

A Guide to the Freshwater Fauna of Ceylon

SUPPLEMENT 3.

C. H. FERNANDO

(Department of Biology, University of Waterloo, Canada)

INTRODUCTION

This supplement to the "Guide to the freshwater fauna of Ceylon" by A. S. Mendis and C. H. Fernando. *Bull. Fish. Res. Stn. Ceylon* 12, 160 pp. (1962) includes a number of additional records to the fauna and nomenclatural changes designed to bring the names of the Rotifera and Hydracarina up to date. This latter involves a complete change in naming of Rotifera to keep in line with modern nomenclature synonymizing species where necessary. A major study on the water mites of India by Cook (1967) has necessitated considerable changes in the naming of Ceylonese species. Besides the Rotifera and Hydracarina the Hemiptera-Heteroptera have received attention as regards the Corixidae and new generic and specific records from published and unpublished material has been included.

A major difficulty in studying freshwater animals (for that matter any animals) is the lack of suitable illustrations of local forms. An attempt has been made to fill this gap for the Rotifera and Turbellaria. It is hoped that in future supplements other groups can be similarly dealt with.

TURBELLARIA

Rhabdocoela

Only two species are on record (see Guide p. 40). In the present paper three cosmopolitan species belonging to genera most likely to be found in Ceylon have been illustrated namely *Stenostomum unicolor* (Schmidt), Fig. A4, Fig. A6, *Macrostomum tuba* Graff Fig. A5 and *Mesostomum ehrenbergi* (Focke). One of the reasons why the Rhabdocoela have been so poorly studied is perhaps the difficulty of preserving them for study. The ideal method to study them is in the living state when their simple structure can often be clearly made out. Some of the larger forms can be fixed in Steimanns fluid: Conc. HNO₃—1 part, Saturated Solution of Mercuric Chloride in 5% NaCl—1 part and Distilled water—1 part. The animals should be allowed to extend themselves in a minimum of water and the preserving fluid poured on. After a minute the specimens should be transferred into 70% Ethyl Alcohol. Rhabdocoels can be located rather easily by bringing vegetation from ponds and keeping them in the laboratory in glass jars. The larger forms can be seen very easily. The smaller forms can be spotted with low power binoculars. Some rhabdocoels and allocooels are capable of aestivating as resistant eggs. They are likely to be found in temporary habitats.

In 10 or 12 years of collecting freshwater animals in Ceylon the author has frequently seen rhabdocoels especially smaller forms. It is likely that both Rhabdocoela and Allocooela are quite common if a search is made for them.

Tricladida

No freshwater triclad has been recorded from Ceylon so far. In the author's experience in Ceylon he has seen them very, very rarely. A number of species are on record from the Indian region belonging to two genera *Planaria* and *Dugesia*. The distinguishing features of these two genera are illustrated in Figs. A 1-3. Whitehouse (1913) described two freshwater triclad from India under the names *Planaria kempfi* and *P. aborensis*. Ball, Reynoldson and Warwick (1968) have stated that *Planaria kempfi* is probably *P. torva* (Müller), a common European form. Meixner (1928) puts Whitehouse's *Planaria aborensis* under the name of *Dugesia gonocephala* (Dug.). These two species

are illustrated in Figs. A1 and 2. Kaburaki (1918, 1925) described three other planarians from the Indian region: *Dugesia annandalei*, *D. andamanensis* and *D. burmaensis*. A useful reference to triclads of the Oriental region is that of Kawakatsu (1964).

Planarians are somewhat easier to study and preserve than rhabdocoels and alloeocoels. However planarians are extremely rare in the tropics. It is likely that some species may be found in the hill country streams and ponds. Planarians can be fixed for study using Steinmann's fluid as for rhabdocoels and alloeocoels.

I am obliged to one of my graduate students Ian R. Ball for his comments on the Turbellaria and for locating for me relevant references on Turbellaria of the Indian Region.

