A review of *Axiocerylon* Grouvelle (Coleoptera, Cerylonidae) with descriptions of new species

by

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With 38 figures

**ABSTRACT**

A review of *Axiocerylon* Grouvelle (Coleoptera, Cerylonidae) with descriptions of new species. — Species of *Axiocerylon* Grouvelle are reviewed, and an identification key is provided. The following new species are described: *baloghi* (New Guinea); *bournei* (New Britain); *burckhardti* (Borneo); *decemcostatum* (Sierra Leone); *ghanense* (Ghana); *gomyi* (Mascarene Is.); *hammondi* (Borneo); *humerale* (Sumatra); *loeblia* (Ivory Coast); *luzonicum* (Philippines); *minimum* (New Britain); *myops* (Philippines); *orousseti* (Philippines); *peckorum* (Fiji); *roberti* (Sumatra); *solomonense* (Solomon Is.); *triste* (Bali); *variabile* (Borneo) and *venustum* (Congo-Brazzaville).

*Axiocerylon* Grouvelle


*Paraxiocerylon* Heinze, 1944: 20. Type-species: *Axiocerylon (Paraxiocerylon) degeneratum* Heinze, 1944, by monotypy.

*Decaxiocerylon* Dajoz, 1982: 149. Type-species: *Axiocerylon (Decaxiocerylon) nigeriense* Dajoz, 1982, by original designation (syn. nov.).

Diagnosis: *Axiocerylon* differs from other genera of *Lapethini* (as defined by Slipinski 1984) by the presence of deep cavities and raised parts on the pronotum, by the

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antennal cavities of prosternum extending to hind-marg in of prosternal hypomera, and by more or less sharply costate elytral intervals.

Comments: The concepts of Axiocerylon by Slipinski (1984) is slightly altered as the study of a large material suggests the synonymy of Paraxiocerylon with Axiocerylon. Characters such as antennal cavities, number of antennal segments and number of elytral costae are insufficient to separate subgenera as all possible character-combinations were observed. Microscopical examination shows that the antennal club of A. cavicolle is 2-segmented (fig. 13) rather than 1-segmented as previously stated. This is unlike other species where the antennal club is distinctly 1-segmented.

In its elongate, piercing mouth parts (figs 2-4) Axiocerylon shows a close resemblance to Angolon Dajoz, Thyroderus Sharp, Cautomus Sharp and some other genera included by Sen Gupta and Crowson (1973) in Aculagnathini (their mouth parts are figured and discussed by Besuchet, 1972). The genera Lapethus Casey, Pseudolapethus Slipinski, Thyroderus Sharp, Axiocerylon Grouvelle and Angolon Dajoz form a distinct group within the Lapethini, defined by following combination of characters: head with distinct occipital line (probably correlated with adaptation to retract the head into the prothorax); prosternum produced anteriorly into a "median lobe" covering gular region of head (fig. 8); antennal cavities well developed and situated on hypomera rather than on median part of prosternum as in the Cautomus-complex; femoral lines more or less developed (the tarsal grooves in Angolon are originated from deep grooves before femoral lines as in Axiocerylon) (fig. 8); aedeagus without parameres (figs 15, 16).

The subdivision of Axiocerylon into natural groups is not clear. Even though the number of antennal segments does not indicate phylogenetic relationship, we use it here for practical reasons.

The three Afrotropical species setulosum Heinze (antenna 9-segmented), venustum sp. n. (8-segmented) and ghanense sp. n. (7-segmented) are closely related; they have almost the same pronotal and elytral sculpture, the same long erect squamiform setae on pronotum and elytra and similar dimensions; the first species is widely distributed throughout Africa, whereas the other two are localized. Of the 55 specimens of setulosum from Banco, Ivory Coast, 50 have both antennae with 9 segments, three have one of the antennae with the segments III and IV fused though still distinct, one has both antennae with similarly fused segments III and IV and the last one has one of the antennae 8-segmented with the complete fusion of the segments III and IV, and the other one 9-segmented, with a fusion of segments III and IV. In venustum from the Niari Valley, Congo-Brazzaville, six specimens have both antennae 8-segmented, three have both antennae with the segments III and IV more or less fused though still distinct, and one has one of the antennae 7-segmented with the complete fusion of segments III and IV, and the other one 8-segmented with partial fusion segments III and IV.

It is interesting to note that, apart from venustum and ghanense, Axiocerylon shows a decrease in the number of antennal segments from West to East (West Africa to Fiji). Antennae 10-segmented (Decaxiocerylon): 3 species from West and Central Africa; 9-segmented (Axiocerylon): 5 species from Africa and 1 from the Seychelles; 8-segmented: 3 species from the Mascarenes and Seychelles; 7-segmented: 5 species from the Indo-Malayan region; 6-segmented (Paraxiocerylon): 12 species from Indonesia (1), Sabah (1), from the Philippines (4) and the Australasian region (without Australia) (6). In the last group, 11 species have elytra with strongly prominent humeral angle forming a lobe; but A. beta Dajoz from Luzon lacks this lobe. Among the species with 7-segmented antennae,
humerale sp. n. from Sumatra and hammondi sp. n. from Borneo have a distinct lobe, whereas the remaining four species do not. The Indo-australasian species have four carinae in alternate intervals on the elytron which are never reduced or interrupted as in Afrotropical (including Mascarenes and Seychelles) members of the genus. Whereas Decaxiocerylon Dajoz is a synonym of Axiocerylon, the situation is less clear for Paraxiocerylon Heinze. More material from the Oriental region is needed to decide whether the latter name is synonym, or forms a subgenus or a genus.

Geographic distribution of the 31 known species:

| Africa (10) | Bali (1) |
| Mascarenes (2) | Philippines (4) |
| Seychelles (2) | New Guinea (2) |
| Ceylon (1) | New Britain (3) |
| Sumatra (2) | Solomon Is. (1) |
| Borneo (3) | Fiji (1) |

The African Axiocerylon, more frequent than the Asian species, are not rare in siftings of forest litter, rotten wood and bark. In Ivory Coast * (3-23.III.1977), Dr. I. Löbl has collected 84 specimens of Axiocerylon setulosum (63), decemcostatum (1), loebli (14), monstruosum (3) and cambeforti (3). In one case, the five species were found together in the same sample: an accumulation of dead leaves with broken branches and rotten wood in the Forest of Yapo.

