

***Awes giraffa* gen.n., sp.n. (Coleoptera, Pselaphidae) from Malaysia and the classification of Goniacerinae**

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***Awes giraffa* gen.n., sp.n. (Coleoptera, Pselaphidae) from Malaysia and the classification of Goniacerinae.** - *Awes giraffa* gen.n., sp.n. is described from West Malaysia. Characters currently used to define the major groups of pselaphids are found to be inconsistent. Both the informal division Macroscelia and the subfamily Goniacerinae may be paraphyletic. Additional characters and better knowledge of the variation of the characters currently used are prerequisites before a more thorough phylogenetic analysis of the constituent groups of the Goniacerinae may be pursued. The presence of a longitudinal groove at the centre of the 3rd abdominal tergite in some taxa may be phylogenetically significant. *Awes* appears to be closely related to *Harmophorus* Motschulsky which is a subjective senior synonym of *Arnyllium* Reitter (syn.n.). *Awes* + *Harmophorus* may be the sister group of the Goniacerini.

Key-words: Coleoptera - Pselaphidae - taxonomy - Malaysia.

INTRODUCTION

The Pselaphidae are one of the more diverse groups of staphylinoid beetles with the number of described species exceeding 8500 (NEWTON & CHANDLER, 1989; subsequent descriptions). They are common in decaying plant debris, especially in tropical forests. Examination of material collected by the coleopterologists of the Genevan Natural History Museum in the last decades in various Southeast Asian countries reveals large number of undescribed taxa. However, it is unusual to discover forms which are radically different from known members of the family. On a recent trip to West Malaysia a single specimen of such a species was collected. Its most striking feature is the unusually long head, which appears highly mobile in vertical plane. Another unusual conspicuous feature is the small abdomen in contrast to the large elytra. The specimen is described below, as a new species and new genus. A cursory phylogenetic analysis is performed in order to appropriately place this species in the higher level classification of Pselaphidae.

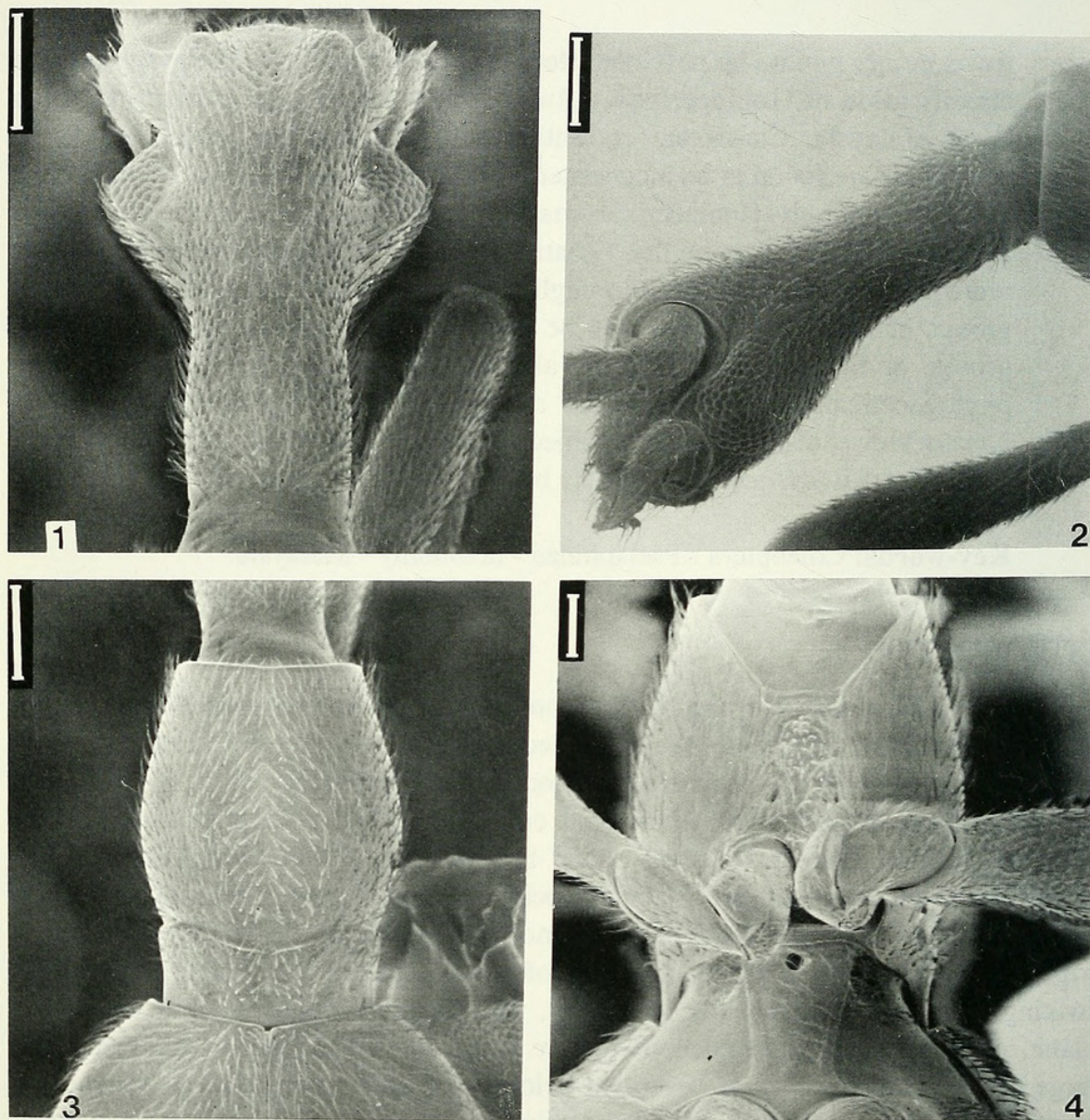
Awas gen.n.

