

Subfamily Orphninae  
Erichson, 1847

## The Orphnine Beetles



<http://www.pbase.com/image/58352336>

*Orphnus* sp., Myanmar

# Orphninae Diversity

- A poorly known group, and species diversity is not well addressed. Arrow (1912) and (Paulian 1984) include about 80 species in the entire subfamily; Frolov (2005) included more than 100 species in Africa alone.
- Includes 2 tribes: Aegidiini Paulian, 1984 and Orphnini Erichson, 1847.
- The tribe Aegidiini is distributed in the New World and includes four genera. The tribe Orphnini is distributed in the Old World and includes 10 genera (Arrow 1912).

# Orphninae Biology

## **Ecology:**

Little is known of the ecology and biology of this small group of scarabs. In the New World, adults are collected at low- to mid-elevations. They have been observed on banana and cacao plantations on banana stems and have been collected in flight intercept traps.

## **Larvae:**

Morón (1991) described the larva of *Aegidium cribratum*. It was found under rotting logs.

## **Collecting:**

Some species have a narrow range of activity—only flying to lights at dusk. For New World taxa, flight intercept traps are possibly the best way to collect representatives of this group.

# Classification and Distribution

- The name Orphninae was erected by Erichson (1847).
- Paulian (1984) elevated the Orphninae to family-level status and created a new subfamily, the Aegidiinae for the New World taxa. We follow Lawrence & Newton (1995) and treat the group as a subfamily of the family Scarabaeidae.
- Includes the tribes Aegidiini Paulian, 1984 and Orphnini Erichson, 1847.
- The Orphninae (Coleoptera: Scarabaeidae) are a small subfamily of scarab beetles. Arrow (1912) listed some 80 species in the entire subfamily, while Frolov (2005) included more than 100 species in Africa alone.
- Distribution: Members of the Orphninae are found in the New World (four genera) and the Old World (ten genera) (Arrow 1912; Paulian 1984). The New World genera occur from southern Mexico to Bolivia, including some of the Caribbean Islands. The Old World genera occur from southern Europe to South Africa and east into Myanmar and Thailand.

