The collection of scolopendromorph Centipedes (Chilopoda) in the Natural History Museum in Vienna: a critical re-evaluation of former taxonomic identifications

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Abstract
The collection of scolopendromorph centipedes in the Natural History Museum in Vienna is one of the most important in the world, having been studied by Carl Graf Attems (1868-1952) for his renowned publications on Scolopendromorpha. The present contribution provides necessary reidentifications as well as synonymies and adds important morphological details. Species of the genera Arthrhorhabdus, Asanada, Cormocephalus, Ethmostigmus, Newportia, Rhoda and Tidops were examined.

Keywords: Scolopendromorpha, Attems' collection, new status, Arthrhorhabdus, Asanada, Cormocephalus, Ethmostigmus, Newportia, Rhoda, Tidops.

Zusammenfassung

Introduction
The myriapod collection in the National History Museum in Vienna is one of the largest and most important in the world. The collection includes Chilopoda, Pauropoda, Symphyla and Diplopoda. Carl Count Attems (1868 - 1952), without doubt one of the greatest specialists in myriapods, was active there for over fifty years, between 1894 and 1952. Due to his scientific work the collection gained high significance. Attems examined collections from all over the world for his systematic and taxonomic studies, including samples collected by famous scientists, expeditions and travellers. He examined series from the National History Museum in Vienna as well as series he received from other museums world-wide (Stagl 2001). Attems (1930a) published a monograph of Scolopendromorpha in the "Tierreich"; it remains a fundamental work for specialists even today.

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The main purpose of the present work is to start both, the careful re-examination of the scolopendromorph collection and the creation of a complete inventory. A critical sighting of the material is conducted, some corrections are provided and new morphological details are added for poorly described species. The re-study of the whole scolopendromorph collection will be the aim over the next few years.

In this contribution the following genera are treated based largely on material in the Vienna Museum: Arthrorhabdus (1 species), Asanada (2 species), Cormocephalus (21 species), Ethmostigmus (3 species), Newportia (5 species), Rhoda (1 species), Tidops (1 species).

**Material and methods**

About 200 lots were examined and data were entered into an electronic database. The scolopendromorph collection contains about 2000 lots. Specimens are stored in glass tubes and preserved in 75% ethanol.

The main part of the collection dates back to the nineteenth and early twentieth century. Data on the specimens were obtained from books of acquisitions, inventories, Attems' register cards, publications but mainly from the labels. In many cases it was very difficult to retrieve and verify information from the labels in the jars; often it was impossible to recognise the localities. Question marks indicate uncertain or unknown localities. Under the heading "Material" the localities are written in the same way as on the labels. Details about the single lots were added under the species names. Acquisition numbers - when known - follow the inventory numbers and are in square brackets. The following abbreviations are used: "leg" for collected (Latin legit), "don" for donated (Latin donavit), "det." for determined (Latin determinavit), "Ex" (exemplars) for the number of individuals, "ad" for adult, "sad" for semiadult, "juv" for juvenile. We were often able to add the date on which the specimens were collected.

The types studied detailed under the heading "Type material", are marked "syntypes", "lectotypes" etc. For all genera, the species are given in alphabetic order, except that the type species, when it is housed in the collection is listed first. An exception is Cormocephalus, in which some groups of morphologically closely related species are clearly recognisable.

**Fam. Scolopendridae Leach, 1815**

**Subfam. Scolopendrinae Leach, 1815**

**Trib. Scolopendrini Leach, 1815**

**Genus Arthrorhabdus Pocock, 1891**

*Arthrorhabdus* Pocock 1891: 221.

*Type species:* *Arthrorhabdus formosus* Pocock, 1891 (by monotypy).
**Arthrorhabdus formosus** POCOCK, 1891

*Arthrorhabdus formosus* POCOCK 1891: 222.
*Arthrorhabdus interveniens*: PORAT 1893: 46.


**Description:** Previous descriptions are generally correct but incomplete, so that it was necessary to add further details.

Maxillae II: claw-shaped praetarsus with two spurs; telopodite with well-developed distal spur on the second telomere; sincoxite very slender, without medial suture.

Forcipules: tooth margin somewhat wider than tooth plate itself; teeth are leaf-shaped, somewhat radiating outward from their base.

Terga: only tergum XXI clearly marginate laterally, according to ATTEMS (1930a) lateral margination begins from terga XVII - XIX).

Sterna: sternum XXI with clear median longitudinal depression (not with sulcus).

Coxopleura: posterior process developed in various degrees; both shape of porose area and number of pores vary considerably; in some specimens medial part of porose area is covered by sternum XXI.

Locomotory legs of first pair with two tarsal and one praefemoral spur; penultimate pair without tarsal spurs.

Terminal legs: short and wide (ratio of praefemoral length: width is about 2:1). Long praetarsus with ventral ridge of numerous, very small "teeth" of different size and shape. Praefemur with various number of spines.

**Variability:** The amounts of both individual and geographic variability in *Arthrorhabdus formosus* are considerably wider than in most other Scolopendrinae.

The following characters vary markedly: 1) length of forcipular tooth plates; 2) length and shape of coxopleural posterior process; 3) number of coxopleural pores and size of porose area; 4) spinulation of terminal praefemur; 5) length of terminal praetarsus; usually it ranges from as long as to twice as long as tarsus II; the only specimen (NHMW 993) with praetarsus much shorter than tarsus II has abnormal terminal legs; 6) all the proportions of terminal legs; for instance both specimens (NHMW 994) have terminal legs remarkably shorter and larger than usual, with strongly reduced praefemoral spinulation.

**Remarks:** LAWRENCE (1975) wrote: "... though fairly common in Namaqualand south of the Orange river, has only been recorded from southern portions of SW Africa and then only once at Helmeringhausen".
Range: S Africa: widespread in Western Cape Province; Eastern Cape Province, Port Elizabeth (Locus typicus); Transvaal; Free State Province; Bangladesh (Dinajpur).

Genus *Cormocephalus* NEWPORT, 1844

*Cormocephalus* NEWPORT 1844: 275.
*Cupipes* KOHLRAUSCH 1881: 78.
*Colobopleurus* KRAEPELIN 1903: 169; GROBBELAAR 1921: 259; LAWRENCE 1955b: 37, 41; KOCH 1983a: 801.
*Hemicormocephalus* KRAEPELIN 1903: 211.
*Cormocephalus* (Colobopleurus) ATTEMS 1930a: 106.

Type species: *Scolopendra rubriceps* NEWPORT, 1843 (by subsequent designation of ATTEMS 1930a: 61).

Remarks: According to KRAEPELIN (1903), the only difference between *Cormocephalus* and *Colobopleurus* is the absence of apical and subapical coxopleural spines in *Colobopleurus*, but there are species within *Cormocephalus* which have no coxopleural spines.

In ATTEMS (1930a), the taxonomic status of *Colobopleurus* is reduced to a subgenus of *Cormocephalus*. The taxa are separated by the degree of contact between the headplate’s posterior margin and tergum I. *Colobopleurus*: "Kopf nicht oder undeutlich vom 1. Tergit überlagert". *Cormocephalus* s. str. "Kopf deutlich vom 1. Tergit überlagert".

The difference between "deutlich" and "undeutlich" is very unclear. Moreover, both specimens of *Colobopleurus* (see below) have the headplate posterior margin clearly covered by the anterior margin of tergum I. On the other hand, in some typical representatives of *Cormocephalus* such as *Cormocephalus nitidus* PORAT, 1871 there is no contact between headplate and anterior margin of tergum I. Thus, as there are no real differences between *Cormocephalus* and *Colobopleurus* KRAEPELIN 1903, we regard the latter as a synonym of *Cormocephalus* NEWPORT, 1845. Our point of view is supported by the results of a numerical analyses made by KOCH & COLLESS (1986); the authors proposed *Colobopleurus* to be a synonym of *Cormocephalus*.

We also regard *Cupipes* KOHLRAUSCH, 1881 as another synonym of *Cormocephalus* following KOCH (1983a), who wrote in his monograph on the Australian *Cormocephalus* species: "I consider all the species of *Cupipes* KOHLRAUSCH 1881 as being synonyms of species of *Cormocephalus* or *Arthrorhabdus* ...". It should be noted, however, that KOCH & COLLESS (1986) suggested to re-elevate the generic status of *Cupipes*, but they included in their numerical analyses only one "*Cupipes*"-species - *Cupipes inermis* KRAEPELIN 1916.

Genus *Cormocephalus* includes about 70 species being the largest genus within the Scolopendrinidae. In this paper a new subdivision of this large and variable taxon is provided. We divide *Cormocephalus* in 4 supergroups and in 9 species groups to facilitate the discussion of its taxonomy with a view to producing a new key (see also Discussion below).

Supergroup I:
Tergum I mainly without longitudinal sulci (very rarely with incomplete paramedian
sulci); paramedian sulci fully developed beginning from tergum II(III); terminal preaefemur with ventro-lateral spines; coxopleuron mainly with well-developed posterior process:

1. **rubriceps species group:** Terminal praetarsus not longer than terminal tarsus II; terminal praefemur with a single row of spines ventro-laterally.


2. **nitidus species group:** Terminal praetarsus not longer than terminal tarsus II; terminal praefemur with 2 rows of spines ventro-laterally; tergum XXI without median longitudinal sulcus; wide coxopleural porose area considerably longer than sternum XXI.


3. **westwoodi species group:** Terminal praefemur with 2(3) rows of spines ventro-laterally; tergum XXI with median longitudinal sulcus; wide coxopleural porose area considerably longer than sternum XXI.


4. **setiger species group:** Terminal praefemur with 2 rows of spines ventro-laterally; tergum XXI with median longitudinal sulcus; narrow coxopleural porose area as long or slightly longer than sternum XXI.


Supergroup II:

Tergum I mainly without any sulci (sometimes with incomplete paramedian sulci); paramedian sulci complete from tergum IV - VII (VIII); terminal praefemur with ventro-lateral spines; coxopleuron with well-developed posterior process:

5. **esulcatus species group:** Terminal praetarsus not longer than terminal tarsus II; coxopleural posterior process with 1 - 3 spines.

*Cormocephalus esulcatus esulcatus* POCOCK, 1901, *Cormocephalus esulcatus schultzei*
Supergroup III:
Tergum I mainly with complete (rarely somewhat shortened) paramedian sulci; paramedian sulci complete from tergum II; terminal praefemur mainly with ventro-lateral spines; coxopleuron mainly with well-developed posterior process:

6. *dentipes* species group: Terminal praetarsus shorter than terminal tarsus II.

7. *gervaisianus* species group: Terminal praetarsus longer than terminal tarsus II.

8. *rugosus* species group: Tergum XXI with median longitudinal sulcus; terminal praefemur with a single row of ventro-lateral spines; terminal praetarsus as long as terminal tarsi together.

Supergroup IV:
Tergum I without sulci; paramedian sulci complete from tergum (II)IV - VIII; terminal praefemur without ventro-lateral spines; coxopleuron without well-developed posterior process:

9. *Colobopleurus* species group:

Taxonomical position too unclear to put in any group:
Cormocephalus rubriceps (Newport, 1843)

Scolopendra rubriceps Newport 1843: 270.
Cormocephalus lobidens: Kohlrausch 1881: 92.
Cormocephalus (C.) rubriceps: Attems 1930a: 71.
Cormocephalus (C.) rubriceps rubriceps: Attems 1930a: 72.


Description: Additional details are given here as previous descriptions were incomplete.

Body length (without terminal legs) up to 130 mm (one of the largest species of the genus).

Antennae: Five basal antennomeres are glabrous.

Terga: lateral margination beginning from tergum VI - VIII; tergum XXI without median longitudinal sulcus.

Sterna: sternum XXI with posterior margin slightly bisinuate.

Terminal legs: long and slender, praefermal dorso-distal process well-developed with two large apical spines. Tarsus II twice as long as praettarsus.

Variability: In one juvenile - just after moulting - (NHMW 912) the 5th basal antennomere is glabrous dorsally only. Two adults (NHMW 910) have a pattern of transverse sulci on the forcipular coxosternum (like in Cormocephalus nitidus). Sometimes terminal leg praefermal is abnormally spined by more numerous and smaller spines, which are randomly arranged (not in rows). Often such an abnormality correlates with having more than two apical spines on the praefermal dorso-distal process, which are visibly smaller than normally. Among the 46 specimens (NHMW 907), there is a visible variability of spinulation of terminal praefermal (especially of dorso-medial spines) and of sizes of dorso-distal praefermal process. Specimens (NHMW 908) have more slender and longer terminal legs than normal, with praefermal dorso-distal process unusually short.

Remarks: In his monograph on Australian Cormocephalus-species Koch (1983a) noted another related Australian species as Cormocephalus turneri Pocock, 1901 (or Cormocephalus (C.) rubriceps turneri sensu Attems, 1930a). Cormocephalus rubriceps "Differs ... principally in the anal-leg coxopleural process being very[?] long rather than short to long". As this character is a "quantitative" one and can vary somewhat in Cormocephalus-species, we like to note that turneri (and its very close relative bung-albinensis Koch, 1983) differs additionally by the presence of very characteristic sulci at the forcipular coxosternum which also has "a pair of [longitudinal] lines or ridges, towards the posterior edge of the base-plates [tooth plates]".
Cormocephalus aurantiipes (NEWPORT, 1844) should be another relative of rubriceps according to ATTEMS (1930a). They differ mainly in the number of glabrous basal antennomeres - five in rubriceps - six in aurantiipes and the absence of median sulcus at tergum XXI in rubriceps. Actually the latter is also distinguishable from aurantiipes by: (a) considerably larger maximal body length; (b) shape of forcipular tooth plates; (c) tergal lateral margination; (d) sternum XXI slightly bisinuated caudally; (e) more narrow coxopleural process; (f) more slender and longer terminal legs; (g) shorter terminal praetarsus.

Some of these characters (b), (f), (g) can change with age. From this perspective the most interesting fact is that in rubriceps terminal legs become comparatively longer with age (unlike in most Cormocephalus - species).

Range: SW, S, SE and E Australia (mainly coastal areas); New Zealand (Terra typica), common in central and southern areas of N Island; Loyalty Islands; Tahiti.

Cormocephalus aurantiipes (NEWPORT, 1844)

Scolopendra aurantiipes NEWPORT 1844: 99.
Scolopendra subminiata NEWPORT 1844: 100.
Cormocephalus obscurus NEWPORT 1845: 421.
Cormocephalus subminiatus NEWPORT 1845: 423; HAASE 1887: 60.
Cormocephalus miniatus NEWPORT 1845: 423.
Cormocephalus aurantiipes var. obscurus: HAASE 1887: 58.
Cormocephalus aurantiipes spinosus: HAASE 1887: 58.
Cormocephalus brevispinatus sulcatus BRÖLEMANN 1912: 49.
Cormocephalus (C.) aurantiipes: ATTEMS 1930a: 73.
Cormocephalus (C.) violaceus sulcatus: ATTEMS 1930a: 74.


Description: A redescription is necessary.

Antennae: Usually 17 antennomeres. The six basal antennomeres are glabrous, both dorsally and ventrally.

Headplate: Paramedian sulci reach nearly to its middle, diverging anteriorly and sometimes slightly bifurcating caudally; the main part of basal plates covered by tergum I.

Forcipules: Coxosternum with one median and a few transverse sulci which form a pattern; each tooth plate with four distinct teeth of which the lateral one is isolated. Praefemoral median tooth well developed, with 3 - 4 lateral tubercles.

Terga: Unclear lateral margination from terga VIII - IX, clear from terga X - XI; tergum XXI with nearly complete longitudinal median sulcus, posteriorly rounded.

Sterna: sternum XXI clearly trapeziform, its posterior margin straight or slightly rounded.
Coxopleura: Conical posterior process well-developed and poreless, bearing two apical spines; no spines at coxopleural posterior margin.

Terminal legs: Praefemur with three ventro-lateral, two (three) ventro-medial, one median and two dorso-medial spines (all of normal size); dorso-distal praefemoral process well developed, normally with two apical spines. Praefemoral length : width = 2.5 : 1. Praetarsus somewhat shorter or of the same length as tarsus II, usually with two spurs.

Variability: Two adults and two subadults (NHMW 940), being typical *Cormocephalus aurantiipes*, have no (only very short) median sulcus on tergum XXI. Also teeth of tooth plates and lateral tubercles of median tooth of forcipular praefemur in both adults are somewhat fused (perhaps this condition is merely age-related). All 10 juveniles (NHMW 913) have longer and more slender terminal legs with rather short praetarsus (this terminal leg structure seems to be due to the age of these specimens).

Remarks: According to ATTEMS (1930a) the closest species to *Cormocephalus aurantiipes* is *Cormocephalus violaceus* NEWPORT, 1845, from which former should differ mainly by: (a) more numerous (13 - 18 and not 3 - 10) laterally marginated posterior terga, (b) presence of median sulcus on tergum XXI. We have found no real difference in tergal margination between these two species, yet they are clearly distinguishable by the second character and other details (see below).

*Cormocephalus brevispinatus sulcatus* has been described by BRÖLEMANN (1912) from Australia (New South Wales, Darling River) and it is as a new combination given, *Cormocephalus* (C.) violaceus sulcatus BRÖLEMANN, 1912 in ATTEMS (1930a). KOCH (1983a), without designation of a new synonymy, included the latter name in the synonymy of *Cormocephalus aurantiipes*, but as he gave no reason for that act we note the following: *Cormocephalus violaceus sulcatus* should differ from *violaceus violaceus* by the presence of a median sulcus at tergum XXI. Such a character, however, is diagnostic for *Cormocephalus aurantiipes* and as no other differences exist between these forms, *Cormocephalus violaceus sulcatus* BRÖLEMANN, 1912 is clearly a junior synonym of *Cormocephalus aurantiipes* (NEWPORT, 1844).

According to the diagnosis, the Australian *Cormocephalus brachycerus* KOCH, 1983 should differ from *aurantiipes* by less of glabrous basal antennomeres (4 - 5 vs. 6 - 9) and longer praefemur of terminal legs. We note the complete absence of a median sulcus at tergum XXI in *brachycerus* as a more important difference.

In the same work, KOCH (1983a) pointed out, that the only Northern locality of *aurantiipes* (which is locus typicus) was taken from literature.

Range: W (mid-part), SW, S and E Australia (mainly coastal and near-coastal areas) and many offshore islands: Northern Territory, Port Essington (Locus typicus).