Type species: Awas giraffa sp.n., gender masculine.

Etylology: from Malaysian "awas" meaning watch out, be careful.

Description

Body large, strongly vaulted. Pubescens simple, aciculate, flattened setae absent. Head strongly elongate, cylindrical posteriorly, thickened anteriorly (Fig. 1, 2). Frons oblique in lateral view, rounded in frontal view, not lobed. Tentorial (gular and vertexal) foveae absent, dorsal and ventral surface without any additional foveae



FIGS 1-4

Awas giraffa gen.n., sp.n.; 1 and 2. head in dorsal and lateral view; 3 and 4. prothorax in dorsal and ventral view. Scale bar = 200 μ m (1-3) and 100 μ m (4).

or grooves. Occiput weakly constricted and glabrous. Antennal fossae large, widely separated, open anteriorly, margined by supraocular ridge. Eye reniform, situated lateroventrally, level with antennal fossa, consisting of large facets. Maxillary palpi small, segment 2 curved, thickened gradually to apex, with few erect setae, segment 3 short, wider than long, about as long as $1/2$ of 2, strongly widened to apex, apex truncate; segment 4 subovate, about as long as 2, about 1.3 x as long as wide. Prementum and postmentum each with a pair of long setae. Postmentum transversely striate. Gular sutures, striae or ridges absent (Fig. 5). Postgenae not set off from gular region nor from vertex. Antennal insertions widely separated. Antenna long, with all segments densely punctate and pubescent. Scape moderately large, curved, evenly thick, truncate at apex. Following segments elongate, apical segments not enlarged, club absent.

Prothorax elongate, conspicuously narrow, deeply emarginate toward prosternum, with ventro-lateral margins oblique (Fig. 3, 4). Pronotum widened medially; with antebasal transverse groove; discal and lateral longitudinal grooves and ridges, and antebasal foveae absent (Fig. 3, 7). Dorsum convex, rounded evenly, not margined laterally; lateral contours arcuate in dorsal view, anterior and basal margins truncate. Hypomeron smooth, narrow. Prosternum (Fig. 4) flat, longer than wide, narrowed anteriorly, sutures distinct only near apical angles, anterior margin truncate; with two subbasal foveae; intercoxal process short, flat.

Mesosternum fused laterally with metasternum. Mesosternal shield narrow, long, narrowed toward mesocoxae, with median fovea close to anterior margin and with distinct lateral ridge. Mesosternal lateral foveae pubescent, situated in large oval depression; intercoxal process short, flat, triangular.

Metasternum strongly vaulted, strongly depressed toward posterior margin; anterior margin raised; mesocoxal fovea pubescent, situated in large depression near lateral margin. Intercoxal processes short, apical process rounded (Fig. 6).

Elytron conspicuously large compared with thorax and abdomen, strongly convex, with rounded humeral area, widened gradually to apex, much wider than prothorax and abdomen; lacking any striae, foveae, grooves or ridges.

Abdomen small, strongly vaulted, segments 4 to 6 with wide apical rim microsculptured. Tergites without marginal carina; tergites 4 to 8 visible in dorsal view. Tergite 3 concealed but strongly sclerotised, with wide longitudinal median groove. Tergite 4 large, entirely fused with sternite 4, with narrow, deep basal constriction and two latero-basal patches of setae; striae, foveae and discal depressions absent. Tergites 5 and 6 narrow, with distinct pleural sutures. Tergite 7 with lateral ridge. Sternite 3 comparatively very large, depressed, with a pair of foveae and latero-basal portion separated by a transverse stria. Sternite 4 large, narrowed medially, constricted at base, especially laterally; intercoxal process elongate, moderately raised. Sternites 5 to 8 short, apical margin of 8 truncate. In male, 6 sternites visible.

Legs long. Procoxae contiguous, gradually widened to apex, with semicircular apical margin, outer surface flat. Mesocoxae and metacoxae subcontiguous, metacoxae bearing a ventral process over the trochanter base. All trochanters with strongly

oblique apex, mesotrochanters longer than metatrochanters. Femora and tibiae slender, femora without particular characters. Base of mesofemur distant from mesocoxa, like in *Macroscelia*. Tibiae gradually and weakly thickened to apex, with apical brush and deep apico-dorsal groove to receive tarsi. Tarsi long, segment 1 very small, slightly longer than wide; segments 2 and 3 strongly flattened laterally, 2 larger than 3. Claws unequal, protarsi with inner claw longer and thicker than outer claw, meso and metatarsus with inner claw shorter and thinner than outer claw.

