THE OXYCEPHALIDS

BY

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WITH EIGHTY-SEVEN ILLUSTRATIONS IN THE TEXT

AND

SEVEN PLATES.

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THE OXYCEPHALIDS.

The Oxycephalids are perhaps the most interesting of all the Amphipoda Hyperiidea on account of their strange external forms as well as the curious transformations which several of their internal and external organs are subjected to. However, it is not only because they present such remarkable features as these that I have been induced to take them up now. The many intricate questions connected with the synonymy of the genera and species have to-day acquired an immediate interest through the publication of two great works both of the highest importance for our knowledge of the Amphipods, »Die Platysceliden» by C. Claus in 1887, and »Report on the Amphipoda collected by H. M. S. Challenger during the years 1873—1876», by the Rev. Thomas R. R. Stebbing in 1888. As my own opinions with regard to the synonymy and relationship of many of the Oxycephalidean species, briefly stated in a preliminary paper »Systematical list of the Amphipoda Hyperiidea», differ on several points from those of the eminent carcinologists just mentioned, I have felt in duty bound to state more fully the reasons on which my systematical arrangement of this abnormal group of animals is founded. Besides, I wish to make use of this opportunity for communicating some new results arrived at by the examination of fresh material recently obtained.

As an introduction I am going to give some historical and morphological notes on the Hyperids in question.

I. HISTORICAL NOTES ON THE OXYCEPHALIDS.

The Oxycephalids seem to have been comparatively late attended to by the zoologists, the first who described such an animal was H. MILNE EDWARDS, **1**, the great reformer of the carcinological system, giving in **1830** the diagnosis of the genus Oxycephalus. He placed the new genus among the »Hypérines anormales», but said »Ces amphipodes s'éloignent de la plupart des Hypérines par la forme grêle et allongée, par leur tête aplatie et lanceolée, etc.» The species he named *Oxycephalus piscatoris*.

Two years later ANASTASIO COCCO, **2** and **2 a**, established the new genus *Orio*, which partly is synonymous with *Oxycephalus*, his species *Orio Ornithoramphus*, however, is very difficult to identify, owing to the incomplete diagnosis; a facsimile of his drawing is given by STEBBING l. c. p. 145; as far as I know it is the first drawing of an Oxycephalid, met with in the literature. NICOLO PRESTANDREA, **3**, described in **1833** a new species of the just mentioned genus, *Orio oxyahingus;* it is very unclear where this species might be placed, in the systematical arrangement below it is omitted as being deficiently described; STEBBING l. c. p. 152 assumes that Oxy*a*hingus must be a misprint for Oxy*r*hingus, and this probably a malformation for Oxyrhynchus. In **1836** F. E. GUÉRIN, **4**, instituted the

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BIBLIOGRAPHY.

1. H. MILNE EDWARDS »Extrait de Recherches pour servir à l'Historie naturelle des Crustacés amphipodes». Annales des Sciences naturelles. Tome 20^{me}, p. 396. Paris, 1830.

2. ANASTASIO COCCO. »Su di alcuni nuovi crustacei de' mari di Messina Lettera del dott. A. C. al celebre dott. WILLIAM ELFORD LEACH, etc.» Effemeridi scientifiche e letterarie per la Sicilia. Tomo 2do, Palermo, 1832. **2 a** see p. 10.

3. NICOLO PRESTANDREA. »Su di alcuni nuovi crustacei dei mari di Messina.» Effemeridi scientifiche e letterarie per la Sicilia. Tomo 6to, Palermo, 1833.

4. F. E. GUÉRIN. »Description de quelques genres nouveaux de Crustacés appartenant à la famille des Hypérines.» Magasin de Zoologie; 6^{me} Année. 1836. Classe VII, p. 10, pl. 18, fig. 2. Paris, 1836.

new species *Oxycephalus oceanicus*, which he himself later, **8**, declared to be synonymous with the typical species of H. MILNE EDWARDS. In **1839**, **6**, he gave a new drawing of it.

In **1838** H. MILNE EDWARDS, **5**, quoted the two species *Oxycephalus »piscatorius»* and *O. oceanicus;* and in **1840**, **7**, he gave a drawing and a fuller description of the type species, changing the name into Oxycephalus piscator; at the same time he gave a diagnosis of a new species. *O. armatus*, which is the first representative for the genus *Rhabdosoma* or Xiphocephalus

In the same year, or in **1841**, EYDOUX and SOULEYET, **8**, gave a long description of *Oxycephalus armatus*, H. MILNE EDWARDS, accompanied by excellent drawings; it is, however, not the true *O. armatus*, but identical with *Rhabdosoma Whitei*, established in 1862 by SPENCE BATE, as will be proved below under this species. After the description of the animal they say l. c. p. 271 that F. E. GUÉRIN, who had aided them with the examination, regarded the species generically distinct from *Oxycephalus*, and established the genus *Xyphocephalus* for its reception. Thus *Xyphocephalus* or Xiphocephalus is the eldest name for the genus and must be accepted instead of the later names.

In **1848** ARTHUR ADAMS and ADAM WHITE, **9**, instituted the genus *Rhabdosoma* for the same *Oxycephalus armatus*, not knowing the just mentioned work; they gave a short generic diagnosis and said that *Rhabdosoma armatum* »forms a singularly interesting link between the Amphipoda and the Læmodipoda, uniting, as it were, the two». They gave also a tolerably

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5. J. B. P. A. DE LAMARCK. Historie naturelle des Animaux sans vertèbres. 2me édition par G. P. DESHAYES et H. MILNE EDWARDS. Tome 5me, p. 308. Paris, 1838.

6. F. E. GUÉRIN. »Typhis». Dictionnaire pittoresque d'Historie naturelle et des phénomènes de la nature. Sous la direction de F. E. GUÉRIN. Tome 9me, p. 498, pl. 708, fig. 4 and 4 a. Paris, 1839.

7. H. MILNE EDWARDS. Historie naturelle des Crustacés. Tome 3me, p. 99—102, pl. 30, fig. 10—12. Paris, 1840.

8. EYDOUX et SOULEYET (and F. E. GUÉRIN). Voyage autour du monde éxécuté pendant les années 1836 et 1837 sur la corvette la Bonite. Zoologie. Tome 1er, p. 267—271, pl. 4 fig. 13—32. Paris, (1841?).

9. ARTHUR ADAMS and ADAM WHITE. »Crustacea». The Zoology of the voyage af H. M. S. Samarang, under the command of Captain Sir EDWARD BELCHER, p. 63, pl. 13, fig. 7. London, 1848.

good drawing, which clearly shows that the specimen described by these naturalists is identical with the type species of H. MILNE EDWARDS.

In **1849** HERCULE NICOLET, **10**, mentioned *Oxycephalus oceanicus* from the seas of Chile, and H. LUCAS, **11**, the genus Oxycephalus among the »Hypérines anormales».

In **1850** GUISEPPE NATALE, **12**, promoted the specific name *Ornithoramphus*, given by Cocco, see above p. 2, to a generic name, and called the species *O. Coccoi.* He described this species at length but without good characteristics; if it is identical with Cocco's species or not, is very difficult to settle. STEBBING l. c. p. 241 suggests, that it possibly may have some relation to *Oxycephalus typhoides*, CLAUS; according to my opinion it is rather near to Oxycephalus latirostris, CLAUS, howbeit, the genus is most likely a synonym for Oxycephalus, H. MILNE EDWARDS. NATALE was doubtful if *Ornithoramphus* might be rather an Isopod, allied to *Sphæromidæ*, than an Amphipod. In the same year the same author, **13**, published in an other paper one more new generic name, *Erpetoramphus*, also probably synonymous with Oxycephalus. Owing to the vague description it is impossible to identify the species which he named *E. Costæ.*

In **1851** H. LUCAS, **14**, mentioned and figured *Oxycephalus oceanicus*, GUÉRIN, not adding any new characteristics.

In the same year Fr. GUGL. HOPE, **15**, issued a catalogue of the crustaceans of the Mediterranean, he enumerates without any charcteristics, under Amphipoda, the following, above mentioned Oxycephalids viz; *Orio oxyrhynchus*, PRESTANDREA, *O. ornithoramphus*, Cocco, *Ornithoramphus Coccoi*, NATALE, and *Erpetoramphus Costæ*, NATALE.

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10. HERCULE NICOLET. Historia fisica y politica de Chile . . . por CLAUDIO GAY. Zoologia. Tomo 3ro, p. 249. Paris, 1849.

11. H LUCAS. »Hypérines». Dictionnaire universel d'Historie naturelle . . . . dirigé par CHARLES D'ORBIGNY. Tome 6me p. 782. Paris, 1849.

12. GUISEPPE NATALE. Descrizione zoologica d'una nuova specie di plojaria e di alcuni crostacei del porto di Messina, etc. p. Messina, 1850.

13. » Su pochi Crostacei del porto di Messina. Lettera del Dottor G. de N. . . al Sg. ACHILLE COSTA, con una tavola in rame. Napoli, 1850 (teste STEBBING, l. c. p. 1621—1624).

14. H. LUCAS. Historie naturelle des Crustacés, des Arachnides et des Myriapodes, p. 240, pl. 18, fig. 9. Paris, 1851.

15. Fr. GUGL. HOPE. Catalogo dei Crostacei Italiani e di molti altri del Mediterraneo, p. 21 and 22. Napoli, 1851.

J. D. Dana, **16—17**, in **1852** placed the Oxycephalids as a subfamily *Oxycephalinæ* in the family *Typhidæ*.

In **1858** C. Spence Bate, **18**, described the new genus *Macrocephalus*, with *M. longirostris*, *n. sp.*, later, **20**, he himself dropped both names, finding them synonymous with *Rhabdosoma*, Adams and White, and *Rh. armatum*, H. Milne Edwards; here below it is quoted as synonym for Xiphocephalus armatus, H. Milne Edwards.

In **1861** the same author, **19**, gave some interesting notes on the young of some Hyperids allied to *Oxycephalus;* the following year he, **20**, established, in his catalogue of the Amphipoda in the British Museum, the family Oxycephalidæ, with two subfamilies, *Synopinæ* and *Oxycephalinæ*; he described there Oxycephalus piscator, H. Milne Edwards, *O. oceanicus*, F. E. Guérin, and O. tuberculatus, n. sp. this latter was described from a mutilated specimen but with characteristics sufficient to show that it is a species of its own, not synonymous with any one of the previously known species; further *Rhabdosoma armatum*, H. Milne Edwards, and *Rh. Whitei*, n. sp. of the former species he gave a new, enlarged description, adding some good characteristics to those mentioned by H. Milne Edwards; of the latter species he gave a detailed description showing beyond doubt that it was a separate species. Unfortunately he did not know both sexes of the two species, but only the female of the former and the male of the latter. C. Claus was probably misled by this fact to interprete *Rh. Whitei*, Spence Bate, as the male form of *Rh. armatum*, H. Milne Edwards. Spence Bate gave also drawings of all these species.

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16. J. D. Dana. »On the Classification of the Crustacea Choristopoda or Tetradecapoda». The American Journal of Science and Arts. 2d Series. Vol. 14, p. 316. New Haven, 1852.

17. » United States Exploring Expedition during the years 1838, 1839, 1840, 1841, 1842, under the command of Charles Wilkes. U. S. N.; Crustacea. Vol. 2, p. 1009 and 1443. Philadelphia, 1852.

18. C. Spence Bate. »On some new Genera and Species of Crustacea amphipoda». Ann. and Mag. of Nat. Hist. 3d Ser. Vol. 1, p. 361. London, 1858.

19. » »On the Morphology of some Amphipoda of the Division Hyperina». Ann. and Mag. of Nat. Hist. 3d Ser. Vol. 8, p. 1—15. London, 1861.

20. » Catalogue of the specimens of Amphipodous Crustacea in the collection of the British Museum, p. 341 — 346. London, 1862.

In **1864** ACHILLE COSTA, **21**, without referring to the genus Oxycephalus or to the family Oxycephalidæ, instituted a kind of subfamily, *Ornithoramphini*, for the reception of the genus *Ornithoramphus*, NATALE, and the two new genera *Natalius* and *Carcinornis*. On the synonymy of the first genus see above p. 3, the genus *Natalius* is probably synonymous with Oxycephalus, and the new species *N. candidissimus*, possibly is O. piscator, H. MILNE EDWARDS; the genus *Carcinornis* is difficult to identify, it comes perhaps near to Streetsia, STEBBING, or Leptocotis, STREETS, because the form of the first two pairs of peræopoda alluded to in the diagnosis is most similar to the form of those pairs in the two mentioned genera; of this latter genus *Carcinornis* he established two new species *C. acutirostris*, and *C. inflaticeps;* the suggestion of STEBBING l. c. p. 347 that the latter may prove to be synonymous to *Oxycephalus typhoides*, CLAUS, is, according to my opinion, not supported by the few characteristics given by COSTA; see below under »Streetsia».

In **1867** COSTA, **22**, mentioned *Ornithoramphus Coccoi*, NATALE, among a collection of Mediterranean crustaceans sent to the exhibition in Paris that year.

In **1871** C. CLAUS, **23**, gave some short notices on the anatomy of the Oxycephalids, mentioning a vesicular organ in the hind part of the head; this vesicle he regarded as an auditory organ; he described further the structure of the eyes, the nervous system, and the organs of circulation. At the same time he gave a new diagnosis of the genus *Oxycephalus*, and described as *O. piscator*, H. MILNE EDWARDS, the animal which here below is named O. Clausi, he argued further that *O. oceanicus*, GUÉRIN, is synonymous with O. piscator, H. MILNE EDWARDS, a fact which GUÉRIN-MÉNEVILLE already in 1841, himself had proved, **8**, and that

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21. ACHILLE COSTA. »Di alcuni crostacei degli acalefi, e di un distomideo parasitto». Rendiconto dell'Accademia delle Scienze Fisiche e Matematiche. Anno 3ro. Faso 4to, p. 86—89. Napoli, 1864.

22. ACHILLE COSTA. »Saggio della collezione de' Crostacei del Mediterraneo Del Museo Zoologico della Università di Napoli spedito alla Esposizione di Parigi del 1867». Annuario del Museo Zoologico della R. Università di Napoli. Anno 4to, p. 44. Napoli, 1867.

23. C. CLAUS. »Untersuchungen über den Bau und die Verwandschaft der Hyperiden». Nachrichten von der K. Gesellschaft der Wissenschaften und der Georg-Augusts-Universität aus dem Jahre 1871, p. 149—157. Göttingen, 1871.

Rhabsosoma Whitei, Spence, Bate, is not a species by itself but only the male form of *Rh. armatum*, H. Milne Edwards, a mistake, which will be duly cleared up under »Xiphocephalus» below. He established also the new genus *Simorhynchus*, with the new species *S. antennarius*, and a new species of *Oxycephalus*, *O. tenuirostris*, mentioned below as Leptocotis tenuirostris. In the same paper he said, »Die Gattung *Synopia*, Dana, die Dana and Spence Bate irrthümlich mit den Oxycephaliden vereinigt haben, gehört zu den Gammariden». Among the Oxycephalidæ he mentioned then *Snehagenia*, n. g. later transferred to the Lycæids.

In **1877** Thomas H. Streets, **24,** described under the name Oxycephalus tuberculatus, Spence Bate an animal which I really think may prove to be identical with Spence Bate's species; he further instituted the new genus Leptocotis with the new species L. spinifera.

In **1878** Claus, **25,** gave some interesting notices about the heart and vessels of Oxycephalidæ and other Hyperids.

In the same year Thomas H. Streets, **26,** described from the Pacific the following Oxycephalids viz; *Oxycephalus tuberculatus*, Spence Bate, which, however, is not identical with Spence Bate's species but with O. Clausi, C. Bovallius; *O. bulbosus*, n. sp., *O. scleroticus*, n. sp. Leptocotis spinifera, Streets, Calamorhynchus, n. g. with C. pellucidus, n. sp., *Rhabdosoma Whitei*, Spence Bate, *Rh. armatum*, H. Milne Edwards, and *Rh. longirostris*, Spence Bate, the latter synonymous with Xiphocephalus armatus, H. Milne Edwards. It is noticeable that he did not himself find the specific difference between the Oxycephalus tuberculatus, described by him in 1877 and the *O. tuberculatus*, mentioned in this his latter paper. The descriptions are accompanied with drawings which are not very good, being executed in a small scale.

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24. Thomas H. Streets. »Contributions to the Natural History of the Hawaiian and Fanning Islands and Lower California». Bulletin of the United States National Museum, 1877. N° 7, p. 136—138. Washington, 1877.

25. C. Claus. »Über Herz und Gefäss-system der Hyperiden». Zoologischer Anzeiger, herausgegeben von J. V. Carus. 1ster Jahrgang, 1878, p. 269—271. Leipzig, 1878.

26. Thomas H. Streets. »Pelagic Amphipoda». Proceedings of the Academy of Natural Sciences of Philadelphia. 1878, p. 276—290, pl. 2. Philadelphia, 1878.

In **1879** CLAUS, **27**, made a revision of the known Platyscelids, and quoted among them the following genera and species as belonging to the family Oxycephalidæ. *Oxycephalus piscator*, H. MILNE EDWARDS, as observed above, p. 6, identical with O. Clausi, C. BOVALLIUS, *O. similis*, in my opinion probably a synonym for O. piscator, H. MILNE EDWARDS, O. latirostris, n. sp., *O. tenuirostris*, CLAUS, quoted as Leptocotis tenuirostris below, *O. porcellus*, n. sp., = Streetsia porcellus, *O. longiceps* n. sp. = Streetsia longiceps, *O. typhoides* n. sp. = Stebbingella typhoides. He adhered to his former statement that *Rhabdosoma Whitei*, SPENCE BATE, was synonymous with *Rh. armatum*, H. MILNE EDWARDS. He transferred the genus *Simorhynchus* to the family »*Lycæidæ*».

In **1880** CLAUS, **28**, placed *Oxycephalinæ* as the fifth subfamily of the fourth Hyperiidean family *Platyscelidæ*, quoting the same genera as in the just cited work.

In the same year OTMAR NEBESKI, **29**, added important facts to our knowledge of the anatomy of the Amphipods; he did not investigate any one of the Oxycephalids but many of his statements throw light upon analogue peculiarities in this family. Just the same ought to be said about YVES DELAGE, **30**, and his admirable treatise on the organs of circulation of the marine Edriophthalmata.

In **1884** GEO. M. THOMSON, **31**, described a new species of Oxycephalus, *O. Edwardsii*, which, however, probably is synonymous with O. piscator, H. MILNE EDWARDS, see below under this species.

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27. C. CLAUS. Die Gattungen und Arten der Platysceliden in systematischer Übersicht». Arbeiten aus dem Zoologischen Institute der Universität Wien und der Zoologischen Station in Triest. Herausgegeben von D:r C. CLAUS. Tom. 2, p. 188—198. Wien, 1879.

28. » Grundzüge der Zoologie. 4te Auflage. Vol. 1, p. 588. Marburg, 1880.

29. OTMAR NEBSEKI. »Beiträge zur Kentniss der Amphipoden von Adria.» Arb. Zool. Inst. der Universität Wien etc. Tom. 3, p. 111—162. With 4 plates. Wien, 1880.

30. YVES DELAGE. »Contribution à l'étude de l'appareil circulatoire des crustacés édriophthalmes marins». Archives de la Zoologie Experimentale et Générale. Vol. 9, p. 1—172, pl. 1—2. Paris, 1881.

31. GEO. M. THOMSON. »Descriptions of new Crustaceans». Transactions and Proceedings of the New Zealand Institute, 1883. Vol. 16, p. 237—240, pl. 12, fig. 14—21, pl. 13, fig. 1. Wellington, 1884.

In the same year J. S. KINGLEY, **32**, gave a drawing of *Rhabdosoma Batei*, n. sp., which name however is only a synonym for Xiphocephalus armatus, H. MILNE EDWARDS.

In **1885** J. V. CARUS, **33**, recorded the Oxycephalids hitherto mentioned from the Mediterranean viz; *Oxycephalus similis*, CLAUS, doubtfully referring to *Natalius candidissimus*, COSTA, as synonymous with it; he further mentioned *O. typhoides*, CLAUS; and enumerated also among the Oxycephalidæ, but with a sign of interrogation, *Carcinornis acutirostris*, COSTA, *C. inflaticeps*, COSTA, *Orio Zancleus*, COCCO, *Chiropristis messanensis*, COCCO, and *Ornithoramphus Coccoi*, NATALE. Of these animals *Orio Zancleus* is an *Eupronoë*, CLAUS, and *Chiropristis* an *Anchylomera*, H. MILNE EDWARDS; for the probable synonymy of the remaining ones see, above p. 4 and 6.

In **1886** A. GERSTAECKER, **34**, gave Oxycephalidæ as the fifth family of the *Hyperina anormalia*, including the two genera Oxycephalus and *Rhabdosoma* and supported the view of CLAUS, that *Rh. armatum* and *Rh. Whitei* were the same species. He gave also a copy of GUÉRIN'S drawing of *Oxycephalus oceanicus*.

In **1887** the author of this treatise, **35**, published a preliminary paper on the systematical arrangement of the Amphipoda Hyperiidea, enumerating and describing briefly the following Oxycephalids, Glossocephalus, n. g. with the species G. Milne Edwardsi, n. sp., and G. spiniger, n. sp.; Oxycephalus piscator, H. MILNE EDWARDS, O. Clausi, n. sp. O. tuberculatus, SPENCE BATE, O. pectinatus, n. sp., O. latirostris, CLAUS, *O. porcellus*, CLAUS, *O. pronoides*, n. sp., *O. Steenstrupi*, n. sp., and *O. longiceps*, CLAUS, the last four species being recorded in the

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32. JOHN STERLING KINGSLEY. The Standard Natural History. Vol. 2; Crustacea and Insects. Boston, 1884.

33. JULIUS VICTOR CARUS. Prodromus Faunæ Mediterraneæ sive Descriptio Animalium Mediterranei incolarum, quam comparata silva rerum quatenus innotuit, adiectis locis et nominibus vulgaribus eorumque auctoribus in commodum Zoologorum congessit J. V. C. Vol. 1, p. 427—428. Stuttgart, 1885.

34. A. GERSTAECKER. D:r H. G. BRONN's Klassen und Ordnungen des Thier-Reichs, wissenschaftlich dargestellt in Wort und Bild. 5ter Band. 2te Abtheilung. Gliederfüssler, Arthropoda, p. 486—487, pl. 25, fig. 6 and 6 a. Heidelberg, 1884—1886.

35. C. BOVALLIUS. »Systematical list of the Amphipoda Hyperiidea». Bihang till Kongl. Svenska Vetenskaps-Akademiens Handlingar. Band 11. N° 16, p. 34—40. Stockholm, 1887.

present treatise as belonging to the genus Streetsia, STEBBING; *Oxycephalus typhoides*, CLAUS, and *O. scleroticus*, STREETS, both here transferred to the genus Stebbingella, n. g.; *Leptocotis Lindströmi*, n. sp., here named Dorycephalus Lindströmi; Leptocotis tenuirostris, CLAUS; Tullbergella, n. g., with the new species T. cuspidata; Calamorhynchus pellucidus, STREETS; *Rhabdonectes*, n. n. instead of *Rhabdosoma*, which name the writer supposed to be preoccupied, but wrongly, as STEBBING (l. c. p. 1606) has clearly proved. Diagnoses were also given of *Rh. armatus*, H. MILNE EDWARDS, and *Rh. Whitei*, SPENCE BATE.

In **1887** the important work of CLAUS, **36**, »Die Platysceliden» was issued. He gave there good drawings of all the species described in his previous paper of 1879 (see p. 8). He maintained his opinions about *Oxycephalus piscator*, H. MILNE EDWARDS, and *Rhabdosoma armatum*, H. MILNE EDWARDS, spoken of above (p. 7 and 8). The descriptive part is a reprint of his paper of 1879, with some few additions.

In the same year G. M. GILES, **37**, described a new species of *Rhabdosoma*, *Rh. investigatoris*, which is however undoubtedly synonymous with Xiphocephalus Whitei, SPENCE BATE; GILES expressed the opinion that CLAUS was quite right in considering *Rhabdosoma Whitei*, SPENCE BATE, as the male of *Rh. armatum*, H. MILNE EDWARDS.

In December **1887** I gave, **38**, a diagram of the systematical relations of the Hyperiidean families, in which the Oxycephalidæ are recorded as the thirteenth family and placed between the *Tryphænidæ* and the *Pronoidæ*.

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36. C. CLAUS. Die Platysceliden, p. 67—75, pl. 22—26. Wien, 1887. Fol.

37. G. M. GILES. »On six new Amphipods from the Bay of Bengal». Journal of the Asiatic Society of Bengal. Vol. 56, p. 219. Calcutta, 1887.

38. C. BOVALLIUS. »Contributions to a Monograph of the Amphipoda Hyperiidea». Part I. 1. Kongl. Svenska Vetenskaps-Akademiens Handlingar. Band 21. N° 5, p. 3. Stockholm, 1887.

39. Th. R. R. STEBBING. »On the Amphipoda collected by H. M. S. Challenger during the Years 1873—1876» Report on the scientific results of the Voyage of H. M. S. Challenger during the years 1873—1876 . . . . Zoology. Vol. 29.

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2 a. ANASTASIO COCCO. »Descrizione di alcuni Crustacei di Messina». Giornale di Scienze, Lettere e Arte per la Sicilia. Tomo 44^to^. Anno XI. Palermo 1833.

Lastly I have to mention the splendid work of the Rev. Thomas R. R. Stebbing, **39**, on the »Challenger» Amphipoda, published at the end of last year, in the bibliographical part of which the accomplished author gives us many valuable hints concerning the synonymy of the Oxycephalidean genera and species, and in the second half of the descriptive part of wich he most accurately sets forth the characteristics of the species obtained during the celebrated »Challenger» Expedition. The descriptions are accompanied by magnificent plates. He describes the following genera and species, Oxycephalus Clausi, C. Bovallius, *Oxycephalus porcellus*, Claus, *O. longiceps*, Claus, the last two below being named Streetsia porcellus, Claus, and S. longiceps, Claus; *Leptocotis ambobus*, n. sp., synonymous with Dorycephalus Lindströmi, C. Bovallius, as will be proved below; Leptocotis mindanaonis, n. sp.; Calamorhynchus rigidus, n. sp.; Streetsia n. g., with the new species S. challengeri; *Rhabdosoma armatum*, H. Milne Edwards, of which he with some doubt quotes *Rh. Whitei* as a synonym, and lastly the new species *Rh. brevicaudatum*. The name *Simorhynchus*, Claus, is changed into Simorhynchotus, n. n., and he places this genus in the family *Lycœidæ*.

In this treatise I propose to distinguish the Oxycephalidæ, Spence Bate and the Xiphocephalidæ as two separate families, and my reasons for doing so will be given below; I further think it necessary to transfer the genus Simorhynchotus, Stebbing, from the *Tryphænidæ* to the Oxycephalidæ, in order to get uniformity in the generic characters; in this latter family I remove *Oxycephalus porcellus*, Claus, *O. pronoides*, C. Bovallius, *O. longiceps*, Claus, and *O. Steentrupi*, C. Bovallius, from the genus Oxycephalus, sensu stricto, to Stebbing's new genus Streetsia; for the reception of *O. typhoides*, Claus, *O. sclero-ticus*, Streets, and a new species with the specific name Théeli, I propose the new genus Stebbingella. For *Leptocotis Lindströmi* the new genus Dorycephalus is instituted. A hitherto undescribed Oxycephalid is the type for the new genus Cranocephalus, with the specific name C. Goësi. The names *Rhabdosoma*, Adams and White, and *Rhabdonectes*, C. Bovallius, are dropped in favour of the generic name Xiphocephalus, proposed by Guérin as early as in 1841 to this genus a new species X. Lilljeborgi is added.

II. THE SYSTEMATICAL POSITION OF THE OXCYCEPHALIDS.

H. MILNE EDWARDS was the first who arranged the Hyperiidean genera, into subdivisions, establishing in 1840 the following three »tribus».

1. »*Hypérines gammaroïdes*», 2. »*Hypérines ordinaires*» and 3. »*Hypérines anormales*». The characteristics used by him for distinguishing these subdivisions were: —

1. The size of the head, »Tête petite» and »Tête très grosse».
2. The width of the body, »Corps comprimé» and »Corps renflé».
3. Maxillipeds with palps, — or wanting a palp.
4. The second pair of antennæ straight, or zigzag-folded, — »Antennes de la seconde paire styliformes», and »Antennes de la seconde pair se reployant sur elles mêmes, etc.»

Of these characteristics the *third* one, depending on a wrong observation, may be dropped without further discussion; the *second* characteristic varies, according to our present knowledge of the Hyperiidean species, so very much, not only among closely allied genera and species, but also in the case of the sexes of the same species, that it has no value whatever. The *first* characteristic varies in the case of two so nearly related families as *Vibilidæ* and *Cyllopodidæ* and may thus be assigned the value of a family-characteristic, but not that of a subtribal one. The *fourth* may be considered as a good characteristic; with regard to the first subtribe, it may be observed however that the form of the second pair of antennæ of the first five families in the following synoptical diagram show some tendency to the »folding type», so strongly developed in the *Oxycephalidæ* and their allies.

J. D. DANA, the next systematizer of the group, placed the Hyperids in three families, 1. *Hyperidæ*, 2. *Phronimidæ*, and 3. *Typhidæ*. The principal characteristics were: —

1. The second pair of antennæ extant, — or able to be hidden under the head or the body.

2. The hind part of the body able to be inflected or doubled up under the body, — or not possessing this faculty.

3. The fifth and sixth pairs of legs mediocre, simple, — or thick, elongated, often prehensile.

The *first* is essentially the same as Milne Edwards' fourth characteristic but is more vaguely expressed. The *second* has, in my opinion, no value, because almost all the Hyperids I have studied have the power of doubling up the urus under the body, though this power is not equally developed in the different genera. The *third* characteristic is utterly artificial, and the use of it would lead to the separation of closely related genera, and would place them in different families as for instance *Euthemisto* among the *Phronimidæ* instead of close to *Hyperia*.

Spence Bate in 1862 followed Dana as to the distinction of *Hyperidæ* and *Phronimidæ* from the other Hyperids, but for the division of these latter into three families *Platyscelidæ*, *Phorcidæ* and *Oxycephalidæ*, he used the following characteristics.

1. The head rounded, — or long, anteriorly produced.
2. The eyes occupying the whole head — or only a part of it.
3. The fifth pair of peræopoda with the femur largely developed, — or imperfectly developed.

The *first* and *second* characteristics are not valuable for distinguishing subtribes and scarcely constant as family-characteristics, while the *third* is a purely generic characteristic.

C. Claus in 1879 included under the name »*Platyscelidea*» the following five families 1. *Typhidæ*, 2. *Scelidæ*, 3. *Pronoidæ*, 4. *Lycæidæ*, and 5. *Oxcyephalidæ*, and used the following *family*-characteristics.

1. The body broad and short, — or more or less compressed, elongated.
2. The urus able to be doubled up, — or without this power.
3. The femora of the fifth and sixth pairs of peræopoda largely developed, forming covers for the underside of body, — or the femora elongated and narrowed.
4. The urus very short, — or elongated.
5. The mouth-organs broad and short, — or elongated and narrow.

The *first* characteristic I have already said is too vague and, in my opinion, only of a specific value, for if you compare for instance the female of *Hyperia Latreillei* with the female of *Eutyphis ovoides*, we find the breadth of the body to be almost the same, and the body often not more depressed in *Eutyphis* than in *Hyperia*. Also among the *Lycæidæ* there are species almost fully as broad as a *Dithyrus* or an *Amphithyrus*. The *second* is, as I have already observed when discussing the family-

characteristics used by DANA, only a relative quantity though it is true that it is carried to the extreme point in the *Eutyphidæ*. The *third* is a good characteristic for distinguishing the *Eutyphidæ* and the *Scelidæ* from the *Oxycephalidæ* and the *Phorcidæ*, but unhappily the *Pronoidæ*, and some forms of the *Lycæidæ* are intermediate. The *fourth* is, in my opinion, very uncertain and liable to sexual variation. The *fifth* is a valuable characteristic for distinguishing the family *Eutyphidæ* from the family *Scelidæ*, but it is difficult to use it in external examination.

After a long study of the different forms of the Amphipoda Hyperiidea I have arrived at the conviction that there are a number of characteristics, little or not at all appreciated by previous authors, but useful for the distinction of subtribes, families and genera within the tribe Amphipoda Hyperiidea, of them I quote the most important here.

A. Characteristics for the distinction of the ***Subtribes*** of the AMPHIPODA HYPERIIDEA.

1. *The point of fixation of the first pair of antennæ.*
2. *The shape of the same pair of antennæ.*
3. *The number of joints of the flagellum of the same pair of antennæ in the male.*

According to these characteristics I propose to divide the Hyperids into three subtribes: —

I. **Hyperiidea recticornia.**
Diagn. The first pair of antennæ are fixed at the anterior part of the head, they are straight, the first joint of the flagellum is large, the following few in number and terminal.

II. **Hyperiidea filicornia.**
Diagn. The first pair of antennæ are fixed at the anterior part of the head, they are straight, the first joint of the flagellum is large, the following many in number (♂), filiform and terminal.

III. **Hyperiidea curvicornia.**
Diagn. The first pair of antennæ are fixed at the inferior part of the head, they are curved (♂), the first joint of the flagellum is very large, the following few in number and subterminal (♂).

These three subtribes correspond exactly with the three subdivisions **A**, **B**, and **C** in the synoptical diagram given in my »Contributions to a Monograph of the Amphipoda Hyperiidea», (p. 3) issued in 1887. The first two subtribes have not the same limits as the first two subdivisions proposed by Milne Edwards and Dana, but the third has almost the same limitation as the »Hypérines anormales» of Milne Edwards, the family *Typhidæ* of Dana, or the families *Platyscelidæ*, *Phorcidæ* and *Oxycephalidæ* together, of Spence Bate, and lastly the same limitation as the »*Platyscelidæ*» of Claus.

B. Characteristics for the distinction of the ***Families*** in the subtribe HYPERIIDEA CURVICORNIA.

1. *The form of the femur of the sixth pair of perœopoda.*
2. *The form of the seventh pair of perœopoda.*
3. *The telson coalesced with the last ural segment, — or free.*
4. *The development of the mouth-organs.*
5. *The second pair of perœopoda transformed, — or not transformed.*

The *first* characteristic distinguishes the *Parascelidæ* and *Euhyphidæ* from the remaining families. The *second* distinguishes the *Phorcoraphidæ*, the *Lycœidæ*, and the *Oxycephalidæ* from the *Pronoidæ*, *Eutyphidæ*, and *Xiphocephalidæ*, this last family being instituted here by me for the reception of the genus Xiphocephalus. The *third* characteristic separates the families *Phorcoraphidæ*, *Pronoidæ*, *Euthamneidæ*, and *Xiphocephalidæ* from the families *Lycœidæ*, *Oxycephalidæ*, *Parascelidæ*, and *Eutyphidæ*. The *fourth* characteristic distinguishes the *Lycœidæ*[1]) from the *Oxycephalidæ* and the *Xiphocephalidæ*, and the *Parascelidæ* from the *Eutyphidæ*. The *fifth* distinguishes the *Phorcoraphidæ* from all the other families.

Within the subtribe I place the family *Phorcorhaphidæ* first because it comes nearest to the Hyperiidea filicornia owing to the situation of the first pair of antennæ; last in the whole tribe I place the family *Eutyphidæ*, because it seems to show the most affinity of any of the Hyperiidean families with the Isopods, especially with the Sphæromids, owing to the form of the body and the very intimate coalition between

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1) As this characteristic is of no use in an external examination another but less good characteristic is used in the synoptical table p. 18.

the telson and the last ural segment. The likeness between the *Xiphocephalidæ* and the *Caprellids*, suggested by previous authors, is very superficial and is no reasn for placing the *Xiphocephalidæ* last in the tribe[1]).

C. Characteristics for the distinction of the ***Genera*** among the OXYCEPHALIDS.

1. *The general form of the head and the rostrum.*
2. *The first pair of peræopoda being simple, — subcheliform, — or cheliform.*
3. *The second pair of peræopoda being subcheliform, — or cheliform.*
4. *The inner rami of the second and third pairs of uropoda coalesced with the corresponding peduncles, — or free.*
5. *The relation between the length of the ural segments.*

These five characteristics are sufficient for the distinction of the genera given here below as constituting the family *Oxycephalidæ*.

D. Characteristics for the distinction of the ***Species*** of the OXYCEPHALIDEAN GENERA.

These characteristics vary of course much in the different genera, but a few which are very useful and of common occurence may be pointed out here.

1. *The armature of the first two pairs of peræopoda.*
2. *The seventh pair of peræopoda.*
3. *The relation between the outer and inner rami of the uropoda.*
4. *The relation between the telson and the last ural segment.*

Within the genus Xiphocephalus particularly the following good specific characteristics may be indicated:

1. *The form of the epimeral of the first pair of peræopoda.*
2. *The form of the lateral parts of the seventh peræonal segment.*
3. *The relation between the length of the first two pairs of uropoda.*
4. *The relation between the last pair of uropoda and the telson.*

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1) For further information on these points see my forthcoming paper »Remarks on the system and synonymy of the Amphipoda Hyperiidea».

To illustrate the systematical position of the Oxycephalids the following schematic table is given:

A. HYPERIIDEA RECTICORNIA.

The first pair of antennæ are fixed to the anterior part of the head, they are straight, the first joint of the flagellum is large, the following few in number and terminal. The second pair are not similar to the first, slender, often angulate.

a 1.	The head is small, not tumid.	
aa 1.	The first joint of the flagellum of the first pair of antennæ is styliform, not tumid.	1. Scinidæ.
aa 2.	The first joint of the flagellum of the first pair of antennæ is lanceolate, tumid.	
aaa 1.	The seventh pair of peræopoda are not transformed.	2. Lanceolidæ.
aaa 2.	The seventh pair of peræopoda are transformed.	3. Vibilidæ.
a 2.	The head is large, tumid.	
aa 3.	The first joint of the flagellum of the first pair of antennæ is tumid.	
aaa 3.	The seventh pair of peræopoda are transformed.	4. Cyllopodidæ.
aaa 4.	The seventh pair of peræopoda are not transformed.	5. Paraphronimidæ.
aa 4.	The first joint of the flagellum of the first pair of antennæ is styliform, not tumid,	6. Thaumatopsidæ.
a 3.	The head with the peræon is transformed into a balloon-like bladder.	7. Mimonectidæ.

B. HYPERIIDEA FILICORNIA.

The first pair of antennæ are fixed to the anterior part of the head, they are straight, the first joint of the flagellum is large, the following many in number filiform (♂), terminal. The second pair are subsimilar to the first, not angulate.

b 1.	The uropoda with distinct rami.	
bb 1.	The mandibles with palp.	8. Hyperiidæ.
bb 2.	The mandibles without palp.	9. Phronimidæ.
b 2.	The uropoda transformed, without rami.	10. Anchylomeridæ.

C. HYPERIIDEA CURVICORNIA.

The first pair of antennæ are fixed to the inferior side of the head, they are curved (♂), the first joint of the flagellum is very large, the following few in number and subterminal (♂). The second pair are folded (♂), or wanting (♀).

c 1. The femur of the sixth pair of peræopoda is not operculiform.

cc 1. The second pair of peræopoda are transformed. The seventh pair of peræopoda are not transformed; the telson is free. 11. PHORCORAPHIDÆ.

cc 2. The second pair of peræopoda are not transformed.

ccc 1. The head is scarcely produced, not forming a rostrum. The maxillæ consist of two laminæ.

cccc 1. The seventh pair of peræopoda are reduced to two or three joints. 12. PRONOIDÆ.

cccc 2. The seventh pair of peræopoda are complete, not transformed.

ccccc 1. The telson is free, not coalesced with the last ural segment. 13. EUTHAMNEIDÆ.

ccccc 2. The telson is coalesced with the last ural segment. 14. LYCÆIDÆ[1]).

1) In my preliminary paper »Systematical list of the Amphipoda Hyperiidea,» I thought it convenient to place the genus *Tryphæna*, A. BOECK, in the same family as *Lycæa*, DANA, and to apply to the family, containing these two genera and the allies of *Lycæa*, the name *Tryphænidæ*, which preceded by nine years the family-name *Lycæidæ*, proposed by CLAUS in 1879 in his systematical arrangement of the Platyscelids. Further study of these interesting Hyperids has however convinced me that *Tryphæna* is more closely allied to the genera *Phorcoraphis*, STEBBING, and *Lycæopsis*, CLAUS, than to *Lycæa* and the other genera placed there by CLAUS. It is principally the peculiar transformation of the second pair of peræopoda that makes it desirable to place *Tryphæna* close to the other members of the old family *Phorcidæ*, beacuse it would be very strange to suppose such a homologous development of the same organ in genera not closely allied. To this characteristic come others which also, but not so thoroughly, point to a closer relation between the three genera, *Phorcoraphis*, *Lycæopsis*, and *Tryphæna*, as for instance the form of the sixth pair of peræopoda, the form of the urus and its appendages, and in some way the shape of the first pair of antennæ. From the point of view of priority the family-

ccc 2. The head is more or less produced forming a rostrum. The maxillæ are rudimentary.

cccc 3. The telson is coalesced with the last ural segment. The seventh pair of peræopoda are complete, not transformed. 15. Oxycephalidæ.

cccc 4. The telson is free[1]), not coalesced with the last ural segment. The seventh pair of peræopoda are transformed. 16. Xiphocephalidæ.

c 2. The femur of the sixth pair of peræopoda is more or less operculiform.

cc 3. The seventh pair of peræopoda are complete, not transformed. The mouth-organs are narrow, protruding. 17. Parascelidæ.

cc 4. The seventh pair of peræopoda are reduced. The mouth-organs are short and broad. 18. Eutyphidæ.

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name *Tryphænidæ* ought to be applied to the family thus composed, but as it has been used as a synonym for *Lycæidæ* by myself and by Stebbing it would make confusion in the synonymy. I therefore prefer to use a family-name derived from the new form given by Stebbing to the old generic name *Phorcus*, which was found to be preoccupied. To maintain, as does Stebbing, the family-name *Phorcidæ*, when the generic name *Phorcus* is rejected, is not convenient as the family-name must refer to a generic name in use within the family.

I have also divided the old family *Tryphænidæ* into two, *Euthamneidæ* — comprising the two genera *Thamyris*, Spence Bate, (or *Brachyscelus*, according to Stebbing) and *Euthamneus*, (the former name *Thamneus* being thus modified to avoid confusion) — and *Lycæidæ*, Claus, — restricting it to the two genera *Lycæa*, Dana, and *Pseudolycæa*, Claus. Of the old members of the family *Tryphænidæ*, as it was composed in my paper, which I have just referred to, I have thus placed *Tryphæna* in the family *Phorcoraphidæ; Paralycæa* in the *Pronoidæ*, (this transposition was really done in 1887 but owing to a typographical error it stands into »Systematical list» with its number from *Pronoidæ* among the *Tryphænidæ*); *Thamyris* and *Euthamneus* in the new family *Euthamneidæ*; *Lycæa* and *Pseudolycæa* in the *Lycæidæ*; and lastly *Simorhynchotus* in the *Oxycephalidæ*.

1) A very puzzling exception to this rule is *Rhabdosoma brevicaudatum*, described by Stebbing (l. c. p 1612, pl. 208). He says namely that the telson is *coalesced* with the last ural segment and much shorter than this segment, broadly rounded and pectinate at the apex, but all these statements are strikingly opposed to my experience which is founded upon the examination of many specimens of the two old species, Xiphocephalus armatus and X. Whitei. I for my part am much inclined to believe that the single specimen which was the type for the new species proposed by Stebbing, may have been abnormal, perhaps injured.

III. MORPHOLOGICAL NOTES ON THE OXYCEPHALIDS.

1. The shape of the body.

The genus Xiphocephalus is certainly the most extreme of all the Hyperiidean forms with regard to its development in length and narrowness, but this extravagant, rod-like form of body is however very naturally connected with the other Hyperids by intermediate links. Thus, if examining the genera of the Oxycephalids, we find first in the series the thick and stout Tullbergella, (fig. 1) in shape of peræon very similar to a true *Hyperia*, and then Oxycephalus, with the body somewhat more compressed, and next Stebbingella, both of them with the head and the hind part of the body tolerably elongated, from them is an easy transition to the slender Streetsia. This slender form of body is more pronounced in Leptocotis and Dorycephalus, which, on the other hand, are readily found to be connected with Xiphocephalus (fig. 2)

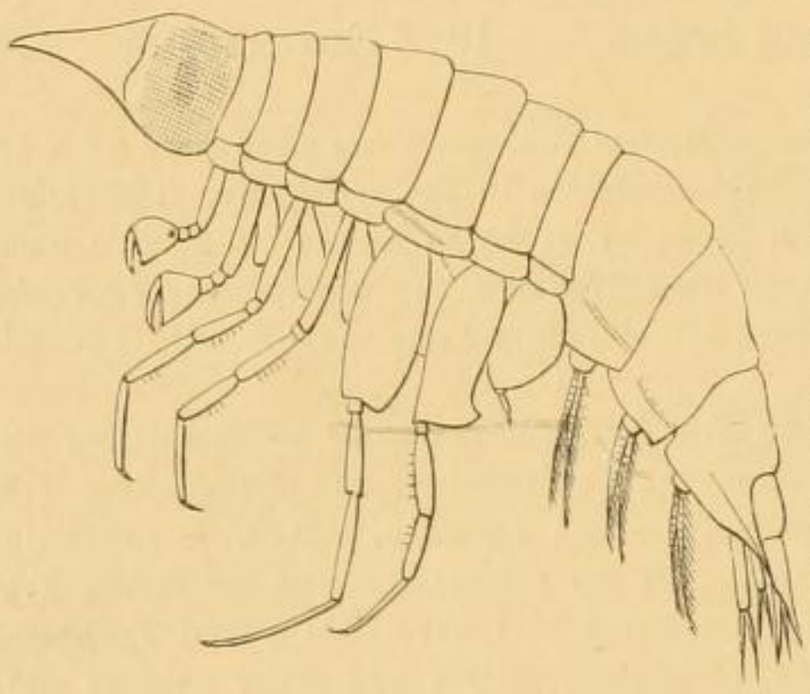

Fig. 1. Tullbergella cuspidata.

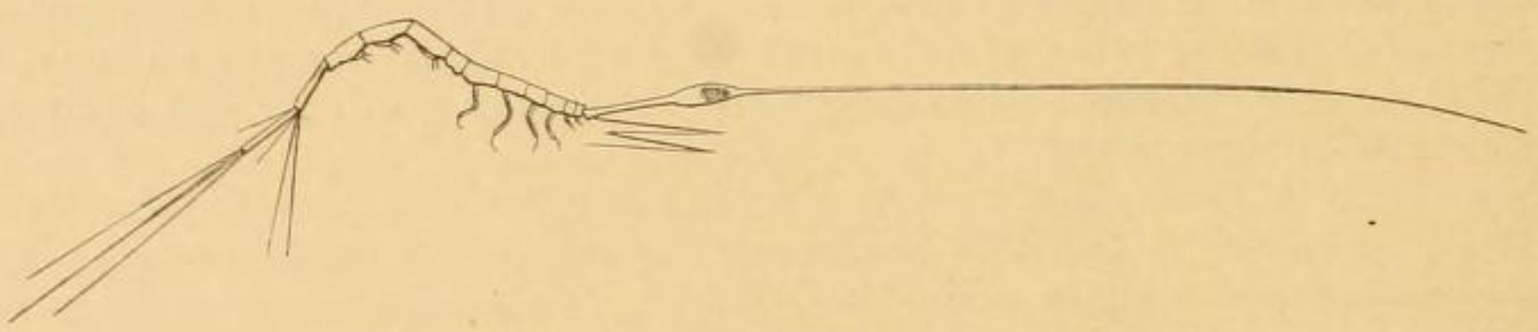

Fig. 2. Xiphocephalas armtaus. ♂.

by the rod-like form of body of Calamorhynchus. The body of the females is usually somewhat broader than that of the males, except in Xiphocephalus, where such a sexual difference is not present.

2. The integument.

In Tullbergella (fig. 27) and Stebbingella (fig. 3) the integument is very thick and hard, and calcareous; in the latter it shows many tubercles, fine notches, scrolls and grooves; in Oxycephalus (fig. 4) the integument is thinner, sometimes forming longer or shorter longitudinal and transversel keels or folds, but these keels are only angulated elevations of the integument, not formed by calcareous deposits as in the two above mentioned genera. In Cranocephalus, (fig. 5) Dorycephalus,

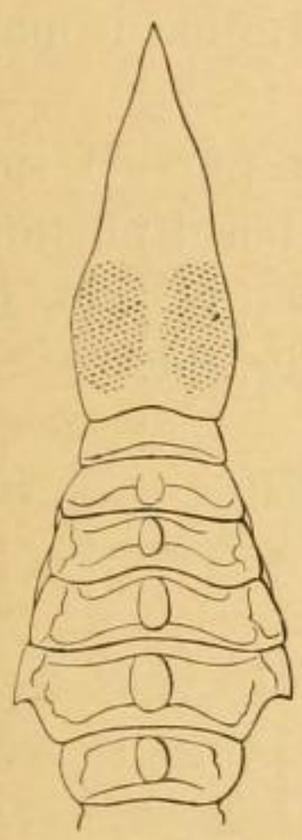

Fig. 3. Stebbingella Théeli. ♀.

