

Two new *Tygarrup* CHAMB. (Chilopoda, Geophilida, Mecistocephalidae) from Indochina

By LIDIA P. TITOVA ¹⁾

(Mit 17 Textabbildungen)

Manuskript eingelangt am 30. November 1982

Summary

A review of the chilopod genus *Tygarrup* chiefly restricted to Asia is given, with special reference to the four presently known species of the Indochinese fauna, i. e. *T. javanicus* ATT., *T. singaporiensis* VERH., *T. triporus* sp. n. and *T. crassignathus* sp. n., both new forms being described from Cambodia. A key is presented to these four species.

Zusammenfassung

Ein Überblick der hauptsächlich in Asien verbreiteten Chilopoden-Gattung *Tygarrup* wird gegeben, dabei werden die vier heute in der indochinesischen Fauna bekannten Arten besonders betont, d. h. *T. javanicus* ATT., *T. singaporiensis* VERH., *T. triporus* sp. n. und *T. crassignathus* sp. n., beide neuen Formen aus Kambodscha werden beschrieben. Ein Schlüssel für diese vier Arten wird vorgeschlagen.

Twelve species have hitherto been described within the mecistocephalid genus *Tygarrup* CHAMBERLIN, 1914, i. e. *T. intermedius* CHAMBERLIN, 1914 from northern South America, *T. javanicus* (ATTEMS, 1907) from Java, Indochina and the Seychelles (ATTEMS, 1907, 1938, 1953; DEMANGE, 1981), *T. anepipe* VERHOEFF, 1939 from Mauritius, *T. griseoviridis* VERHOEFF, 1937 and *T. singaporiensis* VERHOEFF, 1937 from Singapore, *T. nepalensis* SHINOHARA, 1965 from Nepal, *T. monoporos* SHINOHARA, 1961 from north-eastern China, *T. quelpartensis* PAIK, 1961 from Korea, *T. moiwaensis* TAKAKUWA, 1934 and *T. takarazimensis* MIYOSHI, 1957 from Japan, *T. asiaticus* VERHOEFF, 1930 and *T. muminabadicus* TITOVA, 1965 from Central Asia. Despite the seeming clearness, the taxonomy of *Tygarrup* has much to desire. To begin with, the type species, *T. intermedius*, discovered in the USA in soil imported from British Guiana seems to be particularly disjunct both zoogeographically and morphologically in being the only American representative of the genus and in having a conspicuous furcate pattern on anterior sterna. Unfortunately,

¹⁾ Lidia P. TITOVA, Laboratory of Soil Zoology, Institute of Evolutionary Animal Morphology and Ecology, USSR Academy of Sciences, Moscow V-71, Leninsky prospekt 33, USSR.

CHAMBERLIN (1914) did not mention the number of legs in his *intermedius*, nor described some further characters in sufficient detail. VERHOEFF (1939) in his review of *Tygarrup* did give 45 leg-pairs to *T. intermedius*, but this must certainly have been a guesswork. So, now a revision of the types of this species is badly necessary to justify the generic status of all the other forms heretofore referred to as *Tygarrup*. Until this restudy has been done, there is a good chance that the Asian species might represent a genus of their own.

Of the Asian species, several are also very poorly known. Thus, *T. griseo-viridis* was described (VERHOEFF, 1937) without a single illustration, and *T. asiaticus*, judging from the brief original description (VERHOEFF, 1930), is rather a *Krateraspis* LIGNAU than *Tygarrup*.

On the basis of the structure of the apical joint of the second maxillae and number of legs, VERHOEFF (1939) divided *Tygarrup* auct. into two subgenera, *Partygarrupius* erected for the only species *T. moiwaensis* TAK. and *Tygarrupius* (sic!) to include the rest known at that time. The name *Tygarrupius* has no status in nomenclature as a direct invalid substitute of *Tygarrup* s. str., but *Partygarrupius* might prove to be useful for adoption of at least part of the Asian species. For the time being, I prefer to stick to the traditional concept of *Tygarrup* characterized by 45 leg-pairs, rudimentary claws and lateral notches of the second maxillae, short polygonal anterior clypeus chiefly divided into two halves, large and entirely smooth (except in *T. asiaticus* VERH.) posterior clypeus, sterna without furcate pattern (except in *T. intermedius* CHAMB.).