Material from the following institutions was examined:

ANIC: Australian National Insect Collection, CSIRO, Canberra City, Australia (J. F. Lawrence);
BMNH: British Museum (Natural History), London, England (R. D. Pope);
FMNH: Field Museum of Natural History, Chicago, Ill. USA (L. Watrous);
CAS: California Academy of Sciences, San Francisco, Cal. USA (D. Kavanaugh);
DEI: Institut für Pflanzenschutzforschung, Eberswalde, German Democratic Republic (L. Dieckmann);
MRAC: Musée royal de l’Afrique Centrale, Tervuren, Belgium (J. Decelle);
MHNG: Muséum d’histoire naturelle, Genève, Switzerland;
MNHN: Muséum national d’histoire naturelle, Paris, France (N. Berti);
IZPAN: Institute of Zoology, Polish Academy of Sciences, Warsaw, Poland;
TMB: Termeszetudományi Múzeum, Budapest, Hungary (Z. Kaszab);
ZMB: Zoologisches Museum Berlin, German Democratic Republic (M. Uhlig);

We thank the curators and institutions mentioned above for the loan of material.

**KEY TO THE SPECIES**

For practical reasons, the antennal club is considered to be 1-segmented. The length is measured along the mid-line from the anterior margin of head to the apices of elytra.

1. Antenna 6-segmented; elytra usually with strongly prominent humeral angle forming a lobe (fig. 17) ................................................................. 2

* Species found in Ivory Coast were collected with support of the Centre Suisse de Recherches Scientifiques at Adiopodoumé.
Fig. 1.

Axiocerylon monstruosum (Grouv.), dorsal view. Del. S. Vit.
— Antenna 7 to 10-segmented; elytra usually without strongly prominent humeral angle forming a lobe (fig. 30) ........................................ 13
2. Humeral angle acute but without strongly prominent lobe; anterior raised portion of pronotum not divided (according to original description); length: 1.2 mm. Philippines Isl.: Mindoro .......... 5. beta Dajoz
— Humeral angle with strongly prominent lobe (fig. 17) ............... 3
3. Anterior raised portion of pronotum not divided, evenly convex (fig. 34); length: 1.4-1.6 mm. New Guinea .................. 4. baloghi sp. n.
— Anterior raised portion of pronotum sculptured, with prominences and depressions (figs 1, 17) ........................................ 4
4. Pronotum bearing three lateral lobes on either side (fig. 17) ....... 5
— Pronotum with two lateral lobes (fig. 18) .................................. 7
5. Anterior portion of pronotum distinctly raised along fore-margin and narrowly interrupted medially (fig. 17); length: 1.4 mm. New Britain .... 3. bournei sp. n.
— Fore-margin of anterior portion of pronotum with two medially well separated prominences (fig. 10) .................. 6
6. Pronotal sides anterior to hind-angle strongly lobed (fig. 10); length: 1.2-1.4 mm. New Guinea .................. 1. degeneratum Heinze
— Pronot al sides anterior to hind-angle straight (fig. 11); length: 1.6 mm. Philippines Isl.: Luzon ........... 2. luzonicum sp. n.
7. Eyes reduced to some coarse facets, arranged in one or two irregular rows . 8
— Eyes well developed, consisting of numerous fine facets ................. 9
8. Anterior raised portion of pronotum with median transverse depression which is delimited by two transverse prominences in front and by four rounded prominences posteriorly (fig. 18); elytra with four hardly developed carinae each; length: 1.55-1.7 mm. Philippines Isl.: Luzon .......... 6. orousseti sp. n.
— Anterior raised portion of pronotum without transverse depression, with only four rounded prominences posteriorly (fig. 19); elytra with four weakly developed carinae each; length: 1.15-1.2 mm. Philippines Isl.: Luzon ......... 7. myops sp. n.
9. Anterior raised portion of pronotum with only two prominences posteriorly (fig. 25); protibia smooth, not denticulate; length 1.25 mm. Fiji Isl. .......... 12. peckorum sp. n.
— Anterior raised portion of pronotum with four rounded prominences posteriorly; protibia denticulate on external margin .................. 10
10. Antennae slightly longer, the segments IV and V as long as wide; elytral punctures smaller and numerous with intermediate punctures between the strial rows; length: 1.35 mm. Bali ........ 8. triste sp. n.
— Antennae shorter, the segments IV and V transverse; elytral punctures larger and less numerous without intermediate punctures between the strial rows . 11
11. Transverse groove of pronotum very deep, impunctate, shiny; anterior portion of pronotum distinctly raised along fore-margin and with four strongly raised prominences posteriorly (fig. 23); length: 1.05 mm. New Britain ........ 9. minimum sp. n.
— Transverse groove of pronotum moderately deep, punctate; fore-margin of pronotum not raised .................. 12
12. Anterior raised portion of pronotum with four strongly raised prominences; pronotal sides anterior to hind-angle strongly lobed; length: 1.2-1.4 mm. Borneo: Sabah .................. 10. burckhardti sp. n.
Anterior raised portion of pronotum with four weak prominences; pronotal sides anterior to hind-angle straight (fig. 24); length: 1.3 mm Solomon Isl.

11. solomonense sp. n.

13. Antenna 7-segmented ........................................... 14

— Antenna 8 to 10-segmented ........................................ 19

14. Pronotum and elytra with long erect squamiform setae (fig. 22); each elytron with two fine carinae; length: 1.75 mm. Ghana ............... 18. ghanense sp. n.

— Pronotum and elytra without erect setae; each elytron with four strongly raised carinae; Asia ........................................ 15

15. Pronotum bearing two lateral lobes on either side; anterior raised portion of pronotum not divided, evenly convex (fig. 21); length: 1.4 mm. Sri Lanka

— Pronotum bearing three lateral lobes on either side (fig. 20); anterior raised portion of pronotum sculptured ........................................ 16

16. Median lateral lobe of pronotum large, high, strongly prominent; transverse groove of pronotum deep but broad, impunctate or with some punctures, shiny; larger blackish species ................................. 17

— Median lateral lobe of pronotum small, weakly prominent; transverse groove of pronotum deep but narrow, punctate; smaller brown species ........... 18

17. Humeral angle of elytra with strongly prominent lobe; anterior raised portion of pronotum with four rounded equidistant prominences (fig. 20); length: 1.85 mm. Sumatra ........................................ 13. humerale sp. n.