Aedeagus symmetrical, internal muscles present, with median lobe weakly sclerotised, parameres strongly sclerotised, lacking setae.

Comments. *Awas* is defined with following autapomorphies: antennal club absent, prosternum elongate, venter of prothorax deeply emarginate, abdominal sternite 3 long. However, the most conspicuous feature of this genus is the long postocular region of the head, in combination with the large size of the body and the basally constricted, small abdomen.

***Awas giraffa* sp.n.**

Description

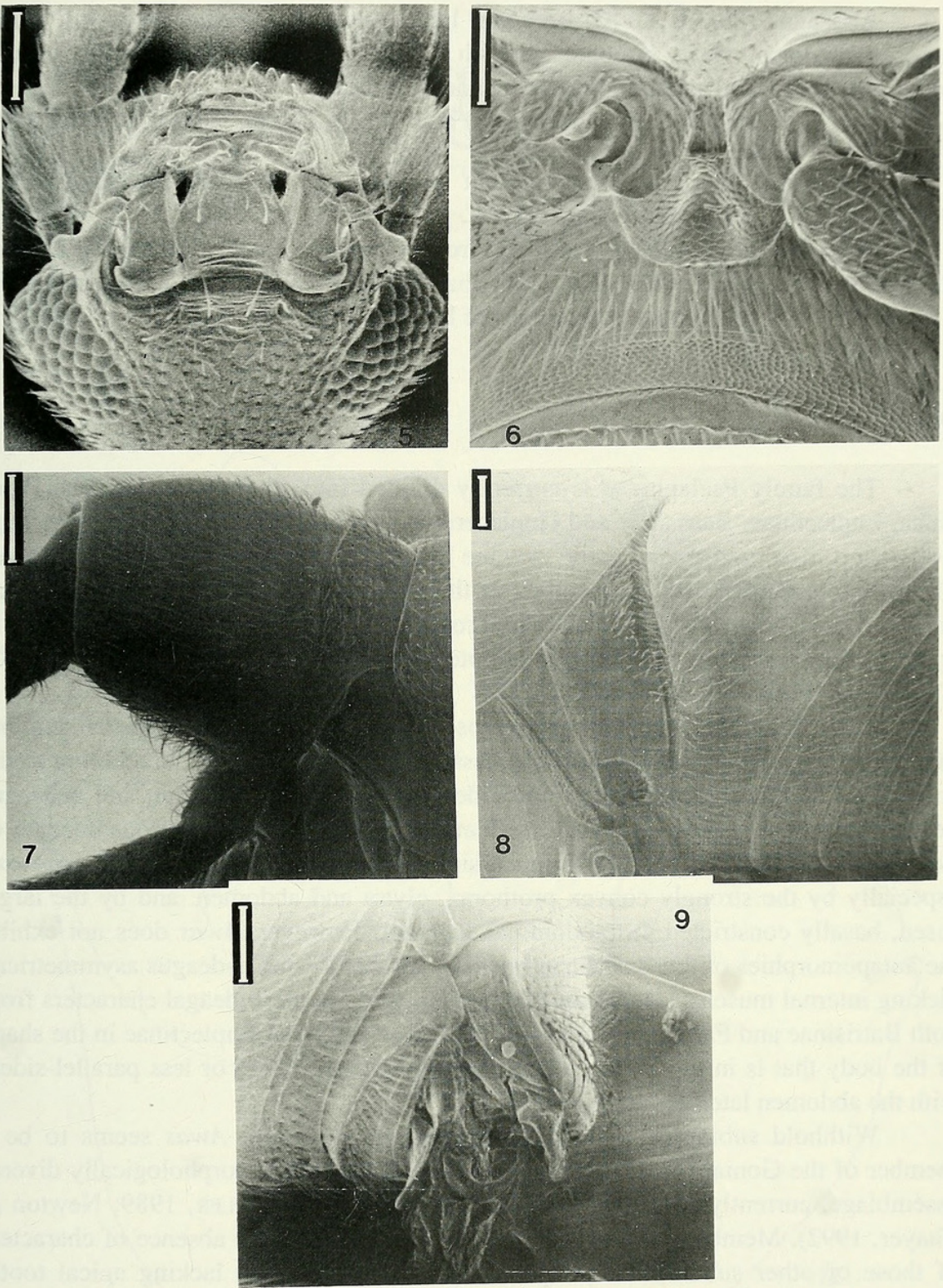
Length 3.5 mm. Body dark reddish-brown, elytral suture darkened. Dorsal surface with more or less decumbent pubescence.