*Cormocephalus violaceus* NEWPORT, 1845

*Cormocephalus violaceus* NEWPORT 1845: 424.
*Scolopendra violacescens* GERVAIS 1847: 275.
*Cormocephalus violacescens*: POCOCK 1898: 60.
*Cormocephalus brevispinatus* C.L.KOCH 1867: 248.
*Cormocephalus purpureus* POCOCK 1893: 127.
Cormocephalus brevispinatus: Kraepelin 1903: 199.
Cormocephalus (C.) violaceus violaceus: Attems 1930a: 74.


**Description:** Antennae: 17 antennomeres, 7 - 9 basal ones glabrous.

Headplate: Sulcated as in Cormocephalus aurantiipes.

Forcipules: Coxosternum with median and a few transverse sulci. Tooth plates with fourteeth of which the lateral one is clearly isolated and the others are fused to various degrees. Praefemoral median tooth small, without clear lateral tubercles.

Terga: Tergum XXI without median sulcus, somewhat pointed caudally.

Sterna: Sternum XXI clearly trapeziform, its posterior margin slightly bisinuate.

Coxopleura: The entire surface is densely perforated with numerous small pores. Posterior process poorly developed (from short conical in smaller specimens to almost undeveloped in larger ones) with two apical spines; a single small lateral spine at posterior coxopleural margin. When present, posterior process is poreless.

Terminal legs: Prefemur ventrally with 2 - 3 lateral and 2 - 4 median spines of normal sizes, medially with 1 - 2 and dorso-medially with two small spines; dorsal spines visibly smaller compared with those in aurantiipes. Two small spines apically on poorly developed dorso-distal process or (when it absent) at its position. Praetarsus as long as tarsus II or somewhat shorter, praetarsal spurs rudimentary or absent.

**Remarks.** Koch (1983a) included Cormocephalus violaceus (part.) under the name Cormocephalus westwoodi, giving no reasons for that action. But violaceus cannot be the same species as westwoodi, because they clearly differ in a diagnostic character; the type of terminal praefemur spinulation. Moreover, these two species definitely belong to different species-groups (see above).

**Range:** E Australia: Queensland; New S Wales.

Cormocephalus incongruens Kraepelin, 1903

Cormocephalus incongruens Kraepelin 1903: 200.
Cormocephalus (C.) incongruens: Attems 1930a: 73.

**Material:** Madagaskar, Ambanja, leg. P. Remy 1947, don. Remy, 1 ad., (3269).

**Remarks:** Attems labelled NHMW 3269 as "Cormocephalus incongruens carens", which remains an unpublished manuscript-name.

Attems (1930a) noted the absence of praetarsal spurs on the terminal legs in Cormocephalus incongruens, although the left terminal praetarsus of the specimen examined bears a single spur.

This species differs from Cormocephalus aurantiipes by: (a) 7 - 8 (versus 6) glabrous
Figs. 1 - 5: *Cormocephalus nitidus nitidus* PORAT, 1871: (1) anterior end of body in dorsal view (schematic), (2) forcipular coxosternum of NHMW 916 in ventral view. – *Cormocephalus nitidus calcaratus* PORAT, 1871 stat.n.: (3) forcipular coxosternum of NHMW 946 in ventral view, (4) terminal praefemur of NHMW 3258 in ventral view. – *Cormocephalus aeruginosus* ATTEMS, 1928: (5) posterior end of body of syntype NHMW 2056 in ventro-lateral view. Scale is 1 mm.
basal antennomeres, (b) tergum XXI not sulcate, (c) sulcate and more narrow terminal sternum, (d) much enlarged terminal legs.

**Range:** Central Madagascar: Abohimitomboo (Locus typicus), (Ambatondrazaka, Ambanja); East Madagascar (Andohahel).

**Cormocephalus nitidus nitidus** PORAT, 1871 (Figs. 1 - 2)

*Cormocephalus nitidus* PORAT 1871: 1154.<br>
*Cormocephalus ambiguus* MEINERT 1886: 227 (nec BRANDT).<br>
*Cormocephalus ambiguus* KRAEPELIN 1903: 210 (nec BRANDT).<br>
*Cormocephalus nitidus* GROBBELAAR 1921: 255; ATTEMS 1928b: 100; LAWRENCE 1968: 78; 1975: 42.<br>
*Cormocephalus nitidus calvus* ATTEMS 1928b: 101.<br>
*Cormocephalus nitidus calvus*: LAWRENCE 1955b: 43, 46; 1959: 368.<br>
*Cormocephalus* (C.) *nitidus*: LEWIS 2001: 15.<br>
*Cormocephalus* (C.) *nitidus nitidus*: ATTEMS 1930a: 86.<br>
*Cormocephalus* (C.) *nitidus nitidus var. calvus*: ATTEMS 1930a: 86.


**Description:** Some details are here added to the description of ATTEMS (1930a).

Body length up to 105 mm.

Headplate: somewhat diverging paramedian sulci do not reach the middle of the headplate, their caudal ends slightly bifurcate, reaching to interior edges of clearly developed basal plates (Fig. 1). Cephalic posterior margin usually closely attached to anterior margin of tergum I.

Forcipules: coxosternum with median sulcus which is crossed by some transverse sulci, forming a more or less complicated pattern (Fig. 2). Basal sutures of tooth plates form a straight line.

Terga: paramedian sulci at tergum II mainly complete, at terga II - III sulci rarely incomplete or interrupted.

Coxopleura: entire surface perforated with pores, only posterior process remaining poreless.

Terminal legs: in all specimens praetarsi are typically slender, long and clearly pointed apically; praetarsal spurs may be present (differs from Attems' diagnosis).
**Variability:** The combination of transverse sulci on the forcipular coxosternum shows considerable individual variation; we found the most numerous sulci in NHMW3259.

Anterior margin of tergum I in one specimen (NHMW 916) and in the largest specimen of NHMW 971 does not reach the cephalic posterior margin, remaining basal plates not covered.

(954) with paramedian sulci incomplete at terga II - III; one specimen with sulci interrupted medially on tergum V.

In three subadults of NHMW 954 ratio of length: width of terminal praefemur is 3:1; these specimens also have unusually short terminal praetarsi.

**Remarks:** ATTEMS (1930a) noted merely "feine Querfurche" on the forcipular coxosternum. However, such a pattern (more or less complicated) is the diagnostic character for this variable species. ATTEMS (1930a) quoted the spiracles at the "beintragenden Segmenten 3, 5 und 7" as very large, but actually there are none at the 7th body segment in Scolopendrinae. Together with Cormocephalus rubriceps, this species is one of the largest of the genus.

*Cormocephalus nitidus calvus* ATTEMS, 1928b has been synonymised to the nominative subspecies by LEWIS (2001) because the material from Mozambique shows unreliability concerning the only difference (number of glabrous basal antennomeres) between these two forms.

**Range:** Widespread in S and SW Africa; SE Africa: KwaZulu Natal; Transvaal; E Africa: Mozambique; Tanzania (near Tanga); Madagascar (Tsaranana Mountain); Australia: Victoria.

*Cormocephalus nitidus calcaratus* PORAT, 1871 *n*.(Figs. 3 - 4)

*Cormocephalus calcaratus* PORAT 1871: 1159.


**Description:** The original description as well as the description in ATTEMS (1930a) is insufficiently detailed necessitating the addition of the following details. New or those differing from former descriptions are marked by (*).

Antennae consisting of 17 antennomeres, the five basal glabrous dorsally.

Forcipules: coxosternum with well-developed median sulcus (*) and some transverse sulci ("ohne Querfurche" sensu ATTEMS) which are developed in various degree (Fig. 3). Praefemoral median tooth (*) well developed, markedly longer than tooth plates, with one apical and one lateral tubercle.

Sterna: sternum XXI with posterior margin practically straight.
Coxopleura: porose area clearly longer than sternum XXI, does not extend to coxopleural posterior margin, which bears spine (*). Posterior process varies from long and slender (*) to medium-long and conical (not short as Attems mentioned).

Terminal legs: praefemur ventrally with a margined depression (Fig. 4); ventro-laterally with two parallel rows of 3 + 5, 4 + 4 or 4 + 5 spines; interio-medially two rows of 2 + 5, 3 + 5, 3 + 6, 5 + 5, 5 + 6 (rarely 1 + 7) spines ("3 - 4 medial spines" sensu Attems); usually numbers of spines are not the same on both legs. Dorso-medially two spines; all praefemoral spines small. Praetarsus mainly (*) with spurs.

Variability: Transverse sulci of forcipular coxosternum in the adult NHMW 937 and in one adult (NHMW 946) are poorly developed but visible. The other adult (NHMW 946) exhibits these sulci very clearly. One of the specimens (NHMW 3258) has an additional subapical spine at coxopleural process. Adult NHMW 937 has 4 + 4 and 4 + 5 ventro-lateral spines at terminal praefemora. Terminal praetarsus without spurs in a few specimens of NHMW 937, NHMW 3258) versus Attems (1930a).

Remarks: Cormocephalus calcaratus Porat, 1871 closely resembles Cormocephalus nitidus Porat, 1871 and Cormocephalus aeruginosus Attems, 1928. According to Attems (1928b, 1930a), calcaratus should differ from the latter by the number of basal glabrous antennomeres and from nitidus by the presence of praetarsal spurs on terminal legs. However, the last character is not reliable for distinguishing taxa of species rank in Cormocephalus because it is variable within some species (for instance nitidus, westwoodi).

Another minor difference is the shape of the transverse sulci of the forcipular coxosternum, which are always very clear in Cormocephalus nitidus nitidus, but may be less developed in Cormocephalus calcaratus. More definitively, these two forms may be separated by the ventro-lateral spinulation of terminal praefemur: two rows of 2 + 2 - 3 + 3 spines in nitidus vs. 4 + 4, 3 + 5, 4 + 5 spines in calcaratus.

In summary, the differences listed above allow us to suggest Cormocephalus calcaratus as a South African subspecies of Cormocephalus nitidus; thus the new synonymy is: Cormocephalus calcaratus Porat, 1871 = Cormocephalus nitidus calcaratus Porat, 1871 stat.n.

Range: Botswana; S Africa: Western Cape Province.

Cormocephalus aeruginosus Attems, 1928 (Fig. 5)

Cormocephalus aeruginosus Attems 1928b: 100.
Cormocephalus (C.) aeruginosus: Attems 1930a: 85.


Description: The original description is very short, so the following details should be added; new data are marked by an asterisk (*).

Body length up to 52 mm (55 according to Attems 1928b), terminal legs up to 11 mm. Antennae composed of 17 antennomeres, of which eight (nine sensu Attems) basal antennomeres are glabrous dorsally.
Headplate: its posterior proportion is covered by tergum I, so practically the whole basal plates are visible (*). Diverging paramedian sulci nearly reach to the cephalic midpoint.

Forcipules: coxosternum with the clear short median sulcus (*). Tooth plates clearly longer than wide; 3 median teeth of the right plate are fused and isolated from lateral tooth; left tooth plate seems to be abnormal (*), having medially two large and one rudimentary teeth and lateral tooth apically divided into two points. Praefemoral median tooth well-developed with one lateral tubercle (*).

Terga: tergum I with rudimentary paramedian sulci anteriorly, sulci complete, beginning from tergum II; tergum XXI with rudimentary median sulcus anteriorly (*).

Sterna II-XX with complete paramedian sulci; sternum XXI trapeziform, somewhat higher than wide, with posterior margin (Fig. 5) slightly truncated, "gerade abgestutzt" sensu ATTEMS (1930a).

Coxopleura: posterior processes (Fig. 5) short, conical, apically rounded and spineless.

Terminal legs: praetarsus considerably shorter than tarsus II, praetarsal spurs well developed.

Remarks: Being very similar to Cormocephalus nitidus, this species is distinguishable by the absence of transverse sulci on the forcipular coxosternum.

We do not consider an absence of coxopleural spines in the examined syntype as a diagnostic character because it seems to be an abnormality. Moreover, ATTEMS (1930a,b) noted two apical spines and one spine at posterior coxopleural margin in most syntypes.

Range: S Africa, Western Cape Province (Locus typicus); Zimbabwe.

Cormocephalus westwoodi westwoodi (NEWPORT, 1844) (Figs. 6 - 7)

Scolopendra Westwoodi NEWPORT 1844: 100.
Scolopendra westwoodi: NEWPORT 1845: 422.
Cormocephalus foecundus NEWPORT 1845: 421.
Cormocephalus foecundus: NEWPORT 1845: 421; KOHLRAUSCH 1881: 86.
Scolopendra foecunda: GERVSAIS 1847: 272.
Cormocephalus dispar PORAT 1871: 1155.
Cormocephalus rugulosus: PORAT 1871: 1155.
Cormocephalus longicornis: PORAT 1871: 1159.
Cormocephalus lanatipes KOHLRAUSCH 1881: 85.
Cormocephalus sarasinorum HAASE 1887: 63.
Cormocephalus fangaroka SAUSSURE & ZEHNTNER 1902: 432.
Cormocephalus westwoodi: KRAEPELIN 1903: 200.
Cormocephalus elegans KRAEPELIN 1903: 206.
Cormocephalus westwoodi elegans: LAWRENCE 1955a: 159.
Cormocephalus westwoodi var. foecundus: KRAEPELIN 1903: 201.
Cormocephalus (C) elegans: ATTEMS 1930a: 83.
Cormocephalus (C) westwoodi westwoodi: ATTEMS 1930a: 78.
Cormocephalus (C) westwoodi dispar: ATTEMS 1930a: 79.
Cormocephalus (C) elegans elegans: ATTEMS 1930a: 84.
Cormocephalus (C) westwoodi dispar var. dispar: ATTEMS 1930a: 79.
Cormocephalus (C) westwoodi westwoodi var. westwoodi: ATTEMS 1930a: 79.
Cormocephalus (C) westwoodi dispar var. fangaroka: ATTEMS 1930a: 80.
Cormocephalus (C) elegans elegans var. elegans: ATTEMS 1930a: 84.

**Type material:** Australien, Gayndah, leg. A. Dietrich, don. Museum Godeffroy, det. Kohlrausch, syntype of Cormocephalus lanatipes, 1 sad. NHMW 955, [Mus. Godeffroy Nr.14944].


**Description:** This widespread form shows a high variability; it therefore includes some forms, that were recorded previously as separate species.

Body length up to 64 mm (NHMW 944).

Antennae: 17 antennomeres, (5)6 - 14(15) basal ones glabrous both dorsally and ventrally.

Headplate: strongly diverging, incomplete paramedian sulci reach to the cephalic midpoint.

Forcipules: Coxosternum may be punctate in various degree, with a short median sulcus, normally without transverse sulci. Tooth plates approximately as long as wide; their basal sutures somewhat curved laterally.

Terga: Tergum I may bear anterior rudiments of paramedian sulci; in some cases lateral margination is visible from tergum V; tergum XXI with a median sulcus of various length.

Sterna: sternum XXI with posterior margin from straight to slightly bisinuated (Figs. 6, 7).

Coxopleura: virtually the entire surface is perforated with pores; poreless area includes the posterior process (Fig. 7) and, sometimes, narrow strip which partially borders coxopleuron (Fig. 6). Process usually with two apical spines; posterior coxopleural margin usually with a single spine of various size.

Locomotory legs: number with/without praetarsal spurs varies widely to their total absence (see below).

Terminal legs: from relatively long (Fig. 7) to short (Fig. 6) and wide. Ventral surface
Figs. 6 - 8: *Cormocephalus westwoodi westwoodi* (Newport, 1844): (6) posterior end of body of syntype of *C. lanatipes* Kohlrausch, 1881 (NHMW 955) in ventral view, (7) posterior end of body (NHMW 3263) in ventral view. – *Cormocephalus westwoodi anceps* stat.n.: (8) forcipular coxosternum of NHMW 3271 in ventral view. Scale is 1 mm.
of praefemur medially with wide, more or less deep longitudinal depression, medial and lateral rows of spines disposed along these "borders". Normal ventro-lateral spinulation consists of two rows of 2+2 or 2+3 spines; praefemoral dorso-distal processes well developed, with two(3) apical spines. Praetarsus from twice as short to somewhat longer than tarsus II, with or without spurs.

**Variability:** Only one specimen (NHMW 2047) has the forcipular coxosternum with some transverse sulci (similar to *Cormocephalus nitidus*) and basal sutures of tooth plates in the form of a straight line. A few of the largest adults (NHMW 3262) have the coxosternal median sulcus with some very short lateral "branches" like *Cormocephalus westwoodi aniceps* (NHMW 3271) (Fig. 8).

Forcipules: coxosternum may be "punctate" to a various degree - these "puncti" are very strongly developed, for instance in NHMW 3262.

Tergum I (NHMW 944) with anterior rudiments of paramedian sulci.

Number of laterally margined posterior terga varies widely - generally from 8 to 16 - 18; lateral margination is recognisable beginning from tergum V in NHMW 944.

Median sulcus of tergum XXI from complete (more usually) to incomplete (2/3 of tergal length in NHMW 953) or, even short; when incomplete/short, it may has a variable configuration: positioned anteriorly (the most frequent condition), posteriorly or broken medially; note that such a character is species specific for most Scolopendrinae.

Posterior margin of terminal sternum from clearly straight (NHMW 944) to slightly bisinuated (NHMW 955).

Coxopleuron is bordered by narrow poreless strip in NHMW 944, 955, 967, 3264, etc. In NHMW 3264 posterior coxopleural margin without spine; unusually large coxopleural pores and processes slightly curved medially in NHMW 956 (determined as *Cormocephalus westwoodi var. foecundus*).

NHMW 944 has all locomotory legs without praetarsal spurs.

Terminal legs vary most of all: (a) from relatively long - in juveniles (NHMW 3262) ratio of praefemoral length : width is 4.5 : 1 - and slender (as in *Cormocephalus multispinosus*) to short (as in *Cormocephalus setiger*) and very wide, pincers-shaped (NHMW 953), ratio of praefemoral length : width is 2.2 : 1; (b) ventral depression on praefemur is better developed when terminal legs are shorter and thicker; maximal depth in NHMW 2047; (c) ventral praefemoral spinulation varies; (d) NHMW 944 has dorso-distal processes of both terminal legs equipped with furnished by three apical spines; (e) NHMW 3262 adults have praetarsus twice and juveniles 2.5 - 3 times shorter than tarsus II; NHMW 953, 955, 956 have these joints nearly of the same length and in NHMW 2047 praetarsus is somewhat longer (note that praetarsal length correlates directly with enlargement of terminal legs and - indirectly - with length of tarsus II); (f) presence of praetarsal spurs correlates indirectly to enlargement of terminal legs (= to comparative length of terminal praetarsus); for example in NHMW 953 and NHMW 955 these spurs are absent, in NHMW 2047 only the lateral spur is present, in NHMW 3263 only the terminal leg bears spurs.

