

CONTRIBUTION TO THE KNOWLEDGE OF THE GENUS *PAOLIGENA* PIC 1927, WITH SYSTEMATIC COMMENTS, DESCRIPTION OF TWO NEW SPECIES AND THE CREATION OF A NEW TRIBE PAOLIGENINI TRIBUS NOVA (COLEOPTERA, TENEBRIONIDAE, TENEBRIONINAE)

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Abstract: The genus *Paoligena* Pic (1927), found in Somalia, in the nest of the naked mole rat *Heterocephala glaber* (Rüppell) from Kenya, is studied. Two new species: *Paoligena uhlehuti* n. sp. from Somalia and *Paoligena hancocki* n. sp. from Ethiopia, are described. The systematic position of this genus is evaluated and the position in the subfamily Tenebrioninae, sensu Doyen (1989) is discussed. Results of the morphological characters, habitus and aedeagus and the larval habitats confirm placement of this genus in the subfamily Tenebrioninae. Other representatives of Praeugenina De Moor (1970), placed in the subfamily Tenebrioninae, *Praeugena* Lacordaire, 1859, have to be separated from the genus *Paoligena* because dissection of the female internal tracts of Praeugenini confirms Doyen and Tschinkel's (1982) findings that these are not "coelometopine", but rather "tenebrionine". The Praeugenini have to be treated as a separate tribe (= subtribe Praeugenina De Moor, 1970) within the Tenebrioninae, close to the Stenochiini, characterized by stellate sensorial 6-8 antennomeres and female genitalia lacking the coelometopine tract (Doyen, 1989).

Key words: Coleoptera, Tenebrionidae, Tenebrioninae, *Paoligena*, Paoligenini **subtribus nova**, rodents, *Heterocephala* nests, eastern Africa.

Contribución al conocimiento del género *Paoligena* Pic, 1927, con comentarios sistemáticos, descripción de dos especies nuevas y creación de una tribu nueva: Paoligenini tribus nova (Coleoptera, Tenebrionidae, Tenebrioninae)

Resumen: Se estudia el género *Paoligena* Pic (1927), descrito de Somalia, en el nido de la rata desnuda (naked mole rat) *Heterocephala glaber* (Rüppell) de Kenia. Se describen dos especies nuevas: *Paoligena uhlehuti* n. sp. de Somalia y *Paoligena hancocki* n. sp. de Etiopía. Se evalúa la posición sistemática del género y se discute su posición en la subfamilia Tenebrioninae, sensu Doyen (1989). Como resultado del estudio de sus caracteres morfológicos, hábitus y edeago, así como del hábitat de las larvas, se confirma la posición del género *Paoligena* Pic, en la subfamilia Tenebrioninae. Otros representantes de Praeugenina De Moor (1970), en la subfamilia Tenebrioninae, *Praeugena* Lacordaire, 1859, deben ser separados del género *Paoligena* porque la disección del aparato genital, sin tracto, de Praeugenini confirma la opinión de Doyen y Tschinkel (1982), separando esta tribu de otros "coelometopinos", y situándola entre los "tenebrioninos". Praeugenini debe tratarse como una tribu aparte: Praeugenini (= subtribu Praeugenina De Moor, 1970) en la subfamilia Tenebrioninae, cerca de los Stenochiini, caracterizada por antenómeros 6-8 con stellae sensoriales y genitalias de las hembras sin el tracto propio de los coelometopinos (Doyen, 1989).

Palabras clave: Coleoptera, Tenebrionidae, Tenebrioninae, *Paoligena*, Paoligenini **subtribus nova**, roedores, nidos de *Heterocephala*, África oriental.

Taxonomy / Taxonomía: Paoligenini **tribus nova**, *Paoligena uhlehuti* n. sp. *Paoligena hancocki* n. sp.

Introduction

The genus *Paoligena* was created by Maurice Pic (1927: 43), by monotypy, as a subgenus of *Praeugena* Lacordaire, 1859 (= *Praoena* Mäklin, 1863), to receive a species from Somalia, described by him at this occasion under the name *Praeugena inhumeralis*. Revising the representatives of the subtribu Praeugenina, De Moor (1970: 8 and 15-16) elevated the subgenus *Paoligena* to generic level, based in the short mesosternum, not longer medially than the first abdominal sternite in its midpoint, the absence of humeral callous and the scarce but conspicuous pubescence dorsally. De Moor (loc. cit.) complete the description of *P. inhumeralis* Pic, remarked that the "lack of prominent humeral callous, the reduced wings and the abbreviated metasternum, seems indicate that this species is evolving towards an apterous state".

The genus *Paoligena* was increased by another species, found in the nest of the naked mole rat *Heterocephala glaber* (Rüppell), in Kenya: *Paoligena heterocephaloides* Penrith, 1982. The habitat of this species indicate that the opinion of De Moor (1970) seems to be correct.

Confined in the galleries of a rat, *Paoligena* exhibits a subterranean, nearly hypogeous and detritivorous *modus vivendi*, occurring in an habitat which is highly special and probably, very different indeed, from the other genera of Praeugenina, which are attracted to light in the night (pers. obs. JF, from local collectors) and never have been found in nest of mammals.

The state of conservation of the pin retaining the holotype of *Paoligena hancocki* n. sp., indicate that the species in question and probably other congeners, own the faculty to exhude a highly corrosive substance to protect the insect, probably the chemical is an acid, octanoic acid or some type of quinone, one of many types secreted by Darkling beetles (Tschinkel, 1975). The pin was completely destroyed between the elytra and the ventral face of the insect and was broken immediately with examination in the box of collection. The specimen was remounted for study and conservation. This corrosive propriety not occur in other genera of Praeugenini.