Until now, only one *Tygarrup*, namely *T. javanicus* (ATT.), has been recorded in Indochina (ATTEMS, 1938, 1953). The more agreeable it is to be able to put on record further three *Tygarrup*, two of which are described herein as new to science and one more as new to the Indochinese fauna. Besides, some remarks are given on the systematics of *T. javanicus*, all the four Indochinese forms being arranged in a tentative key.

The present study is chiefly based upon the material sorted out from the rich samples of *Mecistocephalus insularis* (LUCAS), a common circum-tropical species, of the ATTEMS collection at the Naturhistorisches Museum in Wien (NHMW). The samples had been requested for loan for a direct comparison with a closely related *Mecistocephalus* which had been taken by teams of Soviet soil zoologists in Tonga and Vietnam. The samples sent to me through the kind assistance of Dr. GRUBER of the NHMW proved to be a *bon mélange* of various *Mecistocephalus* (including true *insularis*), *Tygarrup* etc. Among the few specimens of *Tygarrup*, all collected in 1939 in Indochina by Dr. C. DAWYDOFF, four species could be easily recognized, two of which are described as *T. triporus* sp. n. and *T. crassignathus* sp. n. and the other two provide a good chance to supplement the known descriptions or drawings. Besides, *T. singaporiensis* VERH. is recorded outside its terra typica for the first time.

I am deeply obliged to Drs. J. GRUBER and G. PRETZMANN of the NHMW for the opportunity to restudy the materials under their care, as well as to be able to retain several duplicate specimens in my personal collection. The types of the two new forms have been deposited in the NHMW.

Tygarrup triporus sp. n. (Figs. 1—4)

Material: Cambodia, Bokor, 1080 m, 1 ♂ (hind body half), 1 ♀ (holotype) — III. 1939, leg. C. DAWYDOFF (♂: NHMW 1657, ♀: NHMW 1656).

Diagnosis: Judging from the structure of the clypeus, its chaetotaxy and the morphology of the first and second maxillae, the new species seems to be especially closely related to *T. javanicus* (ATT.), but is clearly distinguishable by the rather large and broad last sternum, three large pores from each side of this sternum, teeth on the inner side of forcipular tibia, femur and especially prefemur.

Description: Body ca. 20 mm long. Colour in general light yellow, with dark grey to black pigment; cephalic capsule, forcipules and two anteriormost body segments reddish-orange. Cephalic capsule with a distinct frontal suture, cephalic pleurites without anterior wedge-shaped teeth. Antennae twice as long as cephalic capsule. Anterior clypeus medially divided and bears polygonal structure, posterior clypeus (or plagulae) smooth and provided with 6 or 7 setae from each side at the boundary with the former. Labrum without ciliae at ventral margin, medially in the form of a short and broad wedge-shaped plate. First and second maxillae typical for the genus. Mandibles with 6 pectinate and one rudimentary laminae; 1st pectinate lamina consists of 5 pectinae. Forcipular coxosternum with rather large teeth; chitinous lines absent; prefemur with a good conical tooth; femur and tibia with a smaller inner tooth apiece; claw (tarsus) large and smooth, with a basal widening. Terga smooth, with greyish-black pattern. Sterna with polygonal structure at anterior margin, broad, with the dark pattern like terga. Last sternum round triangular, broad, subequally wide and long; each coxopleuron with 3 large pores partly hidden under the sternum. Anal pores large; last legs thin, slender, sparsely setose, without claws.

Tygarrup crassignathus sp. n. (Figs. 5—8)

Material: Cambodia, without precise locality, 1 ♂ (holotype) — 1939, leg. C. DAWYDOFF (NHMW 1655).