**Remarks:** The most variable characters listed above should not be used for subdividing this species.
ATTEMS (1930a) reduced the status of Cormocephalus dispar PORAT, 1871 to a subspecies of Cormocephalus westwoodi, distinguishing within this species the following subspecies and variations: (a) Cormocephalus westwoodi westwoodi: tergum XXI with or without median sulcus; margination beginning from terga VIII - XIV; terminal prefemur ventro-laterally with two rows (2+2) of spines, tergum XXI with or without [!] median sulcus; (b) Cormocephalus westwoodi westwoodi var. westwoodi: tergum XXI with median sulcus; (c) Cormocephalus westwoodi westwoodi var. huttoni POCOCK, 1893: tergum XXI without [!] median sulcus; (d) Cormocephalus westwoodi dispar PORAT, 1871: tergum XXI with median sulcus; margination beginning from terga III - V(VII); sometimes one of the terminal prefemora ventro-laterally with one row of 2 - 3 spines, locomotory legs I - XX with or without praetarsal spurs; (e) Cormocephalus westwoodi dispar var. dispar: locomotory legs I - XX with praetarsal spurs.

As for the name westwoodi dispar, KOCH (1983a) already placed it under the name westwoodi in his monograph on Australian species of Cormocephalus, giving, however, no reason for this. According to our own observations, there are no clear distinctions between "subspecies" and "varieties" listed above, except for Cormocephalus huttoni (see below), and all the conditions of their "diagnostic" characters fit well within the known range of intraspecific variability of Cormocephalus westwoodi (see above). Moreover, numerous combinations of the characters mentioned under Variability (see above) form some practically complete series of morphological transformations; such series are perfectly presented by 27 specimens of NHMW 3262. No clear geographical variability of any character has been found. Cormocephalus westwoodi dispar is not a geographical subspecies of Cormocephalus westwoodi because of their mutual distribution in Madagascar, Seychelles, S and E Africa.

KOCH (1983a) considered Cormocephalus huttoni POCOCK, 1893 (or Cormocephalus (C.) westwoodi var. huttoni sensu ATTEMS), as a synonym of Cormocephalus westwoodi. According to previous descriptions, this form has no median sulcus on tergum XXI: According to our own observations, however, the presence of this sulcus is diagnostic for Cormocephalus westwoodi. Moreover, KOCH (1983a) noted in the diagnosis of westwoodi: "... species without transverse grooves on maxilliped base-plates and with [!] median sulcus of tergite XXI present (except in very early instars and rarely in adults)". We therefore do not consider huttoni as a synonym of westwoodi but more material is required to clarify their relationship.

Note, that LAWRENCE (1955a) recognized from South Africa, KwaZulu-Natal and from Swaziland subspecies of Cormocephalus westwoodi (except for the nominative form): westwoodi dispar, westwoodi elegans KRAEPELIN, 1903 (which he noted in 1955b as elegans elegans) and a new subspecies westwoodi microdens, which is distinguishable mainly by "Emargination of the tergites begins on segments X - XVII ..." and "prefemur of end-legs usually with 2 - 2 small ventro-lateral spines, occasionally 2 - 3". In the same paper (LAWRENCE 1955a) he mentioned also a fourth subspecies: "Cormocephalus westwoodi nubigenus LAWRENCE". The description followed later (LAWRENCE, 1955b), based on a type-series of 26 specimens from mountaneous (altitude 7750 - 9000 ft) areas in Cape Province and Botswana. Cormocephalus westwoodi nubigenus differs from the other westwoodi-subspecies mainly by having "antennae with the fourbasal segment hairless; prefemur of end-legs with 2 - 2 ventro-lateral minute ("almost invisible") granuli-
form spines". Koch (1983a) refers to Lawrence (1955a) "[he] states the typical form of *C. westwoodi* occurs in the Australian region, and he distinguishes four African subspecies from the Natal-Zululand area.", but placed *westwoodi dispar*, *westwoodi elegans*, *westwoodi microdens* and *westwoodi nubigenus* under the name *Cormocephalus westwoodi* (without giving an explanation and/or a note that he had studied their types). This synonymisation seems to be quite reasonable for the first three of these subspecies, because their diagnostic characters fit clearly inside the range of variability of *westwoodi westwoodi* (see above).

*Cormocephalus westwoodi nubigenus* seems to be (at least according to its diagnosis) a mountain form of *westwoodi*. This point of view is also supported by Kraus (1958b) who investigated six specimens from three mountainous (750 - 1700 m alt.) localities in the Congo. Moreover, Lawrence (1955b) wrote about this form: "The present subspecies seems to have closer affinities with the typical *westwoodi* than with *dispar* though the latter and *nubigenus* both occur at high altitudes in the same[!] localities". Thus, as *westwoodi nubigenus* exists together with *dispar (= westwoodi westwoodi)* it seems to be an independent species. Having no specimens of this form we are unable to comment on its validity. Lawrence (1960), recorded *Cormocephalus dispar fangaroka* Saussure & Zehtnter, 1901 and *Cormocephalus dispar alticursor*, a new subspecies from Madagascar. The former (originally *Cormocephalus fangaroka*) was listed under *Cormocephalus westwoodi* by Koch (1983a). *Cormocephalus dispar alticursor* described on the basis of at least five specimens as Lawrence (1960) noted three localities from Central- and two from Eastern Madagascar. The diagnostic character is the total absence of median sulcus on the terminal tergum. We consider such a condition as being out of the range of variability of *C. westwoodi* (see above about *Cormocephalus huttoni*). As none of the specimens studied by us resembles this form (whose rank should be formally elevated to full species following the synonymisation of *dispar*), its status will be questionable until more material will be investigated.

Among descriptions of forms of *Cormocephalus westwoodi*, Attems (1930a) mentioned two closely related "species": *Cormocephalus foecundus* Newport, 1845 (lateral margination beginning from terga IX - XIV) and *Cormocephalus sarasinorum* Haase, 1887 (distal spine of ventro-medial row on terminal praefemur positioned directly under distal dorsal process). The author pointed out (but without synonymisation), that it is impossible to distinguish both *Cormocephalus foecundus* and *Cormocephalus sarasinorum* from *Cormocephalus westwoodi* and did not mention them in his key. Koch (1983a) placed both names *foecundus* and *sarasinorum* under *westwoodi* giving no reason for that action. In support of the first synonymisation we note, that in specimen (NHMW 953) labelled by Attems as *Cormocephalus westwoodi* var. *foecundus*, the lateral margination actually begins at tergum XI, but this feature fits well within the borders of intraspecific variability of *Cormocephalus westwoodi westwoodi* (also sensu Attems 1930a).

*Cormocephalus lanatipes* Kohlrausch, 1881 was synonymised with *Cormocephalus westwoodi* by Kraepelin (1903). The investigated syntype of *Cormocephalus lanatipes* (NHMW 955) clearly belongs to *westwoodi westwoodi*.

The taxonomic status of specimen NHMW 2047, which has a transverse sulcus at the forcipular coxosternum like in *Cormocephalus nitidus* remains unclear.
Range: E and SE Australia; Tasmania; Sri Lanka; New Zealand, New Guinea; Loyalty Islands; Seychellen; Comores; Reunion; Madagascar: Northern (Montagne d’Ambre), NW coast (Toni Keli Island), Eastern (Ambilobe; Antsingy-Nord), Central (Tananarive; Ankaratra, etc.); S, SW and SE Africa; Botswana (Kalahari); E Africa: Zimbabwe; Zambia (Central Province). Very common.

Cormocephalus westwoodi anceps PORAT, 1871 stat.n. (Fig. 8)

Cormocephalus anceps PORAT 1871: 1157.

Cormocephalus brevicornis KRAEPELIN 1903: 206.
Cormocephalus elegans zuluinus ATTEMS 1928a: 294.


Description: Both the original description and that of ATTEMS (1928b) are not detailed enough; we therefore add the following details:

Antennae: 16 - 17 antennomeres, of those up to 16 basal ones are glabrous both dorsally and ventrally.
Forcipules: coxosternum with short median sulcus (Fig. 8), which may be slightly "branched"; basal sutures of tooth plates curved. Tooth plates clearly longer than wide (Fig. 8), a feature that is better visible in younger specimens; praefemoral median tooth well developed.

Terga: tergum XXI with median sulcus of various length.

Coxopleura: porose area does not reach posterior margin.

Terminal legs: short and wide; praefemur ventrally with a longitudinal depression as in nominative form; ventro-laterally with two rows of 2 + 3, 3 + 3, 3 + 4 spines. Praetarsus varies in length from slightly shorter to considerably longer than tarsus II; paretarsal spurs mainly absent.

**Variability:** NHMW 943 has antennae of 17 joints, of which 15 (16) basal ones are glabous, in NHMW 931 16 and 9 (10) joints correspondingly;

In both adults (NHMW 3273), tergum I does not reach cephalic posterior margin; lateral margination in these specimens is visible at terga XIX - XXI only.

Specimen NHMW 931 has median sulcus developed in the posterior half of tergum XXI only, one adult of NHMW 3271 has such a sulcus strongly shortened.

One specimen of NHMW 950 has coxopleural porose area much shorter than usually, more closely resembling *Cormocephalus insulanus* in this respect.

In specimen NHMW 3273 terminal praefemora with 2 + 2 ventro-lateral (i.e. as in nominative form) and three ventro-medial spines; all praefemoral spines are very small.

Specimens NHMW 930, NHMW 931 have terminal praetarsus nearly as long as tarsus II with small paretarsal spurs; in NHMW 3271 these spurs are well developed.

**Remarks:** PORAT (1871) described *Cormocephalus anceps* from "Caffraria" (E part of Cape Province). According to ATTEMS' (1930a) key for *Cormocephalus* species, both *Cormocephalus westwoodi* and *Cormocephalus anceps* have the terminal praefemur ventro-laterally with two rows of "2 + 1 bis 4 + 5" spines (couplet 7). At couplet 19 of this key, however, he separated *Cormocephalus anceps* with "2 + 3 or 1 + 3" ventro-lateral spines (which contrasts with his own description of this "species") from *Cormocephalus westwoodi* with "1 + 2 or 2 + 2" spines. It is thus impossible to distinguish these two "forms" using this key. ATTEMS (1930a) mentioned the median sulcus of tergum XXI in this species, but some specimens (altogether 33), identified by Attems as *Cormocephalus anceps* or *Cormocephalus anceps anceps*, have no trace of such a sulcus. Moreover, within those 33 specimens we found: *Cormocephalus westwoodi anceps* - 9 specimens, *Cormocephalus westwoodi westwoodi* - 1, *Cormocephalus nitidus calcaratus* - 2, *Cormocephalus oligoporus* - 1, *Cormocephalus multispinosus* - 15, *Cormocephalus insulanus* - 3, *Cormocephalus multispinus* - 1, *Cormocephalus pontifex* - 1, *Scolopendra* sp. - 1. This not only underlines the high degree of variability in *Cormocephalus anceps*, but also the absence of a clear diagnosis for this "species".

In LAWRENCE (1955a) we read (p. 154): "...the various forms of the two species *westwoodi* and *anceps* constitute a complex, the distinguishing characters of which are rather artificial; these forms, here regarded as subspecies, are distributed over a large part of South Africa and occur at all altitudes, but even specimens from a single locality are
subject to considerable variations with regard to the spinulation of the end-legs, the
emargination of the tergites and the number of hairless antennal segments; any of these,
taken by itself, is hardly reliable for distinguishing one subspecies from another."

From our point of view, however, some specimens of "Cormocephalus anceps" differ
generally from Cormocephalus westwoodi by a combination of the following charac-
ters: (a) comparatively higher tooth plates, (b) presence of poreless strip at coxopleural
margins, (c) usually more numerous ventro-lateral spines of terminal praefemur.

Such differences are not reliable enough to separate these two forms as species; we pre-
fer, however, to keep the name anceps for the South and East African subspecies of
westwoodi.

In summary the suggested synonymy is: Cormocephalus anceps PORAT, 1871 = Cormo-
cephalus westwoodi anceps PORAT, 1871 stat.n.

Cormocephalus brevicornis KRAEPELIN, 1903 has been regarded as a junior synonym of
anceps by LEWIS (2001) based on the study of material from Great Zimbabwe Ruins
(Zimbabwe). ATTEMS (1930b) described Cormocephalus brevicornis longipalpus from
"Elisabethville" in the Belgian Congo (Lubumbashi/ Democratic Republic of Congo ).
This form differ from the nominative one by longer antenna and shape of sternum XXI. Both
"differences", however, fit well into the range of variability of westwoodi anceps, so we regar it as a synonym of latter.

Cormocephalus anceps segnis ATTEMS, 1928b has been described from numerous
localities in Cape Province without mentioning either the diagnosis or locus typicus.
According to the original description and both identification keys for Cormocephalus
(ATTEMS 1928b, 1930a) the only difference between this "subspecies" and Cormo-
cephalus anceps anceps is the absence of praetarsal spurs of terminal legs in the former
(the variability of this character has been already discussed above). ATTEMS (1928b,
1930a) also noted about Cormocephalus anceps anceps: "very frequent in the Cape
Province". Therefore, Cormocephalus anceps segnis cannot be a geographical sub-
species of Cormocephalus anceps. LEWIS (2001) considered Cormocephalus anceps
segnis to be a junior synonym of anceps anceps, while we regard it as subspecies of
westwoodi. (It should be noted, that Lewis had not compared anceps segnis to west-
woodi having no specimens of the latter).

Of 13 specimens studied, which were previously determined as Cormocephalus anceps
segnis, 10 actually are the typical representatives of Cormocephalus westwoodi anceps
and the other threespecimens are: one subadult of Cormocephalus esulcatus esulcatus
(NHMW 948), one subadulf of Cormocephalus nitidus nitidus (NHW 3278) and one
specimen of Cormocephalus sp., (very strange small animal with strongly enlarged ter-
mental legs whose praefemur totally lacks spinulation).

Considering all the facts above, we propose Cormocephalus anceps segnis ATTEMS,
1928 be Cormocephalus westwoodi anceps PORAT, 1871 stat.n.

Cormocephalus elegans zuluinus ATTEMS, 1928a has been described from Umtili
River in ZuluI based on a single(!) specimen. Attems noted its similarity to elegans
from which the new form differs by a reduced (only 4) number of laterally bordered posterior
terga and the absence of cephalic basal plates ("... keine Basalplatten sichtbar [!] sind.").
Concerning the last character (which we regard as one of the diagnostic for *Cormocephalus*), these basal plates are sometimes (and always in some species) not easily visible, being completely covered by tergum I. In the same work Attems described *Cormocephalus humilis*, noting the absence of "visible" basal plates; however these structures are well developed in the studied syntype (see below).

LAWRENCE (1955a) combined *Cormocephalus elegans zuluinus* ATTEMS 1928a as *Cormocephalus aniceps zuluinus*, later (LAWRENCE 1955b), however, he named this form again *elegans zuluinus*. This author wrote (1955a: 161): "Whether zuluinus should be regarded as a form of aniceps or of elegans depends upon the relative weight assigned to the diagnostic characters used; the various subspecies of westwoodi and of aniceps are already fairly closely related but I have regarded elegans as another subspecies of westwoodi rather than as an independent species; zuluinus is just as closely related to aniceps as to elegans (i.e. to westwoodi westwoodi) and it has seemed more convenient to regard it as a variant of the former species".

In consideration of the very reduced number of laterally bordered posterior terga in some specimens of *westwoodi aniceps* (see above) we regard zuluinus as a synonym of westwoodi aniceps. 

*Cormocephalus aniceps serrulatus* has been described by VERHOEFF (1941) for a single [!] specimen from Africa without precise locality. This form was differentiated from the nominative one by the length ratio of coxopleuron to terminal sternum, shape of the latter and comparative length of terminal praetarsus. As these such diagnostic characters are not very reliable, we regard this poorly described form as a synonym of westwoodi aniceps.

**Range:** S Africa: Cape Provinces (Terra typica); Northern Cape Province (Kimberley), Namaqualand ["south of Orange river"] (Concordia); KwaZulu-Natal; Free State Province (Kroonstad); Transvaal; Northern Province (Kruger National Park, Leysdorp); Gauteng Province ( Pretoria); SW Africa: Namibia (including valley of Kuiseb River in Namib Desert); Botswana; Lesotho (near Maseru); E Africa: Zimbabwe; Central Africa: Zambia; Democratic Republic of Congo (Lubumbashi).

**Cormocephalus westwoodi ribauti ATTEMS, 1928 stat.n.** (Fig. 9)

*Cormocephalus ribauti* ATTEMS 1928a: 289.
*Cormocephalus (C.) ribauti*: ATTEMS 1930a: 93.

**Type material:** Australia, Sydney, don. Steindachner, det. Attems, syntype of *Cormocephalus (C.) ribauti*, 1 ad., NHMW 922, [1883.1.6].

**Other material:** Australia, NS Wales, Hunter River, Ash Island, det. Attems as *Cormocephalus westwoodi*, 1 ad., NHMW 957 – Australien, Sydney, leg. A. Dietrich, don. Museum Godeffroy, det. Kohlrausch as *Cormocephalus foecundus* NEWPORT, 1845, 1 sad., NHMW 3266, [1881.1.9].

**Description:** The specimens investigated correspond generally to ATTEMS (1928a, 1930a), but some new details should be added.

Antennae: 7 - 11 basal antennomeres glabrous.

Forcipules: Very strongly punctate.
Figs. 9 - 11: *Cormocephalus westwoodi ribauti* ATTEMS, 1928 stat.n.: (9) posterior end of body of syntype (NHMW 922) in ventral view. – *Cormocephalus westwoodi lambertoni* BRÖLEMANN, 1912 stat.n.: (10) forcipular coxosternum of NHMW 970 in ventral view, (11) posterior end of body of NHMW 970 in ventro-lateralal view. Scale is 1 mm.

Coxopleura: Porose area reaches to the posterior margin (Fig. 9), only the process is poreless; the latter with two apical spines, a single spine positionned close to posterior margin.

Terminal legs: Large (Fig. 9), with their surface strongly dotted, praetarsus clearly longer than tarsus II.
Variability: ATTEMS noted 11, but NHMW 957 has 7 - 8 glabrous basal antennomeres.

