THE MALAYAN POND-SKATERS

by

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The pond-skaters or water-striders are a group of aquatic-bugs belonging to the family Gerridae (Hemiptera-Heteroptera). They are extremely common in Malaya and can often be seen moving on the water surface in a back-and-forth skating motion. They occur in waterfalls, streams, lakes, fish-ponds, water reservoirs, ephemeral pools and some have even invaded the sea. Despite the fact that these gerrids occur in almost all types of water-bodies, very little is known about them in Malaya. A few of the species have been recorded by various authors namely Dover (1928), Distant (1930), Esaki (1930), Hungerford and Matsuda (1958, 1960, 1962). Records at light, distribution and dispersal of a few species have been given by Fernando (1960, 1961, 1963a, 1963b, 1963c). A key to the genera was given by Fernando and Cheng (1963).

Our Malayan gerrid fauna comprises a total of 15 genera with more than 30 species, of which several are new. This is in fact far richer than most of the temperate and many of the tropical countries. (Australia—7 spp.; Britain—10 spp.; Ceylon—18 spp.; Indonesia—22 spp.) The richness of our gerrid fauna can perhaps be attributed to the availability and variability of habitats.

Methods of Collection and Preservation

The pond-skaters can be collected by using a pond net or by hand. As they do not sting, they can be handled safely. They are best preserved in 70% alcohol. If alcohol is not available, they can be preserved by simply drying after killing with either ethyl acetate or chloroform. When drying, the insects should be pinned on a piece of cardboard or cork with legs extended. Dried insects must be soaked in alcohol before any detailed studies can be made as they are extremely brittle and, if not handled carefully, the appendages are easily detached. Insects preserved in alcohol are not brittle and hence can be easily dissected whenever necessary.

General Structure

The general structure of a pond-skater is illustrated in Fig. 1. The head bears a pair of long and slender antennae anteriorly, and

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a stout rostrum directed backwards on the ventral side (fig. 2). The three pairs of legs are long and slender. The first pair is always held forward and is used for seizing prey as well as for cleaning the antennae and the rostrum. The second pair is the strongest and used for swimming. The third pair is used as a rudder and a balancing organ.

The gerrids can be easily distinguished from other surface living water-bugs by their bigger size, faster movement, and long legs and antennae. The following key can be used to seperate the various families of surface-living bugs occuring in Malaya: —

1. Head as long as or longer than thorax.....*HYDROMETRIDAE.*
   Head much shorter than thorax.....2.
2. Claws inserted at apex of front tarsus.....3.
   Claws inserted before apex of front tarsus.....4.
3. Antennae 5 jointed.....*HEBRIDAE.*
   Antennae 4 jointed.....*MESOVELIDAE.*
4. Adult usually less than 4 mm. in length. Middle femur not extending beyond abdomen.....*VELIIDAE.*
   Adult usually more than 4 mm. in length. Middle femur extending well beyond abdomen.....*GERRIDAE.*

Biology

The water-striders feed mainly on the insects that have fallen onto the water surface. They seem to prefer live rather than dead insects. In the laboratory they feed readily on freshly killed *Drosophila*, ants, cockroaches, etc. They seize their prey with their fore-legs and insert the stylets which are held within the rostrum into the prey to feed. If the prey is small, the insect keeps on moving while feeding. When the prey is larger than the pond-skater itself, it often drags the prey to some sort of support like stones or floating vegetation to feed. The period of time taken for feeding varies from several minutes to one or two hours depending on the size of the prey. While feeding, the insect will not let go its prey even when disturbed or being chased.

The main predators of the gerrids are insectivorous fishes, frogs, and various carnivorous insect larvae. The nymphs (*i.e.* juveniles) of the gerrids are also to some extent cannibalistic, and have been seen to feed on younger nymphs.

In Malaya, there seems to be no definite breeding season for the gerrids. Nymphs are found all the year round. The eggs are usually white or pale yellow in colour. They are cylindrical or oval in shape