— Humeral angle of elytra without strongly prominent lobe; anterior raised portion of pronotum usually with two widely separated rounded prominences or, by duplication, with four rounded irregularly sized and spaced prominences; length: 1.7-1.9 mm. Borneo: Sabah ................. 14. variabile sp. n.

18. Humeral angle of elytra with strongly prominent lobe; anterior raised portion of pronotum with median transverse depression which is delimited by a transverse prominence in front and by four rounded prominences posteriorly (fig. 26); length: 1.1 mm. Borneo: Sarawak ................. 16. hammondi sp. n.

— Humeral angle of elytra without strongly prominent lobe; anterior raised portion of pronotum with only two weakly but widely separated prominences, without transverse depression anteriorly (fig. 29); length: 1.1 mm. Sumatra ..................... 15. roberti sp. n.

19. Antenna 8-segmented ........................................... 20

— Antenna 9 or 10-segmented ........................................ 23

20. Pronotum and elytra with long erect squamiform setae (fig. 30); elytral punctures small; length: 1.55-1.8 mm. Congo-Brazzaville .... 19. venustum sp. n.

— Pronotum and elytra without erect setae; elytral punctures a lot larger than in other species. Mascarenes and Seychelles Islands ....................... 21

21. Third elytral interval distinctly carinate only posteriorly; elytra nearly as wide as long; length: 1.9-2.1 mm. Mauritius ...................... 20. vinsoni Dajoz

— Third elytral interval distinctly carinate along its entire length; elytra longer than wide ........................................ 22

22. Third antennal segment slightly shorter than 2nd, two times longer than 4th; length: 1.5-2.0 mm. Reunion ................................. 21. gomyi sp. n.

— Third antennal segment about half as long as 2nd, as long as 4th; length: 0.8 mm. Seychelles ....................... 22. sculpicolle (Grouvelle)
23. Antenna 9-segmented ................................................................. 24
   Antenna 10-segmented ........................................................... 29
24. Pronotum and elytra with long erect squamiform setae (fig. 31) ....... 25
   Pronotum and elytra without erect setae (fig. 32) ...................... 27
25. Each elytron with two carinae; body rather flattened; pronotal sculpture little prominent; length: 1.75-2.1 mm. Africa .................. 23. *setulosum* Heinze
   Each elytron with five or three carinae; body convex; pronotal sculpture strongly prominent ............................................. 26
26. Second and fourth elytral intervals distinctly carinate anteriorly; pronotal base with a row of large punctures (fig. 31); length: 3.0-3.1 mm. Sierra Leone, Ivory Coast .................. 24. *decemcostatum* sp. n.
   Second and fourth elytral intervals flat or convex basally, never carinate; pronotal base with a row of small punctures; length: 2.6-3.0 mm. Ivory Coast .................................................. 25. *loebli* sp. n.
27. Anterior transverse groove of pronotum distinctly punctured; three complete rows of punctures between the two interior carinae of elytra; length: 2.0-2.2 mm. Seychelles .................. 26. *cavicolle* Grouvelle
   Anterior transverse groove of pronotum not punctured; two complete rows of punctures between the two interior carinae of elytra, sometimes one, two or three intermediate punctures at base ........................................ 28
28. Anterior transverse groove of pronotum larger; posterior raised portion of pronotum with four rounded prominences (fig. 32); eyes well developed; length: 2.0-2.2 mm. Oriental Africa .................. 27. *kaszabi* Heinze
   Anterior transverse groove of pronotum narrow and deep; posterior raised portion of pronotum with three prominences; eyes somewhat reduced; length: 2.15 mm. Sierra Leone .................. 28. *grouvellei* Dajoz
29. Anterior transverse groove of pronotum narrower than second one; one rounded prominence each near either hind-angle of pronotum (figs 1, 37); protibia strongly widened apically; length: 3.4-3.6 mm. Western Africa ....... 29. *monstruosum* Grouvelle
   Anterior transverse groove of pronotum wider than second one; two rounded prominences each near either hind-angle of pronotum (fig. 38); protibia not widened apically ................................................. 30
30. Elytra with three rows of punctures anteriorly between sutura and first carina; length: 2.8-3.0 mm. Western and Central Africa ....... 30. *cambeforti* Dajoz
   Elytra with two complete rows of punctures between sutura and first carina; length: 2.7-2.8 mm. Nigeria, Cameroon .................. 31. *nigeriense* Dajoz

I. SPECIES WITH 6-SEGMENTED ANTENNAE

1. Axiocerylon degeneratum Heinze


Body short, oval. Colour brown to nearly black. Head with anterior clypeal margin prominent, scarcely sinuate laterally, lateral angles acute; surface coarsely punctured, punctures subcontiguous, intervals forming reticulate pattern. Eyes large, finely faceted.
Antennal segment II longer than III, club longer than the three preceding segments together. Pronotum (fig. 10) transverse (24: 35); anterior and posterior raised portions separated by a wide and deep groove ending in a large and very deep hole on either side; anterior portion with two rounded prominences anteriorly and four rounded prominences posteriorly, separated by a transverse depression; posterior raised portion with two rounded prominences; surface densely reticulated; pronotum bearing three lateral lobes on either side and hind-angles emarginated. Elytra longer than wide (45: 37); costae on intervals 3, 5, 7 and 9; interval 8 at base shortly carinate; costae comparatively well developed, shortly pubescent; strial punctures dense, deep, separated longitudinally by 0.4 times their diameter. Protibia strongly dentate. Prosternal process somewhat pointed medially. Length 1.2-1.4 mm.

Material examined. Papua New Guinea: (NE) between Lae-Bulolo, Markham River, 6.IX.1968 (2, TMB); Wau, Mc. Adam Park, 29.VIII.1968 (1, TMB; 1, MHNG); (SE) Kiunga, 23.VII-2.VIII.1969, all leg. J. Balogh (7, TMB; 1, SAS; 1, MHNG); Friedrich-Wilhelm-Hafen, 1896, Biró (1, TMB). New Britain; Rabauí (Kezarat) 10-12.IX.1969, J. Balogh (1, TMB).

2. Axiocerylon luzonicum sp. n.

This species is similar to _degeneratum_ and differs as follows. Anterior portion of pronotum not divided medially; posterior raised portion much wider and more clearly divided; hind-angles of pronotum straight (fig. 11). Length 1.6 mm.


