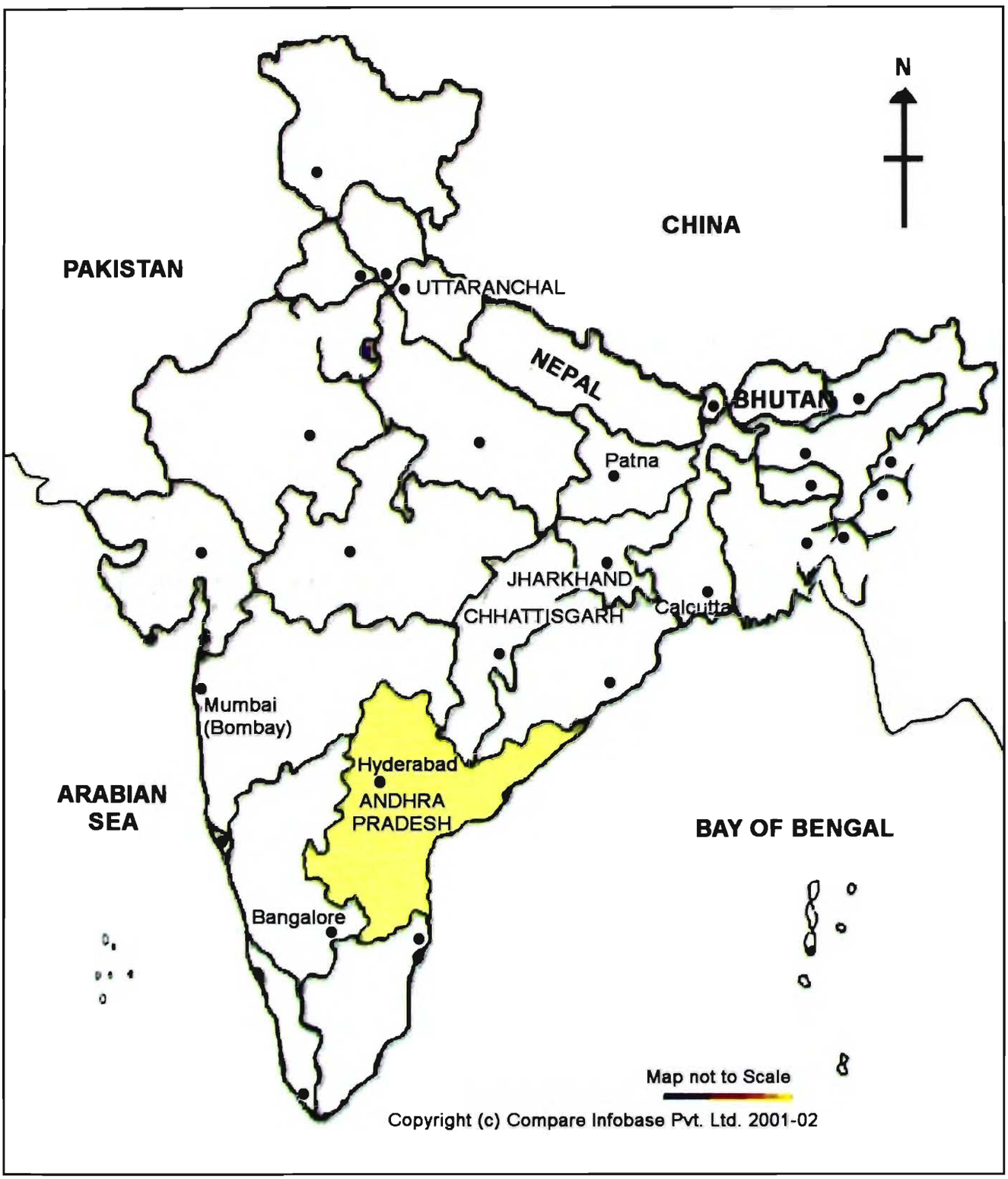
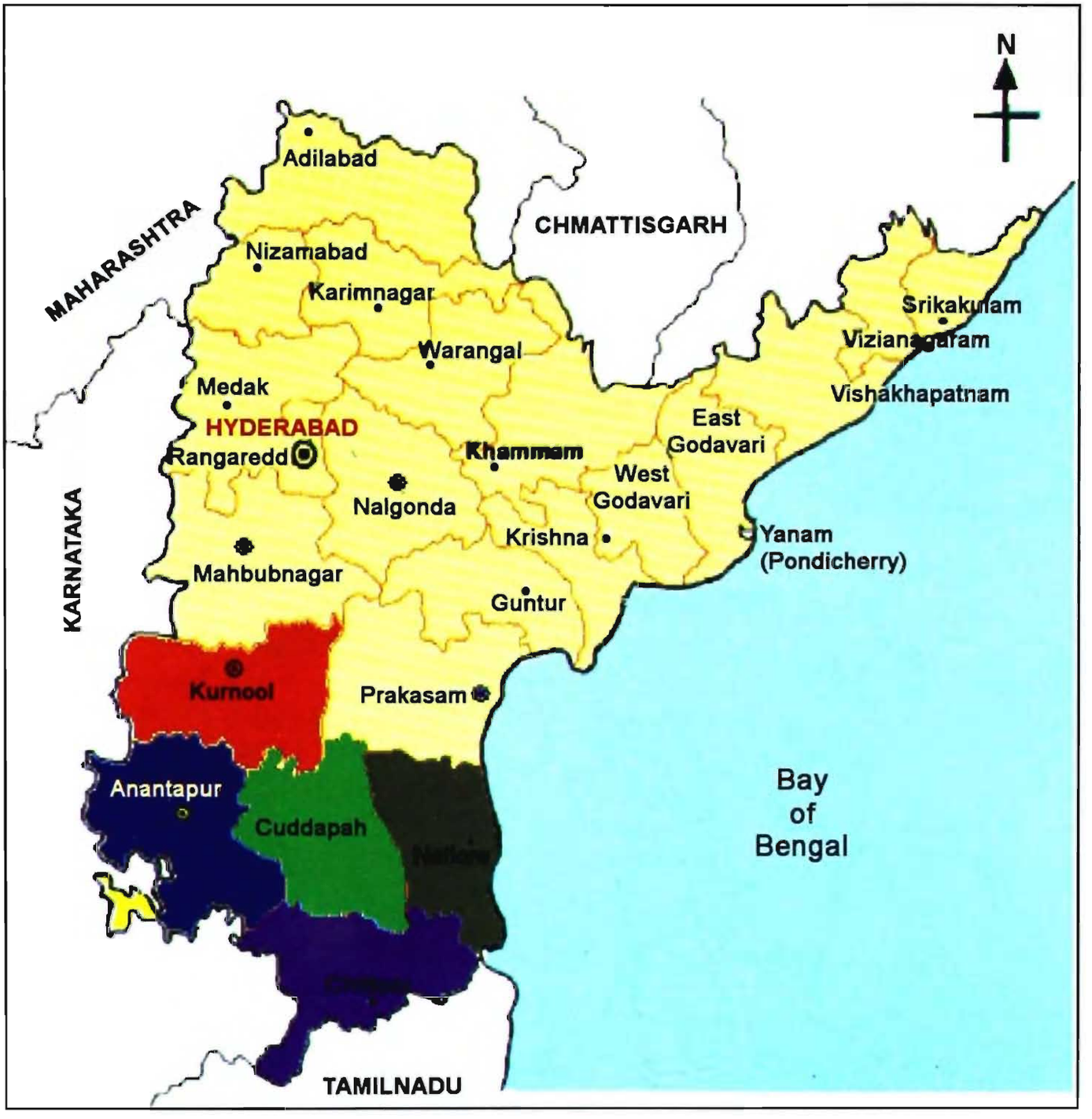


Map. 1 : Location of Andhra Pradesh in India



Map. 2 : Showing district-wise collection localities

PLATE - I

Fig. 1. *Barytelphusa (Barytelphusa) cunicularis* (Westwood)

Fig. 2. *Barytelphusa (Barytelphusa) guerini* (Milne-Edwards)

PLATE - II

Fig. 3. *Oziotelphusa senex senes* (Fabricius)

Fig. 4. *Spiralothelphusa hydrodroma* (Herbst)