

PYREARINUS TERMITILLUMINANS, SP.N., WITH DESCRIPTION  
OF THE IMMATURE STAGES (COLEOPTERA, ELATERIDAE,  
PYROPHORINI)

CLEIDE COSTA

## ABSTRACT

*Pyrearinus termitilluminans*, sp.n., type-locality: Brazil, Goiás, Parque Nacional das Emas, is described based on larvae, pupa and adults collected from nests of *Cornitermes* sp.

## INTRODUCTION

Larvae, pupa and adults of *Pyrearinus termitilluminans*, sp.n., collected at Parque Nacional das Emas, Goiás, Brazil, in nests of *Cornitermes* sp. by Kent H. Redford (Museum of Comparative Zoology, Harvard University and National Zoological Park, Smithsonian Institution) were received in November, 1981.

Associated with this material, Kent H. Redford sent to identification larvae of the families Cicindelidae, Tenebrionidae and Asilidae (Diptera) also collected in the termite mounds.

Studying the elaterid material I concluded that the species is new and belongs to the "*pumilus* group" of the genus *Pyrearinus* Costa, 1975.

*Pyrearinus* larvae were collected in open galleries, the pupa and adults inside sealed galleries with shed larval skins, all of them in the termite mounds. Several adults were collected also flying at night near the termite mounds. These larvae are responsible for the so called phenomenon of the "luminous termite hill", first described by Castelnau, 1850 and afterwards by several other travellers (Kent H. Redford, pers. comm.).

***Pyrearinus termitilluminans*, sp.n.**  
(figs. 1-15)

Mature Larva (figs. 6-14)

Length 20 mm; width of thoracic segment: 3.0 mm, of abdominal segments: 3.5 mm. Head and body dorso-ventrally flattened. Body surface cream-white; head and abdominal sternites with dark spots. Ninth abdominal tergite rounded and with two small apical tubercles followed by two others, smaller and sub-apically located.

Head prognathous, weakly pigmented, depressed. Epicranial suture present. Epicranial stem absent. Front arms lyre-shaped. Ocelli dark pigmented, laterally placed at the basis of the antennae. Nasale (fig. 14) tridentate, with one seta between adjacent teeth. Antennae (fig. 13) 3-segmented, second segment with a small triangular sensory appendix; third segment, the smallest, with one long hair-seta apically. Mandibles (figs. 9-11) moveable, symmetrical, arcuate, stout, with lateral and external setae, without retinaculum and penicillum. Maxilla (fig. 12) with elongate stipites very close at the base, cardo reduced. Maxillary palpi 3-segmented, palpifer present, articulated; galea 2-jointed, lacinia absent. Labium (fig. 12) with two sclerites, prementum small; ligula fused with prementum. Mentum triangular with a pair of long hair setae at base, and two pairs anteriorly. Pronotum as long as the meso- and metanotum together. Coxae separated. Legs with a few stout setae, associated with long hairs. Prosternum triangular, with four pairs of setae. Abdomen with 8 pairs of spiracles similar in size; surface weakly sclerotized, hairy. Sternites with distinct plicae and small rounded dark spots. Ninth abdominal tergite rounded, hairy, with two small apical tubercles followed by two others

smaller and sub-apically located. Tenth abdominal segment small, tubular and with a few setae on the margin; anal opening rounded and with two small hooks. Spiracles biforous.

#### Pupà

Length: 16 mm; width (prothorax): 4 mm. Aedeagus, exarate. Color cream-white. Glabrous. Sides of pronotum with two pairs of cuticular prolongations: one on the anterior margin and one on the posterior angles. Last abdominal segment with one pair of bifurcated urogomphi.