# Relationships and Phylogeny

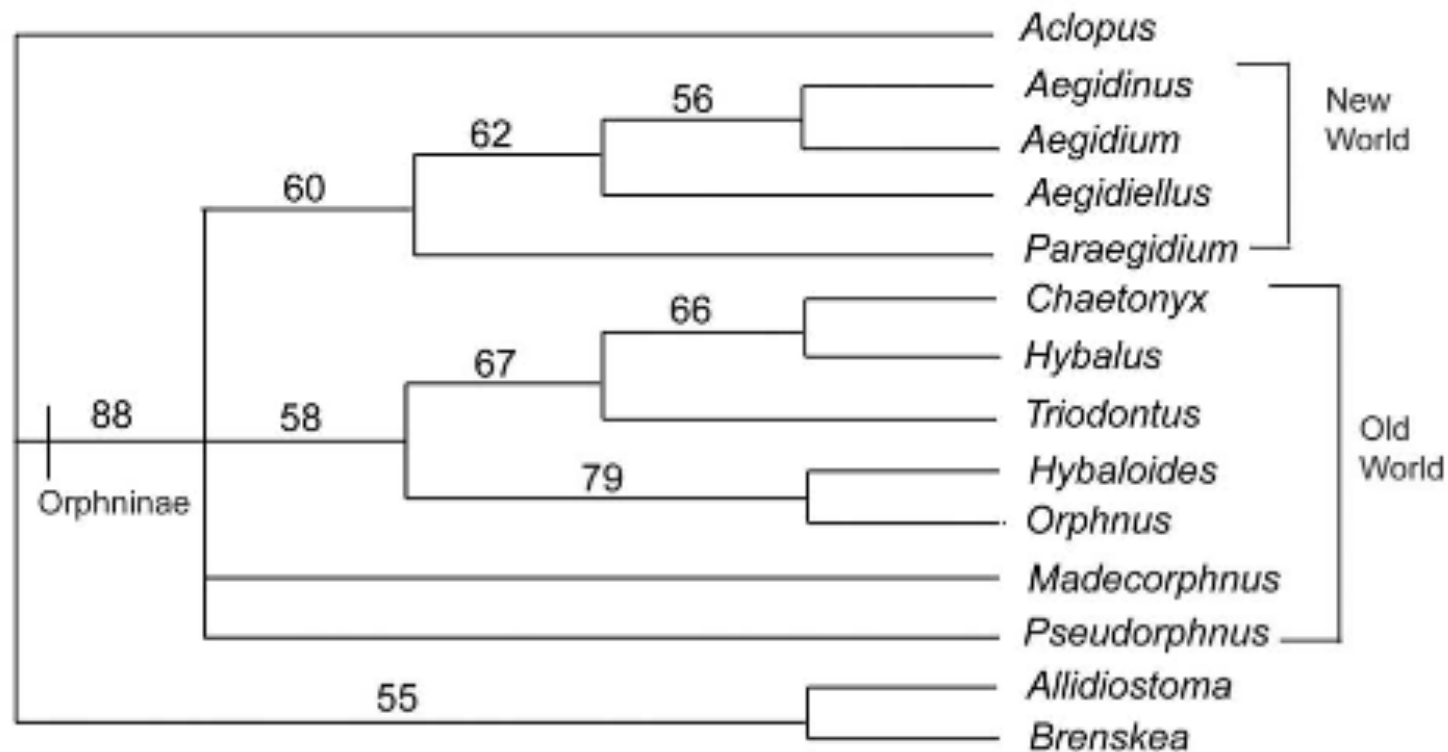
- The Orphninae resemble members of the Hybosorinae based on the prominent mandibles and labrum.
- Arrow (1911) commented that the Orphninae share a pectinate tibial spur (which we have not observed in New World taxa) with the Ochodaeidae.
- Scholtz & Chown (1995) hypothesized that the Orphninae is a member of the Scarabaeidae and is basal to the clade that includes the subfamilies Melolonthinae, Dynastinae, Rutelinae, Cetoniinae, Trichiinae, and Valginae.
- Based on larval characters, Paulian & Lumaret (1982) hypothesized that the Orphninae are intermediate between the "laparostict" and "pleurostict" scarabs and show some convergences with certain tribes of Melolonthinae.
- In a more recent phylogenetic analysis based on larval characters Grebennikov & Scholtz (2004) were not able to establish the phylogenetic relationships of the Orphninae (it was part of a polytomy).
- Phylogenetic analyses based on molecular data suggest that the Orphninae is sister to the Allidiostomatinae (Scarabaeidae).

# Orphninae Erichson 1947

## Clasificación y Relaciones filogenéticas

- Scholtz & Chown (1995) hipotetizaron que los Orphninae serían miembros de Scarabaeidae, como un clado basal dentro de la familia.
- Paulian & Lumaret (1982), sobre la base de caracteres larvales, hipotetizaron que los Orphninae son intermedios entre los escarabajos “laparosticticos” y los “pleurosticticos”.
- Análisis filogenéticos recientes basados en datos moleculares y evidencia morfológica muestran a Orphninae como grupo hermano de Allidiostomatinae.

# Relationships and Phylogeny



**Figure 30.** Strict consensus tree of the Orphninae showing separate Old and New World clades (excludes *Stenosternus costatus* and *Goniorphnus felschei*). Bootstrap values are shown on tree.

