

# *Metapyrophorus pharolim* a new genus and species of Pyrophorini (Coleoptera, Elateridae, Agrypninae)

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**ABSTRACT.** *Metapyrophorus pharolim* a new genus and species of Pyrophorini (Coleoptera, Elateridae, Agrypninae). *Metapyrophorus*, a new monotypic genus, is erected based on *M. pharolim*, new species from Trinidad and Tobago and Venezuela. The genus is characterized mainly by its pair of convex pronotal bioluminescent organs, equidistant between the median line and the lateral margin.

**KEYWORDS.** Bioluminescence; click-beetles; Neotropical Region; systematic.

**RESUMO.** *Metapyrophorus pharolim*, gênero e espécie novos de Pyrophorini (Coleoptera, Elateridae, Agrypninae). O gênero monotípico *Metapyrophorus* é erigido com base na nova espécie *M. pharolim*, de Trinidad e Tobago e Venezuela. O gênero é caracterizado principalmente por um par de órgãos bioluminescentes convexos, localizados próximos da margem posterior do pronoto, equidistantes à linha mediana e à margem lateral.

**PALAVRAS-CHAVE.** Bioluminescência; Região Neotropical; sistemática; vaga-lumes.

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The second author (Costa) when studying the Pyrophorini found some specimens with peculiar characters and supposed that they could belong to unestablished genus. However, she did not erect it because the data were insufficient to make a decision concerning the relationships between those specimens and similar Pyrophorini.

Recently, the first author (Rosa PhD thesis, unpublished data) included those specimens in a cladistic analysis of Pyrophorini, and concluded that they should be included in a new genus, which is named here as *Metapyrophorus*. In that cladistic analysis this genus appears as a sister clade of *Pyrophorus* Billberg, 1820. Both genera share the loss of sexual dimorphism in the prothoracic shape, the convexity of the pronotal bioluminescent organs, the hypomera entirely pilose and a coiled anterior region of the bursa copulatrix. The taxon is recorded from Trinidad and Tobago and Venezuela.

Despite the close relationships between the genera *Metapyrophorus* and *Pyrophorus*, the former does not share the following *Pyrophorus* synapomorphies: the rectangular frons 1.2-1.3 times longer than wide, the very short (reaching half of the pronotal length) and strongly serrate antenna, the strongly convex body, the large bioluminescent organs, and the median longitudinal carina on ventral sclerite of the penis.

The terminology and measurements of ocular indices and density of body punctation follow Calder (1996). Material studied belongs to the following institutions: American Museum of Natural History, New York (AMNH); Muséum National d'Histoire Naturelle, Paris (MNHN), Sociedad de Ciencias Naturales La Salle, Caracas (SCNC) and Museo del Instituto de Zoología Agrícola, Facultad de Agronomía, Univ. Central, Maracay (MIZA).

## *Metapyrophorus* gen. nov.

**Diagnosis.** Frontal carina absent between antennal

insertions; region above antennal insertions carinate and strongly produced forwards; frontoclypeal region short, transverse, gradually sloping from base to labrum. Antennae 11-segmented, weakly serrate. Ocular indices 0.47 (ventral) and 0.43 (dorsal). Pronotum with a pair of small, suboval or circular and convex bioluminescent organs near the posterior margin, directed laterally and equidistant between the median line and the lateral margin, not visible on the hypomera. Ventral sclerite of penis well developed with a dorsal, longitudinal and elongate apodeme. Female larger than males, lateral margins of pronotum slightly more rounded, shorter antennae, abdominal luminescent organ smaller; reproductive tract with colleterial glands tubular, well developed; vagina with a pair of spiny sclerites; anterior section of bursa copulatrix tubular, coiled and with spines internally; spermathecae present, spiraled.

**Etymology.** *Metá* (Greek): prefix meaning change, altered, beyond. Relative to the close phylogenetic relationships between *Metapyrophorus* and *Pyrophorus*.

## *Metapyrophorus pharolim* sp. nov.

(Figs. 1–17)

**Description.** Male (Fig. 1). Body elongate weakly convex; with vestiture consisting of fine, short, dense and decumbent yellowish setae. Integument reddish brown except for a median longitudinal darker strip on pronotum and prosternum. Total length: 23.0–28.0 mm; elytra 3.1 times longer than prothorax; humerus 1.1 times wider than prothorax.