Head 1.07 mm long, across eyes 0.48 mm wide, uniformly densely punctured, with pubescence oriented anteriorly. Central portion of frons depressed medially, anterior frontal edge angulate. Supra-ocular ridge situated centrally. Dorsal convexity higher than ventral. Eyes prominent. Antennomeres 2 and 3 cylindrical, of same size; antennomeres 4 to 10 subcylindrical, each about 1.5 x longer than 3; 4 to 6 almost of same size, following segments somewhat thicker. Antennomere 11 asymmetrically narrowed at apex.

Pronotum 0.68 mm long, 0.52 mm wide, widest at middle. Antebasal groove deep, ending lateroventrally near procoxa, in a shallow fovea. Punctuation very fine, more distinct between antebasal groove and basal margin. Pubescence directed anteriorly, longer and finer than that on the head. Prosternum margined by long, erect setae, prosternal pubescence long, irregular. Mesosternum impunctate. Metasternum very finely punctured, with long, obliquely erect pubescence, absent from inclined apical portion, pubescence at middle directed posteriorly.

Elytra at suture 1.14 mm long, together 0.98 mm wide, widest point near middle, strongly narrowed toward base, weakly narrowed toward apex. Lateral margin arcuate. Humeral region regularly rounded, humeral hump absent. Punctuation very fine, pubescence long, directed apically, similar to that on anterior portion of metasternum.

First visible tergite (4th tergite) 0.68 mm long, 0.80 mm wide, with rounded contours, punctuation and pubescence as that on elytra.



FIGS 5-9

Awes giraffa gen.n., sp.n.; 5. apical portion of head, ventral view; 6. metacoxal processes; 7. prothorax, lateral view; 8. third and fourth sternite, lateral view; 9. apex of abdomen with partly extruded aedeagus, lateral view. Scale bar = 100 μ m (5, 6, 8, 9) and 200 μ m (7).

Aedeagus (Fig. 9, 11-12) 0.54 mm long. Apex of parameres rounded, partly exposed in dorsal view. Internal sac with a pair of hook-shaped sclerites curved dorso-proximally and a tuft of straight median sclerites.

Material. Holotype ♂: West Malaysia, Fraser's Hills, 1300m, Tiong trail, 20.III. 1993, leg. I. Löbl (MHNG).

Comment. *Awes giraffa* does not possess any of the secondary sexual characters which pselaphids usually exhibit.

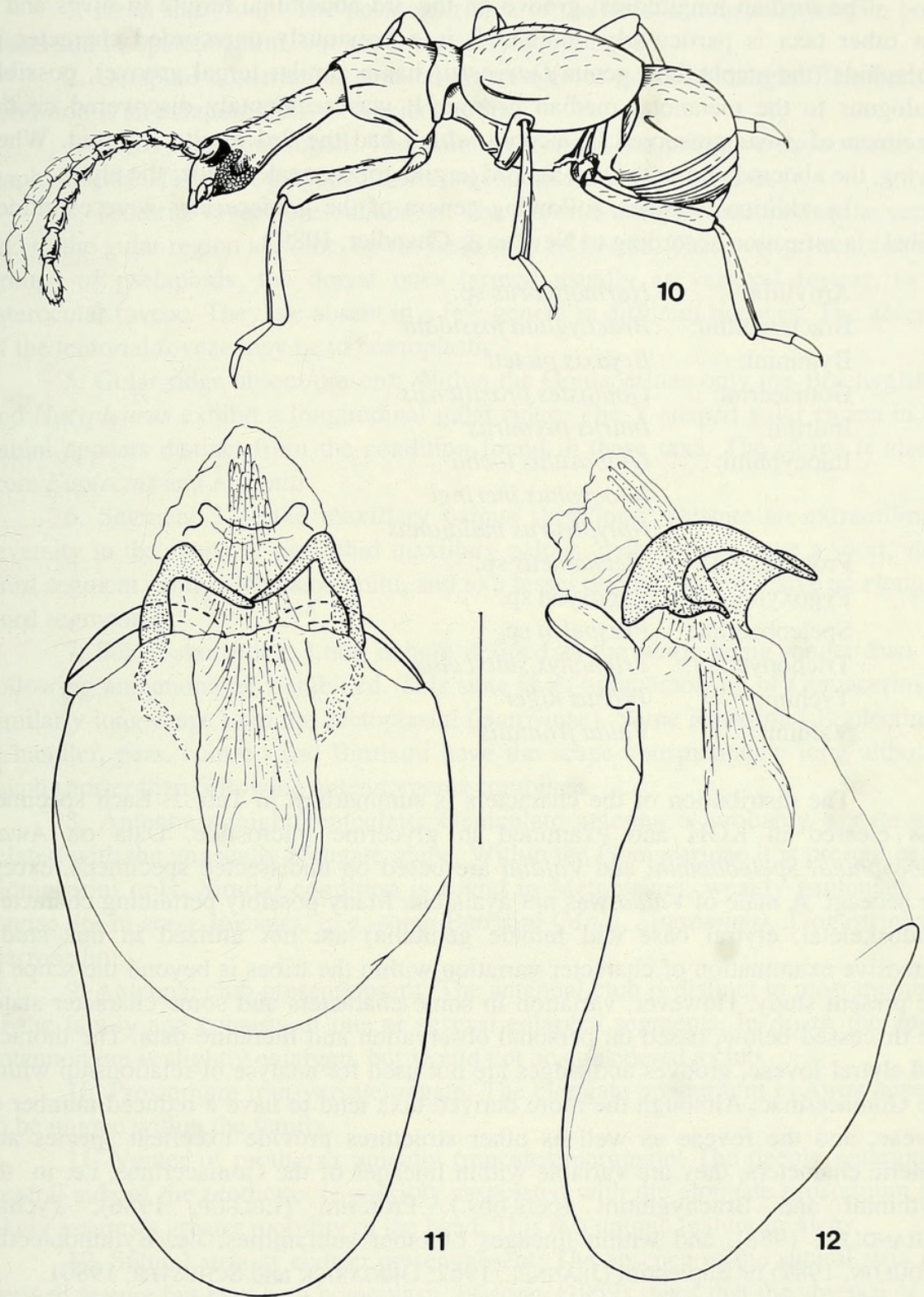
Biology. The specimen was taken from a sample of approximately 2 m² of sifted moist leaves and other plant debris that had accumulated along a forest trail on a steep slope just below one of the ridges of Fraser's Hills.