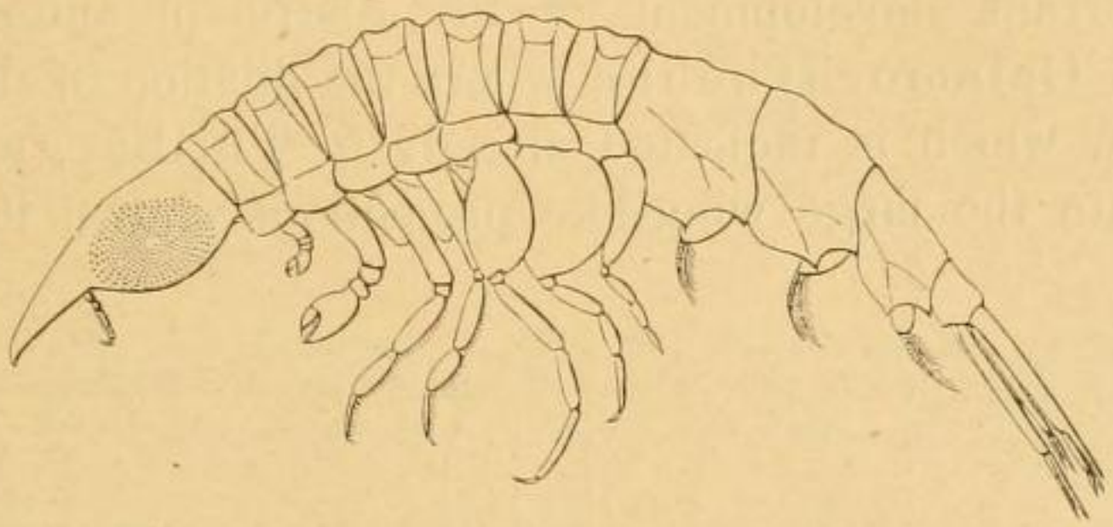

Fig. 4. Oxycephalus Clausi. ♀.

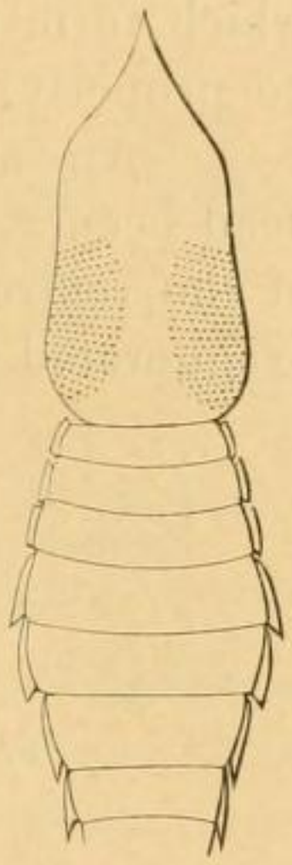

Fig. 5. Cranocephalus Goësi. ♂.

Leptocotis and Xiphocephalus, the integument is still thinner and not at all calcareous, showing in some species small epidermal grooves which will be spoken of under the head »*glands*» below. The hypodermis seems to be either composed of hexagonal cells, or hexagonally reticulated but this reticulation is seldom to be seen distinctly; at the head, the epimerals, and parts of the ural appendages it is most distinct.

The colour is very variable, red, yellow, green, and white; many species are entirely hyaline. Only in Tullbergella cuspidata, and in Xiphocephalus Whitei, have I observed larger pigment-cells, or chromatophors of some kind, of more or less regular star-like form. There are also to be seen separate calcareous (?) concrements in the shape of small, irregularly ovate discs or buttons in the thin integument of some species of Oxycephalus; in the thick, calcareous integument of Tullbergella they are very numerous.

3. *The head.*

The shape of the head of the Oxycephalids shows forms gradually developing almost from the normal type in *Lycæidæ* to the strange-looking, extremely elongated form in Xiphocephalidæ. The genus Glossocephalus has a distinct, but thick and obtuse, tongue-shaped rostrum (fig. 6 and 6 a), Oxycephalus (fig. 7 and 8), Stebbingella (fig. 3), and Streetsia (fiig. 9) offer different steps of development of a more and more elongated and sharp rostrum, open at the under-side; in Dorycephalus and Leptocotis (fig. 10) it has reached the form of a needle, which form is so enormously developed in Xiphocephalus, that it may be properly called filiform (fig. 2).

An aberrant development of the rostral or anterior part of the head occurs in Calamorhynchus where the dilation of the basal portion of the rostrum, which is indicated already in Tullbergella (fig. 12), is exaggerated into the large wing-like projections shown in fig. 11.

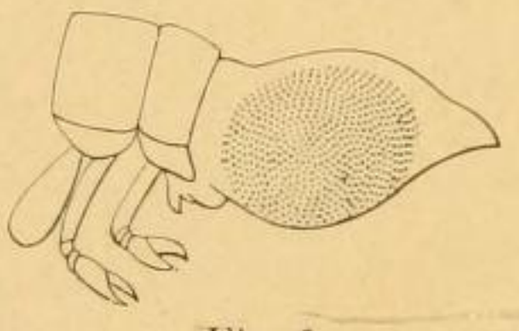

Fig. 6.

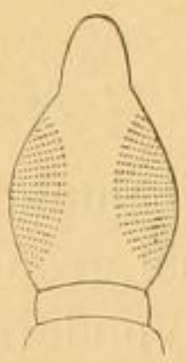

Fig. 6 a. Glossocephalus Milne Edwardsi.

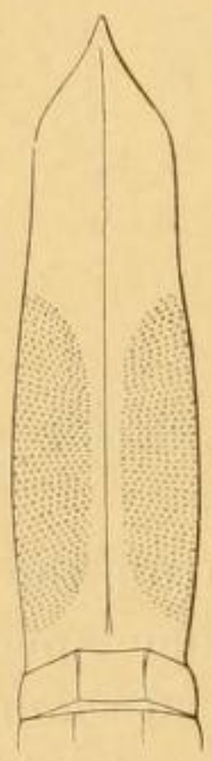

Fig 7. Oxycephalus Clausi. ♂.

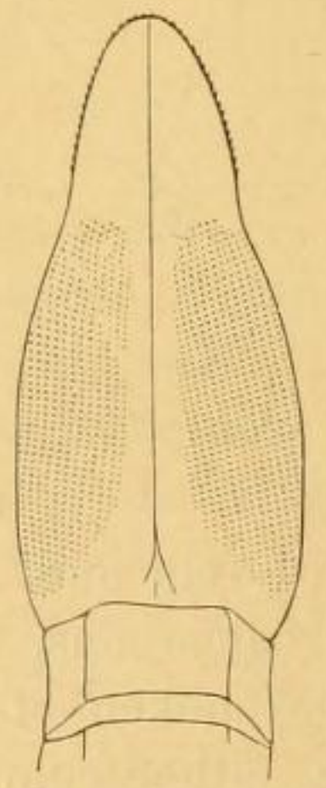

Fig. 8. Oxycephalus Clausi. ♀.

But also the hind part of the head shows a gradual development from being in Streetsia not constricted, in Oxycephalus, Cranocephalus, Tullbergella, and Stebbingella, feebly constricted and scarcely forming a distinct neck, to Dorycephalus, Leptocotis and Calamorhynchus, where the hind part of the head is strongly constricted, forming a distinct, but short neck, and lastly to Xiphocephalus, which has a long and narrow neck, longer than the central part of the head (fig. 2).

The highest part of the head, which may be situated close to the anterior margin of the first peræonal segment, as in Simorhynchotus

and Streetsia, or at a considerable distance therefrom as in Xiphocephalus, is occupied by the eyes. The under side of the head is excavated, forming a groove or channel from the base of the head to the anterior end of the eyes, where the channel is enlarged into a vaulted chamber, at the upper anterior wall of which the first pair of antennæ are fixed. In this channel the second pair of antennæ are received when folded, extending into the lower part of the chamber below the

Fig. 9. Streetsia pronoïdes. ♀.

Fig. 10. Leptocotis spinigera. Facsimile from Streets, Pel. Amph., pl. 1.

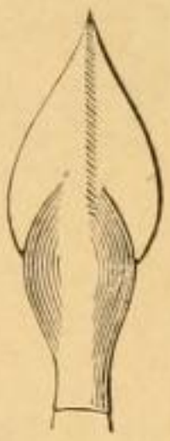

Fig. 11. Calamorhynchus pellucidus. Facsimile from Streets, Pel. Amph., pl. 1.

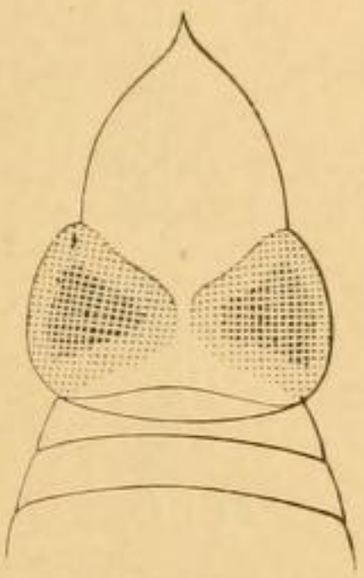

Fig. 12 Tullbergella cuspidata.

first pair. Immediately in front of the bases of the first pair of antennæ the rostrum commences, its underside being open in Oxycephalus, Streetsia, Glossocephalus, Cranocephalus, Tullbergella, and Calamorhynchus, and more or less closed in Stebbingella, Dorycephalus, Leptocotis, and Xiphocephalus. The under margins of the rostral walls are often sharply serrated.

4. *The eyes.*

As in most of the Hyperiidean families they eyes are also strongly developed in the Oxycephalids, and consist of a great number of ocelli. These ocelli are not separated into an upper-eye, (Scheitel-Auge, Claus), and two lateral portions on each side as in *Thyropus* and other genera, but in all the genera of the family Oxycephalidæ, with the exception of Streetsia and Calamorhynchus, the ocelli are distributed into two lateral portions separated from one another at the crown of the head by a more or less narrow space. In Streetsia and Calamorhynchus on the other hand all the the ocelli are fused together into one mass, occupying the whole of the central part of the head. The ocelli consist

each of a double crystalline cone, very long, evenly increasing in thickness from the narrowly pointed base to the apex where the Semperian nucleus is distinct; the basal part being surrounded by the ocular pigment. The two halves of the cone are often separated from one another for a considerable part of their length. The cuticular cornea is distinctly facetted;

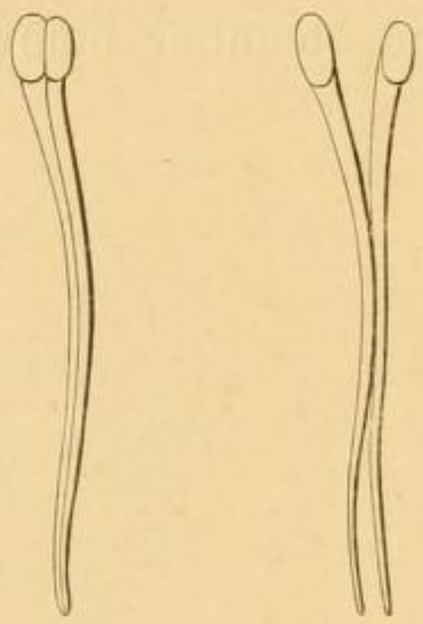

Fig. 13.

Fig. 14.

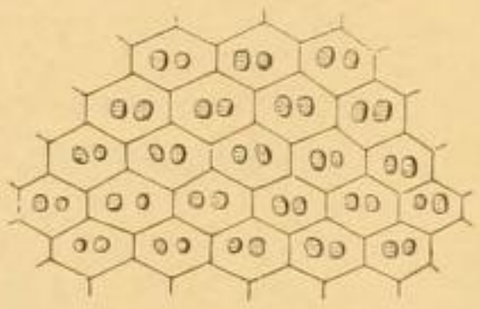

Fig. 15.

Xiphocephalus Whitei.

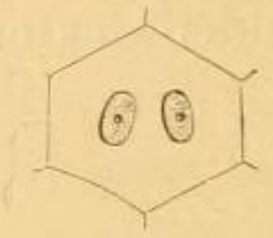

Fig. 16.

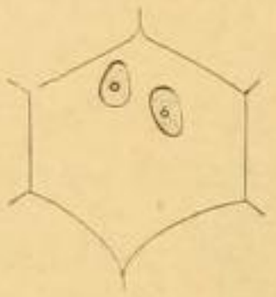

Fig. 17.

these facets being, in my opinion, nothing else but an enlarged hexagonal reticulation such as that which I have mentioned above as occurring in the integument of the body. The number of ocelli and their size vary much from one species to another, and will be recorded below in the specific descriptions.

5. *The first pair of antennæ.*

In the male the shape of the first pair of antennæ essentially agrees with that in the other families belonging to the subtribe *Hyperiidea curvicornia*. The peduncle is three-jointed, but very often the second or third joint is indistinct. The first joint of the flagellum, regarded as the third joint of the peduncle by some authors, is enormously developed, much longer and stouter than the peduncle, curved, and bent downwards almost rectangular to the peduncle (fig. 18); the hind convex side is thickly covered with long cylindrical, olfactory hairs, set in regular, transversal rows, each hair being fixed on a small button-like elevation. The under side of the first joint is truncated and long, the lower anterior corner often being produced into a thick, obtuse process. The sides of this enlarged first joint of the flagellum often show numerous soft tubercles and small grooves, probably containing cutaneous glands (fig. 19).

The following joints of the flagellum are three in number in all the species of the family Oxycephalidæ that I have examined, but vary in length from one species to another (fig. 19 and 20). In the young male the first flagellar joint is scarcely curved, but resembles that joint in the female, and the second flagellar joint is not separated from the first (fig. 21 and 22). In the Xiphocephalidæ on the other hand the

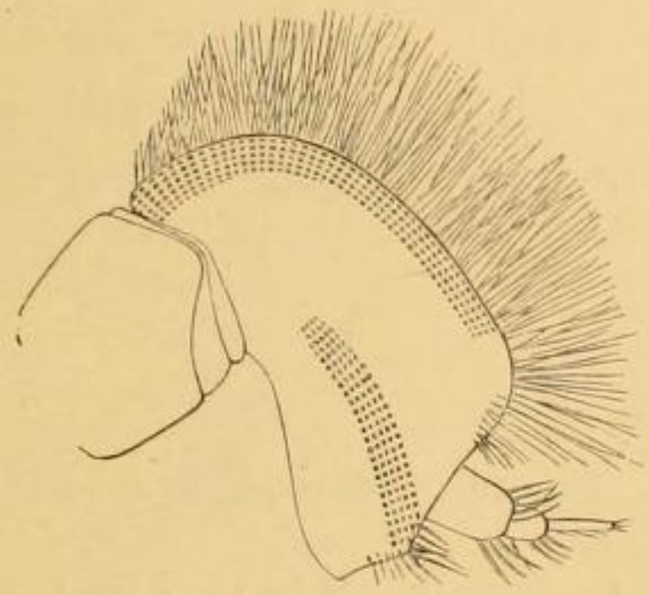

Fig. 18. Tullbergella cuspidata. ♂.

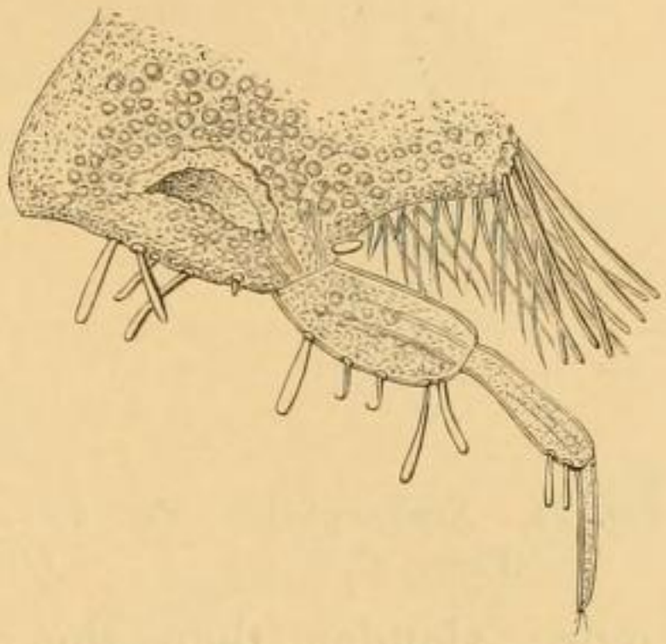

Fig. 19. Oxycephalus pectinatus. ♂.

number of these joints is not the same in the different species, there being three flagellar joints following the first large one in Xiphocephalus armatus, H. Milne Edwards, but only one in X. Whitei, Spence

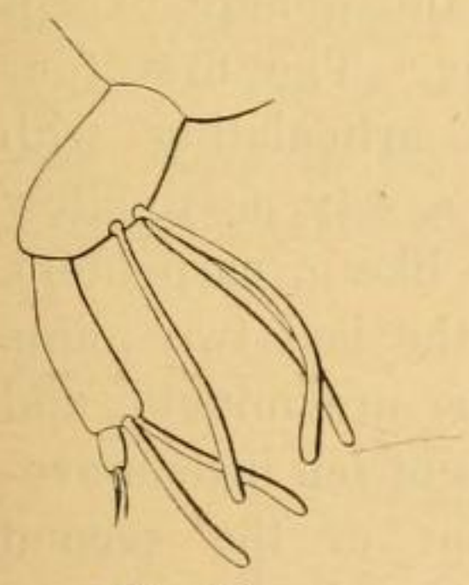

Fig. 20. Streetsia Steenstrupi. ♂.

Fig. 21. Oxycephalus pectinatus. Young ♂.

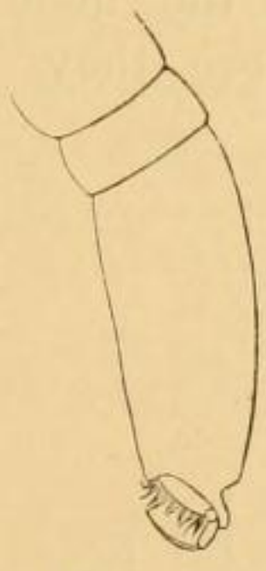

Fig. 22. Oxycephalus Clausi. Young ♂.

Fig. 23. Tullbergella cuspidata. ♀.

Bate. The second flagellar joint is fixed subterminally to the under margin of the first one; the second and following flagellar joints are also provided with long, slender hairs (fig. 19 and 20).

The first pair of antennæ in the female are very different in appearance to those in the male, and differ also in the number of joints. The second joint of the peduncle is usually coalesced with the first,

which is very stout, while the third is distinct; the first joint of the flagellum is not curved, but in a straight line with the peduncle, and much longer than it, though not thicker. In the family Oxycephalidæ, the first flagellar joint is followed by a second and third, the last longer

Fig. 24. Xiphocephalus Whitei ♀.

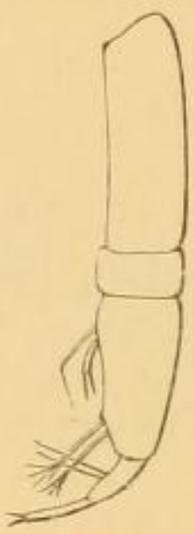

Fig. 25. Simorhynchotus Lilljeborgi. ♀.

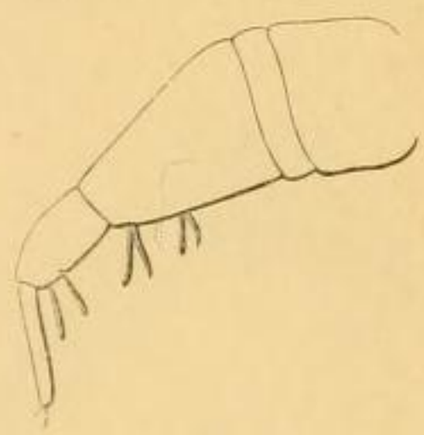

Fig. 26. Glossocephalus spiniger ♀

and more slender than the second. In the family Xiphocephalidæ the flagellum consists of only one joint, much longer than the peduncle, bulbous or tumid at the lower end, and carrying some long olfactory hairs.

6. *The second pair of antennæ.*

They consist in the male of five joints in all the genera except Glossocephalus, where they are composed of six. The first four joints are elongated, articulating with each others in such a way as to allow of being folded up like a carpenter's rule. The last or the last two joints in Glossocephalus are minute, and the articulation allows of but little movement. The first joint of the second pair of antennæ varies in length, according to the length of the head, being shorter than half the second joint in the genera Simorhynchotus, Tullbergella and Cranocephalus (fig. 27 and 28). With this shortness of the first joint is connected a very important difference in the manner of hiding the antennæ when folded. In the three just mentioned genera the folded antennæ are concealed for more than half their length under

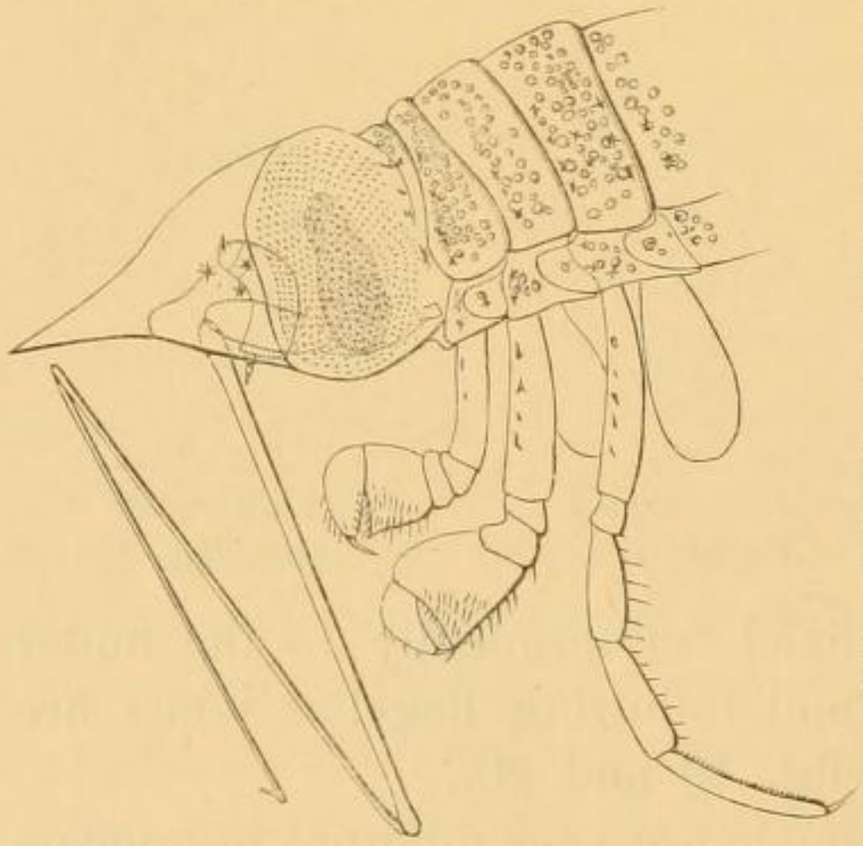

Fig. 27. Tullbergella cuspidata ♂

the peræon between the peræopoda, as in the immediately preceding families of the *Amphipoda curvicornia*, but the anterior part of the folded antennæ, concealed under the head, is comparatively longer than in those families. This feature is very interesting as showing the close relation between the Oxycephalidæ and the *Lycœidæ*. In the other genera the first joint is only a little shorter than the second, and the second pair of antennæ are, when folded, concealed for their whole length under the head within the above mentioned hollow channel, and within the lower part of the spacious chamber, in which the first pair of antennæ are fixed. The length of the antennæ in these latter genera depends naturally

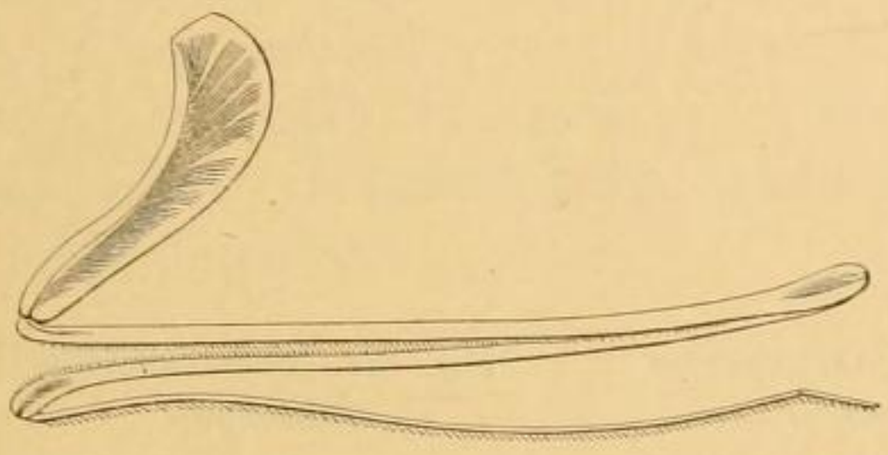

Fig. 28. Simorhynchotus Lilljeborgi.

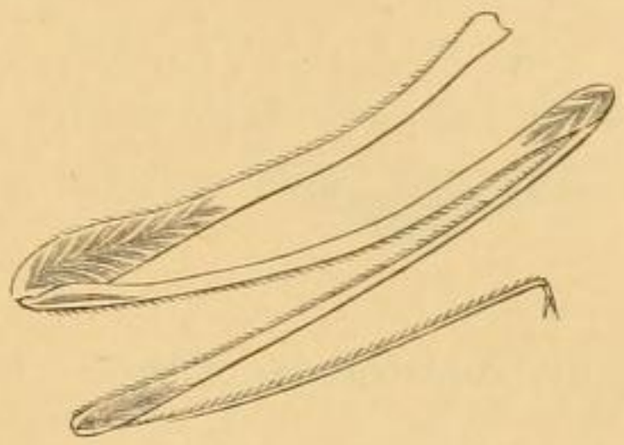

Fig. 29. Oxycephalus pectinatus ♂.

upon the length of the head, so that they are comparatively short and stout in the genera Glossocephalus and Stebbingella (fig. 30), tolerably long in Oxycephalus (fig. 29) and Streetsia, and very long and slender in Dorycephalus (fig. 31) Leptocotis[1]), and Xiphocepha-

Fig. 30. Stebbingella typhoides. Facsimile from Claus Platysceliden, pl.

Fig. 31. Dorycephalus Lindstroemi.

lus (fig. 2). In the three genera, Simorhynchotus, Tullbergella, and Cranocephalus the second joint is more than twice as long as the first, while in all the other the second it is equal to or only a little longer than the first. In all the genera the third and fourth joints are about

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1) The male of Calamorhynchus is hitherto not known.

the same length as the second. The extremities of the first four joints are dilated, showing powerful muscles plumosely arranged. In Stebbingella the antennal joints are much bent (fig. 30) but in the other genera they are more or less straight. The fifth joint, or in Glossocephalus the fifth and sixth joints are very short (fig. 31). The margins of all the joints are fringed with minute hairs.

7. *The mouth-organs.*

These organs are less developed in the Oxycephalids than in most of the other Hyperids. In the genus Xiphocephalus (fig. 32) the *epistoma* forms a rounded, shield-like plate, with a strongly protruding,

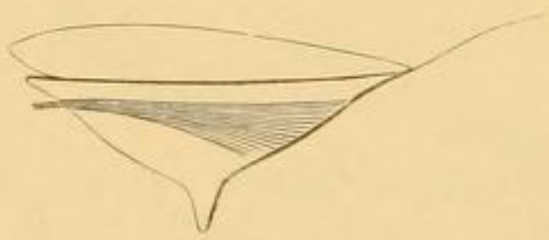

Fig 32. Xiphocephalus Whitei.

Fig. 33. Oxycephalus piscator.

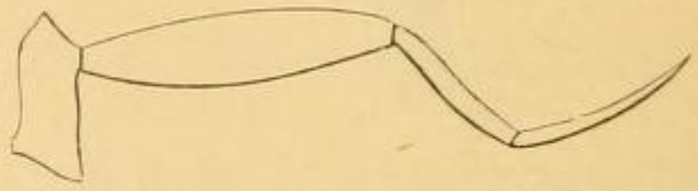

Fig. 34. Simorhynchotus Lilljeborgi.

central, spine-like process. In the true Oxycephalidæ it consists of a tuberculous prominence in front of the mouth-organs.

The *labrum* (fig. 33) is more or less distinctly bilobed, the hind margin feebly curved, and almost entirely smooth.

The *mandibles* (fig. 34—39) are best developed in the genera Tullbergella and Glossocephalus, and most simple in the genus

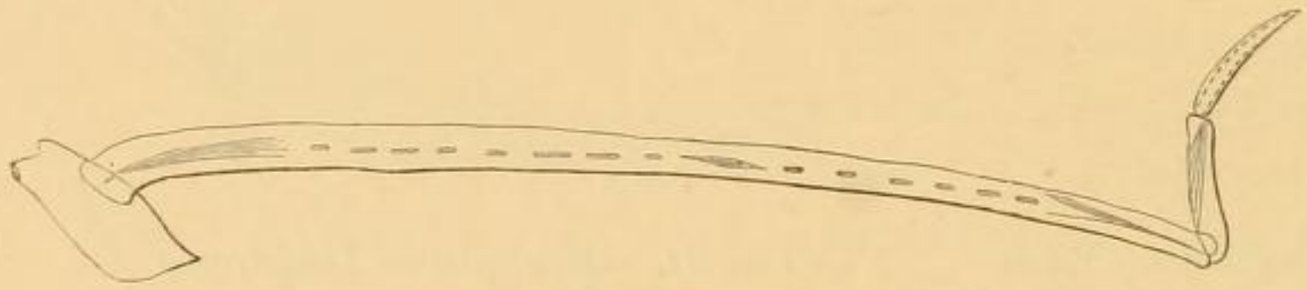

Fig. 35. Oxycephalus piscator. ♂.

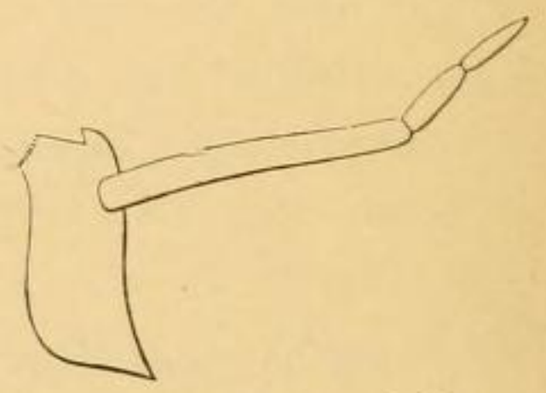

Fig. 36. Oxycephalus piscator. Young ♂.

Xiphocephalus. In the first genus the right mandible has a large, straight, cutting or incisive process with a broad neck springing out from the somewhat elongated stem of the mandible; on the left mandible there is also an accessory process not half as wide as the principal. In Xiphocephalus the mandibles are less elongated than in the Oxyce-

phalidæ and the cutting edge is not at all separated from the stem by a distinct neck. A molar tubercle is wanting in all the representatives of the two families. The palp is strongly developed in the males; among the Oxycephalidæ the first joint is more or less elongated according

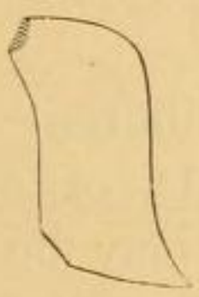

Fig 37. Oxycephalus piscator. ♀.

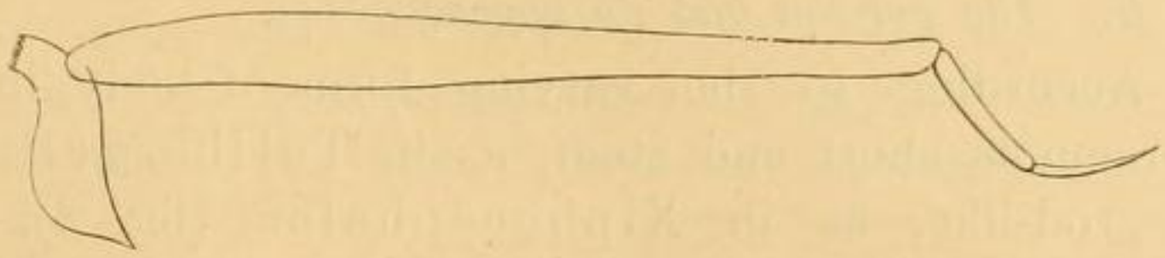

Fig. 38. Streetsia Steenstrupi. ♂.

to the varying length of the head, and always nearly as long as the first joint of the second pair of antennæ; the last two joints are short, subequal in length, and slender. I the Xiphocephalidæ the first joint is enormously elongated, being many times longer than the two terminal joints together.

Fig. 39. Dorycephalus Lindstroemi. ♂.

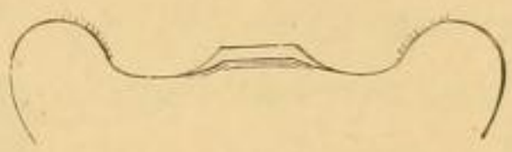

Fig. 40. Tullbergella cuspidata.

The *labium* (fig. 40) is soft, the lateral parts being rounded. Both the pairs of *maxillæ* are very rudimentary being possibly represented by two minute soft laminæ at the base of the mandibles.

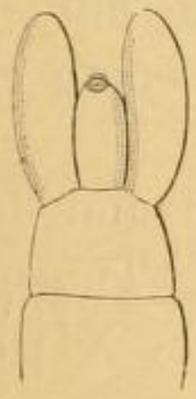

Fig. 41. Oxycephalus piscator.

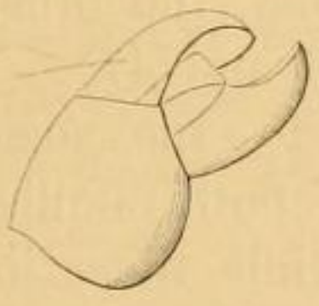

Fig. 42.

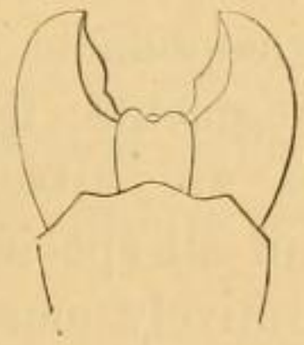

Fig. 43. Glossocephalus spiniger.

Fig. 44. Dorycephalus Lindstroemi.

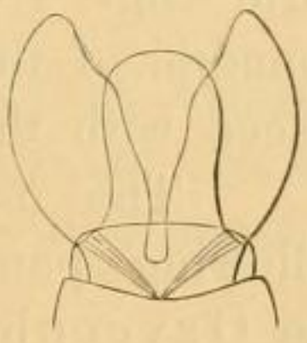

Fig. 45. Xiphocephalus Whitei.

The *maxillipeds* (fig. 41—45) consist of a two-jointed, much bent stem; at the distal or lower margin of the second joint rise laterally two more or less spoon-shaped laminæ, the homologues of the palps in the Gammarids. In the middle between these laminæ there extends a small, sometimes tongue-like process, sometimes more or less cylindrical or tube-

like, bent inwards against the tip of the mandibles. The margins of the lateral laminæ are often tuberculated and serrated or sparingly set with short bristles or fine hairs.

8. The perœon and its appendages.

According to the varying form of body in the different genera the peræon is short and stout, as in Tullbergella (fig. 1), or long and almost rod-like, as in Xiphocephalus (fig. 2), but it may be observed that in the enormous elongation which occurs for instance in Xiphocephalus, has the peræon comparatively less share than the head, the urus, and the pleon.

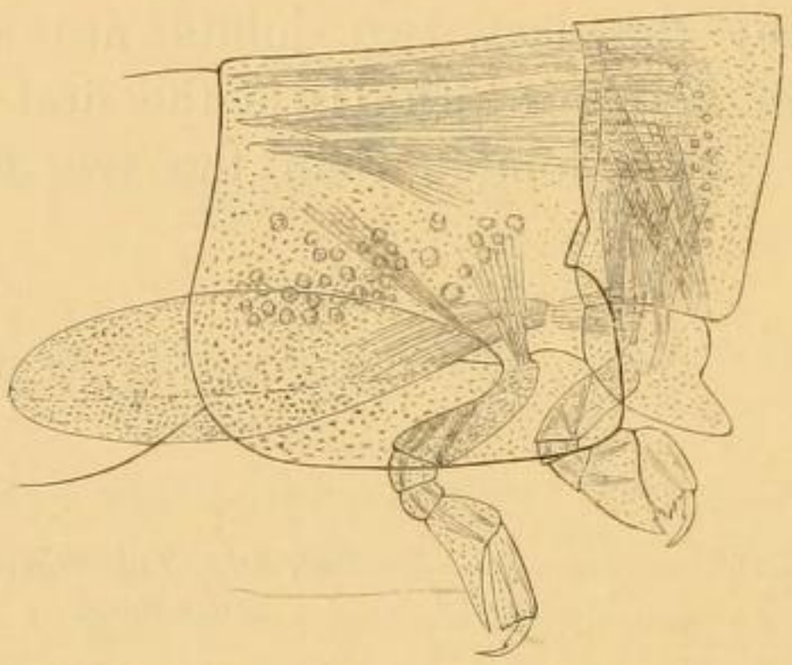

Fig. 46. The first and second peræonal segments of *Xiphocephalus Whitei*. ♂.

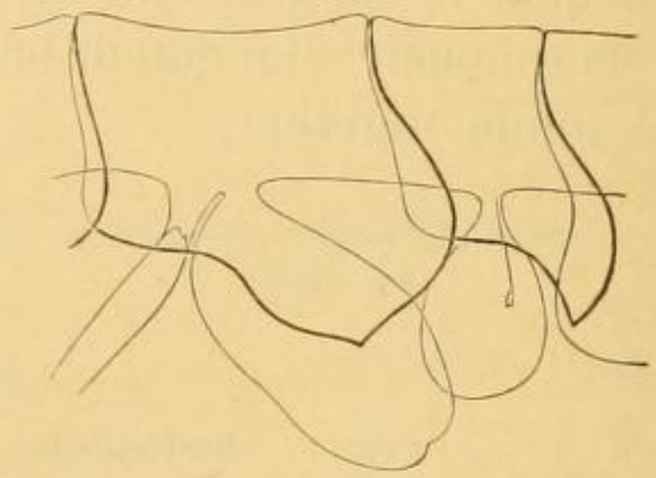

Fig. 47. The sixth and seventh peræonal segments of *Xiphocephalus Whitei*. ♂.

The *epimerals* are distinct in all the genera of the Oxycephalidæ (fig. 1, 3, 4, 5 and 27), but in the Xiphocephalidæ only the epimeral of the first pair of peræopoda is distinct, the others being coalesced with the corresponding segments (fig. 46 and 47).

The *branchial vesicles* are attached to the second and four following pairs of peræopoda in all species of both families. Those in the Oxycephalidæ are comparatively small, while those in the Xiphocephalidæ are very large (fig. 46 and 47).

The *ovitectrices* vary in form in the different genera of the Oxycephalidæ; in Tullbergella, Simorhynchotus, and Stebbingella they are broadly ovate, in Dorycephalus, Streetsia, Oxycephalus, and Leptocotis they are more elongated, the margins being smooth without hairs, and in Glossocephalus they are more irregular in form, the lower end being produced into a sharp angle.

In the Xiphocephalidæ on the other hand there exist no ovitectrices, but the eggs on leaving the oviduct are fixed on the under side of the body, probably by means of some kind of cement, which is possibly secreted from some of the strongly developed glands in the joints of the peræopoda. In any case the manner of carrying the eggs and embryos is very remarkable, and, as far as I know, has not been previously observed (fig. 47). A different number of eggs are fixed under the different segments: under the first I have never observed a single

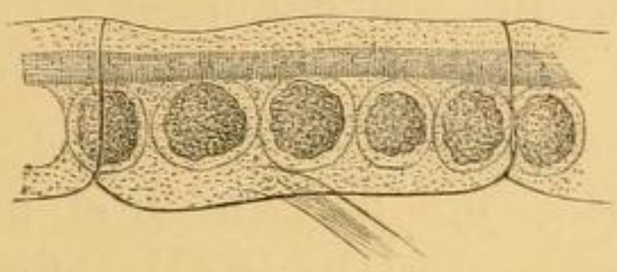

Fig. 48. The fourth peræonal segment of *Xiphocephalus Whitei.* ♀.

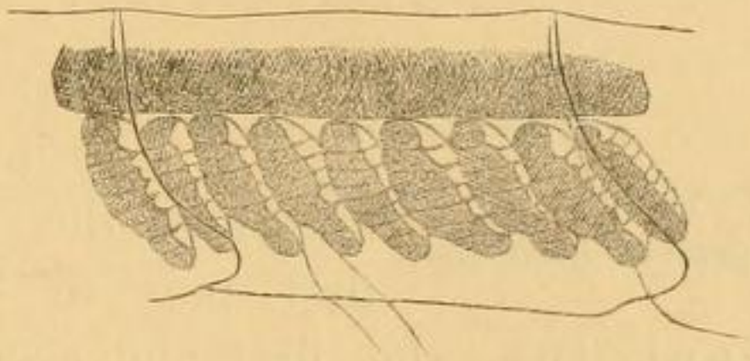

Fig. 49. The sixth peræonal segment of *Xiphocephalus Whitei.* ♀.

egg, under the second three or four pairs are fixed at equal intervals, under each of the third and fourth four or five, under the fifth seven or eight, under the sixth five or six pairs and none under the seventh, one female thus carrying in all from forty to fifty eggs or embryos. I have observed very young eggs thus placed, they being in fact in the third or fourth stage of division, and quite globular (fig. 48), as well as embryos just on the point of breaking the egg membrane (fig. 49), the form of the egg in this case being elongate-ovate, and the young being provided with six pairs of peræonal legs, distinctly developed and armed with strong claws.

The first and second pairs of *peræopoda* are developed into strong grasping or prehensile organs, and show in the different genera almost all the modifications of such organs which are to be observed among the other Hyperids.

We meet with the less complicated form in the first pair of peræopoda of Simorhynchotus (fig. 50), that is to say:

1. **The folding hand** (fig. 50), in which the carpus is only a little dilated, and has a more or less rounded hind margin, so that the metacarpus can be doubled up along it so as to impinge against its *hind* margin, the dactylus thus coming in contact with the tibia.

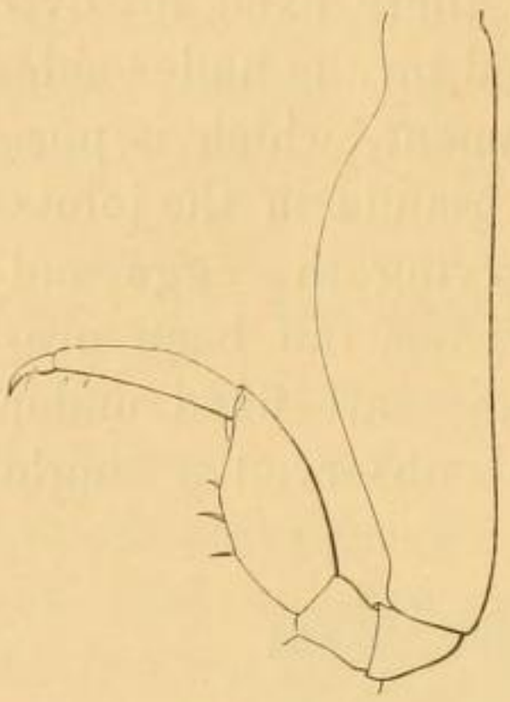

Fig. 50. The first pair of *Simorchynchotus Lilljeborgi.*

This is the same form of prehensile organ which exists in the third and fourth and also in the fifth pair of peræopoda in *Euthemisto* and *Parathemisto.* Moreover the folding hand is common in the *Amphipoda Gammaridea*, in the first three pairs of peræopoda in some families of *Isopoda*, and is probably most strongly developed in the first pair of *Squilla* and other Stomatopods.

The next step in the development of these organs is represented in many genera, as for instance in the second pair in Simorhynchotus, the first pair in Streetsia (fig. 52), the first pair in Dorycephalus, the first and second pairs in Tullbergella (fig. 51), and in others, that is to say:

2. **The subcheliform hand,** (fig. 51—53) in which the carpus is broadly dilated backwards, but not produced downwards, or only very little produced, so that the metacarpus impinges against the *under* margin of the carpus, the dactylus here coming in contact with the hind margin of the carpus. When the hind margin of the metacarpus is in contact with the under margin of the carpus, the metacarpus is at a right angle with the axis of the leg, the leg being supposed to hang straight down.

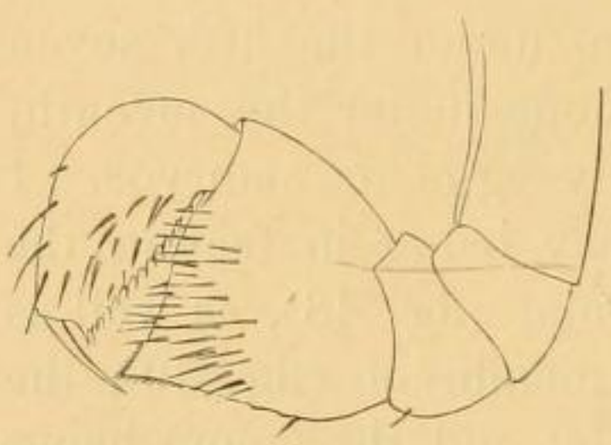

Fig. 51. The first pair of *Tullbergella cuspidata.*

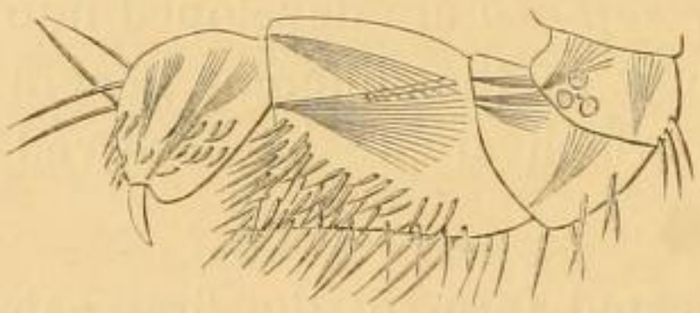

Fig. 52. The first pair of *Streetsia Steentrupi.*

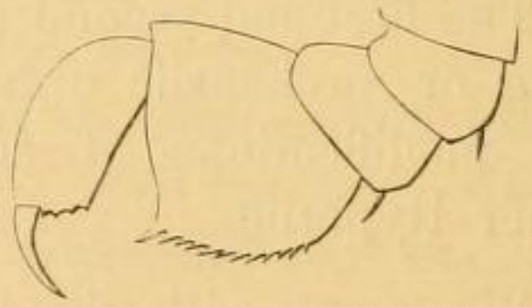

Fig. 53. The first pair of *Cranocephalus Goesi.*

The next form, the most developed prehensile organ, is best represented in the second pair of peræopoda in the genus Oxycephalus (fig. 54), but is also met with in the first pair in the same genus, in the second pair in Streetsia (fig. 55), and in others; that is to say:

3. **The cheliform hand,** in which the carpus is not only dilated backwards, but also produced downwards into a longer or shorter *carpal process*, so that the metacarpus impinges against the *front* margin of the carpal process and the dactylus comes into no contact whatever with the carpus itself. When the hind margin of the metacarpus is in contact with the front margin of the carpal process, the metacarpus is at an angle of from 45° to almost 0° with the axis of the leg.