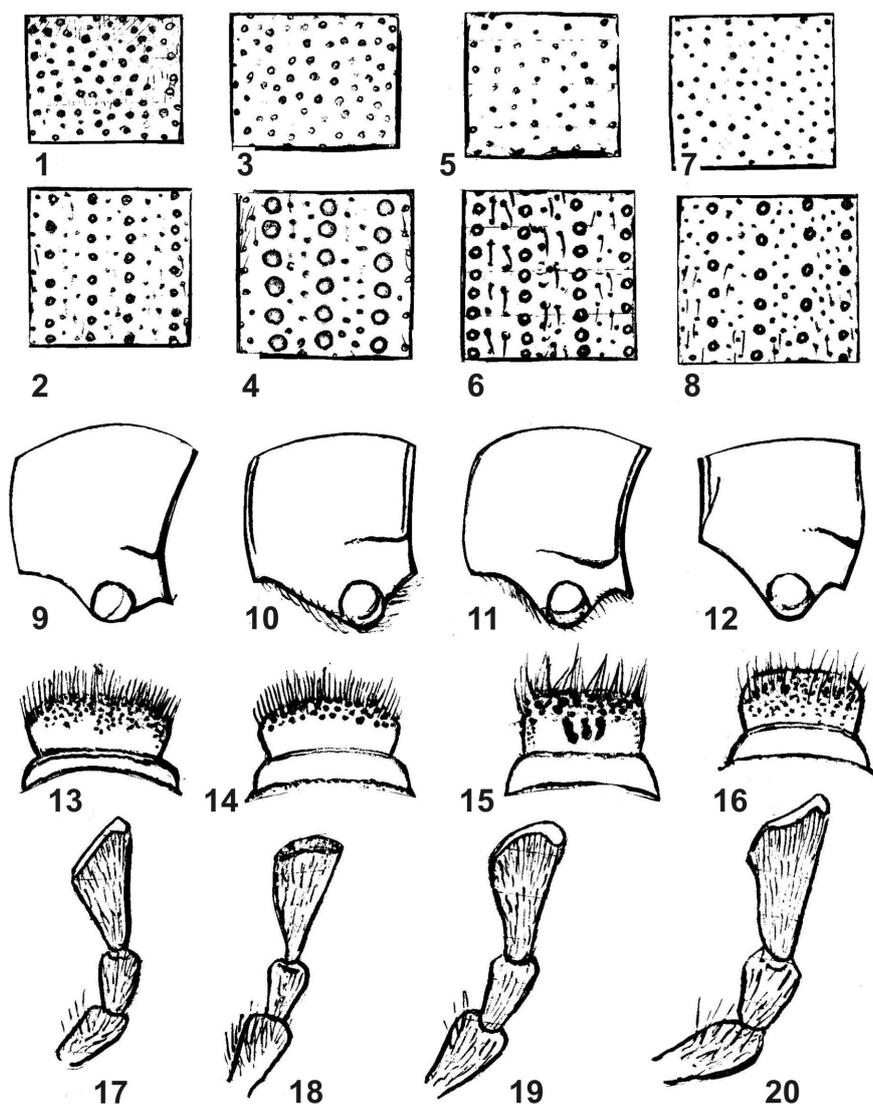


Fig. 1-20. Characters of *Paoligena* sp.: 1-8: Punctures of pronotum and elytra: 1-2. *Paoligena inhumeralis*. 3-4. *Paoligena heterocephaloides*. 5-6. *Paoligena hancocki* n. sp. 7-8. *Paoligena uhlehuti* n. sp. 9-12: Pronotum, profile: 9. *P. inhumeralis*. 10. *P. heterocephaloides*. 11. *P. hancocki* n. sp. 12. *P. uhlehuti* n. sp. 13-16: Labrum: 13. *P. inhumeralis*. 14. *P. heterocephaloides*. 15. *P. hancocki* n. sp. 16. *P. uhlehuti* n. sp. 17-20: Maxillar palpi, right: 17. *P. inhumeralis*. 18. *P. heterocephaloides*. 19. *P. hancocki* n. sp. 20. *P. uhlehuti* n. sp.