3. Axiocerylon bournei sp. n.

Fig. 17. This species, also similar to _degeneratum_, differs as follows. Anterior portion of pronotum (figs 17 and 33) distinctly raised along fore-margin and narrowly interrupted medially, with a larger median transverse depression posteriorly; pronotal transverse groove ending in a much larger hole on either side. Elytra with the carina more raised. Length 1.4 mm.

Material examined. Holotype and one paratype: New Britain: Pomio, 8.VII.1979, J. D. Bourne (MHNG). In rotten wood.

4. Axiocerylon baloghi sp. n.

Colour brown to nearly black, weakly shiny. Head with anterior clypeal margin prominent, scarcely sinuate laterally, lateral angles acute. Punctuation as in _degeneratum_. Eyes consisting of some coarse facets. Antenna as in fig. 12. Pronotum (fig. 34) transverse (31: 45), divided by wide and deep, transverse groove in an anterior and a posterior raised portion, the first not divided, evenly convex, the second shallowly divided medially; pronotum bearing two lateral lobes on either side and hind-angles obtuse. Elytra slightly longer than wide (49: 48); alternate intervals carinate, 1st carina complete, 2nd and 3rd
A REVIEW OF AXIOCERYLON

Axiocerylon setulosum Heinze — 2: anterior part of body, dorsal view; 3: anterior part of body, laterodorsal view; 4: anterior part of head, with mouth parts, laterodorsal view.

Figs 2-4.
evanescent posteriorly, 4th complete forming lateral border; strial punctures twice the size of pronotal ones, 0.4-0.5 times their diameters spaced from each other. Ventral side densely and coarsely punctured, femoral lines well developed. Aedeagus as in fig. 9. Prostibia strongly dentate as in fig. 14. Length 1.4-1.6 mm.

Material examined. Holotype: Papua New Guinea: (NE) Wau, Mt. Kaindi, 19-24.VIII.1969, J. Balogh (TMB). Paratypes: same data as holotype (4, TMB; 1, MHNG); (NE) Wau, Golden Ridge, 3.IX.1968, J. Balogh (2, TMB; 1, MHNG; 1, IZPAN); Kaindi (Wau) 2200 m, 6.XII.1978, L. Deharveng (2, MHNG; 1, IZPAN); Eddy Creek 2050 m, J. Balogh, 30.VII.1968 (1, TMB).

5. Axiocerylon beta Dajoz

**Axiocerylon** (*Paraxiocerylon*) **beta** Dajoz, 1981: 63, fig. 2. Holotype: Philippine Isl., Ile Mindoro, Puerto Galera (MNHN, not available for examination).

According to Dajoz’s description and figure, the species seems well-characterized by the completely rounded clypeus, the anterior and posterior raised portions of pronotum which are not divided, and by the elytra lacking the usually strongly prominent humeral angle forming a lobe. Length 1.2 mm.

6. Axiocerylon orousseti sp. n.

Fig. 18. Colour brown, weakly shiny. Head with anterior clypeal margin rounded medially, surface as in *baloghi*. Eyes reduced, consisting of 10-13 coarse facets in two irregular rows. Antennal segment III slightly shorter than II (5: 4, 5), club as long as the three preceding segments together. Pronotum (fig. 18) transverse (35: 47); anterior and posterior raised portions separated by a wide and deep, shiny impunctate groove; anterior portion with median transverse depression which is delimited by two transverse prominences in front and by four rounded prominences posteriorly; posterior raised portion shallowly divided medially; pronotum bearing two lateral lobes on either side and hind-angles obtuse. Elytra longer than wide (57: 52), with four hardly developed carinae each; carina II much shorter than III; 4th row along carina II with 16 coarse punctures; punctures 2.5-3 times larger in diameter than those on pronotum, spaced longitudinally in a distance of 0.5 times their diameter. Protibia widened apically, external margin serrate. Anterior part of ventrite I weakly concave medially; femoral lines well developed. Length 1.55-1.7 mm.


7. Axiocerylon myops sp. n.

Fig. 19. Colour brown to nearly black, weakly shiny. Head with anterior clypeal margin prominent and acuminate medially, shallowly emarginate laterally. Eyes composed of 3-5 coarse facets; antennal segment II much longer than III (4: 2, 7), club longer
than the three preceding segments together. Pronotum (fig. 19) transverse (30: 42); anterior and posterior raised portions separated by a wide and deep groove; anterior portion with four rounded prominences posteriorly; posterior raised portion shallowly divided medially; pronotum bearing two lateral lobes on either side and hind-angles obtuse. Elytra longer than wide (52: 45) with four weakly raised carinae each; carina II almost as long as III; 4th row along carina II consists of 17-18 punctures; strial punctures twice as long as those on pronotum, spaced from each other in a distance 0.6-0.7 times their diameter. Protibia widened apically, external margin dentate. Length 1.15-1.2 mm.

Material examined. Holotype: Philippine Islands: Luzon: Baguio, 1500 m, 1.1.1980, J. Orousset (MHNG). Paratypes: same data as holotype (1, MHNG; 1, IZPAN). In leaf litter.

8. Axiocerylon triste sp. n.

Colour brown. Head with anterior clypeal margin rounded medially, scarcely sinuate laterally. Eyes large, finely facetted. Antennal segment II longer than III (7: 5), IV and V as long as wide; club distinctly longer than the three preceding segments together. Pronotum transverse (0.43/0.65 mm); anterior and posterior raised portions separated by a wide and deep groove; anterior portion slightly raised along fore-margin and with four rounded, weakly raised prominences posteriorly; posterior raised portion with two rounded prominences; pronotum bearing two lateral lobes on either side, hind-angles obtuse. Elytra longer than wide (0.95/0.70 mm), with four raised intervals sharply carinate; carina II shorter than III; the rows of punctures slightly irregular with additional punctures; nearly three rows between carinae II and III; 4th row along carina II composed of 24-25 punctures slightly larger than those on pronotum. Protibia widened apically, denticulate on external margin. Length 1.35 mm.


9. Axiocerylon minimum sp. n.

Colour brown. Head with anterior clypeal margin rounded. Eyes large, finely facetted. Antennal segment II longer than III (5: 3), IV and V transverse; club much longer than the three preceding segments together. Pronotum (fig. 23) transverse (0.37/0.51 mm); anterior and posterior raised portions separated by a very deep, impunctate, shiny groove; anterior portion distinctly raised along fore-margin and with four strongly raised prominences posteriorly; posterior raised portion with two rounded prominences; pronotum bearing two lateral lobes on either side and hind-angles weakly emarginated. Elytra longer than wide (0.68/0.55 mm), with four raised intervals sharply carinate; carina II as long as III; 4th row along carina II composed of 20 punctures; strial punctures twice as long as those on pronotum. Protibia widened apically, denticulate on external margin. Length 1.05 mm.