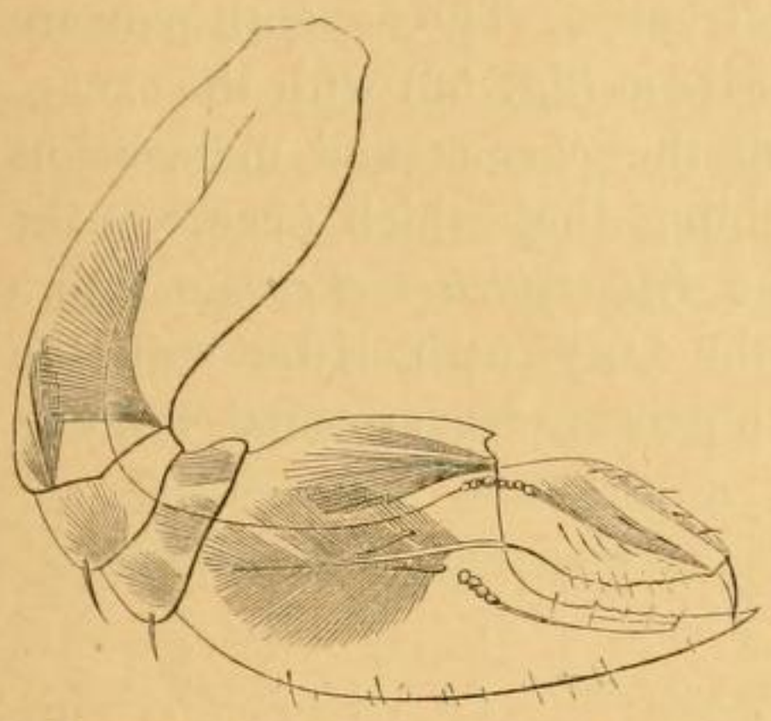

Fig. 54. The second pair of *Oxycephalus Clausi.*

Naturally there are many transitions between the three kinds of prehensile

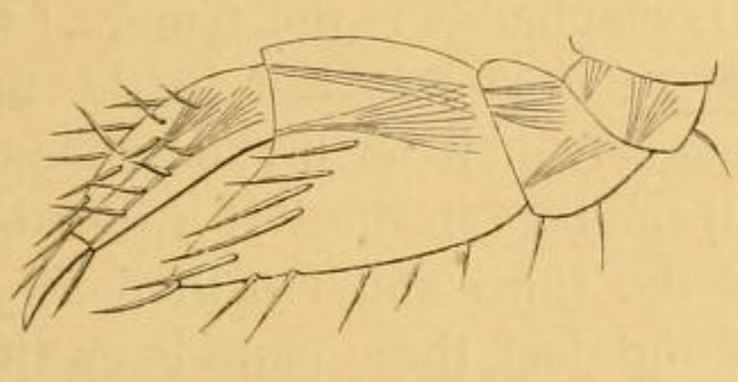

Fig. 55. The second pair of *Streetsia Steenstrupi.*

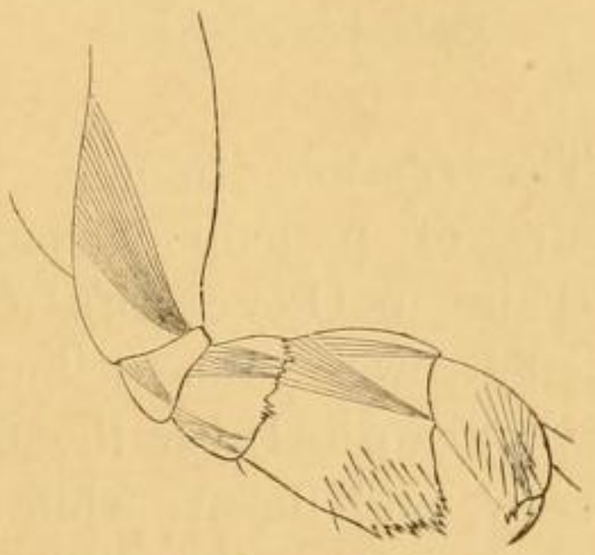

Fig. 56. The first pair of *Dorycephalus Lindstroemi.*

hands, but for practical reasons I think it best to keep these three terms, at least as far as regards the tribe Amphipoda Hyperiidea.

When the lower end of the *metacarpus* is dilated so that this joint shows an *under* margin, straight or excavated, and when the hinder corner of this under margin is produced so that the dactylus, or a portion of the dactylus, impinges against the *under* margin of the metacarpus, I call the double prehensile organ thus formed:

4. **A complexely subcheliform hand,** (fig. 56), or

5. **A complexely cheliform hand,** (fig. 57) as the *carpus* is not or is produced, thus disregarding the fact whether the lower hinder corner of the metacarpus is or is not produced.

None of the following pairs of legs are prehensile in any of the adult forms of the genera dealt with in this treatise. The seventh pair are complete in all the genera of the Oxycephalidæ (fig. 58) with the exception of Tullbergella (fig. 59), in which the carpus and metacarpus are fused together, a feature closely resembling that which occurs in the families *Vibilidæ* and *Cyllopodidæ* among the *Hyperiidea recticornia*, and a feature also suggesting the relation of the Oxycephalidæ with the *Pronoidæ*. In Xiphocephalidæ the seventh pair are transformed (fig. 47).

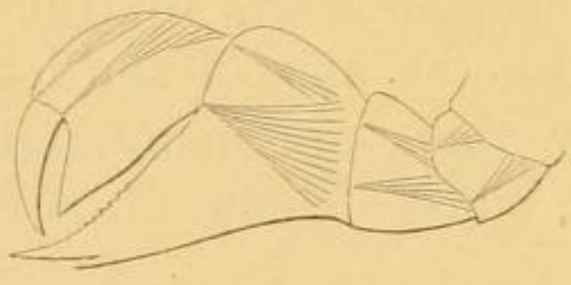

Fig. 57. The first pair of *Xiphocephalus armatus.*

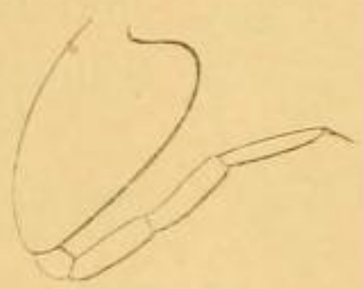

Fig. 58. Streetsia carinata.

Fig. 59. Tullbergella cuspidata.

The *femur*. In none of the Oxycephalids is the femur of the first four pairs of peræopoda much dilated; it is broadest in the first and second pairs in Oxycephalus but scarcely half as broad as long. The femur is narrowest, almost linear, in all the legs in the Xiphocephalidæ. In the Oxycephalidæ the femur of the third and fourth pairs is usually narrow, and linear, while that of the last three pairs is on the other hand more or less dilated; in Glossocephalus it is comparatively narrowest; then come, with the femur increasing in breadth, Dorycephalus, Leptocotis, Calamorhynchus, Streetsia, Tullbergella, Cranocephalus, Oxycephalus and Stebbingella, in which last the femur is much dilated, somewhat tending to the form adopted by the *Parascelidæ*. In Stebbingella we have also the peculiarity, that the external surface of the joint shows some pits or holes which are probably for cutaneous glands (fig. 60). In all the genera except Stebbingella the femur of the sixth pair is broader than, or at least as broad as, the femur of the fifth pair. In Stebbingella the femur of the fifth pair is broadest. In Tullbergella the femur of the sixth pair (fig. 61) is produced at the lower hind corner into a long sharp process. In Streetsia the lower hind apex of the femur of the sixth pair (fig. 62) is produced downwards, so that the genu articulates sub-apically with the femur, a feature which shows some connection with that which occurs in the *Pronoidæ*. The form of the femur of the seventh pair is

more or less ovate except in Stebbingella (fig. 60), where it has a trapezoid form.

The *genu* is always short and not dilated.

The *tibia* is tolerably long, except in the first two pairs of peræopoda; in the third and fourth pairs in Glossocephalus, and in the third and three following in Xiphocephalus it is much elongated. In the female of this last genus it is sometimes, and I think periodically, enormously inflated owing to the strong development of the glands within it. In the former genus it is much dilated, resembling that joint in *Phorcorhaphis* and *Lycæopsis*. The tibia is often provided with hairs or

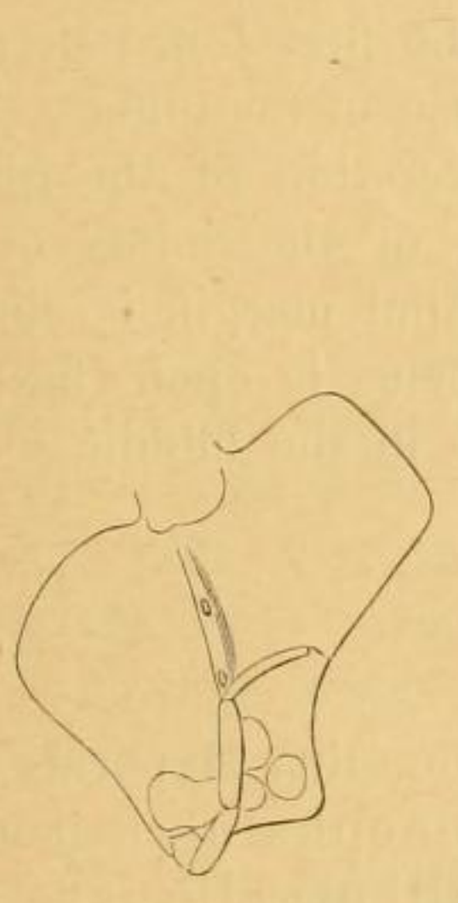

Fig. 60. Stebbingella Théeli.

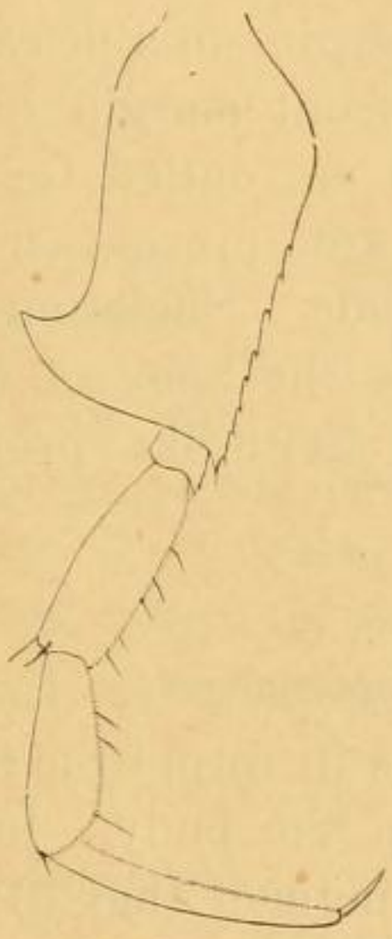

Fig. 61. Tullbergella cuspidata.

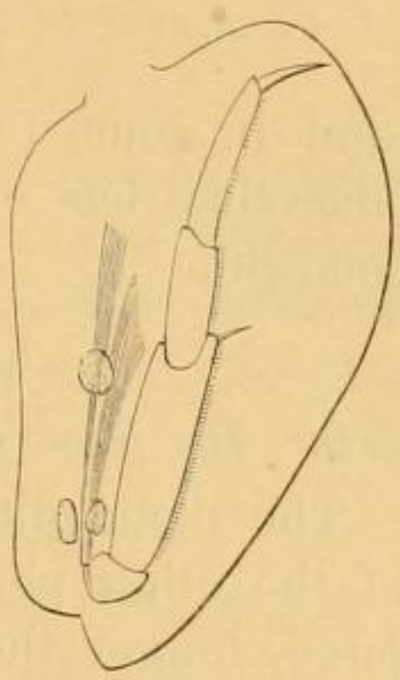

Fig. 62. Streetsia carinata.

spines along the hind margin — in the third and and fourth pairs — or on the front margin — in the fifth and sixth.

The *carpus*. The development of the carpus in the first and second pairs has been spoken of above (p. 31—33). In the third and fourth pairs the carpus is never dilated, as it is for instance in the genera *Parathemisto* and *Euthemisto;* it is often spiniferous or serrated, and in Xiphocephalus sometimes inflated, but not in the same degree as the tibia. In Glossocephalus it is dilated as well as the tibia. The carpus of the fifth and sixth pairs is usually serrated or set with spines; in Xiphocephalus it carries a series of ovate discs or plates armed

Fig. 63 Fig. 64. Xiphocephalus Whitei.

with a row of four or five stout spines, which are probably sensitive organs of some kind (fig. 63).

The *metacarpus* is usually narrow and linear; the hind margin of the third and fourth pairs, and the front margin of the fifth, sixth, and sometimes of the seventh is serrated or pectinated. In Xiphocephalus the metacarpus of the fifth and sixth pairs shows sensitive organs like those of the carpus mentioned just above (fig. 64).

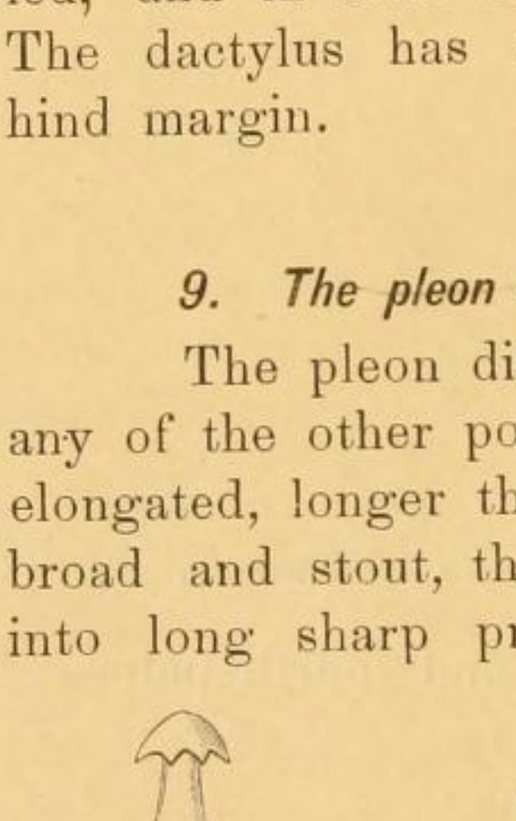

Fig. 65. Oxycephalus Clausi.

The *dactylus* of the first and second pairs as well as that of some or of all the other pairs has often a circular or ovate hole at the base of the hind margin, in the case of the first four pairs, and of the front margin in the case of the others. This hole is an outlet for the secretion of the glands which are present in many of the joints of the peræopoda. Sometimes the hind margin is chanelled, and in some few cases the apex of the dactylus is open (fig. 65). The dactylus has often a tooth-like prominence in the middle of the hind margin.

9. The pleon and its appendages.

The pleon differs less in form from that in the other Hyperids than any of the other portions of the body. In Xiphocephalus it is much elongated, longer than the peræon (fig. 2); in Tullbergella it is very broad and stout, the lower hind corners of the last segment projecting into long sharp processes (fig. 74). In Stebbingella it is hard and tuberculous with grooves and ridges on the external surface, in Dorycephalus the integument is thin and marked with peculiar pits and excavations. The pleopoda are normal; the peduncles are globular, egg-shaped or almost cylindrical. On the inner side of the apex of the peduncle are to be seen those peculiar organs first mentioned by G. O. SARS in his admirable work on the fresh-water Crustacea of Norway[1]) under the name »épines particuliers» and termed »coup-

Fig. 66. Oxycephalus piscator.

Fig. 67. Simorhynchotus Lilljeborgi.

1) G. O. SARS. Crustacés d'eau douce de la Norvège. I p. 5 and 133 pl. 5, fig. 8' and 8". Christiania 1869.

ling spines» by Stebbing in 1888, (l. c. p. XIV). They have usually the form of a club or a mushroom, the head armed with short, strong, retroverted teeth, their purpose being to hold the two pleopods together (fig. 66—69). The rami of the pleopoda are also very similar

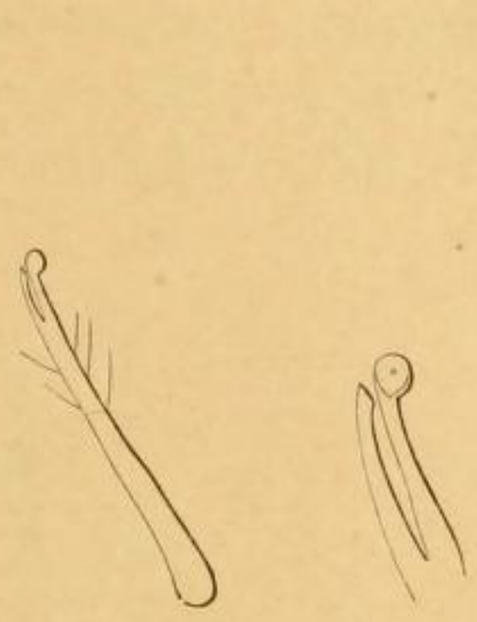

Fig. 68. *Oxycephalus piscator.*

Fig. 69.

Fig. 70. Simorhynchotus Lilljeborgi.

to those in the other Hyperids as well as in the *Amphipoda Gammaridea*. The first large joint of the inner ramus carries a »cleft bristle» (fig. 68—70), also first noticed by G. O. Sars and minutely described by Stebbing from many different forms of the »Challenger» Amphipoda. The following joints are provided each with one pair of feathered bristles.

10. The urus and its appendages.

The first segment of the urus is usually short, much shorter than the last pleonal segment, except in Xiphocephalus in which it is much elongated, rod-like, and longer than the last pleonal segment. The second and third segments are coalesced into one, and usually longer than the first segment, the only exception being Xiphocephalus armatus, in which the coalesced last ural segment is shorter than the first. The last coalesced segment is comparatively broad in Simorhynchotus (fig. 76), Tullbergella (fig. 74), Glossocephalus (fig. 71), and Stebbingella, more elongated in Cranocephalus (fig. 72), Oxycephalus (fig. 75), Streetsia, Dorycephalus (fig. 73) Leptocotis, and Calamorhynchus, and lastly very narrow and rod-like in Xiphocephalus.

The *telson* is invariably coalesced with the last ural segment in all the genera of the Oxycephalidæ, and this character not only suggests the relation of the Oxycephalidæ with the *Lycœidæ*, the *Para-*

scelidæ, and the *Eutyphidæ*, but is also a feature of the *Isopoda*. In the Oxycephalidæ the telson is more or less broad, varying from the broadest form in Simorhynchotus (fig. 76) and Tullbergella (fig. 74) to the narrowly elongated form in Leptocotis and Dorycephalus (fig.

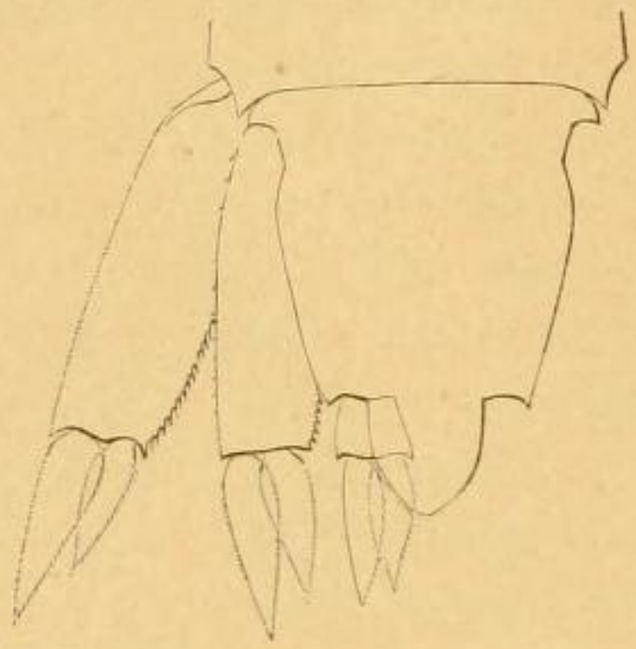

Fig. 71. Glossocephalus Milne Edwardsi.

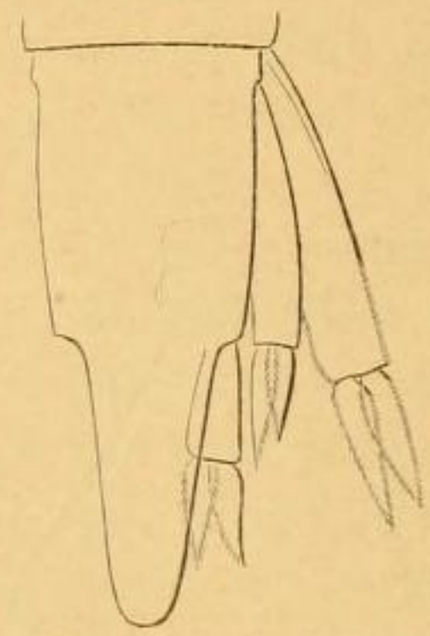

Fig. 72. Cranocephalus Goësi.

73). It is usually sharp-pointed at the apex, but in Cranocephalus and Glossocephalus the apex is broadly rounded (fig 71 and 72). In the Xiphocephalidæ on the other hand the telson is free from,

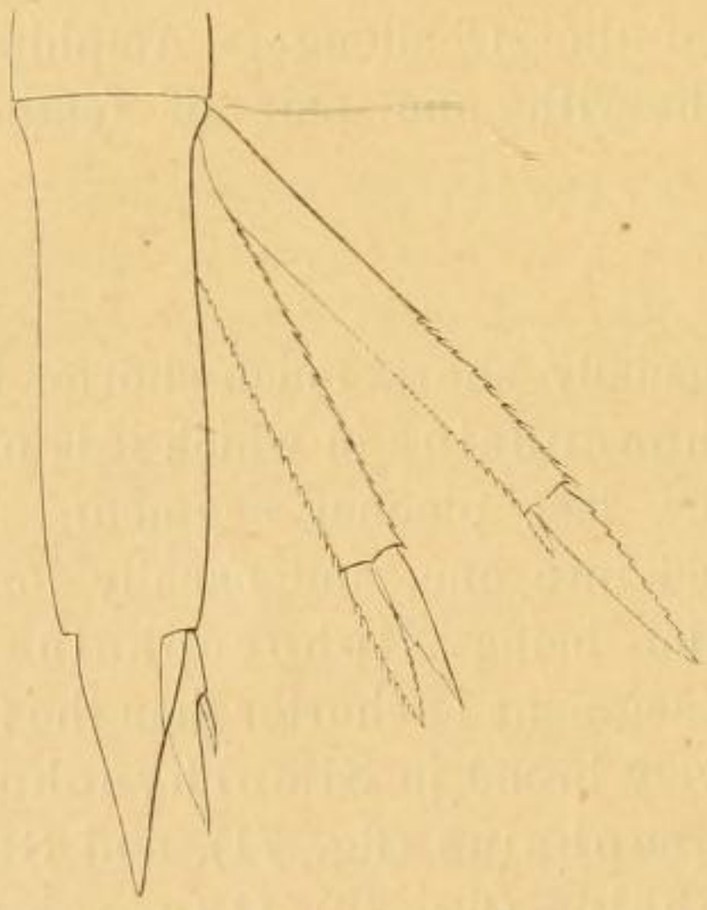

Fig. 73. Dorycephalus Lindstroemi.

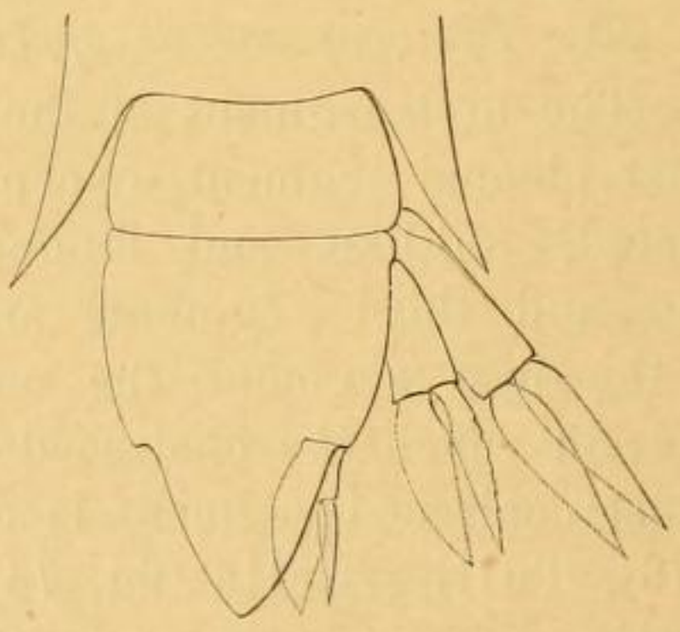

Fig. 74. Tullbergella cuspidata.

and articulating with, the last ural segment; but the new species X. brevicaudatus, described in 1888 by STEBBING (l. c. p. 1612) shows a very remarkable exception to this rule. The case he reports of the telson being coalesced with the last ural segment may possibly be an indi-

vidual abnormity in the only specimen examined owing to some lesion, or if not, I am quite unable to see how such a contradiction is to be explained. In Xiphocephalus the telson is usually much longer than the rest of the urus.

The *uropoda* show naturally the same gradation as the urus from stout, broad, laminar peduncles with broadly lanceolate rami, to extremely elongated, rod-like peduncles with more or less needle-shaped rami. In Glossocephalus (fig. 71) they are very broad and short

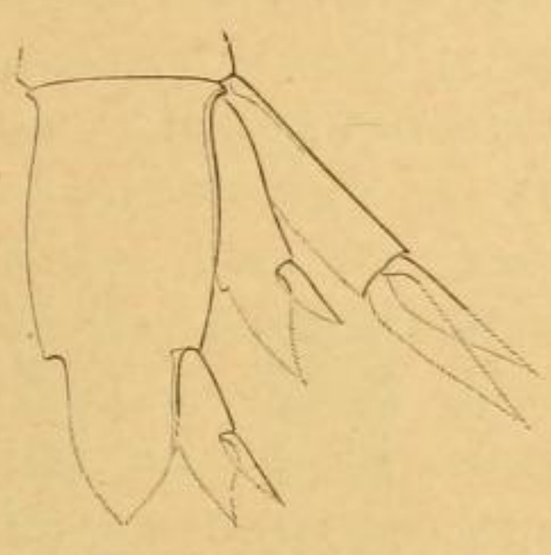

Fig. 75. Oxycephalus piscator.

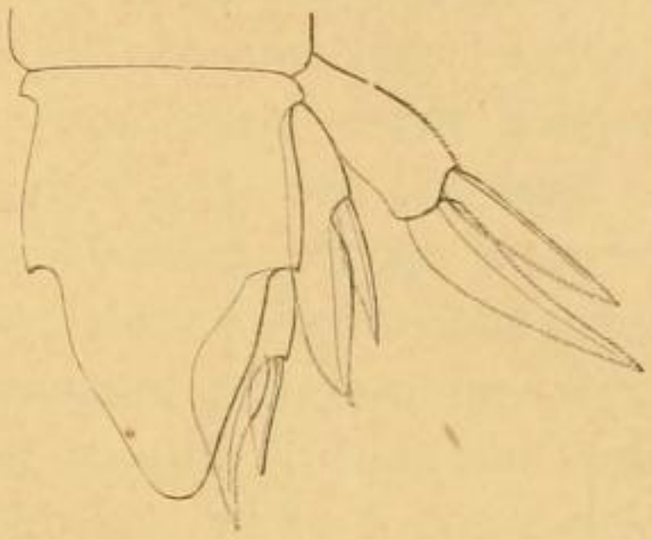

Fig. 76. Simorhynchotus Lilljeborgi.

like those in the genus *Hyperia;* in Simorhynchotus (fig. 76), Oxycephalus, Cranocephalus, Tullbergella and Stebbingella, they are comparatively short; in Dorycephalus (fig. 73), Leptocotis and Calamorhynchus they grow gradationally longer and narrower, the peduncle of the first pair even in Leptocotis being 8 or 10 times longer than broad. In Xiphocephalus the elongation is carried to its extreme limit, the length of the rod-like peduncles being 30—50 times greater than their breadth.

Fig. 77. Dorycephalus Lindstroemi.

In some of the genera, — see the diagram p. 46 — all the rami are free, articulating with the peduncles (fig. 71 and 72), in others viz: Dorycephalus and Tullbergella (fig. 73 and 74) the inner ramus of the last pair is coalesced with the peduncle while all the other rami are free; and lastly in Oxycephalus (fig. 75 and 76) and others the inner rami of the last two pairs are coalesced with the corresponding peduncles, the other rami being free; and in Xiphocephalus also the inner rami of the last two pairs are coalesced with the corresponding peduncles (fig. 78—80).

The outer and the inner ramus are usually both well developed, and more or less equal in length. Exceptions from this are Dorycephalus Lindstroemi (fig. 77), Xiphocephalus armatus (fig. 80) and X. brevicaudatus. In the first of which the outer rami of the first and third pairs and in the two latter those of all the three pairs are very reduced in size, diminutive.

Usually we have well developed *glands* in the peduncles and rami; their outlets are usually situated at the upper end of the rami, where the rami are in contact with one another. In Xiphocephalus

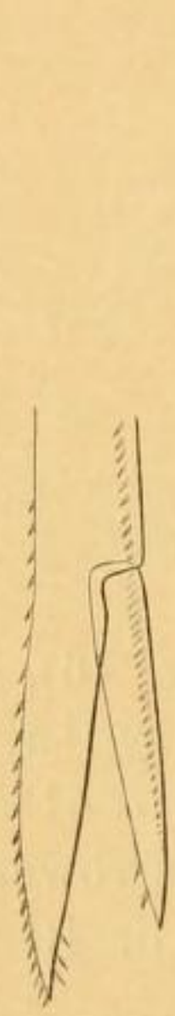

Fig. 78. The second pair of *Xiphocephalus Whitei.*

Fig. 79. The third pair of *Xiphocephalus Whitei.*

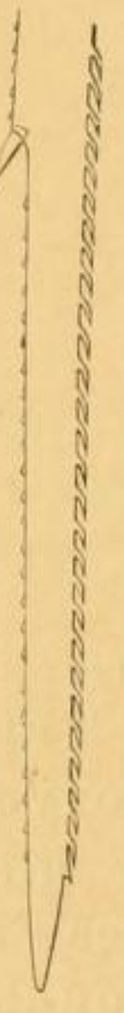

Fig. 80. Xiphocephalus armatus.

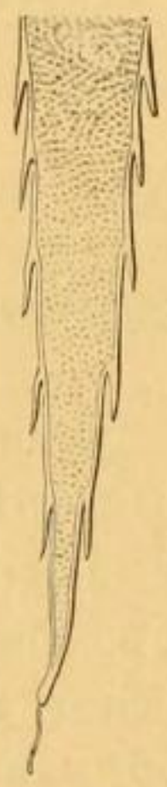

Fig. 81. The inner ramus of the third pair of *Xiphocephalus Whitei.*

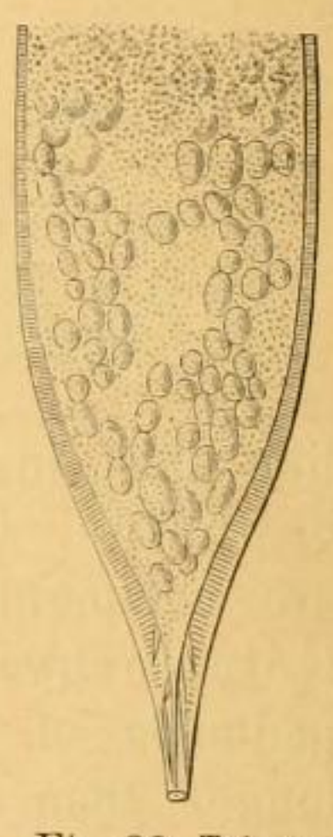

Fig. 82. Telson of *Xiphocephalus Whitei.*

the glands are highly developed, filling not only the uropoda but also the telson; at the apex of the telson a small circular outlet is to be observed; at the end of some of the rami there are also similar outlets to be seen (fig. 81 and 82).[1])

1) In the following parts of the Morphological Notes I give a few preliminary notices on the nervous system, glands, etc., reserving a fuller account of the different organs of the Oxycephalids for the third volume of my »Contributions to a Monograph of the Amphipoda Hyperiidea».

11. The nervous system.

The ganglionic chain shows a strongly developed supra-oesophagial, or cephalic ganglion; from its anterior corners extend the very stout and thick optical nerves, dilating apically into an ovate or bean-shaped disc, which is more or less closely pressed against the layer formed by the retina. Between the optical nerves rise two stout nerves from the front margin of the cephalic ganglion, and run to the first pair of antennæ; at the base of these antennal nerves are situated the two vesicles which have been interpreted by Claus[1]) as auditory organs. These vesicles are small in the Oxycephalidæ but very largely developed in the Xiphocephalidæ. The commissural cords connecting the cephalic ganglion with the infra-oesophagial ganglion are thick and stout, much thicker than for instance in *Lanceolidæ*. Close upon the infra-oesophagial ganglion follow the first two pairs of peræonal ganglia; they are not coalesced with the infra-oesophagial ganglion but in the Oxycephalidæ they are so closely pressed against it that the commissural cords between them are scarcely perceptible. The following four pairs of peræonal ganglia are equidistant, situated each in the middle of the corresponding segments, the third, fourth, fifth, and sixth. The pair of ganglia supplying the seventh peræonal segment and its appendages with nerves are situated just at the limit between the sixth and seventh segments, close to the preceding pair of ganglia but not coalesced with it. In the hind portion of the body the ganglionic chain shows three pairs of ganglia, one pair situated in the middle of each of the pleonal segments, and the last consisting of two or three pairs, fused together and so supplying the whole urus with nerves. The ganglionic chain is thus composed of twelve pairs of ganglia, some pairs being placed closely together. The commissural cords run close to one another, but are not coalesced. In the Xiphocephalidæ the first two pairs of peræonal ganglia are more separated from one another and from the infra-oesophagial ganglion, so that the commissural cords are distinct, but not longer than the ganglia themselves.

12. The glands.

Glands are present in most of the joints of the peræopoda and uropoda of all the species of both the families. They are either simple,

1) C. Claus, **23,** p. 150; **36,** p. 15.

consisting of only one cell, with a short, narrow duct opening into a small circular hole in the surface of the integument (fig. 83), which hole is usually guarded by one or more small simple hairs; or they are composed of many cells, and packed into thick masses round a central lumen from which a common duct runs to the outlet. The outlet is often placed, as mentioned above, at the base of the dactylus (fig. 84), more seldom at its apex (fig. 65), often in semicircu lar incisions at the upper end of the rami of the uropoda, or — as in Xiphocephalus — at the apex of the telson and of the rami of the uropoda (fig. 81 and 82). Usually the glands of the legs are concentrated in the femur, and only a few and scattered glandular cells are to be seen within the following joints, often lying round or close to the duct which runs from the chief mass of glands in the femur to the base of the dactylus (fig. 84); but in the females of the three species of *Xiphocephalus* which I have examined, the tibia and carpus of the third and fourth pairs of peræopoda, as well as the same joints of the fifth and sixth pairs are sometimes inflated, and almost egg-shaped, owing to a strongly developed glandular mass surrounding the axis of the joint for the whole of its length (fig. 85). The development of these powerful glands in the tibia and carpus of those pairs of peræopoda is, however, in my opinion periodical, and may be supposed to have some connection with the fixation of the eggs on the under-side of the body, so I venture the supposition that they are cement-glands. I believe this enormous development of the tibial and carpal glands to be periodical because I have seen fullgrown females of X. armatus and X. Whitei without the joints in question inflated at all; but I have never seen females of the same species with eggs or young ones, which had not at the same time those joints more or less inflated. Thus it seems probable that the development of these glands may be connected with the maternal functions

Fig. 83. Cutaneous gland in the margin of the first epimeral of *Xiphocephalus Whitei.*

Fig. 84. Oxycephalus latirostris.

Fig. 85. The tibia of the fourth pair of peræopoda of *Xiphocephalus Whitei.* ♀.

of the animal, and that we thus may find them increasing or decreasing in volume according to the stage of the development of the ovaria.

The other glands present within the joints of the legs have probably a different function, according to the place they occupy, and so I am inclined to think that the highly developed glands in the uropoda and telson of Xiphocephalus are poison-glands.

13. The young.

The eggs are in the family Oxycephalidæ packed in, and protected by a pouch formed of five pairs of ovitectrices, attached to the second and four following pairs of peræopoda. There the eggs rest until the time of hatching, when the young have a form very similar to that of a true *Hyperia*.

In the Xiphocephalidæ also the young remind one of the form occurring in *Hyperia*, *Vibilia*, and other genera of the first two subtribes. But the manner of bearing the eggs is a very peculiar feature. No ovitectrices exist but the eggs are placed under the peræonal segments, between the lower parts of the sides where they are fixed in two regular rows, as mentioned above (p. 31). When the young are ready to be hatched we find that each egg is cemented to the under surface of the peræon with the head-end, and that the young hang tail downwards (fig. 48 and 49).

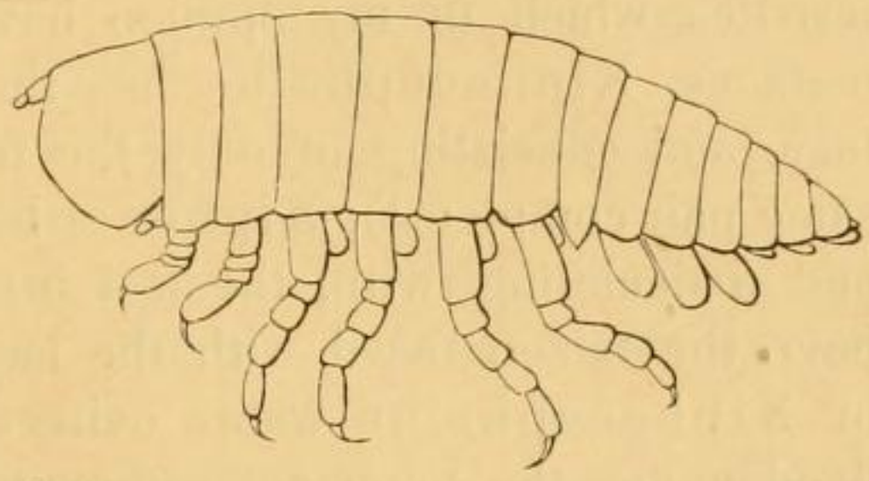

Fig. 86. A young, just hatched, of *Xiphocephalus Whitei.*

The first pair of antennæ in the just hatched young one of Xiphocephalus consist of two small tubercles fixed at the *anterior* side of the head, and no trace of a rostrum is to be seen. The first and five following pairs of peræopoda are developed, all simple and subsimilar in form, and armed with strong claws, the first and second pairs subequal in length, and more than half as long as the following pairs. No trace of the seventh pair is to seen. The pleon and urus are comparatively short, much shorter together than the peræon. The pleopoda are represented by egg-shaped vesicles. The second and third ural segments are free, not coalesced, each carrying a pair of small vesicles, the uropods (fig. 86).

IV. THE OXYCEPHALIDEAN GENERA AND SPECIES.

As I have already said I think it convenient to divide the Oxycephalids into two families, instituting a new family Xiphocephalidæ for the genus Xiphocephalus. I separate this genus from the other Oxycephalids, because it is distinguished from the other genera by characteristics which in my opinion have a more than generic value. So for instance Xiphocephalus has the seventh pair of peræopoda rudimentary, and consisting of only the femur, while the other genera have the same pair complete[1]); Xiphocephalus normally has the telson free from, and articulating with, the last ural segment, while all the other genera have the telson fused with the last ural segment; and lastly the female of Xiphocephalus wants ovitectrices, and carries the eggs and young fixed under the peræonal segments in two regular rows, while the other genera have well developed ovitectrices. On the other hand the two families are connected by some common characteristics, as for instance the reduction of the mouth-organs, the maxillæ being rudimentary in both families, and the rostral elongation of the forepart of the head, and the more pronounced tendency to form an elongated body than is seen in any other family of the tribe. This tendency to elongation is besides expressed in the form of the femora of the fifth and sixth pairs of peræopoda in Xiphocephalidæ, but not met with in these parts in Oxycephalidæ, not even in the genera Leptocotis and Calamorhynchus, which show much elongated uropods.

Dana was the first (**17,** p. 1009, see above, p. 5) who took the Oxycephalids as a whole placing them as a subfamily, *Oxycephalinæ*, of the family *Typhidæ*, at the side of the subfamilies *Typhinæ* and *Pronoinæ*; he then gave the following diagnosis of the *Oxycephalinæ:*

»Abdomen in ventrem se non flectens. Caput oblongum, antennis 1mis superficiem capitis inferiorem insitis».

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1) Except Tullbergella which has the femur and three following joints.

He distinguished the two genera *Oxycephalus* and *Rhabdosoma* from one another by the length of the rostrum and of the uropods.

In 1862 SPENCE BATE (**20,** p. 341) made the subfamily a family of its own, and in 1885 CARUS (**33,** p. 427) considered it as a subfamily of the family *Platyscelidæ*.

The family **OXYCEPHALIDÆ,** SPENCE BATE, 1861.

Diagn. The *head* is more or less elongated and rostrate.

The *eyes* are large, but do not occupy the whole head.

The first pair of *antennæ* are curved (♂), and fixed on the under side of the head; the first joint of the flagellum is very large, and tumid; the following, joints are small, few in number, and subterminal (♂). The second pair are fixed on the under side of the head, are long, slender, and folded four times (♂), or are entirely wanting (♀).

The *mouth-organs* are reduced, the maxillæ being rudimentary; the mandibles are provided with an elongated palp (♂), or without a palp (♀).

The last five pairs of *peræopoda* are walking legs; the femur of the last three pairs is not transformed. The seventh pair are complete. The ovitectrices are well developed.

The *uropoda* are provided with rami.

The *telson* is coalesced with the last ural segment.

In 1887, in my preliminary »Systematical list» I enumerated five genera, in addition to *Rhabdosoma* or *Xiphocephalus*, as composing the family Oxycephalidæ, viz: Glossocephalus, Oxycephalus, Leptocotis, Tullbergella, and Calamorhynchus; a sixth genus Streetsia, was proposed in 1888 by STEBBING; and here I increase the number of genera to ten by transferring the genus Simorhynchotus from the *Lycæidæ* to this family, and by introducing three new genera, viz: Cranocephalus, Stebbingella, and Dorycephalus.

Of these genera Simorhynchotus shows some relation to *Lycæidæ*, Tullbergella to *Euthamneidæ*, Cranocephalus and Stebbingella to *Eutyphidæ*, Glossocephalus to *Phorcoraphidæ*, and Dorycephalus and Leptocotis to *Xiphocephalidæ*.

These ten genera may be distinguished by the characteristics shown in the following synoptical table:

A. The inner rami of the second and third pairs of uropoda are coalesced with the corresponding peduncles.

a 1. The first pair of peræopoda with a folding hand; the second pair with a subcheliform hand. The head is only a little produced, and the rostrum broadly obtuse. — 1. **Simorhynchotus.**

a 2. The first and second pairs of peræopoda with a cheliform hand. The head is produced into a more or less sharp-pointed rostrum. — 2. **Oxycephalus.**

B. The inner ramus of the third pair of uropoda is coalesced with the peduncle.

b 1. The last ural segment is not twice as long as the first. — 3. **Tullbergella.**

b 2. The last ural segment is more than twice as long as the first.

bb 1. The anterior part of the head is dilated into wing-like projections. — 4. **Calamorhynchus.**

bb 2. The anterior part of the head is not dilated. — 5. **Dorycephalus.**

C. The inner rami of all the uropoda are free, not coalesced with the peduncles.

c 1. The last ural segment is not twice as long as the first.

cc 1. The hind part of the head is not constricted into a neck. The head is produced into a sharp rostrum. The first pair of peræopoda with a subcheliform hand, the second with a cheliform, the carpal process being more or less spine-like — 6. **Streetsia.**

cc 2. The hind part of the head is constricted into a neck.

ccc 1. The first two pairs of peræopoda with a subcheliform hand. The head is produced into a sharp rostrum.

cccc 1. The second pair of antennæ in the male are hidden under the head and the peræon, when folded, the first joint not being half as long as the second. — 7. **Cranocephalus.**

cccc 2. The second pair of antennæ in the male are hidden only under the head, when folded, the first joint being about as long as the second. — 8. **Stebbingella.**

ccc 2. The first two pairs of peræopoda with a cheliform hand, the carpal process being spoon-shaped. The head is produced into an obtuse, rounded rostrum. — 9. **Glossocephalus.**

c 2. The last ural segment is more than twice as long as the first. — 10. **Leptocotis.**

Gen. 1. **Simorhynchotus,** Th. STEBBING, 1888.

Diagn. The *head* is short, not produced, or only a little produced, forming a thick, broad, obtuse snout. The hind part of the head is not constricted.

The second pair of *antennæ* in the male are concealed under the head and the peræon, when folded.

The first pair of *peræopoda* have a folding hand, the second pair a subcheliform. The carpus and metacarpus of the fifth pair are not dilated.

The last *ural* segment is about as long as the first, and is broader than long.

The inner rami of the last two pairs of *uropoda* are coalesced with the corresponding peduncles.

The *telson* is very broad, and triangular.

Syn.[1])	**1861. Simorhynchus.**	C. CLAUS.		**23**[2]),	p. 156.
	»	»	1879.	**27,**	p. 188 (42).
	»	»	1887.	**36,**	p. 65.
	1888. Simorhynchotus.	TH. STEBBING.		**39,**	p. 1572.

When CLAUS in 1861 instituted the genus *Simorhynchus* he placed it in the family Oxycephalidæ; in 1879 he removed it from this family and put it among the *Lycæidæ*. In my opinion however it must be regarded as an Oxycephalid, so I have placed it here as the first genus of the family Oxycephalidæ, chiefly for the reason that the mouth-organs agree with those in the Oxycephalidæ in the form of the mandibles and maxillipeds, and in the rudimentary state of the maxillæ. Also in the form of the last five pairs of peræopoda there is a great resemblance between this genus and the genus *Oxycephalus*. It is however a link between the Oxycephalidæ and the *Lycæidæ*, connecting these two families for which it is so hard to find good distinguishing characteristics, since the principal characteristic used by CLAUS, namely the elongation of the head, is so very gradual; the best characteristic is without doubt the presence of maxillæ in the *Lycæidæ*, but it is of no value for external examination.

CLAUS' name *Simorhynchus* was changed in 1888 to Simorhynchotus by STEBBING, because the former name was found to have been previously applied to a genus of birds.

The species established by CLAUS in 1861 was S. antennarius, the next new species was S. Lilljeborgi, proposed by me in 1887 (**35,** p. 34), and here I describe a new species S. Stebbingi.

The three species are easily distinguished, as is shown below.

A. The head is produced into a short, obtuse rostrum. The telson is acute at the apex.
- **a** 1. The outer ramus of the second pair of uropoda is about as long as the peduncle. 1. **S. antennarius.**
- **a** 2. The outer ramus of the second pair of uropoda is much shorter than the peduncle. 2. **S. Stebbingi.**

B. The head is rounded in front, not produced into a rostrum. The telson is rounded at the apex. 3. **S. Lilljeborgi.**

1) For a more complete synonymy of this and the following genera and species see: C. BOVALLIUS, Contributions to a Monograph of the Amphipoda Hyperiidea, I, 3.

2) This and the following similar figures in the lists of synonyms and in the text refer to the bibliographical list above, p. 2—10.

1. **Simorhynchotus antennarius,** C. CLAUS, 1861.

Diagn. The *head*, with the rostral prolongation, is about as long as the five first peræonal segments together. The rostral part is very broad, thick, and obtuse at the apex.

The lower anterior corner of the first flagellar joint of the first pair of *antennæ* in the male is produced into a process, which is more than half as long as the breadth of the joint.

The femur of the first and second pairs of *peræopoda* is much longer than all the following joints together. The femur of the seventh pair is scarcely more than half as long as that of the sixth, and much narrower than the femur of the fifth pair.

The peduncle of the first pair of *uropoda* is as long as the inner ramus, and longer than the outer.

The *telson* is as long as broad, with the apex sharp-pointed.

Syn. **1861. Simorhynchus antennarius,** C. CLAUS. **23,** p. 156.
» » » **27,** p. 188 (42).
» » » **36,** p. 65, pl. 17, fig. 9—19.

All these three descriptions, just cited, are incomplete, and therefore the drawing given by CLAUS in 1887 was of much value for the identification of the species. In addition to the characteristics given in the diagnosis above the following may also be mentioned.

The *head* rises a little above the peræon, but does not form a distinct neck behind. Seen from below the under side of the rostral[1]) portion is flat, and broader than a third part of the head.

The lower hind corner of the first flagellar joint of the first pair of *antennæ* is produced downwards to the middle of the third joint. The second, third, and fourth flagellar joints are about equal in length.

The sixth *peræonal* segment is longer than the fifth, the seventh is more than half as long as the sixth.

The metacarpus of the first pair of *peræopoda* is shorter than the carpus; the dactylus is about half as long as the metacarpus. The

1) By the rostrum or the rostral portion of the head is here always meant the part situated between the point of fixation of the first pair of antennæ and the apex of the head.

carpus of the second pair is about twice as long as it is broad at the lower end; the free part of the under margin is quite half as long as the hind margin of the metacarpus; the lower hind corner is angular; the dactylus is about half as long as the metacarpus. The fifth pair are a little longer than the whole peræon; the femur is more than twice as long as broad, as long as the three following joints together, and about twice as long as the metacarpus. The femur of the sixth pair is ovate, nearly twice as long as broad, and about as long as the three following joints together; the carpus is more than half as long as the tibia, and only a little shorter than the metacarpus. The seventh pair reach to the under margin of the genu of the sixth pair.

The first two *pleonal* segments together are shorter than the last five peræonal segments together. The lateral parts of all the pleonal segments are rounded below and behind.

The first segment of the *urus* is shorter than the last coalesced, which is shorter than the telson.

The rami of the first and second pairs of *uropoda* are elongate-ovate; the inner ramus of the third pair is falci-form, and the outer narrowly elongate.

COLOUR. Faintly red, almost hyaline, with black or very deep red spots all over.

LENGTH. My largest specimen measured 7 mm, the smallest 5 mm, all were males; CLAUS gives 7 mm for his specimens.

HAB. CLAUS records the animal from Zanzibar, and from the Pacific; I have taken it in the Bay of Panamá in 1882.

2. **Simorhynchotus Stebbingi,** n. sp.

The name is given in honour of the Rev. THOMAS R. R. STEBBING.

Diagn. The *head*, with the rostral prolongation, is a little longer than the first five peræonal segments together. The rostral part is somewhat narrowed, and rounded at the apex.

The lower front corner of the first flagellar joint of the first pair of *antennæ* in the male is produced into a process, which is less than half as long as the breadth of the joint.

The *peræon* is scarcely longer than the first two pleonal segments together.