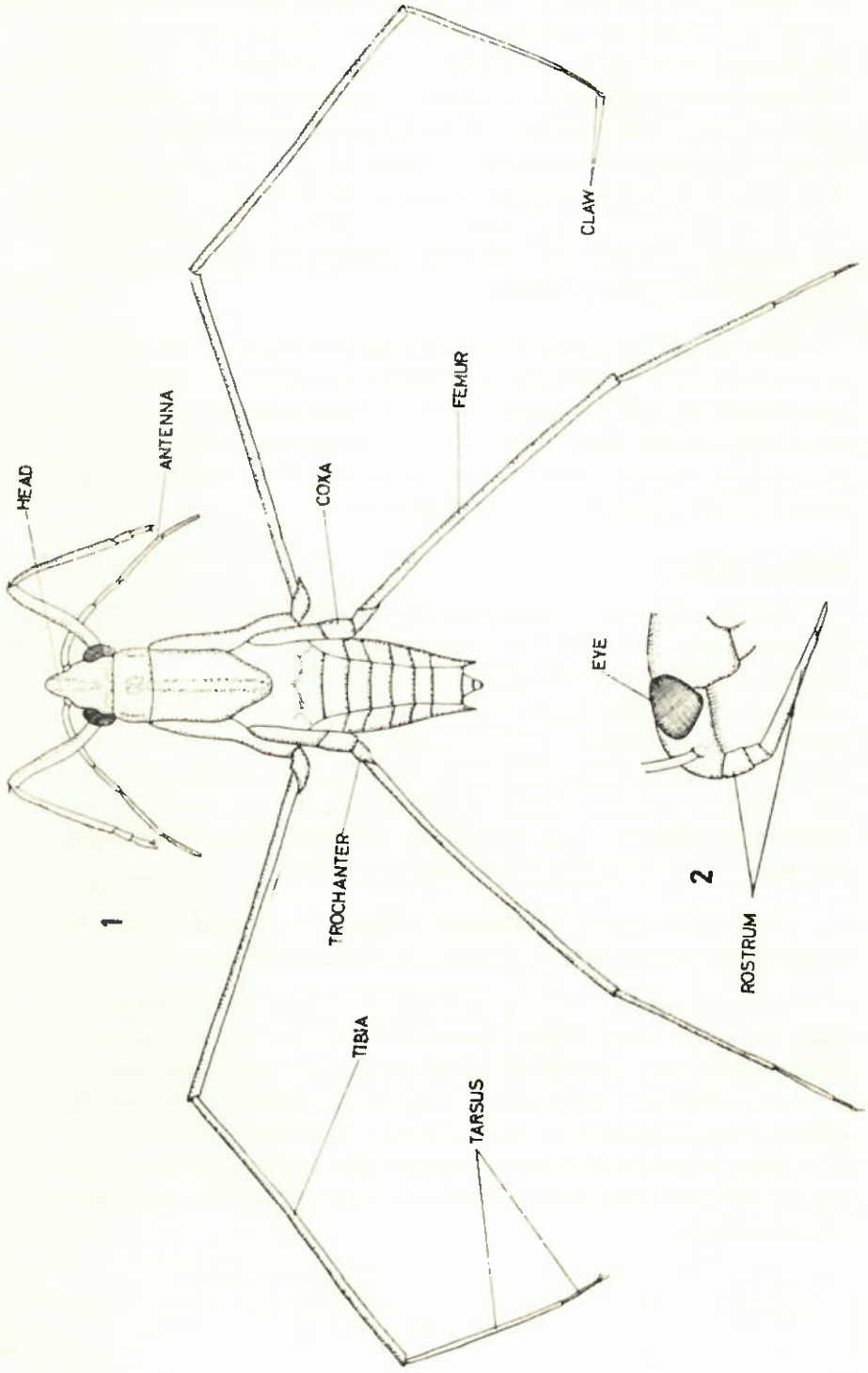

Fig. 1. General view of a pond-skater. Fig. 2. Side view of head showing rostrum.

and about 1 mm. in length. Eggs are laid singly and glued to stones or on roots of floating vegetation below water level. The time taken for the eggs to hatch depends largely on the temperature. There are five nymphal stages and the duration of each stage is again variable. The nymphs are very similar to adults in shape but very much smaller in size. They may differ considerably from the adults in colour pattern. The nymphs are always wingless except those of the last instar which may have short wing buds. Most of the adults of our local gerrids are wingless. Winged forms are only common in those species that are found in temporary habitats.

Most of our gerrids seem to prefer shady portions of the habitats and it is a common experience to find them concentrated under bridges, near stones or other obstacles. Some of them may shelter amongst vegetation. Besides the problem of shade, the gerrids are also sensitive to the flow of water. Many of our species are found only in flowing waters, while a few occur in standing waters.