Diagnosis: Judging from the structure of the clypeus, last sternum, number and size of its pores, the new species seems to be especially closely related to *T. singaporiensis* VERH., but is very clearly distinguishable from all the hitherto known *Tygarrup* by the incrassate forcipular prefemur and its large inner tooth, as well as the well-developed (especially due to distal joints)

and relatively sparsely setose telopodites of the second maxillae reaching the upper part of the anterior clypeus.

Description: Body ca. 23 mm long, slightly tapering toward both head and telson. Colour in general dark yellow, with dark grey granular pattern; cephalic capsule and forcipules brick-yellowish. Head twice as long as wide, closed forcipules reach frontal margin. Cephalic pleurites without anterior wedge-shaped teeth. Antennae moniliform, about as long as head capsule. Anterior clypeus with polygonal structure, medially narrowly divided by a smooth line of posterior clypeus, also smooth and provided with 2 or 3 short setae at the boundary with the former. Ventral margin of labrum laterally slightly arched, free of ciliae, medial plate short and broad. Mandibles consist of 6 pectinate and one rudimentary laminae; 1st pectinate lamina of 5 pectinae. First maxillae with a median longitudinal suture on syncoxite; a pair of terminal outgrowths partly broken off. Telopodite of second maxillae consists of elongate joints so that the terminal one slightly protrudes beyond clypeal margin; claw rudimentary, tiny; medial part of syncoxite with polygonal structure. Forcipular coxosternum with a pair of small paramedian teeth at anterior margin, without chitinous lines; prefemur well incrassate, with a prominent pointed inner tooth; femur without tubercle; tibia with a small tubercle; claw large, smooth, somewhat broadened at base. Terga smooth, with the pigmented pattern. Sterna smooth, broad; last sternum subtriangular, about 1.5 times longer than wide. Last legs slender, without claws, almost naked (perhaps the setae were broken off). Each coxopleuron of last segment with numerous pores of various size ventrally and laterally, two largest pores situated at the edge of the sternite, both coxopleura and sternum densely pubescent at inner margin. Anal pores present.

Tygarrup singaporiensis VERHOEFF, 1937 (Figs. 9—13)

Material: Cambodia (?), Atoll Tizard — 1938—39, leg. C. DAWYDOFF, 6 exs. (NHMW 1654), 1 ♂ (Coll. TITOVA).

Remarks: Body of dark colour due to dark pattern, head brick-red. Anterior clypeus narrow, medially divided; posterior one very broad, from each side at its boundary with the former bears 10 or 11 lateral and 6 or less paramedian setae. Forcipular coxosternum with large teeth at anterior margin; prefemur with a round tubercle; femur with a poor, tibia with a larger tubercle. Last sternum subtriangular, truncate, ca. 1.5 time longer than broad at base, quickly tapering toward caudal end; each coxopleuron with numerous pores of various size, 2 or 3 of which, the largest, are situated at margin of the sternum.

VERHOEFF (1937) indicated the clypeal chaetotaxy of his specimens as being the same as in *T. javanicus*, whereas the examples from the NHMW have it quite different (cp. Figs. 9 and 14). Besides, the typical *singaporiensis* was said to have a round inner tubercle on forcipular prefemora, though no other peculiarities were mentioned. In general, VERHOEFF's (1937) original description

of this species is far too brief to miss this opportunity to redescribe in sufficient detail the material believed to be conspecific and originating from outside Singapore. This is the first discovery of *T. singaporiensis* in the Indochinese fauna!

Tygarrup javanicus (ATTEMS, 1907) (Figs. 14—17)

Materials: Cambodia, Kampong Thom, 2 exs. — IV. 1939, leg. C. DAWYDOFF (NHMW 1653); Vietnam, Plateau Thai Nguyen, Buon luoi ca. 65 km N of An khe, primary tropical forest, 7 exs. — 7. I. 1981, leg. T. K. SERGEEVA (Coll. TIROVA).