The femur of the first and second pairs of *peræopoda* is much longer than all the following joints together. The femur of the seventh pair is about as long as three-fourths of that of the sixth, and is as broad as the femur of the fifth pair.

The peduncle of the first pair of *uropoda* is shorter than the inner ramus, but a little longer than the outer. The outer ramus of the second pair is much shorter than the peduncle. The outer ramus of the last pair is more than half as long as the inner, and styliform.

The *telson* is as long as broad, and acute at the apex.

Syn. **Simorhynchotus antennarius,** TH. STEBBING. **39,** p. 1572.

As *Simorhynchotus antennarius*, STEBBING, is, in my opinion, specifically distinct from *S. antennarius*, CLAUS, I have proposed here a new name for the former. I have done so without any hesitation because I have myself taken and examined specimens of both, and I have thus been able to complete in respect to some minor details the description given by STEBBING from a single and somewhat damaged specimen.

The upper surface of the *head* is somewhat deeper than the dorsal line of the peræon. Seen from below the under side of the rostral portion is strongly concave, and much narrower than a third of the head.

The lower hind corner of the first flagellar joint of the first pair of *antennæ* is produced downwards, but does not reach to the under margin of the second flagellar joint. The third flagellar joint is much shorter than the second; the fourth joint is fully as long as the two preceding together.

The fifth *peræonal* segment is longer than the sixth; the seventh is as long as the sixth.

The metacarpus of the first pair of *peræopoda* is shorter than the carpus; the dactylus is a third part as long as the metacarpus. The carpus of the second pair is not twice as long as it is broad at the lower end; the free part of the under margin is more than half as long as the hind margin of the metacarpus; the lower hind corner is angular; the dactylus is a third part as long as the metacarpus. The fifth pair are as long as the peræon and the first two pleonal segments together; the femur is twice as long as broad, much shorter than the three following joints together, and only a little longer than the metacarpus. The femur of the sixth pair is a third part longer than broad, irregularly pear-shaped,

and nearly as long as the three following joints together; the carpus is not half as long as the tibia, and much shorter than half the metacarpus. The seventh pair reach to the apex of the femur of the sixth pair.

The first two *pleonal* segments together are almost as long as the whole peræon. The lateral parts of all the segments are rounded below and obtuse behind.

The first segment of the *urus* is as long as the last coalesced, which is considerably shorter than the telson.

The outer ramus of the first pair is narrow, falci-form, the inner is elongate and sharp-pointed. The rami of the second pair are narrowly elongate and sharp-pointed, the inner ramus being more than twice as long and broad as the outer. The inner ramus of the third pair is constricted in the middle, the upper half is ovate, and the lower half narrow, linear, and truncated at the apex.

COLOUR. Greyish white, whitout spots, the eyes deep red.
LENGTH. 4—6 mm.
HAB. The »Challenger» specimen was taken in the Atlantic, off the coast of Africa, at Lat. 11° 5' N. and Long. 18° 15 W. (STEBBING). I have taken several specimens in the tropical region of the Atlantic, from Long. 20° to 65° W.

3. **Simorhynchotus Lilljeborgi,** C. BOVALLIUS, 1887.

Pl. I fig. 1—7; and p. 26, fig. **25**; p. 27, fig. **28**; p. 28, fig. **34**; p. 32, fig. **50**; p. 36, fig. **67**; p. 37, fig. **70**; and p. 39, p. **76**.

The name is given in honour of Prof. W. LILLJEBORG.

Digan. The *head* is scarcely produced, is rounded, and longer than the first three peræonal segments together.

The lower front corner of the first flagellar joint of the first pair of *antennæ* in the male is produced into a short process, which is less than half as long as the breadth of the joint.

The *peræon* is much longer than the pleon.

The femur of the first and second pairs of *peræopoda* is quite as long as all the following joints together. The femur of the seventh pair is nearly as long as that of the sixth, and is somewhat narrower than the femur of the fifth pair.

The peduncle of the first pair of *uropoda* is much shorter than the inner ramus, and also shorter than the outer. The outer

ramus of the second pair is longer than the peduncle. The outer ramus of the last pair is fully three-fourths as long as the inner.

The *telson* is longer than broad, and rounded at the apex.

Syn. **1887. Simorhynchotus Lilljeborgi,** C. BOVALLIUS. **35,** p. 34.

This species is remarkable for the globular, not produced head, and is besides easily distinguished from its congeners by the characteristics recorded above with respect to the uropoda and the telson.

The upper surface of the *head* rises a little above the dorsal line of the peræon.

The lower hind corner of the first flagellar joint of the first pair of *antennæ* is produced downwards, and reaches a little beyond the under margin of the second flagellar joint. The third flagellar joint is longer than the second; the fourth is still longer, but much shorter than the two preceding joints together.

The fifth *peræonal* segment is as long as the sixth; the seventh is as long as the sixth.

The metacarpus of the first pair of peræopoda (p. 32, fig. 50; Pl. I fig. 4—7) is as long as the carpus; the dactylus is nearly a third as long as the metacarpus. The carpus of the second pair is a third longer than it is broad at the lower end; the free part of the under margin is more than half as long as the hind margin of the metacarpus; the lower hind corner is obtusely rounded; the dactylus is about a third as long as the metacarpus. The fifth pair are as long as the peræon and the first pleonal segments together; the femur is about twice as long as broad, much shorter than the three following joints together, and almost as long as the metacarpus. The femur of the sixth pair is scarcely longer than broad, is almost circular, and much shorter than the three following joints together; the carpus is longer than two-thirds of the tibia, and more than half as long as the metacarpus. The seventh pair reach beyond the middle of the tibia of the sixth pair.

The first two *pleonal* segments together are shorter than the last four peræonal segments together. The lateral parts of all the segments are slightly rounded below, and that of the last is angular behind.

The first segment of the *urus* is somewhat longer than the last coalesced, which is about as long as the telson.

The rami of the first pair of *uropoda* (p. 39, fig. 76) are elongate-lanceolate. The outer ramus of the second pair is narrowly elongate; the inner is broadly lanceolate, and more than twice as broad as, but only a little longer than, the outer. The inner ramus of the third pair is falciform, sharp-pointed.

COLOUR. Light red, without spots.
LENGTH. 5—6 mm.
HAB. The tropical region of the Atlantic.

Gen. 2. Oxycephalus, H. MILNE EDWARDS, 1830.

Diagn. The *head* is elongated, and produced into a moderately long rostrum, which is more or less sharp-pointed, and is open on the under side. The hind part of the head is only feebly constricted.
The second pair of *antennæ* are, when folded, hidden under the head.
The first two pairs of *peræopoda* are cheliform. The carpus and metacarpus of the fifth pair are not dilated.
The last coalesced *ural* segment is about twice as long as the first, but is not twice as long as broad.
The inner rami of the last two pairs of *uropoda* are coalesced with the corresponding peduncles.
The *telson* is broad and triangular, with the sides more or less curved.

Syn.

1830. Oxycephalus,	H. MILNE EDWARDS.			**1,** p. 396.
»	»	H. MILNE EDWARDS.	1840.	**7,** p. 99.
»	»	C. SPENCE BATE.	1862.	**20,** p. 342.
»	»	C. CLAUS.	1879.	**27,** p. 190 (44).
»	»	C. BOVALLIUS.	1887.	**35,** p. 35.
»	»	C. CLAUS.	1887.	**36,** p. 68.
»	»	TH. STEBBING.	1888.	**39,** p. 1576.
1832. Orio,	A. COCCO.			**2,** p. 13.
1850. Ornithoramphus,	G. NATALE.			**12.** p. 87.
1864. Natalius,	A. COSTA.			**21,** p. 87.

Instead of tracing the history of the genus and the various species assigned to it, the most important facts of which are briefly given above in the historical introduction, I only give here a list of all the species adding to them the names which I believe to be their true names, that is to say those under which they are recorded in this treatise.

1830 *Oxycephalus piscatoris*, H. MILNE EDWARDS, = Oxycephalus piscator.
1836 *O. oceanicus*, F. G. GUÉRIN-MÉNEVILLE, = Oxycephalus piscator.
1840 *O. armatus*, H. MILNE EDWARDS, = Xiphocephalus armatus.
» *O. piscator*, » = Oxycephalus piscator.
1862 *O. tuberculatus*, C. SPENCE BATE, = Oxycephalus tuberculatus.
» *O. oceanus*, (GUÉRIN) C. SPENCE BATE, = Oxycephalus piscator.
1871 *O. tenuirostris*, C. CLAUS, = Leptocotis tenuirostris.
1878 *O. tuberculatus*, (SP. BATE) TH. STREETS, = Oxycephalus Clausi.
» *O. bulbosus*, TH. STREETS, = Oxycephalus piscator.
» *O. scleroticus*, » = Stebbingella sclerotica.
1879 *O. piscator*, (M. EDW.) C. CLAUS, = Oxycephalus Clausi.
» *O. similis*, C. CLAUS, = Oxycephalus piscator.
» *O. latirostris*, » = Oxycephalus latirostris.
» *O. porcellus*, » = Streetsia porcellus.
» *O. longiceps*, » = Streetsia longiceps.
» *O. typhoides*, » = Stebbingella typhoïdes.
1884 *O. Edwardsii*, GEO. THOMSON, = Oxycephalus piscator.
1887 *O. Clausi*, C. BOVALLIUS, = Oxycephalus Clausi.
» *O. pectinatus*, » = Oxycephalus pectinatus.
» *O. pronoïdes*, » = Streetsia pronoïdes.
» *O. Steentrupi*, » = Streetsia Steenstrupi.

1832 *Orio ornithoramphus*, A. COCCO, = Oxycephalus latirostris?
1850 *Ornithoramphus Coccoi*, G. NATALE, = Oxycephalus latirostris?
1864 *Natalius candidissimus*, A. COSTA, = Oxycephalus piscator?

As I have said above I am not able to pronounce with certainty as to the identity of the three last forms owing to the bad, originally given, descriptions, but, judging from the form of the first two pairs of peræopoda and the urus, I feel pretty sure that they belong to the genus Oxycephalus. The only way to fix their identity would be to make a careful examination of the Mediterranean Oxycephali at the very places where they are to be found.

The limits which I have here assigned to the genus Oxycephalus thus include only five of the above enumerated species, which may be distinguished by the following synoptical table:

A. The hind margin of the metacarpus of the first and second pairs of peræopoda is strongly serrated.

a 1. The lateral parts of the pleonal segments are smooth on the under margin. The lower front corner of the carpus of the second pair of peræopoda is not protruding. 1. **O. piscator.**

a 2. The lateral parts of the pleonal segments are armed with a strongly projecting tooth on the under margin. The lower front corner of the carpus of the second pair of peræopoda is strongly protruding, forming a broad heel in front of the base of the metacarpus. 2. **O. Clausi.**

B. The hind margin of the metacarpus of the first and second pairs of peræopoda is smooth. 3. **O. tuberculatus.**

C. The hind margin of the metacarpus of the first and second pairs of peræopoda is pectinated.

c 1. The seventh pair of peræopoda are scarcely more than half as long as the sixth pair. The telson is more than half as long as the last ural segment, and is longer than the last pair of uropoda. 4. **O. pectinatus.**

c 2. The seventh pair of peræopoda are nearly as long as the sixth pair. The telson is half as long as the last ural segment, and is shorter than the last pair of uropoda. 5. **O. latirostris.**

1. **Oxycephalus piscator,** H. MILNE EDWARDS, 1830.

Pl. I, fig. 8—16; and p. 28, fig. **33**, **35**, and **36**; p. 29, fig. **37**, **41**, and **42**; p. 36, fig. **66**; p. 37, fig. **68** and **69**; p. 39, fig. **75**.

Diagn. The *body* is compressed, and not tuberculate. The segments of the *peræon* are smooth, not angulated or tuberculated.

The *head* is shorter than the peræon, with a short rostrum which is abruptly narrowed near to the apex in the male, but evenly tapering in the female. The hind part of the head is about twice as long as the rostrum, and is somewhat depressed in the male, but inflated and globular in the female.

The front margin of the carpal process of the first and second pairs of *peræopoda* is longer than the hind margin of the metacarpus, which is serrated, and bordered with strong bristles; the lower front corner of the carpus is a little protruding in the first pair but not at all in the second. The fifth pair are much longer than the sixth. The femur of the sixth pair is irregularly pear-shaped, only a little broader than that of the fifth, and somewhat longer than that of the seventh pair which is shorter than all the following joints together.

The lateral parts of the *pleonl* segments are rounded in front and below, and the under margins are not produced into tooth-like projections; the hind corners are angulated, and sharp-pointed, but not produced.

The last coalesced *ural* segment is much longer than the telson, but not twice as long.

The peduncle of the first and second pairs of *uropoda* is longer than the inner ramus; the peduncle of the third pair is a little shorter than the inner ramus. The outer rami are somewhat shorter than the inner.

The *telson* is tongue-shaped, with the apex sharp-pointed and the margins serrated; it is somewhat shorter than the last pair of uropoda.

Syn.	**1830.**	**Oxycephalus piscatoris,**	H. MILNE EDWARDS.		**1,** p. 396.
	»	**piscator,**	»	1840.	**7,** p. 100, pl. 30, fig. 10.
	»	»	» SPENCE BATE.	1862.	**20,** p. 342, pl. 54, fig. 3.
	»	»	» C. BOVALLIUS.	1887.	**35,** p. 35.
	1836.	» **oceanicus,**	F. E. GUÉRIN-MÉNEVILLE.		**4,** p. 10, pl. 18, fig. 2.
	1878?	» **bulbosus,**	TH. STREETS.		**26,** p. 280, pl. 2, fig. 2.
	1879.	» **similis,**	C. CLAUS.		**27,** p. 193(47).
	»	»	»	1887.	**36,** p. 71, pl. 23, fig. 9.
	1884.	» **Edwardsii,**	G. W. THOMSON.		**31,** p. 238, pl. 12, fig. 14-21, and pl. 12, fig. 1.

The animal, described and figured below is, in my opinion, the true Oxycephalus piscator of H. MILNE EDWARDS; a comparison of the original diagnosis with the following description and drawings will show that all the characteristics given by H. MILNE EDWARDS agree with those of this animal. I am also pretty sure that the *Oxycephalus similis*, CLAUS, is identical with this species, the more so as I have examined many specimens taken at the very same locality, Messina, by my friends Professor HJALMAR THÉEL and D:r A. APPELÖF. And again I am convinced that *Oxycephalus Edwardsii*, G. W. THOMSON, is nothing but the young male of O. piscator. Whether *O. bulbosus*, TH. STREETS, is an

independent species, or identical with O. piscator, is a question, which I am not yet able to answer definitively, but I am much inclined to think that the two are identical, as practically there are no differences to be found in the description of STREETS.

The *head* is somewhat longer and more depressed in the male than in the female, in which the ocular region is tumid and rises considerably above the dorsal line of the peræon, a feature which seems to occur, in a smaller or higher degree, in all the female forms in the family, and which may thus be looked upon as a sexual distinction. In the male the head is as long as the six first peræonal segments together, in the female as long as the first five. The rostrum is scarcely half as long as the rest of the head.

The first pair of *antennæ* in the male are comparatively slender; the first joint of the flagellum is about four times as long as it is broad at the apex; the three following joints together are longer than the breadth of the first flagellar joint.

The *peræon* shows a very feeble median keel dorsally, and an almost evanescent lateral ridge on each side in the fully adult animal, in the younger state the peræon is perfectly smooth.

The *epimerals* are long and deep, fully a third part as deep as the height of the peræon.

The first pair of *peræopoda* (Pl. I, fig. 11) are much shorter. than the second; the lower front corner of the carpus is a little protruding, but does not form a distinct heel as in the following species; the carpal process is irregularly serrated, with broad teeth, and bordered by very long, stout bristles; it is somewhat longer than the hind margin of the metacarpus, which forms a thin serrated edge, with short triangular teeth (Pl. I, fig. 12); against the rounded lower corner of this edge the dactylus impinges, so that the first pair really have a complexely cheliform hand (see above, p. 33). The second pair (Pl. I, fig. 13) have a very long cheliform hand, the carpus, without the process, being half as long again as the metacarpus; the front margin of the carpus runs in a line with that of the metacarpus, the lower corner not protruding at all; the carpal process is serrated, bordered with a few short bristles, and is considerably longer than the hind margin of the metacarpus, but does not reach to the apex of the dactylus. The third and fourth pairs are equal in length and slender; along the hind margin of the tibia and carpus there are some short spines. The fifth pair are the longest; the femur is almost ovate, and as long as the three following

joints together. The femur of the sixth pair is irregularly pear-shaped, a fifth part longer than broad, only a little broader than the femur of the fifth pair, and shorter than the four following joints together; the front margin of the tibia is fringed with a row of spines, one longer one and one very short one alternating; the front margin of the carpus has a similar row of spines, one longer one and two very short ones alternating; the front margin of the dactylus is sparingly serrated. The seventh pair (Pl, I, fig. 14), reach to the middle of the carpus of the sixth; the femur is pear-shaped, and somewhat shorter than all the following joints together; the metacarpus is a little longer than the carpus, but shorter than the tibia.

The under margins of the *pleonal* segments are more or less rounded, sometimes uneven, but not produced into tooth-like projections as in *Oxycephalus Clausi.*

The last coalesced *ural* segment is a little more than a third part longer than broad.

The first pair of *uropoda* (p. 39, fig. 75) reach to the apex of the last, and to the apex of the telson; the peduncle is a little longer than the inner ramus, which is a little longer than the outer; both rami are strongly serrated. The second pair reach a little beyond the apex of the peduncle of the first pair, and very little beyond the base of the last pair; the peduncle is somewhat longer than the inner ramus, and twice as long as the outer. The third pair reach scarcely beyond the apex of the telson; the peduncle is as long as the inner ramus, which is a trifle longer than the outer.

The *telson* is only about a sixth part longer than broad, and triangular, the margins being very convex, and serrated.

COLOUR. Yellowish.
LENGTH. 14—20 mm.
HAB. The temperate, subtropical, and tropical regions of the Atlantic; the Mediterranean; the Indian Ocean the subtropical and tropical regions of the Pacific.

2. **Oxycephalus Clausi,** C. BOVALLIUS, 1887.

The name is given in honour of Professor C. CLAUS.

Pl. I, fig. 19—24; Pl. II, fig. 1; and p. 21, fig. **4**; p. 22, fig. **7** and **8**; p. 25, fig. **22**; p. 33, fig. **54**; p. 36, fig. **65**.

Diagn. The *body* is somewhat compressed, the segments of the peræon are scutellated, separated from each others by deep furrows.

The *head* is shorter than the peræon, with a moderately long rostrum, which in the male is abruptly narrowed near the apex, but in the female tapers evenly, and has the apex rounded. The hind part of the head is a little longer than the rostrum.

The front margin of the carpal process of the first two pairs of *peræopoda* is longer than the hind margin of the metacarpus, which is serrated and bordered with strong bristles; the lower front corner of the carpus protrudes a little in the first pair and much in the second, forming a broad heel in front of the metacarpus. The fifth pair are much longer than the sixth. The femur of the sixth pair is almost circular, much broader than that of the fifth, and about as long as that of the seventh pair, which is itself longer than all the following joints together.

The lateral parts of the *pleonal* segments are rounded in front; at the middle of the under margin of each projects a strong, tooth-like process, and the hind corner is produced and sharp-pointed.

The last coalesced *ural* segment is only a little longer than the telson.

The *telson* reaches beyond the apex of the last pair of uropoda.

Syn.

1878.	**Oxycephalus tuberculatus,**	[SPENCE BATE]	TH. STREETS.		**26,** p 278, pl. 2, fig. 1.
1879.	»	**piscator,**	[H. MILNE EDWARDS]	C. CLAUS.	**27,** p. 190 (44).
»	»	»	»	1887.	**36,** p. 69, pl. 22, fig. 1-9, and pl. 23, fig 1-8.
1887.	»	**Clausi,**	C. BOVALLIUS.		**35,** p. 35.
»	»	»	TH. STEBBING.	1888.	**39,** p. 1566, pl. 201.

The species is at once distinguished from its congeners by the raised, almost prismatic dorsal sections of the peræonal segments, by the strongly protruding heel of the carpus of the second pair of peræopoda, by the almost circular femur of the sixth pair, and by the tooth-like, sharp-pointed projections on the under margins of the pleonal segments.

The *head* (p. 22, fig. 7 and 8) is longer in the male than in the female, especially the hind part of it. On the upper side the median line forms a distinct keel, ending in the apex, which is feebly bent downwards. The under margins of the rostrum are serrated. In the male the head is as long as the first six peræonal segments together, in the female as long as the first four.

The first pair of *antennæ* are like those in the preceding species, but the last three joints of the flagellum are not longer than the breadth of the first flagellar joint; the second is quite as long as the third, but much thicker.

The first pair of *peræopoda* (Pl. I, fig. 21) have the carpus very broad, with the lower front corner forming a broad angular heel at the base of the metacarpus; the carpal process is like that in the preceding species, but more strongly serrated and shorter than the hind margin of the metacarpus; the hind margin forms a thin, strongly serrated edge, the lower corner of which is angular. The second pair (p. 33, fig. 54) are much longer and stouter than the first pair; the carpus, without the process, is only a fourth part longer than the metacarpus; the lower front corner forms a broader heel than in the first pair; the carpal process is bluntly serrated, and reaches almost to the apex of the dactylus. The femur of the fifth pair is ovate, coarsely serrated on the front margin, and considerably shorter than the three following joints together. The sixth pair (Pl. I, fig. 23) are much shorter than the fifth; the femur is very broad, almost circular, serrated along the margins, and fully a third part broader than that of the fifth pair; the carpus is a little more than half as long as the tibia, with a row of longer and shorter spines along the front margin, one long one and four short ones alternating; the dactylus is serrated on the front margin. The seventh pair (Pl. I, fig. 24) reach fully to the apex of the carpus of the sixth pair; the femur is about as long as that of the preceding pair, and a little more than half as broad; it is longer than all the following joints together.

The *pleon* in the male is as long as the last six peræonal segments together; in the female it is as long as the last five. The lateral

part of each segment is convex in front of the projecting tooth, and concave behind it, the hind corner is produced, and sharp-pointed.

The last coalesced *ural* segment is about a fourth part longer than broad.

The first pair of *uropoda* (Pl. II, fig. 1) reach fully to the apex of the last pair, but not to the apex of the telson; the peduncle is serrated on both margins, and is a little longer than the inner ramus, which is somewhat longer than the outer, both being serrated. The second pair reach to the middle of the inner ramus of the first pair, and to the apex of the peduncle of the last pair; the peduncle is quite as long as the inner ramus, which is about a third part longer than, and more than twice as broad as, the outer. The third pair are very broad, and shorter than the telson; the peduncle is shorter than the inner ramus, which is twice as broad as, and a little longer than, the outer.

The *telson* is more than a third part longer than broad, triangular, and is serrated along the margins.

COLOUR. Light brownish to yellowish green.
LENGTH. 20—35 mm.
HAB. In all the seas of the subtropical and tropical regions.

3. **Oxycephalus tuberculatus,** SPENCE BATE, 1862.

Pl. II, fig. 2 and 3.

Diagn. The *body* is compressed, the segments of the peræon are tuberculate.

The *head* is shorter than the peræon, and has a long rostrum. The hind part of the head is shorter than the rostrum.

The front margin of the carpal process of the first two pairs of *peræopoda* is nearly as long as the hind margin of the metacarpus, which is smooth, and provided with a few bristles; the lower front corner of the carpus protrudes, forming a heel in front of the metacarpus. The fifth pair are about as long as the sixth. The femur of the sixth pair is broadly ovate, a little broader than that of the fifth pair, and more than twice as long as that of the seventh, which itself is more than twice as long as all the following joints together.

The lateral parts of the *pleonal* segments are rounded in front, below, and behind, and the under margins are without tooth-like projections.

The last coalesced *ural* segment is somewhat shorter than the telson (?).

The *telson* reaches beyond the apex of the last pair of uropoda.

Syn. **1862. Oxycephalus tuberculatus,** SPENCE BATE. **20,** p. 343 pl. 54, fig. 5.
» » » TH. STREETS. 1877. **24,** p. 136.
» » » C. BOVALLIUS. 1887. **35,** p. 36.

In addition to the characteristics quoted in the diagnosis, and which are taken from the description of SPENCE BATE, and with respect to a few particulars from STREETS work of 1877, I cite here some more details from the same authors:

SPENCE BATE says (l. c. p. 343).

»Antepenultimate pair of pleopoda having the rami short, serrated; penultimate not so long as the preceding, having the margins of the rami smooth; ultimate not reaching to the extremity of the telson, rami having the margins serrated. Telson acutely triangular, margins serrated.»

STREETS says(l. c. p. 136).

»Head not quite as long as the first five segments of the thorax, broad, inferior margin broadly convex; rostrum more than half the length of the head, triangular, acute; eyes large, covering the whole of the lateral surfaces of the head. — — — The first pair of gnathopoda shorter than the second, but similar to them in other respects; carpus produced anteriorly nearly to the apex of the propodos, margins furnished with a few long setæ, not serrated; propodos subovate; dactylus nearly half as long as the propodos. The flexible margins of the following thoracic feet furnished with a few setæ, or hairs».

COLOUR. ?

LENGTH. 10 mm. ($^{8}/_{20}$ ths of an inch, SPENCE BATE, and 0.40 of an inch, STREETS).

HAB. Cape of Good Hope, (SPENCE BATE); The North Pacific Ocean, Lat. 5° N, Long. 128° W, (STREETS).

4. **Oxycephalus pectinatus,** C. BOVALLIUS, 1887.

Pl. II, fig. 4—6; and p. 25, fig. 19 and 21; and p. 27, fig. 29.

Diagn. The *body* is scarcely compressed, the peræonal segments are smooth.

The *head* is about as long as the peræon, and has a short rostrum. The hind part of the head is more than twice as long as the rostrum.

The front margin of the carpal process of the first pair of *peræopoda* is as long as, that of the second pair longer than, the hind margin of the metacarpus, which is strongly pectinated, with long teeth, and a few long bordering bristles; the lower front corner of the carpus does not protrude. The fifth pair are longer than the sixth. The femur of the sixth pair is pear-shaped, considerably broader than that of the fifth, and only a little longer than that of the seventh pair, which is itself about as long as all the following joints together.

The lateral parts of the first two *pleonal* segments are straight in front and below, while that of the third segment is rounded; the under margins without tooth-like projections. The hind corner of the first segment is rounded, that of the second angular, and that of the third produced, and sharp-pointed.

The last coalesced *ural* segment is much longer than the telson, but not twice as long.

The *telson* reaches to the apex of the last pair of uropoda.

Syn. **1887. Oxycephalus pectinatus,** C. BOVALLIUS. **35,** p. 36.

Oxycephalus pectinatus is most closely allied to *O. latirostris*, but differs in the length of the head, in the armature of the first two pairs of peræopoda, in the comparatively short seventh pair, and in the telson being more than half as long as the last ural segment.

The *head* (Pl. II, fig. 4) in the male is a little longer than all the peræonal segments together, in the female a little shorter. The rostrum is scarcely more than a third part as long as the rest of the head.

The first pair of *antennæ* (p. 25, fig. 19 and 21) in the male are comparatively robust; the first joint of the flagellum is three times as

long as it is broad at the apex, the three following joints together are a little longer than the breadth of the first flagellar joint. The second pair (p. 27, fig. 29) are longer and more robust than in *Oxycephalus piscator*, or in *O. Clausi.*

The *peræon* is entirely smooth, and the *epimerals* are less deep than in *O. piscator*, scarcely equalling a fourth part of the height of the peræon.

The first pair of *peræopoda* (Pl. II, fig. 5) are shorter than the second; the front margin of the carpus runs in a line with that of the metacarpus; the carpal process is about as long as the stem of the joint, and is armed along its front margin with closely set, long, spine-like teeth, which give a combe-like appearance to the whole; the apex of the process forms a strong, sharp tooth. The metacarpus is stout, and somewhat longer than the stem of the carpus; its hind margin does not form an edge as in *Oxycephalus piscator;* it is as long, and armed in the same way, as the front margin of the carpal process, but the spine-like teeth are a little shorter. The dactylus is about a third part as long as the metacarpus, and has a tooth at the middle of the hind margin. The second pair (Pl. II, fig. 6) have the cheliform hand comparatively much shorter than in *Oxycephalus piscator* or in *O. latirostris*, the carpus, without the process, being scarcely longer than the meta-carpus; the front margin runs in a line with the front margin of the metacarpus; the carpal process is longer than the rest of the joint; its front side is armed as in the first pair, but the teeth composing the pectination are much longer; the hind margin of the metacarpus, which is considerably shorter than the carpal process, has exactly the same pectination, and is bordered by four or five long bristles. The dactylus is like that in the first pair. The fifth pair are the longest; the femur is elongate, having the front margin straight and the hind convex; it is more than twice as long as broad, and shorter than the three following joints together. The femur of the sixth pair is a third part longer than broad, and much shorter than the four following joints together, and has the margins smooth; the front margins of the tibia and carpus are armed as in *Oxycephalus piscator;* the front margin of the metacarpus has a similar armature, but with a varying number of short spines between the single long spines; the dactylus is strongly pectinated. The seventh pair reach scarcely to the apex of the tibia of the sixth pair; the upper hind portion of the femur is considerably dilated and forms an obtuse angle; the metacarpus is as long as the carpus, and a trifle shorter than the tibia.

The *pleon* is about as long as the whole peræon. The under margins of the first two segments are straight, that of the third convex, and all are without tooth-like projections.

The last coalesced *ural* segment is about a fourth part longer than broad.

The first pair of *uropoda* reach to the apex of the last pair, and almost to the apex of the telson; the peduncle is considerably longer than the inner ramus, which is as long as the outer, and both are strongly serrated. The second pair do not fully reach to the apex of the last pair; the peduncle is a little longer than the inner ramus, which is a little longer than, and more than twice as broad as, the outer; both are serrated. The third pair are a trifle shorter than the telson; the peduncle is shorter than the rami, which are equal in length, and serrated.

The *telson* is about a third part longer than broad, triangular, the margins being convex and smooth.

COLOUR. Almost hyaline, the ocular pigment dark brown.
LENGTH. 10—16 mm.
HAB. The tropical region of the Atlantic.

5. **Oxycephalus latirostris,** C. CLAUS, 1879.

Pl. II, fig. 7—12; and p. 42, fig. **84**.

Diagn. The *body* is compressed, the peræonal segments are smooth.

The *head* is a little shorter than the peræon, and has a short rostrum. The hind part of the head is more than three times as long as the rostrum.

The front margin of the carpal process of the first two pairs of *peræopoda* is longer than the hind margin of the metacarpus, which is pectinated, with comparatively short teeth and a few bordering bristles; the lower front corner of the carpus is not protruding. The fifth pair are much longer than the sixth. The femur of the sixth pair is narrowly pear-shaped, a little broader than that of the fifth, and quite as long as that of the seventh pair, which is itself shorter than all the following joints together.

The lateral parts of the *pleonal* segments are feebly rounded in front, and almost straight below, the under margins being without tooth-like projections; the hind corner of each is angular.

The last coalesced *ural* segment is about twice as long as the telson.

The *telson* is much shorter than the last pair of uropoda.

Syn. **1879. Oxycephalus latirostris,** C. CLAUS. **27,** p. 193(47).
» » » 1887. **36,** p. 71, pl. 24, fig. 1.
» » » C. BOVALLIUS. 1887. **35,** p. 36.

Oxycephalus latirostris agrees in some characteristics with *O. piscator*, as for instance in the length and general form of the cheliform hand in the second pair of peræopoda, and in the form of the urus and its appendages, but the distinguishing characteristics are many. From *O. pectinatus* it is, as I have already said (p. 62), easily distinguished.

The *head* is a little longer than the first six peræonal segments together. The rostrum is less than a third part of the length of the rest of the head.

The *peræon* shows a slight transversal depression on the dorsal side of each segment.

The first pair of *peræopoda* (Pl. II, fig. 9) are shorter than the second; the lower front corner protrudes a little in front of the base of the metacarpus; the carpal process is much shorter than the stem of the joint, but longer than the hind margin of the metacarpus, and is serrated along the front margin, with strong, equal, rounded teeth; it is also serrated along the hind margin. The metacarpus is considerably shorter than the stem of the carpus, and serrated like the carpal process. The dactylus is shorter than a fourth part of the metacarpus, and has a blunt tooth at the hind margin. The second pair (Pl. II, fig. 10) have the cheliform hand much longer than the first, the carpus, without the process, being half as long again as the metacarpus; the hind margin of the carpus and of the process is set with short slender bristles; the carpal process is serrated along the front margin as in the first pair, and reaches almost to the apex of the dactylus. The metacarpus and dactylus are like those in the first pair. The fifth pair are the longest; the femur is elongate-ovate, more than twice as long as broad, and shorter than the three following joints together. The femur of the sixth pair (Pl. II, fig. 11) is narrowly pear-shaped, with the margins smooth, twice

as long as broad, and as long as the three following joints together; the tibia has a row of spines along the front margin, two very short spines and one long one alternating; the front margin of the carpus is armed in the same way, with three short ones and one long one alternating; the serration of the front margin of the metacarpus is more irregular; the dactylus is serrated. The seventh pair reach beyond the apex of the carpus of the sixth pair; the femur is narrow, elongated, and as long as the femur of the sixth pair; the front margin is concave; the metacarpus is somewhat longer than the three preceding joints together.

The *pleon* is about as long as the last six peræonal segments together.

The last coalesced *ural* segment is nearly twice as long as broad.

The first pair of *uropoda* (Pl. II, fig. 12) reach to the apex of the last pair, and beyond the apex of the telson; the peduncle is a little longer than the inner ramus, which is considerably longer than the outer; both are serrated. The second pair reach beyond the apex of the peduncle of the last pair; the peduncle is longer than the inner ramus, which is longer and broader than the outer; both are serrated. The third pair are considerably longer than the telson; the peduncle is shorter than the rami, which are equal in length, and serrated.

The *telson* is about a third part longer than broad, triangular, with the margins very convex, and smooth.

COLOUR. White as ivory.
LENGTH. 16—22 mm.
HAB. The subtropical region of the Atlantic; the Indian Ocean.

Gen. 3. **Tullbergella,** C. BOVALLIUS, 1887.

The name is given in honour of Professor TYCHO TULLBERG of Upsala.

Diagn. The *head* is short and broad, produced into a short, broad sharp-pointed rostrum, which is open on the under side. The hind part of the head is feebly constricted.

The *second* pair of *antennæ* are hidden under the head and the peræon, when folded.

The first two pairs of *peræopoda* are subcheliform. The carpus and metacarpus of the fifth pair are not dilated. The seventh pair are incomplete.

The last coalesced *ural* segment is longer than the first, and about as long as it is broad.

The inner ramus of the third pair of *uropoda* is coalesced with the corresponding peduncle.

The *telson* is broad and triangular, with the sides more or less curved.

Syn. **1887. Tullbergella,** C. BOVALLIUS. **35,** p. 38.

Tullbergella is easily distinguished from the other genera of the family by the not compressed, broad, and robust form of body, the short head and rostrum, and the incomplete seventh pair of peræopoda. In the form of the second pair of antennæ it agrees with *Simorhynchotus* and *Cranocephalus*; in the form of the first two pairs of peræopoda it resembles *Cranocephalus* and *Stebbingella*.

Hitherto only one species is known.

1. **Tullbergella cuspidata,** C. BOVALLIUS, 1887.

Pl. II, fig. 13; and p. 20, fig. 1; p. 23, fig. 12; p. 25, fig. 18 and 23; p. 26, fig. 27; p. 29, fig. 40; p. 32, fig. 51; p. 34, fig. 59; p. 35, fig. 61, and p. 38 fig. 74.

Diagn. The *head* is a little longer than the first four peræonal segments together. The rostrum is broad, abruptly narrowed at the apex, and about as long as the hind part of the head, which is much broader than the base of the rostrum.

The free under margin of the carpus of the first two pairs of *peræopoda* is serrated, armed with bristles, and longer than the hind margin of the metacarpus. The lower hind corner of the femur of the sixth pair is produced backwards into a strong, triangular, sharp-pointed process. The femur of the seventh pair is more than half as long as that of the sixth, and more than twice as long as the three following joints together. The epimeral of the fifth pair shows a tuberculous prominence.

The lateral parts of the *pleonal* segments are straight and smooth below; the hind corner of the first two segments is angular, that of the third is strongly produced backwards into a long, triangular, sharp-pointed process, which reaches beyond the hind margin of the first ural segment.

The last coalesced *ural* segment is about as long as the telson. The *telson* is rounded at the apex, and reaches quite to the apex of the last pair of uropoda.

Syn. **1887. Tullbergella cuspidata,** C. BOVALLIUS. **35,** p. 38.

Tullbergella cuspidata is probably the stoutest and most robust of all the Oxycephalids. The integument of the body is thicker and harder than in the other representatives of the family, *Stebbingella Théeli* perhaps excepted. The form of the rostrum shows, as mentioned above, some tendency towards the »wing-like projections» so enormously developed in the genus *Calamorhynchus*.

The *head* (p. 20, fig. 1 and p. 23, fig. 12) is somewhat longer than the first four peræonal segments together, and is scarcely longer in the male than in the female. The ocular region forms on each side a large hemispherical intumescence, which stands out globularly from the surface of the head. The hindest portion of the head shows a feeble constriction, but does not form a neck. The rostrum is very broad at the base, with almost parallel, and somewhat bulging sides for about half its length; the distal half of the rostrum is triangular with the apex sharp-pointed. This shape of rostrum forms a transition from that in *Oxycephalus* to the extremely dilated rostral portion of the head in *Calamorhynchus*.

The *eyes* (p. 23, fig. 12) are separated from one another by a comparatively broad strip at the crown of the head.

The first pair of *antennæ* in the male (p. 25, fig. 18) are very thick and robust; the first joint of the flagellum is scarcely more than a third longer than it is broad at the base; the three following joints together are much shorter than the breadth of the first joint; the second flagellar joint is much thicker than, and about twice as long as, the third; the fourth is slender, and nearly as long as the second. In the female the first pair (fig. 23) are more curved than in the preceding genus; the flagellum consists of three joints; the first is twice as broad at the base as at the apex, and a little shorter than the two following joints together. The second pair in the male (p. 26, fig. 27) have the first joint shorter than half the second, the third a trifle longer than the second, the fourth considerably shorter than the third, and the last or fifth joint very short, scarcely equalling one-twentieth of the length of the fourth. All the joints are closely fringed with short hairs along the under margins.

The *peræonal* segments are somewhat convex transversely; the surface is slightly rugose, being thickly set with small nobs or tubercles (p. 26, fig. 27).

The first pair of *peræopoda* (p. 32, fig. 51) are a little shorter than the second; the femur is linear, and narrow; the carpus is nearly square, somewhat narrowed at the base, and not produced; the under free margin is finely serrated, bordered with short bristles, and is a little longer than the hind margin of the metacarpus, which forms a thin serrated edge, with simple teeth; the dactylus is smooth, and not fully half as long as the metacarpus. The second pair (Pl. II, fig. 13) are similar to the first in shape, but the serration on the hind margin of the metacarpus consists of larger, finely denticulated teeth. The third and fourth pairs are comparatively slender, and much shorter than the fifth pair; the femur is narrow, linear, and not broader than the following joints The fifth pair have the femur fully as broad as that of the sixth, almost ovate, with the lower front corner a little produced; it is consideraby shorter than the three following joints together. The sixth pair (p. 35, fig. 61) are much shorter than the fifth; the lower hind corner of the femur is produced into a broad, triangular, sharp-pointed process, which is a little more than half as long as the breadth of the femur; the femur is about as long as the three following joints together. The seventh pair are incomplete, consisting of only the femur, genu, tibia, and carpus; all the joints are provided with glands; the femur is fully as broad as, and about a third part shorter than, that of the sixth pair; it is more than twice as long as all the following joints together.

The *pleon* is about as long as the last six peræonal segments together. The lateral, sharp-pointed process of the last pleonal segment (p. 38, fig. 74) does not reach fully to the middle of the last coalesced ural segment.

The first *ural* segment is more than half as long as the last coalesced, which is about a fourth part broader than long, and a little longer than the telson.

The first pair of *uropoda* (p. 38, fig. 74) reach fully to the apex of the last pair, and a little beyond the apex of the telson; the peduncle is shorter than the inner ramus, which is a trifle shorter than the outer, both being elongate-lanceolate, sharp-pointed, and serrated. The second pair do not fully reach to the apex of the last pair; the peduncle is shorter than the rami, which are equal in

length, and serrated; the inner ramus is broader than the outer. The third pair reach fully to the apex of the telson; the peduncle is half as long as the inner ramus, which is more than twice as broad as, and a little longer than, the outer.

The *telson* is triangular, with curved margins, and is a little longer than it is broad at the base.

COLOUR. Brownish, with dark red spots.
LENGTH. 9—13 mm.
HAB. The Indian Ocean.

Gen. 4. **Calamorhynchus,** TH. STREETS, 1878.

Diagn. The *head* is long and broad, produced into a long, broadly dilated and sharp-pointed rostrum, which is open on the under side. The hind part of the head is constricted, forming a short neck.

The second pair of *antennæ* are hidden under the head, when folded (?).

The first two pairs of *peræopoda* are subcheliform. The carpus and metacarpus of the fifth pair are not dilated.

The last coalesced *ural* segment is nearly three times as long as the first, and nearly four times as long as it is broad.

The inner ramus of the third pair of *uropoda* is coalesced with the corresponding peduncle.

The *telson* is elongated, and narrowly triangular.

Syn. **1878. Calamorhynchus,** TH. STREETS. **26,** p. 285.
» » TH. STEBBING. 1888. **39,** p. 1599.

This genus is at the first view easily distinguished from all the other genera by the peculiar form of the head, with its wing-like expansions of the rostrum; in this characteristic *Tullbergella* comes nearest to it, but is very different from it in almost all other points.

Beside the typical species, Calamorhynchus pellucidus, described in 1878 by STREETS, another, C. rigidus, is given by STEBBING

in his Report on the »Challenger» Amphipoda. The two species are distinguished from one another by the length of the seventh pair of peræopoda, and by that of the uropoda.

A. The seventh pair of peræopoda are scarcely longer than the femur of the sixth. 1. **C. pellucidus.**

B. The seventh pair of peræopoda are nearly as long as the whole sixth pair. 2. **C. rigidus.**

1. **Calamorhynchus pellucidus,** TH. STREETS, 1878.

Pl. II, fig. 14 and 15.

Diagn. The *head* is much longer than the whole peræon; the rostrum is shorter than the ocular region of the head.

The second pair of *peræopoda* are nearly cheliform, with the front margin of the carpal process as long as the hind margin of the metacarpus. The femur of the last three pairs is lanceolate; the seventh pair are scarcely longer than the femur of the sixth pair.

The first pair of *uropoda* reach to the apex of the second, but de not attain the apex of the last pair, which are a little shorter than the telson.

Syn. **1878. Calamorhynchus pellucidus,** TH. STREETS. **26,** p. 285, pl. 2, fig. 5.

From the original description of STREETS I add the following details:

»Head long, nearly one-third of the total length, its breadth twice that of the thorax; neck short, and slightly narrower than the thorax; the portion containing the eyes oblong, convex above and below when viewed in profile, elevated above, in the median line, into a sharp ridge, which terminates at the apex of the rostrum, below the eyes form two long and rounded lobes separated by a broad, shallow groove; rostrum flattened, posteriorly broader than the eyes, commencing an either side of the eyes in a broad, rounded wing-like expansion, and tapering forward to a long and acute apex. — — — Segments of the thorax subequal. — — — The anterior three abdominal segments subequal, the postero-

inferior angle acute, projecting. The sixth segment long and narrow, slightly longer than the peduncle of the first pair of caudal appendages. — — — Telson narrow, acute at apex.»

COLOUR. Pellucid.
LENGTH. »12 mm.» (STREETS).
HAB. The Pacific, Lat. 28° 6′ N, Long. 140′ 12′ W. One specimen a female (STREETS).

2. **Calamorhynchus rigidus,** TH. STEBBING, 1888.

Diagn. The *head* is much longer than the whole peræon, as long as the peræon and the first two pleonal segments together; the rostrum is fully as long as the ocular region of the head.
The lower hind corner of the carpus of the second pair of *peræopoda* is less produced than in the preceding species. The femur of the last three pairs is more or less pear-shaped; the seventh pair are nearly as long as the whole sixth.
The first pair of *uropoda* reach far beyond the apex of the second, and to the apex of the last pair, which are much shorter than the telson.

Syn. **1888. Calamorhynchus rigidus,** TH. STEBBING. **39,** p. 1600, pl. 206.

Apart from the characteristics recorded in the diagnosis respecting the seventh pair of peræopoda and the relation of the uropoda, the differences between the two species seem to be very small, or at least are not easily appreciated owing to the vague description given by STREETS of his species, and to the want of drawings. The characteristics recorded above are however sufficient for the distinction of the two species.

For particulars on Calamorhynchus rigidus I refer the reader to the original description and drawings given by STEBBING.

COLOUR. ?
LENGTH. 23 mm. (nine-tenths of an inch, STEBBING).
HAB. The South Atlantic. Lat. 37° 45′ S, Long. 33° 0′ W. »One specimen, female, with young in the pouch» (STEBBING).

Gen. 5. **Dorycephalus,** n. g.

Derivatio: *δόρυ* = a spear, and *κέφαλος* = a large-headed fish, see ARISTOTELES.

Diagn. The *head* is long and narrow, produced into a comparatively short, narrow, sharp-pointed rostrum, which is closed on the under side. The hind part of the head is constricted, forming a short, cylindrical neck.

The second pair of *antennæ* are hidden under the head, when folded.

The first two pairs of *peræopoda* are subcheliform, or the second are cheliform. The carpus and metacarpus of the fifth pair are not dilated.

The last coalesced *ural* segment is a little more than twice as long as the first, and somewhat more than three times as long as broad.

The inner ramus of the third pair of *uropoda* is coalesced with the corresponding peduncle.

The *telson* is narrowly triangular.

This new genus closely resembles *Leptocotis* in general form of body, but differs in the comparatively shorter and broader last ural segment and uropoda, and by the inner ramus of the last pair of uropoda being coalesced with the peduncle. The type for the genus is *Leptocotis Lindstroemi*, briefly described by me in 1887 (**35**, p. 38). The new species *Leptocotis ambobus*, proposed by STEBBING in 1888 (**39**, p. 1594) certainly belongs to this genus, and at my first comparison of STEBBING's species with my own I supposed them to be identical, but after a close re-examination of my specimens I must allow that there are some small differences, which can scarcely be explained as individual variations; but on the other hand both are easily distinguished from *Leptocotis tenuirostris*, CLAUS, and *L. spinigera*, STREETS, by the form of the urus and its appendages. Such being the case I record them here as two distinct species.

A. The second pair of peræopoda are subcheliform. The femur of the seventh pair is half as long as that of the sixth.

1. **D. Lindstroemi.**

B. The second pair of peræopoda are cheliform. The femur of the seventh pair is not half as long as that of the sixth.

2. **D. ambobus.**

1. **Dorycephalus Lindstroemi,** C. BOVALLIUS, 1887.

The name is given in honour of Professor GUSTAF LINDSTRÖM of Stockholm.

Pl. II, fig. 16—18; Pl. III, fig, 1; and p. 27, fig. **31**; p. 29, fig. **39** and **44**; p. 33, fig. **56**; p. 38, fig. **73**, and p. 39, fig. **77**.

Diagn. The *head* is about as long as the whole peræon and the first pleonal segment together.

The first pair of *peræopoda* are subcheliform; the under free margin of the carpus is as long as the hind margin of the metacarpus; the lower part of the hind margin of the carpus is provided with seven or eight teeth, some of them double-pointed. The second pair are subcheliform, with the lower hind corner of the carpus a little produced; the carpal process is strongly serrated on the front margin, and provided with three long sharp teeth on the hind margin just above the apex; the front margin of the carpal process is quite as long as the hind margin of the metacarpus. The femur of the seventh pair is fully half as long as that of the sixth, a little longer than broad, and twice as long as all the following joints together.

The lateral parts of the first two *pleonal* segments are angular behind; the hind corner of the third segment is produced into a triangular, sharp-pointed process, reaching beyond the middle of the first ural segment.

The inner ramus of the second pair of *uropoda* is only a trifle longer than the outer; the inner ramus of the third pair is twice as long as the peduncle, and more than twice as long as the outer ramus.

Syn. **1887. Leptocotis Lindstroemi,** C. BOVALLIUS. **35,** p. 38.

If the above diagnosis be compared with that of *Dorycephalus ambobus*, which follows, it at once will be seen that only small and trifling characteristics can be given for the distinction of the two species, and I am much inclined to think that the latter ought to be considered as a Pacific variety of the former. The closer discription of D. Lindstroemi will support the view that the two species are very nearly allied; but as I have myself examined specimens of *D. ambobus*, and as all the characteristics indicated by STEBBING are exactly the same as in my speci-

mens, I have not ventured to unite the two species under one name, though I was at first much disposed to do so.

The *body* is more compressed and slender than in the genus *Oxycephalus*, the thin integument shows, especially on the peræon, small pits and excavations, round, or oblong, or S-shaped, probably occupied by cutaneous glands.