DISCUSSION

The family Pselaphidae is currently divided into six subfamilies. The Faroninae, Euplectinae, Batrisinae and Goniacerinae are characterized as possessing relatively short mesotrochanters, while they are long in the Pselaphinae and Clavigerinae. The first four subfamilies are grouped in the division Brachyscelia, the Pselaphinae and Clavigerinae form the division Macroscelia. This classification is difficult to apply to some taxa and has not been adopted by all authors (e.g. PARK, 1942; 1952; CHANDLER, 1990).

Awes resembles members of Macroscelia due to its long mesotrochanters, but may be distinguished from them in possessing adjacent metacoxae, in addition to the constricted abdominal base, large undivided 4th abdominal segment, and aedeagus bearing apical parameres. The last three features are convergent in various lineages of Brachyscelia. Many Batrisinae exhibit a similar shape of the body as that in *Awes*, especially by the strongly convex prothorax, elytra and abdomen, and by the large, fused, basally constricted 4th abdominal segment. However, *Awes* does not exhibit the autapomorphies of the Batrisinae (apically toothed scape; aedeagus asymmetrical, lacking internal muscles). *Awes* may be distinguished in the aedeagal characters from both Batrisinae and Faroninae, and from Faroninae and most Euplectinae in the shape of the body that is in the latter two taxa usually flat and more or less parallel-sided, with the abdomen laterally margined.

Withhold subfamily definitions for the other groups, *Awes* seems to be a member of the Goniacerinae. The Goniacerinae consist of a morphologically diverse assemblage, currently placed in 12 tribes (NEWTON & CHANDLER, 1989; Newton & Thayer, 1992). Members of Goniacerinae have in common the absence of characters of those of other subfamilies (long second tarsomere, scape lacking apical tooth, aedeagus usually symmetrical, with internal muscles and distinct parameres). The characters used by modern authors (i.e. JEANNEL, 1959; PARK, 1953a, 1953b; CHANDLER, 1988, 1990) are tentatively used to examine the relationship of *Awes* within the subfamily and are discussed below, together with some additional characters.



FIGS 10-12

Awes giraffa gen.n., sp.n., habitus (10) and aedeagus (11, 12) in dorsal and lateral view. Scale bar = 100 μ m.

The median longitudinal groove on the 3rd abdominal tergite in *Awas* and a few other taxa is particularly notable. It is a previously unrecorded character in pselaphids (the staphylinid genus *Dasycerus* has a similar tergal groove), possibly analogous to the metanotal median groove. It was accidentally discovered on the specimen of *Awas* preserved in alcohol which had the 3rd tergite exposed. When drying, the abdomen retracted and the 3rd tergite got concealed under the elytra.

In addition to *Awas*, following genera of the goniacerines were examined (tribal classification according to Newton & Chandler, 1989):

Arnylliini	<i>Harmophorus</i> sp.
Brachyglutini:	<i>Brachygluta fossulata</i>
Bythinini:	<i>Bryaxis picteti</i>
Goniacerini:	<i>Goniastes brasiliensis</i>
Imirini:	<i>Imirus permirus</i>
Iniocyphini:	<i>Globosulus loebli</i>
	<i>Iniocyphus jheringi</i>
	<i>Natyleurus malaianus</i>
Proterini:	<i>Mechanicus</i> sp.
Pygoxyini:	<i>Pygoxyon</i> sp.
Speleobamini:	<i>Prespelea</i> sp.
Trichonychini:	<i>Trichonyx sulcicollis</i>
Tychini:	<i>Tychus niger</i>
Valdini:	<i>Valda frontalis</i>