**Head** (Fig. 3). Frons concave, rectangular (1.2 times wider than long); frontal carina absent between antennal insertions; region above antennal insertions carinate and strongly produced forwards; frontoclypeal region short, transverse,

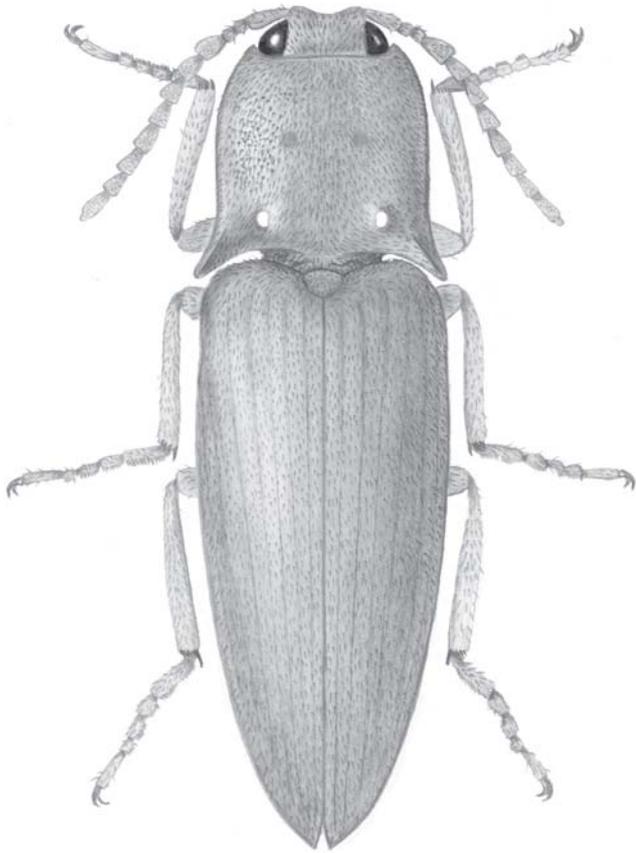


Fig. 1. *Metapyrophorus pharolim* sp. nov. Male. Dorsal habitus, length 23.0 mm.

gradually sloping from base to labrum, punctation fine, dense and umbilicate. Antenna (Figs. 1, 4) 11-segmented, weakly serrate from antennomere IV, reaching the posterior angle of pronotum on the antennomere XI; antennomere III 1.4 times longer than the II; antennomere IV 1.9 times longer than III. Indices of eye prominence 0.47 (ventral) and 0.43 (dorsal). Mouthparts prognathous moderately declined. Labrum strongly sclerotized, semicircular, strongly punctate and bearing long setae. Mandible with latero-dorsal face coarsely punctate, with long setae; inner margin with a subapical tooth, base with brush of hairs. Maxilla with membranous, densely pilose galea and lacinia; cardo and mediostipes with short and fine setae; basistipes with long and strong setae; maxillary palpi 4-segmented, last segment securiform. Labium with membranous prementum, with short setae; mentum with long setae and palpi 3-segmented, last segment securiform.

**Prothorax** (Figs. 1, 2, 5, 6) 1.1 – 1.2 times wider than long, parallel-sided, lateral margins entirely carinate. Pronotum slightly convex, with the median longitudinal third more convex, with a pair of small, suboval or circular and convex bioluminescent organs near the posterior margin, directed laterally and equidistant between the median line and the lateral margin, not visible on the hypomeron; pronotal disc with a pair of glabrous lateral small areas, generally slightly depressed;

punctation of medium size, dense and umbilicate on the disc; fine, dense and umbilicate on the lateral and posterior margins. Fore angles of pronotum acute, wide and produced; hind angles narrow, elongate, divergent and uncarinate. **Hypomeron** (Fig. 6) entirely pilose, with punctation fine, dense and umbilicate; posterior margin truncate, without spines. Notosternal suture straight. **Prosternum** (Fig. 5) elongate, produced forwards to form a “chin piece”; median longitudinal area strongly and sparsely punctate, lateral and anterior margins with smaller, dense and umbilicate punctation. Prosternal process with a subapical tooth. The length of posterior area to the tooth corresponds to 24-25% of the total length of the process.