Remarks: Cormocephalus ribauti was described by ATTEMS (1928a) for a single specimen and should differ from Cormocephalus westwoodi primarily by much longer terminal praetarsus (ATTEMS 1928a, 1930a). This joint should be no longer than terminal tarsus II in Cormocephalus westwoodi and "merklich länger als der 2. Tarsus" in Cormocephalus ribauti. But the high variability of this character in Cormocephalus westwoodi discussed above, shows that this character is certainly unsuitable for separating species in the westwoodi - group. No other differences have been found in known descriptions of these forms.

KOCH (1983a) synonymised ribauti under westwoodi but without any explanation; he did not recognise any subspecies among westwoodi. But our own experience shows one reliable difference between Cormocephalus ribauti and the nominative form of westwoodi, namely the strongly punctate surface of both forcipules and terminal legs in the former; this character is certainly insufficient to maintain Cormocephalus ribauti as an independent species. In summary, we consider this form to be an East Australian subspecies of Cormocephalus westwoodi i.e.: Cormocephalus ribauti ATTEMS, 1928 is Cormocephalus westwoodi ribauti ATTEMS, 1928 stat.n.

Range: E Australia: Sydney (Locus typicus); New South Wales.

Cormocephalus westwoodi lambertoni BRÖLEMANN, 1922 stat.n. (Figs. 10 - 11)

Cormocephalus lambertoni BRÖLEMANN 1922: 225.
Cormocephalus (C.) lambertoni: ATTEMS 1930a: 93.

Material: Madagaskar, E-Küste, Wald bei Moramanga, 700m, leg. F. Sykora, don. Ministerium des Äusseren, det. Attems as Cormocephalus (C.) westwoodi dispar, 3 Ex., NHMW 970, [1894.1.65].

Description: Known descriptions lack sufficient detail.

Antennae: Reach to the posterior margin of tergum V; 11 basal antennomeres are glabrous.

Forcipules: characteristically broadened (Fig. 10), being clearly visible from the dorsal side, their surface clearly punctate. Praefemoral median tooth well-developed with one lateral tubercle, clearly higher than tooth margin.

Terga: tergum III with clear lateral margination, but tergum IV with unclear one; all the following terga clearly margined.

Sterna: sternum XXI very long and narrowed posteriorly, its posterior margin clearly bisinuated.

Coxopleura: porose area reaches to the posterior margin (Fig. 11), latter without spine.

Terminal legs: short and strongly enlarged (Fig. 11), their surface not punctate. Ventral surface of praefemur without well-developed median depression. Praetarsus (Fig. 11) as long as 1.5 tarsus II, praetarsal spurs absent.

Variability: Sizes of spines at terminal praefemur vary.
Remarks: According to Attems (1930a), *Cormocephalus lambertoni* Brölemann, 1922 differs from *Cormocephalus westwoodi* by the length of terminal praetarsus, as the previous form (see Remarks to *Cormocephalus ribauti* above). The examined specimens may be distinguished from *Cormocephalus westwoodi westwoodi* only when a combination of the following data is used: (a) length of antennae, (b) number of terga laterally margined, (c) shape of posterior margin of sternum XXI, (d) length of terminal praetarsus. With regard to distribution, both *Cormocephalus westwoodi westwoodi* and *Cormocephalus lambertoni* are recorded from Madagascar, but because all of the few known precise localities are different for two these forms, *Cormocephalus lambertoni* is here currently regarded as a geographical subspecies of *Cormocephalus westwoodi*.

Thus, we suggest the new synonymy: *Cormocephalus lambertoni* Brölemann, 1922 is *Cormocephalus westwoodi lambertoni* Brölemann, 1922 stat.n.

Range: Madagascar: Tananarive (Locus typicus), Ambatondrazaka, Moramanga.

*Cormocephalus cupipes* Pocock, 1891

*Cormocephalus cupipes* Pocock 1891: 64.
*Cormocephalus (C.) cupipes*: Attems 1930a: 77; Lewis 2001: 11.


Description: The following details are added to the descriptions:

Forcipules: coxosternum with short median sulcus only; tooth margin of tooth plates consists of 5 - 9 small teeth of which lateral tooth is not clearly isolated (as in *Scolopendra subspinipes* Leach, 1815).

Sterna: Sternum XXI characteristically narrow, with a longitudinal depression (not longitudinal sulcus, as Attems (1930a) noted).

Coxopleura: Porose area wide, considerably longer than sternum XXI.

Terminal legs: Strongly enlarged, of very characteristic shape, see Attems (1930a). Praetarsus much shorter than tarsus II.

Variability: one specimen from NHMW 2046 has very narrow coxopleural porose area, slightly longer than sternum XXI.

Remarks: Attems (1928b) described the narrow coxopleural porose area, but in (1930a) he noted this area as wide.

Lawrence (1955a) noted that "the flattening of end-legs has probably come about it conformity" with living "beneath the bark of trees and in no other habitat".

Range: S Africa: KwaZulu-Natal (Terra typica), (Durban; Amanzimtoti); Transvaal (Kruger National Park, near Skukuza); E Africa: Zimbabwe; Mozambique, Maputo Province (Masiene, near Chai Chai; Catuana; Namaacha).
Cormocephalus mecutinus ATTEMS, 1928

*Cormocephalus mecutinus* ATTEMS 1928a: 284.
*Cormocephalus (C.) mecutinus*: ATTEMS 1930a: 81.


**Description:** The following details should be added to known descriptions.

Body length 53 mm (40 mm sensu ATTEMS 1928a).

Coxopleura: the caudal borders of porose area in the specimen examined are not clearly visible, as this area seems to reach coxopleural posterior margin; the latter with one spine, versus ATTEMS (1930a).

Terminal legs: Short and very wide.

**Remarks:** Besides the holotype in the Museum Hamburg no other specimen of *Cormocephalus mecutinus* has been recorded until now.

From our point of view no differences exist between the original description of *Cormocephalus mecutinus* (which lacks illustration) and known descriptions of *Cormocephalus multispinosus*. ATTEMS' (1930a) key does not permit clear separation of these two species; according to couplet 16 *Cormocephalus mecutinus* should have terminal praefemur with "2 + 2 bis 2 + 3" ventro-lateral spines versus *Cormocephalus multispinosus* with "4 + 5 bis 5 + 6" spines. However, in both couplet 28 and the description of *mecutinus*, ATTEMS mentioned 9 - 11 spines, exactly the same as in *multispinosus*. Also, note that ATTEMS' Figure 89 shows the coxopleuron of *Cormocephalus multispinosus* rather than of *Cormocephalus mecutinus*, contrasting with the accompanying description of the latter.

According to the present authors' observations these two species seem to be generally distinguishable from each other by a combination of the following characters: (a) much shorter coxopleural porose area in *Cormocephalus multispinosus*, (b) shorter and larger terminal legs in *Cormocephalus mecutinus* and (c) 2 - 3[?] rows of ventro-lateral spines at terminal praefemur in *mecutinus* versus two such rows in *multispinosus* (latter condition may be an abnormality). At the same time we have seen in *multispinosus* some variations in the sizes of the coxopleural porose area. one specimen (NHMW 3267) has left terminal praefemur furnished ventro-laterally with three rows of spines (abnormality? see above). (It should be added that *Cormocephalus mecutinus angolensis* ATTEMS, 1930 is a synonym of *Cormocephalus multispinosus*; see Remark 2 to latter). Considering all the facts listed above, we provisionally keep the name *Cormocephalus mecutinus* until more material (including holotype) becomes available.

**Range:** SE Africa: Mozambique, "Landschaft" Mecutine, ca. 70 km W of Mozambique coast (Locus typicus); S Africa: Northern Cape Province, Little Namaqualand.

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*Cormocephalus humilis* ATTEMS, 1928

*Cormocephalus humilis* ATTEMS 1928a: 294.
*Cormocephalus humilis*: LAWRENCE 1953: 413.
*Cormocephalus (C.) humilis*: ATTEMS 1930a: 82.

**Type material:** E-Africa, Zanzibar, syntype, 1 juv., NHMW 2057. Another specimen. belongs to *Otostigmus* s.str.

**Description:** Headplate: with clear basal plates (vs. original description).
Remarks: In the original description the close resemblance to Cormocephalus brevicornis KRAEPELIN, 1903 (= C. westwoodi anceps) was noted. ATTEMS (1930a) mentioned Cormocephalus humilis as the closest species to Cormocephalus mecutinus, noting absence of cephalic basal plates in former as diagnostic character. We have found these structures well-developed in the single known syntype. However, as Cormocephalus humilis seems to be differentiable from mecutinus by the spinulation of the terminal praefemur, see ATTEMS (1930a), and the quite typical shape of the forcipular tooth plates, we provisionally maintain this name until more material from this part of E Africa becomes available.

Range: E Africa: Tanzania, Zanzibar Island (Terra typica); Malawi.

*Cormocephalus multispinus* (KRAEPELIN, 1903) (Figs. 12 - 13)

*Hemicormocephalus multispinus* KRAEPELIN 1903: 211.

*Hemicormocephalus multispinus*: GROBBELAAR 1921: 255; ATTEMS 1928b: 93.


*Cormocephalus multispinus quadridens* LAWRENCE 1953: 414.

*Cormocephalus (C.) multispinus*: ATTEMS 1930a: 86.


Description: Both the original description and ATTEMS’ (1930a) data are not detailed enough; new data are marked by (*).

Body length up to 47 mm (40 mm sensu ATTEMS); long, relatively slim body contrasts with short, wide terminal legs (*).

Antennae: short, reaching to the posterior margin of tergum I only (as ATTEMS mentioned); of 17 antennomeres 6 - 7 basal ones glabrous.

Headplate: incomplete paired longitudinal sulci reach to cephalic midpoint (*), short median posterior sulcus (*) present (Fig. 12); basal plates very clear. Posterior cephalic margin more or less covered by tergum I, bearing some other (*) sulci (Fig. 12).

Forcipules: coxosternum without sulci; tooth plate nearly square-shaped with tooth margin consisting of 3 - 4 teeth, which have no common dark-brown base; basal sutures of tooth plates form straight line (*). Praefemoral median tooth very small but with large lateral tubercle (*).

Terga: paramedian sulci may be shortened anteriorly on terga II - III (*), at terga IV - XX the sulci always complete; terminal tergum with median sulcus. This tergum as long as penultimate one (*), a condition which is unusual for Scolopendrinae.

Sterna: very long terminal sternum strongly narrowed posteriorly, the ratio of its anterior : posterior margins being 2 - 2.5 : 1 (*).

Coxopleura: conical process (Fig. 13) with 2 - 3 apical, 1 - 2 subapical, 1 - 2 lateral and 0 - 1 dorsal (*) spines (i.e. every process with no less than 4 - 5 spines).

Terminal legs: clearly enlarged but with praetarsus much shorter (*) than tarsus II (Fig. 13). Praefemur with two ventro-lateral rows (Fig. 13) of 3 + 5, 4 + 5, 5 + 5 spines,
two ventro-medial rows of 3+5, 3+6 (*) spines and 3-4 dorso-medial spines. Long dorso-distal praefemoral process with two curved apical spines.

**Remarks:** This species clearly differs from *Cormocephalus multispinosus* by: (a) shorter antennae, (b) wider forcipular tooth plates, which have no solid tooth margin, (c) more numerous and larger coxopleural spines, (d) considerably shorter and larger terminal legs.

**Lawrence** (1953) described *Cormocephalus multispinus quadridens* based on a single specimen from Nyasaland (now Malawi) in E Africa. The author mentioned: "The single specimen differs very little from the typical form ... mainly in having only 4 spiniform teeth on the coxopleural process, instead of 5 or 6". This number of coxopleural spines falls within the variability of this species, thus we regard *multispinus quadridens* as a synonym of *multispinus*.

In 1955b describing *Cormocephalus rhodesianus* for six specimens from Zimbabwe, **Lawrence** noted: "This specimen [i.e. holotype, collected "30 miles North of Beit Bridge"] is probably most closely related to *Cormocephalus multispinus* (Kraepelin), the only South African species with more than 3 spines on the coxopleural process." According to the original description and the accompanying figure *rhodesianus* clearly belongs to the setiger - group, having narrow coxopleural porose area which is not longer than the terminal sternum.

**Lawrence** (1955a) wrote that *multispinus* is "a very characteristic representative of the forest humus fauna".

**Range:** S Africa: KwaZulu Natal, Port Durban (Locus typicus), (Pietermaritzburg); Lesotho (Mokhotlong); Mpumalanga province (E Transvaal); E Africa: Malawi (Shire river).

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**Cormocephalus setiger** **Porat**, 1871

*Cormocephalus setiger* **Porat** 1871: 1158.
*Cormocephalus setiger* **Porat** 1871: 1158.
*Cormocephalus (C.) setiger* **Attem** 1930a: 76.


**Description:** Forcipules: coxosternum without transverse sulci; very small praefemoral median tooth closely pressed to praefemur.

Terga: tergum XXI with medial sulcus.

Sterna: with longitudinal depression.

Coxopleura: pores occupy narrow oval area in the middle of coxopleuron.

Body segment XXI strongly enlarged.

Terminal legs: enlarged, but praetarsus much shorter than tarsus II; praetarsal spurs absent. Both tibia and tarsal joints are densely covered by short semitransparent setae (Attems 1930a mentioned such setae as a male character).
Figs. 12 - 16: *Cormocephalus multispinus* (KRAEPELIN, 1903): (12) anterior end of body in dorsal view (schematic), (13) posterior end of body of NHMW 3255 in lateral view. – *Cormocephalus multispinosus* ATTEMS, 1909, syntype of *C. spinulosus* ATTEMS, 1928 (NHMW 2022): (14) anterior end of body of in dorsal view, (15) right forcipular tooth plate in ventral view (schematic), (16) posterior end of body in ventro-lateral view. Scale is 1 mm.
Variability: NHMW2044 has unusually long coxopleural porose area.

Remarks: This species is very similar to Cormocephalus westwoodi; according to Attems' (1930a) key, they may be distinguished from each other by the length and width of the coxopleural porose area. Although the first character is too variable in some Scolopendrini (Arthrorhabdus, some Cormocephalus) to be diagnostic, the width of this area seems to be species specific. Thus, *Cormocephalus setiger* may be separated from *Cormocephalus westwoodi* by: (a) narrower coxopleural porose area, (b) fewer (2 + 2 versus 2)3 + 3 - 4 in *westwoodi*) ventro-medial spines of terminal praefemur and (c) considerably more slender body.

*Cormocephalus rhodesianus* Lawrence, 1955b - a certain member of the *setiger* group (see also Remarks to *multispinus* above) - has in this group a quite independent position (first of all because of abundant ventro-lateral spinulation of terminal praefemur). Besides the type-series, some other specimens have been reported by Lawrence (1966) from Kruger National Park (Transvaal).

Range: S Africa: Eastern Cape Province (terra typica) (Port Elizabeth); Western Cape Province (Table Mountain, Cape Town, Mosselbaai); Transvaal; KwaZulu Natal (Durban, Hluhluwe Game Reserve); Lesotho (Mount Moorosi, Quthing); Botswana, Kalahari; Zimbabwe (Salisbury).

_Cormocephalus multispinosus_ Attems, 1909 (Figs. 14 - 17)

*Cormocephalus oligoporus multispinosus* Attems 1909: 14.


*Cormocephalus (C.) spinulosus* Attems 1928b: 290 syn.n.

*Cormocephalus (C.) spinulosus*: Attems 1930a: 80; Lawrence 1955b: 12, 42, 48; 1975: 42.

*Cormocephalus (C.) multispinosus*: Attems 1930a: 75.

*Cormocephalus mecutinus* var. angolensis Attems 1930c: 373 syn.n.


Description: The following details should be added to the original description and to ATTEMS (1930a).

Antennae: 10 - 11 basal antennomeres are almost glabrous.

Headplate: with well-developed basal plates and paramedian sulci which reach to cephalic mid point (Fig. 14).

Forcipules: coxosternum with clear median sulcus. Tooth plates (Fig. 15) slightly longer than wide; 3 median and one isolated lateral teeth may be fused into more or less solid tooth margin. Plates' basal sutures form a straight line, with their lateral ends curved caudally (Fig. 15). Praefemoral median tooth with one lateral tubercle.

Terga: tergum I not sulcate, terga II - XX with complete paramedian sulci, tergum XXI with complete median sulcus. Only 5 - 6 posterior terga with clear lateral margination.

Sterna: sternum XXI (Figs. 16, 17) with median longitudinal depression and straight posterior margin.

Coxopleura: porose area narrow-oval, somewhat longer than terminal sternum (Figs. 16, 17); pores numerous, of small and very small size. Posterior process (Figs. 16, 17) with two apical spines; one spine at coxopleural posterior margin.

Locomotory legs: all with praetarsal spurs.

Terminal legs: generally slender, pretarsal spurs present. Praefemur (Figs. 16, 17) ventro-laterally with two rows of 4 + 5, 5 + 5, 4 + 6, 5 + 6 spines; dorso-distal praefemoral process with two apical spines of usual sizes, other praefemoral spines considerably smaller.

Variability: Length of coxopleural porose area varies from slightly longer than sternum XXI to clearly longer, but it does not extend to coxopleural posterior margin (Figs. 16, 17). Shape of terminal legs varies from more to less slender. NHMW 2022 has left coxopleural process abnormally spineless (Fig. 16). One of specimens NHMW 3267 has two ventro-lateral rows of spines at the right and three rows at the left terminal praefemur.

Remarks: Cormocephalus spinulosus ATTEMS, 1928 has been described from Okasise near Okahandja (Namibia), closely resembling Cormocephalus anceps sensu ATTEMS (1928a, 1930a). According to the key of ATTEMS (1930a), spinulosus has terminal prefemur with "2 + 2 bis 2 + 3" ventro-lateral spines (differing from Cormocephalus multispinosus), but in the same key spinulosus should differ from anceps, having 11 such spines (i.e. as in multispinosus).

LAWRENCE (1955b) noted about one of 5 specimens of Cormocephalus spinulosus he had: "The specimen from Kaoko-Otavi differs from Attems' description in having 4 + 4 ventro-lateral spines on the [terminal] prefemur instead of 5 + 6 or 6 + 6, the claw of end-legs without spurs."

The syntype examined is typical representative of Cormocephalus multispinosus, including the presence of well-developed cephalic basal plates (vs. ATTEMS 1930a).