References

- BALL, I. R. REYNOLDS, T. B. and WARWICK, T. (1969). The taxonomy, habitat and distribution of the fresh-water triclad *Planaria torva* (O. F. Muller, 1774) in Britain. *J. Zool., Lond.*, 157, 99-123
- HYMAN, L. H. 1943. On a species of *Macrostomum* (Turbellaria: Rhabdocoela) found in tanks of exotic fishes. *Amer. Mid. Nat.*, 30, pp. 322-335.
- KABURAKI, T. 1918. Freshwater triclads from the basin of the Tule Lake. *Rec. Indian Mus.*, 14.
- 1925—Planarians from the Andamans. *Rec. Indian Mus.*, 27, pp. 29-32.
- KAWAKATSU, M. 1964. On the ecology and distribution of freshwater planarians in the Japanese Islands, with special reference to their vertical distribution. *Hydrobiologia*, 26, pp. 349-410.
- LUTHER, A. 1963. Die turbellarian Ost fennoskandians. IV. Neorhabdocoela. *Soc. Fauna Flora Fenn. Fauna Fennica*, N-16, 103 pp.
- MEINER, J., 1928. Der genitalapparat der tricladen und seine beziehungen zu ihren allgemeinen, Morphologie, Phylogenie, Ökologie und Verbreitung. *Z. Morph. Okol. d Tiere*, 11, pp. 570-612.
- WHITEHOUSE, R. H. 1913. Zoological results of the Abor Expedition, XXII, Freshwater planaria. *Rec. Indian Mus.*, 8, pp. 317-321.

Rotifera

The list of species given in the "Guide" is nomenclaturally out of data. Dr. M. G. George, Department of Biology, University of Waterloo has kindly revised the names for me according to Wisniewski (1954). A totally new list is given in the present supplement arranged in alphabetical order for families. Five new records have been added to the Ceylonese list namely *Brachionus diversicornis* Daday, *Brachionus patulus* Muller, *B. angularis* Gosse *B. budapestiensis* Daday, and *Lecane papuana* (Murray). These were identified by Dr. E. H. Ahlstrom from material sent by the author. Mendis (1965) records *Trochosphaerium* sp. from Ceylon. This is probably *Trochosphaera aequatorialis* Semper the only species in the genus.

A monogonate and bdelloid-rotifer have been illustrated in Fig. B 1 and 2. Genera not illustrated in the "Guide" have been illustrated in Fig. B 3-7. Since extensive nomenclatural changes have been made, a list of the generic names in the guide and their revised names are given so that the figures in the guide can be used with the new list.

The rotifers recorded from Ceylon consist almost entirely of planktonic forms. It is hoped that some bdelloid rotifers can be collected and identified in the not too distant future. Rotifera should be collected with a fine mesh (No. 25) plankton net and preserved in very dilute formalin.

Excellent works on the Rotifera are available for those embarking on a study of this interesting group. Donner's (1965) work translated into English is an excellent guide to start with. Some of the more important works are given for limnologists and taxonomists.

List of Ceylonese species :—

- Family — Asplachnidae
Asplachna brightwelli Gosse
Asplachnopus multiceps (Schrank)
- Family — Brachionidae
Anuraeopsis navicula Rousselet
 **Brachionus angularis* Gosse
Brachionus budapestensis Daday
Brachionus calcyciflorus Pallas
Brachionus caudatus Barrois and Daday
 **Brachionus diversicornis* (Daday)
Brachionus falcatus Zacherias
Brachionus forficula Wierzejski
 **Brachionus patulus* Muller
Brachionus quadridentatus Hermann
Brachionus rubens Ehrenberg
Epiphanes macrourus Barrois and Daday
Euchlanis dilatata Ehrenberg
Keratella tropica Apstein
Lepadella ovalis Muller
Lepadella triptera Ehrenberg
Mytilina mucronata Muller
Mytilina uentralis Ehrenberg
Notholca sp.
Platyias quadricornis (Ehrenberg)
Scaridium longicaudum (Muller)
Trichotria pocillum (Muller)
- Family — Conochilidae
Conochilus hippocrepis (Schrank)
- Family — Dicranophoridae
Dicranophorus robustus Harring and Myers
- Family — Flosculariidae
Lacinularia flosculosa (Muller)
Limnias melicerta Weisse
Sinantheria semibullata (Thorpe)
- Family — Lecanidae
Lecane leontina (Turner)
Lecane ludwigi (Eckstein)
Lecane ungulata (Gosse)
Lecane luna Muller