Material and methode

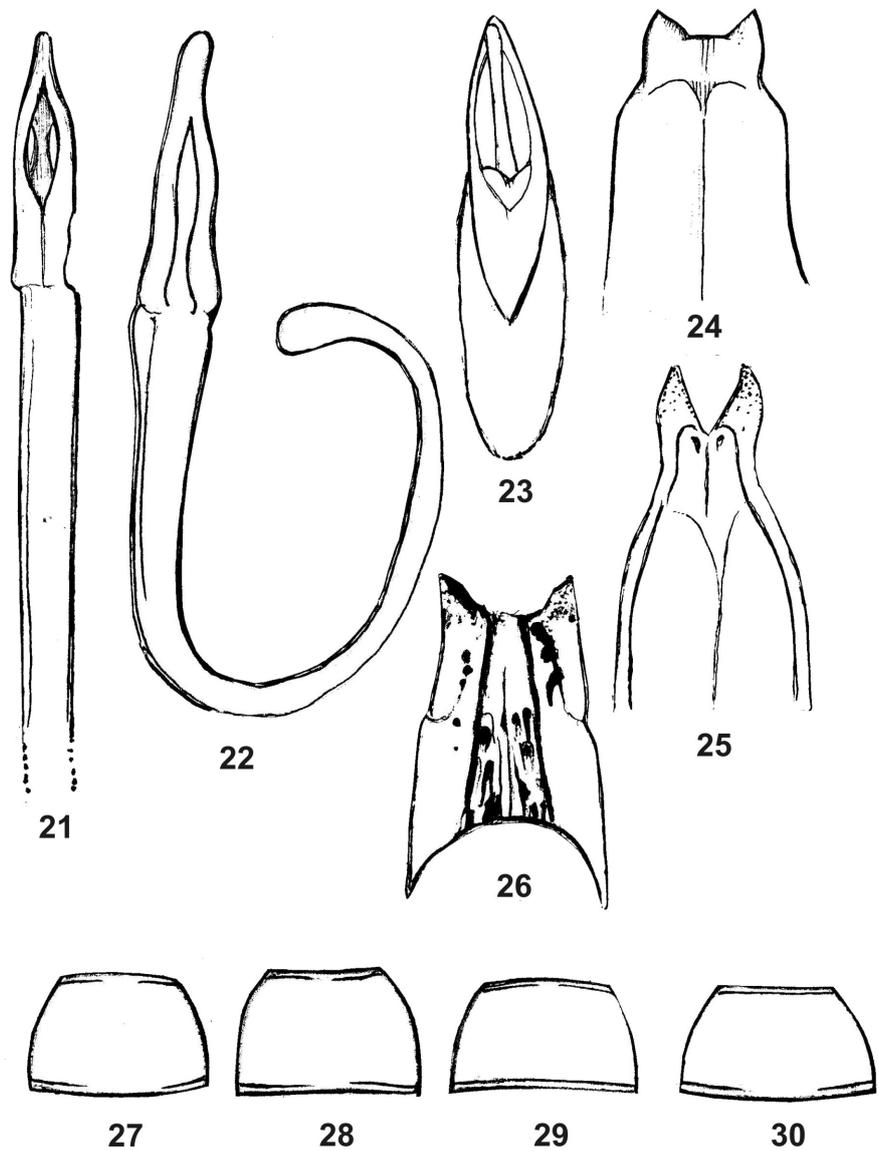
The species of this genus seems to be uncommon or the habitat is extremely hidden (Hill *et al.*, 1955), so specimens belonging to *Paoligena* are extremely rare in the collections. It is obvious that Pic (1927), assiduous searcher for many years of the collections of the Muséum national d'Histoire naturelle, Paris (MNHN), and many others collections, only found a single specimen preserved, not in Paris, but in the Museum of Florens collection (MZUF), to describe this interesting genus. De Moor (1970), in the Monograph of the Praeugenina, obtained material from the largest collections of the world but, only found two specimens: a single specimen, belonging to the formerly unknown male of the monotypic *P. inhumeralis*, from Gardo, Somalia, and another specimen from Isiolo, Kenya, which turned out to be an undescribed species (*Paoligena heterocephaloides* Penrith). I have found four specimens, three are preserved in The Natural History Museum, London, consisting of another male of the first species described, *P. inhumeralis*; another female of *P. heterocephaloides* from Kenya and a new species from Ethiopia, recognized by K. G. B. Blair, *in litt.*, as a new species. A fourth specimen, representing another new species from Ethiopia, was found in the Museum of Zoology of the University of Glasgow.

Preparation: The material has been summerged a few minutes in ca 90° C, distilled, boiled water and preserved about 60 minutes in a solution of 1/3 distilled water, 1/3 ethyl acetate and 1/3 80 % ethanol to obtain adequate transparence of the genitalia, which after study, were dried and mounted on a label, together with each specimen with watersoluble glue. To preserve intact the holotype, the aedeagus of the new species *P. hancocki*, was studied, without extraction by the transparence of the abdominal sac.

Sytematic position

The present study reveal that the genus *Paoligena* Pic, 1927, previously placed in the tribe Praeugenina De Moor (1970), and considered belonging to the Strongyliini, as a lineage or tribe, by Gebien (1948) and Tschinkel & Doyen (1980), in fact belongs in the subfamily Tenebrioninae, rather than to the Cnodaloninae Gistel, 1856 (Bouchard, 2001) (= Coelometopinae Doyen, 1989, Stenochinae Bouchard *et al.*, 2005). The name Stenochiinae proposed by Bouchard *et al.*, (2005) to remplace Cnodaloninae, Gistel, 1856, Bouchard (2001) is invalid (cf Aalbu, 2006).

Fig. 21-30. Characters of *Paoligena* sp.: **21-23.** Aedeagus: **21.** *P. heterocephaloides*. **22.** *P. hancocki* n. sp. **23.** *P. inhumeralis*. **24-26.** Ovipositor: **24.** *P. inhumeralis*. **25.** *P. heterocephaloides*. **26.** *P. uhlehuti* n. sp. **27-30.** Pronotum: **27.** *P. inhumeralis*. **28.** *P. heterocephaloides*. **29.** *P. hancocki* n. sp. **30.** *P. uhlehuti* n. sp.