**Scutellum** pentagonal, abruptly elevated above the mesoscutum level. **Mesoventrite** (Fig. 7) slightly sloping up posteriorly, with anterior articulating surfaces grooved and divided in two parts, one ventral and the other dorsal, the last one not visible beyond the ventral part; ventral part bisinuous. **Metanotum** with median posterior area with a longitudinal apodeme.

**Mesoventral cavity** (Fig. 7) deep, approximately 2.4 times longer than mesocoxal diameter, borders parallel-sided convergent between mesocoxae. Floor of mesoventral cavity with a median, short and narrow groove densely lined with short, golden setae above an elongated, narrow and shiny median band. Meso-metaventral suture distinct. **Mesepisternum** (Fig. 7) with a semicircular depression on the anterior margin, which is carinate posteriorly. Mesocoxal cavities (Fig. 7) slightly transverse, oblique, closed by mesepimeron and mesepisternum; mesotrochantin exposed. **Metaventrite** finely punctate, punctation dense and umbilicate, denser on lateral margins; discrimen long, almost reaching the anterior margin. Metacoxal plates well developed, slightly oblique (*ca.* 23° to the transverse axis of body), gradually narrowed outwards. Metepisternum *ca.* 6.7 times longer than wide.



Fig. 2. *Metapyrophorus pharolim* sp. nov. Prothorax (dorsal) (photo by Giro Pastore).

**Elytron.** Striae complete, weakly impressed, interstices flat, rough, finely and densely punctate; sides gradually tapering apicad; apex acute slightly divergent.

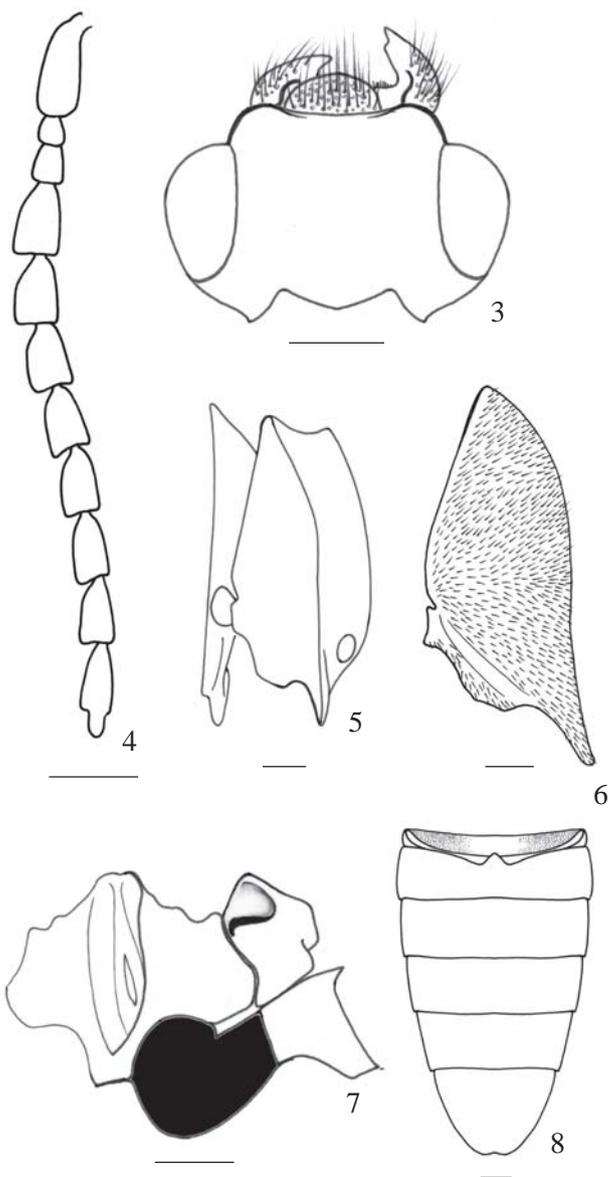
**Abdomen** (Fig. 8) gradually tapering apicad, with apex slightly emarginate; punctuation fine, dense and umbilicate, denser on lateral margins and on last ventrite posteriorly. First sternite weakly sclerotized, with a subtrapezoidal luminescent organ occupying *ca.* 1/3 of the sternite width. Tergite VIII (Fig. 13) evenly weakly sclerotized, V-shaped, almost straight at base, clothed with fine and short setae, longer on posterior and latero-distal borders. Sternite VIII (Fig. 14) transverse, partially membranous; anterior margin straight, emarginate at middle posteriorly, bearing short setae latero-posteriorly. Sternite IX and tergite X fused basally; sternite IX (Fig. 12) elongate, rounded at base and apex, apex bearing short setae latero-posteriorly. Tergites IX and X (Fig. 11) partially fused, tergite IX with anterior margin straight, posterior margin bilobate with several short setae latero-posteriorly; tergite X semielliptical.