Colby 2009

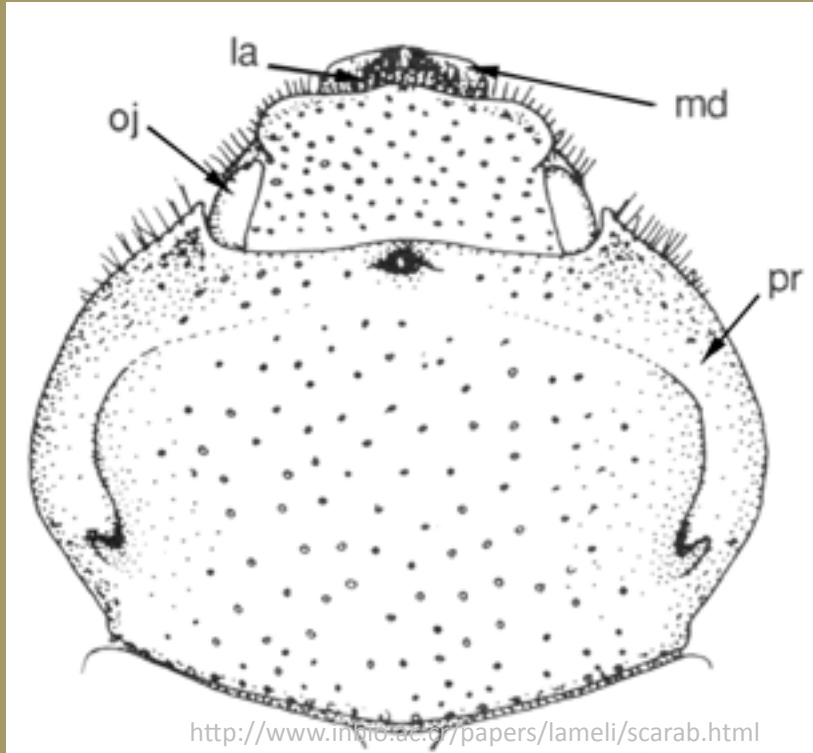
## Phylogeny of Orphninae based on morphological characters.

# Orphninae Characters

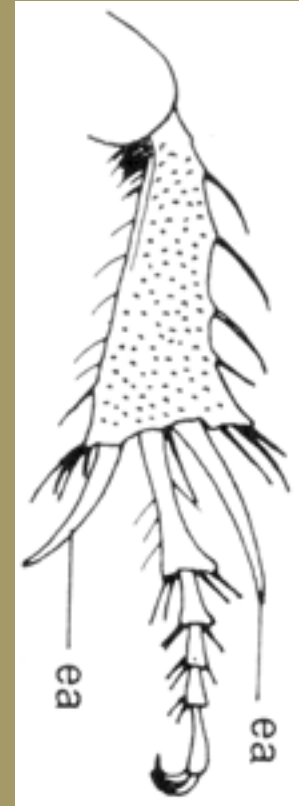
- Form elongate oval.
- Labrum and mandibles prominent, produced beyond apex of clypeus, clypeus with or without horn.
- Antenna with 10 segments, antennal club with 3 tomentose segments.
- Anterior coxae transverse.
- Pronotum with or without horn-like lateral or anterior projections.
- Scutellum exposed.
- Metasternum longer than abdominal sternites.
- Metatibia with apical spines separated by basal metatarsal segment.
- Tarsal claws on all legs not independently movable, claws equal in length or size. Onychium cylindrical with 2 setae.
- Pygidium exposed weakly beyond apices of elytra.