Adults (figs. 1-5; 15)

Male. Dark-brown; pronotum and propleura yellowish, anterior margin and basal spot on the pronotum, darker. Pubescence extremely fine and invisible to the naked eye. Eyes prominent. Front concave with punctures fine, denser on the margins. Antenna short, serrate from the fourth segment onwards; second small, third a little longer, elongate and almost of the same length as the fourth. Prothorax (fig. 1) a little convex, sides marginated; anterior angles rounded and large; hind angles slightly divergent, short and with a weak carina. Luminous spots small, confused with the color of the integument. Pronotum with punctures heterogeneous, fine and scarce, intervals between punctures smooth except on the margins where they are micropunctulate. Prosternum with punctures coarse and umbilicate, transversal stripe near the anterior margin, smooth. Propleura with punctures fine and scarcely, intervals between punctures micropunctulate. Metasternum and abdomen finely punctured. Elytra rounded to apex, slightly marginated, finely punctate-striate, intervals flat and punctured. Abdominal luminous organ small, not lamellate.

Genitalia (fig. 15): simple, median lobe tapering to apex, lateral lobe short.

Female. Larger, more convex; eyes smaller; luminous spots on pronotum larger and very distinct (fig. 2). Genitalia (figs. 3-5): ovipositor weakly sclerotized; bursa copulatrix and median oviduct without spines and or sclerotized plates; accessory glands well developed.

Dimensions (mm)	Male	Female
Total length	15.0	17.0
Length of the pronotum	3.0	4.0
Length of elytron	11.0	12.0
Width of the pronotum	4.0	5.0
Humeral width	4.0	4.0

Holotype. Male. BRASIL. Goiás. Parque Nacional das Emas, 2-4.x.1981 K.H. Redford in the nest of *Cornitermes* sp. (MZSP).

Paratypes. BRASIL. Goiás. Parque Nacional das Emas, 2-4.x.1981 K.H. Redford in the nest of *Cornitermes* sp. 11 males (MCZ); 10 males (MZSP); 1 female (MCZ); 1 female (MZSP); 1 pupa and 2 larvae (MZSP).

#### DISCUSSION

The larvae are quite different from other known *Pyrearinus* larvae. The body is less dorso-ventrally flattened, less sclerotized and less pigmented; the ninth abdominal segment is rounded and practically without tubercles; the anal hooks are less developed; the ocelli are dark pigmented. These characters seem to be adaptive to the life inside galleries.

In recent years I had the opportunity to study several Coleoptera larvae (including many Elateridae genera) found inside termite nests. Some Elateridae larvae found inside termite nests have a more or less swollen abdomen resembling Isoptera queens. These larvae feed on the workers, nymphs, etc., of Isoptera. The inside of the nest is a closed environment, protected from most climatic variations and outside enemies. In certain cases, termite nests



seem to constitute the main and perhaps the only feeding source and place for the development of the beetle (S.A. Vanin, C. Costa and L.R. Fontes, in press).

*Pyrearinus termitilluminans*, sp.n., is the first elaterid larva found not inside the nest but superficially on the shell mound inside small galleries.

It seems that at least in the *Cornitermes* sp. nest, the whole mound is not only a protected environment but also serves for the larva to hunt its preys.

Some interesting considerations may also be drawn from the larvae of Tenebrionidae, Cicindelidae and Asilidae (Diptera) associated to the *Pyrearinus* larvae. Tenebrionidae larvae are not predacious, probably they are digging the galleries and feeding on organic material found in the nest. Cicindelidae larvae are predacious and live in definite fixed burrows, being highly adapted to this habitat. Asilidae larvae are predacious on Coleoptera larvae and commonly found inside decayed logs, not being recorded living in termite nests. More studies must be done on the role of those insects in this ecosystem.

*P. termitilluminans* belongs to the "pumilus group" (Costa, 1975) which includes 6 species: *scintillula*, *flatus*, *fragilis*, *vitticollis*, *pumilus* and *termitilluminans*. This group is characterized by the integument seeming glabrous to the naked eye; the hind angles of the prothorax short, flattened and slightly or not divergent, weakly carinate; male genitalia with median lobe small.