Thus, as the observed conditions of the diagnostic characters fit well within the limits of individual variability of Cormocephalus multispinosus, we suggest the new synonymy: Cormocephalus spinulosus ATTEMS, 1928 is Cormocephalus multispinosus ATTEMS, 1909 syn.n.
In the same work Lawrence described two specimens ("much contracted and twisted"
holotype and juvenile syntype, which "differing somewhat [?] in the spinulation of the
end-legs") as Cormocephalus brincki (locus typicus Pakhuis Mts. in Cape Province).
We read: "The species resembles spinulosus ATTEMS (i.e. multispinosus) in the antennae,
lateral emargination, and the fairly large number of small spines on the prefemur of the
end-legs." However, according to the original description and accompanied picture,
brincki (if it really exists) should belong to the another species-group (westwoodi-
group) having long coxopleural porose area which "far surpassing the posterior margin
of the [terminal] sternite" and three ventro-lateral spine-rows at the terminal praefemur.

Cormocephalus mecetinus var. angolensis ATTEMS 1930 differs from the nominative
form by: "kleinen Dorn am Hinterrand der Coxopleuren und durch die zwei Klauen-
sporne der Endbeine". The high degree of variability of these characters already has
been discussed; moreover, Attems himself mentioned their instability.

According to ATTEMS (1930a) Cormocephalus mecetinus should have 2 + 2 or 2 + 3
ventro-lateral spines at the terminal praefemur, but in the original description of
Cormocephalus mecetinus var. angolensis ATTEMS noted 4 + 4 ventral-lateral spines;
this data corresponds to Cormocephalus multispinosus (Fig. 17).

Thus, as all revised syntypes of Cormocephalus mecetinus var. angolensis clearly be-
long to Cormocephalus multispinosus, the new synonymy is: Cormocephalus mecetinus
var. angolensis ATTEMS, 1930 = Cormocephalus multispinosus ATTEMS, 1909.

Range: S Africa: Northern Cape Province, Little Namaqualand ["south of Orange
river"] (terra typica) (Concordia, Komaggas); Gauteng Province (Vryburg); Western
Cape Province (Worcester, Malmesbury); Botswana; SW Africa: Namibia; Angola.

Cormocephalus oligoporus Kraepelin, 1903

Cormocephalus oligoporus KRAEPELIN 1903: 205.
Cormocephalus oligoporus: ATTEMS 1928b: 97; LAWRENCE 1955b: 11, 42, 47; 1959: 368;
1975: 42.
Cormocephalus (C.) oligoporus: ATTEMS 1930a: 76.

Material: SW-Afrika, Neudamm (42 km ENE Windhuk), leg. W. Michaeelsen, 10. May 1911, Hamb.dtsch-
s.w.afr. Studienreise, don. Michaeelsen, 1 Ex., NHMW 923. – SW-Afrika, Keetmanshoop, leg. W.
Michaeelsen, 20. Jul. 1911, Hamb.dtsch-s.w.afr. Studienreise, don. Michaeelsen, 1 Ex., NHMW 924. – SW-
1 Ex., NHMW 925. – S-Afrika, Eierfontain, 1 Ex., NHMW 2041. – S-Afrika, Kapland, det. Attems as
Cormocephalus anceps anceps, 1 sad., NHMW 3260.

Description: Tergum I with incomplete paramedian sulci between its middle and
posterior margin.

Remarks: This species is closely related to Cormocephalus multispinosus, from which
it is distinguishable by: (a) presence of incomplete paramedian sulci on tergum I; note
that ATTEMS (1930a) mentioned presence of short anterior paramedian sulci at tergum I
in Cormocephalus multispinosus, (b) shorter and larger terminal legs; (c) less abundant
spinulation of terminal praefemur.

Range: SW Africa.(Namibia, etc.); Botswana; S Africa: Cape Provinces; S Zimbabwe,
(Hawange).
Figs. 17 - 20: *Cormocephalus multispinosus* ATTEMS, 1909: (17) posterior end of body of syntype of *C. mecutinus* var. *angolensis* ATTEMS, 1930 (NHMW 2033) in ventral view. – *Cormocephalus insulanus* ATTEMS, 1928, syntype (NHMW 935): (18) posterior end of body in ventral view, (19) distal part of locomotory leg XIV in lateral view, (20) distal part of locomotory leg XIII in dorsal view. Scale is 1 mm.
**Cormocephalus insulanus ATTEMS, 1928** (Figs. 18 - 20)

*Cormocephalus michaelseni*: ATTEMS 1922: 98 (nec KRAEPELIN, 1903: 215).

*Cormocephalus* (C.) *insulanus*: ATTEMS 1930a: 76.


**Description**: Forcipules: tooth plates as long as wide (similar to those in *Cormocephalus oligoporus*).

Terga: tergum XXI with median sulcus.

Coxopleura: porose area very clearly bordered, from as long to somewhat longer (also in some syntypes, Fig. 18) than sternum XXI; latter condition is contrary to ATTEMS’ (1930a) data.

Posterior coxopleural margin without spines; long slim posterior process with two curved spines apically (Fig. 18).

Locomotory legs: praetarsi very large; pretarsal spurs long, widely radiating outward from praetarsal base (Figs. 19, 20).

**Variability**: Three specimens (NHMW 3268) have both, forcipular tooth plates and coxosternal median sulcus like *Cormocephalus westwoodi aniceps* (Fig. 8).

**Remarks**: This species has been described from Namibia by ATTEMS (1922) as *Cormocephalus michaelseni*, but KRAEPELIN (1908) already used this name for the species from SW Australia. In the key for *Cormocephalus* ATTEMS (1928a) re-named this species as *Cormocephalus insulanus* with footnote as "Nomen novum pro *Cormocephalus michaelseni* ATTEMS, 1922 (nec KRAEPELIN, 1908)". Oddly, the type-series of *Cormocephalus insulanus* (NHMW 935) was labelled by Attems as *Cormocephalus (Hemiscolopendra) michaelseni*.

*Cormocephalus insulanus* is quite similar to *Cormocephalus westwoodi aniceps* but, belonging to the other species-group, is readily distinguishable by much shorter coxopleural porose area; another remarkable difference is very special structure of both praetarsi and pretarsal spurs of locomotory legs (Figs. 19, 20).

Quite similar structures were described for *Cormocephalus deventeri* by LAWRENCE (1970: fig. 1b). The adult holotype and two subadult syntypes were collected at Sylvia Hill in Central Namibia. We read: "... the new form does not seem to show any special relationships with the other five species of the genus found in South West Africa [namely: *esulcatus schultzei*, *insulanus*, *multispinosus*, *oligoporus* and *spinulosus* (= *multispinosus*)]; it is easily distinguished from any of them by the unusually long and conspicuous claws and claw spurs of the legs as well as by the small number of spines of the end-legs, which are themselves small and granuliform.". But both *insulanus* and *esulcatus schultzei* (see below) show locomotory praetarsi (and their spurs) of quite
similar form with *deventeri*. Latter seems to be more similar to *insulanus* than to *esulcatus schultzei*, having complete median sulcus at tergum XXI and complete (although interrupted) paramedian sulci at tergum III. The spines at the terminal praefemur are considerably smaller as in *multispinosus*. *Cormocephalus deventeri* differs from other members of the *insulanus*-group mainly by the reduced number (2 + 2 ventro-lateral and 1 + 3 ventro-medial) of terminal praefemur spines. Summing up, we regard this species to the *insulanus*-group but the validity is still questionable, because the type specimens have not been investigated.

**Range:** SW Africa: Namibia, "Lüderitzbucht" (Locus typicus); S Africa: Cape Provinces.

*Cormocephalus esulcatus esulcatus* POCOCK, 1901

*Cormocephalus esulcatus* POCOCK 1901: 458.


*Cormocephalus* (C) *esulcatus esulcatus*: ATTEMS 1930a: 88.


**Description:** Forcipules: coxosternum without transverse sulci.

Terga I - IV not sulcate, terga V - VI with strongly shortened paramedian sulci.

Sterna: sternum XXI trapeziform, less narrowed caudally than in *Cormocephalus nitidus*.

Coxopleura: porose field occupies a narrow area in the middle, does not extend to both lateral margins of sternum XXI and coxopleural margin. Posterior coxopleural margin with spine.

Locomotory legs: praetarsi and their spurs of usual shape.

Terminal legs: praetarsus with spurs; without them according to ATTEMS (1930a).

**Variability:** One of the investigated specimens has terga of the anterior body half "bordered" by small spots of dark pigment; the same spots are also scattered on pleura of this specimen.

**Remarks:** In the very short original description, Pocock noted the close resemblance of this species to *Cormocephalus westwoodi* from which *esulcatus* should differ by body coloration, the absence of median sulcus on tergum XXI and more slender terminal legs.

According to the much more detailed description given by ATTEMS (1930a), *Cormocephalus esulcatus* is closer to *Cormocephalus pontifex*, *Cormocephalus punctatus* and other species which have complete paramedian sulci beginning from terga IV - VII rather to *westwoodi* - group (in which these sulci are complete beginning from tergum II).

Note that a few juvenile specimens of *Cormocephalus nitidus* are quite similar to *esulcatus*, having incomplete (or interrupted) paramedian sulci at terga II - III. Thus, *esulcatus* is distinguishable from the juvenile specimens of *nitidus* by: (a) absence of transverse sulci at forcipular coxosternum, (b) much narrower coxopleural porose area.

Two subspecies of this species have been described: *esulcatus schultzei* ATTEMS 1909
(see below) from Kubub in Namibia and *esulcatus capensis* Attems 1928b from two localities in Cape Province.

Koch (1983a) noted in Range of *esulcatus*: "...Lawrence (1955b) follows Attems (1930b) in retaining two South African taxa, *schultzei* and *capensis*, as subspecies of *esulcatus". He placed both names under *Cormocephalus esulcatus*. (It is not clear, whether he has studied Lawrence's types). There are no specimens of *esulcatus capensis* in the collection studied, so we do not discuss this form here. But we have not put this form under the name *esulcatus esulcatus*, because of the differences in their diagnostic characters: presence of short paramedian sulci at terga II - IV and much longer and wider coxopleural porose area in *esulcatus capensis*.

**Range:** SE Australia: Victoria, Ferntree Gully (Locus typicus); SE New South Wales; Australian Capital Territory; S Africa: Eastern Cape Province (Algoa Bay); Transvaal.

*Cormocephalus esulcatus schultzei* Attems, 1909


**Type material:** Namibia, Kubub, leg. Schultze, 1903 - 1905, syntype, 1 ad., NHMW 3201.

**Description:** Details marked by asterisk (*) differ from Attems' data.

Antennae: with 17 antennomeres, of which the 5 basal ones are glabrous.

Forcipules: coxosternum with median sulcus; praefemoral median tooth considerably longer than tooth plate, with the only lateral tubercle.

Terga: tergum XXI without sulcus.

Coxopleura: posterior margin without (*) spine. Oddly, Attems (1909, 1930a) noted presence of small spine, but this structure is clearly absent in the accompanying drawings.

Locomotory legs with very long praetarsal spurs (*) reaching at least to middle of paretarsus (like in *Cormocephalus insulanus*, Figs. 19, 20).

Terminal legs: dorso-distal process of left praefemur with 3 (*), of right one with two apical spines; praetarsus with spurs.

**Remarks:** According to the original description, the main difference between *Cormocephalus esulcatus schultzei* and the nominative form is a presence of short anterior paramedian sulci at tergum I (other indicated differences are of minor taxonomic importance or non-existent). We note also the very unusual structure of praetarsal spurs of locomotory legs as another important character. Another known species with similar distal parts of the locomotory legs is *Cormocephalus insulanus* (see above), but the latter is readily distinguishable by a presence of median sulcus at tergum XXI.

Summing up, we prefer to retain this subspecies vs. Koch (1983a), who synonymised it with this nominative form without any reason.

**Range:** SW Africa: Namibia, Great Namaqualand, Kubub (Locus typicus) (Rooibank near Walvis Bay, Farm Barby).
**Cormocephalus pontifex ATTEMS, 1928** (Fig. 21)

*Cormocephalus pontifex* ATTEMS 1928b: 95.
*Cormocephalus pontifex*: LAWRENCE 1955b: 47; 1975: 42
*Cormocephalus (C.) pontifex*: ATTEMS 1930a: 87.

**Type material:** S-Afrika, Kapland, don. Mus. Kapstadt, 1924, syntypes, 4 Ex., (2043).


**Description:** Neither the original description nor the description in ATTEMS (1930a) is complete, so we add the following details.

**Headplate:** paramedian sulci reach to the cephalic midpoint, bifurcating somewhat anteriorly; about the last third of headplate is covered by tergum I.

**Forcipules:** tooth plates somewhat longer than wide, with 4 teeth of which the lateral one is clearly isolated.

**Terga:** tergum I with the short posterior paramedian sulci, tergum II not sulcate. Terga III - V with very short paramedian sulci anteriorly and posteriorly; these sulci complete from tergum VI.

**Sterna:** with very unclear median longitudinal depression; sternum XXI with slightly rounded posterior margin (Fig. 21).

**Coxopleura** (Fig. 21): porose area nearly as long as sternum XXI, oval-shaped and clearly narrower than wide coxopleuron; large pores rather scattered. Conical posterior process with two apical spines, usually one small spine is positioned at the posterior margin of one or both coxopleura.

**Terminal legs:** comparatively thick with ratio of praefemoral length : width = 3.5(4) : 1. Praefemoral spinulation (Fig. 21): ventro-laterally two rows of (1)2 + 2 spines, ventro-medially two rows of 1 + 3 (or 0 + 4) spines, medially 0-1 and dorso-medially two spines. Dorso-distal praefemoral process well developed, with two apical spines. Praetarsus shorter than tarsus II, with spur.

**Variability:** NHMW 3277 has coxopleural porose area clearly shorter than sternum XXI; its right coxopleuron posteriorly with one, but left one with two spines. In the same adult, terminal legs are more enlarged than usually, their praefemur ventro-laterally with 2 + 1 spines.

**Remarks:** This species seems to be very closely related to *Cormocephalus oligoporus*, including such a rare character as the presence of short posterior paramedina sulci at tergum I. According to the key proposed by ATTEMS (1930a), *Cormocephalus pontifex* differs by the complete paramedian sulci beginning from terga IV - VI versus beginning from terga II(III) in oligoporus. Our own observations indicate these species are also distinguishable by wider terminal legs with less ventro-laterally spined praefemur in pontifex.

One adult (NHMW 2053) is distinguishable from the nominative form by: (a) terga I - III with short posterior paramedian sulci, terga IV - V with the same sulci longer; (b) sterna with clear longitudinal depression; (c) thicker terminal praefemur (length : width...
= 2.5 : 1); (d) absence of dorso-distal process at terminal praefemur; (e) terminal praefemur ventro-laterally with two rows of $2 + 3 (0 + 3)$ spines, ventro-medially with $2 + 3$ or 5, medially with two and dorso-medially with $2 - 4$ spines.

**Range:** SW Africa: Namibia; Botswana; S Africa: Gauteng Province Vryburg (Locus typicus); Northern Cape Province, Little Namaqualand.

**Cormocephalus andinus** (KRAEPELIN, 1903)

*Cupipes andinus* KRAEPELIN 1903: 182.

*Perustigmus rapax* VERHOEFF 1941: 77 - 81.

*Perustigmus alticolus* VERHOEFF 1941: 82, 83.

*Cupipes annectans* CHAMBERLIN 1941: 501.

*Cupipes andinus*: CHAMBERLIN 1944a: 182.


*Cormocephalus (C.) andinus rubrifrons* BÜCHERL 1950: 177.

*Cormocephalus andinus rubrifrons*: BÜCHERL 1974: 100.

**Material:** Mexico, Campeche Bay, don. Mus. Basel, det. Attems as *Cormocephalus bonaerius*, 1 sad., NHMW 3204.

**Description:** Body length 50 mm, with somewhat curved terminal legs measuring 57 mm. Antennae: 16 + 17 antennomeres, 8 basal ones glabrous. Headplate: somewhat diverging paramedian sulci are complete. Terga: tergum I with complete paramedian sulci; terga XVII (XVIII) - XXI with clear lateral margination.

**Range:** Mexico: Campeche Bay; Bolivia: La Paz (Terra typica) (Volcano Sorata); Peru (to alt. 3500 m); Ecuador (including Galapagos Islands); Brazil: Amazonas, Para.

**Cormocephalus bonaerius** ATTEMS, 1928 (Figs. 22 - 25)

*Cormocephalus bonaerius* ATTEMS 1928a: 287.

*Cormocephalus bonaerius*: BÜCHERL 1974: 100.

*Cormocephalus (C.) bonaerius* ATTEMS 1930a: 99; BÜCHERL 1941b: 298; 1943: 22; KRAUS 1957b: 382.

**Type material:** Antillen, Insel Bonnaire bei Insel Curaçao, leg. & don. A. Gabriel, lectotype [designated herein] 1 ad., paralectotype 1 sad., NHMW 919. – [Lesser Antilles, Island] Bonnaire bei Insel Curaçao, leg. & don. A. Gabriel, paralectotypes 10 sad., NHMW 921.

**Description:** The original description lacks some important taxonomic details, so we selected the largest syntype as a lectotype. The forcipules of this specimen are figured in the original description (they are quite recognisable because of the unusual structure of the tooth plates). Antennae: in the lectotype the right antenna of 18 (not of 16) antennomeres, the left one is broken after the 13th antennomere; in the paralectotype (NHMW 919) the right antenna of 17 antennomeres, the left one is broken after 12th antennomere. In both specimens only 6 basal antennomeres are glabrous both dorsally and ventrally (instead of 7 - 8 basal ones according to ATTEMS).
Figs. 21 - 25: *Cormocephalus pontifex* Attems, 1928, syntype NHMW 2043: (21) posterior end of body in ventral view. – *Cormocephalus bonaerius* Attems, 1928: (22) anterior end of body of lectotype NHMW 919, dorsal view, (23) posterior end of body of paralectotype NHMW 921, dorsal view, (24) posterior end of body and (25) left terminal leg of paralectotype NHMW 919, ventral view. Scale is 1 mm.
Headplate (Fig. 22): paramedian sulci cover more than half of head, strongly diverge anteriorly. Basal plates well bordered, extending somewhat beyond the lateral margins of headplate.

Forcipules: praefemoral median tooth with a single lateral tubercle, clearly higher than tooth margin.

Terga: tergum I with complete paramedian sulci (Fig. 22). Terga beginning from XVII with unclear lateral margination, which is clear at tergum XXI only; this tergum (Fig. 23) is very short (in the lectotype its length : width = 1 : 2, in the paralectotype 1 : 1.5), with somewhat rounded posterior margin. This tergum has a complete or almost complete median sulcus.