10. Axiocerylon burckhardtii sp. n.

Colour brown to nearly black. Head with anterior clypeal margin rounded medially. Eyes large, finely facetted. Antennal segment II longer than III (7: 5), IV and V transverse; club distinctly longer than the three preceding segments together. Pronotum transverse (0.40/0.59 mm); anterior and posterior raised portions separated by a wide and moderately deep, punctate groove; anterior portion with only four rounded, strongly raised prominences; posterior portion with two rounded, strongly raised prominences; pronotum bearing two lateral lobes on either side; hind-angles emarginate. Elytra longer than wide (0.85/0.65 mm), with four sharply carinate raised intervals; these carinae more raised that those of A. triste, minimum and solomonense; carina II shorter than III; two rows of large punctures between the carinae; 4th row along carina II composed of 20-21 punctures which are distinctly larger than those on pronotum. Metasternum and ventrite I coarsely punctured; femoral lines distinct. Protibia widened apically, denticulate on external margin. Length 1.2-1.4 mm.

Material examined. Holotype: East Malaysia, Sabah: Poring Hot Springs, 550-600 m, 9-10.V.1987, D. Burckhardt and I. Löbl (MHNG). Paratypes: same data as holotype (4, MHNG; 1, IZPAN); Sabah: Poring Hot Springs, 500 m, 7.V.1987 (1, MHNG); Poring Hot Springs, Langanan Falls, 900-950 m, 12.V.1987 (1, MHNG); Croker Range between Kota Kinabalu and Tambunan, 1200 m, 19.V.1987 (1, MHNG); leg. D. Burckhardt and I. Löbl. Sifted leaf litter in Dipterocarpaceae forests.

11. Axiocerylon solomonense sp. n.

Colour brown, weakly shiny. Head with anterior clypeal margin rounded medially, scarcely sinuate laterally. Eyes large, finely facetted. Antennal segment II slightly longer than III (4: 3) IV and V transverse; club much longer than the three preceding segments together. Pronotum (fig. 24) transverse (26: 38); anterior and posterior raised portions separated by a wide and moderately deep, punctate groove; anterior portion with only four weakly raised prominences; posterior raised portion with two rounded prominences; pronotum bearing two lateral lobes on either side and hind-angles obtuse. Elytra longer than wide (53: 40) with four raised intervals sharply carinate; carina II as long as III; 4th row along carina II composed of 20 punctures; strial punctures twice as long as those on pronotum, intervals between punctures about as long as diameter of punctures. Protibia widened apically, denticulate on external margin. Length 1.3 mm.


12. Axiocerylon peckorum sp. n.

Colour brown. Head as in baloghi, eyes larger and finer faceted. Pronotum (fig. 25) transverse (26: 38); anterior raised portion with two weakly prominences posteriorly; posterior raised portion weakly divided medially; surface densely punctated. Elytra longer
than wide (47: 41); four carinae weakly developed and shortly pubescent, setae short, adpressed; strial punctures spaced in a distance of 0.5-0.8 times their diameters. Protibia smooth, not denticulate. Length 1.25 mm.


Figs 8-11.  

II. SPECIES WITH 7-SEGMENTED ANTENNAE

13. Axiocerylon humerale sp. n.

Fig. 20. Colour brown to nearly black. Head with anterior clypeal margin acuminate medially; surface densely and coarsely punctured, dull; punctures subcontiguous, intervals forming a reticulate pattern. Eyes moderately large, oval, composed of four to five rows of facets. Antennal segment II twice as long as wide, III slightly longer than wide;
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Figs 12-16.


club longer than the four preceding segments together. Pronotum transverse (36: 57); anterior and posterior raised portions separated by a wide and very deep groove ending in a large and very deep hole on either side; this transverse groove shiny, sparsely punctured; anterior portion with only four rounded equidistant prominences; posterior raised portion with two transverse prominences; pronotum bearing three lateral lobes on either side, hind-angles obtuse. Elytra longer than wide (67: 60); humeral angle with strongly prominent lobe; each elytron with sharp carina on 3rd, 5th, 7th and 9th interval; carina I completely developed from base to apex of elytron, carina II shorter than III, both evanescent apically, IV forming lateral largin of elytron; strial punctures large, twice as large as those on pronotum, spaced from each other in a distance of 0.4-0.5 times their diameter; 4th row along carina II with 22-23 punctures. Protibia strongly widened apically, smooth, not denticulate. Ventral side coarsely punctured, ventrite I deeply impressed anteromedially; femoral lines scarcely visible. Length 1.85 mm.

14. *Axiocerylon variabile* sp. n.

This species is similar to *humerale* and differs as follows. Transverse groove of pronotum impunctate or with only a few punctures. Anterior raised portion of pronotum usually with two widely separated rounded prominences; these have often on their inner side a more or less developed adpressed hump, giving four rounded or two transverse prominences. Humeral angle of elytra without strongly prominent lobe; but two specimens have a distinct, prominent lobe on each side! Ends of elytral carinae I slightly convergent in *humerale*, distinctly divergent in *variabile*; 4th row along carina II with 16-18 punctures. Length 1.7-1.9 mm.

Material examined. Holotype: East Malaysia, Sabah: Crocker Range between Kota Kinabalu and Tambunan, 1270 m, 17.V.1987, D. Burckhardt and I. Löbl (MHNG). Paratypes: same data as holotype (16, MHNG; 2, IZPAN; 1, BM); Sabah: Crocker Range, 1200 m, 19.V.1987 (10, MHNG); Poring Hot Springs, Langanan Falls, 850-950 m, 12 and 14.V.1987 (7, MHNG); Poring Hot Springs, 500-600 m, 7, 9, 10 and 11.V.1987 (4, MHNG); leg. D. Burckhardt and I. Löbl. Sifted leaf litter.

15. *Axiocerylon roberti* sp. n.