* New Record for Ceylon

		* <i>Lecane papuana</i> (Murray)
		<i>Monostyla bulla</i> Gosse
		<i>Monostyla quadridentata</i> Ehrenburg
Family	—	Philodinidae
		<i>Rotaria neptunia</i> Ehrenberg
		<i>Rotaria rotaria</i> Pallas
Family	—	Synchaetidae
		<i>Polyarthra vulgaris</i> Carlin
		<i>Synchaeta pectinata</i> Ehrenberg
Family	—	Testudinellidae
		<i>Hexarthra mira</i> Hudson
		<i>Testudinella elliptica</i> Ehrenberg
		<i>Testudinella patina</i> (Hermann)
		<i>Tetramastix opoliensis</i> Zacharias
		<i>Trochosphaera aequatorialis</i> Semper
Family	—	Trichocercidae
		<i>Trichocerca tenuior</i> Gosse
		<i>Trichocerca rattus</i> (Muller)
		<i>Trichocerca elongata</i> (Gosse)
		<i>Trichocerca scipio</i> (Gosse)
		<i>Trichocerca figris</i> (Muller)

The following list of the generic names in the "Guide" and the revised names are given for use with figures in the "Guide":—

<i>Megalotrocha</i>	=	<i>Sinantheria</i>
<i>Diglena</i>	=	<i>Dicranophorus</i>
<i>Furcularia</i>	}	= <i>Epiphanes</i>
<i>Notops</i>		
<i>Salpina</i>	=	<i>Mytilina</i>
<i>Cathypna</i>	=	<i>Lecane</i>
<i>Metapodia</i>	=	<i>Lepadella</i>
<i>Mastigocerca</i>	}	= <i>Trichocerca</i>
<i>Coelopus</i>		
<i>Rattulus</i>		
<i>Dinocharis</i>	=	<i>Trichotria</i>
<i>Pedalion</i>	=	<i>Hexarthra</i>
<i>Noteus</i>	=	<i>Platyas</i>
<i>Pterodina</i>	=	<i>Testudinella</i>
<i>Colurus</i>	=	<i>Colurella</i>
<i>Rotifer</i>	}	= <i>Rotaria</i>
<i>Actinurus</i>		

* New record for Ceylon

References

- AHLSTROM, E. H. 1940. A revision of the rotatorian genera *Brachionus* and *Platyias*. *Bull. Amer. Mus. Nat. Hist.*, 77, pp. 143-184.
- BARTOS, E. 1959. Virnici—Rotatoria. *Fauna U.S.S.R.* 15, 969 pp. Praha.
- DONNER, J. 1956. *Rotifers*. Translated and adapted by H. G. S. Wright. Fredrick Warne and Co., Lond. and N.Y. 80 pp.
- 1965—Ordnung Bdelloidea (Rotatoria, Radertiere). *Bestimmungsbucher Zur Boden fauna Europas*, 6, pp. 1-297.
- MENDIS, A. S. 1965. A preliminary survey of 21 Ceylon lakes. 2. Limnology and fish production potential. *Bull. Fish. Res. Stn. Ceylon*, 18, pp. 7-16.
- PEJLER, B. 1962. On the taxonomy and ecology of benthic and periphytic Rotatoria. *Zool. Bidrag. Fran. Uppsala*. 33, pp. 328-442.
- RUDESCU, L. 1960. Rotatoria. *Fauna Republicii Populare Romine*. Vol. 2, Fasc. 11. Trochelminthes. *Acad. Republicii Populare Romine*. 1192 pp.
- VOIGT, M. 1957. *Rotatoria*. Die Rotertiere Mitteleuropas. Gebriider Borntraeger, Berlin Nikolassie, 508 pp. + Tables.
- WISZNIEWSKI, J. 1954. Matériaux relatifs a'la nomenclature et a la bibliographie des Roteferes. *Polsk. Arch. Hydrobiol.*, 15, pp. 1-260.
- WULFERT, K. 1965. Revision der Rotatorien-gattung *Platyias* Harring 1913, *Limnologica*, 3, pp. 41-64.

Crustaceae

Copepoda

Egarsilus sp.

Specimens of *Egarsilus* sp. were found on the gills of the fish *Puntius sarana* in Parakramasamudra, Polonnaruwa, by the author. This genus of parasitic copepoda has not been recorded Ceylon so far.

Insecta

Hemiptera

Family — Hydrometridae

New records of this family are as follows :—

Hydrometra zeylanica Gunawardene and Karunaratne.