Malayan Fauna

Our Malayan gerrid fauna can be divided into 4 groups based on their typical habitats. The fast flowing stream members include *Ptilomera, Pleciobates, Rheumatogonus* and *Metrocoris*. The slow stream dwellers include *Gerris, Cylindrostethus, Stenobates, Limnometra, Amemboa, Cryptobates, Ventidius* and *Esakia*. The genus *Gerris* occurs in standing waters also, whilst *Limnogonus* and *Rhagadotarsus* are typical of standing waters. *Halobates* is the only marine gerrid occuring in Malaya. It is one of the rare true marine insects and has been found in oceans miles away from land.

The various genera of Malayan Gerridae can be recognised by means of the tabular key on p. 120 and the accompanying figures.

Although we have such a rich and interesting gerrid fauna, not much is known about them. Any collection from Malaya would be much appreciated. Collections could be sent to the Department of Zoology, University of Singapore. Specimens should preferably be preserved in 70% alcohol or spirits of wine if alcohol is not available. It is most important that each collection be accompanied by a label stating the place and date of collection, type of habitat, and name of the collector.

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REFERENCES

DISTANT, W. L., 1930. Report on the Rhynchota. Part I Heteroptera. *Fasciculi Malayensis (Zoology) II:* 225–272.

DOVER, C., 1928. Notes on a collection of aquatic Rhynchota from the Buitenzorg Museum. *Treubia. 10:* 65–72.

ESAKI, T., 1926. The water striders of the sub-family Halobatinae in the Hungarian National Museum. *Ibid. 23:* 117–164.

——— 1930. New or little-known Gerridae from the Malay Peninsula. *J.F.M.S. Mus. 16:* 13–24.

FERNANDO, C.H., 1960. Colonization of freshwater habitats with special reference to aquatic insects. *Proc. Cent. Bicent. Congr. S'pore. (1958):* 182–186.

——— 1961. Notes on aquatic insects caught at light in Malaya with a discussion of their distribution and dispersal. *Bull. Nat. Mus. S'pore. 30:* 19–31.

——— 1963a. Notes on aquatic insects colonizing an isolated pond in Mawai, Johore. *Bull. Nat. Mus. S'pore. 32:* 80–89.

——— 1963b. Records of insects caught at light in Kahang, Johore. *Bull. Nat. Mus. S'pore. 32:* 159–160.

——— 1963c. The distribution of aquatic insects in South East Asia with special reference to their dispersal. *Bull. Nat. Mus. S'pore. 32:* 72–79.

FERNANDO, C. H. & L. CHENG, 1963. A guide to Malayan Water Bugs (Hemiptera-Heteroptera) with keys to the genera. Cyclostyled copy available from the Department of Zoology, University of Singapore. (Price $1).

HUNGERFORD, H.B., 1958. Some interesting aspects of the World distribution and classification of aquatic and semi-aquatic Hemiptera. *Proc. 10th. Internat. Congr. Ent. (1956) 1:* 337–348.

HUNGERFORD, H. B. & R. MATSUDA, 1958. The *Tenagogonus-Limnometra* Complex of the Gerridae. *Kans. Univ. Sci. Bull. 39 (9):* 371–457.

——— 1960. Concerning the genus *Ventidius* and 5 new species (Heteroptera: Gerridae). *Kans. Univ. Sci. Bull. 40 (7):* 323–343.

——— 1962. The genus *Cylindrostethus* Fieber from the Eastern Hemisphere. *Kans. Univ. Sci. Bull. 43 (3):* 83–111.

[Since submitting this paper, two further genera, *Rhyacobates* and *Tenagogonus*, have been collected. The former genus was recorded by Prof. S. Miyamoto (pers. comm.). L.C.]