This decision of Doyen and Tschinkel (1982, 1989), transferring *Nesogena* Mäklin and *Praeugena* from Cnodaliini (= Stenochiini) to Tenebrionini, making the subfamily Coelometopinae uniform in term of larval habitat requirement. Adults of Cnodaloninae are often found in decayed wood and larvae feed and develop in decayed wood. Many Tenebrioninae occur in decayed wood too, but in many cases develop in stored products, caves and nest of mammals, like *Paoligena*. Only a few larvae of Coelometopinae are known. The life and the larval development of *Praeugena* and relatives (De Moor, 1970) remain unknown. According personal communication (*in litt.*) of local collectors in Voka, R. of Congo, some *Praeugena* occur in the canopy, together with several species of *Strongylium* and are arboreal and probaably, phytophagous. The magnificent metallic, strongly coloured habitus of *Praeugena* is an obvious mimetic response to the forestal environment and match with the vegetation. This evolutionary strategy is very different from the discrete colour of *Paoligena*, adapted to sand or earth substrat.

As results of the present study, the position of *Paoligena* is found to be whitin the subfamily Tenebrioninae sensu Doyen and Tschinkel (1982) for the following reasons.

All examined genera of Praeugenina *Praeugena* Lacordaire (1859), *Nesogena* Mäklin (1863) and *Dysgena* (1863) have stellate sensoria on the apical 6-8 antennal segments, as Cnodaloninae and Stenochiini (Strongyliini). *Paoligena* exhibits a combination of stellate and longly setose preapical antennomeres, exactly as some Tenebrionini (genus *Achrostus* Fairmaire). The fact that these exhibits stellate and setose sensoria on the apical 6-8 antennal segments, like Tenebrionini, combined with the absence of Cnodalonine tract (fig. 32), is an indication of absence of relationship with the only Tenebrioninae tribe wich also has just stellate sensoria on the apical 6-8 antennal segments: These are the Centronopini *sensu* Doyen (1979), in which proximity it is best to place the Praeugenini, transferring *Paoligena* to the a new tribe Paoligenini, close to Tenebrionini in the sufamily Tenebrioninae.

Praeugna lack what Doyen (1879) termed the a "Coelometopine tract" (fig. 32). The bottom of the figure, is the enlarged *bursa copulatrix* connected with the cluster of tubules or spermatheca at the middle is connected with a very long and slender filament at the end. The organ is consistent with Doyen and Tschinkel (1980, p. 361) description of the "multiple" spermatheca of *Praeugena*.

The spermatheca, accessory glands and genital tube of some *Praeugena* are closely similar to female structures of *Strongylium* Kirby (Stenochiini, Tschinkel and Doyen, 1980, p. 341, fig. 26). The spermatheca is enormous and very delicately membranous, forming an organ (termed hereby: "strongyloid" type) which is closely similar in both genera (fig. 33-34 and 35-36). However, other species of *Praeugena*, exhibits another type of ovopositor, the "talanoid" type (fig. 32-33) strongly subparallelly shaped, recalling the pieces of paramers of the aedeagus. The ovipositor of *Paoligena* (Fig. 24-26) is very short and different in shape from both types of ovipositor found in species belonging to *Praeugena* (fig. 33-36).

The aedeagi of *Praeugena* are not homogenous and exhibits extremely different forms (De Moor, 1970), but the aedeagus of *Paoligena* is different, unpigmented and feebly quitinose, abnormal in shape, either extremely short (fig. 23) or extremely long, in both cases very unlike the quitinous aedeagus of all known species of the genus *Praeugena*.

Moreover, species belonging to *Paoligena* are depigmented, yellowish to testaceous-redish, lacking or presenting feebly stridulatory gula, exhibits a finely pubescent and depressed body, extremely different from all other known genera of *Praeugena* and related genera. The more or less vestigial stridulatory gula is not a synapomorphy of Praeugenini, appearing in many other groups of Tenebrionidae.

Nothing is known about the life cycle of Praeugenini (Moor, 1970) but nearly all genera exhibits shiny, strongly metallic colour reflecting sun light. Exceptionally, a few species are dark, dully or testaceous. Strongly metallic colours indicate heliophilous, floricolous or forestal habitat; the habitus reflecting condensate water drops in the vegetation confusing predators.

Paoligena are probably opportunistic detritivores, as many other member of the subfamily Tenebrioninae, that live in rodents nest and burrows, feeding on the concentrations of rich organic matter concentrated in these areas, cleaning the galleries of rats. A separation to tribal and subfamilial level of *Paoligena*, probably will be supported by different habitat, when facts about the cycle of life of other genera of Praeugenini will be known. Perhaps the morphologic relationship between *Paoligena* and *Praeugena* is purely homoplastic, accidental. Another detritivorous representative of Tenebrionini, *Achrostus asiaticus* Masumoto and Girard (1998), described from Thailand, strongly recall the habitus of *Praeugena*. This case of homoplasia support ulteriorly separation of *Paoligena* from *Praeugena*, as representatives of two different tribus in the subfamily Tenebrioninae, presented in this paper.

Paoligenini tribus nov. Ferrer

GENUS TYPE OF PAOLIGENINI *TRIBUS NOVA*: *Paoligena* Pic, 1927, by monotypy.

CHARACTERS OF THE TRIBU:

Size reaching 12 mm. long. Body ovoide to navicular, depressed dorsally, with elongate and slender antennae and legs, recalling superficially the shape of some Praeugenini, but completely depigmented, yellowish to redish-testaceous, finely and sparsely pubescent, lacking the strong stridulatory gula of all others genera of Praeugenini. antennae with antennomeres 6-8 stellatae-setose. *Paoligena* differ from

Praeugenini in the short mesosternum, not longer medially than the first abdominal sternite in its midpoint and in the absence of humeral callous. The aedeagus placed ventrally in dorsal view, become in some species abnormally elongate (fig. 21-22). Ovipositor with gonostyles atrophiate, absents (24-26), very different from any other groups of Praeugenini (Tschinkel and Doyen, 1980). *Paoligena* inhabiting in subterranean nest of naked mole rats, highly probably detritivorous.