The rostrum is considerably longer than a third part of the length of the whole *head*. The ocular region is more evenly egg-shaped in the female than in the male.

The first pair of *antennæ* in the male have the lower front corner of the first flagellar joint produced into a narrowly conical process, which is as long as the breadth of the joint. The last three flagellar joints together are scarcely as long as a third part of the under margin of the first joint; the second joint is as long as the third, the fourth is a little longer than the first, and is very slender. The second pair in the male have the first three joints almost equal in length; the fourth is a little shorter than the third, but is twenty-four times as long as the fifth or last joint (p. 27, fig. 31).

The first pair of *peræopoda* (p. 33, fig. 56) have the femur nearly as long as the four following joints together; the lower margin of the tibia is finely serrated; the carpus is only a little produced, with the under margin sparingly serrated; the front margin of the metacarpus is strongly convex, the hind margin is straight forming an edge, which is serrated only at the lower corner, with six or seven spine-like teeth; the dactylus is short, curved, with a small tooth on the hind margin, and is a third part as long as the metacarpus. The second pair (Pl. II, fig. 17) have the carpus more produced than in the first pair, but still the carpal process is not half as long as the stem of the joint, and the prehensile organ, formed by the carpus and metacarpus, must be termed a subcheliform hand; the metacarpus is considerably shorter than the stem of the carpus; its hind margin is provided with four shallow notches rather than serrated, and has five or six spine-like teeth at the lower corner. The third and fourth pairs are very slender, the metacarpus of both pairs is a trifle shorter than the tibia. The fifth pair have the femur quite as long as the three following joints together; the apex is outdrawn behind the genu almost to the apex of that joint; the tibia is much longer than the metacarpus, which is twice as long as the dactylus. The sixth pair have the femur fully as long as, and

considerably broader than, that in the preceding pair, and almost as long as the four following joints together; the upper hind corner is much dilated, and the apex is produced behind the genu, forming a broadly rounded process which reaches to the apex of the genu; the tibia is nearly as long as the three following joints together; the front margin is fringed with a row of equal, long, spine-like teeth; the front margin of the metacarpus shows longer and shorter hair-like bristles, not disposed in regular, come-like groups as in *Dorycephalus ambobus;* the dactylus is a third part as long as the metacarpus. The seventh pair (Pl. II, fig. 18) are a fourth part shorter than the femur of the sixth; the carpus is somewhat longer than the metacarpus; the dactylus is not fully half as long as the metacarpus.

The *pleon* in the male is a little shorter than the last six peræonal segments together; in the female it is a little shorter than the last five.

The first pair of *uropoda* (p. 38, fig. 73) reach to the apex of the last pair, but do not attain the apex of the telson; the peduncle is about nine times as long as broad, a little more than twice as long as the outer ramus, and quite as long as the last coalesced ural segment; it is finely pectinated along the inner margin, and coarsely serrated along the lower half of the outer; the outer ramus is elongated, sharp-pointed, more than four times as long as the inner, coarsely serrated along the outer margin, and finely pectinated along the inner; the inner ramus (p. 39, fig. 77) is lanceolate, serrated along both margins. The second pair reach to the middle of the inner ramus of the last pair; the peduncle is about seven times as long as broad, more than twice as long as the inner ramus, and armed on the margins as that of the first pair; both rami are elongated and sharp-pointed; the inner is serrated on both margins, the outer ramus is serrated on the inner margin and smooth on the outer. The third pair do not reach to the apex of the telson; the peduncle is half as long as the inner ramus, which is strongly serrated along the inner margin and almost smooth on the outer; the outer ramus is shorter than the peduncle, almost styliform, serrated on the inner margin and smooth on the outer.

The *telson* is elongate-triangular, sharp-pointed, nearly half as long as the last coalesced ural segment, and about three times as long as it is broad at the base.

COLOUR. White, almost hyaline, sprinkled with red.
LENGTH. 10—13 mm.
HAB. The subtropical region of the Atlantic.

2. **Dorycephalus ambobus,** TH. STEBBING, 1888.

Diagn. The *head* is about as long as the whole peræon and the first two pleonal segments together.

The first pair of *peræopoda* are subcheliform; the under free margin of the carpus is longer than the hind margin of the metacarpus; the lower part of the hind margin of the carpus is provided with a dozen sharp, simple teeth. The second pair are cheliform, with the carpus strongly produced; the carpal process is strongly serrated on the front margin, and provided with six or eight sharp teeth on the hind margin just above the apex; the front margin of the carpal process is longer than the hind margin of the metacarpus. The femur of the seventh pair is not half as long as that of the sixth, as long as broad, and half as long again as all the following joints together.

The lateral parts of the first two *pleonal* segments are angular behind; the hind corner of the third segment is produced into a sharp-pointed process.

The inner ramus of the second pair of *uropoda* is a fourth part longer than the outer; the inner ramus of the third pair is three times as long as the peduncle, and twice as long as the outer ramus.

Syn. **1888. Leptocotis ambobus.** TH. STEBBING. **39,** p. 1594, pl. 205.

For a full account of Dorycephalus ambobus I refer the reader to the description and drawings given by STEBBING.

COLOUR. Almost hyaline, the ocular pigment dark brown.
LENGTH. 11—14 mm; (eleven-twentieths of an inch, STEBBING).
HAB. The tropical region of the Pacific; New Caledonia; »South Pacific, Lat. 36° 32′ S; Long. 132° 52′ W.» (STEBBING).

Gen. 6. Streetsia, TH. STEBBING, 1888.

The name was given by STEBBING in honour of D:r TH. H. STREETS, of the United States' Navy.

Diagn. The *head* is very long, narrow, produced into a long, evenly tapering, sharp-pointed rostrum, which is open on the under side. The hind part of the head is more or less constricted, but does not form a neck.

The second pair of *antennæ* are hidden under the head, when folded.

The first pair of *peræopoda* are subcheliform; the second are more or less cheliform. The carpus and metacarpus of the fifth pair are not dilated.

The last coalesced *ural* segment is not twice as long as the first, and more or less elongated.

The inner rami of all the three pairs of *uropoda* are free, not coalesced with the corresponding, peduncles.

The *telson* is triangular, sharp-pointed, and more or less elongated.

Syn. **1888. Streetsia,** TH. STEBBING. **39,** p. 1603.

The original generic diagnosis of STEBBING contains some characteristics which, in my opinion, have only specific value, as for instance those respecting the last five pairs of peræopoda and the length of the telson. The diagnosis runs:

»*Head* not constricted at the base, much longer than the peræon, the rostrum very elongate and the eyes still more so.

The *Gnathopods* complexy subchelate. *The second Peræopods* longer than the *First. The Fourth Peræopods* with the hinder apex of the first joint acutely produced. *The Fifth Peræopods* with dilated first joint exceeding in length the other five joints together; the outstretched limb exceeding in length the first joint of the fourth pair.

The Uropods with the rami distinct from the peduncles; the *Third Uropods* with peduncles much longer than broad.

The Telson produced far beyond the uropods, much longer than the coalesced fifth and sixth segments of the pleon.«

According to my views on the systematization of the Oxycephalids *Oxycephalus porcellus*, CLAUS, *O. longiceps*, CLAUS, *O. pronoïdes*, C. BOVALLIUS, *O. Steenstrupi*, C. BOVALLIUS, and a new species, here to be

described, must be placed in this genus; I am myself inclined to consider *Leptocotis mindanaonis*, STEBBING, really to be a Streetsia, but following the rule of not uniting an already established genus or species with another without full evidence, I shall for the present content myself with giving a diagnosis for distinguishing it from the species of Streetsia.

Beside the typical species Streetsia Challengeri the following species are to be recorded here, viz: S. porcellus, CLAUS, S. longiceps, CLAUS, S. pronoïdes, C. BOVALLIUS, S. Steenstrupi, C. BOVALLIUS, and S. carinata, n. sp. They are to be distinguished as shows the following synoptical table:

A. The last ural segment is shorter than the telson.	
a 1. The lower hind corner of the femur of the sixth pair of peræopoda is produced into a long, sharp-pointed process.	1. **S. Challengeri.**
a 2. The lower hind corner of the femur of the sixth pair of peræopoda is produced into a short, rounded process.	2. **S. porcellus.**
B. The last ural segment is about as long as the telson.	
b 1. The under margin of the carpus, and the hind margin of the metacarpus of the first pair of peræopoda are serrated.	
bb 1. The dactylus of the first and second pairs of peræopoda is much shorter than half the metacarpus. The femur of the seventh pair is longer than all the following joints together.	3. **S. pronoïdes.**
bb 2. The dactylus of the first and second pairs of peræopoda is longer than half the metacarpus. The femur of the seventh pair is much shorter than all the following joints together.	4. **S. carinata.**
b 2. The under margin of the carpus, and the hind margin of the metacarpus of the first pair of peræopoda are smooth. The dactylus of the first pair is not half as long, that of the second pair is half as long, as the metacarpus. The femur of the seventh pair is a little longer than all the following joints together.	5. **S. Steenstrupi.**

C. The last ural segment is longer than the telson. The under margin of the carpus, and the hind margin of the metacarpus of the first pair of peræopoda are smooth. The dactylus of the first two pairs is not half as long as the metacarpus. The femur of the seventh pair is as long as all the following joints together. 6. **S. longiceps.**

1. **Streetsia Challengeri,** TH. STEBBING, 1888.

Diagn. The *head* is nearly as long as the peræon and pleon together; the rostrum is considerably more than half as long as the rest of the head.

The *peræon* is dorsally rounded.

The under margin of the carpus of the first two pairs of *peræopoda* is serrated, with the hind corner projecting into a long, sharp tooth; the hind margin of the metacarpus is serrated and fully as long as the under margin of the carpus; the dactylus is more than half as long as the metacarpus. The fourth pair are much longer than the third. The lower hind corner of the femur of the sixth pair is produced downwards into a very long, sharp-pointed process reaching considerably below the apex of the genu. The femur of the seventh pair is much more than half as long as that of the sixth, and is a little longer than all the following joints together.

The *pleon* is dorsally carinated, with the lateral parts of the last two segments acutely produced behind.

The last coalesced *ural* segment is not twice as long as broad, and only half as long as the telson.

The peduncle of the first pair of *peræopoda* is quite as long as the last coalesced ural segment, and a little longer than the inner ramus.

The *telson* is about four and a half times as long as broad, and is carinated.

Syn. **1888. Streetsia Challengeri,** TH. STEBBING, **39,** p. 1603, pl. 207.

For further details I refer the reader to the work of STEBBING.

COLOUR?

LENGTH. »A little over an inch» (STEBBING).

HAB. The North Pacific; Lat. 35° 35′ N, Long 150° 50′ E. One specimen, a female (STEBBING).

2. **Streetsia porcellus,** C. CLAUS, 1879.

Pl. IV, fig. 4—6.

Diagn. The *head* is about as long as the whole peræon; the rostrum is considerably more than half as long as the rest of the head.
The *peræon* is dorsally rounded.
The under margin of the carpus of the first pair of *peræopoda* is rounded, without projecting corner, strongly denticulated, with comparatively few, but very long and sharp, spine-like teeth; the hind margin of the metacarpus is sparingly serrated; the dactylus is longer than two-thirds of the metacarpus.
The under margin of the carpus of the second pair is finely serrated, with the hind corner a little produced and sharp-pointed; the hind margin of the metacarpus is serrated, and considerably shorter than the under margin of the carpus; the dactylus is longer than two-thirds of the metacarpus.
The fourth pair are not longer than the third. The lower hind corner of the femur of the sixth pair is produced downwards into a short rounded process. The femur of the seventh pair is about half as long as that of the sixth (?), and somewhat longer than all the following joints together.
The *pleon* is not carinated; the lateral parts of all the segments are somewhat produced behind, and sharp-pointed.
The last coalesced *ural* segment is about as long as broad, and somewhat more than a fourth part shorter than the telson.
The peduncle of the first pair of *uropoda* is longer than the last coalesced ural segment, and longer than the inner ramus.
The *telson* is not twice as long as broad.

Syn.	**1879.**	**Oxycephalus porcellus,** C. CLAUS.			**27,** p. 194 (48).
	»	»	»	1887.	**36,** p. 71, pl. 24. fig. 7—9.
	»	» (Spec. A) »	TH. STEBBING.	1888.	**39,** p. 1587, pl. 203.

Streetsia porcellus differs from all its congeners in the broad urus and in the form of the second pair of peræopoda, and especially in the fine serration on the under margin of the carpus of that pair. I am pretty sure that *Oxycephalus porcellus, Specimen B,* described and figured by STEBBING

(l. c. p. 1589, pl. 204 A) is not identical with the present species, though it seems to belong to the genus Streetsia. In the form of the urus and of the first two pairs of peræopoda it comes near to *Streetsia carinata*.

The short original description, of the species, given by CLAUS in 1879, and repeated in 1887, runs:

»Körper ziemlich gedrungen, mit glattem, starkem Integument, circa 8 mm. lang. Schnabel mässig lang, und shnauzenförmig. Beine minder gestreckt, mit langen Krallen bewaffnet. Die Greifhände der beiden vorderen Paare kurz und gedrungen. Letztes Beinpaar mit sehr schmächtiger Platte, dünn und gestreckt. Die vorderen stark gezackt, die hinteren feingezähnelt. Abdomen sehr kräftig, glattrandig. Das Caudaldoppelsegment kurz, merklich kürzer als die Schwanzplatte.»

STEBBING gives in his Report of the »Challenger» Amphiopoda an exhaustive description and good drawings of Oxycephalus porcellus, *Specimen A*, which most probably is identical with CLAUS' O. porcellus.

COLOUR. ?
LENGTH. »8 mm.» (CLAUS), »a little over half an inch», (STEBBING)
HAB. The Indian Ocean, Zanzibar (CLAUS); The South Pacific, »between Api and Cape York, surface» (STEBBING).

3. **Streetsia pronoïdes,** C. BOVALLIUS, 1887.

Pl. III, fig. 7—12; and p. 23, fig. 9; p. 35, fig. 62.

Diagn. The *head* is as long as the peræon and half the first pleonal segment; the rostrum is fully as long as the rest of the head.

The *peræon* is dorsally rounded.

The under margin of the carpus of the first pair of *peræopoda* is straight, with the hind corner obtusely rounded, not projecting, and is serrated, with short, broad teeth; the hind margin of the metacarpus is feebly serrated, and is fully as long as the under margin of the carpus; the dactylus is about a fifth part as long as the metacarpus. The under margin of the carpus of the second pair is provided with a few short, broad teeth, and has the hind corner very little produced, and sharp-pointed; the hind margin of the metacarpus is armed with a few short, spine-like teeth along its lower half, and is somewhat longer than the under margin of the

carpus; the dactylus as in the first pair. The fourth pair are not longer than the third. The lower hind corner of the femur of the sixth pair is produced downwards into a rounded process, which reaches beyond the apex of the genu. The femur of the seventh pair is more than half as long as that of the sixth, and is longer than all the following joints together.

The *pleon* is not carinated; the lateral parts of the segments are angular behind.

The last coalesced *ural* segment is nearly twice as long as broad at the base, and is quite as long as the telson.

The peduncle of the first pair of *uropoda* is quite as long as the last coalesced ural segment, and is considerably longer than the inner ramus.

The *telson* is elongate-triangular, and is about three times as long as it is broad as the base.

Syn. **1887. Oxycephalus pronoïdes,** C. BOVALLIUS. **35,** p. 37.

Streetsia pronoïdes is distinguished from its congeners by the very short dactylus of the first two pairs of peræopoda, and by the ovate, not posteriorly dilated femur of the seventh pair.

The *body* is comparatively high and compressed, but not carinated.

The hind part of the *head* is not constricted; the rostrum seen from above (p. 23, fig. 9) is narrowly triangular, evenly tapering from the base towards the apex.

The *peræon* is comparatively long with high and large *epimerals*.

The first pair of *peræopoda* (Pl. III, fig. 8) have the carpus longer than broad; the hind margin is fringed with five or six long bristles; the lower corner is obtusely rounded, and shows no teeth on the hind margin, but has six short and broad triangular teeth on the under margin, the outermost of which is the broadest and is obtusely rounded at the apex; both sides of the lower hind corner of the joint are set with a large number of long stout bristles; the metacarpus is very broad, scarcely more than a third part longer than broad; the front side is strongly convex, and fringed with long bristles; the hind margin forms a thin edge, bluntly serrated, and bordered by short bristles; the short dactylus is smooth on the hind margin. The second pair (Pl. III, fig. 9) have the hind margin of the carpus fringed with bristles, as in the first

pair; the feebly produced lower corner is set with bristles on the sides, the apical tooth is short and broad, but sharp-pointed; the metacarpus is more slender than in the first pair, but armed in the same way. The fifth pair are much longer than the sixth; the femur is more than twice as long as broad, and considerably longer than the three following joints together. The sixth pair (Pl. III, fig. 10) have the femur irregularly pear-shaped, and longer than all the following joints together; the genu articulates subapically with the femur as in all the species of Streetsia, which I have examined, and is fixed on the inner side of the femur so that the last five joints of the leg are entirely concealed under the femur when folded up. For this reason the name pronoïdes has been applied to the species, but this feature is not confined to this species but common to all the species of Streetsia, as just mentioned. The front margin of the tibia is pectinated with longer and shorter teeth, one long one and two short ones alternating; the lower front and hind corners are produced. The seventh pair (Pl. III, fig. 11) are quite as long as the femur of the sixth; the femur is ovate, not fully twice as long as broad, and distinctly longer than all the following joints together.

The *pleon* is somewhat shorter than the first six peræonal segments together. The hind corner of the third segment is not produced but is angular.

The first pair of *uropoda* (Pl. III, fig. 12) reach about to the apex of the last pair; the peduncle is linear, and is about five times as long as broad; the rami are elongate-lanceolate; the inner is serrated on both margins, and is only a little longer than the outer, which is serrated on the inner margin and smooth on the outer. The second pair reach a little beyond the apex of the peduncle of the last pair; the peduncle is shorter than the inner ramus, which is broader, and considerably longer, than the outer, both are serrated as in the first pair. The third pair reach as far as two-thirds of the length of the telson; the peduncle is considerably shorter than the inner ramus, and quite as long as the outer, which is much narrower than the inner ramus; both are serrated as in the first pair.

The *telson* has the margins smooth, and only feebly curved.

COLOUR. Whitish.
LENGTH. 8 mm.
HAB. The tropical region of the Atlantic, the Caribbean Sea.

4. **Streetsia carinata,** n. sp.

Pl. III, fig. 13—15, Pl. IV, fig. 1 and 2; and p. 34, fig. 58.

Diagn. The head is as long as the peræon and the first pleonal segment together; the rostrum is not fully as long as the rest of the head.

The *peræon* is dorsally carinated.

The under margin of the carpus of the first pair of *peræopoda* is strongly serrated, with short, broad teeth, and has the hind corner projecting into a long sharp tooth; the hind margin of the metacarpus is smooth, and is longer than the under margin of the carpus; the dactylus is more than half as long as the metacarpus. The second pair are almost cheliform, with the front margin of the carpal process smooth and ending into a broad sharp tooth; the hind margin of the metacarpus is armed with a few short, broad teeth, and is about as long as the front margin of the carpal process with the apical tooth; the dactylus is more than half as long as the metacarpus. The fourth pair are a little longer than the third. The lower hind corner of the femur of the sixth pair is produced downwards into a long rounded process, which reaches far beyond the apex of the genu. The femur of the seventh pair is not half as long as that of the sixth, and is much shorter than all the following joints together.

The *pleon* is dorsally carinated; the lateral parts of the segments are rounded behind.

The last coalesced *ural* segment is about a third part longer than broad, and is quite as long as the telson.

The peduncle of the first pair of *uropoda* is shorter than the last coalesced ural segment, and is as long as the inner ramus.

The *telson* is lanceolate, and is about three times as long as broad.

Streetsia carinata is easily distinguished from the other species by the peræon and pleon being dorsally carinated, and the femur of the seventh pair of peræopoda considerably much shorter than all the following joints together.

The hind part of the *head* is not constricted; the rostrum seen from above (Pl. IV, fig. 2) is elongate-lanceolate.

The *epimerals* are not as high as in the preceding species.

The first pair of *peræopoda* (Pl. III, fig. 13) have the carpus longer than broad, with the under margin somewhat convex; the hind margin has a single bristle; the lower corner projects into a strong, narrow tooth, and shows five or six sharp broad teeth on the hind margin above the apical tooth; the two undermost teeth are much longer than the others; the under margin shows four broad, triangular teeth in front of the large apical tooth; the metacarpus has the same form as in the preceding species, but is nearly twice as long as broad; the dactylus is curved, and armed with a small tooth on the hind margin a little below the middle. The second pair (Pl. III, fig. 14) have the carpus produced so as to form with the metacarpus an almost cheliform hand, though it is really only a subcheliform hand, because the metacarpus does not impinge upon the apex of the carpal process but passes across the inside of it, the edge of the metacarpus and the sharp front margin of the carpal process meeting one another like the blades of a pair of scissors; the dactylus is like that in the first pair. The fifth pair are much longer than the sixth; the femur is twice as long as broad, and quite as long as the three following joints together. The sixth pair have the femur a little shorter than all the following joints together. The seventh pair (p. 34, fig. 58) are about as long as the femur of the sixth; the femur is almost triangular, with the margins feebly convex, and is not fully twice as long as it is broad at the base; it is scarcely longer than the three following joints together.

The *pleon* is as long as the first five peræonal segments together. The hind corner of the third segment is produced backwards, and is broadly rounded.

The first pair of *uropoda* (Pl. III, fig. 15) reach a little beyond the middle of the inner ramus of the last pair; the peduncle is linear, and about five times as long as broad; the inner ramus is elongate-lanceolate, serrated on both margins, with spine-like teeth, and is considerably longer than the outer ramus, which is elongated, somewhat curved, smooth on the outer margin, and serrated on the inner. The second pair reach to the middle of the inner ramus of the last pair; the peduncle is as long as the inner ramus, which is broader, and much longer, than the outer; both rami are serrated as in the first pair. The third pair reach as far as five-sixths of the length of the telson; the peduncle

is considerably shorter than the inner ramus, and a little shorter than the outer; the inner ramus is lanceolate, sparingly serrated on both margins, with spine-like teeth, and is more than three times as broad as the outer ramus; the outer ramus is almost styliform, and is two-thirds as long the inner; it is smooth on the outer margin, and serrated on the inner.

The *telson* has the margins smooth and tolerably convex.

COLOUR. Yellowish, with the eyes dark brown.
LENGTH. 10 mm.
HAB. The tropical region of the Pacific, the Bay of Panamá.

5. **Streetsia Steenstrupi,** C. BOVALLIUS, 1887.

Pl. III, fig. 2—6; and p. 25, fig. **20**; p. 29, fig. **38**; p. 32, fig. **52**; p. 33, fig. **55.**

Diagn. The *head* is a little longer than the whole peræon, the rostrum is scarcely more than a third part as long as the rest of the head.

The *peræon* is dorsally rounded.

The under margin of the carpus of the first pair of *peræopoda* is entirely smooth, with the hind corner projecting into a short, broadly triangular process; the hind margin of the metacarpus is smooth, and is somewhat longer than the under margin of the carpus; the dactylus is scarcely a third as long as the metacarpus. The second pair are almost cheliform; the front margin of the carpal process is nearly straight and entirely smooth; the hind margin of the metacarpus is smooth, and is a little longer than the front margin of the carpal process; the dactylus is half as long as the metacarpus. The fourth pair are not longer than the third. The lower hind corner of the femur of the sixth pair is produced downwards into a short, rounded process, which reaches about to the apex of the genu. The femur of the seventh pair is only a fourth part shorter than that of the sixth, and is somewhat longer than all the following joints together.

The *pleon* is not carinated; the lateral parts of the segments are scarcely produced, but are angular behind.

The last coalesced *ural* segment is about a third part longer than broad, and is about as long as the telson.

The peduncle of the first pair of *uropoda* is longer than the last coalesced ural segment, and much longer than the inner ramus.

The *telson* is lanceolate, very sharp-pointed, and somewhat more than twice as long as broad.

Syn. **1887. Oxycephalus Steenstrupi,** C. BOVALLIUS. **35,** p. 37.

Streetsia Steenstrupi comes near to the next species, *S. longiceps*, CLAUS, but differs from it in the very long and strongly developed seventh pair of peræopoda, by the last coalesced ural segment being rather shorter than the telson, and by the peduncle of the second and third pairs being not longer than the corresponding inner rami.

The *Oxycephalus longiceps*, STEBBING, agrees with the specimens of Streetsia Steenstrupi, which I have examined, in the characteristics of the seventh pair of peræopoda and the uropoda, and thus decidedly differs from *Oxycephalus longiceps*, CLAUS, but as it also differs from Streetsia Steenstrupi in the characteristics of the first two pairs of peræopoda, I can scarcely consider it identical either with the present species or with *Streetsia longiceps*, CLAUS, and think that it ought to have a new specific name.

The *body* is compressed, but not at all carinated.

The hind part of the *head* is a little constricted; the rostrum seen from above is broadly lanceolate, with the apex narrowed.

The first pair of *antennæ* (Pl. III, fig. 3) have the first flagellar joint fully twice as long as is it is broad at the apex, which is dilated downwards and forwards; the second flagellar joint is about as long as the third, and is provided with three very long olfactory hairs; the fourth joint is unusually short, cylindrical, and scarcely a third part as long as the third (p. 25, fig. **20**).

The *epimerals* are high, but not longer than the under margins of the corresponding peræonal segments.

The first pair of *peræopoda* (p. 32, fig. **52**) have the carpus considerably longer than broad; the hind margin is richly fringed with long stout bristles; the under margin is concave, entirely smooth and sharp-edged; the lower corner is a little projecting forming a broad and short triangular process, but not outdrawn into a spine-like tooth; the sides of the triangular projection are densely covered with very stout and long bristles; the metacarpus is very thick and short, less than a third part longer than broad; the front margin is strongly convex, and provided with four or five very long bristles; the hind margin forms a very thin and sharp edge, which is smooth, but which, when examined under a strong

magnifying power, shows traces of a very minute serration consisting of densely placed rounded teeth; the apex of the hind margin projects a little along the dactylus into a broadly rounded process; the dactylus is short, with the hind margin entirely smooth. The second pair (p. 33, fig. 55) have the stem of the carpus as long as broad; the hind margin is fringed with five or six long bristles; the carpal process is broadly triangular, not outdrawn into an apical spine-like tooth; the front margin is entirely smooth, and without spines; the sides ot the joint and of the process show an oblique row of long bristles; the metacarpus is comparatively narrow; the front margin is convex, the hind is straight and smooth, not forming a distinct edge; the dactylus is fully half as long as the metacarpus, with the hind margin smooth. The fifth pair are much longer than the sixth; the femur is about twice as long as broad, with the lower hind corner produced downwards into a broadly rounded process reaching to the apex of the genu; the femur is shorter than the three following joints together. The sixth pair have the femur about as long as all the following joints together; the apical process is broadly rounded, and reaches fully to the apex ef the genu; the front margin of the tibia is fringed with longer and shorter spine-like teeth, one long one and one short one alternating (Pl. III, fig. 5). The seventh pair are very long, reaching nearly to the apex of the tibia of the sixth pair; the femur is broad, scarcely a third part longer than broad, with the upper hind portion dilated; it is a little longer than all the following joints together.

The *pleon* is as long as the first five peræonal segments together. The hind corner of the pleonal segments is not produced backwards, but is angular.

The first pair of *uropoda* (Pl. III, fig. 6) reach almost to the apex of the last pair; the peduncle is linear, nearly five times as long as broad, and more than a third part longer than the inner ramus; the inner ramus is elongate-lanceolate, serrated on both margins, and is longer than the outer ramus, which is elongated, sharp-pointed, smooth on the outer margin and serrated on the inner. The second pair reach nearly to the middle of the inner ramus of the last pair; the peduncle is much broader than that in the first pair, and not fully three times as long as broad; the inner lower corner is a little projecting, and sharp-pointed, as in the first pair; the inner ramus is only a little longer than the peduncle, lanceolate, serrated on both margins, and is considerably longer than, and not fully twice as broad as, the outer ramus, which is serrated on the inner margin, and smooth on the outer. The third pair reach as far as four-

fifths of the length of the telson; the peduncle is much shorter than the inner ramus, and a little shorter than the outer; the inner ramus is elongate-lanceolate, serrated on both margins, and considerably broader and longer than the outer ramus, which is serrated as in the preceding pair.

The *telson* has the margins smooth and tolerably convex.

COLOUR. Almost hyaline.
LENGTH. 10—12 mm.
HAB. The tropical region of the Atlantic.

6. **Streetsia longiceps,** C. CLAUS, 1879.

Pl. IV, fig. 3.

Diagn. The *head* is as long as the whole peræon; the rostrum is nearly half as long as the rest of the head.

The *peræon* is dorsally rounded.

The under margin of the carpus of the first pair of *peræopoda* is entirely smooth (?) with the hind corner projecting into a long narrow sharp-pointed process; the hind margin of the metacarpus is smooth (?) and somewhat shorter than the under margin of the carpus; the dactylus is not half as long as the metacarpus. The second pair are cheliform; the front margin of the carpal process is smooth (?) the apex narrowly sharp-pointed; the hind margin of the metacarpus is smooth (?) and is about as long as the front margin of the carpal process; the dactylus is not half as long as the metacarpus. The fourth pair are only a little longer than the third. The lower hind corner of the femur of the sixth pair is scarcely produced. The femur of the seventh pair is about half as long as that of the sixth, and is as long as all the following joints together.

The *pleon* is not carinated; the lateral parts of the segments are produced behind, and sharp-pointed.

The last coalesced *ural* segment is a little longer than the telson.

The peduncle of the first pair of *uropoda* is a little longer than the inner ramus.

Syn. **1879. Oxycephalus longiceps,** C. CLAUS. **27,** p. 194 (48).
» » » **36,** p. 72, pl. 24, fig. 10.

The description of CLAUS being very short and the drawing not very instructive, it is impossible to say anything definite about the closer affinities of the species, but from the characteristics known it seems most likely that it belongs to the genus Streetsia, and that it is not identical with any of the above recorded species. Above (p. 90) I have suggested that *Oxycephalus longiceps* of STEBBING is another species than that described by CLAUS.

The original diagnosis given by CLAUS in 1879 runs:

»Kopf sehr lang, mit dem rüsselförmigen Schnabel fast so lang als der Mittelleib. Pigmentkörper des Auges sehr gestreckt, fast quadrangulär. Beine schlank und dünn. Die Greifhand der beiden vorderen Beinpaare mit scharfem, gezähneltem. Rande und einfacher, langer Endspitze. Siebentes Beinpaar klein. Schwimmfüsse dünn und schmächtig. Integument glatt und ziemlich dünn. Seitenflügel der Abdominalsegmente unbewaffnet. Das Caudaldoppelsegment nur wenig länger als die Schwanzplatte, ebenso die Stielglieder der Uropoden nicht viel länger als die Aeste.«

COLOUR. ?
LENGTH. 6 mm. (young ♂, CLAUS).
HAB. The Indian Ocean, Zanzibar (CLAUS).

Streetsia (?) **mindanaonis,** TH. STEBBING, 1888.

Diagn. The *head* is as long as the peræon, the pleon, and the first ural segment together; the rostrum is about half as long as the rest of the head.

The *peræon* is dorsally rounded.

The first pair of *peræopoda* are subcheliform; the under margin of the carpus is smooth, with the hind corner a little projecting and sharp-pointed; the hind margin of the metacarpus is smooth; the dactylus is minute. The second pair are cheliform, with the carpal process ending into a slender, spine-like tooth; the front and hind margins of the carpal process are serrated; the hind margin of the metacarpus is finely serrated, and provided with short bristles; it is much longer than the front margin of the carpal process with the

apical tooth; the dactylus is not half as long as the metacarpus. The fourth pair are longer than the third. The femur of the seventh pair is as long as that of the sixth, and is as long as all the following joints together.

The lateral parts of the first two *pleonal* segments are squared behind; that of the third segment is acutely produced backwards.

The last coalesced *ural* segment is much more than twice as long as broad, and is considerably longer than the telson.

The peduncle of the first pair of *uropoda* is a little shorter than the last coalesced ural segment, and is nearly twice as long as the inner ramus.

The *telson* is lanceolate, and is more than twice as long as broad.

Syn. **1888. Leptocotis mindanaonis,** TH. STEBBING. **39,** p. 1598, pl. 204, c.

For further information on the subject I refer the reader to STEBBING's work.

COLOUR. Hyaline spotted with orange (STEBBING).
LENGTH. »About two-fifths of an inch» (STEBBING).
HAB. Off Mindanao, Philippines (STEBBING).

Gen. 7. Cranocephalus, n. g.

Derivatio: *κράνος*, = helmet, and *κέφαλος* = a large-headed fish.

Diagn. The *head* is short and thick, produced into a very short, sharp-pointed rostrum, which is open on the under side. The hind part of the head is constricted.

The second pair of *antennæ* are hidden under the head and the peræon, when folded.

The first two pairs of *peræopoda* are subcheliform. The carpus and metacarpus of the fifth pair are not dilated.

The last coalesced *ural* segment is longer than, but not twice as long as, the first, and is not twice as long as broad.

The inner rami of all the three pairs of *uropoda* are free, not coalesced with the corresponding peduncles.

The *telson* is tongue-shaped and elongated.

The genus Cranocephalus is well defined from all the other genera of the family. In the short head and in the second pair of antennæ being concealed under the head *and the peræon* it resembles *Simorhynchotus* and *Tullbergella;* in the form of the peræopoda it comes tolerably near to *Stebbingella*, which also has broadly expanded femora in the last three pairs. Only one species is hitherto known.

1. **Cranocephalus Goësi,** n. sp.

The name is given in honour of D:r AXEL GOËS of Kisa, Sweden.

Pl. IV, fig. 7—9; and p. 21, fig. **5**; p. 32, fig. **53**; and p. 38, fig. **72**.

Diagn. The *body* is smooth and even, with a thin but hard integument.

The *head* is nearly as long as the first six peræonal segments together; the hind part is a little constricted; the broadly triangular rostrum is scarcely half as long as the rest of the head.

The under margin of the carpus of the first pair of *peræopoda* is entirely smooth, with the hind corner projecting into a short sharp tooth; the hind margin is strongly serrated, without spines or bristles, the hind margin of the metacarpus is as long as the free under margin of the carpus, and forms an edge which is smooth on the hind margin but armed with a few sharp teeth on the under margin. The under margin of the carpus of the second pair is smooth, with the apical tooth somewhat longer than in the first pair; the hind margin is feebly serrated, and providod with some very short bristles; the hind margin of the metacarpus is about as long as the free under margin of the carpus, the upper part is smooth; the lower obliquely truncated end is provided with a few strong teeth. The femur of the sixth pair is a fifth part longer than broad, with the lower hind corner produced downwards into a broadly rounded process, which reaches to the apex of the genu. The seventh pair reach to the apex of the carpus of the sixth pair.

The lateral parts of the *pleonal* segments are a little produced behind, and sharp-pointed.

The peduncle of the first and second pairs of *uropoda* is fully twice as long as the inner ramus.

The *telson* is more than two and a half times as long as it is broad at the base; and is considerably longer than the last pair of uropoda; the apex is broadly rounded.

The helmet-shaped *head* (Pl. IV, fig. 7) viewed in profile resembles that figured by STREETS (**26,** pl. 2, fig. 36) from the female of *Stebbingella sclerotica*. It is very broad and deep, almost as deep as it is long without the rostrum. The under side of the rostrum is bordered behind by a small duplicature of the integument.

The first pair of *antennæ* (Pl. IV, fig. 8) have the first joint of the flagellum twice as long as it is broad at the apex; the three following joints are subequal in length, and are together quite as long as the under margin of the first joint.

The *peræon* has the segments very neatly defined but not protruding. The *epimerals* are entirely smooth and even, without tubercles or spinous processes, and are somewhat longer than the under margins of the corresponding peræonal segments.

The first pair of *peræopoda* (p. 32, fig. **53**) have the carpus nearly as long as broad; the metacarpus is as long as the carpus, with the front margin convex; the dactylus is gently curved, half as long as the metacarpus, and smooth on the hind margin. The second pair (Pl. IV, fig. 9) are only a little longer than the first; the metacarpus is a little longer than the carpus; the dactylus is half as long as the metacarpus, and is like that in the first pair. The third and fourth pairs are very slender and equal in length. The fifth pair are longer than the sixth; the femur is broad, only a fourth part longer than broad, and a little longer than the three following joints together. The femur of the sixth pair is broadly pear-shaped, about a fifth part longer than broad, and about a sixth part broader than that of the fifth pair. The seventh pair have an almost trapeziform femur, which is as broad at the base as it is long, and a little longer than all the following joints together.

The *pleon* is somewhat longer than the last five peræonal segments together. The under margins of the segments are straight.

The last coalesced *ural* segment is less than a third part longer than it is broad at the base.

The first pair of *uropoda* (p. 38, fig. **72**) reach a little beyond the middle of the inner ramus of the last pair; the peduncle is longer than the last coalesced ural segment, almost linear, and about four times as long as broad, with the lower parts of the margins

serrated; it is more than twice as long as the inner ramus, which is a little longer than the outer; both rami are elongate-lanceolate, and are serrated on both margins. The second pair reach fully to the apex of the peduncle of the last pair; the peduncle is linear, more than four times as long as broad, and quite twice as long as the inner ramus, which is considerably longer than the outer and is serrated on both margins; the outer ramus is smooth on the outer margin and serrated on the inner. The third pair reach as far as four-fifths of the length of the telson; the peduncle is linear, more than twice as long as broad, and considerably longer than the inner ramus, which is as long as the outer and is serrated on both margins; the outer ramus is serrated as in the preceding pair.

The *telson* has the margins smooth and straight.

COLOUR. White as ivory, with red spots on the lower parts of the body, the eyes are dark red.
LENGTH. 8 mm.
HAB. The tropical region of the Atlantic.

Gen. 8. Stebbingella, n. g.

The name is given in honour of the Rev. TH. R. R. STEBBING.

Diagn. The *head* is moderately long and broad, and is produced into a tolerably long and sharp-pointed rostrum, which is closed on the under side. The hind part of the head is constricted.
The second pair of *antennæ* are hidden under the head, when folded.
The first two pairs of *peræopoda* are subcheliform. The carpus and metacarpus of the fifth pair are not dilated.
The last coalesced *ural* segment is longer than, but not twice as long as, the first, and is only a little longer than broad.
The inner rami of all the three pairs of *uropoda* are free, not coalesced with the corresponding peduncles.
The *telson* is triangular, and sharp-pointed.

This genus has been established for the reception of those Oxycephalids, which, according to my views as to the generic characteristics shown in the family Oxycephalidæ (see above p. 16) are intermediate between the genera *Oxycephalus*, *Streetsia*, and *Leptocotis*.

The first Oxycephalidean species described, which belongs to this new genus, is *Oxycephalus scleroticus*, TH. STREETS, from the year 1878, the second is *O. typhoïdes*, described by CLAUS in 1879, and the last is the new species recorded below under the name Stebbingella Théeli.

A. The lower hind corner of the pleonal segments is produced backwards, and sharp-pointed.

a 1. The last ural segment is as long as the telson. The rostrum is longer than the rest of the head (♂). The seventh pair of peræopoda are shorter than the femur of the sixth pair. 1. **S. sclerotica.**

a 2. The last ural segment is more than twice as long as the telson. The rostrum is much shorter than the rest of the head (♂). The seventh pair of peræopoda are much longer than the femur of the sixth pair. 2. **S. typhoïdes.**

B. The lower hind corner of the pleonal segments is squared, not produced, nor sharp-pointed. The last ural segment is about a fourth part longer than the telson. The rostrum is nearly as long as the rest of the head (♂). The seventh pair of peræopoda are longer than the femur of the sixth pair. 3. **S. Théeli.**

1. **Stebbingella sclerotica,** TH. STREETS, 1878.

Pl. IV, fig. 13—16.

Diagn. The *body* is dorsally carinated, with a broad, rounded ridge, and a row of nodules along the sides above the epimerals. The fifth epimeral has a prominent spine directed backwards; the whole surface of the body is finely granulated.

The *head* is as long as the first five peræonal segments together; the rostrum is considerably longer than the rest of the head, and is wedge-shaped.

The first four joints of the second pair of *antennæ* are subequal in length and straight; they reach, when folded, nearly to the the apex of the rostrum.

The first pair of *peræopoda* have the under side of the carpus provided with spines, and the hind corner projecting into an acute apical tooth; the hind margin of the metacarpus is somewhat longer than the under margin of the carpus. The second pair have the carpus more produced than the first pair, with the under margin straight and smooth; the hind margin of the metacarpus is as long as the under margin of the carpus, and is provided with spines. Along the middle of the femur of the last three pairs there is a row of four pits. The seventh pair are shorter than the femur of the sixth.

The *pleon* is fully as long as the first five peræonal segments together; the under margin of the segments is straight; the hind corner is produced and sharp-pointed.

The last coalesced *ural* segment is as long as the telson.

The first pair of *uropoda* reach to the apex of the last pair. The rami are lanceolate.

The *telson* is broad, triangular, and reaches beyond the apex of the last pair of uropoda.

Syn. **1878, Oxycephalus scleroticus,** TH. STREETS. **26,** p. 281, pl. 2, fig. 3.

As to the calcareous and peculiarly sculptured integument STREETS says:

»Animal with the tegumentary covering hard and resisting — — — —. The thorax elevated along the median line into a broad, rounded ridge, with the sides sloping down from the summit; the ridge appearing somewhat nodulated; a row of nodules along the side above the epimerals; on the fifth epimeral a prominent spine, directed backward; the segments of the thorax decreasing posteriorly, each segment bulging, not overriding its fellow; the whole surface of the body finely granulated».

It is very probable that the female, which he describes, does not belong to this species; it was not taken in the same locality, and it seems not impossible that it may have been a *Cranocephalus*, since his description of the granulated and nodulous integument refers to the male form only.

As to this supposed female he says:

»The female of this species is more robust than the male. The head is deeper and broader, more rounded above and below, the notch posterior shallower; the rostrum shorter and narrower. Superior antennæ

straight, or slightly curved, slender, not produced at the apex of the third joint of the peduncle. In the one specimen of this sex in the collection the spine of the fifth epimeral was absent».

COLOUR. ?
LENGTH. The male 10—15 mm; the female 10 mm. (STREETS).
HAB. The tropical region of the Pacific, the male at Lat. 25° 13′ to 26° 13′ N, Long. 143° 15 W; the female at Lat. 25° 50′ N, Long. 132° 45′ W. (STREETS).

2. **Stebbingella typhoïdes,** C CLAUS, 1879.

Pl. IV, fig 10—12; and p. 27, fig. 30.

Diagn. The segments of the *body* are bulging and protruding, but not carinated. The fifth epimeral has a prominent, curved spine, directed backwards.

The *head* is a little longer than the first five peræonal segments together. The rostrum is narrow and sharp-pointed, and is half as long as the rest of the head.

The first four joints of the second pair of *antennæ* are unequal in length and strongly arched.

The first pair of *peræopoda* have the under margin of the carpus smooth, with the hind corner projecting into a spine-like tooth; the hind margin of the metacarpus is about as long as the under margin of the carpus. The second pair have the carpus like that in the first pair; the hind margin of the metacarpus is shorter than the under margin of the carpus. On the femur of the fifth and sixth pairs there are no pits, but along the middle of the femur of the seventh pair there is a long ridge and two pits. The seventh pair are much longer than the femur of the sixth, and reach almost to the apex of the tibia of that pair.

The *pleon* is a little longer than the last four peræonal segments together; the under margin of the pleonal segments is almost straight; the hind corner is produced and sharp-pointed.

The last coalesced *ural* segment is more than twice as long as the telson.

The first pair of *uropoda* reach to the apex of the telson.

The *telson* is short, but a little longer than the last pair of uropoda.

Syn. **1879, Oxycephalus typhoïdes,** C. CLAUS. **27,** p. 195 (49).
» » » 1887. **36,** p. 72, pl. 24, fig. 11—14.

Stebbingella typhoïdes is easily distinguished from the two other species by the even, not noduluos integument, and by the last coalesced ural segment being more than twice as long as the telson.

The original description as it was given by CLAUS in 1879 runs:

»Körper mässig comprimirt, mit einem Paar von Seitenstacheln an den Epimeren des fünften Thoracalsegments. Kopf kugelig aufgetrieben, mit sehr tiefer Antennengrube und spitzem, ziemlich kurzem Schnabel. Nackengegend stark verengert. Die vorderen Antennen des Männchens gross, mit stumpfem Zahnfortsatz an dem sehr gestreckten Schaft, zweites Antennenpaar sehr lang, mit stark ausgebogenen Gliedern und kurzem Endgliede. Greifhand der vorderen Beinpaare mit ungezähntem, in eine lange Spitze ausgezogenem Rand. Die Schenkelplatten des fünften und sechsten Beinpaares sind breite, mächtig vergrösserte Scheiben, von fast birnförmigem Umrisse und liegen wie *Eutyphis (Thyropus)* klappenartig der Bauchseite an. Siebentes Beinpaar gross und lang, mit umfangreicher, am Hinterrande lang ausgezogener Schenkelplatte. Aussenfläche der letzteren mit langer Firste und zwei Gruben. Die Seitenflügel der Abdominalsegmente ziehen sich in einem langen spitzen Fortsatz aus. Das Caudaldoppelsegment mehr als zweimal so lang wie die kurze Schwanzplatte. Letztes Uropodenpaar sehr kurz».

COLOUR. ?
LENGTH. 8—9 mm. (CLAUS).
HAB. The Indian Ocean, Zanzibar; The Mediterranean (CLAUS).

3. **Stebbingella Théeli,** n. sp.

The name is given in honour of Professor HJALMAR THÉEL of Upsala.

Pl. V, fig. 1—4; and p. 21, fig. 3; and p. 35, fig. 60.

Diagn. The *body* is dorsally carinated, each of the peræonal segments showing on the summit an egg-shaped, calcareous tubercle, and on the four middle segments there are large tubercles above the epimerals; the pleon has a longitudinal keel, the

segment being sculptured on the sides and showing large grooves. The body increases in breadth from the first peræonal segment to the middle of the fifth, then narrows abruptly towards the pleon; the fifth epimeral thus shows an angular protruding tubercle.

The *head* is longer than the first six peræonal segments together; the rostrum is not fully as long as the rest of the head, and is triangular, and sharp-pointed.

The first four joints of the second pair of *antennæ* are subequal in length, and are feebly bent.

The first pair of *peræopoda* have the under margin of the carpus serrated, with the hind corner feebly projecting, and sharp-pointed; the hind margin of the carpus is also serrated; the hind margin of the metacarpus is serrated, without spines, and is shorter than the under margin of the carpus. The second pair have the under margin of the carpus serrated, and the hind corner does not project more than in the first pair; the hind margin is notched, and provided with four or five spinelike bristles; the hind margin of the metacarpus is serrated, and is nearly as long as the under margin of the carpus. Along the middle of the femur of the fifth pair there are three pits, on that of the sixth four, and on that of the seventh pair three pits and some larger grooves at the apex of the joint. The seventh pair are much longer than the femur of the sixth, and reach beyond the apex of the tibia.

The *pleon* is a little longer than the last four peræonal segments together; the under margin of the pleonal segments is feebly convex; the hind corner is squared, and not at all produced.

The last coalesced *ural* segment is a third part longer than the telson.

The first pair of *uropoda* reach to the apex of the last pair. The rami are narrowly elongate.

The *telson* is almost lanceolate, and reaches scarcely beyond the apex of the last pair of uropoda.

Stebbingella Théeli is very similar to *S. sclerotica* in form, and if there were not the differences in the armature of the first two

pairs of peræopoda, in the length of the seventh pair and of the last coalesced ural segment, they would rather be looked upon as local varieties. As far as it is possible to judge from the description of STREETS, and from his unsatisfactory drawing, there are great differences in the sculpture on the peræon and pleon.

The species is one of the most beautiful of all the Hyperids, and it is a wonder that it has so long escaped the attention of zoologists.

The integument of the *body* (Pl. V, fig. 1; p. 21 fig. 3) is very thick and calcareous, showing a rich sculpture, especially on the peræon, which consists of protruding bands or rolls, straight and curved, and curiously formed nobs and tubercles, interrupted by notches and furrows. The epimerals are very thick, the third, fourth, and fifth are much thicker than high; the fifth is abruptly incised or rather truncated at the middle so as to form a broadly protruding angular tubercle, which, however, does not project into a more or less curved spine-like tooth as in the two other species.

The *head* is dorsally carinated, and is considerably longer in the female than in the male, especially as to the rostrum. In the male (p. 21, fig. 3) the rostrum is half as long again as it is broad at the base (i. e. the point of fixation of the first pair of antennæ), and a little shorter than the rest of the head; in the female, on the other hand, the rostrum is more than three times as long as it is broad at the base, and longer than the rest of the head; the rostrum is closed on the under side more completely in the female than in the male.