Fig. 29. Colour brown. Head with anterior clypeal margin acuminate medially; surface densely punctured. Eyes large, finely facetted. Antennal segment II nearly twice as long as wide, III small, as long as wide; club longer than the four preceding segments together. Pronotum transverse (27: 40); anterior and posterior raised portions separated by a narrow and deep punctate groove; anterior portion widely and shallowly divided medially; posterior portion with two transverse prominences; pronotum bearing three lateral lobes on either side and hind-angles obtuse. Elytra longer than wide (53: 43) with four sharp carinae; carina II shorter than III, both evanescent apically; strial punctures 1.5 times larger than those on pronotum, spaced in a distance of 0.5-0.7 times their diameter; 4th row along carina II with 21-22 punctures. Protibia strongly widened apically with smooth external margin. Base of ventrite I with shallow groove medially. Length 1.1 mm.


16. *Axiocerylon hammondi* sp. n.

Colour brown. Head with anterior clypeal margin slightly acuminate medially; surface coarsely punctured, punctures subcontiguous, spaces intervals forming a dull and reticulate pattern. Eyes large, finely facetted. Antennal segment II nearly three times as long as III (7: 2,5), club longer than the four preceding segments together. Pronotum (fig. 26) transverse (0.40/0.55 mm); anterior and posterior raised portions separated by a narrow and deep groove which is densely punctured; anterior portion with a shallow transverse depression which is delimited by a slightly and not divided transverse prominence in front and by four distinct rounded prominences posteriorly; posterior raised portion with four protuberances; pronotum bearing three lateral lobes on either side and hind-angles obtuse. Elytra longer than wide (0.70/0.60 mm); humeral angle with strongly
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Figs 17-22.

prominent lobe; each elytron with four sharply carinate costae; carina II shorter than III; strial punctures large, 2.5 times larger than those on pronotum, spaced in a distance of 0.8 times their diameter; 4th row along carina II with 14-15 punctures. Protibia widened apically, external margin denticulate. Length 1.1 mm.

Material examined. Holotype: East Malaysia, Sarawak: 4th Division, Gunung Mulu N. P., nr. Base Camp, 50-100 m, V-VIII.1978, P. M. Hammond and J. E. Marshall (BMNH); under bark of cut logs.


Figs 23-28.
17. *Axiocerylon* brincki Slipinski


Fig. 21. Head convex with anterior clypeal margin acuminate medially; surface densely punctured, punctures subcontiguous, forming a reticulate pattern. Eyes small, coarsely faceted, slightly prominent; antennal club 1-segmented. Pronotum (fig. 21) transverse, 0.53 times as long as wide; anterior raised portion not divided, evenly convex; pronotum bearing two lateral lobes on either side. Elytra as long as wide, widest at anterior third; each elytron with 9 rows of punctures and four costae; costa I on 3rd interval complete, costa II on 5th interval extending from base to close to apex, costa III on 7th interval similar to costa II, costa IV on 9th interval forming lateral margin of elytron; strial punctures much larger than those on pronotum, standing 0.2 times their diameter apart. Prosternal process on ventral side flat, rounded apically; metasternum and ventrites coarsely punctured, femoral lines scarcely visible. Protibia denticulate on external margin. Length 1.4 mm.


18. *Axiocerylon* ghanense sp. n.

Fig. 22. This species is similar to *A. setulosum* (cf. p. 924) from which it differs in the 7-segmented antenna (9-segmented in *setulosum*) with segment III slightly more than twice as long as wide; in the transverse pronotum (0.60/0.83 mm) which is widest at base, and bears weak prominences on its raised portions (2 on anterior and 4 on posterior portion) (fig. 22) compared to evenly convex raised portions in *setulosum* (fig. 6); in the elytra (1.20/0.95 mm) which have four rows of punctures between the two external carinae (three in *setulosum*). Length 1.75 mm.


III. SPECIES WITH 8-SEGMENTED ANTENNAE

19. *Axiocerylon* venustum sp. n.

Fig. 30. This species, also similar to *A. setulosum* (cf. p. 924), is very closely related to *A. ghanense*, and differs from the latter in the 8-segmented antenna with subegual segments III and IV, distinctly longer than wide. Aedeagus as in fig. 15. Length 1.55-1.8 mm.

20. **Axiocerylon vinsoni** Dajoz

*Axiocerylon vinsoni* DAJOZ, 1975: 1061, fig. 5. Holotype: "Ile Maurice, Mont Cocote", 8 VII.1956 (J. Vinson) (Muséum, Paris). DAJOZ 1980: 191, fig. 67 A.

**Remarks.** We were unable to find a specimen labeled as holotype of *A. vinsoni* in the collections of the Museum of Paris. However, in the Grouvelle collection is a specimen from the locality indicated by Dajoz (1975), fitting the description, which is likely to be the holotype.

Body wide, oval, black and shiny. Pubescence simple, very short, recumbent, not squamiform. Head with anterior clypeal margin rounded medially; surface with rather small punctures. Eyes reduced, composed of two rows of coarse facets. Relative length of antennal segments II-V as 4: 3: 1.5: 1. Pronotum transverse (28: 43), widest at basal third; anterior and posterior raised portions separated by a wide and deep, shiny impunctate groove; these raised portions weakly punctated, shiny, each with very shallow median groove. Elytra wider than long (42: 46), widest at basal third; each elytron with two costae (5th and 7th interval); 3rd interval convex at base, distinctly carinate posteriorly; strial punctures spaced in a distance of 0.2 times their diameter. Ventral side of body punctured; prosternal process narrow, rounded apically; mesosternum scarcely concave; metasternum flat, without groove; femoral lines distinct. Length 1.9-2.1 mm.

Material examined. Mascarene Islands, Mauritius: Mont Cocote, 8 XI.1956, J. Vinson (1, MNHN, holotype?); Mont Cocote, 600 m, 29.1.1971, Y. Gomy; sifting (2, MHNG; 1, IZPAN); Macabe forest, 600 m, 21.1.1971, Y. Gomy; sifting (3, MHNG); Mont Le Pouce, 700 m, 20 XI.1974, P. Schauenberg (2, MHNG).

21. **Axiocerylon gomyi** sp. n.

Similar to *vinsoni* but body more elongate oval, vertical punctures larger, eyes larger, composed of 4-5 rows of small facets. Relative length of antennal segments II-IV as 4: 3: 1.5. Pronotum (fig. 35) transverse (27: 40); posterior raised portion widely and shallowly divided medially. Elytra longer than wide (71: 63), widest at basal fourth; each elytron with three costae on 3rd, 5th and 7th interval; costa I complete, II joining costa I near apex, III complete, forming lateral margin of elytron; strial punctures dense, spaced in a distance of 0.2-0.3 times their diameter. Ventral side as in *vinsoni* but mesosternum deeply concave, metasternum impressed medially and femoral lines scarcely visible. Length 1.2-2.0 mm.