Hydrometra butleri Hung. and Evans.

Hydrometra kahallensis Karunaratne

Mr. P. B. Karunaratne, National Museum, Ceylon, has kindly allowed me to quote from his unpublished paper his new species.

Family — Notonectidae

Mr. I. Lansbury, Hope Department of Entomology, Oxford, has revised the genus *Enithares*. While this paper is still in press he has permitted me to quote his findings.

Only two species of *Enithares* are on record after the synonymy has been sorted out.

Enithares ciliata F. This species refers to records of *E. abbreviata* over which it has priority.

Enithares simplex (Kirby). *E. tempeltoni* refers to the female of *E. simplex*.

Family — Corixidae

This is the best studied group of aquatic Hemiptera in Ceylon. Both taxonomic and ecological work on this group has indicated a rich and varied composition. The genus *Micronecta* is represented by 17 species and subspecies largely due to intensive collecting by the author. In comparison the Micronectinae known from India and Indonesia amount to only 17 and 10 species respectively.

The best of *Micronecta* spp. has undergone a series of nomenclatural changes which have been embodied in the guide and subsequently in supplements 1 and 2. Dr. A. Wroblewski of the Polish Academy of Sciences has made extensive studies on *Micronecta* from the Oriental region. He has a paper in press which revises a number of names. The amended Ceylonese list according to him is as follows ; —

- M. albifrons* (Motsch)
- M. ceylonica* sp. nov.
- M. fernandoi* Wrobl.
- M. flavens* Wrobl.
- M. grisea* (Fieb.)
- M. ludibunda langkana* ssp. nov.
- M. ludibunda ludibunda* Bredd.
- M. memonides* Kirk
- M. prashadana* Hutch
- M. punctata* (Fieb.)
- M. punctinotum* Chen
- M. quadristrigata* Bredd.
- M. santae-catherinae* Hutch
- M. scutellaris* (Stal)
- M. striata* Fieb
- M. tarsalis* Chen
- M. (synaptonecta)* sp.

The following changes and synonymy have been made. ;—

- M. grisea* = *M. thysta* Dist.
- M. striata* = *M. siva* Kirk
- M. albifrons* = *M. facioclavus* Chen.

Family — Gerridae

The gerrid fauna is being actively studied by Mr. P. B. Karunaratne with my assistance. He has found a number of new species and new generic records for Ceylon.

The new generic records for Ceylon are *Strongylovelia*, *Naboandelvs* and *Halovelia*. A number of new species have been found in the following genera *Ptilomera*, *Rhagodotarsus* and *Ventidivus* besides.

References

- DEN DOER, M. H. 1965. Revisionary notes on the genus *Metrocoris* Mayer (Heteroptera, Gerridae), with descriptions of four new species. *Zool. Verh.*, 74, pp. 1-38.
- FERNANDO, C. H. 1965a. A preliminary survey of 21 Ceylon lakes. 3 Parasites and Predators, food of fish and, marginal fauna. *Bull. Fish. Res. Stn. Ceylon.*, 18, pp. 17-28.
- 1965b—A preliminary account of the water bugs of the family Corixidae in Ceylon. *J. Bombay nat. Hist. Soc.*, 61, pp. 603-613.
- GUNAWARDENE, W. T. T. P. and KARUNARATNE, P. B. 1965. The genus *Hydrometra* (Hemiptera, Heteroptera) in Ceylon, with description of a new species. *Spolia Zeylan.*, 30, pp. 233-244.
- KARUNARATNE, P. B. 1968. *Hydrometra kahallensis* sp. nov. (Hemiptera, Heteroptera) from Ceylon. *Spolia Zeylan.* 31, (in Press).
- WROBLEWSKI, A. 1967. Further notes on Micronectinae from Viet-Nam (Heteroptera, Corixidoi). *Bull. Ent. Polon.* 37, pp. 229-251.

FERNANDO

Ephemeroptera

The taxonomy of this group has been neglected in Ceylon. A few species are on record (*see* Suppl. 2 "Guide", pp. 186-187).

An extensive collection of Ephemeroptera from Ceylon is being worked on by Dr. William L. Peters, Florida Agricultural and Mechanical University, Tallahassee, Florida. In a personal communication he states that an estimated 30 new genera and 150 new species are in this collection. A new species of *Prosopistoma* has been described from this collection by him.