Sterna: sternum XXI (Fig. 24) with posterior margin very slightly bisinuated (sometimes nearly straight).

Spiracles: small, almost round, see Attems (1930a) with a "flap" consisting of two (not three, as in overwhelming majority of Scolopendrinae) cuticular folds.

Coxopleura (Fig. 24): porose area does not reach to the lateral coxopleural margin; rather scattered pores are of various sizes. Posterior process absent, with only a small spine positioned at its place.

Locomotory legs: all with praetarsal spurs.

Terminal legs: short and thick (Figs. 23, 25); praetarsus clearly longer than tarsus II (Fig. 25), praetarsal spurs absent.

**Variability:** Forcipular tooth plates in the lectotype of rather atypical structure - at the right plate the lateral tooth is strongly isolated as opposed to those in the paralectotype (in which both tooth plates are nearly symmetrical).

Paralectotypes (NHMW 921) have antenna composed of 15 - 19 (mainly of 17) antenno-meres (also 17 + 19), of which 6 - 6.5 basal ones are glabrous dorsally.

In the most paralectotypes (NHMW 921), the median sulcus of tergum XXI does not reach to its posterior margin.

One paralectotype has one coxopleuron without an apical spine; in other paralectotypes coxopleura with additional small spine at the posterior margin.

**Remarks:** No specimen was designated as holotype and the original description lacks some important taxonomic details, so the largest syntype has been selected as a lectotype. We have selected this specimen because its forcipules have been drawn in the original description (they are quite recognisable because of the unusual structure of the tooth plates). This species is very closely related to Cormocephalus andinus, from which it may be distinguished by the absence of coxopleural process (Fig. 24), shorter cephalic paramedian sulci (Fig. 22) and fewer laterally margined posterior terga.

The only adult specimen of bonaerius from Peru (without more precise locality) was mentioned by Bücherl (1943).

**Range:** Lesser Antilles: Bonnaire Island near Curaçao Island (Locus typicus); Peru (?).

**Cormocephalus devylderi** PORAT, 1893 (Fig. 26)

*Cormocephalus Devylderi* PORAT 1893: 8.
*Cormocephalus (Colobopleurus) devylderi*: ATTEMS 1930a: 107.

**Description:** Investigated specimen corresponds well to known descriptions, but the following details should be noted.

Forcipules: clearly visible from dorsal point of view; anterior ends of two diverging sulci cross each other close to anterior margin of coxosternum, (Fig. 26) together with some transverse sulci.

Coxopleura: without any spines.

Terminal legs: with nor praefemoral or praetarsal spurs.

**Remarks:** Specimen examined has pattern of sulci at forcipular coxosternum (Fig. 26) somewhat more complicated than Attems (1930a) showed.

**Range:** S Africa: Northern Cape Province, W coast, Little Namaqualand ["south of Orange river"], (Locus typicus) (Kimberley, Concordia); North West Province, Transvaal, (Rustenburg); Gauteng Province (Pretoria).

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*Cormocephalus fontinalis* ATTEMS, 1928 (Fig. 27)

*Colobopleurus fontinalis* ATTEMS 1928b: 105.

*Colobopleurus fontinalis*: LAWRENCE 1955b: 41, 42; 1959: 368.

*Cormocephalus* (*Colobopleurus*) *fontinalis*: ATTEMS 1930a: 107.


**Description:** The investigated specimen generally corresponds to the original description, but the following details should be added.

Forcipules: are clearly visible from dorsal side, their coxosternum with anteriorly bifurcated median sulcus which is crossed by a single transverse sulcus (Fig. 27). Praefemoral median tooth with 1 - 2 small tubercles; tooth margin very similar to *Cormocephalus devylderi*.

Coxopleura: nearly entire surface perforated with pores; rudimentary knob at position of posterior process bears two tiny spines apically.

Terminal legs: praefemur with 1 - 3 tiny dorso-medial spines, one spine at position of dorso-distal process.

**Remarks:** This species seems to be most closely related to *Cormocephalus devylderi* because of: (a) unusually long tooth plates, (b) absence of coxopleural process and (c) very long and slender terminal legs. However, it is distinguishable by lack of median sulcus and more complicated "pattern" at forcipular coxosternum in *Cormocephalus devylderi* (Fig. 26) and by presence of minor spinulation of both coxopleura and terminal praefemora in *fontinalis*.

**Range:** S Africa: Western Cape Province, Matjiesfontein (Locus typicus); Northern Cape Province (Hanover); Eastern Cape Province (Burgersdorp, Dunbrody, Algoa Bay); Free State Province (Smithfield); Transvaal.
Genus *Rhoda* MEINERT, 1886

*Rhoda* MEINERT 1886: 188.

**Type species.** *Rhoda thayeri* MEINERT, 1886 (by monotypy).

*Rhoda calcarata* (POCOCK, 1891) (Figs. 28 - 29)

*Pithopus calcaratus* POCOCK 1891: 224.

*Pithopus calcaratus*: KRAEPELIN 1903: 170.


*Scolopendropsis calcaratus*: BRÖLEMANN 1909: 32.


**Description:** Antennae: of 19 - 21 antennomeres.

Maxillae II: second joint of telopodite with well-developed distal spur.

Headplate (Fig. 28): comparatively small, with incomplete median sulcus which begins at its posterior margin; a large posterior proportion of head is covered by tergum I. Narrow sulci form a pattern at certain places on the cephalic basal plates.

Forcipules: clearly visible from dorsal view (Fig. 28); coxosternum with a median and one transverse sulcus. Basal sutures of tooth plates form a straight line.

Sterna: sternum XXI (Fig. 29) clearly trapeziform, somewhat longer than wide, with caudal angles rounded, posterior margin slightly curved (or straight). Complete well developed narrow median depression (not sulcus!). Both sternum XXI and coxa form a common flat surface (Fig. 29), being closely impressed to each other.

Coxopleura (Fig. 29): practically as long as terminal sternum, without any process and with (one) two spines at straight posterior margin. Entire coxopleural surface is perforated by small pores.

Locomotory legs: praetarsus slightly shorter than tarsus I, latter usually is clearly shorter than tarsus II (diagnostic character for *Rhoda*); only distal part of praetarsus (about ¼) is strongly chitinised. Praetarsal spurs well developed.

Terminal legs: very short and very strongly enlarged.

**Variability:** In NHMW 996 the smaller specimen has one coxopleural spine; some of the examined specimens have locomotory tarsus II nearly as long as tarsus I.

**Remarks:** *Scolopendropsis bahiensis* BRANDT, 1841 is the same form as *Rhoda calcarata* (POCOCK, 1891), being abnormal in having 23 leg-bearing segments (SCHILEYKO, in prep.).

**Range:** Brasil: Bahia (Locus typicus); Pernambuco; Serra; Joazeiro; Soledad; Para; Mato Grosso; Alagoas; Barra do Tapirare; Peru (Amancais near Lima).
Tribe Asanadini VERHOEFF, 1907

**Genus Asanada MEINERT, 1886**

*Asanada* MEINERT 1886: 189.  
*Pseudocryptops* POCOCK 1891: 225.

**Type species.** *Asanada brevicornis* MEINERT, 1886 (by monotypy).

**Remarks:** Original description of *Asanada* lacks information about presence of locomotory tarsal spurs; ATTEMS (1930a) mentioned their total absence as a diagnostic character for this genus. However, tarsal spurs on all the locomotory legs have been found in *Asanada brevicornis* from continental Vietnam, while specimens from Vietnamese islands have no such spurs, SCHILEYKO (1995).

*Asanada brevicornis* MEINERT, 1886

*Asanada brevicornis* MEINERT 1886: 189.  

**Material:** Indien, Katch (Bombay), 1 Ex., NHMW 998 – Zentral Annam, Cauda bay, Nhatrang, leg. & don. C. Dawydoff, 1 Ex., NHMW 2035.

**Description:** Locomotory legs with one tarsal spur each.

**Variability:** Cephalic posterior margin (NHMW 2035) placed in transverse fold of anterior margin of tergum I (see also SCHILEYKO 1995).

**Range:** India: Bombay; Himalayas: Kooloo (?) (Locus typicus); China; N Myanmar; Central and S Vietnam; Reef Island; Andaman Islands; New Guinea; Australia: Queensland, Saibai Island; NE, Iron Range, Line Hill.

*Asanada socotrana* POCOCK, 1899

*Asanada socotrana* POCOCK 1899: 9.  
*Asanada brevicornis* var. afra SILVESTRI 1918: 311.  
*Asanada socotrana kalaharina* LAWRENCE 1936: 100.  
*Asanada socotrana kalaharinas* LAWRENCE 1955b: 17.  
*Asanada socotrana kalaharinus*: LAWRENCE 1955b: 41.  
*Asanada kalaharinus:* LAWRENCE 1966: 233  
*Asanada walkeri attems:* LEWIS 1968: 176.  
*Asanada walkeri walkeri:* LEWIS 1968: 176.  
*Asanada zambiana* DOBRORUKA 1969: 356.  
*Asanada sokotrana* [sic]: LEWIS & WRANIK 1990: 63.

**Material:** Uganda, Desert du Turkana, Omo Exped., 1 Ex., NHMW 999. – Sudan, Gehel Gulfan, leg. & don. F.-Werner, 14. Mar. 1914, 2 Ex., NHMW 1000. – Rhodesia; Bulawayo, det. Attems as *Asanada*

**Description:** Locomotory legs: tarsal spurs absent completely.

**Terminal legs:** femur with complete median sulcus on dorsal surface.

**Variability:** Number of antennomeres is the same in all specimens studied, although antennal length varies considerably (the shortest antennae reach to posterior margin of headplate, having basal antennomeres much wider than high).

**Remarks:** There is considerable confusion about separating the species in Asanada. According to Attems (1930a) socotrana might be distinguished from brevicornis by a complete dorsal median sulcus of the terminal femur (versus incomplete in the latter). But Lewis (1967) described sokotrana attemsi (should be "socotrana") with "[terminal] femur with narrow complete longitudinal sulcus" and noted various[!] length of this sulcus in the nominative subspecies. He wrote (page 195): "However, Pocock (1903) in his supplementary description of A. sokotrana [should be "socotrana"] says of the anal legs ‘patella [femur] sulcate above in its distal half’ … all the [Pocock’s] specimens examined [eight specimens at all] have only the last half to two-thirds of the femora sulcate … Various authors give different lengths for the femoral sulcus but this may represent differences in subjective assessment as the ‘fade-out’ is very gradual … The structure of the sulcus is very different in the two subspecies, of equal length throughout in atemsi, widening posteriorly in sokotrana".

Lewis (1973) recorded specimens of socotrana from Nigeria with both, incomplete sulci (so-called "form 1" and "form 3") and with complete ones (so-called "form 2"). He gave detailed analysis of taxonomic important characters and their variability in Asanada. About these sulci (p. 99): "When the apophysis [which is disposed beneath dorsal median sulcus of terminal femur] is well developed it creates the impression of a trough-like groove when seen the semi-transparent cuticle of the femur". (All personally examined specimens of socotrana, however, have real dorsal sulcus at the terminal prae-femur).

So, we suppose socotrana and brevicornis to be distinguishable mainly by a structure of sternum XXI, which is much wider and shorter in socotrana.

Another confusion is about the status of Asanada walkeri (Pocock, 1891) (formerly Pseudocryptops walkeri). Lewis (1968) re-examined the types of walkeri and concluded that it is conspecific with socotrana. He suggested the following synonymies: Asanada socotrana socotrana Pocock, 1899 = Asanada walkeri walkeri (Pocock, 1891) and Asanada socotrana atemsi Lewis, 1967 = Asanada walkeri atemsi Lewis, 1967. Lewis (1973), however, re-established socotrana as a separated species (also synonymising walkeri atemsi (i.e. socotrana atemsi) with socotrana socotrana) and later (Lewis 1986, 2001) considered both socotrana and walkeri as two different species. In the last paper (Lewis 2001) synonymised socotrana’s "form 1" with Asanada zambiana Dobroruka, 1969.

**Range:** Socotra (Locus typicus); Witu Islands; Arabian Peninsula: Saudi Arabia, Oman, Yemen; Africa: Sudan; Nigeria; Uganda; Congo; Guinea; E Africa: Zimbabwe; Zambia (Central Province); SE Africa: Transvaal; Botswana; India (Bombay).
Subfam. Sterropristinae VERHOEFF, 1937

Genus Ethmostigmus POCOCK, 1898

_Heterostoma_ NEWPORT 1845: 413.
_Dacetum_ KOCH C.L. 1847: 156.
_Ethmostigmus_ POCOCK 1898: 327.

Type-species: _Scolopendra trigonopoda_ LEACH, 1817 (by subsequent designation of ATTEMS 1930a: 174).

_Ethmostigmus trigonopodus_ (LEACH, 1817) (Figs. 30 - 31)

_Scolopendra trigonopoda_ LEACH 1817: 36.
_Heterostoma trigonopoda_ NEWPORT 1845: 413; GERVAIS 1847: 245.
_Ethmostigmus trigonopodus trigonopodus_: LEWIS 2001: 44.


Description: Headplate: sometimes rudimentary "basal plates" are visible at the posterior margins.

Maxillae II: with two - not one, as ATTEMS (1930a) noted - well-developed praetarsal spurs, sometimes upper spur is much thinner than lower one.

Forcipules: each tooth plate (Fig. 30) with four teeth, of which two median ones have common base.

Sterna II - XX with clear and almost complete paramedian sulci.

Coxopleura (Fig. 31): posterior process approximately as long as sternum XXI, with two apical spines of normal size, one enlarged ventro-lateral spine and 1 - 3 spines at the dorso-medial arcuate edge.

Terminal legs: praetarsus with two rudimentary spurs.

Variability: Rudimentary cephalic "basal plates" in NHMW 3231 and in some specimens from NHMW 3209. All specimens of NHMW 3209 have upper praetarsal spur of maxilla II much thinner than lower one. One adult of NHMW 3209 has right forcipular tooth plate like _Ethmostigmus rubripes_.

Remarks: _Ethmostigmus australianus stechowi_ VERHOEFF 1941 has been synonymyzed with _trigonopodus_ by LEWIS 1968.

As the most closely related form to this species, ATTEMS (1930a) noted _Ethmostigmus pygomegas_ (KOHRAUSCH, 1881) (see below). LEWIS (1992) described _Ethmostigmus trigonopodus pygomenasoides_ for 8 specimens from Nepal (Districts: Myagdi, Lalitpur,
Figs. 30 - 32: *Ethmostigmus trigonopodus* (Leach, 1817): (30) forcipular tooth plates of NHMW 3209, ventral view, (31) posterior end of body of NHMW 3209, ventral view. – *Ethmostigmus pygomegas* (Kohlrausch, 1881): (32) posterior end of body of NHMW 1561, ventral view. Scale is 1 mm.

Taplejung and Gorkha), that subspecies "appears to be more closely related to *trigonopodus* than to *pygomenas* [should be *pygomegas*] and is, therefore described as a subspecies of the former". Lewis (2001), however, wrote in his remarks to *trigonopodus pygomenasoides*: "The Langtang [National Park in Nepal] specimen is very similar to *E. t. trigonopodus*".

Study of five specimens of *trigonopodus* from West- and three specimens from Central Nepal show us no special differences from the typical representatives of the nominative form.

Another closely related species is *Ethmostigmus rubripes* (Brandt, 1840), which should be distinguishable by three (four in *trigonopodus*) teeth of the forcipular tooth plates (Attems 1930a). But as two median teeth in *trigonopodus* have a common base
(Fig. 30), these species differ only by the degree of fusion of these teeth (we observed situations in *trigonopodus* when one tooth plate is typical, but another has three teeth as in *rubripes*).

Among four adults of NHMW 3206, determined as *Ethmostigmus trigonopodus*, we found one adult of *Scolopendra v. valida* H. LUCAS, 1840 which is very similar superficially to *trigonopodus*.

LAWRENCE (1955b) wrote about *trigonopodus*: "This large, predominantly tropical species occurs only in the northern Transvaal and southern Rhodesia (Zimbabwe) thence northwards throughout Africa. It is certainly not found in the Cape Province as stated by Attems quoting Kraepelin and does not seem to have been recorded from the South West Africa, Natal and Zululand".

**Range:** From Algeria and Ethiopia to South Africa, excluding wes'tern and southern provinces; Zanzibar Archipelago; Witu Islands; Fernando Po Island; Turkey: Aksehir; W Nepal, Anapurna reservation area.

*Ethmostigmus pygomegas* (KOHLRAUSCH, 1881) (Fig. 32)

*Heterostoma pygomegas* KOHLRAUSCH 1881: 63.
*Heterostoma rapax* HAASE 1887: 91.
*Ethmostigmus pygomegas*: KRAEPELIN 1903: 158; ATTEMS 1930a: 176 - 177.

**Material:** Himalaya, don. Museum Godeffroy, det. Koelbel as *Heterostoma rapax*, 1 Ex., (NHMW 1561), [1882.1.14], [Godeffroy number: 4946].

**Description:** We emphasise the following details:

Maxillae II with two praetarsal spurs.

Forcipules: tooth plates as in *trigonopodus*.

Terga: tergum I with incomplete paramedian sulci.

Sterna: sternum XXI clearly bisinuated posteriorly (Fig. 32).

Coxopleura: posterior process much longer than sternum XXI (Fig. 32), with one - two apical and one enlarged subapical spine ventrally; another enlarged spine ventrolaterally. All coxopleural processes perforated with pores except for both apical ends of process and narrow ventral strip.

**Remarks:** According to ATTEMS (1930a) this species should mainly differ from the previous one by (a) SE (?) Asian distribution (versus Africa and Turkey for *trigonopodus*), (b) structure of coxopleural process, (c) two (one in *trigonopodus*) praetarsal spur of maxillae II. But these two spurs have also been found in *trigonopodus* (see also LEWIS 1968). These species are only distinguishable by the length and spinulation of the coxopleural process (considerably shorter in *trigonopodus*). Concerning the different distribution we know some typical specimens of *trigonopodus* collected in Nepal (see above).

Taking in consideration all these facts we prefer to keep provisionally the name *pygomegas* until more material becomes available.

**Range:** Himalaya (Terra typica): Silhet, Bhutan; E Himalayas, Assam; Myanmar.
**Ethmostigmus rubripes** (BRANDT, 1840)

**Description:** Previous descriptions are generally correct, but this widespread and variable species includes some forms previously noted as independent taxa of species rank. Thus the true range of variability of the main characters is as follows:

Antennae reach to tergum IV - VI, with 17 - 20 antennomeres, of which four basal ones are glabrous dorsally and three ventrally. Small seta, which cover more distal antennomeres, are arranged in longitudinal parallel rows.