Material examined. Holotype: Mascarene Islands, La Réunion: Hauts Sainte Rose, 25 X.1970, Y. Gomy; sifting (MHNG). Paratypes: all from La Réunion and leg. Y. Gomy; same data as holotype (10, MHNG; 3, IZPAN); Philippe, forêt de Mare Longue (7, MHNG; 1, IZPAN); rivière Mare Longue, 450 m, 15 II.1971 (4, MHNG); Takamaka, 26 I.1972 (3, MHNG).

22. **Axiocerylon sculpticolle** (Grouvelle), comb. n.

*Thyroderus sculpticolle* GROUVELLE, 1918: 44, 47, Pl. II, fig. 12. Holotype: Seychelles Islands, Silhouette (BMNH, examined).

Remark. This species is known from the holotype only. Due to the poor condition of the specimen (see the note of Hugh Scott in GROUVELLE’S paper on p. 45) it is not
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Figs 29-32.

possible to give a full description of the species, which is apparently wingless. According the original description, a second specimen is known from Mahé: Morne Blanc; it seems to be lost.

Similar to *A. vinsoni* and *gomyi* in the 8-segmented antennae and the pronotum (fig. 27). The species differs from *vinsoni* and *gomyi* in the antennal segment III which is as long as IV and about half as long as II. Elytra as in *gomyi*. Length 0.8 mm. This is the smallest *Axiocerylon* sp. known so far.

Material examined. Seychelles Islands, Silhouette; in the forests of Mont Pot-à-eau, at high elevation, 1908 (Percy Sladen Trust Expedition) (BMNH, holotype).

IV. SPECIES WITH 9-SEGMENTED ANTENNAE

23. *Axiocerylon setulosum* Heinze

*Axiocerylon setulosum* Heinze, 1944: 18, fig. 2. Holotype: Cameroon, Soppo, 800 m (ZMB, examined). DAIJOZ 1975: 1062, fig. 9.

Body elongate oval, rather flattened. Colour brown to nearly black. Pronotum and elytra with long, yellow, erect, squamiform setae and short, fine, recumbent setae (figs 3, 5, 7). Head with anterior elyopeal margin acminate medially and emarginate at apex (fig. 4); surface densely punctured, punctures slightly smaller than facets of eyes, each with a fine seta. Eyes large, composed of 4-5 rows of small facets. Relative length of antennal segments II-V as 5: 2: 1.5: 1.5, III slightly longer than wide. Pronotum (fig. 6) transverse (27: 34), widest at basal fourth; anterior and posterior raised portions punctured, evenly convex, separated by a wide and deep, shiny impunctate groove. Elytra longer than wide (47: 38) with two weakly raised costae on 6th and 9th interval (fig. 5); costa I ending close to apex, I forming lateral margin of elytron; 2nd and 4th interval weakly convex in basal half; three rows of punctures between the two external carinae; strial punctures subequal, separated by one diameter. Ventral side of body punctured, pronotal process narrow, rounded apically; mesosternum scarcely concave; metasternum flat but with fine median groove; femoral lines distinct. Length 1.75-2.1 mm.

Material examined. More than 100 specimens (MHNG, MRAC, IZPAN, TMB, ZMB) from Sierra Leone, Ivory Coast, Ghana, Togo, Cameroon, Congo Brazzaville and Zaire.

24. *Axiocerylon decemcostatum* sp. n.

Fig. 31. Body elongate oval, convex, nearly black. Pronotum and elytra with long, yellow, erect squamiform setae and short, recumbent squamiform setae. Head with anterior elyopeal margin acminate medially; surface convex, coarsely and densely punctate; punctures spaced in a distance of 0.2 times their diameter, intervals forming reticulate pattern. Eyes large, composed of 5 rows of small facets, smaller than vertical punctures. Relative length of antennal segments II-V as 6: 3: 3: 2.5. Pronotum (fig. 31) transverse (39: 67) with strongly prominent sculpture, widest at basal fourth; anterior raised portion subdivided transversally by a distinct transverse groove connected on each side to the very large and deep, shiny impunctate groove which is separating anterior and
posterior raised portions; posterior raised portion faintly transversally carinate, without protuberances; tubercle near hind-angles as long as wide; base of pronotum forming a well delimited, depressed ribbon with a row of large punctures parallel to basal margin. Elytra slightly longer than wide (77: 74); each elytron with 5, not sharply carinate costae; costa I and costa II on basal half of 2nd and 4th interval; costa III on 6th interval, carinate apically; costa IV on 8th interval, beginning behind the base and slightly shorter than costa III; costa V on 10th interval, forming lateral margin of elytron; strial punctures subequal, separated by one diameter. Metasternum flat but with fine median groove; femoral lines distinct. Length 3.0-3.1 mm.

Material examined. Holotype: Sierra Leone: Guma Mountain, 500 m, 18.1.1979, J. Klapperich (MHNG). Paratypes: same data as holotype (1, MHNG; 1, IZPAN). Ivory Coast, Agboville: Forêt de Yapo, near Yapo-Gare, 21-22.III.1977, 1. Löbl (1, MHNG).

25. Axiocerylon loebli sp. n.

This species is similar to decemcostatum and differs as follows. Body wider; vertical punctures smaller, as large as facets of eyes, each with a short squamiform seta; antennal segment III slightly longer than IV. Pronotum (fig. 36) strongly transverse (37: 63), with the same sculpture as decemcostatum; tubercle near hind-angles longer than wide; base of pronotum with a row of small punctures parallel to basal margin. Elytra longer than wide (71: 68); each elytron with 3 sharp costae; costa I on 6th interval, complete, ending close to apex; costa II beginning behind the base, less raised than costa I; costa III on 10th interval, complete, forming lateral margin of elytron; 2nd and 4th intervals more or less convex basally, never carinate; strial punctures spaced in a distance of 1-2 times their diameter. Length 2.6-3.0 mm.