The distribution of the characters is summarised in Tab. 1. Each specimen was cleared in KOH and examined in glycerine microslide. Data on *Awas*, *Iniocyphina*, *Speleobamini* and *Valdini* are based on undissected specimens, except for aedeagi. A male of *Valda* was not available. Many possibly pertaining characters (endoskeletal, elytral base and female genitalia) are not utilized in this study. Extensive examination of character variation within the tribes is beyond the scope of the present study. However, variation in some characters and some character states are discussed below, based on personal observation and literature data. The thoracic and elytral foveae, grooves and ridges are not used for analyse of relationship within the Goniacerinae. Although the more derived taxa tend to have a reduced number of foveae, and the foveae as well as other structures provide excellent species and generic characters, they are variable within lineages of the Goniacerinae, i.e. in the Bythinini and Brachyglutini (pers.obs.), Proterini (LELEUP, 1986), Tychini (CHANDLER, 1988), and within lineages of other subfamilies, i.e. Bythinoplectini (COULON, 1989) or Euplectini (JEANNEL, 1962; GRIGARICK and SCHUSTER, 1980).

The following list portrays characters currently used to define the tribes of the Goniacerinae with a statement of their form in *Awas*, including autapomorphies (the presumably plesiomorphic condition is based on characters in Faronini (*Faronus*) and Euplectini (*Euplectus*):

1. Head short/long: The postocular area of the head is unusually long in both, *Awas* and in *Speleobamini*, but not necessarily homologous.

2. Occipital constriction situated near/far from pronotal margin. The derived condition is an autapomorphy of *Speleobamini*.

3. Frons lobed/not lobed. The unlobed frons is the primitive state within the staphylinoids. However, the lobed frons is generalized in *Pselaphidae*.

4. Tentorial foveae present/absent: The tentorial arms are attached to the vertex and to the gular region at points on the head seen as foveae. These are present in most groups of *pselaphids*, the dorsal ones termed usually as vertexal foveae, or as interocular foveae. They are absent in a few genera in different lineages. The absence of the tentorial foveae may be to homoplastic.

5. Gular ridge absent/present: Within the *Goniacerinae* only the *Brachyglutini* and *Natypleurus* exhibit a longitudinal gular ridge. The Y-shaped gular carina in the *Jubini* appears distinct from the condition found in these taxa. The carina is absent from *Euplectus* and *Faronus*.

6. Segment 3 of the maxillary palpus short/long: Despite an extraordinary diversity in the shape of *pselaphid* maxillary palpus, most groups have a short, stout third segment. *Imirini*, *Speleobamini*, and to a lesser degree *Tychini*, have an elongate third segment.

7. Scape short/long: Long is here defined as the scape being longer than the following antennomeres combined. This state is an autapomorphy of *Goniacerini*. A similarly long scape is in the *Metopiasini* (*Batrisinae*). Some *Rhexiina* (*Euplectinae*) (Chandler, pers. comm.) and *Batrisini* have the scape conspicuously long although much shorter than following antennomeres combined.

8. Antenna straight/geniculate: Geniculate antenna is probably a state correlated with the unusually elongate scape. Within the *Goniacerinae* it is present in the *Goniacerini* only. Similar condition is found in *Metopiasini*; weakly geniculate antennae are in some lineages, e. g. some *Batrisini* (*Mnia*, *Siteromina*), *Trogastrini* and *Barrosellini*.

9. Antennal club present/absent: The antennal club is distinct in most members of the family and consists of one or several enlarged segments. In *Awas*, the apical antennomere is slightly enlarged, but would not be considered a club.

10. Prosternum transverse/elongate: The elongate prosternum in *Awas* appears to be unique within the family.

11. Venter of prothorax apically truncate/emarginate: The deeply emarginate ventral side of the prothorax is possibly associated with the elongate prosternum and likely assures a greater mobility of the head. This is a unique feature to *Awas*.

12. Sutural stria of elytron present/absent: The absence of the sutural stria is a derived feature but may be a homoplasy. JEANNEL (1959) states that the absence of the sutural stria in “*Tanypleurini*” (= *Iniocyphini*) is a characteristic of the tribe. *Natypleurus* (= *Tanypleurus*) has the elytron with a distinct, although shortened sutural stria.

13. Metacoxae approximate/distant: While constant in some subfamilies it varies in the Goniacerinae. The approximate condition occurs in Faroninae and Euplectinae, and the distant condition in Pselaphinae and Clavigerinae.

14. Elongate median groove absent/present on third abdominal tergite. The third tergite is usually entirely covered by the elytra. The presence of a median groove on this tergite has not been observed in any member of the other nominal subfamilies of pselaphids.

15. Abdominal tergite 4 small/large: The tergite is defined by its relative size to tergite 5. A large tergite 4, longer than tergite 5, occurs in several lineages (i.e. Euplectini, Batrisini, Pselaphini).

16. Abdominal tergite 4 with base wide/constricted: The constricted condition is certainly derived and possibly correlated with the enlarged size of the 4th abdominal segment.