Prosopistoma lieftincki Peters

Reference

PETERS, W. L. 1967. New species of *Prosopistoma* from the Oriental region (*Prosopistoma*: Ephemeroptera). *Tidsch. voor. Ent.*, 110, pp. 207-222.

Coleoptera

Family — Dytiscidae

Brinck (1949) has revised the genus *Cybister* breaking it up into a number of subgenera. The Ceylonese list remains unchanged except for the elevation of *Cybister prolixus* Sharp to a specific rank from its status as a variety of *Cybister sugillatus* Er.

References

- BRINCK, P. 1945. Nomenclature und Systematische Studien über dytisciden. III. Die klassifikation der cybistinen. *Kungl. Fysiogr. Sällsk. Handl.*, 56, pp. 1-20.
- OCHS, G. 1967. Über die arten der familie Gyrinidae (Coleoptera). *Opusc. zool. Bpest.*, 7, pp. 229-235.

Hydracarina

The recent paper by Cook (1967) has necessitated a further revision of the names given in the "Guide" and Suppl. I to the Guide (1963). The list of Ceylonese species is probably only a small portion of the actual number present. Cook's (1967) revision of the water mites of India should provide a suitable basis for a detailed study of the Ceylonese species:

Hydrachna dilatata Daday
Diplodontus silvestrii (Daday)
Oxus pictus (Daday)
Unionicola singalensis (Daday)
Neumania nodosa (Daday)
Encentridophorus horvathi (Daday)
Piona dadayi (Piersig)
Piona conglobata (Koch)
Piona coccinea (Piersig)
Arrenurus singalensis Daday
Arrenurus madarasi Daday
Arrenurus ceylonicus Daday
Arrenurus rostratus Daday
Arrenurus orientalis Daday

Arrenurus liberatus Walter
Arrenurus congener Daday
Arrenurus gottlandicus (Neuman)

According to Cook *Arrenurus gottlandicus* is a very doubtful record being known otherwise only from Sweden *Piona coccinea* var. *imminuta* (Piersig) which occurs in Europe is another rather doubtful record.

Reference

COOK, D. R. 1967. The water mites of India. *Mem. Amer. Ent. Inst.*, 9, pp. 1-411.

General Remarks

A number of workers are actively engaged in taxonomic studies on Ceylonese freshwater material. Professor Per Brinck, Zoological Institute, Lund, Sweden, made extensive collections of freshwater insects and Crustaceae (Swedish Ceylon Expedition in 1962). This material is under study by him and other specialists. The present author and Mr. P. B. Karunaratne are studying the Hemiptera-Heteroptera. Dr. D. G. Frey, Indiana University, collected Cladocera which he is working on. Professor A. Wroblewski, Polish Academy of Sciences, is monographing the Micronectinae of the Oriental region and has access to much Ceylonese material. Dr. William L. Peters, Agricultural and Mechanical University, Tallahassee, Florida, is engaged in a project in Asiatic mayfly ecology.

We still have many wide gaps in the taxonomy of Ceylonese freshwater animals. Very little has been done on the plankton in this century. The smaller fauna, e.g. Protozoa, Rotifera and Rhabdocoela, are very poorly known.

It is hoped that local students will take up the study of Ceylonese freshwater animals. The author is willing to help by providing references, specialist advice in the groups he has worked on or names of specialists interested in Ceylonese or Asian freshwater animals.

General References

This includes references not given under the various groups of the fauna but referring to Ceylonese forms.

BRINKHURST, R. O. 1963. Taxonomical studies on the Tubificidae. *Arch. fur. Hydrobiol. Suppl.* 2, pp. 1-89.

CRUZ, H., RATNAYAKE, W. E. and SATHANANTHAN, A. H. 1964. Observations on the structure and life-cycle of the Digenetic fish trematode *Transversotrema patialense* (Soparkar). *Ceylon J. Sci. (Bio-Sci.)*, 5 pp. 8-17.

GEISLER, R. 1967. Limnologischen-Ichthyologischen beobachtungen in Sudwest-Ceylon. *Int. Rev. Hydrobiol.*, 52 pp. 559-572.

NAIDU, K. V. 1965. Studies on the freshwater Protozoa of South India, II. *Hydrobiologia*, 25, pp. 545-570.