Remarks: Body 18—20 mm long, rather densely pubescent. Colour light yellow, forcipules and two anteriormost segments reddish-orange. Cephalic capsule with a good frontal suture. At the boundary between anterior and posterior clypeus from each side there are 6 or 7 setae. Forcipular coxosternum with small anterior tubercles; prefemur with a sharp tooth; femur without, tibia with a tubercle. Anteriormost 10 or 11 sterna have polygonal structure anteriorly and scattered pores medially. Last sternum subtriangular, subequally long and wide at base. Each coxopleuron with 22 or 23 ventral and lateral pores and with a pair of larger ones at edge of the sternum. Anal pores present.

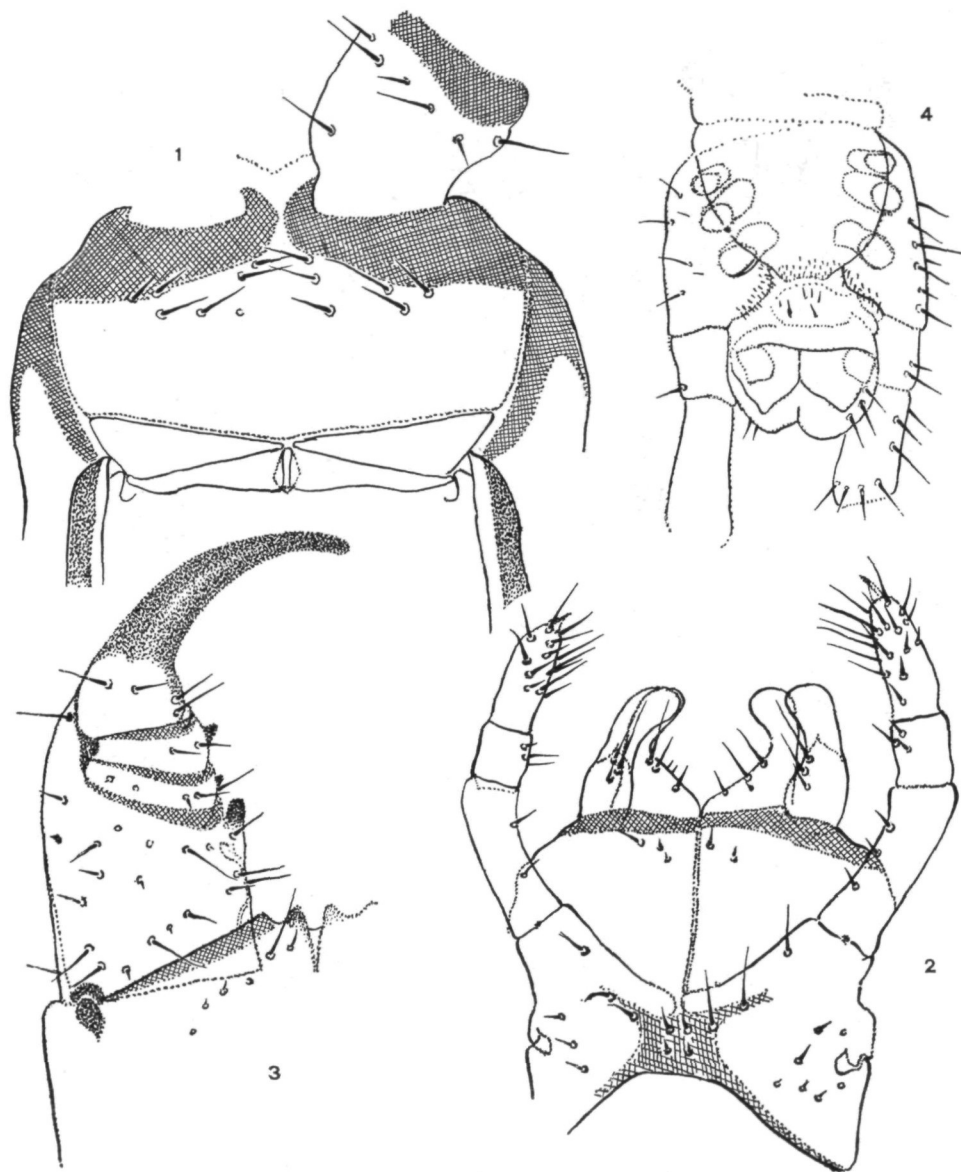
This species has been known already somewhat variable as the earlier (re)descriptions or drawings (ATTEMS, 1907, 1938, 1953; DEMANGE, 1981) show. The above remarks and new illustrations throw additional light on the variability of this species which seems to be quite widespread, partly perhaps through human agency.