17. Marginal carinae of abdominal tergite 4 present/absent: The absence of the marginal carinae is considered derived as they are present in some Faroninae and Euplectinae.

18. Abdominal sternite 3 short/long: The sternite is longer than the 5th sternite and is an autapomorphy of *Awas*.

19. Abdominal sternite 3 distinct/indistinct: The 3rd sternite is not visible in dry specimens of *Brachygluta* and its allies (e. g. *Rybaxis*) but can be seen when specimens are cleared.

20. Abdominal sternite 3 evenly curved/laterally depressed: The depressions in the abdomen of *Awas* are particularly conspicuous. They are possibly correlated with the unusual large size of the sternite.

21. Male abdomen with 7/6 or 5 visible sternites: These character states are variable within faronine and euplectine lineages. The reduction is considered derived.

22. Abdominal sternites 7 and 8 distinct/fused. The fused sternites 7 and 8 appear to be an autapomorphy of the Tychini.

23. Abdominal sternite 4 not weakly narrowed/strongly narrowed medially: Sternite 4 is considered narrowed when the middle portion is much shorter than the lateral margin. It is not narrowed in the outgroups.

24. Mesotrochanter short/elongate: The trochanter is considered elongate when it is much longer than wide and the femoral base is distant from the coxa. In some taxa it is difficult to define the character state.

25. Tibial groove absent/present: The apico-dorsal tibial groove in *Awas* appears to be an autapomorphy within the Goniacerinae. This character is present in the Clavigerinae (LÖBL, 1994).

26. Tarsomeres 2 and 3 subcylindrical or moderately flattened/flat: The character state is sometimes difficult to define.

27. Tarsomere 2 of hind legs larger/smaller than or as large as tarsomere 3: The relative size of the tarsomeres appears variable within the Goniacerinae. The polarity of the character state is uncertain.

28. Each tarsus with two distinct, unequal claws/one claw strongly reduced or absent: The presence of two symmetrical claws as in Faronini and Jubini is considered plesiomorph. The degree of the reduction of one of the claws may be variable within a lineage (LELEUP, 1986).

29. Parameres of the aedeagus situated ventrally/apically: The transposition of the parameres toward apical portion of the median lobe of the aedeagus appears a homoplasy. With pselaphids, ventral parameres are present in Pselaphinae and Speleobamini. Faroninae, Euplectinae, Batrisinae and Clavigerinae possess aedeagi more derived from the generalised staphylinoid type.

As obvious from Tab. 1, *Awas* shares with *Harmophorus*, *Goniastes* and *Natypleurus* medially sulcate (and relatively strongly sclerotised) 3rd abdominal tergite in combination with the approximate metacoxae. The presence of an elongate median groove on the 3rd tergite may be a synapomorphy of these taxa. *Natypleurus* is linked with *Awas* in having the abdominal sternite 4 shortened medianly. Other data suggest close relationship of *Awas* to *Harmophorus* and *Goniastes* but not so to *Natypleurus*. *Awas* and *Harmophorus* have in common 10 derived character states from the 29 listed ones. The large and fused 4th abdominal segment, which is much longer than the combined following ones, the medially shortened 4th ventrite and the flat tarsi may be significant. The absence of the abdominal margin and the presence of 6 sternites in male are reductions. The elongate trochanters may be correlated to the long legs in both groups. *Goniastes* (as all Goniacerini) is characterised by geniculate antenna and a very long scape, conditions absent from other members of the Goniacerinae.

TABLE 1

Distribution of characters, including autapomorphies, in *Awas* and genera representating the currently recognised tribes of Goniacerinae.

	1		2			
	12345	67890	12345	67890	12345	6789
1 <i>Awas</i>	10110	00011	10011	11101	10111	1001
2 <i>Harmophorus</i>	00100	00000	00011	01001	10110	1101
3 <i>Brachygluta</i>	00001	00000	00101	00011	10000	0011
4 <i>Bryaxis</i>	00000	00000	00100	00000	10000	0011
5 <i>Goniastes</i>	00000	01100	01010	00001	10010	0111
6 <i>Imirus</i>	00000	10000	00100	00000	10000	1011
7 <i>Iniocyphus</i>	00100	00000	01100	00000	10100	0012
8 <i>Natypleurus</i>	00011	00000	00111	00000	00100	1011
9 <i>Globosulus</i>	00010	00000	01100	01001	10100	0011
10 <i>Mechanicus</i>	00000	00000	00100	00000	00000	0010
11 <i>Pygoxyon</i>	00000	00000	00100	00000	00000	1010
12 <i>Prespelea</i>	11000	10000	00001	00001	00010	1010
13 <i>Trichonyx</i>	00000	00000	00100	00000	10000	0011
14 <i>Tychus</i>	00000	10000	00100	00000	01000	0001
15 <i>Valda</i>	00000	00000	00000	00000	00010	010?
16 outgroup	0000?	00000	00000	00000	?000?	0001

The aedeagi in these groups are basically similar, the plesiomorphic condition is present only in *Mechanicus*, *Pygoxyon* and *Prespelea*. The aedeagal characters in *Iniocyphus*, with medio-apical, asymmetrical, basally fused parameres, appear to be unique.