# What is an Orphnine?



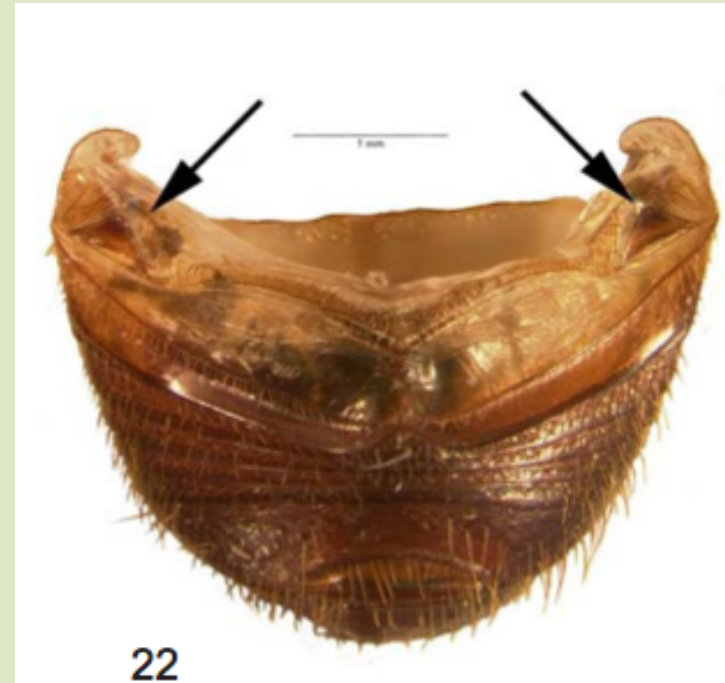
Prothorax and head of *Aegidium* sp.  
(la= labrum; md= mandible; oj= eye;  
pr= prothorax).



Dorsal view of the  
metafemur of *Aegidium* sp.  
showing the apical spurs (ea  
= apical spurs).

# What is an Orphnine?

- Uñas tarsales simples, del mismo tamaño (no son independientemente móviles).
- Apratato estridulador presente (metacoxas – 1er esternino abdominal).
- Genitalia del macho simétrica o asimétrica, parámetros complejos.
- *Spiculum gastrale* desarrollado o no.



# What is an Orphnine?



Fig. 4. Head (dorsal view) of *Aegidinus* sp. Arrow on right points to labrum, arrow on left indicates mandibles.

Mandibles produced beyond apex of the clypeus

# Orphnine Characteristics

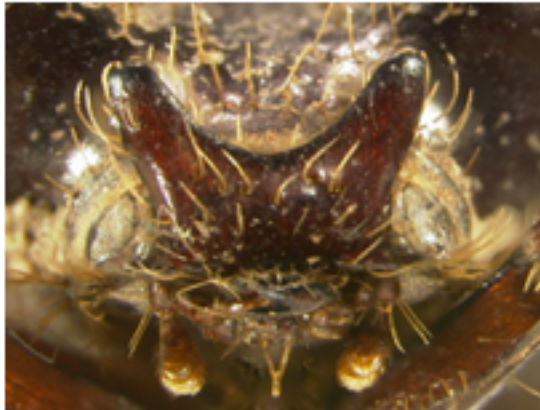


Fig. 1. Head (frontal view) of male *P.costalimai* showing bifurcate clypeus.



Fig. 2. Pronotal sculpturing of *P.costalimai*.

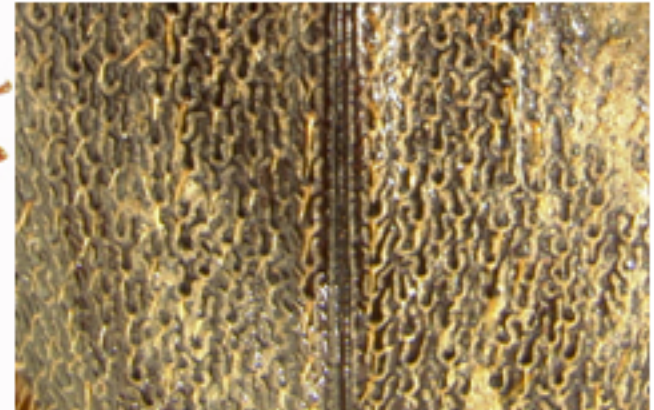


Fig. 3. Elytral sculpturing of *P.costalimai*.

Form of the clypeal apex (with or without a bifurcated process).

Dorsal sculpturing and distribution of setae.

# Orphnine Characteristics



Fig. 5. Mesofemur (ventral view) of *Aegidium* sp. Arrow indicates ridge.



Fig. 6. Mesofemur (ventral view) of *Aegidiellus alatus*. Arrow indicates absence of ridge.