—1966—Check list of the freshwater Oligochaeta of the Indian Sub-Continent and Tibet. *Hydrobiologia*, 27, pp. 208-226.

STRASKRABA, M. 1965. Re examination of the taxonomic status of *Niphargus indicus* Chilton (Amphipoda, Gammaridae) and its zoogeographical relations. *Proc. Sumo. Crustaceae, India* (1964), pt. 1, pp. 126-132.

FERNANDO

ADDENDUM

Turbellaria

Order Rhabdocoela

A variety of species belonging to this group have been noted among freshwater material collected during the last six months from Ceylon. *Catenula* sp. was identified definitely. This is the first record of this genus in Ceylon.

Order Tricladida

Dugesia sp. was collected from a number of localities in Ceylon by the author and other collectors during August–November, 1968. This is the first definite record of a genus of this group in Ceylon. It appears that there are two species in the material collected. Sexual specimens are very few in our material, perhaps there is a seasonality in the development of sex organs.

The following new records were made by Costa (1967) :—

<i>Aeolosoma hemprichi</i> Ehr.	<i>Dero nivea</i> Aiyer
<i>Aeolosoma bengalense</i> Steph.	<i>Dero sawayi</i> Marcus
<i>Chaetogaster diastrophus</i> (Gruithuisen)	<i>Aulophorus furcatus</i> (Muller)
<i>Chaetogaster langi</i> Brescher	<i>Aulophorus hymanae</i> Naidu
<i>Chaetogaster crystallinus</i> Vejdovsky	<i>Allonais inaequalis</i> (Steph.)
<i>Nais communis</i> Piguët	<i>Allonais rayalaseemensis</i> Naidu
<i>Nais menoni</i> Naidu	<i>Pristina longiseta longiseta</i> Ehr.
<i>Slavina appendiculata</i> (d'Udekem)	<i>Pristina evelinae</i> Marcus
<i>Dero cooperi</i> Steph.	<i>Pristina minuta</i> (Steph.)

To this must be added the record of *Phreodrilus* (*Phreodriloides zeylanicus* (Stephenson) overlooked previously but included in Brinkhurst (1965).

Coleoptera

Vazirani (1969) has described two new species from Ceylon, namely *Canthydrus pseudomorsbachi* and *Copelatus ceylonicus*. He has also added a number of new records to the Ceylonese list. These are *Laccophilus basalis* Aube, *Hydrovatus ufoniger* Clark, *Guignotus flammulatus* (Sharp) and *Orectocheilus neglectus* Ochs.

References

- BRINKHURST, R. O. 1965. A taxonomic revision of the Phreodrilidae (Oligochaeta). *J. Zool.*, 147, pp. 363–386
- COSTA, H.H. 1967. A systematic study of freshwater Oligochaeta from Ceylon. *Ceylon J. Sci. (Bio. Sci.)*, 7, pp. 37–51.
- COSTA, H.H. AND FERNANDO, E.C.M. 1967 The food and feeding relationships of the common meso and macrofauna in the Maha Oya, a small mountainous stream at Peradeniya, Ceylon. *Ceylon J. Sci. (Bio. Sci.)*, 7, pp. 37–57
- FERNANDO, C. H. AND ELLEPOLA, W. B. 1969. A preliminary study of two village tanks (reservoirs) in the Polonnaruwa area with biological notes on these reservoirs in Ceylon. *Bull. Fish. Res. Stn. Ceylon*, 20, pp. 3–13,
- VAZIRANI, T. G. 1969. Two new species and notes on other species of aquatic Coleoptera from Ceylon. *Spolia zeylan.*, 31 (In press).