26. Axiocerylon cavicolle Grouvelle


Body wide, oval, convex, nearly black. Pubescence scarcely distinct, with very short, fine, recumbent setae. Head with anterior clypeal margin rounded; surface densely and coarsely punctured, punctures subcontiguous, intervals forming reticulated pattern. Eyes strongly reduced, composed of 5-7 coarse facets. Antenna (fig. 13) thin, with 2-segmented club, segments only visible in microscopic preparation; relative length of segments II-V as 4: 2: 2: 1.5. Pronotum transverse (28: 43) with sculpture similar to decemcostatum but raised portions transversally carinate, tubercle near hind-angles more slender, longer than wide and base without well delimited, depressed area; anterior transverse groove of pronotum distinctly punctured; base with a fine row of punctures. Elytra as long as wide (51:
Figs 33-38.
Axiocerylon, pronotum, dorsal view — 33: A. bournei sp. n.; 34: A. baloghi sp. n.; 35: A. gomyi sp. n.; 36: A. loebli sp. n.; 37: A. monstruosum (Grouv.);
50), each elytron with 3 sharp costae; costa I on 3rd interval, complete, wider, rounded and prominent at apex of elytra; costa II on 6th interval, ending before apical margin; costa III on 8th interval forming lateral margin of elytra; three complete rows of punctures between the two interior costae; strial punctures separated by 2-3 diameters. Ventral side as in fig. 8; metasternum flat, without median groove; ventrite I flat; femoral lines distinct. Length 2.0-2.2 mm.

Material examined. Seychelles Islands: Silhouette, 1908 (Percy Sladen Trust Expedition) (1, BMNH; 2, MNHN). Mahé, at high elevation in the forests, 1908 (idem) (1, BMNH); Mahé, Congo Rouge, 10.II.1971, J. Beneteau (2, MHNG; 1, IZPAN) and Cassedents, 300 m, 10.II.1971, J. Beneteau (1, MHNG); under barks, in rotten trunk.

27. Axiocerylon kaszabi Heinze


Fig. 32. This species is similar to *cavicolle* and differs as follow. Body more elongate oval. Eyes large, composed of 4-5 rows of small facets. Antenna thick, with 1-segmented club; relative length of segments II-V as 4: 2.5: 2.5: 2. Pronotum transverse (30: 42); anterior transverse groove not punctured; anterior raised portion not transversally carinate but rounded; posterior raised portion with four rounded prominences; tubercle near hind-angles wider. Elytra with two complete rows of punctures between the two interior costae, sometimes one, two or three intermediate punctures at base. Metasternum with a deep, rounded depression posteriorly; base of ventrite I with a deep, transverse depression; femoral lines scarcely visible. Length 2.0-2.2 mm.

Material examined. Kenya: Lac Djipe, 1904, Kittenberg (holotype, TMB); Shimba Hills, Makadara Forest, 400 m, 30.XI.1974, V. Mahnert and J.-L. Perret (1, MHNG); Lamu Distr., forest near Witu, 26.X.1977, same collectors (6, MHNG; 2, IZPAN). Tanzania: Arusha-Chini, 1904, Kittenberg (1 paratype, TMB); Uluguru Mts., Bunduki, 1300 m, P. Basilewsky and N. Leleup, humus in rain forest (1, BMNH); Tanga Prov., Mingano, Geigelz Estate, R. C. H. Sweeney; at light (3, BMNH); Moba, 780 m, XI.1957, H. Bomans; at light (1, MRAC).

DAJOZ (1984: 26) recorded the species from Malawi (Mulanje, Lichenya, 1800 m).

28. Axiocerylon grouvellei Dajoz

*Axiocerylon grouvellei* Dajoz, 1975: 1059, figs 1, 2. Holotype: Sierra Leone: Rhobomp (MNHN, examined).

The species is similar to *kaszabi* from which it differs in the more reduced eyes, in the narrower and deeper anterior transverse groove of the pronotum, in the posterior raised portion with three rounded prominences and in the larger punctures on the base of pronotum. Length 2.15 mm.

Material examined. Sierra Leone: Rhobomp, Coll. Grouvelle (holotype, MNHN).
V. SPECIES WITH 10-SEGMENTED ANTENNAE

29. Axiocerylon monstruosum (Grouvelle)


Fig. 1. Body elongate oval, convex, nearly black. Pubescence composed of short, yellow, recumbent, squamiform setae. Head with anterior clypeal margin rounded; surface densely and coarsely punctured, punctures subcontiguous, intervals forming reticulated pattern. Eyes large, with small facets. Antenna thick; relative length of segments II-VI as 6: 4: 3.5: 3: 3. Pronotum (fig. 37) transverse (40: 75) with strongly prominent sculpture; anterior transverse groove narrower than second one; raised portion between these two impunctate grooves with two transverse rounded prominences; posterior raised portion with four rounded prominences; only one elongate, rounded tubercle near each hind-angle; the flat area on the base of pronotum particularly long, with 2-3 irregular rows of punctures. Elytra longer than wide (87: 73); each elytron with 3 sharp costae; costa I on 3rd interval, complete but slightly carinate near the apex, costa II on 6th interval, ending before apical margin; costa III forming lateral margin of elytron; 3 rows of punctures between suture and costa I and between costa II and III respectively; strial punctures separated by 2 diameters. Ventral side of body punctured; prosternal process comparatively short, straight at apical margin; metasternum with median groove; ventrite I concave antero-medially; femoral lines distinct. Protibia strongly widened apically. Length 3.4-3.6 mm. This is the largest Axiocerylon sp. known so far.


DAJOZ (1975: 1063) recorded the species from Guinea (N’Zérékoré).

30. Axiocerylon cambeforti Dajoz


This species is similar to monstruosum from which it differs as follows. Body wider. Head with anterior clypeal margin acuminate medially and with fine, longitudinal, median carina between antennae and eyes. Pronotum (figs 28, 38) transverse (37: 67); anterior transverse groove wider than second one; raised portion between these impunctate grooves entirely carinate, lacking prominences; two coupled elongate tubercles near each hind-angle; flat area on the base of pronotum narrower, smooth. Elytra (71: 75) wider than long; costae II and III in profil more or less distinctly sinuate. Prosternal process acuminate apically; femoral lines indistinct. Protibia not widened apically. Aedeagus as fig. 16. Length 2.8-3.0 mm.

31. Axioxylon nigeriense Dajoz


This species is similar to *cambeforti* and is distinguished by the two rows of strial punctures between sutura and costa I (three rows in *monstruosum* and *cambeforti*). Length 2.7-2.8 mm.


DAJOZ (1984: 26) recorded the species from the République centrafricaine (Bozo, lac du Sorier).

REFERENCES