Presence or absence of a mesofemural ridge.



*Aegidium* Westwood, 1846



Major male *Aegidium* sp.



Minor male *Aegidium* sp.



Female *Aegidium* sp.

## *Aegidium* Westwood, 1846

Distribution: Neotropical realm. Mexico, Guatemala, Belize, Honduras, Nicaragua, Costa Rica, Panama, Guadeloupe, Dominica, St. Vincent, Colombia, Venezuela, Guyana, French Guiana, Ecuador, Peru, Brazil, Bolivia.

Biology: Life history is largely unknown. Adults of *Aegidium cribratum* Bates have been reported feeding on decaying banana stems and have been found in soil under rotting logs (Morón 1991).

Larvae: Larvae: Morón (1991) described the third instar larvae and the pupae of *Aegidium cribratum*.

Composition: 12 species.





***Aegidiellus* Paulian, 1984**



Major male *Aegidiellus alatus*



Minor male *Aegidiellus alatus*



Female *Aegidiellus alatus*



## ***Aegidiellus* Paulian, 1984**

Distribution: Neotropical realm. Brazil.

Description: Length 9-11 mm. Pronotum with median, laterally compressed boss or horn at anterior edge. Females with fovea posterior to horn or boss. Major males with erect horns; horns  $90^\circ$  from plane of disc, widely separated, slightly recurved at apices; horns reduced to rounded tubercles in minor males. Area between horns slightly depressed to foveate.

Biology: Life history is unknown.

Larvae: The larval stage is unknown.

Composition: 1 species.



*Paraegidium* Vulcano, Pereira, and Martínez, 1966



Major male *P. costalimai*



Minor male *P. costalimai*



Female *P. costalimai*

***Paraegidium* Vulcano, Pereira, and Martínez, 1966**

Distribution: Neotropical realm. Brazil and Peru.

Description: Length 8mm or less. Color brown, black, or grey. Males with clypeus reflexed and bifurcate. Females with clypeus slightly reflexed, not bifurcate. Pronotum densely punctate, punctures vermicular to U- shaped. In some males, pronotum on sides produced into two forward projecting horns; females never with horns. Elytra densely punctate; punctures U- shaped, with a single seta at center.

Biology: Life history is unknown.

Larvae: The larval stage is unknown.

Composition: 1 species.





***Aegidinus* Arrow, 1904**



Major male *Aegidinus* sp.



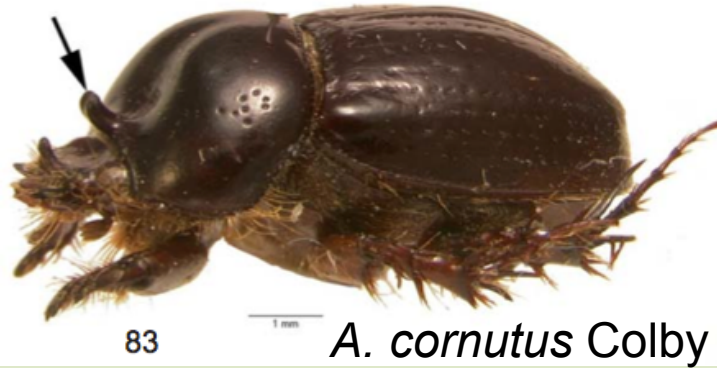
Minor male *Aegidinus* sp.