*Pyrearinus termitilluminans*, sp.n., is closed related to *P. fragilis*, by the punctulate elytral intervals, the marginated prothorax, prosternum with coarse punctures; differs by the color pattern, the punctures of pronotum and propleura and the flat elytral intervals. A few specimens of *P. fragilis* from Rio Grande do Sul, Brasil, were collected inside termite nests.

Adults show accentuate sexual dimorphism, males with eyes larger than the females, body less convex, luminous spots on prothorax less developed. This kind of dimorphism is common to all species of the *pumilus* group and also to other groups.

The distribution of the *pumilus* group (cf. Costa, 1975: 183, map 7), shows some species in the Brazilian open formations and others in the forested Amazonian area. Mapping all the localities of the "luminous termite hills" referred to in the literature, I observed a great coincidence with the distribution of the "pumilus group". Castelnau, 1850, observed the phenomenon of the "luminous termite nests" at "Água Limpa", near Goiás; Smith, 1879, near Santarém, Pará; Knab, 1895, at Lower Amazonas; Knab, 1909, at Santarém, Pará; Branner, 1910 (referring *Lustosa*) at the northern part of Mato Grosso where it joins Bolivia; Neiva & Penna, 1916 at several localities from Mato Grosso, Goiás and Bahia; Lenko & Papavero, 1979 referred observations of Marien, 1946 at Mato Grosso and Otero, 1954, at Goiás; Redford, 1981 at Goiás, Parque Nacional das Emas.

It seems that the distribution of the *pumilus* group is associated with that of the termite nests. This could explain the fact that specimens from this group are rare in the collections.

Costa (1978) pointed out that the difficulties found in the identification of some species of the genus *Pyrearinus* will be probably solved by the study of their biology and habitat. The discovery of the habitat of *Pyrearinus termitilluminans* made more comprehensive the status of the "pumilus group".