**Leg** narrow and pilose. Tibia compressed laterally, apex with two small and subequal spurs and a row of spiniform setae on outer and inner margins; tarsomeres simple, obliquely truncate, ventrally densely pilose. Tarsal claws simple, with two strong elongate setae arising from the outer flat portion and a few ones finer and shorter on lateral and dorsal surfaces; empodium sclerotized with two strong setae.

**Hind wing.** Apical area 0.15 as long as the whole wing, bearing two narrow, oblique and convergent basad sclerotizations. Radial cell *ca.* 5.7 times as long as wide, with proximal, posterior angle straight; RP elongate almost reaching the wing base; CuA<sub>1</sub> cross-vein-like, between MP<sub>3+4</sub> and CuA<sub>2</sub>; medial area with 5 free veins (MP<sub>3</sub>, MP<sub>4</sub>+CuA<sub>1</sub>, CuA<sub>2</sub>, CuA<sub>3+4</sub>+AA<sub>1+2</sub> and AA<sub>3+4</sub>); wedge cell absent.

**Aedeagus** (Figs. 9, 10). Phallobase 1.4-1.6 wider than long, connected to parameres by a transparent membrane, generally with anterior margin more sclerotized and notched at middle. Paramere with apex obliquely truncate with latero-dorsal oblique carina, bearing several elongate setae ventrally and short dorsally; median base articulated to dorsal sclerite of penis through a medium process, ventrally they are not articulated. Penis with dorsal and ventral sclerites: dorsal sclerite gradually tapering to apex, with basal struts 0.35 as long as the total length of penis; ventral sclerite a little wider than the half width of the dorsal one, flat and with a longitudinal and elongate apodeme.

**Female.** Larger than males, shorter antenna, the abdominal apex rounded and the abdominal luminescent organ smaller (1/5 as wide as sternite I). Total length: 29.0-35.0 mm; elytra 3.0- 3.3 times longer than prothorax; humerus 1.1 times wider than prothorax. Tergite VIII (Fig. 15) V-shaped with anterior margin straight; covered with several short setae, longer on lateral and posterior margins. Sternite VIII (Fig. 16) partially sclerotized, with spiculum 0.7 as long as total sternite length; apical portion U-shaped, with several short setae, longer on posterior and lateral margins; fore lateral angles acute and prominent basad. **Ovipositor** (Fig. 17). Baculum as long as