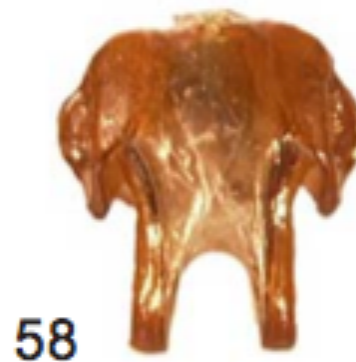
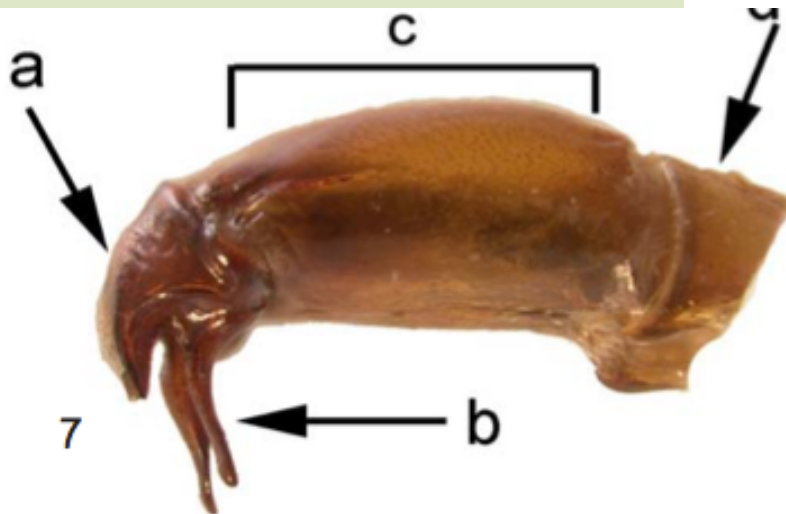
Female *Aegidinus* sp.

## *Aegidinus* Arrow, 1904

- [\*Aegidinus\*](#) Arrow 1904. Incluye 15 especies de Colombia, Trinidad, Venezuela, Guayana, Guayana Francesa, Ecuador, Perú, Brasil, Bolivia y Argentina. Revisión: Colby 2009.



*A. oribates* Colby



## *Aegidinus* Arrow, 1904

Distribution: Neotropical realm. Trinidad, Colombia, Venezuela, Guyana, Ecuador, Peru, Brazil, Bolivia.

Description: Length 7-12 mm. Color brownish red to reddish brown. Both sexes with exerted, semicircular labrum and external, lateral lobe on mandibles. Major males with medial horn on anterior border of clypeus; females without horn. Anterior margin of pronotum (males) with slightly transverse, median tubercle (may be produced into horn) or not. Pronotum with central fovea, each basolateral edge raised into carina or low, rounded tumosity in males.

Biology: Life history is unknown.

Larvae: The larval stage is unknown.

Composition: 3 species.





## Orphnini



*Hybalus cornifrons* (Brullé, 1833), Greece

## Orphnini



<http://www.biolib.cz/en/image/id123805/>

*Hybalus cornifrons* (Brullé, 1833), Greece



# Resources

Colby, J. 2009. Monographic revision of the genus *Aegidinus* Arrow (1904) and generic phylogeny of the world Orphninae (Coleoptera: Scarabaeidae: Orphninae). *Insecta Mundi* 0076: 1-41.

Paulian, R.1984. Les Orphnidae Américains (Coléoptères, Scarabaeiodea). *Annales de la Société Entomologique de France* (N.S) 20:65-92.

Arrow, G. J. 1912. Scarabaeidae: Pachypodinae, Pleocominae. Aclopiniae. Glaphyrinae, Ochodaeinae, Orphninae, Idiostominae, Hybosorinae, Dynamopinae, Acanthocerinae, Troginae. *Coleopterorum Catalogus pars 43. W. Junk, Berlin. 66 pp.*

Jameson, M.L. and F.C. Ocampo. Scarabaeidae. Orphninae Erichson 1847. Orphnine beetles. <http://www-museum.unl.edu/research/entomology/Guide/Scarabaeoidea/Scarabaeidae/Orphninae/Orphninae-Overview/OrphninaeO.html>

Solis, Angel. 2011. LA SUPERFAMILIA SCARABAEOIDEA DE COSTA RICA. Familia Scarabaeidae. Grupo I de Subfamilias (Pleurosticti). <http://www.inbio.ac.cr/papers/lameli/scarab.html>