Forcipules: tooth plates with three teeth (Fig. 33), of which median one often bears the trace of fusion of two "primary" teeth.

Terga: complete paramedian sulci mainly beginning from tergum III (sometimes tergum I with incomplete paramedian sulci); unclear lateral margination from terga VI - XX.

Sterna: paramedian sulci poorly developed as short anterior rudiments; sternum XXI with complete median depression, not sulcus as ATTEMS (1930a) noted, bisinuation of its posterior margin in shape of an angle of about 100 - 150° (Figs. 34 - 36, 39).

Coxopleura: posterior process from short (as long as sternum XXI), not pointed apically, with dorso-medial arcuate edge (Fig. 34) furnished with longitudinal row of 5 - 7(8) spines (in typical *Ethmostigmus rubripes*) to much longer, pointed apically, rounded dorsally (i.e. without dorso-medial arcuate edge; Fig. 37) and furnished with fewer dorsal spines (in most specimens formerly determined as *Ethmostigmus platycephalus*). Poreless strip on ventral coxopleural surface is narrowed anteriorly in both "rubripes" and "platycephalus" (Figs. 34 - 36, 38, 39); the distal part of process is also poreless.

Locomotory legs I - III with two tarsal spurs; legs I with one praefemoral, one femoral and one tibial spur.

Terminal legs: varying considerably in the structure. Praetarsus from clearly shorter to twice as long as tarsus II; when shorter, it has praetarsal spurs. Praefemoral dorso-distal process (Figs. 35, 39) with 1 - 3 apical spines.

**Variability:** The main variability is in the length and structure of the posterior coxopleural process (see Remarks below). Between the populations, the length of the terminal praetarsus varies from clearly shorter to twice as long as tarsus II; however, every population contains animals whose terminal praetarsus and tarsus II are equally long.

**Remarks:** According to ATTEMS' (1930a) key, *Ethmostigmus platycephalus* (NEWPORT, 1845) has a coxopleural process more than twice as long as sternum XXI, with 0 - 3 dorsal spines, dorsally only slightly "gewölbt" (= arcuate). In *Ethmostigmus rubripes*, the coxopleural process is "relatively" short, less than twice as long as sternum XXI, not lyriform and strongly "ausgebaucht" (= arcuate ?) dorsally. In the latter species this dorsal arcuate edge bears a longitudinal row of "3 - 5, selten nur zwei" spines; no other real differences exist between known descriptions of these two forms. Specimens examined, labelled as *Ethmostigmus rubripes* and *Ethmostigmus platycephalus* are generally distinguishable by the structure of the coxopleural process which, however, varies considerably (Figs. 34 - 38). The shape of the terminal legs is also a character that varies in the same way in both these forms. A virtually complete transformational series of coxopleural configuration has been found among investigated specimens. This
character varies not only between the populations, but also within one locality.

Examples of variability: (a) NHMW 1040, the smallest adult has a long ("platycephalus-type") coxopleural process which however bears five dorsal spines; (b) among NHMW 1035 the armament of the coxopleural process varies in three specimens (labelled as Ethmostigmus platycephalus); (c) coxopleural processes in three adults (NHMW 1042) are both of "rubipes-type" (typically short, Fig. 35) and of "platycephalus-type" (very long, but with 3 - 4 dorsal spines); (d) both specimens of (NHMW 1032) have coxopleural processes spined as abundantly as in Ethmostigmus rubripes, but of intermediate length; (e) some specimens in NHMW 1562 have typically short (of "rubriceps-type"), but lyriform coxopleural processes (Fig. 34).

Unfortunately, because there are few precise localities on the old labels, it is currently rather problematic to estimate a degree of mutual distribution for "typical rubriceps" and "platycephalus".

Nevertheless, as there are no clear borders of variability in the main diagnostic character (structure of coxopleural process) between "typical rubripes" and "platycephalus", the latter should not be retained as an independent species.

In summary we suggest the new synonymy: Ethmostigmus platycephalus (NEWPORT, 1845) is Ethmostigmus rubripes platycephalus (NEWPORT, 1845) stat.n.

**Ethmostigmus rubripes rubripes** (BRANDT, 1840) stat.n. (Figs. 33 - 35)

_Scolopendra rubripes_ BRANDT 1840: 156.
_Scolopendra rubripes:_ BRANDT 1841: 65.
_Heterostoma sulcidens_ NEWPORT 1844: 416.
_Scolopendra rapax_ GERVAIS 1847: 248.
_Heterostoma bisulcatum_ TÖMÖSVARY 1885: 65 syn.n..
_Heterostoma rubripes:_ HAASE 1887: 89.
_Heterostoma bisulcatum:_ HAASE 1887: 92.
_Ethmostigmus bisulcatus:_ KRAEPELIN 1903: 160; ATTEMS 1930a: 179.
_Ethmostigmus rubripes:_ ATTEMS 1930a: 179; CHAMBERLIN, 1939: 5; 1944b: 3; KOCH 1983b: 836, 837, 844 - 848.
_Ethmostigmus australians:_ ATTEMS 1930a: 177.
_Heterostoma rubripes var. grossipes:_ POCOCK 1891: 58.

**Material:** N-Neuseeland, leg. A. Reischek, 1884, don. A. Reischek, 3ad., 1 sad., NHMW 914, [1890.II.17].
Figs. 33 - 35: *Ethmostigmus rubripes rubripes* (Brandt, 1840): (33) forcipular tooth plates of NHMW 1039, ventral view, (34) posterior end of body of NHMW 1562, ventro-lateral view, (35) posterior end of body of NHMW 1042, ventral view. Scale is 1 mm.


**Variability:** The posterior margin of sternum XXI may be bisinuated from slightly to nearly forming a right angle; the latter condition seems to be a male-character: in a few
adults (NHMW 1041, NHMW 1036, etc.) the penis is evaginated, being closely ad-
pressed to the bisinuate sternal margin. Apical one- to two-thirds of the coxopleural
posterior process sometimes coloured lighter than rest of coxopleuron; this character is
apparently directly correlated with the previous one, being observed in all the specimens
noted above. In many localities the animals have terminal legs of usual shape, with prae-
tarsus clearly shorter than tarsus II and with praeatarsal spurs. In all five adults from
Java (NHMW 1041, NHMW 1562) however, these legs are considerably enlarged, with
praeatarsus nearly as long as tarsus II; both adults from Borneo (identified as Ethmo-
stigmus bisulactus; NHMW 1025, NHMW 1026) have the terminal praeatarsus as long
as 1.5 times tarsus II. All these seven specimens lack terminal praeatarsal spurs, except
for one outer one on the right terminal leg of one specimen of NHMW 1041. The most
enlarged, dorsally flattened terminal legs are in two adults from the Solomon Archipelago,
having the terminal praeatarsus twice as long as tarsus II. Their praeefemoral spinulation
is reduced to two ventro-lateral, two ventro-medial and four dorso-medial spines plus
a strongly enlarged dorso-distal process. In NHMW 1562 forcipular tooth plates
with three usual teeth, the inner of which is solid (i.e. without traces of fusion of two
previous teeth).

Remarks: Ethmostigmus bisulcatus was described by TÖMÖSVARY (1885) as Hetero-
stoma bisulcatum. According to ATTEMS (1930a) this form occurs on Borneo, Java, Siam
and differs from Ethmostigmus rubripes by having much shorter antenna. Antennomeres
are wider than high in bisulcatus, but higher than wide in rubripes. No other differences
exist between these two species according to the known descriptions. However, within
rubripes these two characters vary considerably and some typical rubripes (NHMW
1562, NHMW 3222, etc.) have antennae reaching to posterior margin of tergum III (i.e.
as bisulcatus should have), being composed of square-shaped antennomeres.

Both examined adults of Ethmostigmus bisulcatus (NHMW 1025, NHMW 1026) have
antennae of 20 joints from which the four basal ones are glabrous dorsally and three
ventrally, i.e. as in typical Ethmostigmus rubripes. Both antennae of NHMW 1025 and
the right one of NHMW 1026 reach the anterior margin of tergum IV, having antennomeres
of usual shape. Only the left antenna of NHMW 1026 reaches to the middle of
tergum III, having joints much shorter than wide. These minor variations clearly fit well
into the range of intraspecific variability of rubripes.

Thus, in all other taxonomically important respects (poorly developed sternal para-
median sulci; structure and spinulation of coxopleural processes; structure, spinulation
and joint proportions of typically enlarged terminal legs), the examined specimens
are normal representatives of the nominative form. We therefore feel confident in
suggesting the new synonymy: Ethmostigmus bisulcatus (TÖMÖSVARY, 1885) is
Ethmostigmus rubripes rubripes (BRANDT, 1840).

Ethmostigmus australianus CHAMBERLIN, 1920 has been synonymised with rubripes by
KOCH (1983b); this author did not recognize any rubriceps’ subspecies, australianus is
regarded here as a synonym of rubripes rubripes.

Range: Indonesia: Borneo, Java (Terra typica); Laos; China; widespread in Australia;
Fitzroy and Baudin Islands; Solomon Islands; Sunday Island; N New Zealand (Guano
Island); New Guinea.
**Ethmostigmus rubripes platycephalus** (NEWPORT, 1845) stat.n. (Figs. 36 - 38)

Heterostoma platycephala NEWPORT 1845: 415.
Heterostoma platycephala: GERVAIS 1847: 246.
Heterostoma Lorìae SILVESTRI 1894: 631.
Scolopendra cribri/era GERVAIS 1847: 248 syn.n.

Ethmostigmus platycephalus: ATTEMS 1930a: 180; CHAMBERLIN 1939: 4; 1944a: 182; 1944b: 3.
Ethmostigmus platycephalus cribrifer: ATTEMS 1930a: 182.

**Material:**

**Variability:** In the adult of NHMW 3234 tergum I does not reach to cephalic posterior margin, the latter with clearly developed "basal plates"; tergum I bears semilunar sulcus anteriorly.

The most variable structure is the coxopleural process; in the adult of NHMW 3242 it is about three times as long as sternum XXI.
Remarks: ATTEMS (1930a) distinguished two subspecies of Ethmostigmus platycephalus: Ethmostigmus platycephalus spinosus (NEWPORT, 1845) (see below) and Ethmostigmus platycephalus cribrifer (GERVAIS, 1847). The latter differs from the nominative form by one (versus 2 - 4) apical and 2 - 3 (versus 0 - 1) dorsal spines on the coxopleural process. However, among the examined specimens, labelled as Heterostoma cribriferum or Ethmostigmus platycephalus cribrifer (Fig. 38), we have found a complete transformation series for the number of dorsal coxopleural spines between these two subspecies. In some animals examined here the dorsal spines are more numerous: six and seven in NHMW 3241 or five and seven in NHMW 3242. In 1953 ATTEMS described Ethmostigmus platycephalus cribrifer in more detail, noting 2 - 6 dorsal coxopleural spines and the impossibility of separating Ethmostigmus platycephalus cribrifer from Ethmostigmus platycephalus platycephalus because, usually, there is no clear border between subapical and the most caudal dorsal coxopleural spines (Fig. 38). It should be noted that, in the same locality (1030), one animal may have coxopleural process clearly of "cribrifer-type" (with one apical spine), but another has typical process of "platycephalus-type".

Also, the number of apical spines on the coxopleural process varies sometimes in the animals of the same series: the adult specimen in NHMW 1558 clearly has one apical spine (Fig. 37), while the NHMW 1558 juvenile has two apical spines. Besides, there are intermediate forms between "rubripes-" and "cribrifer-type": NHMW 3232 subadult has coxopleural process more than twice as long as sternum XXI and with one apical spine, but its dorsal edge is strongly arcuate and abundantly spined as in typical "rubripes". Thus, as the representatives of this form clearly belong to Ethmostigmus rubripes and generally have a long coxopleural process (of "platycephalus-type"), the suggested new synonymy is: Ethmostigmus platycephalus cribrifer (GERVAIS, 1847) is Ethmostigmus rubripes platycephalus (NEWPORT, 1845).

This subspecies never has been recorded from Australia before - not even in the most recent and detailed monograph by KOCH (1983b). Thus, the two specimens NHMW 1558 from "Australien" without more precise locality is the first Australien record of rubripes platycephalus if label was correct (this vial is also marked as "Alte Sammlung").

Range: Oceanian Islands: Umboi, Mioko, Duke of York; New Britain; Tahiti; Solomon Islands; New Guinea; Indonesia, Moluccas Islands; Philippines: Spratly Island; Australia(?); Sri Lanka; Laos; N and S Vietnam; Cambodia; China.

Ethmostigmus rubripes spinosus (NEWPORT, 1845) stat.n. (Fig. 39)

Heterostoma spinosa NEWPORT 1845: 414.
Heterostoma spinosa: GERVAIS 1847: 246.
Ethmostigmus spinosus: KRAEPELIN 1903: 103.
Ethmostigmus platycephalus spinosus: ATTEMS 1930a: 181.

Figs. 36 - 39: *Ethmostigmus rubipes platycephalus* (Newport, 1845) stat.n.: (36) posterior end of body of NHMW 3238, ventral view, (37) posterior end of body of NHMW 1558, lateral view, (38) posterior end of body of NHMW 3244, lateral view. – *Ethmostigmus rubipes spinosus* (Newport, 1845) stat.n.: (39) posterior end of body of NHMW 1565, ventro-lateral view. Scale is 1 mm.

**Description:** The following detail should be corrected.

Body length up to 125 mm.

Headplate: sometimes with small but well-developed "basal plates", which may be present at one side only.

Forcipules: tooth plates as in nominative form.

Coxopleura (Fig. 39): posterior process dorsally with more or less arcuate edge, 1.2 - 2.5 times as long as sternum XXI. Laterally with 1 - 2 spines of which lower one of normal size (not very small as stated by Attems (1930a)), dorsally with 1 - 2 spines (0 - 1 sensu Attems).

Locomotory legs: two anterior pairs with two tarsal spurs (the first pair only according to Attems (1930a)).

**Variability:** Three subadults (NHMW 1031) and adult (NHMW 1563) have small but clear cephalic "basal plates" (one subadult has basal plates at one side only). Among six specimens of NHMW 1031, length of coxopleural process varies from 1.2 to twice the length of sternum XXI; a very large adult of NHMW 1563 has coxopleural process 2.5 times as long as sternum XXI. Adults of NHMW 1564 and one subadult of 1031 have one coxopleural process with two, but another one with one dorsal spine. Subadults of NHMW 1564 have no dorsal spines. Proportion of body length to terminal leg length differs sharply in subadult and adult animals: in NHMW 1564 subadults this ratio is 55 mm: 20 mm, in adults 105 mm: 25 mm. This probably means that the terminal legs do not grow gradually. 23 juveniles (NHMW 1564) (which seem to be freshly hatched) have no such spurs on legs; their exuvia are not pigmented.

**Remarks:** Heterostoma spinosa Newport, 1845 was reduced by Attems (1930a) to a subspecies of Ethmostigmus platycephalus, differing from the nominative form by features of terminal praefemur (Fig. 39): (a) enormously enlarged dorso-distal process and (b) mainly two (three in *p. platycephalus*) vento-lateral spines.

If Ethmostigmus platycephalus belongs (as a subspecies) to Ethmostigmus rubripes, then Ethmostigmus spinosus also must belong to rubripes. However, we consider this form to be a good subspecies because of: (a) its distribution in Sri Lanka (and Myanmar?), (b) stable combination of the following characters: strong enlargement of both dorso-distal process and all other spines of terminal praefemur, this joint ventro-laterally with two spines, coxopleural process with two apical, 1 - 2 dorsal and 1 - 2 lateral spines.

In summary, the suggested synonymy is: Ethmostigmus platycephalus spinosus (Newport, 1845) = Ethmostigmus rubripes spinosus (Newport, 1845) stat.n.

Chamberlin (1939) proposed Ethmostigmus spinosus nannus for two subadults from Doormanpad, New Guinea, with only one diagnostic character: an absence of the dorsal spine(s) of coxopleural process. Some subadults of rubripes spinosus (1564; see above) do not have those dorsal spines and both known specimens of spinosus nannus are also subadult. So the question about the validity of this form remains open.

**Range:** Sri Lanka (Trinkomali; Kandy, etc.); Myanmar ?; S Vietnam, Dong Nai Province.
Fam. Scolopocryptopidae POCOCK, 1896

Subfam. Scolopocryptopinae POCOCK, 1896

Genus Tidops CHAMBERLIN, 1915

*Tidops* CHAMBERLIN 1915: 495.
*Tidops*: ATTEMS 1930a: 284; BÜCHERL 1941b: 341.

Type-species. *Tidops simus* CHAMBERLIN, 1915 (by monotypy).

Remarks: This genus has been transferred from Newportiinae to Scolopocryptopinae by SCHILEYKO (2002).

*Tidops collaris* (KRAEPELIN, 1903)

*Newportia collaris* KRAEPELIN 1903: 90.
*Newportia bicegoi* BRÖLEMANN 1905: 67.
*Tidops echinopus* CHAMBERLIN 1921: 4.
*Tidops echinopus*: ATTEMS 1930a: 286; BÜCHERL 1941b: 341.


Description: Investigated specimens correspond well to the known descriptions.

Range: French Guyana: Bas Carsevenne [?] (Locus typicus); Guyana: Dunoon [?]; Brazil: Amazonas; Pará; Paraguay.

Subfam. Newportiinae POCOCK, 1896

Genus Newportia GERVAIS, 1847

*Newportia* GERVAIS 1847: 243, 298.

Type-species: *Newportia longitarsis* (NEWPORT, 1845) (by monotypy).

*Newportia amazonica* BRÖLEMANN, 1905

*Newportia (Scolopendridae) amazonica* BRÖLEMANN 1905: 69.


Description: Antennae: 17 antennomeres, four basal ones with a few short setae dorsally and with some long setae ventrally.
Headplate: with divergent, incomplete paramedian sulci extend reach to cephalic middle, no transverse sulcus. Headplate clearly covers the anterior margin of tergum I.

Forcipules: anterior margin of the coxosternum with two wide and low tooth plates with strongly chitinized tooth margins.

Terga: tergum I with complete paramedian sulci and complete semilunar sulcus in anterior half. Paramedian sulci of tergum II very short and developed only anteriorly and posteriorly, complete from tergum III. Lateral sulci present on terga V - XX. Midbody terga with poorly-expressed medial keel. Tergum XXIII with lateral margination and shallow medial depression in posterior half.