The first pair of *antennæ* in the male have the first flagellar joint twice as long as it is broad at the under margin; the projecting lower front corner is a little more than a third part as long as the under margin of the joint; the second joint is a little shorter than the third, which is a trifle shorter than the fourth; all the three together are shorter than the under margin of the first flagellar joint. The first peduncular joint in the female is very long; the flagellum is slender and consists of three joints. The second pair in the male reach to the middle of the rostrum; the first joint is tolerably curved, and a little shorter than the second, which is shorter than the third; the fourth is much shorter than the second.

The first pair of *peræopoda* (Pl. V, fig. 2) are considerably smaller than the second; the carpus is a third part broader than long, and has the lower front corner a little protruding in front of the base of

the metacarpus; the metacarpus is about twice as long as broad; the dactylus has the hind margin smooth, and is more than half as long as the metacarpus. The second pair (Pl. V, fig. 3) have the carpus nearly as long as broad; the lower front corner as well as the hind corner are less projecting than in the first pair. The third and fourth pairs are equal in length, tolerably slender, and considerably shorter than the fifth pair. The fifth pair have the femur much dilated, broadest below the middle, and scarcely more than a fifth part longer than broad; the lower front and hind corners are produced downwards to the middle of the genu; the three pits on the outer side are ovate in form; the femur is as long as the genu, tibia, carpus, and half the metacarpus together. The sixth pair are shorter than the fifth; the femur is much dilated, broader than long, and nearly as long as all the following joints together; the lower hind corner is not produced. The femur of the seventh pair (p. 35, fig. 60) is somewhat longer than all the following joints together, and is about as long as that of the sixth pair.

The last coalesced *ural* segment is about a third longer than broad.

The peduncle of the first pair of *uropoda* (Pl. V, fig. 4) is quite as long as the last coalesced ural segment, and more than three times as long as broad; the inner ramus is much shorter than the peduncle, and much longer than the outer ramus; both rami are serrated on both margins. The second pair reach a little beyond the apex of the peduncle of the last pair, the peduncle is much longer than the inner ramus, which is about a third part longer than the outer; the inner ramus is serrated on the outer margin and smooth on the inner; the outer ramus is serrated on the inner margin and smooth on the outer. The third pair reach almost to the apex of the telson; the peduncle is quite as long as the inner ramus, which is serrated on both margins, and scarcely longer than the outer ramus.

The *telson* has the margins smooth, and feebly convex.

COLOUR. Bright yellow, lustrous as if polished, the eyes are dark red.
LENGTH. 15—21 mm.
HAB. The Indian Ocean.

Gen. 9. **Glossocephalus,** C. BOVALLIUS, 1887.

Derivatio: *γλῶσσα* = the tongue, and *κέφαλος* = a large-headed fish.

Diagn. The *head* is comparatively short and broad, and produced into a broad rostrum, which is rounded in front. The under side of the rostrum is open. The hind part of the head is constricted.

The second pair of *antennæ* are hidden under the head, when folded, and, to a small extent, under the peræon.

The first two pairs of *peræopoda* are cheliform. The carpus and metacarpus of the fifth pair are much dilated.

The last coalesced *ural* segment is longer than, but not twice as long as, the first, and is only a little longer than broad.

The inner rami of all the three pairs of *uropoda* are free, not coalesced with the corresponding peduncles.

The *telson* is short, and tongue-shaped.

Syn. **1887. Glossocephalus,** C. BOVALLIUS. **35,** p. 35.

This genus is most easily distinguished from all the other genera of the family by the much dilated tibia, carpus, and metacarpus of the fifth pair of peræopoda, and also by the wide, almost cup-shaped carpus of the first two pairs. The dilated form of the joints of the fifth pair strikingly recall that feature in the sixth pair of *Phorcorhaphis*, STEBBING, and *Lycæopsis*, CLAUS.

The genus contains hitherto two species:

A. The hind margin of the metacarpus of the first pair of peræopoda is smooth. The seventh pair are longer than the femur of the sixth. 1. **G. Milne-Edwardsi.**

B. The hind margin of the metacarpus of the first pair of peræopoda is armed with a strong tooth. The seventh pair are shorter than the femur of the sixth. 2. **G. spiniger.**

1. **Glossocephalus Milne-Edwardsi,** C. BOVALLIUS, 1887.

The name is given in honour of Professor ALPHONSE MILNE EDWARDS.

Pl. V, fig. 5; and p. 22, fig. 6 and 6 a; p. 38, fig. 7l.

Diagn. The *head* in the male is as long as the first four peræonal segments together, in the female as long as the first three; the rostrum is about half as long as the rest of the head.

The metacarpus of the first pair of *peræopoda* has the hind margin entirely smooth, and the lower front corner only feebly produced. The third pair are considerably longer than the fourth and a little longer than the fifth. The carpus of the fifth pair is more than twice as long as the tibia. The sixth pair are shorter than the fifth. The seventh pair do not reach fully to the apex of the tibia of the sixth pair.

The lateral parts of the *pleonal* segments are rounded behind.

The first and second pairs of *uropoda* reach about to the apex of the last pair.

Syn. **1887. Glossocephalus Milne-Edwardsi, 35,** p. 35.

The integument of the *body* is smooth, without tubercles or excavations, hard and bright as if polished.

The *rostrum* is very broad at the apex, in the male half as broad as the ocular region, in the female a little narrower.

The first pair of *antennæ* in the male are less curved than usually in this family, and have the front corner of the first flagellar joint not at all projecting; the first flagellar joint is not twice as long as broad; the second joint is longer than the third, and as long as the fourth; these last three joints together are nearly twice as long as the under margin of the first joint. The first pair in the female are robust, with the first flagellar joint thick and tumid, and nearly as long as the two following joints together. The second pair in the male are six-jointed; the first joint is somewhat curved, and considerably shorter than the second, which is shorter than the third; the fourth joint is a little shorter than the second; the fifth and sixth are short, equal in length, and together about an eighth part of the length of the fourth joint.

The first two segments of the *peræon* are short and together scarcely as long as the third, the first three segments together are somewhat

shorter than the fifth, which is the longest of all; the sixth and seventh segments are equal in length. The *epimerals* are long, irregularly rounded below, and fully as long as the under margins of the corresponding segments.

The first two pairs of *peræopoda* are very small in comparison with the following pairs, and have the carpus shaped as an egg with the top obliquely cut off. The carpal process of the first pair is armed on the outer margin with two spine-like teeth, and is sharp-pointed at the apex; the metacarpus is longer than the stem of the carpus; the hind margin is straight, smooth, and sharp, and is longer than the front side of the carpal process; the front margin is convex, with the apex produced into a very short, and feebly curved tooth; the dactylus is smooth on the hind margin, and fully half as long as the metacarpus. The second pair are closely similar to the first, but the outer margin of the carpal process wants teeth; the metacarpus is only a little longer than the stem of the carpus, and has the hind margin concave, smooth, and a little longer than the front side of the carpal process; the dactylus is not more than a third part as long as the metacarpus, and has the hind margin smooth. The third pair are very slender and elongated, more than nine times as long as the second pair, the femur and tibia are much elongated, being more than eight times as long as broad. The fourth pair are like the third, but shorter. The fifth pair have the femur dilated, and not fully three times as long as broad; the front margin is serrated; the tibia is dilated, not twice as long as broad; the carpus is much dilated, about as broad as the femur, and a little more than twice as long as it is broad at the apex; the metacarpus is dilated, lanceolate, with both margins finely serrated, and is about as long as the carpus; the dactylus is very short. The sixth pair are about a fifth part shorter than the fifth pair, and have the femur somewhat narrower; the tibia and carpus are dilated, but not as much as in the preceding pair; the metacarpus is as long as the two preceding joints together, and is finely serrated on both margins. The femur of the seventh pair is broadly ovate, more than half as long as that of the sixth pair, and about a fourth part longer than all the following joints together.

The *pleon* is a little longer than the last three peræonal segments together, and is not carinated.

The last coalesced *ural* segment is quite as long as it is broad at the base, and has the margins convex; it is two and a half times as long as the telson.

The peduncle of the first pair of *uropoda* (p. 38, fig. 71) is about three times as long as broad, with feebly convex and serrated margins; it is longer than the last coalesced ural segment, and nearly twice as long as the outer ramus, which is more than a third longer than the inner; the rami are lanceolate, and serrated on both margins. The second pair reach fully as far as the first; the peduncle is longer than the last coalesced ural segment, and more than three times as long as broad, with the margins serrated; the outer ramus is more than half as long as the peduncle, and a little longer than the inner; the rami are narrower than in the first pair, and are serrated on both margins. The third pair are not twice as long as the telson; the peduncle is somewhat broader than long, and a third part as long as the outer ramus, which is a little longer than the inner; the rami are serrated as in the preceding pair.

The *telson* is broadly tongue-shaped, with the margins serrated, and is twice as long as the peduncle of the last pair of uropoda.

COLOUR. Yellowish white.
LENGTH. The male 17 mm, the female 9 mm.
HAB. The tropical region of the Atlantic.

2. **Glossocephalus spiniger,** C. BOVALLIUS, 1887.

Pl. V, fig. 6—9; and p. 26, fig. **26**; p. 29, fig. **43**.

Diagn. The *head* is longer than the first three peræonal segments together; the rostrum is not a third part as long as the rest of the head.

The metacarpus of the first pair of *peræopoda* has the hind margin armed with a very long, sharp tooth at the middle, and some small teeth above it, and the lower front corner produced into a long, sharp-pointed tooth, which is about half as long as the dactylus. The third pair are about as long as the fourth, and much shorter than the fifth. The carpus of the fifth pair is not twice as long as the tibia. The sixth pair are fully as long as the fifth. The seventh pair are much shorter than the femur of the sixth, scarcely reaching to three-fourths of its length.

The lateral parts of the *pleonal* segments are angular behind.

The first and second pairs of *uropoda* reach beyond the apex of the last pair.

Syn. **1887. Glossocephalus spiniger,** C. BOVALLIUS. **35,** p. 35.

The first pair of *peræopoda* (Pl. V, fig 8) have the same form as in the preceding species, but the carpal process is longer, armed with a single, very long, spine-like tooth on the outer margin, and has the apex produced into a long, curved, spine-like tooth; the metacarpus is much longer than the stem of the carpus, with the hind margin as long as the front side of the carpal process; the spine-like tooth on the hind margin is nearly half as long as the hind margin; the front margin is convex, with the long apical tooth nearly straight and sharp-pointed; the dactylus is curved, smooth on the hind margin, and is two-thirds as long as the metacarpus. The second pair (Pl. V, fig. 9) have the carpus similar to that in the first pair; the metacarpus is much longer than the stem of the carpus, with the hind margin concave, and entirely smooth; the front margin is convex, with the apex projecting into a feebly curved tooth, which is somewhat shorter than that in the first pair; the dactylus is nearly half as long as the metacarpus with the hind margin smooth. The third and fourth pairs are equal in length, more robust than in the preceding species, and much shorter than the fifth pair; the third pair are scarcely four times as long as the second. The femur of the fifth pair is narrower than in *Glossocephalus Milne-Edwardsi*, being more than four times as long as broad; the tibia is twice as long as broad; the carpus is a third part longer than the tibia, and about three times as long as it is broad at the apex; the metacarpus is dilated, lanceolate, and somewhat shorter than the carpus. The sixth pair are a trifle longer than the fifth; the metacarpus is shorter than the two preceding joints together. The femur of the seventh pair is not half as long as that of the sixth, and is much longer than all the following joints together.

The *ovitectrices* are crescent-shaped (Pl. V, fig. 6).

The *pleon* is much shorter than the last three peræonal segments together, and is dorsally feebly carinated.

The last coalesced *ural* segment is a fourth longer than broad.

The first pair of *uropoda* reach far beyond the apex of the last pair; the peduncle is a third part longer than the outer ramus, which is nearly twice as long as the inner; the peduncle is much longer than the

last coalesced ural segment. The peduncle of the second pair reach as far as that of the first, but the rami are shorter. The third pair are twice as long as the telson, with the rami nearly equal in length.

The *telson* is obtusely triangular; it is a third part as long as the last coalesced ural segment, and is only a little longer than the peduncle of the last pair of uropoda.

COLOUR. White.
LENGTH. 11 mm.
HAB. The Indian Ocean, Lat. 7°—2° S; Long. 80°—90° E.

Gen. 10. **Leptocotis,** TH. STREETS, 1877.

Diagn. The *head* is long, and produced into a comparatively short, narrow, sharp-pointed rostrum. The hind part of the head is constricted, forming a short cylindrical neck.
The second pair of *antennæ* are hidden under the head, when folded.
The first pair of *peræopoda* are subcheliform; the second are cheliform. The carpus and metacarpus of the fifth pair are not dilated.
The last coalesced *ural* segment is three or four times as long as the first, narrowly elongated, and cylindrical.
The inner rami of all the three pairs of *uropoda* are free, not coalesced with the corresponding peduncles.
The *telson* is narrowly elongated and cylindrical.

Syn. **1877. Leptocotis,** TH. STREETS. **24,** p. 136.
» » 1878. **26,** p. 283.
» » TH. STEBBING. 1888. **39,** p. 1593.

STREETS, when instituting the new genus Leptocotis (**24,** p. 137) observed that it »exhibits a remarkable blending of the characters of *Oxycephalus* and *Rhabdosoma*». The characteristic which most suggests affinity with Xiphocephalidæ is undoubtedly the narrowly elongated form of the last ural segment, of the peduncles of the uropoda, and of the telson. The other characteristics pointed out by STREETS correspond rather with *Streetsia* than with *Xiphocephalus*. From *Dorycephalus* the genus may he distinguished by the inner ramus of the third pair of uropoda being free, not coalesced with the peduncle, and by the second pair of peræopoda being

more nearly cheliform than in *Dorycephalus;* the best distinguishing characteristic is, however, the considerable elongation of the urus and its appendages. But by this last characteristic *Leptocotis mindanaonis*, STEBBING, is clearly excluded from the genus, and if it be not placed in the genus *Streetsia*, as I think it may be, and have already suggested (above p. 81), it ought to be the type for a new genus.

The generic diagnosis given by STREETS in 1877 contains only a few passages which could possibly serve for characterization of his new genus. They are:

»Gnathopoda short and complexly chelate. — — —. Caudal appendages long, biramous. Telson cylindrical, long».

In 1878 he gave the following diagnosis:

»Body long and slender. Head produced anteriorly to the superior antennæ in a long, slender rostrum, constricted posteriorly at its articulation with the thorax, the constricted portion short. Superior antennæ short, three-jointed, curved in the male; inferior antennæ five-jointed, joints subequal, excepting the last which is short. Mandibular appendage three-jointed. First and second pairs of thoracic legs short, chelate; the third and fourth simple; the last three pairs with the basal joint dilated; the last pair diminutive. The sixth abdominal segment (the fifth and sixth fused) elongated. The caudal appendages long, linear. Telson long, triangular at apex».

Whether *Oxycephalus tenuirostris*, CLAUS, and Leptocotis spinifera, STREETS, are identical or not is a very difficult question to settle, because the authors do not record at all, or only vaguely, any details of importance for specific distinction; I must therefore restrict myself to giving the two species below with the characteristics which are available from their descriptions.

1. **Leptocotis spinifera,** TH. STREETS, 1877.

Pl. V, fig. 15—17.

Diagn. The *head*, without the rostrum, is as long as the whole peræon; the rostrum is slightly more than half as long as the rest of the head.

The segments of the *peræon* increase in length backwards. The epimerals are long, broadly ovate, and transversely rugose.

The dactylus of the first two pairs of *peræopoda* is half as long as the metacarpus. The whole seventh pair are not half as long as the femur of the sixth.

The lateral parts of the first two *pleonal* segments are square behind, not produced; that of the third segment is produced behind into a long, spinous process.

Syn. **1877. Leptocotis spinifera,** TH. STREETS. **24,** p. 137.
» » » 1878. **26,** p. 283, pl. 2, fig. 4.

From the first description of the species published in 1877 I give the following passages:

»Head long, with the rostrum longer than the thorax; vertical diameter of the head greater posteriorly than anteriorly; the superior surface on a higher level than the dorsum of the thorax; abruptly constricted behind the eyes and in front of the first thoracic segment; the inferior border slightly convex; the under surface hollowed out on each side anteriorly in the form of fossæ for the reception of the superior antennæ; supra-fossal margin arched and slightly elevated; rostrum long, acute, slightly arched. — — —. Thorax seven-jointed; segments increasing in length posteriorly; epimerals long, broadly ovate, transversely rugose. Gnathopoda short chelate; the second pair longer than the first; carpus of first pair scarcely produced anteriorly, and inferiorly serrated; propodos broad, serrated on inferior margin; dactylus half the length of the propodos, arched, with a minute spine about the middle of the inferior surface, antagonizing with the extremity of the carpus. Second pair having the carpus more produced anteriorly than the first, extending to, or slightly beyond, the apex of the propodos, and terminating in a long fine point; propodos and dactylus similar to the first pair. — — — Fifth pair rudimentary, coxa dilated, small, with the remaining joints not half as long as the coxa of the preceding pair. — — — — Caudal appendages long, cylindrical, serrated along their inner margins, biramous; outer pair longer than the two following; ultimate short, reaching further than the inner. Telson long, cylindrical, extending beyond the extremities of the lamellæ».

From his later description in 1878 the following may be added:

»Head long, excluding the rostrum, as long as the thorax; — — — rostrum slightly more than one-third the length of the head (including its own length,) slender, acute, sligthtly arched. — — — The second

pair of legs similar to the first; the third and fourth pairs simple, slender, shorter than the fifth; the fifth, sixth, and seventh with the first joint dilated; the basal joint of the sixth broader than the fifth, but with the remaining joints shorter, and closely pectinated along their anterior margin; the pectinations on the third joint coarse, on the fourth very fine, while those on the fifth joint are intermediate between the two preceding; the last pair of legs diminutive, not half as long as the basal joint of the preceding. The first three segments of the abdomen subequal, inferior margins finely serrated, the third segment with the postero-inferior angle produced into a long, spinous process, the angle of the first and second segments square behind, not produced; the peduncles of swimming feet broadly oval. Sixth abdominal segment and telson elongated».

COLOUR. ?
LENGTH. 8—13 mm (STREETS).
HAB. The tropical region of the Pacific (STREETS).

2. **Leptocotis tenuirostris,** C. CLAUS, 1871.

Pl. V, fig. 10—14.

Diagn. The *head*, without the rostrum, is about as long as the first four peræonal segments together; the rostrum is only a little shorter than the rest of the head.

The middle segments of the *peræon* are the longest, the following decrease in length.

The dactylus of the first two pairs of *peræopoda* is more than half as long as the metacarpus. The whole seventh pair are more than half as long as the femur of the sixth.

The lateral parts of the first two *pleonal* segments are somewhat produced and rounded behind, that of the third segment is produced behind and sharp-pointed (?).

Syn. **1871. Oxycephalus tenuirostris,** C. CLAUS. **23,** p. 155.
» » » **27,** p. 194 (48).
» » » **36,** p. 71, pl. 24, fig. 2.

The original diagnosis of *Oxycephalus tenuirostris* from the year 1871 runs:

»Schnabel überaus dünn und gestreckt ungefähr so lang als der Kopf. Nackengegend desselben verengert und tief eingebogen. Körper

schlank und gracil, mit sehr dünnen Beinen. Das verschmolzene Caudalsegment stabförmig verlängert, ebenso die Basalglieder der beiden vordern Caudalgriffelpaare, welche mindestens 4 bis 5mal so lang sind als ihre lanzetförmigen Endäste (Annäherung an Rhabdosoma)».

From the description given by CLAUS in 1879 the following new details are taken:

»— — Antennen des Männchens mit hakenförmigem Zapfen am Ende des Stammes, die des Weibchens von mässiger Länge. Die Antennen des zweiten Paares ausserordentlich verlängert. Beine dünn und schlank, das letzte Paar klein. Die beiden vorderen Paare mit stark gezähnter Greifhand. Die Seitenflügel der Abdominalsegmente unbewaffnet. Das Caudaldoppelsegment stabförmig gestreckt, drei bis viermal so lang als die schmale Schwanzplatte».

COLOUR. (?)
LENGTH. About 10 mm. (CLAUS).
HAB. The Indian Ocean, the Gilolo-Passage. (CLAUS).

The family **Xiphocephalidæ,** n. f.

Diagn. The *head* is much elongated, provided with a narrow neck, and a long, needle-shaped rostrum.

The *eyes* are large, but occupy only a short space of the length of the head.

The first pair of *antennæ* are curved (♂), and fixed on the under side of the head; the first joint of the flagellum is very large, and tumid, the following joints are few in mumber, and subterminal (♂), or wanting (♀). The second pair are fixed on the under side of the head, are long, slender, and folded four times (♂), or entirely wanting (♀).

The *mouth-organs* are reduced, the maxillæ being rudimentary; the mandibles are provided with a much elongated palp (♂), or without a palp (♀).

The third, fourth, fifth, and sixth pairs of *peræopoda* are walking legs; the femur of the fifth and sixth pairs is not transformed. The seventh pair are transformed into a bladder-like sac. Ovitectrices are wanting.

The *uropoda* are provided with rami.
The *telson* is not coalesced with the last ural segment[1]).

Characteristic features of this family, in addition to those given in the diagnosis, are the enormous development of the auditory vesicles in the hind part of the head, the not less highly developed glands in some of the joints of the peræopoda (see above, p. 42), and also the peculiar manner of bearing and protecting the eggs and young ones (see above p. 31 and 43). The most striking among the external characteristics is the extreme elongation of the head and the urus, with its appendages, but notwithstanding this there are very few details showing analogies with the other elongated forms of Amphipoda, viz: *Tanaidea* and *Caprellidea*.

The first description of an animal belonging to this family was published in 1840 by H. MILNE EDWARDS (**7**, see above p. 3). In the following year EYDOUX and SOULEYET (**8**, p. 267) gave a detailed description of an Oxycephalid, which they supposed to be identical with the *Oxycephalus armatus* of H. MILNE EDWARDS. The drawing which they gave, is the first we have of a Xiphocephalid, and in execution has not been rivalled to this day; a copy of it in reduced scale is given below (Pl. VII, fig. 1). In the work of these authors we also find the first recognition of the animal in question as the type for an independent genus. According to their statement it was F. E. GUÉRIN-MÉNEVILLE, who proposed the new generic name Xiphocephalus. He did not give a full diagnosis, it is true, but the identity of the genus there was no possibility of mistaking, as the description of the species was exhaustive, and the accompanying drawing excellent, as I have mentioned above. From this generic name the present family-name has been taken.

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[1]) An exception is *Xiphocephalus brevicaudatus*, TH. STEBBING.

Gen. 1. **Xiphocephalus,** F. E. GUÉRIN-MÉNEVILLE, 1841.

Diagn. The *body* is much elongated, rod-like.
The *head* shows a distinct neck, an egg- or spindle-shaped ocular region, and a much elongated, needle-shaped rostrum.
The first two pairs of *peræopoda* are cheliform, and very small.
The last coalesced *ural* segment is cylindrical, rod-like.
The peduncles of the *uropoda* are much elongated, and very narrow. The inner ramus of the last two pairs is coalesced with the corresponding peduncle.
The *telson* is much elongated, and needle-shaped.

Syn.

1841. Xiphocephalus,	F. E. GUÉRIN-MÉNEVILLE.			**8,** p. 271.
1848. Rhabdosoma,	A. ADAMS and A. WHITE.			**9,** p. 63.
»	»	SPENCE BATE.	1862.	**20,** p. 344.
»	»	TH. STREETS.	1878.	**26,** p. 286.
»	»	C. CLAUS.	1879.	**27,** p. 195 (49).
»	»	»	1887.	**36,** p. 73.
»	»	TH. STEBBING.	1888.	**39,** p. 1606.
1858. Macrocephalus,	SPENCE BATE.			**18,** p. 361.
1887. Rhabdonectes,	C. BOVALLIUS.			**35,** p. 39.

The passage relating to the name Xiphocephalus, in the work of EYDOUX and SOULEYET runs:

»M. GUÉRIN-MÉNEVILLE, qui a bien voulu étudier avec nous cette espèce, pense qu'elle devra être séparée du genre Oxycéphale pour former une nouvelle division générique à laquelle on pourrait donner le nom de *Xyphicéphale*[1]), qui exprime son principal caractère; il se fonde en cela sur ce que les Oxycéphales véritables ont le corps plus court, de forme différente, et en ce qu'ils ont sept paires de pattes, dont deux didactyles et cinq ambulatoires».

ADAMS and WHITE, when they instituted *Rhabdosoma*, gave scarcely any ampler diagnosis than GUÉRIN-MÉNEVILLE. They said:

»We regret that the state of the only specimen in the British Museum is such that we cannot give the generic character with that detail which we should wish. — -- — The head is as long as the rest of the body, and ends in a very long beak; from the state of

1) »*Xyphicephale*» in the text, but Xiphocephalus is the correct spelling.

our specimen we cannot describe this, but indicate it on the plate from a drawing made at the time of capture. The immense length of the body and the beak would sufficiently mark this generic form».

On the same typical specimen on which ADAMS and WHITE had founded the genus *Rhabdosoma*, SPENCE BATE in 1858 founded his genus *Macrocephalus*. Four years later he himself dropped the new name in favour of *Rhabdosoma*.

In 1840 H. MILNE EDWARDS (**7**, p. 101) described *Oxycephalus armatus* with characteristics fully sufficient for the identification of the species. The *Oxycephalus armatus*, which was described at length by EYDOUX and SOULEYET (**8**, p. 267—71) is not identical with MILNE EDWARDS' species, but with that subsequently instituted by SPENCE BATE (see below p. 127).

The *Rhabdosoma armatum*, ADAMS and WHITE, is a true Xiphocephalus armatus, as is of course also *Macrocephalus longirostris*, SPENCE BATE, the two names really having been given to the same specimen.

The *Rhabdosoma Whitei*, SPENCE BATE, is a good species, and the characteristics given by its founder, are quite adequate.

The *Rhabdosoma armatum* and *Rh. Whitei*, recorded in 1878 by STREETS, are the true species, but his *Rh. longirostre* is based only on the bad drawing of SPENCE BATE from ADAMS and WHITE's typical specimen of Xiphocephalus armatus (see below p. 121).

The *Rhabdosoma armatum*, described by CLAUS in 1879 and 1887, is a mixture of the two species just metioned, the male being Xiphocephalus Whitei, and the female X. armatus.

The *Rhabdosoma Batei*, figured in 1884 by J. S. KINGSLEY (**32**, fig. 98), is a synonym for Xiphocephalus armatus.

The *Rhabdosoma investigatoris*, proposed in 1887 by G. M. GILES (**37**, p. 219), is identical with Xiphocephalus Whitei (see below p. 127).

The *Rhabdosoma armatum*, recorded in 1888 by STEBBING, is a Xiphocephalus Whitei. His new species, *Rh. brevicaudatum*, seems to be a good species.

Here I propose a new species Xiphocephalus Lilljeborgi.

The four species to be accounted for are distinguished as shows the following synoptical table:

A. The second pair of uropoda are shorter than the last coalesced ural segment. The flagellum of the first pair of antennæ in the male is four-jointed. The hind corner of the seventh peræonal segment is rounded. The last coalesced ural segment is longer than the first. The first pair of uropoda are shorter than the third. The telson is longer than the pleon and urus together. 1. **X. armatus.**

B. The second pair of uropoda are longer than the last coalesced ural segment. The telson is shorter than the pleon and urus together.

b 1. The last coalesced ural segment is as long as, or shorter than, the first.

bb 1. The seventh peræonal segment is not half as long as the sixth, the hind corner is produced downwards into a crescent-shaped, sharp-pointed process. The flagellum of the first pair of antennæ in the male is two-jointed. The first pair of uropoda are about as long as the third. 2. **X. Whitei.**

bb 2. The seventh peræonal segment is more than half as long as the sixth, the hind corner is obtusely angular, and only feebly produced. The first pair of uropoda are much longer than the third. 3. **X. Lilljeborgi.**

b 2. The last coalesced ural segment is twice as long as the first. The seventh peræonal segment is more than half as long as the sixth, the hind corner is broadly rounded. The first pair of uropoda are longer than the third. 4. **X. brevicaudatus.**

1. **Xiphocephalus armatus,** H. MILNE EDWARDS, 1840.

Pl. VI, fig. 1—20; and p. 20, fig. **2**; p. 34, fig. **57**, and p. 40 fig. **80**.

Diagn. The *head*, without the rostrum, is longer than the first six peræonal segments together. The neck is a little longer than the ocular region. The rostrum is much longer than the peræon and pleon together.

The flagellum of the first pair of *antennæ* in the male is four-jointed.

The seventh *peræonal* segment is about as long as the sixth, the hind corner is broadly rounded, not produced downwards.

The *epimeral* of the first pair of *peræopoda* is tongue-shaped. The carpal process of the first pair has a single sharp tooth on the hind margin; the lower hind corner of the metacarpus is sharp-pointed. The femur of the fifth and sixth pairs is dilated.

The first *ural* segment is much shorter than the last coalesced.

The first pair of *uropoda* are shorter than the third; the second pair are shorter than the last coalesced ural segment. The outer ramus of the first pair is nearly half as long as the inner; the outer ramus of the second pair is scarcely a fourth part as long as the inner; the outer ramus of the third pair is diminutive, much shorter than a tenth part of the inner.

The *telson* is longer than the pleon and urus together.

COLOUR. White, almost hyaline, with red spots on the last joints of the legs and on the uropoda, the eyes are deep red, almost black.

LENGTH. 50—120 mm.

HAB. The tropical region of the Atlantic, the Indian Ocean the Pacific.

Syn. **1840. Oxycephalus armatus,** H. MILNE EDWARDS. **7,** p. 101.

Rhabdosoma armatum, » A. ADAMS and A. WHITE. 1848. **9,** p. 63, pl. 13, fig. 1.

» » » SPENCE BATE. 1862. **20,** p. 334, pl. 54, fig. 6.

» » » TH. STREETS. 1878. **26,** p. 288, pl. 2, fig. 7.

» » (e. p.) » C. CLAUS. 1879. **27,** p. 194 (51).

» » » » » 1887. **36,** p. 74, pl. 26, fig. 1-4.

Rhabdonectes armatus, » C. BOVALLIUS. 1887. **35,** p. 39.

1858. Macrocephalus longirostris, SPENCE BATE. **18,** p. 362.

The original description of H. MILNE EDWARDS runs:

»Tête aussi longue que tout le reste du corps, terminée par un rostre styliforme très-long, renflée au milieu dans le point occupé par les yeux, puis rétrécie dans une étendue assez considérable, et renflée de nouveau à son extrémité postérieure, où se trouve la bouche. Antennes de la première paire très-petites et terminées par une lamelle ovalaire; celles de la seconde paire extrêmement longues et grêles. Pates des deux premières paires extrêmement petites; le premier article de celles des cinquième et sixième paires étroit et semblable à celui des pates précédentes. Les pates de la septième paire paraissent manquer complétement; mais il existe, au point où elles devraient s'insérer, une lamelle membraneuse semblable à celle fixée près de la base des pates précédentes. Portion postérieure de l'abdomen très-étroite; le sixième segment cylindrique, et terminé par un stylet impair aussi long que le corps. Les fausses pates de trois dernières paires très-grêles, très-longues, et terminées chacune par deux stylets. Longueur, environ 1 pouce».

All characteristics in this diagnosis, except one, agree exactly with the specimen, which has been the type for my description below, and the characteristics of the rostrum and the telson do not agree with any other of the forms I have examined. The only characteristic which at first seems difficult to conciliate with the features in my type specimen is: »le premier article de celles (pates) des cinquième et sixième paires étroit et semblable à celui des pates précédentes», though if we take into consideration the fact that MILNE EDWARDS did not try to mark the distinction between two species of the present genus Xiphocephalus, but that between a Xiphocephalus and *Oxycephalus piscator*, the seeming discrepancy will loose much of its importance. In comparison with the very broad, almost circular or pear-shaped femora of the fifth and sixth pairs of peræopoda in *Oxycephalus piscator*, the feebly dilated femora of the same pairs in Xiphocephalus armatus, must be considered as very narrow, but still we must allow that they are somewhat broader than those of the third and fourth pairs.

In corroboration of my opinion as to the identity of Xiphocephalus armatus, H. MILNE EDWARDS, with the present species, comes the fact that the specimens of Xiphocephalus marked *Oxycephalus armatus* and *Rhabdosoma armatum* in the collection of the »Musée d'Histoire

naturelle» in Paris were all Xiphocephalus armatus, after my diagnosis; one of these specimens, that marked «*Oxycephalus armatus*, MILNE EDWARDS, *Quoy et Gaimard*», and therefore most likely his original specimen, has been the type for the diagnosis and description I have given here, and from it the drawing has also been made (Pl. VI, fig. 1).

ADAMS and WHITE gave no specific description, but a good drawing, the first published of this species. A copy of it on a reduced scale is given below (Pl. VI, fig. 14).

SPENCE BATE in 1858 proposed the new generic and specific name *Macrocephalus longirostris*, taking for his type the very specimen that was the original of the drawing given in 1848 by ADAMS and WHITE. This being the case there is not the slightest doubt as to the identity of Xiphocephalus armatus with *Macrocephalus longirostris*.

The description given by SPENCE BATE in 1862 is very good, and points out some valuable characteristics, as for instance the carpal process of the first pair peræopoda having a secondary tooth on the hind margin, the sixth pair being shorter than the fifth, and the second pair of uropoda not being longer than the last ural segment. But with respect to the first pair of uropoda he is in error, as the original drawing of the animal, which was made at the capture, clearly shows (Pl. VI, fig. 14); and as ADAMS and WHITE as early as in 1848 stated that the specimen then was in bad order there is no wonder that the later drawing and description are somewhat incorrect.

TH. STREET's description of the species, published in 1878, is valuable, as it records two good specific characteristics, not appreciated before, namely the form of the under part of the seventh peræonal segment, and the dilation of the femur of the fifth and sixth pairs of peræopoda; the accompanying drawing is not good. His contention for maintaining a *Rhabdosoma longirostre*, which is based on the incorrect figure in SPENCE BATE's Catalogue, pl. 54, fig. 6, has no great weight, as I have said above. We must rely rather upon the original drawing from the fresh specimen than upon the later figure made from the same specimen in a bad state.

CLAUS in 1871 (8, p. 155), 1879, and 1887 argued that *Rhabdosoma Whitei* was the male form of *Rh. armatum*, and thus his descrip-

tion contained no characteristics of use for the specific distinction. He asserted further that only the fifth and sixth pairs of peræopoda were provided with branchial vesicles, while, as I have shown above, the second, third, and fourth pairs also have such appendages, but as they are usually concealed by the projecting lateral parts of the peræonal segments, i. e. the coalesced epimerals, they may easily escape notice.

In 1887 I gave a short diagnosis of *Rhabdonectes armatus*, H. Milne Edwards, with characteristics fully sufficient to distinguish it from *R. Whitei*.

Among the »Challenger» specimens of Xiphocephalids there seem to be none belonging to the present species.

The *body* is much compressed, and is only a little broader in the female than in the male. The integument is very thin, but hard, almost vitreous, and perfectly smooth.

The *head*, without the rostrum, is not fully as long as the peræon. The neck is about a fourth part longer than the ocular region. The rostrum is four or five times longer than the rest of the head, needle-shaped, with two marginal, serrated ridges on the under side; the apex of the rostrum is sharp-pointed. The rostrum is rather longer in the adult female than in the male. The antennal groove is large in the male, forming a protruding convexity in front of the ocular region; in the female it is less spacious, and is not visible on the dorsal side of the head.

The first pair of *antennæ* in the male (Pl. VI, fig. 3) are like that pair in *Oxycephalidæ*, having the second and third pedunclar joints almost fused and the last three joints of the flagellum together not half as long as the under margin of the first flagellar joint. In the young male the first pair are very like that in the young of *Oxycephalus piscator*. In the female this pair (Pl. VI, fig. 4) consist of a two-jointed peduncle, and a long single flagellar joint, which is almost spindle-shaped, and set with long olfactory hairs. The second pair in the adult male reach, when folded, to the front wall of the antennal groove; the joints are straight, and have the under margin fringed with short hairs.

The *mandibles* are comparatively small, and want a molar tubercle; the mandibular palp in the male is very long, its first joint being a little longer than the first joint of the second pair of antennæ; the second and third joints ave very short, subequal in length.

The *peræon.* The first segment is two-thirds as long as the second; the third, fourth, fifth, and sixth are equal in length; the seventh is only a little shorter than the sixth.

The *epimeral* of the first pair of peræopoda (Pl. VI, fig. 6) is free from, and articulating with, the first segment; it is deeper than long, evenly rounded, almost tongue-shaped, and has the front margin serrated. The epimerals of the following pairs are coalesced with the corresponding segments; those of the second, third, fourth, and fifth pairs have the under margin almost straight and sligthly serrated, and the corners obtusely rounded; that of the sixth pair has the hind portion somewhat deeper than the front part, and circularly rounded; the epimeral of the seventh pair (Pl. VI, fig. 5) has the under margin dumbbell-shaped, as STREETS justly remarks (**26,** p. 289), the hind portion being less deep than the front part, and circularly rounded.

The *branchial vesicles* are very large, tumid, elongate-eggshaped, and attached to the second, third, fourth, fifth, and sixth pairs of peræopoda in the male, as well as in the female; that of the second pair is longer than the whole leg, those of the following pairs are a little shorter than the corresponding femora; those of the fifth and sixth pairs are thicker, and more tumid, than the preceding.

The *peræopoda.* The first pair (Pl. VI, fig. 7, and p. 34, fig. 57) are very short, and are, when folded up, almost concealed by the large epimeral; the carpus is very broad; the carpal process is triangular, much longer than the stem of the carpus, and has a large sharp tooth at the middle of the hind margin; the front margin is serrated, and is much longer than the hind margin of the metacarpus, reaching about to the apex of the dactylus; the hind portion of the metacarpus forms a thin sharp edge, and has the lower corner triangularly produced and sharp-pointed; the dactylus is stout, curved, and about three-fourths as long as the metacarpus. The second pair (Pl. VI, fig. 8) are a little longer than the first, and have the carpus comparatively less dilated; the carpal process is somewhat curved, and reaches fully to the apex of the dactylus. The third and fourth pairs (Pl. VI, fig. 9) are similar in shape, but the fourth is somewhat longer; the femur is linear, about five times as long as broad; the tibia is longer than the femur, is linear in the male, and often also in the female, being about five or six times as long as broad; but in the ovigerous female the joint is more or less inflated, containing highly developed glands. The femur of the fifth pair is a little dilated, being

however four or four and a half times as long as broad; that of the sixth pair (Pl. VI, fig. 10) is more dilated, being about three and a half times as long as broad; the tibia and carpus are narrow and linear in the male and in the not ovigerous female, but much inflated in the female which carries eggs. The seventh pair consist of a single bladder-like joint, which is broader below.

The *pleon* is about as long as the peræon, and is dorsally carinated. The under margin of the segments is feebly curved, the hind corner is sharp-pointed, but scarcely produced.

The *urus* is about as long as the last two pleonal segments together; the first ural segment is thicker, and considerably shorter, than the last coalesced segment. On the under side of the segments run two marginal, serrated ridges.

The first pair of *uropoda* (Pl. VI, fig. 11) in the adult male and female are considerably shorter than the last pair, and do not reach to the middle of that pair; they are more than twice as long as the second pair, and have the inner ramus about half as long as the outer. The second pair (Pl. VI, fig. 12) do not reach beyond the apex of the last coalesced ural segment, and have the outer ramus a fourth part as long as the inner, which is about a sixth part as long as the peduncle. The third pair (Pl. VI, fig. 13, and p. 80, fig. 40) are much shorter than the telson, and have the outer ramus very diminutive being shorter than a twelfth part of the inner.

The *telson* is straight, sharp-pointed, and has serrated margins; it is much longer than the pleon and urus together.

2. **Xiphocephalus Whitei,** SPENCE BATE, 1862.

The name was given by SPENCE BATE in honour of Mr. ADAM WHITE.

Pl. VII, 1—20; and p. 24, fig. 13—17; p. 26, fig. **24**; p. 28 fig. **32**; p. 29, fig. **45**; p. 30, fig. **46** and **47**; p. 31, fig. **48** and **49**; p. 35, fig. **63** and **64**; p. 40, fig. **78**, **79**, **81**, and **82**; p. 42, fig. **83** and **85**; p. 43, fig. **86**; and p. 129, fig. **87**.

Diagn. The *head*, without the rostrum, is as long as the first six peræonal segments together. The neck is a little longer than the ocular region. The rostrum is shorter than the peræon and pleon together.

The flagellum of the first pair of *antennæ* in the male is two-jointed.

The seventh *peræonal* segment is not half as long as the sixth; is crescent-shaped, sharp-pointed, and produced downwards.

The epimeral of the first pair of *peræopoda* is obtusely crescent-shaped, and projects forwards. The carpal process of the first pair is smooth, without tooth on the hind margin; the lower hind corner of the metacarpus is sharp-pointed. The femur of the fifth and sixth pairs is narrow, not dilated.

The *pleon* is dorsally carinated.

The first *ural* segment is as long as, or longer than, the last coalesced segment.

The first pair of *uropoda* are about as long as the third; the second pair are longer than the last coalesced ural segment, but shorter than the third pair. The outer ramus of all the three pairs is more than half as long as the inner.

The *telson* is a little longer than the last pair of uropoda, and is shorter than the urus.

COLOUR. Yellowish white.

LENGTH. 35—75 mm.

HAB. The Southern tropical and subtropical regions of the Atlantic; the Indian Ocean; the tropical regions of the Pacific.

Syn. **1841. Oxycephalus armatus,**	[H. MILNE EDWARDS]. EYDOUX and » SOULEYET.		**8,** p. 267, pl. 4, fig. 13-32.
Rhabdosoma armatum,	» C. CLAUS.	1871.	**23,** p. 155.
» »	» »	1879.	**27,** p. 197 (51).
» »	» »	1887.	**36**, p. 74, pl. 25, fig. 1-6, pl. 26, fig. 5.
» »	» TH. STEBBING.	1888.	**39,** p. 1607.
1862. Rhabdosoma Whitei,[1])	SPENCE BATE.		**20,** p. 345, pl.
» »	» TH. STREETS.	1878.	**26,** p. 287, pl. 2, fig. 6.
Rhabdonectes »	» C. BOVALLIUS.	1887.	**35,** p. 39.
1887. Rhabdosoma investigatoris, G. M. GILES.	»		**37,** p. 219, pl. 4.

The original description of SPENCE BATE in 1862 was fully sufficient for the identification of his species. I give here the most important passages of it.

»— — Sixth segment of the pleon (= the last coalesced ural segment) not longer than the preceding. — — — First pair of gnathopoda having the coxa (= the epimeral) anteriorly produced to an obtuse point; carpus broadly infero-anteriorly produced as far as the inferior angle of the propodos; propodos short, stout, inferior angle anteriorly produced; dactylos long, arcuate, capable of antagonizing at the apex with the extremity of the carpus only. Second pair of gnathopoda much longer than the first; carpus infero-anteriorly produced beyond the extremity of the propodos, the process being slender and curved, terminating in a fine point; propodos increasing towards the distal extremity, inferior angle slightly anteriorly produced; dactylos arcuate, antagonizing at the extremity with the apex of the carpus. Pereiopoda gradually increasing in length posteriorly, the fourth pair being the longest; fifth obsolete. Antepenultimate pair of pleopoda reaching to half the length of the ultimate; peduncle having the outer margin coarsely, the inner finely serrated: penultimate pair originating on the inner side of the preceding, and longer than the sixth segment of the pleon (= the last coalesced ural segment); peduncle having the outer margin coarsely, the inner finely serrated; ultimate pair nearly as long again as the sixth

1) SPENCE BATE, in his publication of 1861 (**19,** p. 15, pl. 1, fig. 4) gave a drawing of the animal, and mentioned the name *Rhabdosoma Whitei*, but only in the explanation of the plates, and without the slightest description.

segment of the pleon; peduncle having both margins coarsely serrated; rami short, sharp, lanceolate, serrated. Telson cylindrical, reaching beyond the extremity of the ultimate pair of pleopoda, terminating obliquely in a fine point».

From the earlier publication of Eydoux and Souleyet I give the diagnosis and parts of the detailed description:

»Oxycephalus, corpore perangusto, elongatissimo, pellucido et roseo; capite longo, antice rostro longissimo et acuto terminato; ultimis segmentis abdominis longis, angustis et spinosis; ultimo perlongo et acuto».

»La tête, moins longue d'un tiers environ que le reste du corps, est un peu rétrécie après sa naissance et de forme cylindrique; elle présente ensuite un renflement allongé sur lequel se trouvent les yeux qui sont grands, ovalaires, non saillants, et qui ne se distinguent du reste de la tête que par les facettes dont ils sont composés; après cette portion renflée, la tête se rétrécit en un rostre styliforme très-grêle et très-aigu à son sommet, qui est à peu près deux fois aussi long qu'elle. En dessous de la base de ce rostre, en avant des yeux et dans une fossette assez profonde, se trouvent les antennes supérieures ou de la première paire, qui sont courtes, recourbées, composées de trois articles dont le second est très-grand, arqué, cilié en dehors, dilaté au bout et portant le troisième article, qui est très-petit et rudimentaire, au milieu de son bord antérieur. Dans les femelles, cette antenne est également composée de trois articles, mais qui sont d'une forme tout à fait différente; c'est le deuxième article qui est le plus petit, et le troisième, qui est le plus grand, est de forme ovalaire et cilié à son extrémité seulement. — — — — Immédiatement après les parties que nous venons de décrire (= les antennes inférieures), vient le tubercule buccal contre lequel sont appliquées deux paires de petites pattes didactyles, auxquelles font suite quatre autres paires de pattes ambulatoires assez longues, grêles et uniformes dans les mâles, à articles basilaires[1]) plus ou moins renflés chez les femelles. Le dernier segment thoracique est beaucoup plus court que les autres, dans les deux sexes, et dépourvu de la paire de pattes qu'il porte chez les Amphipodes voisins et même chez *l'Oxycephale océanique;* il présente seulement, en dedans, une petite lamelle arrondie

1) This statement, that the femur of the third, fourth, fifth, and sixth pairs of peræopoda in the female is inflated as well as the tibia and carpus, may very likely be right, though I have not observed this feature in any of the species.

qui ne déborde pas ses parois latérales et qui semble être le vestige de la dernière paire de pattes. Les autres pattes portent en dedans et à leur base, des grandes lamelles ovalaires, placées longitudinalement sur les cotés des segments thoraciques et qui, en se croisant par leurs bordes, servent de réceptacle aux oeufs et aux jeunes. L'abdomen est composé de six segments dont les trois premiers sont assez grands et portent chacun une paire de fausses pattes courtes, à tige très-large et terminée par deux filets ciliés. La queue est formée par les trois articles suivants qui sont allongés, minces, cylindriques, épineux en dessus et en dessous, les épines supérieures étant beaucoup plus petites que les inférieures; les deux premiers portent à leur extrémité postérieure de fausses pattes à tige très-longue et très-grêle, et terminées chacune par deux filets ciliés et fort courts[1]), le dernier[2]), aussi long que le précédents, se termine en pointe aigue.»

»— — — les jeunes Oxycéphales sont très-différents des adultes et ont une assez grand ressemblance avec le genre *Pronoé*.»

This description and the excellent drawing clearly prove that the animal examined by EYDOUX, SOULEYET, and GUÉRIN-MÉNEVILLE was a Xiphocephalus Whitei and not a *X. armatus*.

The description given by STREETS in 1878 agrees, in the characteristics recorded by him, with the features shown in the specimens which have been the types for my desription below.

Moreover the short description of *Rhabdosoma armatum* given by STEBBING in 1888 shows that his specimens **A**, **B** and **C** must be referred to Xiphocephalus Whitei.

Lastly I must refer to the new species *Rhabdosoma investigatoris* proposed by G. M. GILES in 1887. He does not give any description of the species but a very good drawing which is reproduced here on a somewhat reduced scale. Notwithstanding the differences, which he points out under five heads, at least the specimen figured is a true Xiphocephalus Whitei, as is easily seen on a comparison with the drawing of an adult male given below (Pl. VII, fig. 9). GILES erroneously considers the specimen figured by him to be an adult female, and says:

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1) They do not mention the second pair of uropoda although this pair are distinctly given in their drawing.

2) The telson.

(**37,** p. 220) »The male differs further in the inferior antennæ being much shorter, and the mandibular appendage correspondingly diminished.» It is clear therefore that both his specimens are males.