As a result, four *Tygarrup* are known now in Indochina, all of them being quite easily distinguishable by the following key.

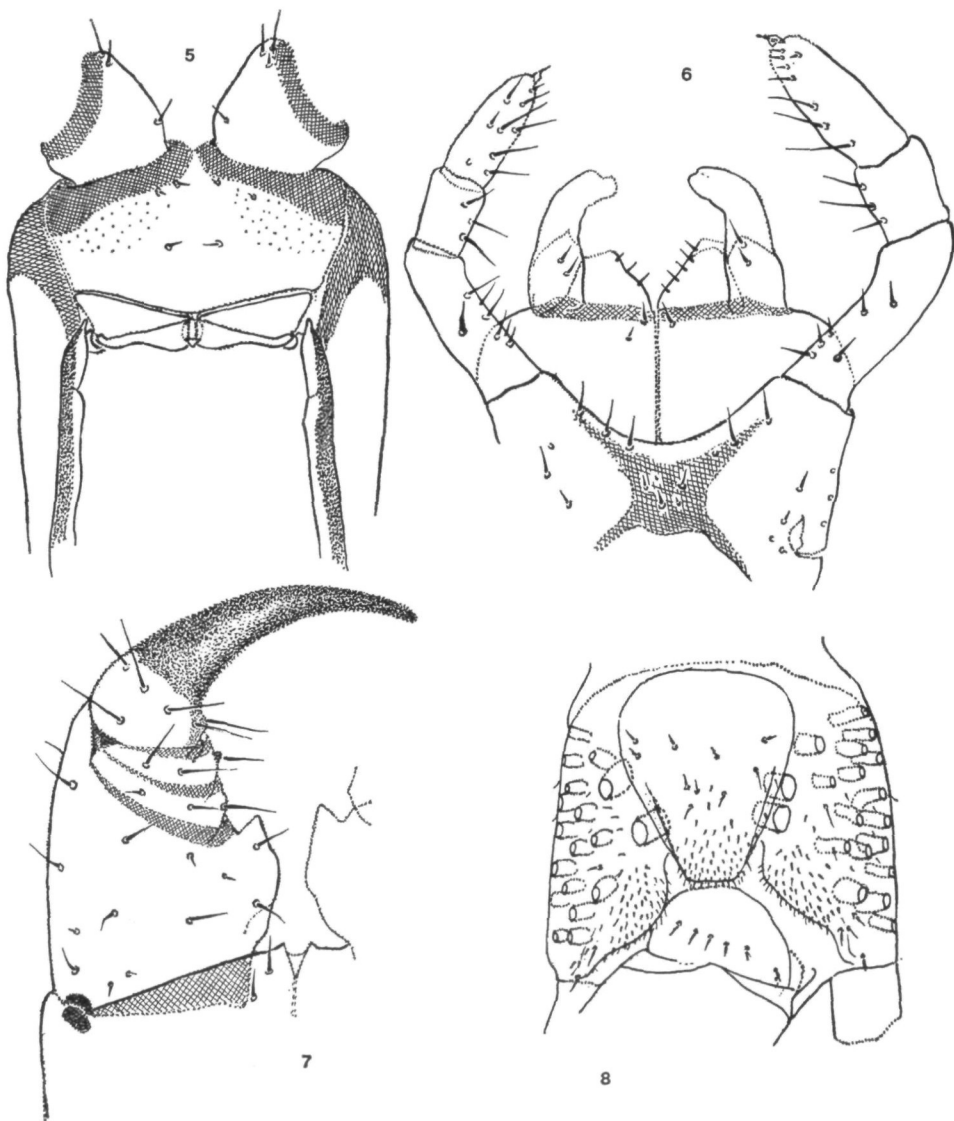
- 1(6) Last coxopleura with numerous pores of various size, a pair of especially large ones at edge of the sternum from each side
- 2(3) Last sternum subequally long and wide. Inner tooth on forcipular prefemur conical *T. javanicus* (ATT.).
- 3(2) Last sternum considerably longer than wide at base. Inner tooth on forcipular prefemur of different shape
- 4(5) Last sternum ca. 1.5 times longer than wide at base, moderately tapering toward caudal end. Forcipular femur without inner tooth, prefemoral tooth very large, triangular, pointed *T. crassignathus* sp. n.
- 5(4) Last sternum ca. twice as long as wide, rapidly tapering toward caudal end. Forcipular femoral tooth also present, prefemoral tooth small, rounded *T. singaporiensis* VERH.
- 6(1) Last coxopleura with but three large pores at edge of the sternum from each side *T. triporus* sp. n.