Sterna II - XX with longitudinal median sulcus. Last sternum trapeziform, some wider than long, with posterior margin almost straight.

Coxopleura: posterior process long and slender, apically pointed. Porose area consists of about 35 large, scattered pores.

Locomotory legs I - XXI with tarsi completely fused; tibia with lateral spur only, no tarsal spurs.

Terminal legs: praefemur with 4 and femur with one curved spine ventrally, all of them equally large. Tarsus long, tarsal joints nearly equal in length and poorly separated from each other; tarsus II without clear division. Claw-shaped praetarsus well developed.

Variability: According to the original description and to ATTEMS (1930a) the locomotory legs lack any spurs. However, NHMW 1571 (being a typical representative of this species) has a lateral tibial spur (SCHILEYKO & MINELLI 1998).

Range: Brazil: Amazonas Manaus (Locus typicus), Para (Santarém Novo).

Newportia lasia CHAMBERLIN, 1921

Newportia lasia CHAMBERLIN 1921: 10.


Description: Investigated specimen corresponds well to the known descriptions.

Range: Guyana: Dunoon? (Locus typius). Brazil: Amazonas; Paraguay.

Newportia monticola POCOCK, 1890

Newportia monticola POCOCK 1890: 144.
Newportia rogersi POCOCK 1896: 34.
Newportia parva: CHAMBERLIN 1921: 12 - 13; non Newportia monticola, BÜCHERL 1953: 119 - 120.
Newportia occidentalis Kraus 1954: 320.
Newportia atopa Chamberlin 1957: 37.
Newportia ecuadorana Chamberlin 1957: 39.
Newportia schlingeri Chamberlin 1957: 40.


Variability: Newportia monticola is one of the most widespread and common representatives of this genus; the following variability in terminal legs is thus expected: number of joints of tarsus II from five to 11, three or four praefemoral ventral spines, 0 - 2 medial and 0 - 2 ventral spines on femur.

Range: Costa Rica (including Cocos Island); Guyana; Ecuador (including Galapagos Islands): Chimborazo (Locus typicus); Colombia; Venezuela: Merida; Peru; Brazil: Amazonas.

Newportia simoni Brölemann, 1898

Newportia simoni Brölemann 1898: 251.


Remarks: In the specimens studied, outer branches of bifurcated paramedian sulci of tergum I do not reach to its anterior margin, but clearly cross semilunar sulcus.

This species differs from Newportia monticola only by the shape of paramedian sulci of tergum I (other differences indicated by Attems (1930a) are erroneous). The fact that they are sympatric in some areas (for instance on the Yrazu Volcano in Costa Rica) is good evidence for the validity of Newportia simoni (Schileyko & Minelli 1998).

Range: Venezuela: La Guayara (Locus typicus); Columbia (Corozal); Costa Rica.

Newportia stolli (Pocock, 1896)

Newportia mimetica Chamberlin 1922: 5.
Newportia sulana Chamberlin 1922: 6.
Newportia sulana: Bücherl 1941b: 341.

Material: Kolumbien, Los Pacharitos, Ubabé, leg. O. Bürger, det. Attems as Newportia ernsti, 1 Ex., NHMW 2009.

Range: Mexico: Chiapas, Campeche; Guatemala: Quezaltenango (Locus typicus), Tikal Reserve, San Rafael, Izabal; Belize; Honduras; El Salvador; Colombia; Brazil: Amazonas, Pará.

Discussion

Genus Ethmostigmus

Of the three studied species two (trigonopodus and rubripes) have a very wide occurrence in the Old World (see above), but rubripes is more variable, including two subspecies, which have previously been recorded as separate species. The third species, pygomegas, seems to be endemic for the continental part of SE Asia and for adjacent mountaneous region of Central Asia. This form is very close to trigonopodus, being possibly a geographic variation [subspecies] of the latter.

In a few species the length proportion between the body and the terminal legs are clearly related to the age of the specimens (a similar trend has been recorded by Lewis 1989 for Newportia); we do not suppose the variations in the terminal legs of rubripes, described above, to be sexual difference. The terminal legs stop growing quite early for example in Ethmostigmus rubripes spinosus.

Genus Tidops

Chamberlin (1915) describing this genus wrote: "Eleven pairs of elliptic spiracles, one pair being present on the seventh segment". According to this basic character, Schileyko & Pavlinov (1997) regarded Tidops as a member of Newportiinae [and Schileyko & Minelli (1998) noted it as the closest genus to Newportia].

Further investigations of a large amount of material showed actual absence of this spiracle pair in Tidops collaris (Kraepelin 1903). This species seems to be the only real representative of Tidops, because both other species are only known from the type-series. One of them (Tidops simus) is a very doubtful form, being described from Grenada by only a single specimen, which seems not to be adult (length 19 mm and only 13 antennomeres). So this genus has been transferred from Newportiinae to Scolopocryptopinae (Schileyko 2002).
Genus *Asanada*

*Asanada brevicornis* occurs in SE Asia and the adjacent region of Central Asia, in Australia and some Pacific islands, while the second species - *A. socotrana* (not *sokotrana*, as some authors wrote) – is certainly an African endemic. We assume that the specimen of *socotrana* known from "Indien, Katch" (see above) has been artificially introduced, or labels were interchanged.

Genus *Cormocephalus.*

Two thirds of species, examined in this paper, belong to the genus *Cormocephalus* and to the former genus *Colobopleurus* (now *Cormocephalus*). We do not discuss the validity and status of other related taxa, not presented in the paper, like *Hemiscolopendra, Psiloscolopendra, Dekanonyx Verhoeff, 1937, Tangopleurus Verhoeff, 1941, Dolichonychius Verhoeff, 1941.*

*Cormocephalus* is the largest genus within the Scolopendrinae, including about 100 described species, about 70 we regard as valid ones. At this moment the taxonomy of *Cormocephalus* - one of the most morphologically variable taxa among eyed Scolopendromorpha - is far away from satisfactory. Attems (1930a) was the last to revise *Cormocephalus*; many species - included in Attems (1930a) and described after 1930 - are unclearly or/poorly described.

Another problem is the absence of a really recent (and accepted) subdivision of this large and variable taxon. According to Attems (1930a), there are four subgenera, with the absence of tarsal spurs at the locomotory legs as a characteristic attribute: *Cormocephalus s.str., Cormocephalus (Colobopleurus) Kraepelin, 1903, Cormocephalus (Hemiscolopendra) Kraepelin, 1903 and Cormocephalus (Psiloscolopendra) Kraepelin, 1903* - the last three taxa have been originally described as independent genera. For *Cupipes Kohlrusch, 1881* see above; *Hemicormocephalus Kraepelin, 1903* was synonymised with *Cormocephalus* by Attems (1930a), confirmed by Koch (1983a).

This *Cormocephalus* subdivision has also been used in the more recent papers of Lawrence (1955, 1968) on the fauna of South Africa.

According to the (a) distribution of sulci on the anterior terga, (b) presence of coxopleural spines and (c) ventro-lateral spinulation of the terminal praefemur we recognise four large groups of species (or supergroups) within *Cormocephalus*; the fifth group includes 8 species with unclear position (see Remarks on *Cormocephalus*). The supergroups contain the following basic groups of species which differ from each other by: (a) distribution of sulci on the terminal tergum, (b) comparative sizes of coxopleural porose area, (c) spinulation of terminal praefemur, (d) comparative length of terminal pretarsus.

Super-group I: *rubriceps* species group (8 species), *nitidus-* (3 species), *westwoodi-* (11 species) and *setiger-* (7 species) species group.

Super-group II: *esulcatus* species group (6 species).

Super-group III: *dentipes-* (10 species), *gervaisianus-* (14 species) and *rugosus-*
(3 species) species group.

Supergroup IV: *Colobopleurus* species group (3 species).

Koch & Colles (1986) obtained "Four subgroups of Cormocephalus" for the Australian fauna. They wrote: "Only the lack of a substantial moat prevents these subgroups from being strong candidates for generic status". But at the recent level of knowledge the question about taxonomic rank/status of any species group inside Cormocephalus should remain open.

According to the original description, the former genus/subgenus *Colobopleurus* includes two South African species (*Cormocephalus devylderi* Porat, 1893 and *Cormocephalus parcespinatus* Porat, 1893), differing from *Cormocephalus*-species by the complete absence of apical and subapical coxopleural spines. But some typical *Cormocephalus*-species - such as *C. amphieurys* (Kohlrausch, 1878), *C. mediosulcatus* Attems, 1928, *C. brasiliensis* Humbert & Saussure, 1870 - have no coxopleural spines at all.

Attems (1930a) added to *Colobopleurus* species *Colobopleurus fontinalis* Attems, 1928 (S Africa), *Colobopleurus inopinatus* Kraepelin, 1908 (Australia) and *Colobopleurus makrosestrus* Attems, 1928 (India); in all these species 1 - 2 small coxopleural spines may be present. Accordingly, in Attems' key for the subgenera, a coxopleural structure - in Verhoeff's (1941) key - the absence of coxopleural process - has been used to separate *Colobopleurus* from *Hemiscolopendra* and *Psiloscolopendra*, not from *Cormocephalus* s.str.

Another original diagnostic character of *Colobopleurus* is the absence of ventral and ventro-lateral spines on the terminal praefemur vs. their presence in all species of *Cormocephalus*. Attems (1930a) placed *inopinatus* and *makrosestrus* into *Colobopleurus*, although they did not fit the definition of that genus. Note that only species of *Colobopleurus* and *Cormocephalus* have well-produced cephalic basal plates. Thus, as no real differences of generic rank exist between *Colobopleurus* and *Cormocephalus*, we propose former to be a junior synonym of *Cormocephalus*.

Three of five nominative species of *Colobopleurus* (*devylderi*, *fontinalis* and *parcespinatus*, i.e. all its South African members) form the ninth basic group of species (see above), having terminal praefemur spineless, ventrally and ventro-laterally. Both the remaining species, *inopinatus* and *makrosestrus* (which seem to be Australian and Indian endemics respectively), have as is usual for *Cormocephalus*, ventro-lateral spines on the terminal praefemur and are, for the moment, placed in the last basic group of "unclear" species.

Summing up, as characters as (a) distribution of sulci on the anterior terga, (b) presence of coxopleural spines, (c) ventro-lateral spinulation of the terminal praefemur, (d) comparative sizes of coxopleural porose area and (e) distribution of sulci on the terminal tergum, are the most reliable in the taxonomy of *Cormocephalus*. Other characters are much more variable (for example length of terminal praetarsus vary within some species, like in *Cormocephalus westwoodi*) or show convergence between different
groups (for instance absence of developed coxopleural process in all species of the supergroup IV and in a few members of supergroup III. Thus, as many characters as possible should be used for certain identification of the groups.

A new general key to this large and widespread genus is hardly needed, the last one (ATTEMS 1930a), does not permit to separate some species groups (for example westwoodi- from nitidus species group). The most recent papers contain only regional keys (LAWRENCE 1955a, 1955b, 1960, KOCH 1983a), or completely lack keys and contain certain mistakes (BÜCHERL 1974). The suggested division of Cormocephalus in supergroups and basic groups on a base of the most reliable characters, could be the first step to create a general key.

Summary

I. The following taxa of species rank are examined:

*Arthrorhabdus formosus* POCOCK, 1891
*Cormocephalus rubriceps* (NEWPORT, 1843)
*Cormocephalus aurantiipes* (NEWPORT, 1844)
*Cormocephalus violaceus* NEWPORT, 1845
*Cormocephalus incongruens* KRAEPELIN, 1903
*Cormocephalus nitidus nitidus* PORAT, 1871
*Cormocephalus nitidus calcaratus* PORAT, 1871
*Cormocephalus aeruginosus* ATTEMS, 1928
*Cormocephalus westwoodi westwoodi* (NEWPORT, 1844)
*Cormocephalus westwoodi anceps* PORAT, 1871
*Cormocephalus westwoodi ribauti* ATTEMS, 1928
*Cormocephalus westwoodi lambertoni* BRÖLEMANN, 1922
*Cormocephalus cupipes* POCOCK, 1891
*Cormocephalus mecutinus* ATTEMS, 1928
*Cormocephalus humilis* ATTEMS, 1928
*Cormocephalus multispinus* (KRAEPELIN, 1903)
*Cormocephalus setiger* PORAT, 1871
*Cormocephalus multispinosus* ATTEMS, 1909
*Cormocephalus oligoporus* KRAEPELIN, 1903
*Cormocephalus insulanus* ATTEMS, 1928
*Cormocephalus esulcatus esulcatus* POCOCK, 1901
*Cormocephalus esulcatus schultzei* ATTEMS, 1909
*Cormocephalus pontifex* ATTEMS, 1928
*Cormocephalus andinus* (KRAEPELIN, 1903)
*Cormocephalus bonaerius* ATTEMS, 1928
*Cormocephalus devylderi* PORAT, 1893
*Cormocephalus fontinalis* ATTEMS, 1928
*Rhoda calcarata* (POCOCK, 1891)
*Asanada brevicornis* MEINERT, 1886
*Asanada socotrana* POCOCK, 1899
*Ethmostigmus trigonopodus* (LEACH, 1817)
II. A new subdivision of the genus *Cormocephalus* in 4 supergroups which include 9 species groups is provided.

III. The following taxonomic changes/notes are made:

1) *Colobopleurus KRAEPELIN, 1903* is the synonym of *Cormocephalus NEWPORT, 1845*.

2) *Cormocephalus violaceus sulcatus BRÖLEMANN, 1912* is a new synonym of *Cormocephalus aurantiipes (NEWPORT, 1844)*.

3) *Cormocephalus incongruens careens ATTEMS* remains an unpublished manuscript-name.

4) *Cormocephalus calcaratus PORAT, 1871 = Cormocephalus nitidus calcaratus PORAT, 1871* stat.n.

5) Synonyms of *Cormocephalus westwoodi westwoodi* (NEWPORT, 1844): *Cormocephalus dispar fangaroka SAUSSURE & ZEHTINTER, 1901*; *Cormocephalus westwoodi dispar PORAT, 1871*; *Cormocephalus westwoodi elegans KRAEPELIN, 1903*; *Cormocephalus westwoodi microdens LAWRENCE, 1955*; *Cormocephalus foecundus NEWPORT, 1845* and *Cormocephalus lanatipes KOLHLAUSCH, 1881*.

*Cormocephalus westwoodi rubigenus LAWRENCE, 1955, Cormocephalus dispar alticursor LAWRENCE, 1960* and *Cormocephalus huttoni POCOCK, 1893* (or *Cormocephalus westwoodi westwoodi* var. *huttoni POCOCK, 1893* sensu *Attems* 1930a) can not be (at least formally) synonymised to *Cormocephalus westwoodi westwoodi* (NEWPORT, 1844) at this moment.

6) *Cormocephalus anceps PORAT, 1871 = Cormocephalus westwoodi anceps PORAT, 1871* stat.n.

Synonyms of *Cormocephalus westwoodi anceps PORAT, 1871*: *Cormocephalus brevicornis longipalpus ATTEMS, 1930*; *Cormocephalus anceps segnis ATTEMS, 1928*; *Cormocephalus elegans zuluinus ATTEMS, 1928* and *Cormocephalus anceps serrulatus VERHOEFF, 1941*.

7) *Cormocephalus ribauti ATTEMS, 1928* is *Cormocephalus westwoodi ribauti ATTEMS, 1928* stat.n.

8) *Cormocephalus lambertoni BRÖLEMANN, 1922* is *Cormocephalus westwoodi lambertoni BRÖLEMANN, 1922* stat.n.
9) *Cormocephalus multispinus quadridens* LAWRENCE, 1953 = *Cormocephalus multispinus* (KRAEPelin, 1903).

10) New synonyms of *Cormocephalus multispinosus* ATTEMS, 1909: *Cormocephalus spinulosus* ATTEMS, 1928 and *Cormocephalus mecutinus* var. *angolensis* ATTEMS, 1930. *Cormocephalus brincki* LAWRENCE, 1955 is a questionable form not close to *multispinosus*, being a member of another (*westwoodi-* species group.

11) *Cormocephalus insulanus* ATTEMS, 1928 has been described by ATTEMS 1922 as *Cormocephalus Michaelseni* (nomen preoccupatum), and re-named as *insulanus* by ATTEMS in 1928b. We regard *Cormocephalus deventeri* LAWRENCE, 1970 (if really exists) to the *insulanus* species group.

12) We do not consider provisionally *Cormocephalus esulcatus schultzei* ATTEMS, 1909 and *Cormocephalus esulcatus capensis* ATTEMS, 1928 as the synonyms of *Cormocephalus esulcatus esulcatus* POCK, 1901.

13) Lectotype has been designated for *Cormocephalus bonaerius* ATTEMS, 1928.

14) *Scolopendropsis bahiensis* BRANDT, 1841 is the same form as *Rhoda calcarata* (POCK, 1891) (SCHILEYKO, in prep.).

15) Difference between *Asanada brevicornis* MEINERT, 1886 and *Asanada socotrana* POCK, 1899 was reduced.

16) *Ethmostigmus trigonopodus pygomenasoides* LEWIS, 1992 from Nepal seems to be the same with *Ethmostigmus trigonopodus trigonopodus* (LEACH, 1817). Difference between *Ethmostigmus trigonopodus* and *Ethmostigmus rubripes* (BRANDT, 1840) has been reduced.

17) Difference between *Ethmostigmus pygomegas* (KOHLRAUSCH, 1881) and *Ethmostigmus trigonopodus* (LEACH, 1817) has been reduced.

18) *Ethmostigmus bisulcatus* (TÖMÖSVARY, 1885) is *Ethmostigmus rubripes rubripes* (BRANDT, 1840).

19) *Ethmostigmus platycephalus* (NEWPORT, 1845) is *Ethmostigmus rubripes platycephalus* (NEWPORT, 1845) stat. n., *Scolopendra cribriferum* GERVAIS, 1847 (ATTEMS' (1030a) *Ethmostigmus platycephalus cribrifer*) is *Ethmostigmus rubripes platycephalus* (NEWPORT, 1845).

20) *Heterostoma spinosa* NEWPORT, 1845 (or *Ethmostigmus platycephalus spinosus* sensu ATTEMS 1930a) is *Ethmostigmus rubripes spinosus* (NEWPORT, 1845) stat. n. Validity of *Ethmostigmus spinosus nannus* CHAMBERLIN, 1939 is questionable.

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