Tabular Key to Malayan Gerridae

HABITAT	BODY SHAPE	ADULT LENGTH	COLOUR	ADDITIONAL NOTES	GENERA
Fast-flowing streams	Elongate	>20 mm.	Brown	Middle femur of ♂ fringed with hairs	*Ptilomera* (Fig. 4)
	Elongate	about 10 mm.	Black	White markings on head and pronotum	*Pleciobates* (Fig. 6)
	Elongate	<10 mm.	Greenish with black markings	♀ with black median stripe and much larger than ♂	*Rheumatogonus* (Fig. 3)
	Oval	About 5 mm.	Yellow with black markings	Often found at quieter portions of fast streams	*Metrocoris* (Fig. 5)
Slow-flowing streams	Elongate	10–15 mm.	Reddish-brown	Common in standing waters too	*Gerris* (Fig. 7)
	Elongate	10–20 mm.	Reddish-brown or black	Body long and thin, more or less cylindrical	*Cylindrostethus* (Fig. 8)
	Elongate	<5 mm.	Black with brown markings	Front tibia strongly widened apically in ♂	*Stenobates* (Fig. 9)
	Elongate	10–15 mm	Reddish-brown with dark markings	Antennae usually as long as body	*Limnometra* (Fig. 10)
	Elongate	About 5 mm.	Reddish brown with dark markings	Often found amongst vegetation	*Amemboa* (Fig. 12)
	Oval	<5 mm.	Reddish-brown	Found usually among vegetation	*Cryptobates* (Fig. 11)
	Oval	<5 mm.	Greenish with black markings	Often occur in groups	*Ventidius* (Fig. 13)
	Oval	<5 mm.	Black with white markings	♂ third antennal segment with stiff hairs on margin	*Esakia* (Fig. 14)
Standing water	Elongate	>5 mm.	Brown	Winged forms common	*Limnogonus* (Fig. 15)
	Elongate	<5 mm.	Black with blue markings	Abdomen very pointed	*Rhagadotarsus* (Fig. 16)
Marine	Oval	About 5 mm.	Silvery grey	Tibia of middle leg in both sexes fringed with long hairs	*Halobates* (Fig. 17)