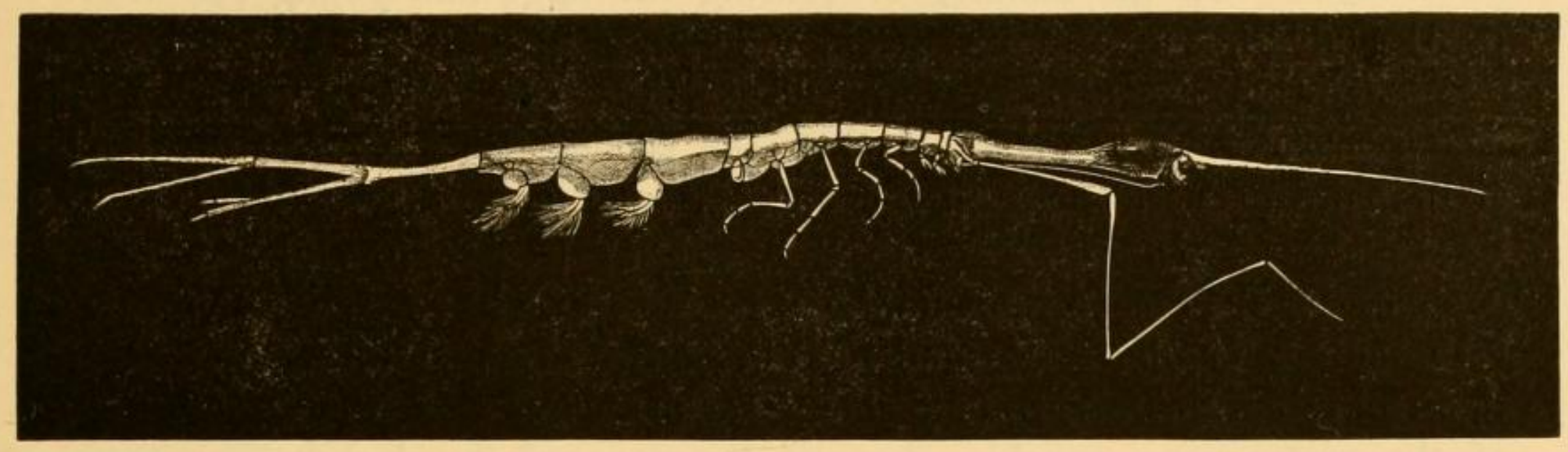

Fig. 87. Rhabdosoma investigatoris, GILES. Reduced copy from GILES, **37,** pl. 4, fig. 1.

The *head*, without the rostrum, is quite as long as the first six peræonal segments, in the male as well as in the female. The neck is more than a third part longer than the ocular region. The rostrum is about twice as long as the rest of the head, or in the female a little longer; the under margins are serrated. The antennal groove is like that in the preceding species.

The first pair of *antennæ* in the male (Pl. VII, fig. 10) have a two-jointed flagellum; the second joint (Pl. VII, fig. 11) is shorter than a third part of the under margin of the first flagellar joint. In the female this pair (p. 26, fig. **24**) have a single-jointed flagellum, which is almost globular at the apex. The first joint of the second pair in the male is the longest, the fifth joint is diminutive.

The *epistoma* (p. 28, fig. **32**) is more protruding than in *Xiphocephalus armatus*, and is armed with a sharp-pointed, process in the middle.

The *peræon* (p. 30, fig. **46** and **47**) The first segment is about half as long as the second; the seventh is not half as long as the sixth.

The *epimeral* of the first pair of peræopoda is free and articulating with the segment; it is crescent-shaped, with the anteriorly projecting corner obtuse (Pl. VII, fig. 13). The following epimerals are coalesced with the corresponding segments; those of the second, third, and fourth pairs have the under margin very slightly bilobed, with broadly rounded corners; that of the fifth pair has the hind part very deep and broadly rounded; that of the sixth pairs has also the hind part very deep, rounded in front and behind, and with a feebly projecting angle at the

middle (p. 30, fig. **47**). The epimeral of the seventh pair has the front corner feebly rounded and the hind part deeply projecting downwards, almost crescent-shaped, with the sharp-pointed apex directed straight downwards. On the manner of bearing the eggs and young see above p. 31 and 43, and also Pl. VII, fig. 20.

The *branchial vesicles* (p. 30, fig. **46**) are like those in *Xiphocephalus armatus*, and are attached to the second, third, fourth, fifth, and sixth pairs of peræopoda in the male as well as in the female.

The *peræopoda*. The first pair (Pl. VII, fig. 15) have the carpus comparatively broader than in the preceding species; the carpal process is broadly triangular; the hind margin is entirely smooth, without tooth; the front margin is serrated, and is much longer than the hind margin of the metacarpus, reaching beyond the apex of the dactylus; the hind portion of the metacarpus is produced at the lower corner into a sharp-pointed angle; the dactylus is curved, and is about half as long as the metacarpus. The second pair (Pl. VII, fig. 16) are much longer than the first; the carpal process reaches a little beyond the apex of the metacarpus, but does not attain the apex of the dactylus. The third and fourth pairs are similar in shape and equal in length; the femur is narrower at the base than at the apex; the tibia is longer than the femur, linear in the male and in the not ovigerous female, but inflated, as well as the carpus, in the female which carries more or less developed eggs. The fifth and sixth pairs are similar in shape and subequal in length, the sixth sometimes being a trifle longer than the fifth; the femur is longer than in the two preceding pairs, narrow and linear, about ten or eleven times as long as broad, and a little longer than the tibia; the tibia and carpus are inflated in ovigerous females (p. 42, fig. **85**), as I have said above, but linear in the other individuals; the not inflated carpus and the metacarpus of the sixth pair are armed on the front margin with peculiar comb-like sets of spines or bristles fixed on ovate discs (see above p. 35—36 and p. 35, fig. **63—64**); the metacarpus is longer than the carpus, and the dactylus is more than a third part as long as the metacarpus. The seventh pair consist of a single, evenly rounded, bladder-like joint.

The *pleon* is carinated; in the male it is considerably longer than the peræon; in the female it is scarcely longer than the last six peræonal segments together. The under margin of the pleonal segments is strongly convex or rather protruding, the hind corner is produced into a tolerably long and sharp-pointed process.

The *urus* is about as long as the whole pleon; in the female it is a little longer; the first ural segment is about as long as, or longer than, the last coalesced segment. Both segments are serrated on the under side.

The first pair of *uropoda* (Pl. VII, fig. 18) are about as long as the last pair, and reach fully to the middle of that pair; the first pair are less than a third part longer than the second pair, and have the inner ramus only a little longer than the outer. The second pair (p. 40, fig. 78) reach beyond the apex of the last coalesced ural segment, and have the outer ramus only a little shorter than the inner. The third pair (p. 40, fig. 79) are distinctly shorter than the telson, and have the outer ramus somewhat more than half as long as the inner (p. 40, fig. 81).

The *telson* (p. 40, fig. 82) is sharp-pointed, and sometimes obliquely bent at the apex; it is considerably shorter than the urus.

3. **Xiphocephalus Lilljeborgi,** n. sp.

The name is given in honour of Professor WILHELM LILLJEBORG of Upsala.

Pl. VII, fig. 21—24.

Diagn. The *head*, without the rostrum, is a little longer than the first five peræonal segments. The neck is scarcely longer than the ocular region. The rostrum is fully as long as the peræon and pleon together.

The seventh *peræonal* segment is more than half as long as the sixth; the hind corner of the epimeral is somewhat produced downwards, and is obtuse at the apex.

The epimeral of the first pair of *peræopoda* is obtusely triangular. The carpal process of the first pair is armed with two small teeth on the hind margin; the lower hind corner of the metacarpus is rounded. The femur of the fifth and sixth pairs is narrow, not dilated.

The *pleon* is dorsally smooth, not carinated.

The first *ural* segment is as long as the last coalesced segment.

The first pair of *uropoda* are considerably longer than the third, the second pair are much longer than the last coalesced

ural segment, and are nearly as long as the third pair. The outer ramus of the first two pairs is nearly as long as the inner; the outer ramus of the third pair is not half as long as the inner.

The *telson* is about as long as the last pair of uropoda, and is as long as the urus.

COLOUR. Light red all over the body.
LENGTH. 45—60 mm.
HAB. The tropical region of the Atlantic, at Lat. 17° 30′ N., Long. 37° 5′ W.

Xiphocephalus Lilljeborgi differs from the other species in the form of the first pair of peræopoda and their epimerals, in the form and length of the seventh peræonal segment, in the length of the first pair of uropoda, and in the relation between the rami of all the three pairs.

The *peræon.* The first segment is about two-thirds as long as the second; the seventh is scarcely a fourth part shorter than the sixth.

The *epimeral* of the first pair of peræopoda is deeper than long, obtusely triangular, with the apex directed straight downwards. That of the seventh pair has the hind corner a little projecting downwards, with the apex obtuse.

The *peræopoda.* The carpal process of the first pair (Pl. VII, fig. 23) is triangular, armed with two low teeth on the hind margin, and provided with two or three broad teeth on the front margin, which is a little longer than the hind margin of the metacarpus, but does not attain the middle of the dactylus; the hind margin of the metacarpus is produced at the lower corner into a rounded and serrated process; the dactylus is strongly curved, and is quite as long as the metacarpus. The second pair (Pl. VII, fig. 24) are much longer than the first; the carpal process is very slender and sharp-pointed, reaching far beyond the apex of the metacarpus, and beyond the middle of the dactylus. The third and fourth pairs are similar in shape and equal in length; the tibia is about as long as the femur. The fifth and sixth pairs are sinilar in shape, but unequal in length, the sixth pair being distinctly longer than the fifth; the metacarpus is scarcely longer than the carpus. The single joint of the seventh pair is almost truncated at the apex.

The *pleon* is not carinated, and is longer than the whole peræon. The under margin of the segments is convex; the hind corner is feebly produced and sharp-pointed.

The *urus* is scarcely longer than the last two pleonal segments together, and is thicker, and more robust, than in the two preceding species. The first segment is quite as long as the last coalesced segment.

The first pair of *uropoda* are about a fifth part longer than the last pair, and reach far beyond the middle of that pair; the first pair are more than a third part longer than the second, and have the outer ramus about as long as the inner. The second pair reach far beyond the apex of the last coalesced ural segment, and have the outer ramus only a little shorter than the inner. The third pair reach almost to the apex of the telson, and have the outer ramus not half as long as the inner.

The *telson* is comparatively thick, is straight and sharp-pointed, and is quite as long as the urus.

4. **Xiphocephalus brevicaudatus,** TH. STEBBING, 1888.

Diagn. The *head*, without the rostrum, is longer than the whole peræon. The neck is a third part longer than the ocular region.

The seventh *peræonal* segment is only a little shorter than the sixth; the hind part of the epimeral is somewhat deeper than the front part, and is broadly rounded.

The epimeral of the first pair of *peræopoda* is as deep as long (?), with rounded corners. The carpal process of the first pair is finely denticulated on the hind margin; the lower hind corner of the metacarpus is squared. The femur of the fifth and sixth pairs is moderately dilated.

The *pleon* is dorsally smooth, not carinated (?).

The first *ural* segment is half as long as the last coalesced segment.

The first pair of *uropoda* are much longer than the third; the second pair are much longer than the last coalesced ural segment, and are quite as long as the third pair. The outer ramus of the first pair is about half as long as the inner; that of the second pair is not a sixth part as long as the inner; that of the third pair is minute, not a tenth part as long as the inner.

COLOUR. ?
LENGTH. »The specimen outstretched measured four-fifths of an inch, the rostrum being broken» (STEBBING).
HAB. »North Atlantic, Lat. 10° 55′ N., Long. 17° 46′ W. surface. — — One specimen, female» (STEBBING).

Syn. **1888. Rhabdosoma brevicaudatum,** TH. STEBBING **39,** p. 1612, pl. 208.

Xiphocephalus brevicaudatus comes near to *X. armatus* in the form of the first and seventh peræonal segments, in the somewhat dilated femora of the fifth and sixth pairs, in the short first ural segment, and in the very short outer rami of the uropoda; to *X. Lilljeborgi* it shows relationship in the form of the first pair of peræopoda, and in the length of the peduncle of the first two pairs of uropoda. From all the other species it is easily distinguished by the serration of the hind margin of the carpal process in the first pair of peræopoda.

For further details I refer the reader to STEBBING's work.

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„ 24.	„ „ „ „ „ „ *Xiphocephalus Whitei*, ♀.	„ „ „ „	„ 26.
„ 25.	„ „ „ „ „ „ *Simorhynchotus Lilljeborgi*, ♀.	„ „ „ „	„ „
„ 26.	„ „ „ „ „ „ *Glossocephalus spiniger*, ♀.	„ „ „ „	„ „
„ 27.	The forepart of the body of *Tullbergella cuspidata*, ♂.	„ „ A. M. Westergren)	„ „
„ 28.	The second pair of antennæ of *Simorhynchotus Lilljeborgi*, ♂.	„ „ „	„ 27.
„ 29.	„ „ „ „ „ „ *Oxycephalus pectinatus*, ♂.	„ „ „	„ „
„ 30.	„ „ „ „ „ „ *Stebbingella typhoïdes*, ♂.	(Reduced copy from Claus, **36**)	„ „
„ 31.	The last joint of the second pair of antennæ of *Dorycephalus Lindstroemi*.	(Drawn by the author)	„ „
„ 32.	Epistoma of *Xiphocephalus Whitei*, ♂.	„ „ „ „	„ 28.
„ 33.	Labrum of *Oxycephalus piscator*, ♂.	„ „ „ „	„ „
„ 34.	Mandible of *Simorhynchotus Lilljeborgi*, ♂.	„ „ „ „	„ „
„ 35.	„ „ *Oxycephalus piscator*, ♂.	„ „ „ „	„ „
„ 36.	„ „ „ „ young, ♂.	„ „ „ „	„ „
„ 37.	„ „ „ „ ♀.	„ „ „ „	„ 29.
„ 38.	„ „ *Streetsia Steenstrupi*, ♂.	„ „ „ „	„ „
„ 39.	„ „ *Dorycephalus Lindstroemi*, ♂.	„ „ „ „	„ „
„ 40.	Labium of *Tullbergella cuspidata*, ♂.	„ „ „ „	„ „
„ 41 and 42.	Maxillipeds of *Oxycephalus piscator*, ♂.	„ „ „ „	„ „
„ 43.	„ „ *Glossocephalus spiniger*, ♀.	„ „ „ „	„ „
„ 44.	„ „ *Dorycephalus Lindstroemi*, ♂	„ „ „ „	„ „
„ 45.	„ „ *Xiphocephalus Whitei*, ♀.	„ „ „ „	„ „
„ 46.	The first two peræonal segments of *Xiphocephalus Whitei*, ♂.	„ „ A. M. Westergren)	„ 30.
„ 47.	The sixth and seventh peræonal segments of the same animal, ♂.	„ „ the author)	„ „

Fig. 48. The fourth peræonal segment of the same animal, with a row of eggs, ♀. (Drawn by A. M. Westergren) p. 31.

„ 49. The sixth peræonal segment of the same animal with a row of nearly hatched young, ♀. „ „ „ „ „

„ 50. The first pair of peræopoda of *Simorhynchotus Lilljeborgi*, ♂. „ „ the author) „ 32.

„ 51. „ „ „ „ „ „ *Tullbergella cuspidata*, ♂. „ „ „ „ „ „

„ 52. „ „ „ „ „ „ *Streetsia Steenstrupi*, ♂. „ „ „ „ „ „

„ 53. „ „ „ „ „ „ *Cranocephalus Goësi*, ♂. „ „ „ „ „ „

„ 54. The second pair of peræopoda of *Oxycephalus Clausi*, ♂. „ „ the author) „ 33.

„ 55. „ „ „ „ „ „ *Streetsia Steenstrupi*, ♂. „ „ „ „ „ „

„ 56. The first „ „ „ „ *Dorycephalus Lindstroemi*, ♂. „ „ A. M. Westergren) „ „

„ 57. „ „ „ „ „ „ *Xiphocephalus armatus*, ♂. „ „ the author) „ 34.

„ 58. The seventh pair of peræopoda of *Streetsia carinata*, ♀. „ „ „ „ „ „

„ 59. „ „ „ „ „ „ *Tullbergella cuspidata*, ♂. „ „ „ „ „ „

„ 60. „ „ „ „ „ „ *Stebbingella Théeli*, ♂. „ „ „ „ „ 35.

„ 61. „ „ „ „ „ „ *Tullbergella cuspidata*, ♂. „ „ „ „ „ „

„ 62. The sixth „ „ „ „ *Streetsia pronoïdes*, ♀.[1] „ „ „ „ „ „

„ 63. Peculiar sensitive organs from the carpus of the sixth pair in *Xiphocephalus Whitei*, ♂. „ „ A. M. Westergren) „ „

„ 64. Similar organs from the metacarpus of the sixth pair in the same animal, ♂. „ „ „ „ „

„ 65. The dactylus of the first pair of peræopoda of *Oxycephalus Clausi*, ♂. „ „ the author) „ 36.

„ 66. Coupling spine from the first pair of pleopoda of *Oxycephalus piscator*, ♂. „ „ „ „ „

1) Wrongly named Streetsia carinata in the text, p. 35.

Fig. 67. Coupling spines from the first pair of pleopoda of *Simorhynchotus Lilljeborgi*, ♂. (Drawn by the author) p. 36.

„ 68 and 69. Cleft bristle from the first pair of pleopoda of *Oxycephalus piscator*, ♂. „ „ „ „ „ 37.

„ 70. Cleft bristle from the first pair of pleopoda of *Simorhynchotus Lilljeborgi*, ♂. „ „ „ „ „ „

„ 71. The urus of *Glossocephalus Milne Edwardsi* ♂. „ „ „ „ „ 38.

„ 72. „ „ „ *Cranocephalus Goësi*, ♂ „ „ „ „ „ „

„ 73. „ „ „ *Dorycephalus Lindstroemi*, ♂. „ „ A. M. Westergren) „ „

„ 74. „ „ „ *Tullbergella cuspidata*, ♂. „ „ the author) „ „

„ 75. „ „ „ *Oxycephalus piscator*, ♂. „ „ „ „ „ 39.

„ 76. „ „ „ *Simorhynchotus Lilljeborgi*, ♂. „ „ „ „ „ „

„ 77. The inner ramus of the first pair of uropoda in *Dorycephalus Lindstroemi*, ♂. „ „ A. M. Westergren) „ „

„ 78. The second pair of uropoda of *Xiphocephalus Whitei*, ♀. „ „ the author) „ 40.

„ 79. „ third „ „ „ „ *X. Whitei*, ♀. „ „ „ „ „ „

„ 80. „ third „ „ „ „ *Xiphocephalus armatus*, ♂. „ „ „ „ „ „

„ 81. The inner ramus of the third pair of uropoda of *Xiphocephalus Whitei*, ♀. „ „ A. M. Westergren) „ „

„ 82. The telson of the same animal, ♀. „ „ „ „ „

„ 83. Cutaneous gland form the margin of the epimeral in the first pair of peræopoda of *Xiphocephalus Whitei*, ♂. „ „ „ „ 42.

„ 84. The dactylus of the first pair of peræopoda of *Oxycephalus latirostris*, ♀. „ „ „ „ „

„ 85. The tibia of the fourth pair of peræopoda in *Xiphocephalus Whitei*, filled with glands, ♀. „ „ „ „ „

„ 86. A young of *Xiphocephalus Whitei*. „ „ the author) „ 43.

„ 87. *Xiphocephalus Whitei*, from the side, young ♂. (Facsimile from Giles, **37**) „ 129.

PLATE I.

Simorhynchotus Lilljeborgi, Oxycephalus piscator, and O. Clausi.

PLATE I.

Simorhynchotus Lilljeborgi, C. Bovallius.

Fig. 1. The male from the side. (Drawn by the author.)
„ 2. The first pair of antennæ, ♂. „ „ „ „
„ 3. The head of the female. „ „ „ „
„ 4. The last flagellar joints of the first pair of antennæ, ♀. „ „ „ „
„ 5. The second pair of peræopoda, ♂. „ „ „ „
„ 6. The sixth „ „ „ ♂. „ „ „ „
„ 7. The dactylus of the seventh pair of peræopoda, ♂. „ „ „ „

Oxycephalus piscator, H. Milne Edwards.

Fig. 8. The male from the side. (Facsimile from H. Milne Edwards, **7**.[1])
„ 9. A young male from the side. (Drawn by the author.)
„ 10. A female from the side. (Reduced copy from Claus, **36**.)
„ 11. The first pair of peræopoda, ♂. (Drawn by the author.)
„ 12. The dactylus of the same pair, ♂. „ „ „ „
„ 13. The second pair of peræopoda, ♂. „ „ „ „
„ 14. The seventh „ „ „ ♂. „ „ „ „
„ 15. The dactylus of the same pair, ♂. „ „ „ „
„ 16. A female from the side (*O. bulbosus*). (Facsimile from Streets, **26**.)
„ 17. The first pair of peræopoda, ♀. „ „ „ „
„ 18. The second „ „ „ ♀. „ „ „ „

Oxycephalus Clausi, C. Bovallius.

Fig. 19. The male from the side. (Drawn by A. M. Westergren.)
„ 20. „ „ „ „ „ (Facsimile from Streets, **26**.)
„ 21. The first pair of peræopoda, ♂. „ „ „ „
„ 22. The second „ „ „ ♂. „ „ „ „
„ 23. The sixth „ „ „ ♂. (Drawn by A. M. Westergren.)
„ 24. The metacarpus of the seventh pair, ♂. „ „ „

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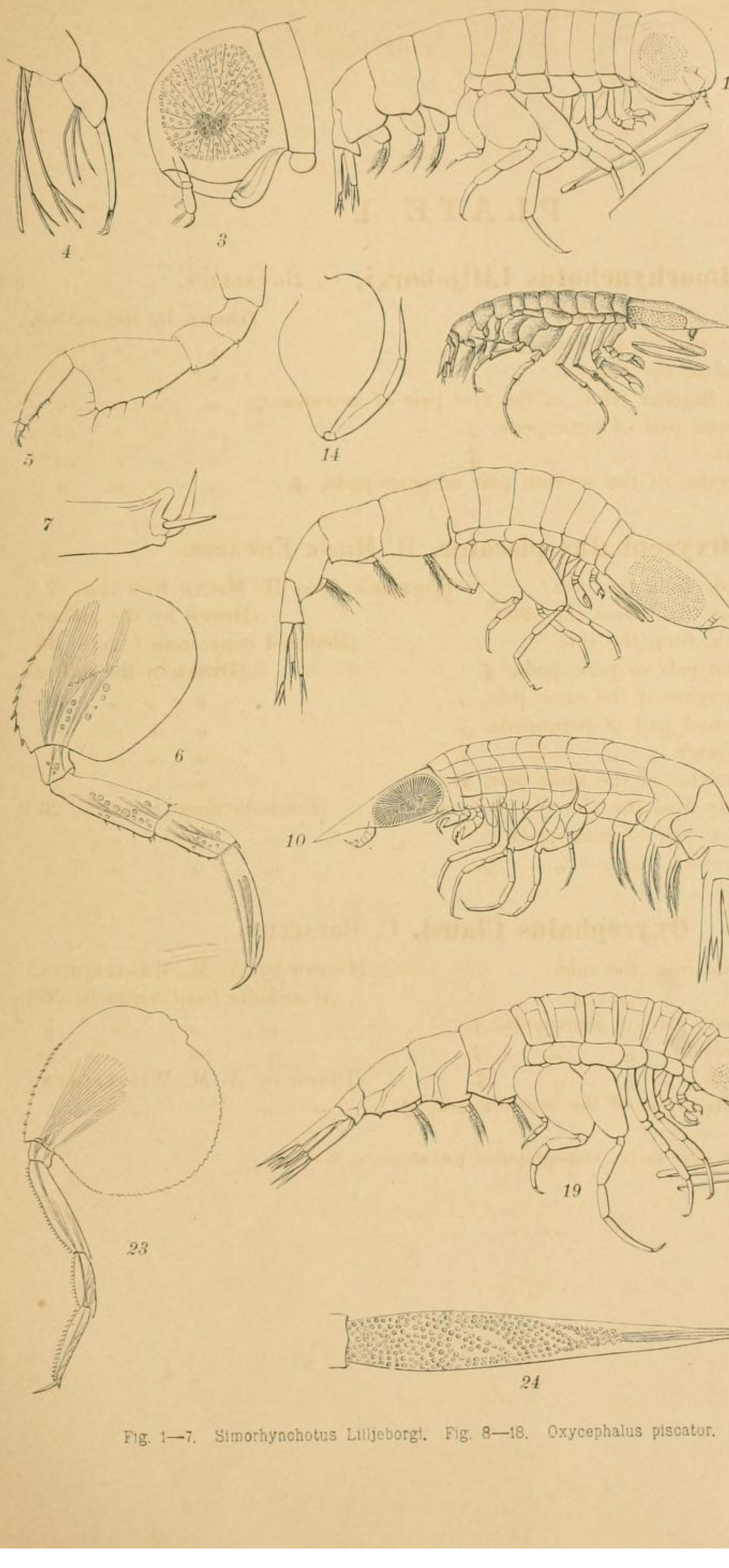
[1]) The figures refer to the bibliographical list above, p. 2—10.



W. Meyer sculp.

Fig. 1—7. Simorhynchotus Liljeborgi. Fig. 8—18. Oxycephalus piscator. Fig. 19—24. Oxycephalus Clausi.

PLATE II.

Oxycephalus Clausi, O. tuberculatus, O. pectinatus, O. latirostris, Tullbergella cuspidata, Calamorhynchus pellucidus and Dorycephalus Lindstroemi.

PLATE II.

Oxycephalus Clausi, C. Bovallius.

Fig. 1. The urus, ♂. (Drawn by the author.)

Oxycephalus tuberculatus, Spence Bate.

Fig. 2. The animal from the side. (Facsimile from Spence Bate, **20**.)
„ 3. The second pair of peræopoda. „ „ „ „

Oxycephalus pectinatus, C. Bovallius.

Fig. 4. The head from above, ♂. (Drawn by A. M. Westergren.)
„ 5. The first pair of peræopoda, ♂. „ „ „
„ 6. The second „ „ „ ♂. „ „ „

Oxycephalus latirostris, Claus.

Fig. 7. The female from the side. (Drawn by the author.)
„ 8. „ „ „ „ „ (Reduced copy from Claus, **36**.)
„ 9. The first pair of peræopoda, ♀. (Drawn by the author.)
„ 10. The second „ „ „ ♀. „ „ „ „
„ 11. The dactylus of the seventh pair of peræopoda, ♀. „ „ „ „
„ 12. The urus, ♀. „ „ „ „

Tullbergella cuspidata, C. Bovallius.

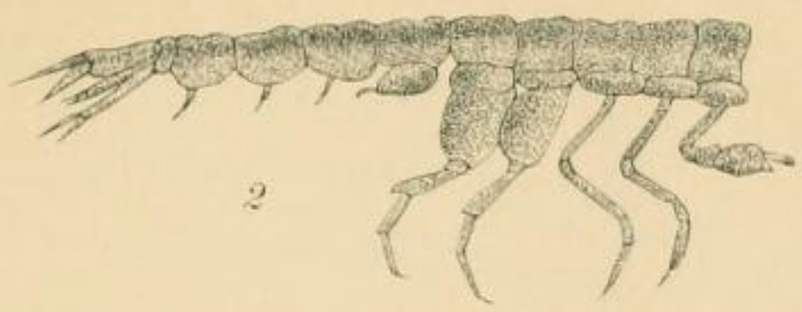
Fig. 13. The second pair of peræopoda, ♂. (Drawn by the author.)

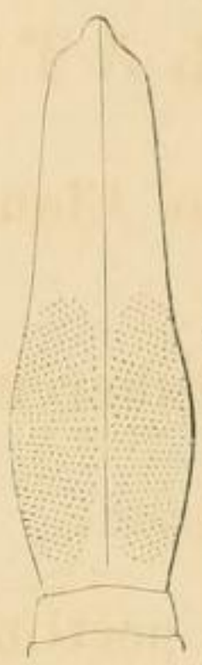
Calamorhynchus pellucidus, Th. Streets.

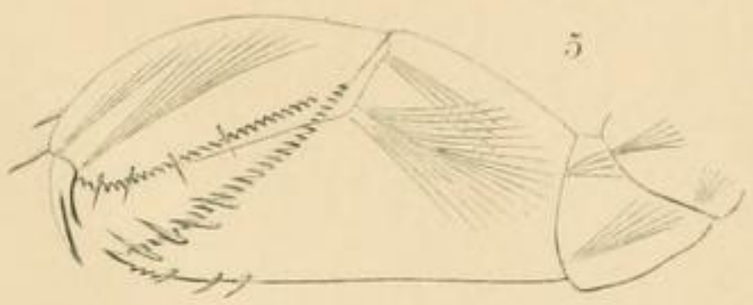
Fig. 14. The head from above, ♀. (Facsimile from Streets, **20**.)
„ 15. The second pair of peræopoda, ♀. „ „ „ „

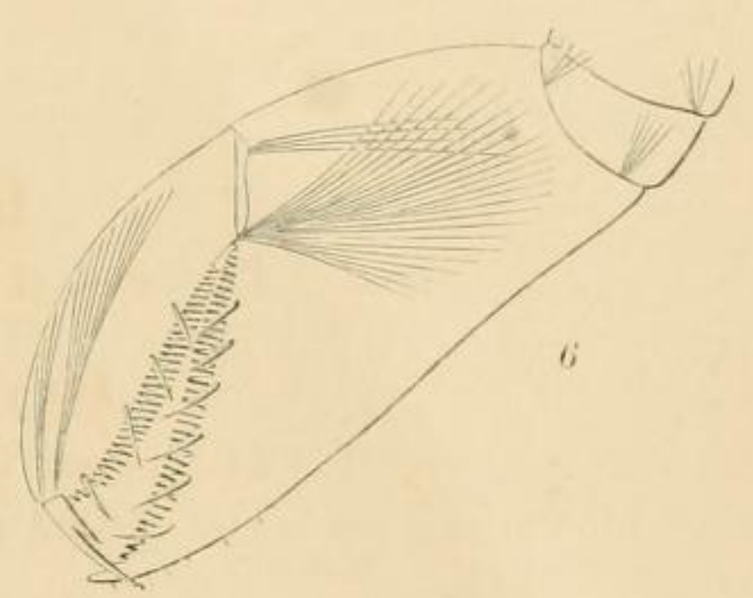
Dorycephalus Lindstroemi, C. Bovallius.

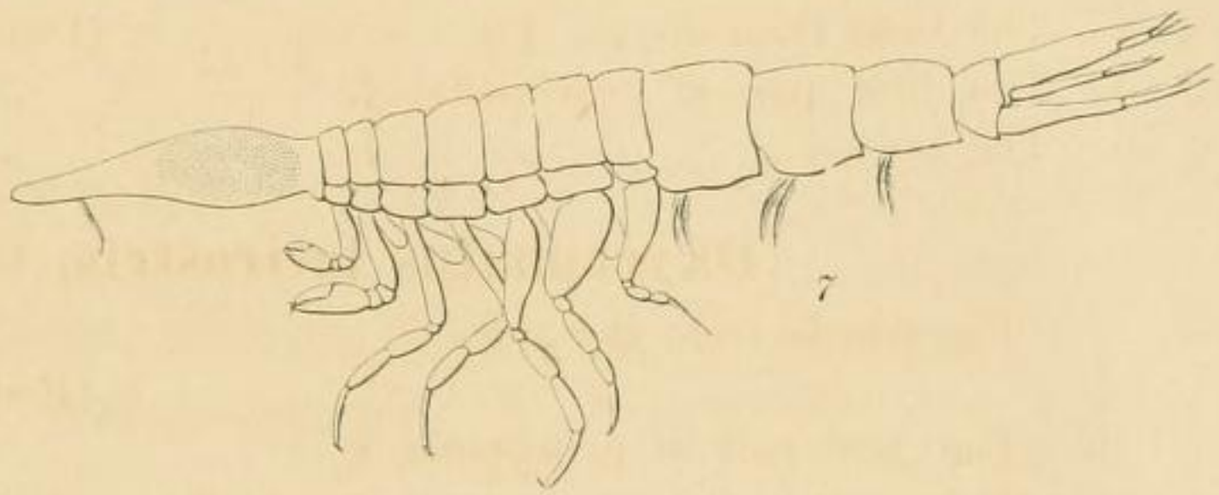
Fig. 16. The female from the side. (Drawn by the author.)
„ 17. The second pair of peræopoda, ♂. „ „ A. M. Westergren.)
„ 18. The seventh „ „ „ ♂. „ „ the author.)

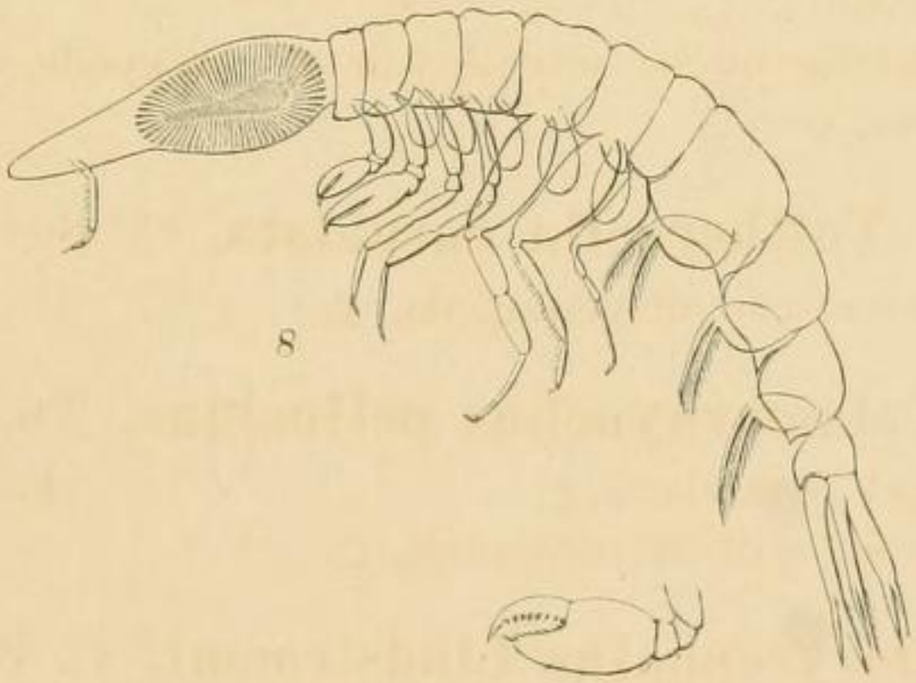


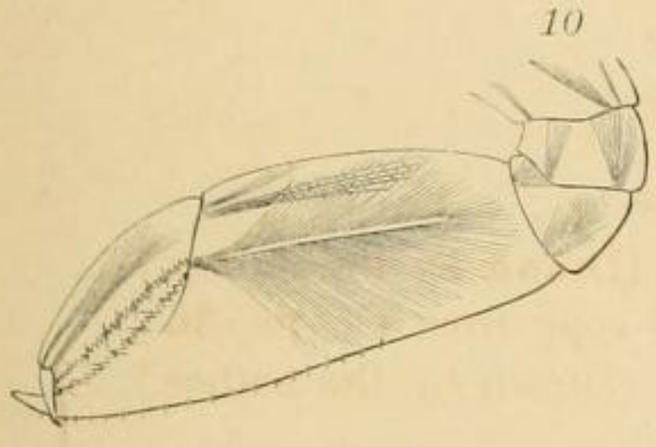


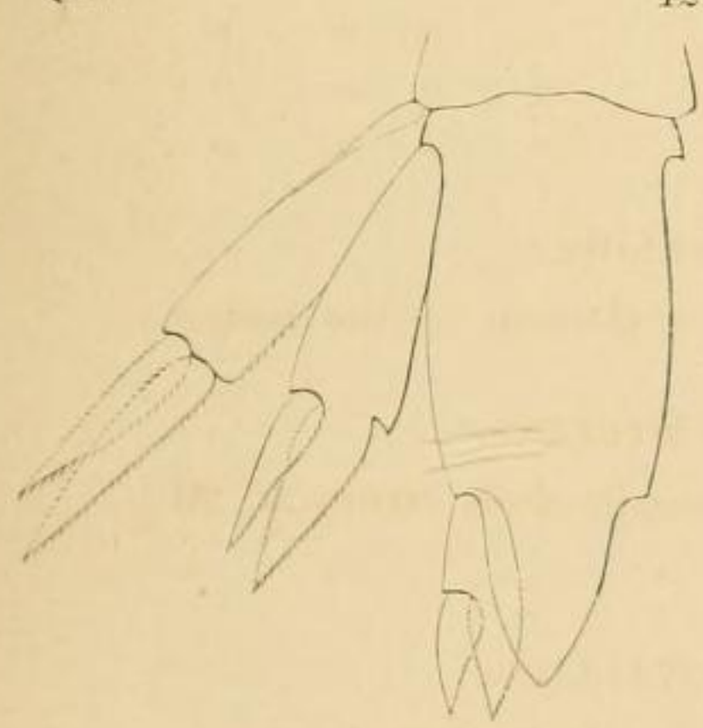


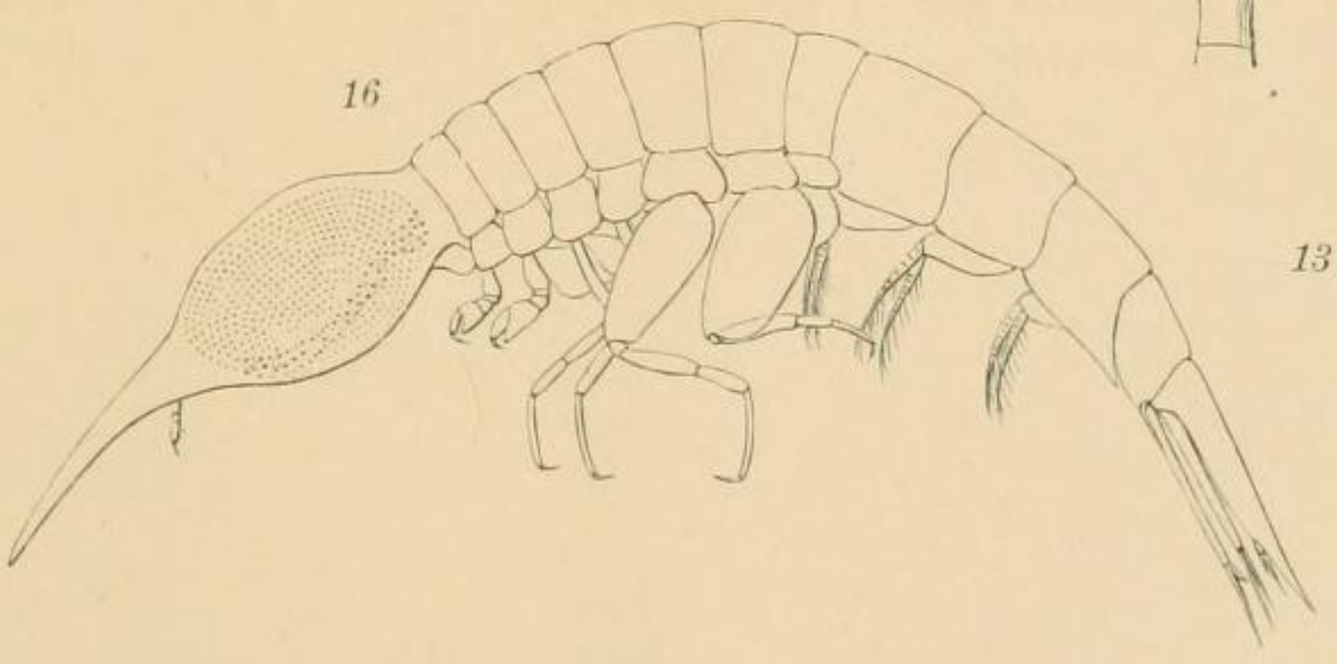












W. Meyer sculp.

Fig. 1. Oxycephalus Clausi. Fig. 2—3. Oxycephalus tuberculatus. Fig. 4—6. Oxycephalus pectinatus. Fig. 7—12. Oxycephalus latiorstris. Fig. 13. Tullbergella cuspidata. Fig. 14, 15. Calamorhynchus pellucidus. Fig. 16—18. Dorycephalus Lindstroemi.

PLATE III.

Dorycephalus Lindstroemi, Streetsia Steenstrupi, S. pronoïdes, and S. carinata.

PLATE III.

Dorycephalus Lindstroemi, C. Bovallius.

Fig. 1. The male from the side. (Drawn by A. M. Westergren.)

Streetsia Steenstrupi, C. Bovallius.

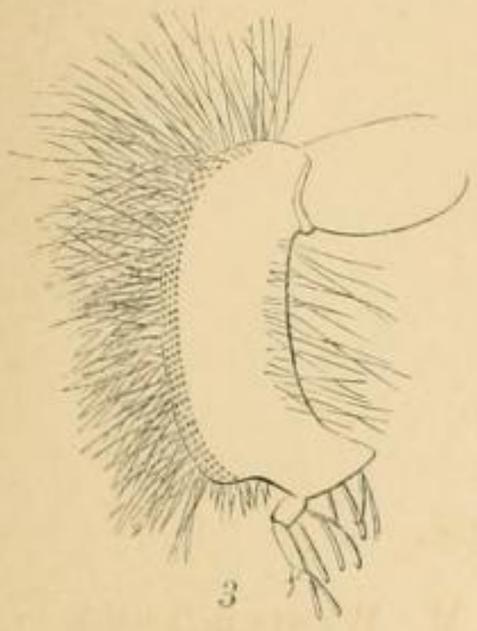
Fig. 2. The male from the side (Drawn by A. M. Westergren.)
„ 3. The first pair of antennæ, ♂. „ „ „
„ 4. The dactylus of the fourth pair of peræopoda, ♂. „ „ „
„ 5. The carpus and metacarpus of the sixth pair of peræopoda, ♂. „ „ „
„ 6. The urus, ♂. „ „ the author).

Streetsia pronoïdes, C. Bovallius.

Fig. 7. The female from the side. (Drawn by the author.)
„ 8. The first pair of peræopoda, ♀. „ „ „ „
„ 9. The second „ „ „ ♀. „ „ „ „
„ 10. The sixth „ „ „ ♀. „ „ „ „
„ 11. The seventh „ „ „ ♀. „ „ „ „
„ 12. The urus „ „ „ ♀. „ „ „ „

Streetsia carinata, n. sp.

Fig. 13. The first pair of peræopoda, ♀. (Drawn by the author.)
„ 14. The second „ „ „ ♀. „ „ „ „
„ 15. The urus „ „ „ ♀. „ „ „ „



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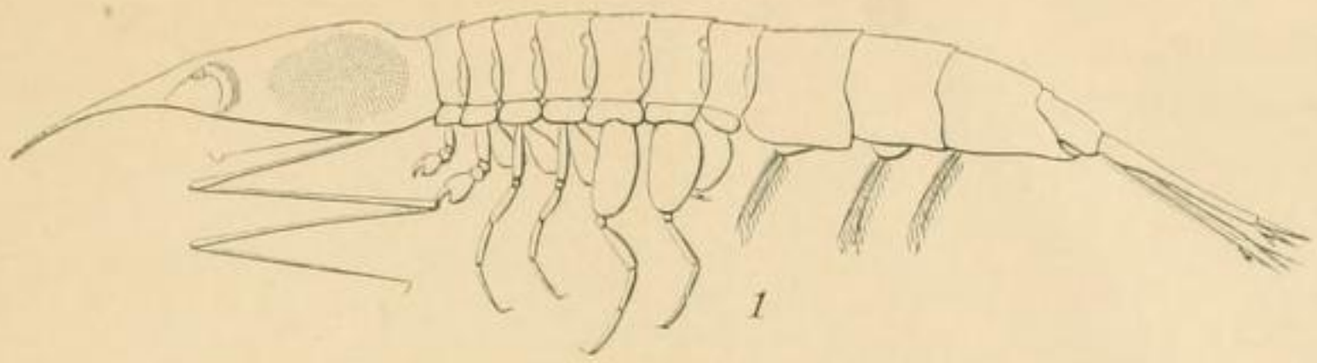

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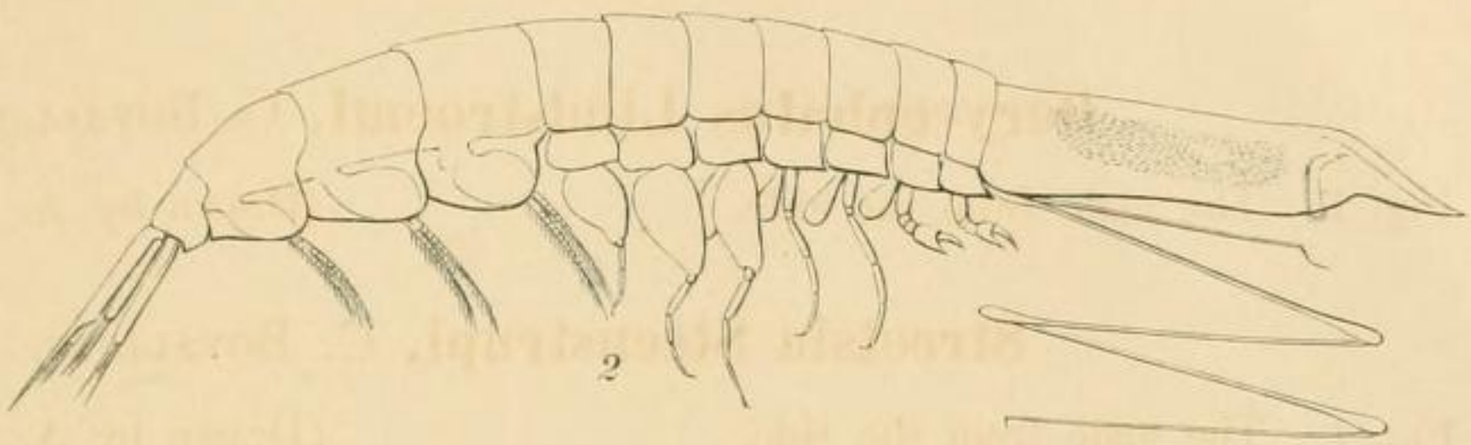

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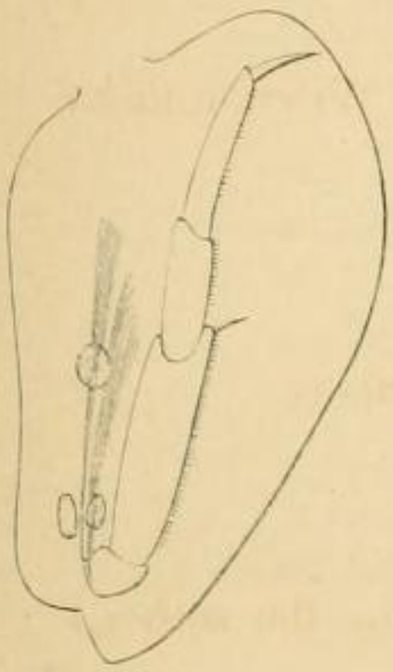

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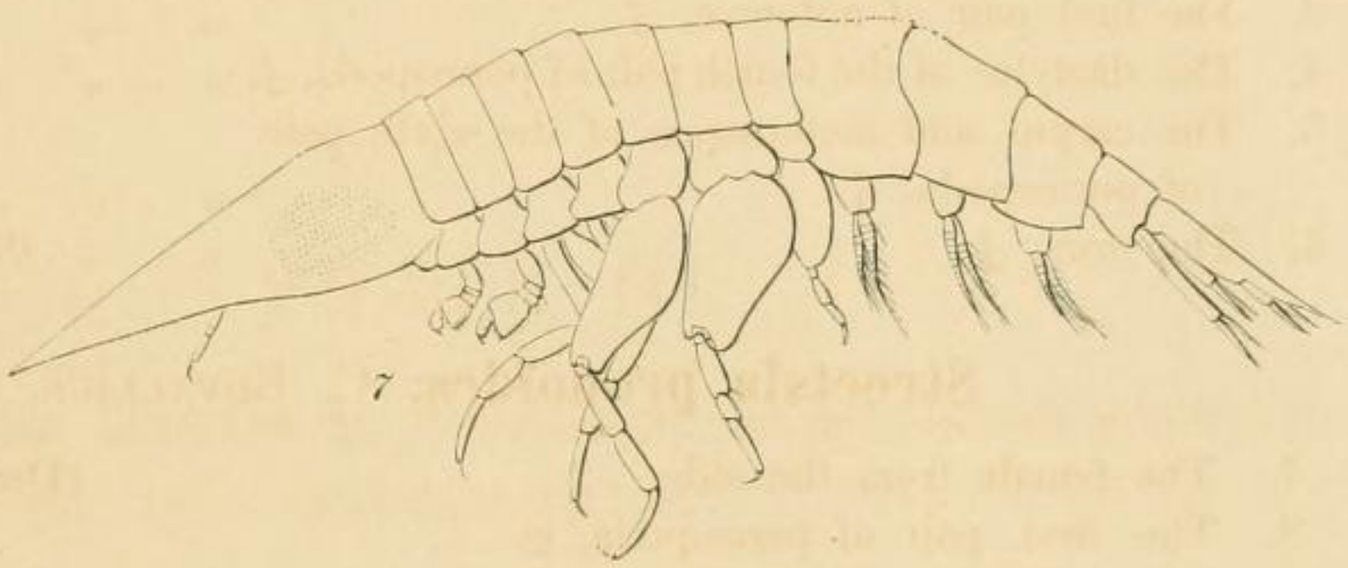

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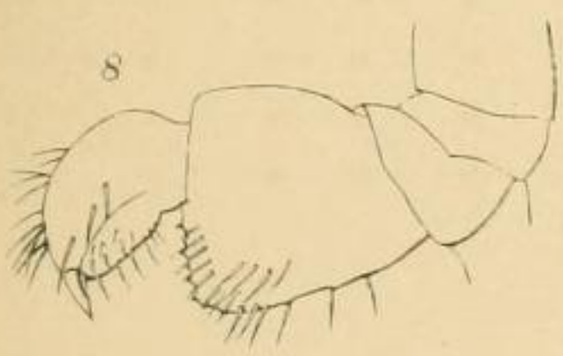

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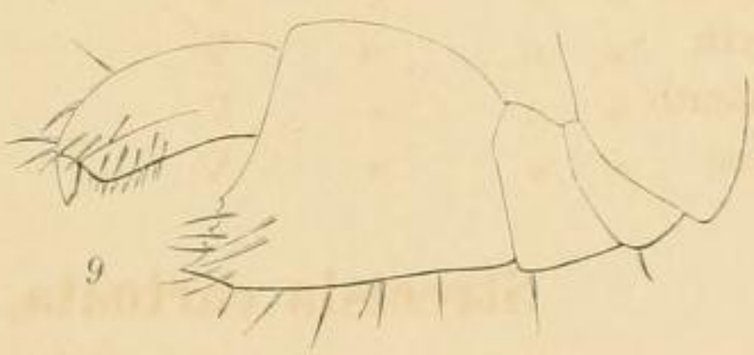

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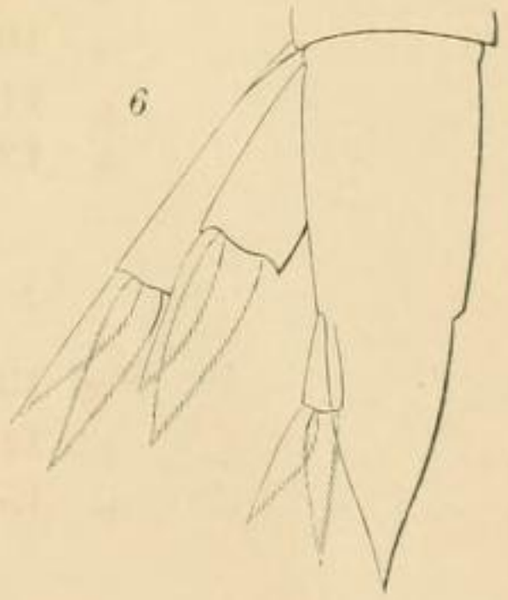

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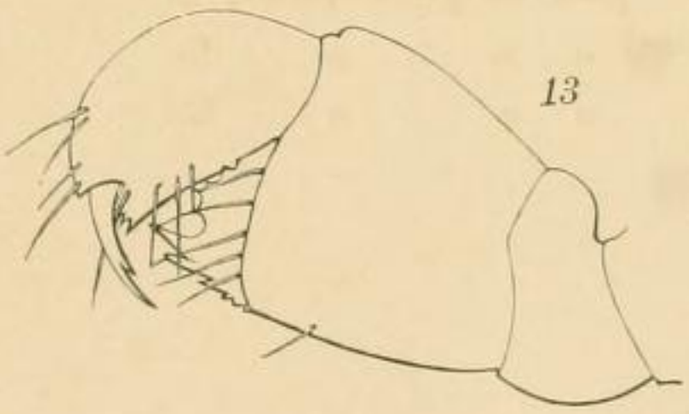

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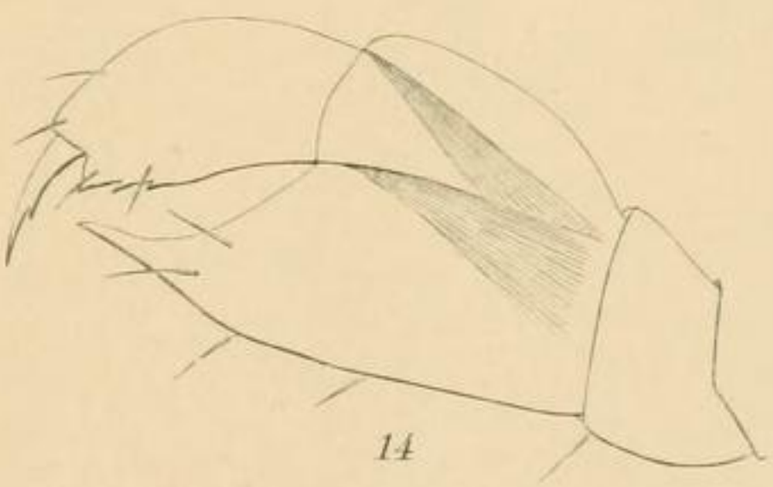

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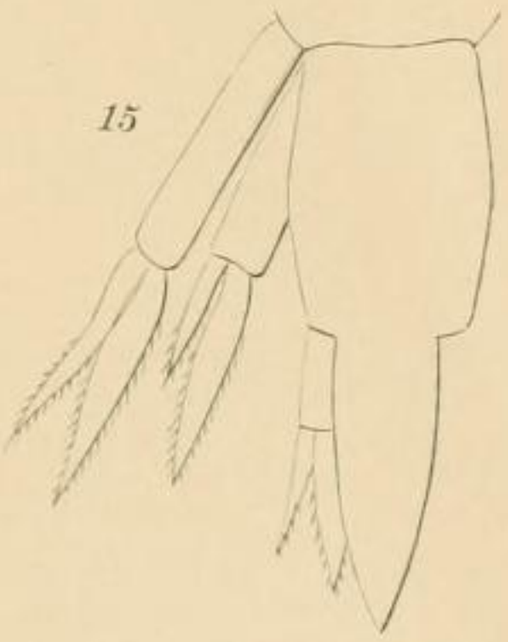

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W. Meyer sculp.