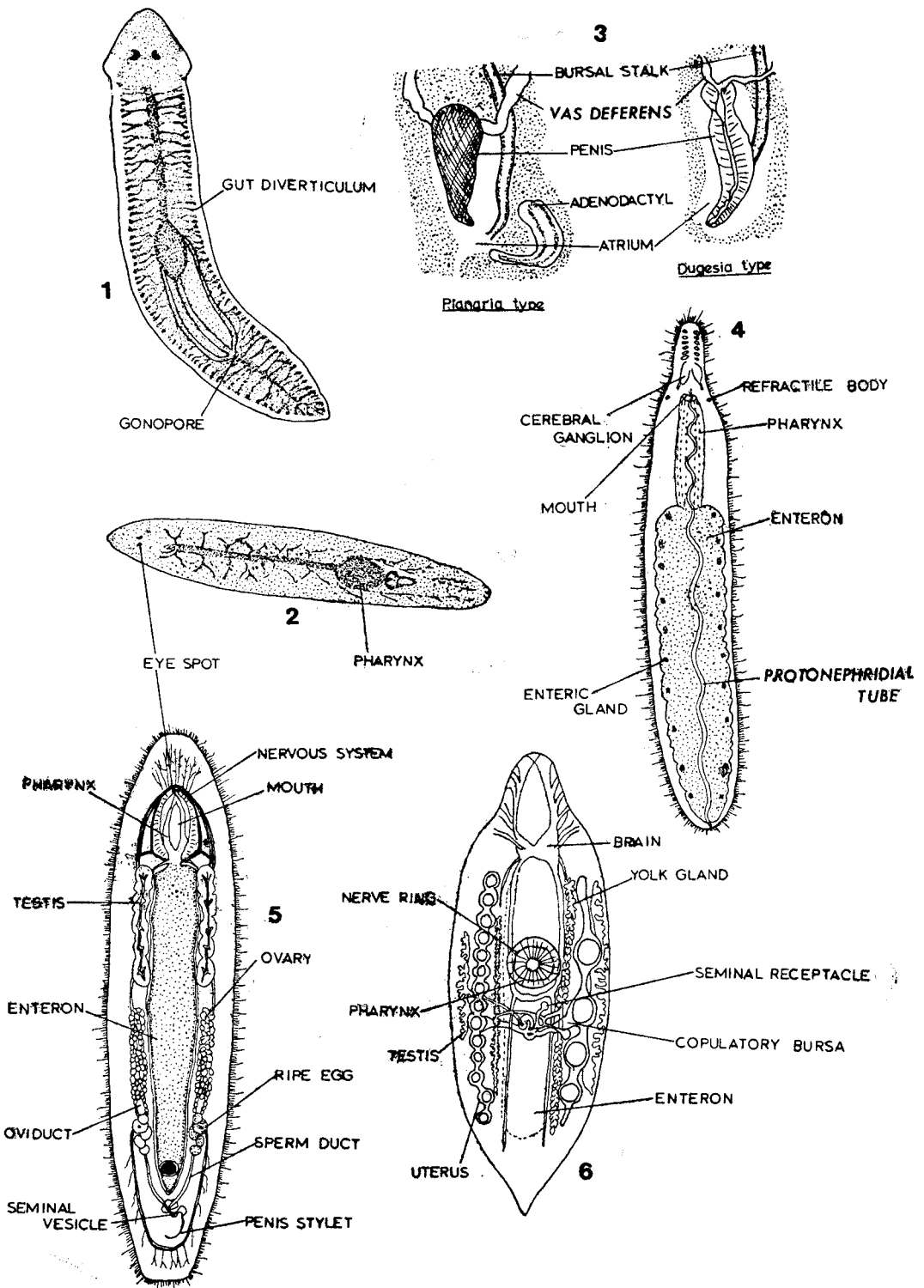


Fig. A 1. *Dugesia aborensis* (Whitehouse) = *D. gonocephala* (Dug).

2. *Planaria kempfi* Whitehouse = *P. torva* (Muller). The anterior end of *Planaria* and *Dugesia* are distinctive.

3. Squash preparation of the genital area of *Planaria* and *Dugesia* to show relations of organs and ducts. The *planaria* type has an adenodactyl or muscular pouch opening into the atrium.

4. *Stenostomum unicolor* (Schmidt).

5. *Macrostomum tuba* (Graff).

6. *Mesostomum ehrenbergi* Focke

All figures redrawn : 1 and 2 after Whitehouse, 1913 ; 3 and 4 from figures of Mr. Ian R. Ball ; 5 after Hyman 1946, and 6 after Luther 1963.