References

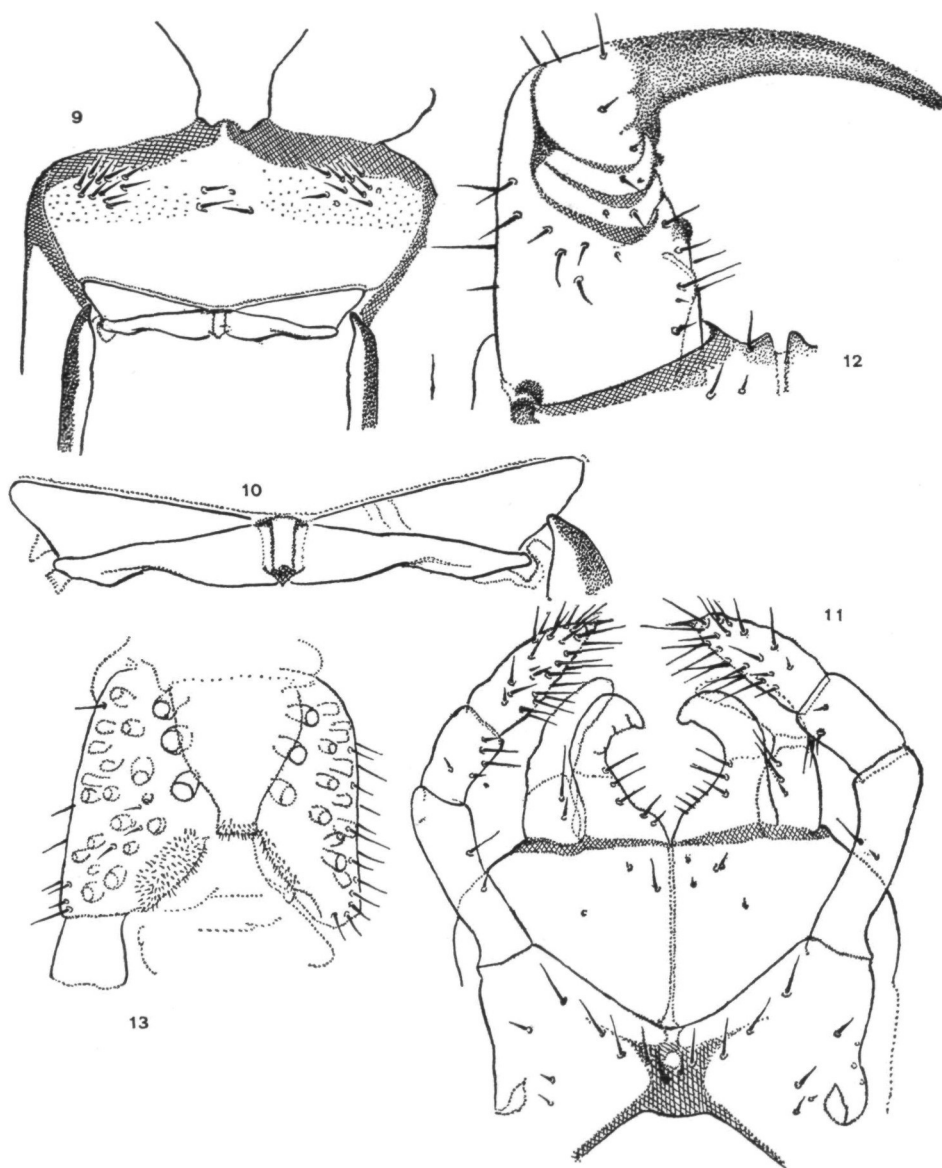
- ATTEMS, C. (1907): Javanische Myriopoden gesammelt von Direktor Dr. K. KRAEPELIN im Jahre 1903. — Mitt. Hamburg. naturh. Mus., 24: 77—142. — Hamburg.
- (1938): Die von Dr. C. DAWYDOFF in Französisch Indochina gesammelten Myriopoden. — Mém. Mus. natn. Hist. nat. Paris, N. S., 6 (2): 187—353. — Paris.
- (1953): Myriopoden von Indochina. Expedition von Dr. C. DAWYDOFF (1938—1939). — Ibid., Sér. A (Zool.), 5 (3): 133—230. — Paris.
- CHAMBERLIN, R. V. (1914): The Stanford Expedition to Brasil, 1911, John C. The Chilopoda of Brasil. — Bull. Mus. Comp. Zool., 58 (3): 151—221. — Harvard.
- DEMANGE, J.-M. (1981): Contributions à l'étude de la faune terrestre des îles granitiques de l'archipel des Séchelles (Mission P. L. G. BENOIT—J. J. VAN MOL 1972). Myriapoda-Chilopoda. — Rev. Zool. afr., 95 (3): 623—652. — Tervuren.
- MIYOSHI, Y. (1957): Über eine neue Gattung von Diplopoda, eine neue Art und eine neue Unterart von Chilopoda. — Zool. Mag., 66: 264—268. — Tokyo.