Analysis of the phylogenetic relationship with the heuristic search of PAUP 3.1.1. produces 15 trees. Branch swapping was done on all starting trees including nonminimal ones. Stepwise addition sequence was random. Branch swapping options of MULPARS and steepest descent were activated. Tree length: 55, consistency index: 0.545. All trees show ((*Awas* + *Harmophorus*) *Goniastes*) relationships. Twelve trees show *Valda* as sister group of *Goniastes* + *Harmophorus* + *Awas*. Three trees show (((*Awas* + *Harmophorus*) *Goniastes*) *Prespelea*) and *Valda* placed at the base of a large polytomy or tritomy. Thus, the sister group relationship of *Awas* and *Harmophorus* may be reasonably founded. All other relationships seem obscure. The present data demonstrate dubious taxonomy of the group. The Iniocyphini, with *Iniocyphus* as sister group of *Globosulus*, appear ill-founded. An assessment of the significant characters within each lineage of the actual goniacerines is a prerequisite for better understanding of their phylogeny but is beyond the goal of the present study.

In conclusion, *Awas* is placed in the Arnylliini, a Southeast Asian taxon that actually includes a single genus, *Harmophorus* Motschulsky, 1851. *Arnyllium* Reitter, 1884 is its subjective junior synonym - syn.n.

An undescribed genus closely related to *Harmophorus* is represented by a specimen from Sulawesi in the collection of the MHNG. It may be distinguished from *Harmophorus* by the margined abdomen.

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REFERENCES

- CHANDLER, D. S. 1988. A cladistic analysis of the world genera of Tychini (Coleoptera: Pselaphidae). *Trans. American Entomol. Soc.* 114: 147 - 165.
- CHANDLER, D. S. 1990. Insecta: Coleoptera Pselaphidae, pp 1175 - 1190. In: D. L. DINDAL (ed.) *Soil Biology Guide*. J. Wiley & Sons.
- COULON, G. 1989. Révision générique des Bythinoplectini Schaufuss, 1890 (=Pyxidicerini Raffray, 1903, syn. nov.) (Coleoptera, Pselaphidae, Faroninae). *Mém. Soc. r. belge Ent.* 34: 1 - 282.

- GRIGARICK, A. A. & R. O. SCHUSTER, 1980. Discrimination of genera of Euplectini of north and Central America (Coleoptera: Pselaphidae). University of California Publications, Entomology 87: 1 - 56, 79 plates.
- JEANNEL, R. 1959. Révision des Psélaphides de l'Afrique intertropicale. *Annls Mus. r. Congo Belge, Sci Zool.* 75: 1 - 742.
- JEANNEL, R. 1962. Les Psélaphides de la Paléoantarctide occidentale, pp. 225 - 479. In: DELAMARE DEBOUTTEVILLE, C. & E. RAPOPORT (eds) *Biologie de l'Amérique australe, I. Etudes sur la Faune du Sol.* CNRS, Paris.
- LELEUP, N. 1986. Mission entomologique du Dr. Ivan Löbl en Côte-d'Ivoire. Coleoptera Pselaphidae VII. Goniacerini et Proterini. *Revue suisse Zool.* 93: 507 - 571.
- LÖBL, I. 1994. The systematic position of Colilodionini with description of a new species (Coleoptera, Pselaphidae). *Revue suisse Zool.* 101: 286-297.
- NEWTON, A. F. Jr & D. S. CHANDLER, 1989. World catalog of the genera of Pselaphidae (Coleoptera). *Fieldiana, Zoology*, N.S. 53: IV + 93 pp.
- NEWTON, A. F. Jr & M. K. THAYER, 1992. Current classification and family-group names in Staphyliniformia (Coleoptera). *Fieldiana, Zoology*, N.S. 67: III + 92.
- PARK, O. 1942. A study in neotropical Pselaphidae. Northwestern University Studies in the Biological Sciences and Medicine, Number 1. Northwestern University, Evanston, Ill., X + 403 pp, 21 pls.
- PARK, O. 1952. A revisional study of Neotropical pselaphid beetles. Part one. Tribes Faronini, Pyxidicerini and Jubini. *Chicago Academy of Sciences. Special Publication* No. 9: 1 - 49.
- PARK, O. 1953a. New or little known pselaphid beetles of the United States with observation on taxonomy and evolution of the family Pselaphidae. *Bull. Chicago Acad. Sci.* 9: 249 - 283.
- PARK, O. 1953b. Discrimination of the genera of pselaphid beetles of the United States. *Bull. Chicago Acad. Sci.* 9: 299 - 331.



Löbl, I. 1994. "Awas giraffa gen. n., sp. n. (Coleoptera, Pselaphidae) from Malaysia and the classification of Goniacerinae." *Revue suisse de zoologie* 101, 685–697. <https://doi.org/10.5962/bhl.part.79924>.

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