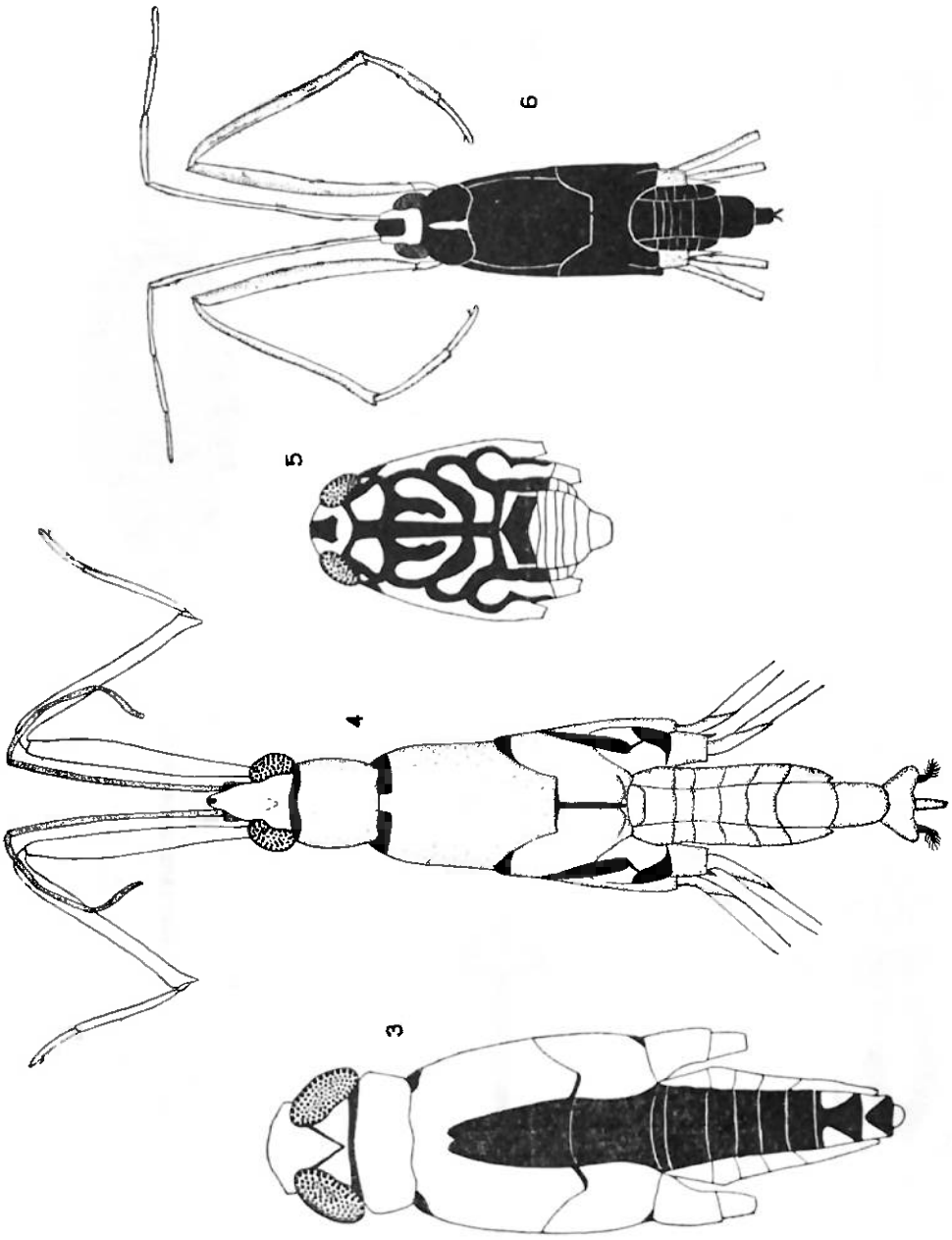

Fig. 3. *Rheumatogonus*. Fig. 4. *Ptilomera*. Fig. 5. *Metrocoris*. Fig. 6. *Pleciobates*.

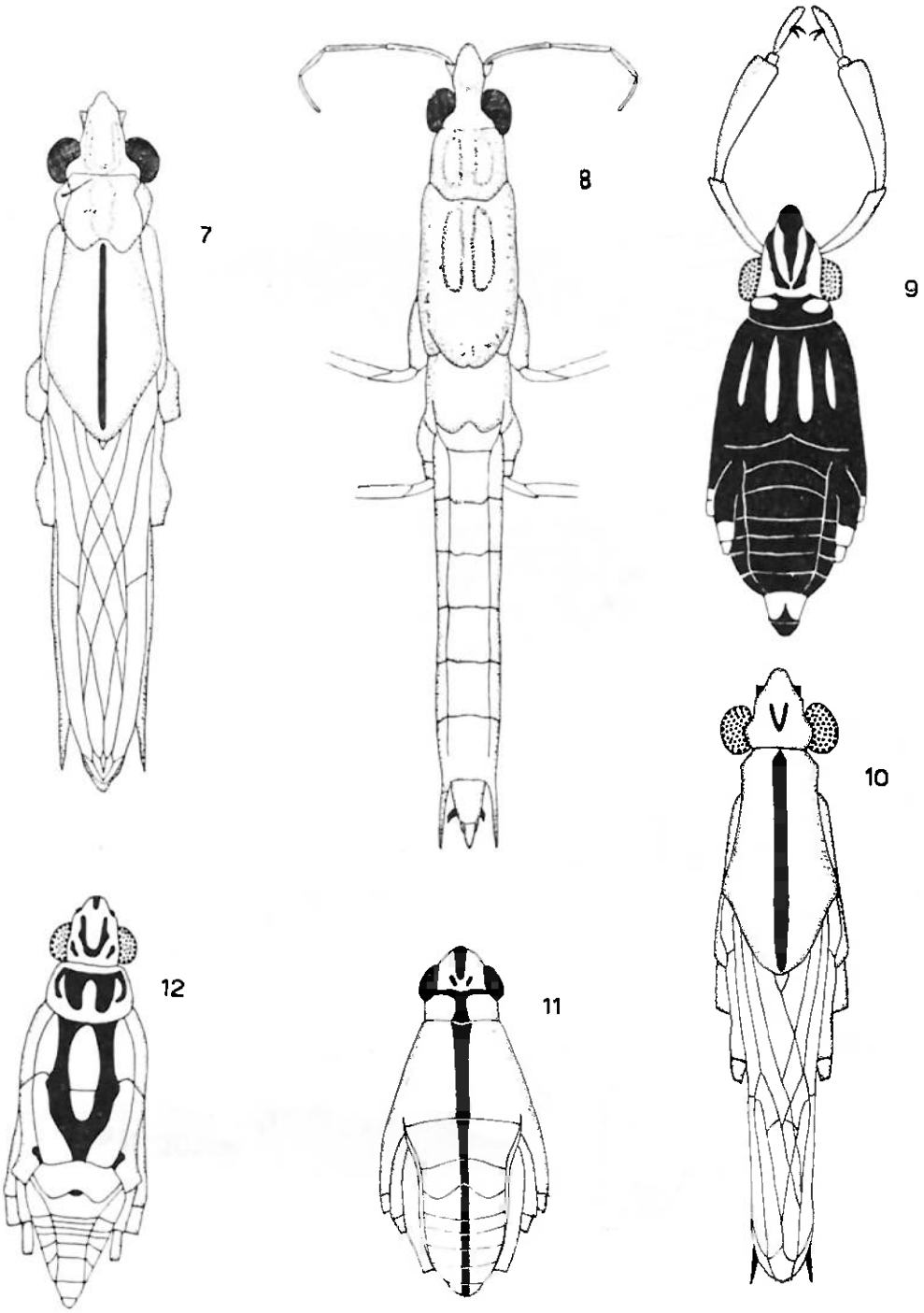

Fig. 7. *Gerris.* Fig. 8. *Cylindrostethus.* Fig. 9. *Stenobates.* Fig. 10. *Limnometra.*
Fig. 11. *Cryptobates.* Fig. 12. *Amemboa.*