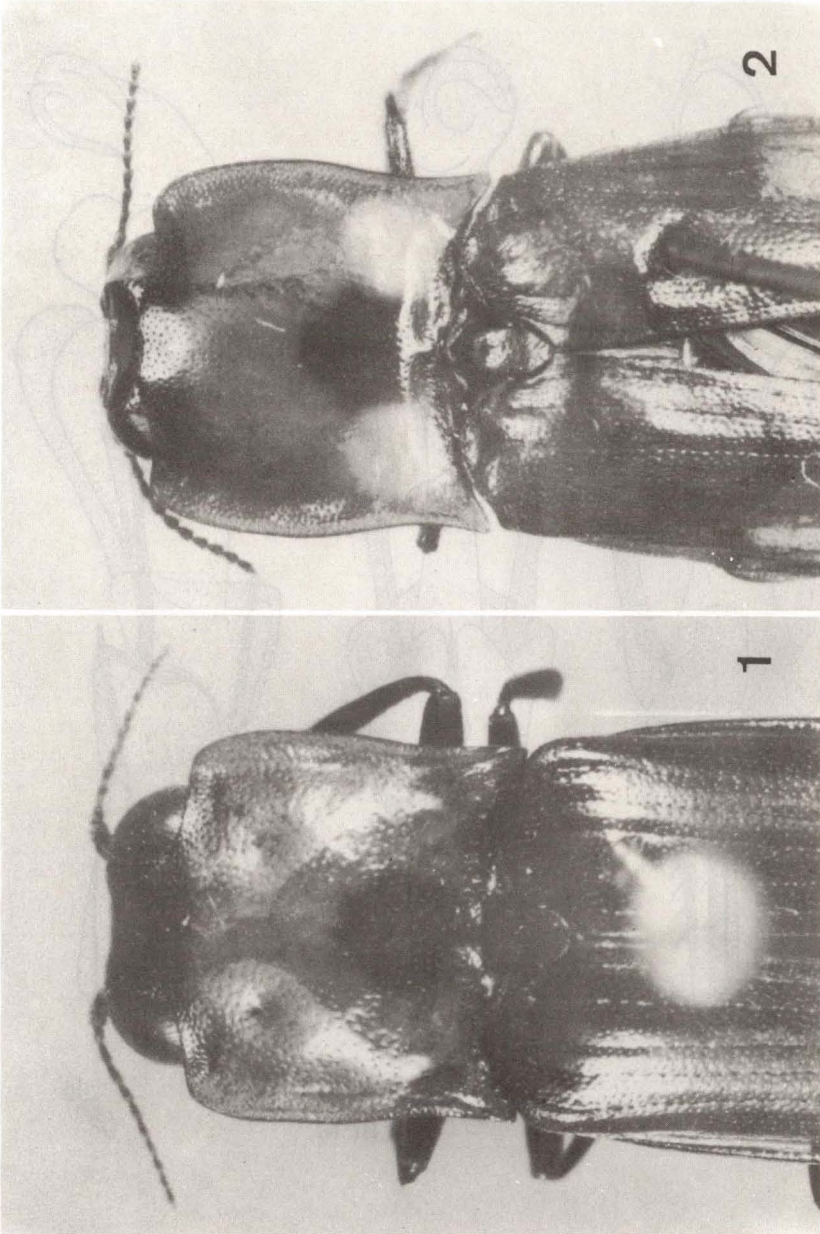
#### ACKNOWLEDGMENTS

I thank my colleague Nelson Papavero for the suggestive name "*termitilluminans*" I gave to this species and Giro Pastore for the photographs.

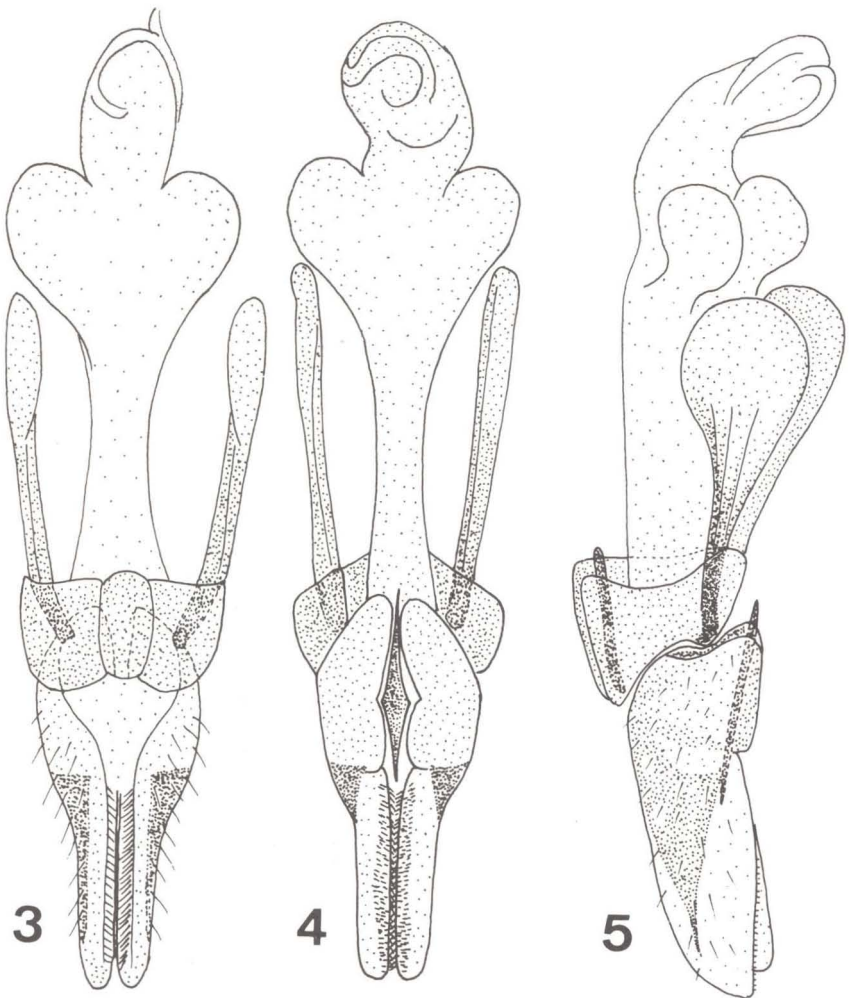
#### REFERENCES

- Branner, J.C., 1910. The luminosity of termites. *Science* 31: 24-25; 32: 342.  
 Castelnau, F., 1850. *Expédition dans les parties centrales de l'Amérique du Sud, Histoire du Voyage, Paris, 2: 485 pp.*