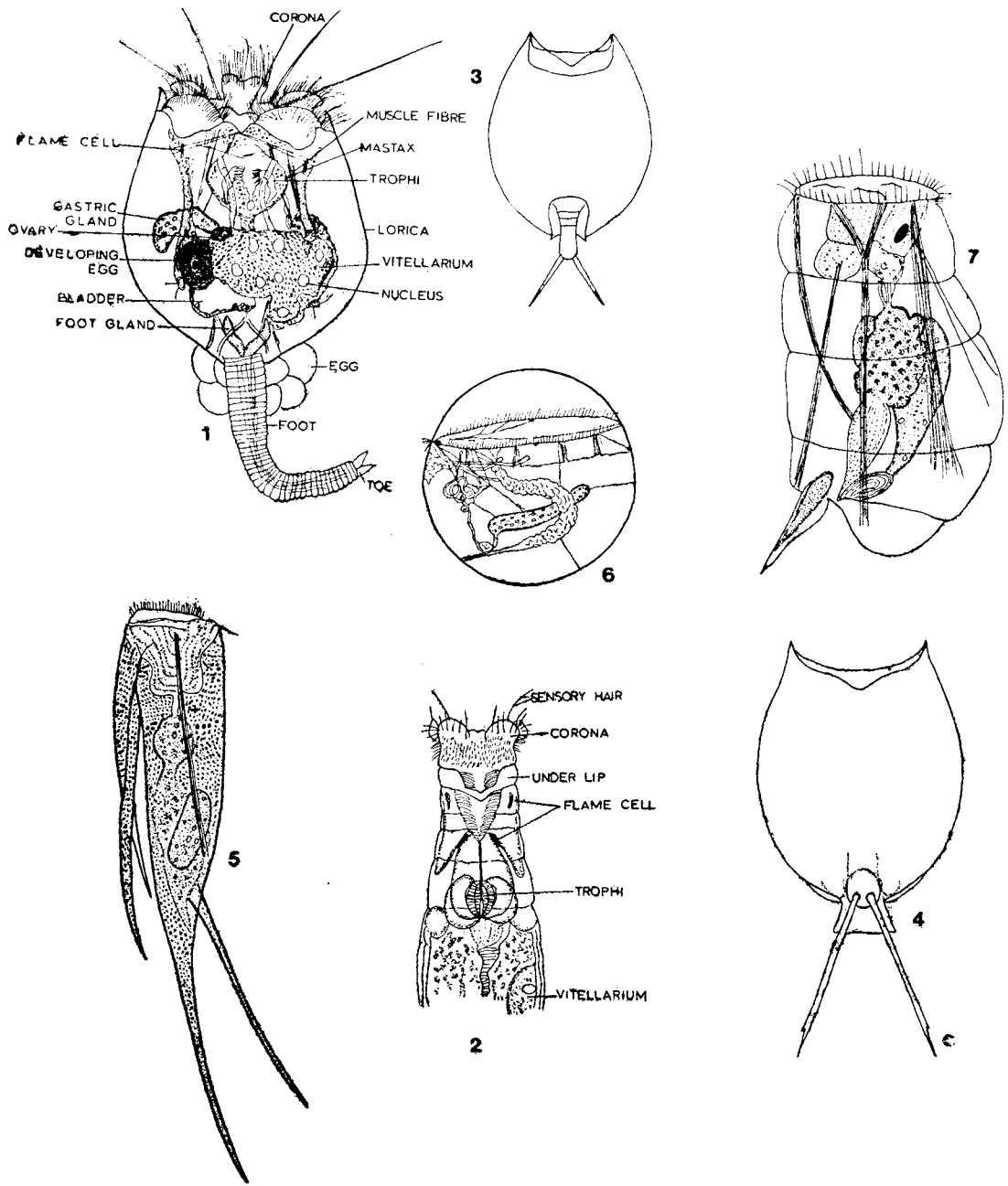


Fig. B. 1. *Brachionus urceolaris* mictic female (Monogonata).
 2. Anterior portion of *Macrotrachela ehrenbergi* (Bdelloidea), ventral view with corona unfolded.
 3. *Lepadella ovalis*, ventral view.
 4. *Lecane leontina*, ventral view.
 5. *Tetramastix opoliensis* lateral view.
 6. *Trochosphaera aequatorialis* lateral view.
 7. *Asplanchnopus multiceps* lateral view.
 All figures redrawn. : 1 and 2 from Donner, 1956 ; 3 and 4 from Pejler, 1962 ; 5 and 7 from Rudescu, 19 and 6 from Ward and Whipple, 1959