LIST OF SPECIES

***Paoligena inhumeralis* Pic 1927**

Fig. 1-2, 9, 13, 17, 23-24, 27, 37.

Praeugena (Paoligena) inhumeralis Pic 1927: 63.

Paoligena inhumeralis Pic, De Moore 1970: 15.

Paoligena inhumeralis Pic, Penrith 1982: 292.

MATERIAL EXAMINED: Holotype, female: Somalia ital. mer.: V. Duca Abruzzi, IV-V.1926, Miss. Ent. Paoli/67. Holotypus (pink label print) "La Specola" Firenze 7207 (MZUF).

A male: British Somaliland, W. A. Macfadyen leg. British Museum 1929.398 (NHM).

***Paoligena heterocephaloides* Penrith, 1982**

Fig. 3, 4, 10, 14, 18, 21, 25, 28, 38.

Paoligena heterocephaloides Penrith, 1982: 292

MATERIAL EXAMINED: Paratypes: females: Kenya, Garissa Bura, Tana River/1148. Com. Inst. Ent. coll. n° 11280, Von Someron/BM 1928.68 (TM).

***Paoligena hancocki* n. sp.**

Fig. 5, 6, 11, 15, 19, 22, 29, 40.

MATERIAL EXAMINED: **Holotype**: Male, Ethiopia: Coloja Gahr, Abyssinie Est, alt. 2800 fts., 24.III.06, ex coll. T. G. Bishop. Hunter Zool. Mus. 2022. University of Glasgow, United Kingdom.

DIAGNOSIS: All known species of *Paoligena* seems to be very homogenous, making recognition difficult. The colour and shape of the body of this new species is very similar to *P. heterocephaloides*. Distinctive characters are: The large and slightly curved basal membrane of labrum (fig.15), the densely pubescent, apically curved joint of the maxillar palpi (fig.19). The base of pronotum with an entire margin, the prosternal apophyse hardly visible in lateral view, the excavate basal area of elytra and the very long and curved aedeagus (fig. 22).

DESCRIPTION: Dimensions: Length: 16 mm; Maximum of width at elytra: 6,5 mm.

Body alate, scarcely pubescent, shiny, dorsally compressed, uniformly reddish brown, including all appendages and legs.

Clypeo-genal area strongly sinuate, eyes surpassing the lateral contour of the head, temporal area produced, sparsely pubescent. Punctures of integument strongly rounded, separated by a distance equivalent to the diameter of a puncture. Antennas long, surpassing the middle of elytra, third antennomere four times longer than broad, the following subequal, apical antennomere unfortunately lacking.

Pronotum bare, shiny, finely margined anteriorly, posteriorly trapezoidal, like others species of this genus, the latero-basal margin visible in profile (fig. 11). Finely, sparsely punctured.