- PAIK, K. Y. (1961): The myriapeds fauna of Quelpart Island, Korea. — Kyungpook Univ. Theses Coll., 5: 75—88. — Taegu.
- SHINOHARA, K. (1961): Two new species of Mecistocephalidae (Chilopoda). — Zool. Mag., 70 (7): 212—216. — Tokyo.
- (1965): A new species of Chilopoda from Himalaya. — Journ. Coll. Arts & Sci. Chiba Univ., 4 (3): 303—306. — Chiba.
- TAKAKUWA, Y. (1934): Neue japanische Mecistocephalidae. — Annot. Zool. Japon., 14: 355—363. — Tokyo.
- TITOVA, L. P. (1965): [A new chilopod (*Tygarrup muminabadicus* TITOVA sp. n.; Mecistocephalidae) from South Tadzikistan]. — Zool. Zhurnal, 44 (6): 871—876. — Moskva [in Russian].
- VERHOEFF, K. W. (1930): Über Myriapoden aus Turkestan. — Zool. Anz., 91 (9—12): 243—247. — Leipzig.
- (1937): Chilopoden aus Malacca, nach den Objecten des Raffles Museum in Singapore. — Bull. Raffles Mus., 13: 198—270. — Singapore.
- (1939): Chilopoden der Insel Mauritius. — Zool. Jahrb. (Syst.), 72 (1—6): 71—98. — Jena.