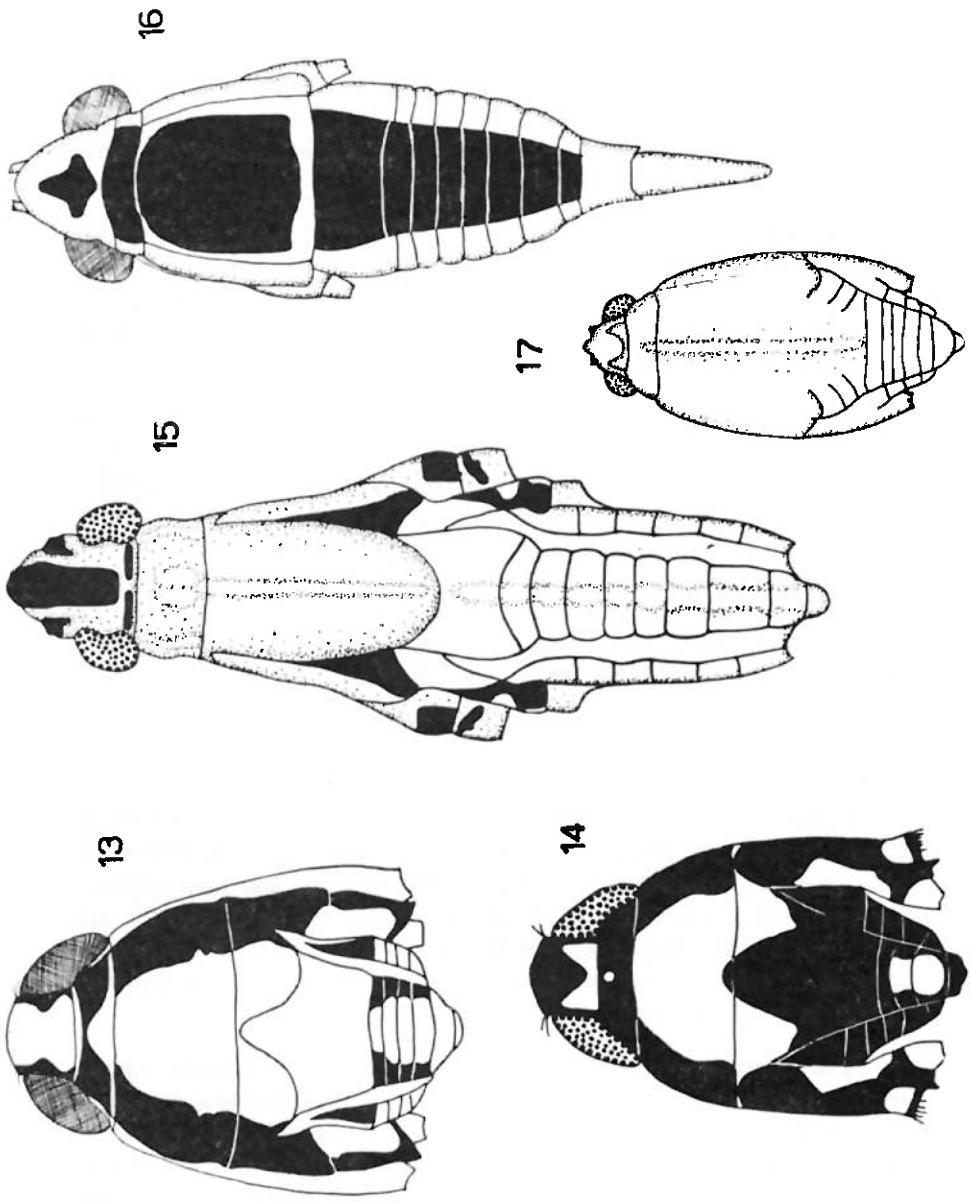

Fig. 13. *Ventidius*. Fig. 14. *Esakia*. Fig. 15. *Limnogonus*. Fig. 16. *Rhagadotarsus*. Fig. 17. *Halobates*.