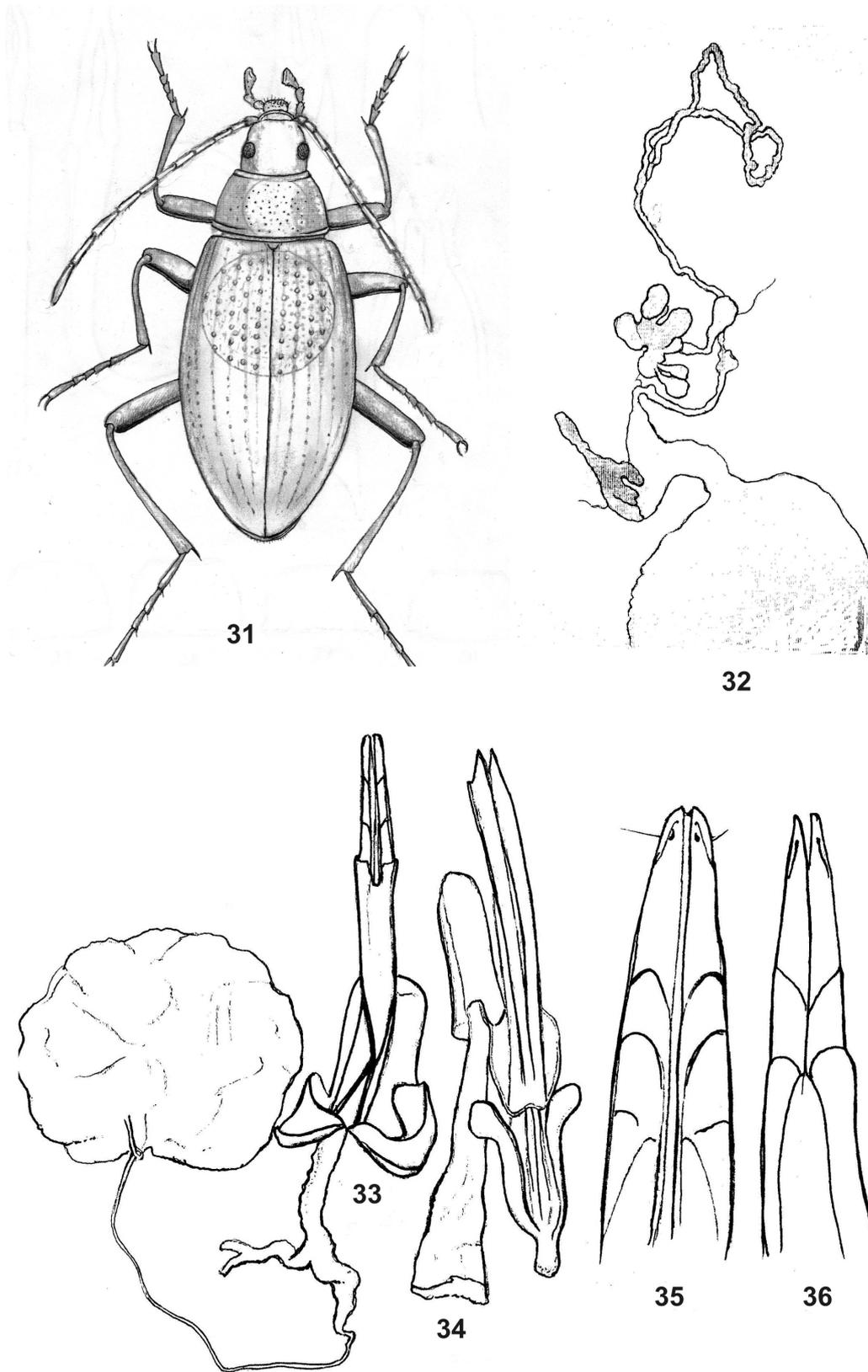


Fig. 31. Habitus *P. uhlehuti* n. sp. **Fig. 32-36.** Characters of *Praeugena*: **32.** Genital Tract of *Praeugena* (*Praeugena viridescens* Gerstaecker); **33-34.** Ovipositors of *Praeugena* ("talanoid" typ); **35-36.** idem ("strongyloid" typ).

Elytra oval, maximum of width at middle, base deeply excavate between the callous humeri and the scutellum. Striae formed by rounded well separate punctures, intervals finely covered with much smaller points bearing a yellowish, backwards inclined seta, forming a fine pubescence only visible

from a certain point of view. Elytral first and second discal striae free, third stria connected to the sixth, fourth with fifth. This disposition is clearly different from *P. inhumeralis* (in which the first stria is apically connected with the sixth, the second with thirt, the fourth, fifth, seven and eighth free. In *P.*

heterocephaloides and in the new species *P. uhlehuti* the striae become completely irregular and confluent rugose apically.

Ventral face shiny, sparsely pubescent. Mentum more transverse than in the precedent species. Gula deeply, longitudinally excavate, finely alutaceous, but not stridulatory riddled. Apophyse of prosternum pointed, hardly visible from lateral view. Mesosternum pubescent, strongly punctured, convex and carinated at anterior margin.

Abdomen covered with a long, sparse, yellowish pubescence, reclined backwards. Apophyse of first abdominal sternite triangularly pointed, strongly, densely punctured. All sternites are depressed at sides, coarsely punctured, not as densely as surface of apophyse, punctures becoming strigose laterally. Anal sternite unmarginated, with a short fringe of golden setae apically.

Legs slender with yellowish pubescence, as in the congeners, without diagnostic features.

Aedeagus: Similar to the aedeagus of *P. heterocephaloides*, but the opening of the parameres is completely open, sinuated basally, with the basal piece extraordinary long and recurved (fig. 22).

ETYMOLOGY: Species named after Mr. Geoff Hancock, Curator of the Museum of Zoology of the University of Glasgow, Scotland, in which this species was discovered.

REMARKS: This species was pinned in an old box of the coll. T. G. Bishop, placed between a serie of Somalian *Micranterus femoralis* Gersstaecker, and a *Thanatophilus* sp. The groupe was marked by pencil as corresponding to the precited locality by a "french dealer".

***Paoligena uhlehuti* n. sp.**

Fig. 7, 8, 12, 16, 20, 25, 30, 31, 40.

MATERIAL EXAMINED: Holotype: female, Ethiopia: Abyssinie, Diré Daoua, ca 4.500 fts. III.1938, H. Uhlehut leg. *Uhlehutia navicularis* gen.? & sp. n. Blair *in litt.*/ Brit. Mus. 1935-374 (NHM)

DIAGNOSIS:

Dimensions: Length: 12.20 mm.; Maximum of width at elytra: 6 mm.

Similar in size and morphological characters to *P. inhumeralis* Pic and only distinguishable by combination of following characters: Antennal joints proportionally elongated. Penultimate apical joint of maxillar palp long (fig. 20); Basal rebord of pronotum conspicuous in lateral aspect (fig. 12). Pubescence of elytra and rows of punctures stronger (fig. 8). Apex of the ovipositor longer, and of different shape (fig. 25).

DESCRIPTION:

Head and pronotum shiny, bare, elytra dull, sparsely pubescent.

Labrum rectangular, irregularly punctured, covered on anterior area by a golden, hirsute pubescence. Mandibles asymmetric, left larger than right, Maxillary palps long, subtruncate apically (fig. 20). Epistoma truncate, clypeal membrane circous, finely margined anteriorly; Clypeo-genal area sinuate, with a depression marked by a fine line, corresponding to the insertion of the antennae. Eyes small, separated frontally by distance equivalent to near seven times the diameter of an eye measured dorsally. Eyes reniforms in lateral

view, inferior globe much larger than dorsal. Tempora finely pubescent and abruptly convergent backwards.