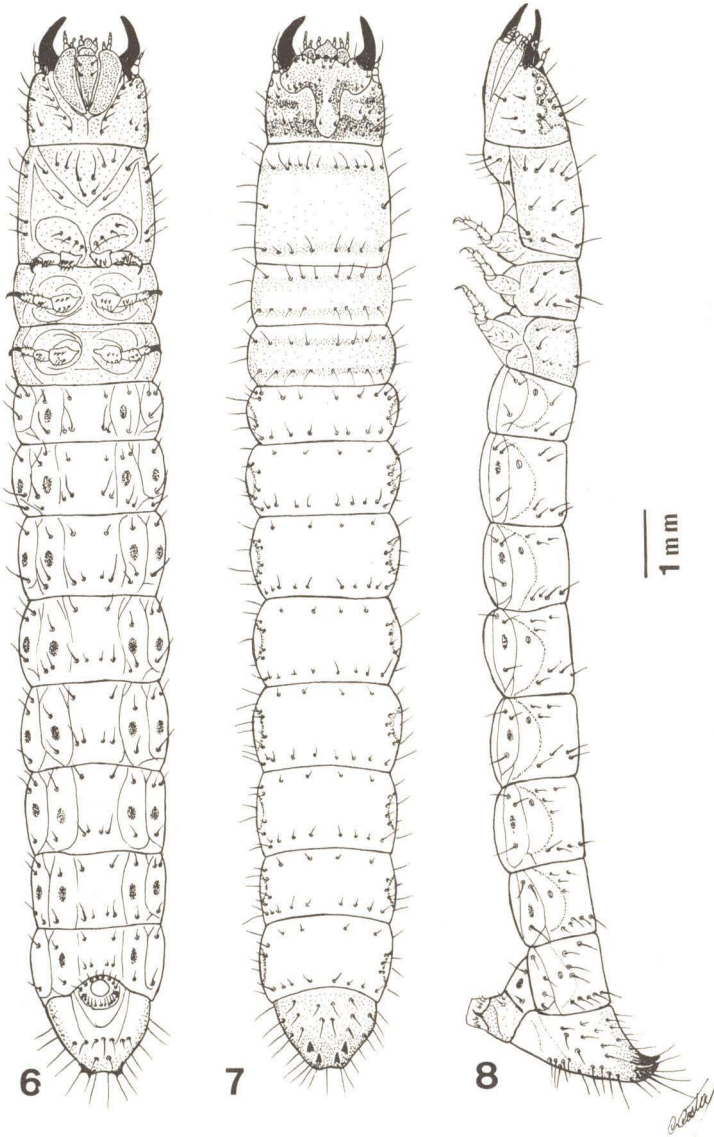
- Costa, C., 1975. Systematics and evolution of the tribes Pyrophorinae and Heligmini, with description of Campyloxeninae, new subfamily (Coleoptera, Elateridae) *Arqos Zool., S Paulo* 26(2): 49-190.
- Costa, C., 1978. Sistemática e Bionomia de *Pyrearinus* Costa, 1975 (Coleoptera, Elateridae). *Ibid.* 20(4): 185-236.
- Fonseca, J.S. da, 1880-1881. *Viagem ao redor do Brasil, 1875-1878*, 1: 400 pp; 1880, 2: 407 pp., 1881. Rio de Janeiro.
- Knab, F., 1895. Ant nests. *Ent. News* 6: 15-16.
- Knab, F., 1909. Luminous termite hills. *Science* 30: 574-575.
- Lenko, K. & N. Papavero, 1979. *Insetos no folclore*. Conselho Estadual de Artes e Ciências Humanas (Coleção folclore, n.º 18).
- Marien, A., 1946. *Era um poaieiro (novela matogrossense)*. Livraria Técnica Editora, S. Paulo.
- Otero, L.S., 1954. *Gente de rancho. Contos Goianos*. Bolsa de Publicações "Hugo de Carvalho Ramos", Goiânia.
- Neiva, A. & B. Penna, 1916. Viagem científica pelo norte da Bahia, sudoeste de Pernambuco, sul do Piauí e de norte a sul de Goyaz. *Mems Inst. Oswaldo Cruz* 8(3): 74-224, 28 pls., 1 map.
- Smith, H., 1879. *Brazil, the Amazons and the coast*, 644 pp., C. Scribner's Sons, New York.