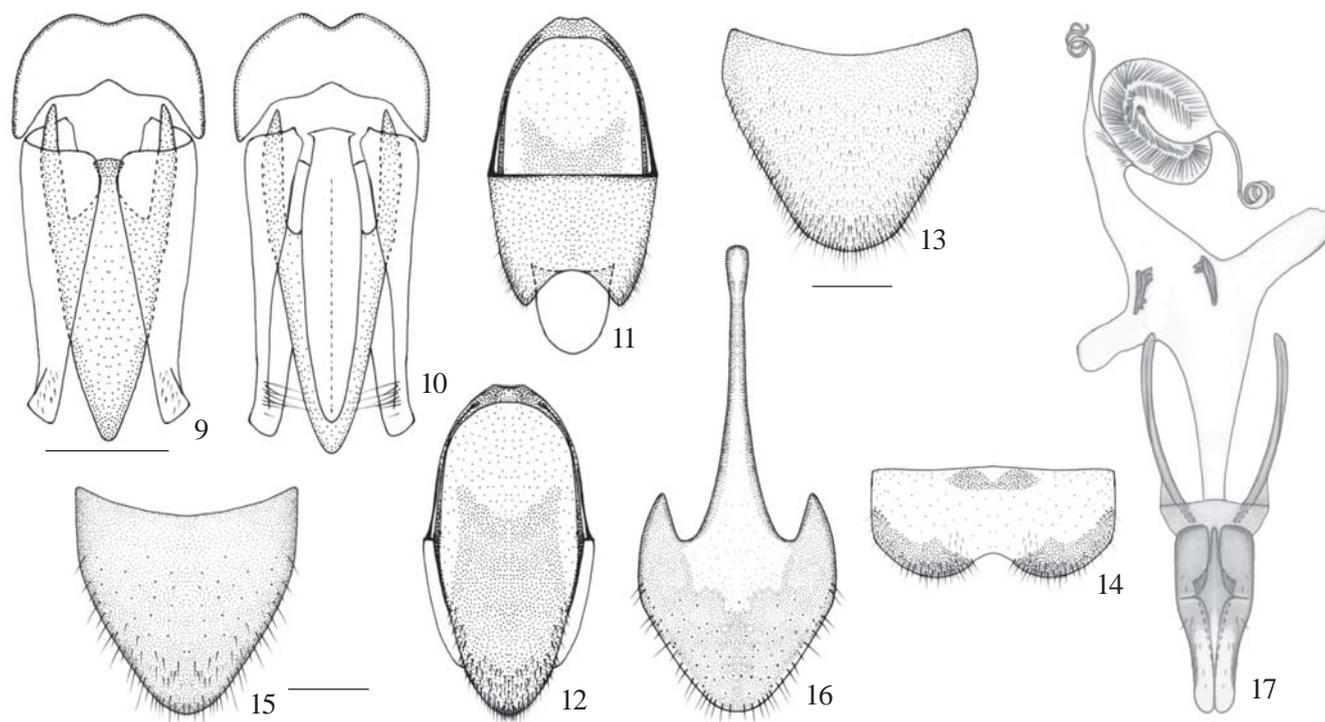
Figs. 3-8. *Metapyrophorus pharolim* sp. nov. Male. 3, head (dorsal); 4, antenna; 5, prothorax (lateral); 6, hypomeron; 7, mesothorax (latero-ventral); 8, abdomen (ventral). Scale: 1.0 mm.

coxites, strongly sclerotized; coxites partially sclerotized with several short setae. **Reproductive tract.** Colleterial glands well developed, approximately 3 times longer than wide. Vagina with a pair of strongly sclerotized and spiny sclerites near the colleterial glands. Anterior section of bursa copulatrix tubular coiled, with rows of several elongate spines internally. Spermathecae moderately elongate, spiraled.

**Distribution.** Trinidad and Tobago, Venezuela.

**Holotype male.** TRINIDAD AND TOBAGO. Caparo [without date], A. Heyne, Berlin-Wilm, Coll. Fleutiaux (MNHN).

**Paratypes (4 males, 2 females).** TRINIDAD AND TOBAGO. Same data of holotype, 1 male and 1 female (MNHN); St. Ann's, Port of Spain, 28.VI.1957, M. Nieves coll., 1 male (AMNH). VENEZUELA. Falcón: Morrocoy, 31.III.1958, T. F. A. coll., 1 male. (SCNC). Monagas,



Figs. 9-17. *Metapyrophorus pharolim* sp. nov. Male. 9, 10, aedeagus (dorsal, ventral); 11, tergites IX and X; 12, sternite IX; 13, tergite VIII; 14, sternite VIII. Female. 15, tergite VIII; 16, sternite VIII; 17, ovipositor and reproductive tract. Scale: 1.0 mm.

05.VI.1967, Jasepin, 1 female (MIZA). Bolivar: S. Nuria, 3 Chorros, 26.V.1975, B. Bechyne coll., 1 male, (MIZA).

**Taxonomic discussion.** *Metapyrophorus pharolim* possesses some noticeable, although not exclusive, autapomorphies. The longitudinal apodeme on the ventral sclerite of penis occurs independently in *Compsoplinthus* Costa, 1975 and in some species of *Fulgeochlizus* Costa, 1975. The pair of spinose sclerite posteriorly to colleterial glands of female reproductive tract is also observed in some species of *Pyrearinus* Costa, 1975 and Hapsodrilina (*sensu* Costa, 1975). The strongly convex pronotal bioluminescent organs directed laterally also occur in *Pyrophorus tuberculifer* Eschscholtz, 1829. The combination of those autapomorphies, the produced region above antennal insertions and the pair of convex vesicles equidistant between the medium line and the lateral posterior margin easily distinguish this species from any other Pyrophorini.

**Etymology.** *Pharolim* (Latin): small lighthouse. Relative to the pair of small and convex bioluminescent organs of the pronotum.

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