Tegument covered of strongly, irregularly and sparsely disposed punctures.

Antennae filiform, reaching the middle of the elytra.

Pronotum subtrapezoidal, convex discally, anterior margin straight, extremely finely margined anteriorly, the anterior angles obtuse, the posterior angles nearly right, base margined laterally, carina interrumpted at middle, but perceptible basally from lateral point of view (fig. 30), the tegument much finer punctured than the head (fig. 7).

Elytra oval-elongate, duller than the pronotum and head, two times longer than broad, maximum width before middle, humeral callous absent, base straight, the lateral margin only visible apically, each elytron with nine striae including a presutural, short line of points. The striae forming rows of rounded slightly irregular punctures. Intervals completely flattened, covered by superficial, sparsely disposed points, bearing conspicuous, yellowish, backwards reclined seta (fig. 8).

Ventral face: Mentum subpentagonal transverse, pubescent, punctured, weakly excavate at sides. Gula without stridulatory ridges. Prosternum bare, propleural area sparsely and shortly pubescent, apophyse of prosternum recurved between coxae, invisible laterally, truncate at apex (fig. 12). Mesosternum feebly excavate at middle, finely pubescent, exhibiting a short, shiny longitudinal carina anteriorly. Metasternum truncate anteriorly, with a dark longitudinal line at middle, finely punctured, pubescent. Epimeral area much denser, strongly punctured. Epipleura superficially punctured and finely margined at internal border.

Abdomen shiny, apophyse of first sternite pointed apically, triangular between coxae, densely punctured; abdominal sternites pubescent, impressed at each side. Anal sternite unmarginated with a short golden fringe of apical pubescence.

Legs slender, pubescent, as in other congeners, without diagnostic features.

ETYMOLOGY: Blair (det. *in litteris*) had chosen the name "*navicularis*" probably aluding to the curious shape of body of this insect. We prefer name this species after the collector: Mr. H. Uhlehut.

Key to separate the species of *Paoligena*:

- 1 Elytral striae finely punctured (fig. 2, 8). Colour yellowish brown 2
- Elytral striae strongly punctured (fig. 4, 6). Colour reddish brown 3
- 2 Antennae surpassing the middle of the elytra. Pubescence of elytra fine and scarce (fig. 2), with yellowish backwards reclined setae, basal margin of pronotum un conspicuous in profil view (fig. 9). Medial area under the apophyse of prosternum without longitudinal carina (fig. 9). Aedeagus short (fig. 23). Somalia..... *inhumeralis* Pic.
- Antennae not surpassing the middle of the elytra. Basal margin of pronotum finely traced. Pubescence of elytra sparse but conspicuous (fig. 8). Medial area under the prosternal apophyse with a small longitudinal carina. (Aedeagus unknown). Somalia *uhleuhti* n. sp.
- 3 Basal margin of pronotum conspicuous (fig. 10), Punctures of elytra foveate (fig. 4). Prosternum and mesosternum covered of a large yellowish pubescence. Prosternal