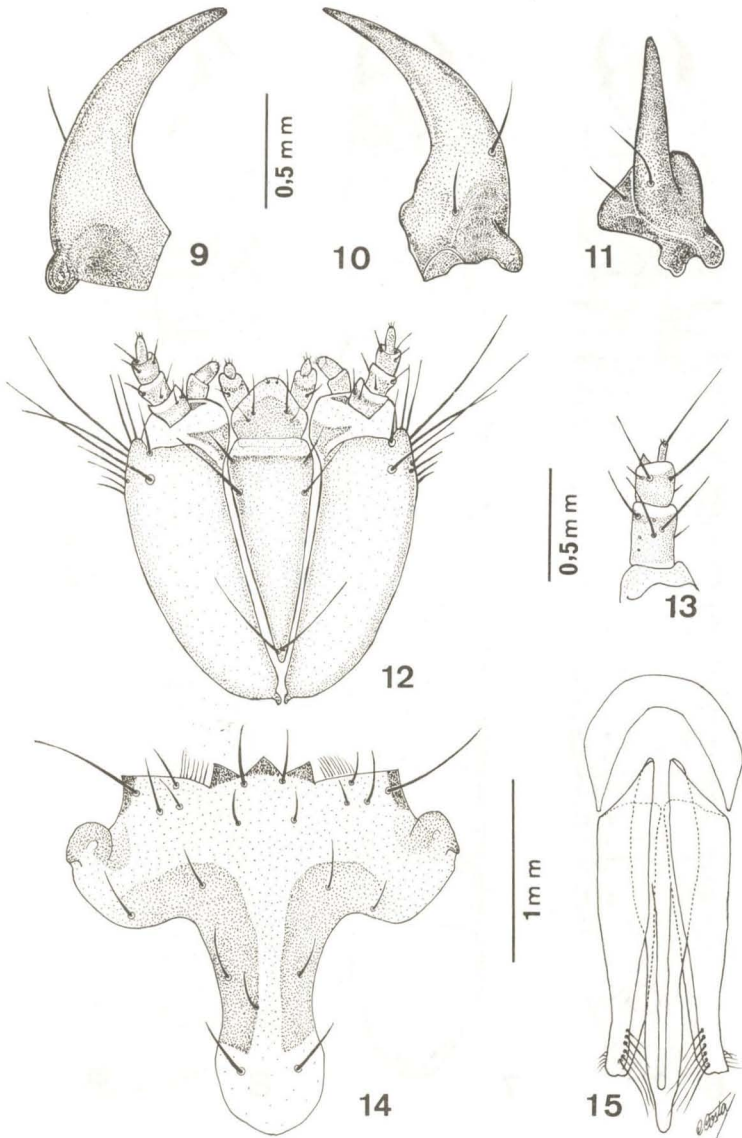
*Pyrearinus termittuminans*: 1. male, 2. female

*Alveta*





*P. termitilluminans*, 6-8, ventral, dorsal and lateral view of mature larva.



*Ptermitilluminans*: 9-11. mandible; 12. hypostoma; 13. antenna; 14. nasale; 15. male genitalia.