Fig. 1. Dorycephalus Lindstroemi. Fig. 2—6. Streetsia Steenstrupi. Fig. 7—12. Streetsia pronoides.
Fig. 13—15. Streetsia carinata.

PLATE IV.

Streetsia carinata, Streetsia longiceps, Streetsia porcellus, Cranocephalus Goësi, Stebbingella typhoïdes and Stebbingella sclerotica.

PLATE IV.

Streetsia carinata, n. sp.

Fig. 1. The female from the side. (Drawn by the author.)
„ 2. The head from above, ♀. „ „ „ „

Streetsia longiceps, C. Claus.

Fig. 3. The female from the side. (Reduced copy from Claus, **36**.)

Streetsia porcellus, C. Claus.

Fig. 4 The female from the side. (Reduced copy from Claus, **36**.)
„ 5. The first pair of peræopoda, ♀. „ „ „ „ „
„ 6. The second „ „ „ ♀. „ „ „ „ „

Cranocephalus Goësi, n. sp.

Fig. 7. The male from the side. (Drawn by the author.)
„ 8. The first pair of antennæ, ♂. „ „ „ „
„ 9. The second pair of peræopoda, ♂. „ „ „ „

Stebbingella typhoïdes, C. Claus.

Fig. 10. The male from the side. (Reduced copy from Claus, **36**.)
„ 11. The animal from above. „ „ „ „ „
„ 12. The second pair of peræopoda. „ „ „ „ „

Stebbingella sclerotica, Th. Streets.

Fig. 13. The male from the side. (Facsimile from Streets, **26**.)
„ 14. The head of the female. „ „ „ „
„ 15. The first pair of peræopoda. „ „ „ „
„ 16. The second „ „ „ „ „ „ „ „

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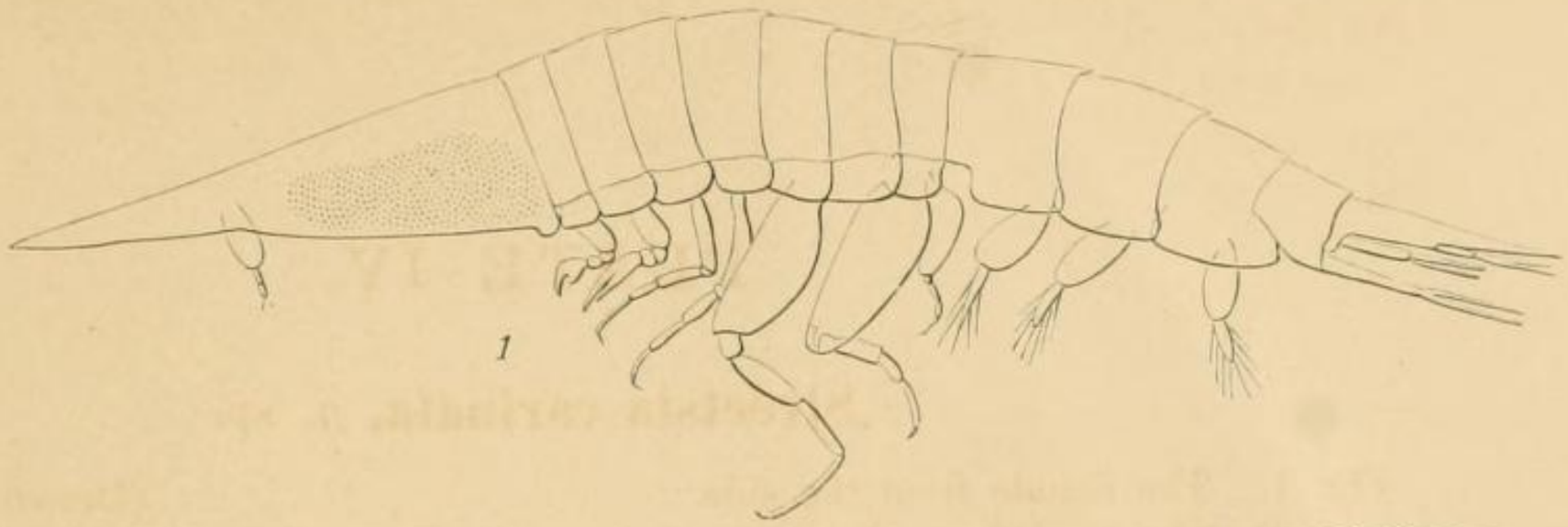

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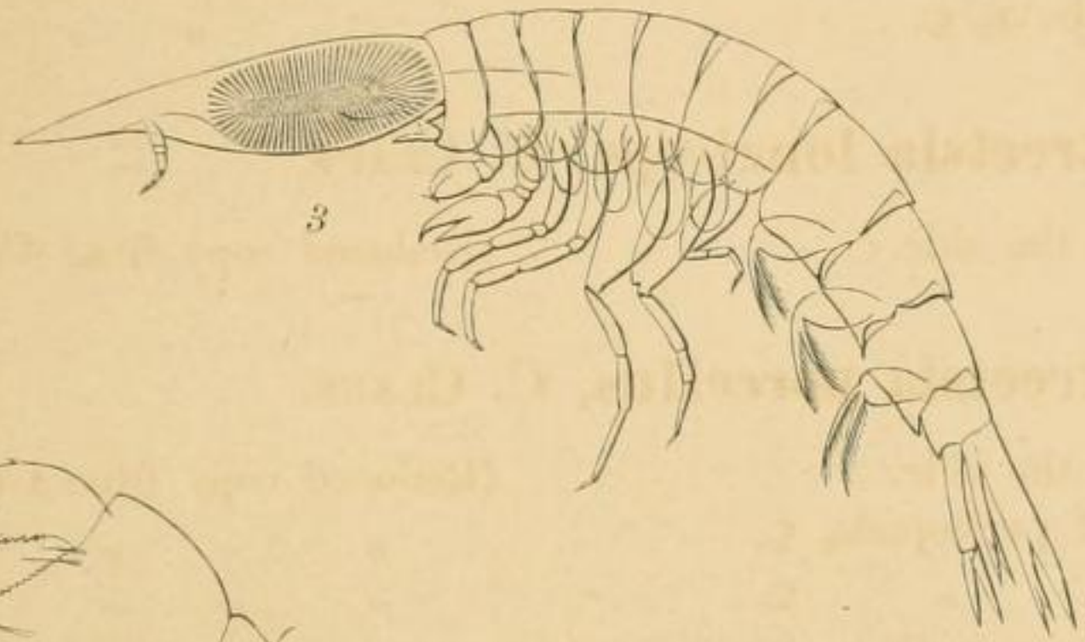

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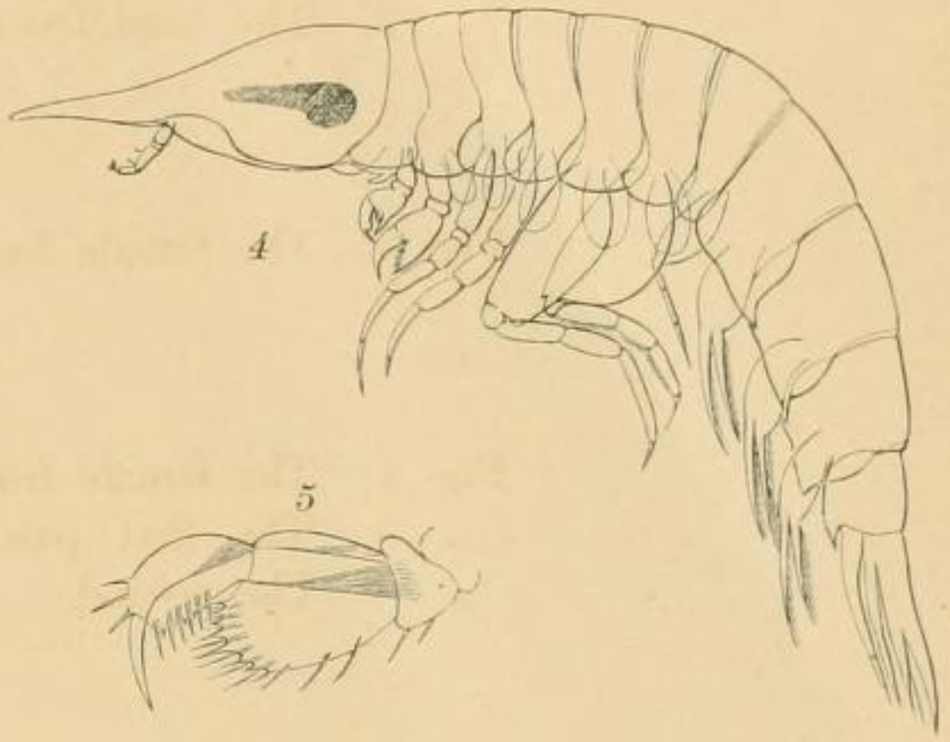

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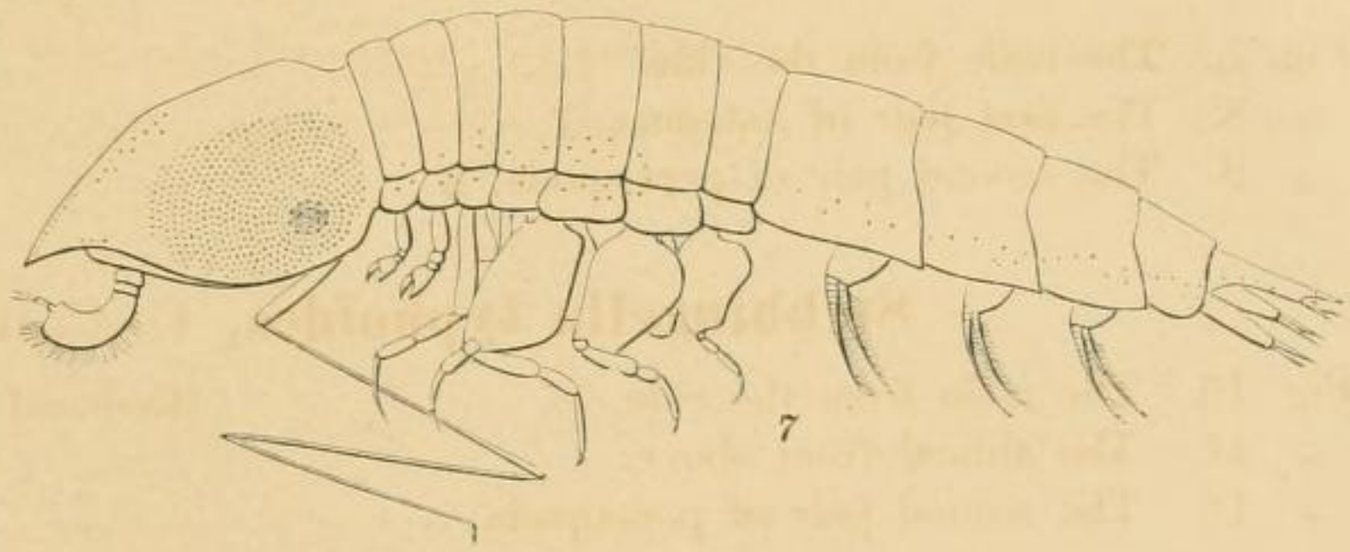

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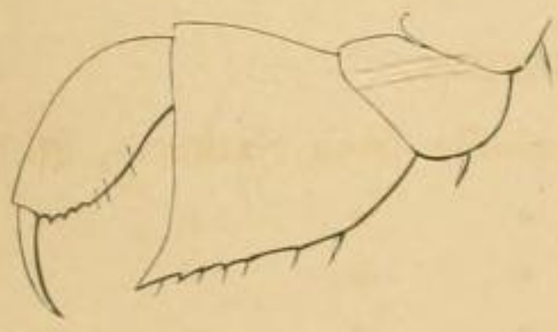

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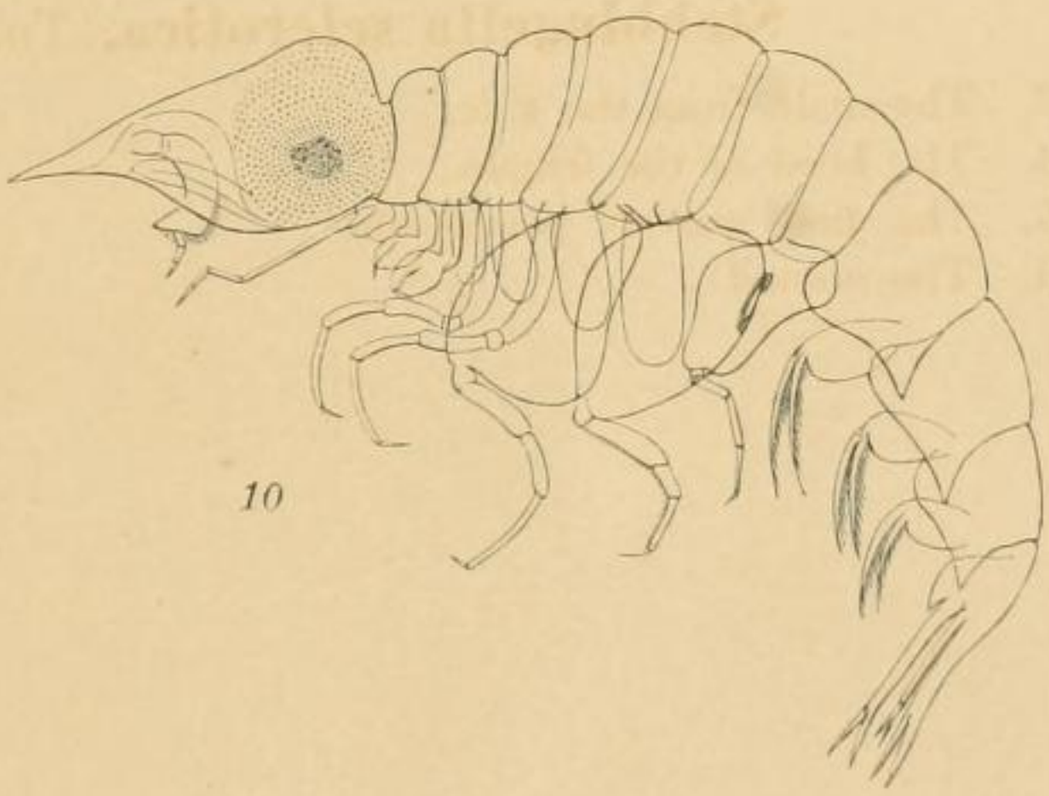

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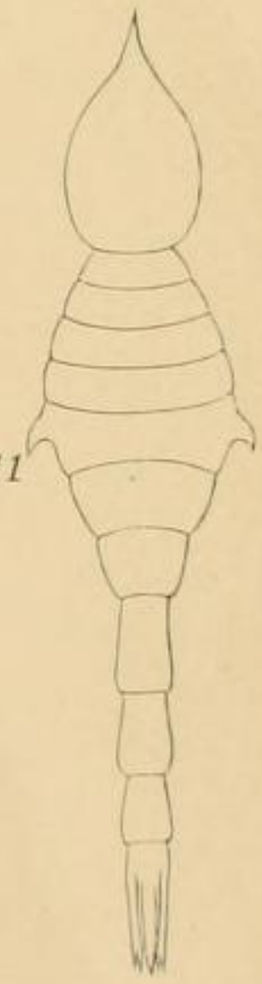

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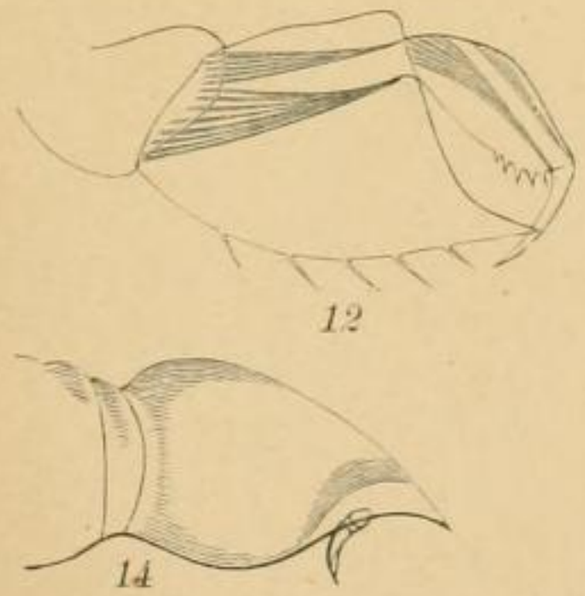

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W. Meyer sculp.

Fig. 1—2. Streetsia carinata. Fig. 3. Streetsia longiceps. Fig. 4—6. Streetsia porcellus. Fig. 7—9. Crancephalus Goësi.
Fig. 10—12. Stebbingella typhoides. Fig. 13—16. Stebbingella sclerotica.

PLATE V.

Stebbingella Théeli, Glossocephalus Milne-Edwardsi, G. spiniger, Leptocotis tenuirostris, and L. spinifera.

PLATE V.

Stebbingella Théeli, n. sp.

Fig. 1. The male from the side. (Drawn by A. M. Westergren).
„ 2. The first pair of peræopoda, ♂. „ „ the author).
„ 3. The second „ „ „ ♂. „ „ „ „
„ 4. The urus, ♂. „ „ „ „

Glossocephalus Milne-Edwardsi, C. Bovallius.

Fig. 5. The male from the side. (Drawn by A. M. Westergren).

Glossocephalus spiniger, C. Bovallius.

Fig. 6. The female from the side. (Drawn by the author).
„ 7. The head from above, ♀. „ „ „ „
„ 8. The first pair of peræopoda, ♀. „ „ „ „
„ 9. The second „ „ „ ♀. „ „ „ „

Leptocotis tenuirostris, C. Claus.

Fig. 10. The male from the side. (Reduced copy from Claus, **36**).
„ 11. The first pair of antennæ, ♂. „ „ „ „ „
„ 12. The „ „ „ „ ♀. „ „ „ „ „
„ 13. The „ „ „ peræopoda, ♂. „ „ „ „ „
„ 14. The second „ „ „ ♂. „ „ „ „ „

Leptocotis spinifera, Th. Streets.

Fig. 15. The male from the side. (Facsimile from Streets, **26**).
„ 16. The head of the female from the side. „ „ „ „
„ 17. The second pair of peræopoda. „ „ „ „

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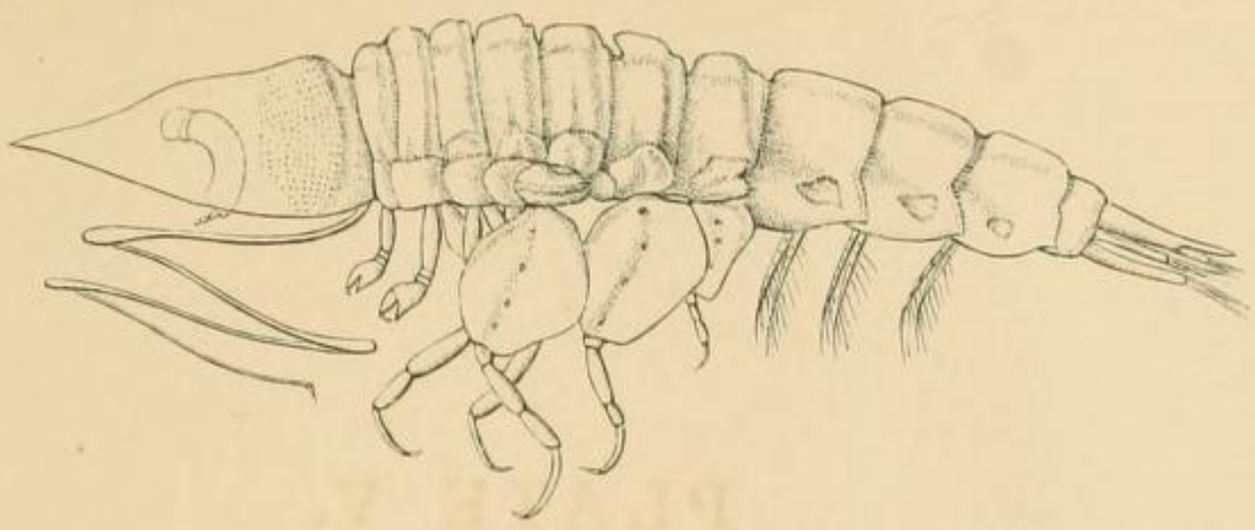

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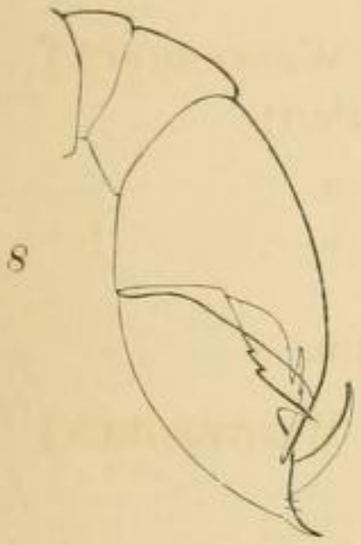

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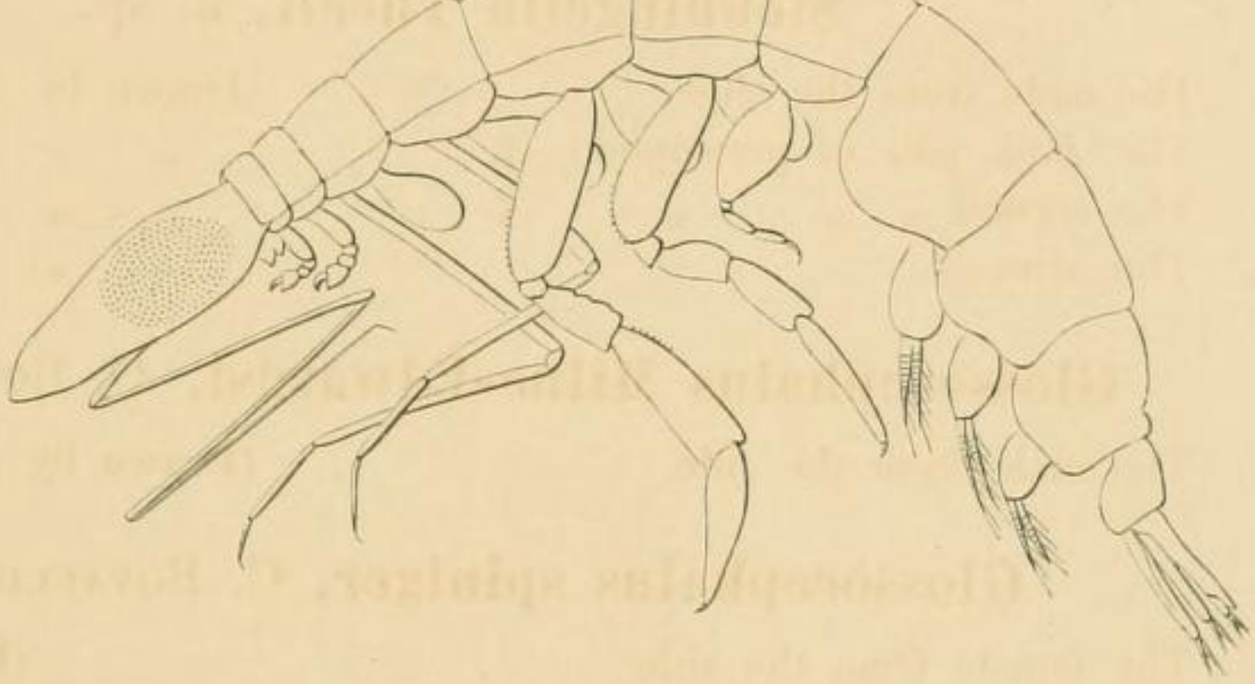

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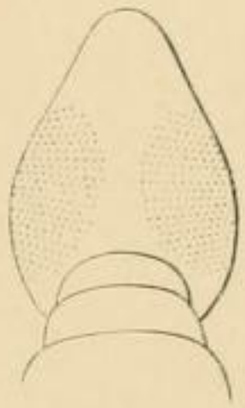

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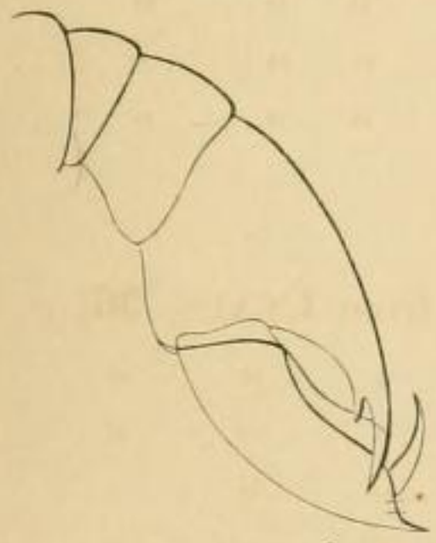

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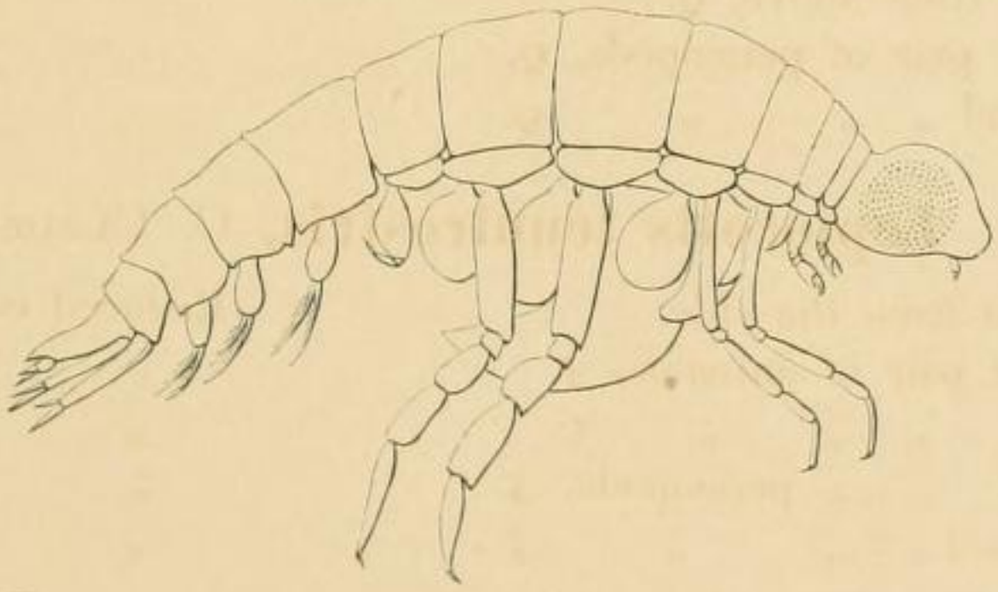

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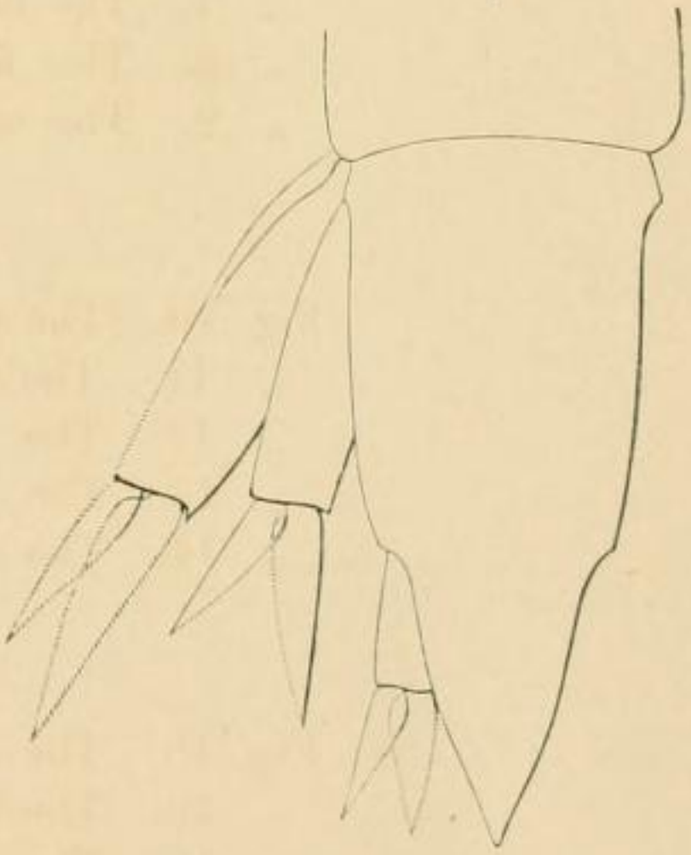

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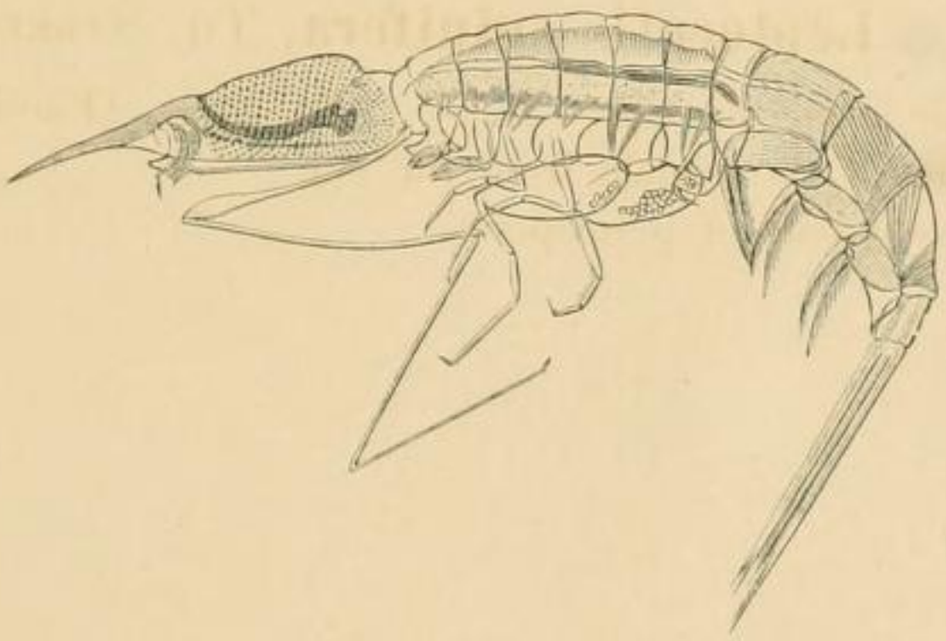

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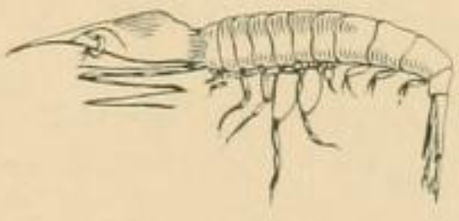

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W. Meyer sculp.

Fig. 1—4. Stebbingella Théeli. Fig. 5. Glossocephalus Milne-Edwardsi. Fig. 6—9. Glossocephalus spiniger. Fig. 10—14. Leptocotis tenuirostris. Fig. 15—17. Leptocotis spinifera.

PLATE VI.

Xiphocephalus armatus.

PLATE VI.

Xiphocephalus armatus, H. Milne Edwards.

Fig.	1.	The female from the side.	(Drawn by the author).
„	2.	The male „ „ „	„ „ „ „
„	3.	The first pair of antennæ, ♂.	(Drawn by A. M. Westergren).
„	4.	„ „ „ „ „ ♀.	„ „ „
„	5.	The last two peræonal segments, ♂.	„ „ the author).
„	6.	The epimeral of the first pair, ♂.	„ „ „ „
„	7.	The first pair of peræopoda, ♂.	„ „ „ „
„	8.	The second „ „ „ ♂.	„ „ „ „
„	9.	The fourth „ „ „ ♀.	„ „ „ „
„	10.	The sixth „ „ „ ♀.	„ „ „ „
„	11.	The first „ „ uropoda, ♂.	„ „ „ „
„	12.	The third „ „ „ ♂.	„ „ „ „
„	13.	The second „ „ „ ♂.	„ „ „ „
„	14.	The female from the side.	(Facsimile from Adams and White, **9**)
„	15.	The first pair of antennæ, ♀.	„ „ Spence Bate, **20**).
„	16.	The „ „ „ peræopoda, ♀.	„ „ „ „
„	17.	The second „ „ „ ♀.	„ „ „ „
„	18.	The female from the side, ♀.	„ „ Streets, **26**).
„	19.	The first pair of peræopoda, ♀.	„ „ „ „
„	20.	The second „ „ „ ♀.	„ „ „ „

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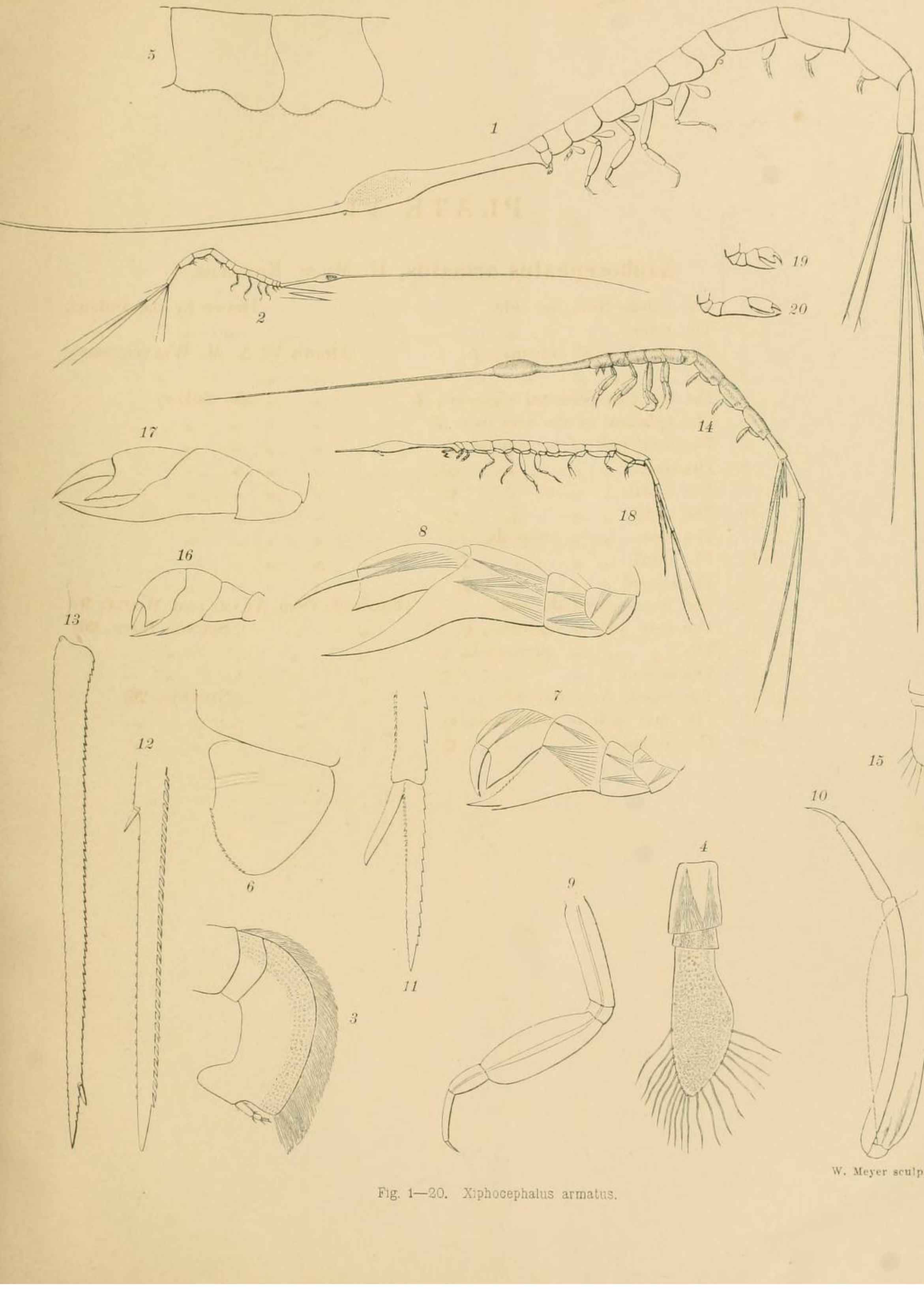

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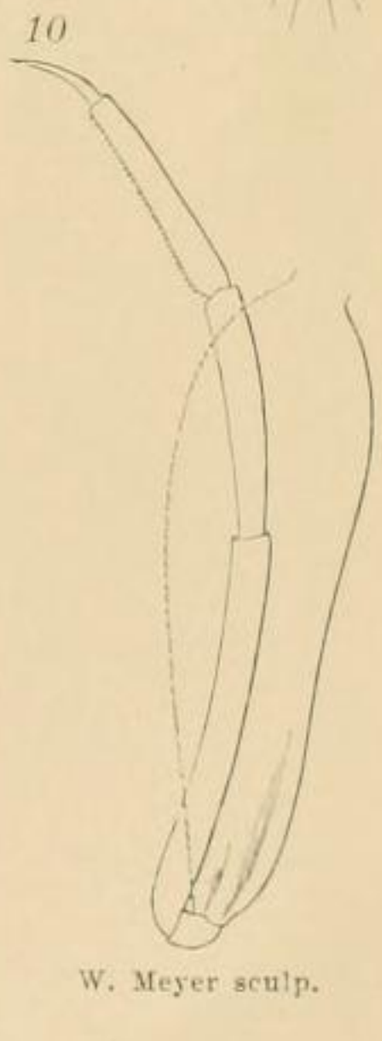

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W. Meyer sculp.

Fig. 1—20. Xiphocephalus armatus.

PLATE VII.

Xiphocephalus Whitei and X. Lilljeborgi.

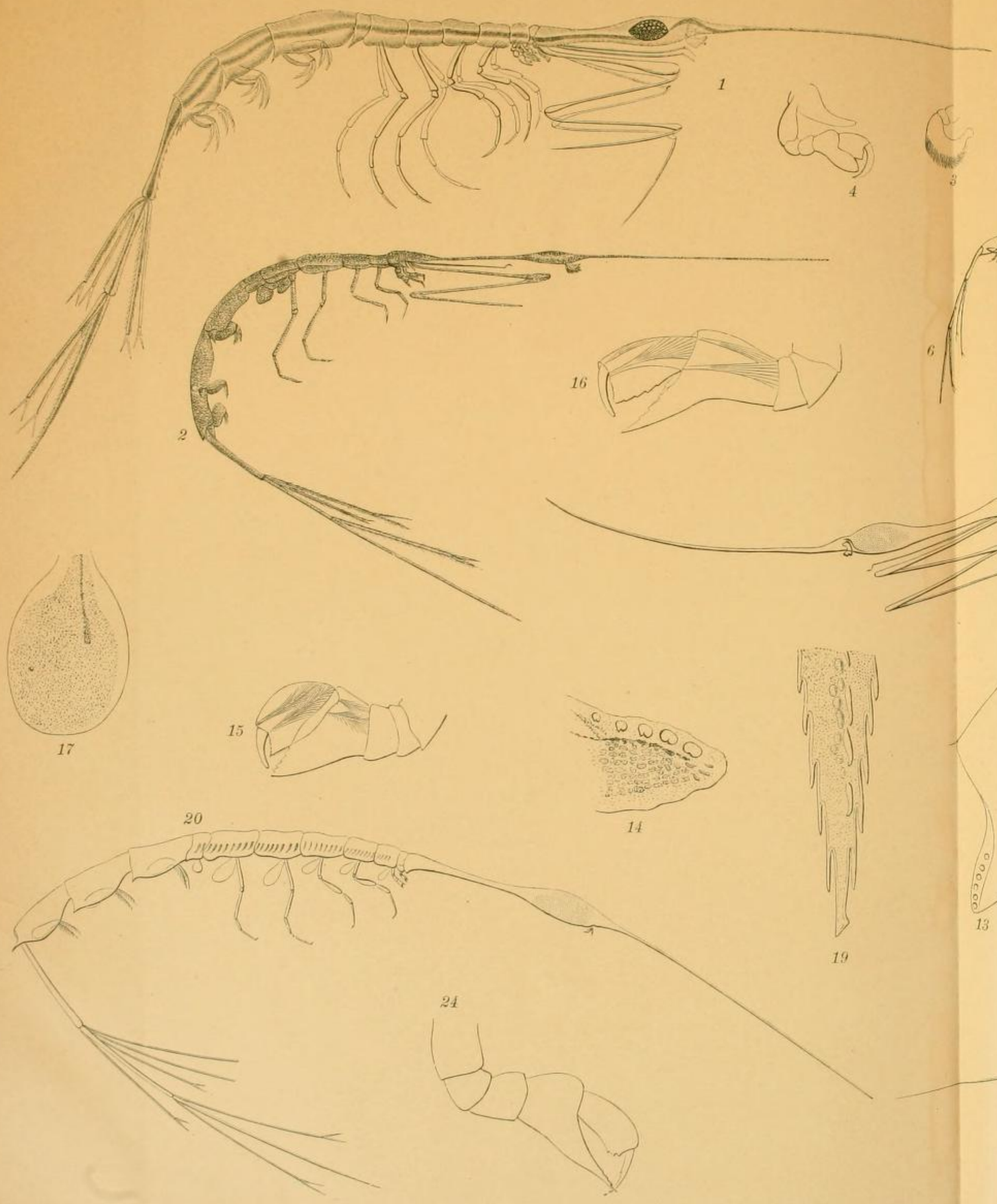
PLATE VII.

Xiphocephalus Whitei, Spence Bate.

Fig. 1. The male from the side. (Reduced copy from Eydoux and Souleyet, **9**).
„ 2. The „ „ „ „ (Facsimile from Spence Bate, **20**).
„ 3. The first pair of antennæ, ♂. „ „ „ „
„ 4. The „ „ „ peræopoda, ♂. „ „ „ „
„ 5. The second „ „ „ ♂. „ „ „ „
„ 6. The female from the side. (Facsimile from Streets, **26**).
„ 7. The first pair of peræopoda, ♀. „ „ „ „
„ 8. The second „ „ „ ♀. „ „ „ „
„ 9. The male from the side. (Drawn by the author).
„ 10. The first pair of antennæ, ♂. (Drawn by A. M. Westergren).
„ 11. The second flagellar joint of the same pair, ♂. „ „ „
„ 12. The last two joints of the mandibular palp, ♂. „ „ „
„ 13. The epimeral of the first pair of peræopoda, ♂. „ „ the author).
„ 14. The front end of the same, ♂. „ „ A. M. Westergren).
„ 15. The first pair of peræopoda, ♀. „ „ the author).
„ 16. The second „ „ „ ♀. „ „ „ „
„ 17. The seventh „ „ „ ♂. „ „ „ „
„ 18. The first „ „ uropoda, ♂. „ „ „ „
„ 19. The apex of the inner ramus of the second pair of uropoda, ♂. „ „ A. M. Westergren).
„ 20. The female from the side. „ „ the author).

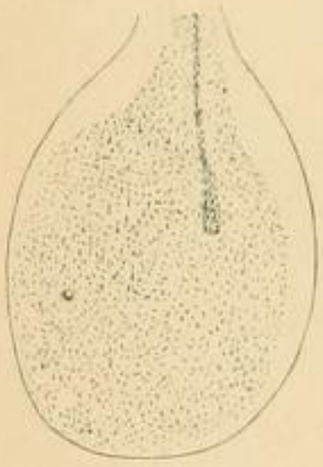
Xiphocephalus Lilljeborgi, n. sp.

Fig. 21. The female from the side. (Drawn by the author).
„ 22. The first pair of antennæ, ♀. „ „ „ „
„ 23. The „ „ „ peræopoda, ♀. „ „ „ „
„ 24. The second „ „ „ ♀. „ „ „ „



W. Meyer sculp.

Fig. 1—20. Xiphocephalus Whitei. Fig. 21—24. Xiphocephalus Liljeborgi.



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