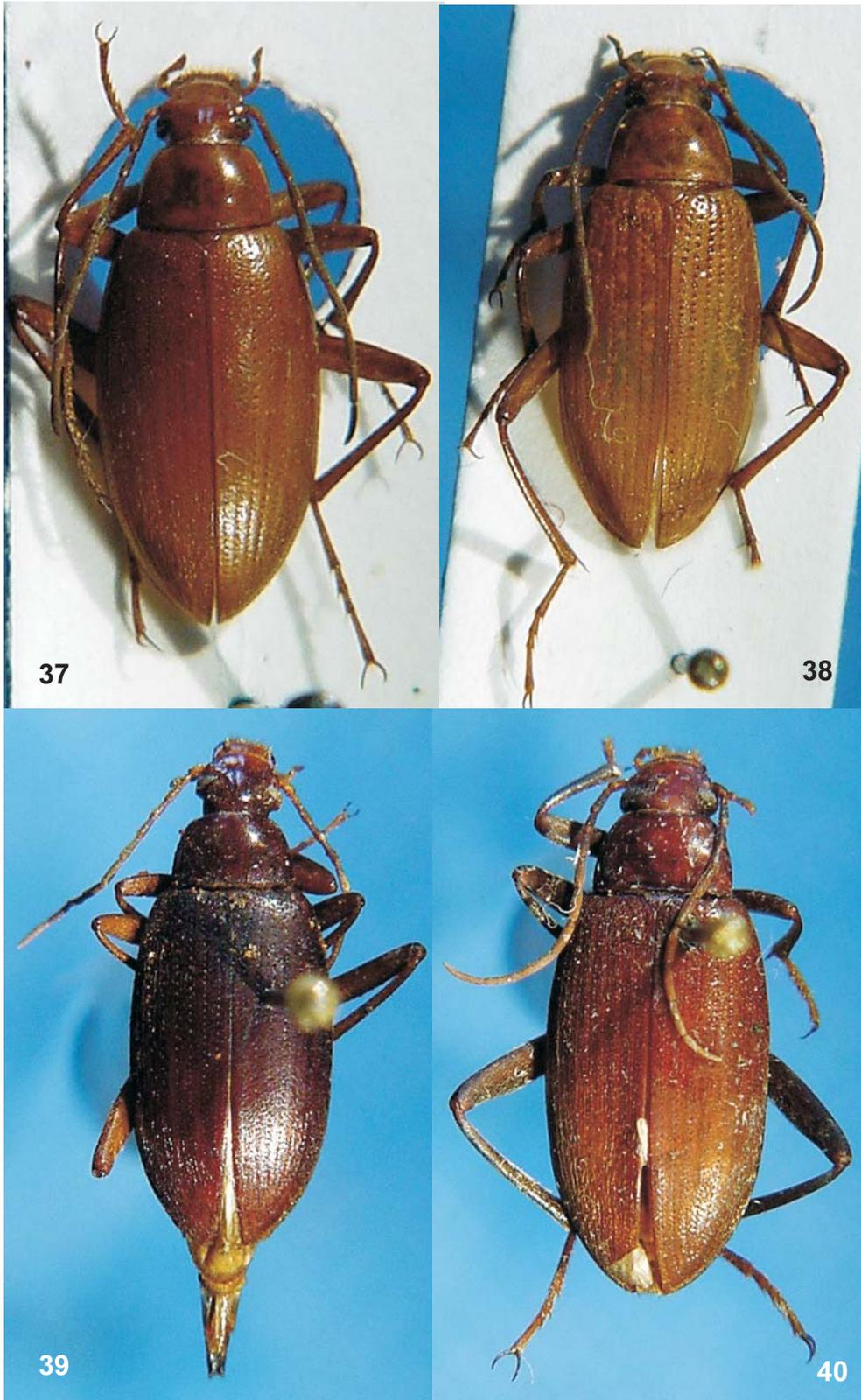


Fig. 37-40. Habitus of *Paoligena*: 37. *Paoligena inhumeralis*; 38. *Paoligena heterocephaloides*; 39. *Paoligena hancocki* n. sp.; 40. *Paoligena uhlehuti* n.sp.

- apophyse hardly visible laterally. Aedeagus very long and stright. (fig. 21). Kenya..... *heterocephaloides* Penrith
- Striae of elytra strongly punctate (fig. 6). Pronotum and mesosternum scarcely pubescent, Prosternal apophyse of prosternum visible laterally (fig. 11). Aedeagus very long and recurved (fig. 22). Ethiopia..... *hancocki* n. sp.

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Litterature

- AALBU, R. 2006. Where are we at: Assessing the current state of Tenebrionidae systematics on a global scale (Coleoptera, Tenebrionidae). Actes du deuxième Symposium international sur les Tenebrionidae. (Taxonomie, Biogéographie et Faunistique). *Les Cahiers scientifiques du Muséum de Lyon*, fascicule **10**: 55-70.
- BOUCHARD, P. 2001. Phylogenetic relationship of the Australian Coelometopini. *Organisms Diversity and Evolution*, **1**: 17-43.

- BOUCHARD, P., J. F. LAWRENCE, A. E. DAVIES & A. F. NEWTON 2005. Synoptic Classification of World Tenebrionidae (Insecta, Coleoptera) with a review of Family-group names. *Annales Zoologici, Warszawa*, **55**(4): 499-530.
- DE MOOR, P. 1870. *Monograph of the Praeugenina (Coleoptera, Tenebrionidae), Strongyliini*. *Transvaal Museum Memoirs*, **17**(1-7): 203 pp.
- DOYEN, T. J. 1989. reconstitution of Coelometopini and Tenebrionini and related tribes of America North of Colombia. (Coleoptera, Tenebrionidae). *Journal of New York Entomological Society*, **97**: 277-304.
- DOYEN, T. J. & W. R. TSCHINKEL 1982. Pheneric and cladistic relationship of Tenebrionid beetles (Coleoptera). *Systematic Entomology*, **7**: 127-183.
- GEBIEN, H. 1948 (1944). Katalog der Tenebrioniden, Teil 3, *Mitteilungen der Münchner Entomologische Gesellschaft*. **34**: 497-555. (842-899).
- HILL, W. C. O., A. PORTER, R. T. BLOOM, J. SEAGO & M. P. SOUTHWICK 1955. Field and Laboratory studies on the naked mole rat *Heterocephala glaber*. *Proceedings of the Zoological Society of London*, **128**: 455-513.
- LACORDAIRE, J. T. 1859. *Histoire naturelle des Insectes, Genera des Coléoptères, ou exposé methodique (etc.) dans cet ordre d'Insectes*. Paris, Roret ed., **5**: 479-488.
- MÄKLIN, F. W. 1863. Die Gattung *Praogena* und deren representanten. *Acta Societas Scientiarum Fennica*, **7**: 555-583.
- MASUMOTO, K & G. GIRARD 1998. A new species of the genus *Achrostus* (Coleoptera, Tenebrionidae, Tenebrionini) from Asia. *Elytra*, Tokyo, **26**(2): 399-402.
- PENRITH, M. L. 1982. A new species of *Paoligena* Pic. (Coleoptera, Tenebrionidae, Strongyliini) from Kenya. *Annals of the Transvaal Museum*, **33**(17): 291-298.
- PIC, M. 1927. Deuxième liste de Coléoptères de la Somalie italienne, avec descriptions de nouvelles espèces. *Memoria della Società Entomologica Italiana*, **6**: 37-43.
- TSCHINKEL, W. R. 1975. A comparative study of the chemical defensive systems of tenebrionid beetles. I. Chemistry of the secretion. *Journal of Insect Physiology*, **21**: 753-783.
- TSCHINKEL, W. R. & T. J. DOYEN 1980. Comparative anatomy of the defensive glands, ovipositors and female genital tubes of Tenebrionid beetles (Coleoptera). *Journal of Insect Morphology*, **9**: 321-368.