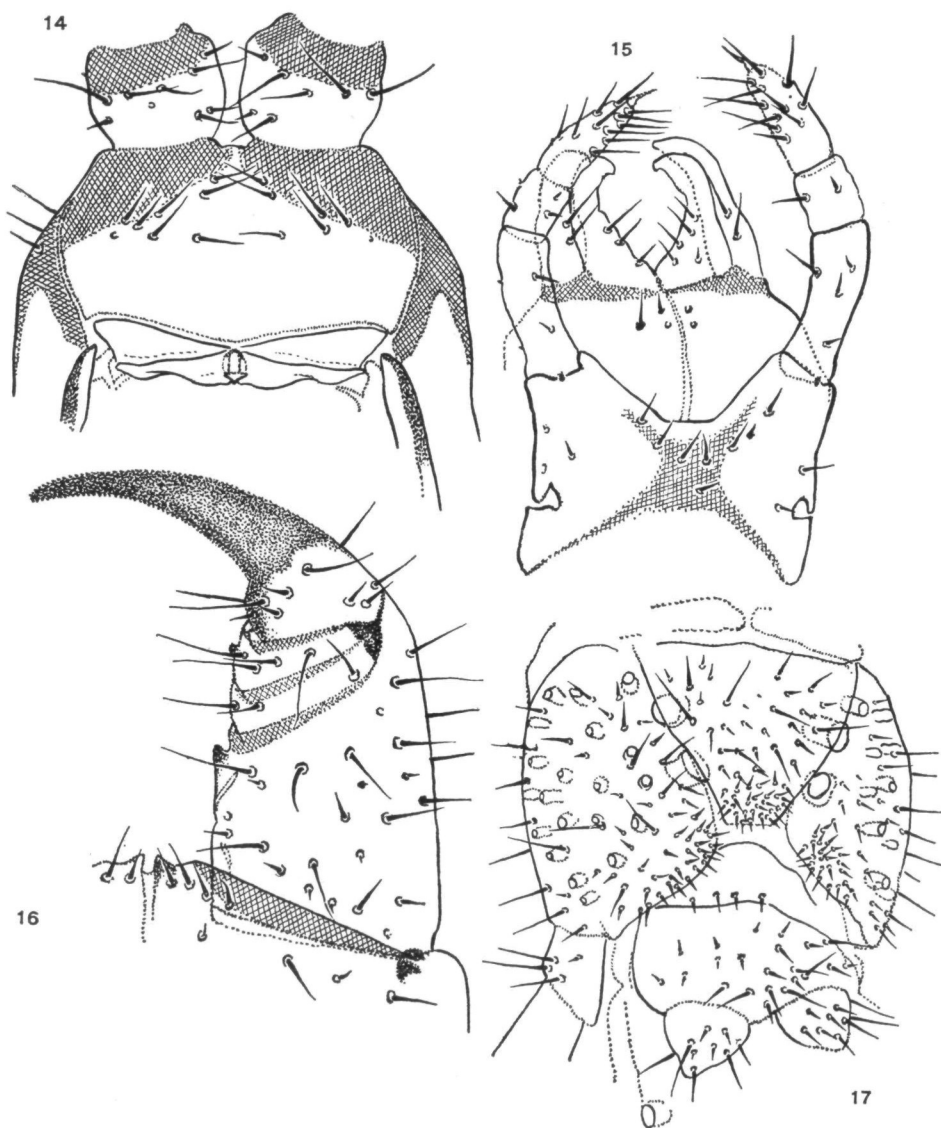
Figs. 1—4. *Tygarrup triporus* sp. n., ♀ holotype: 1. clypeus, 2. first and second maxillae, 3. forcipular telopodite, 4. caudal body portion



Figs. 5—8. *Tygarrup crassignathus* sp. n., ♂ holotype: 5. clypeus, 6. first and second maxillae, 7. forcipular telopodite, 8. caudal body portion



Figs. 9—13. *Tygarrup singaporiensis* VERHOEFF, 1937, ♂: 9. clypeus, 10. labrum, 11. first and second maxillae, 12. forcipular telopodite, 13. caudal body portion



Figs. 14—17. *Tygarrup javanicus* (ATTEMS, 1907), ♀: 14. clypeus, 15. first and second maxillae, 16. forcipular telopodite, 17. caudal body portion