

EPIGEAN TENEBRIONIDS (COLEOPTERA: TENEBRIONIDAE) FROM THE CHOROS ARCHIPELAGO (COQUIMBO REGION, CHILE)¹

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ABSTRACT: Using pitfall traps, we studied the taxonomic diversity of epigean tenebrionids in the Choros Archipelago, formed by the Choros, Damas and Gaviota Islands, which are part of the Pingüino de Humboldt National Reserve. We identified fourteen species arranged in eight genera and six tribes, of which seven species were common to the archipelago. Five genera are reported for the first time as occurring in insular habitat islands: *Psectrascelis* Solier, *Entomochilus* Solier, *Diastoleus* Solier, *Scotobius* Germar, and *Thinobatis* Eschscholtz, *Gyriosomus granulipennis* Pizarro-Araya and Flores is recorded as endemic to the Choros Island.

KEY WORDS: Coastal desert, coastal dunes, islands, epigean, Chile, Coleoptera, Tenebrionidae, Choros Archipelago, Coquimbo Region, winglessness

The Pingüino de Humboldt National Reserve is located on the coastal border between the Huasco (Atacama Region) and Elqui (Coquimbo Region) provinces of Chile, comprising a total area of 859.3 ha. Created in 1990, it forms part of the country's National System of Protected Wild Areas (SNASPE by its Spanish acronym). Part of this reserve encompasses the Choros Archipelago, which includes three islands (Fig. 1): Choros (29° 15' S, 71° 32' W), with a surface of 322 ha; Damas (29° 13' S, 71° 31' W), with a surface of 56 ha, and Gaviota (29° 15' S, 71° 28' W), with a surface of 182 ha. These islands are located in the north-western end of the Punta Choros area, in the Coquimbo Region (Castro and Brigardello 2005).

These insular ecosystems are within the transitional coastal desert (TCD, 25-32° S), which is characterized by the presence of a particular arthropod fauna in terms of specific richness (Cepeda-Pizarro et al., 2005a, 2005b, Pizarro-Araya et al., 2008, Valdivia et al., 2008) and endemisms (Jerez 2000, Pizarro-Araya and Flores 2004, Pizarro-Araya and Jerez 2004).

Among epigean arthropods, tenebrionids (Coleoptera) are a characteristic group of the insect fauna of arid and semiarid ecosystems (Deslippe et al., 2001), in which both adults and immature stages play an important role in the fragmentation process of plant debris, in nutrient cycles, and in the diet of other consumer organisms, mainly vertebrates (Crawford et al., 1993). Knowledge of Tenebrioni-

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Table 1. Percent relationships of Tenebrionidae species present in the Choros Archipelago (Coquimbo)

| | | Islands | | | |
|----------------|--|------------|------------|------------|------------|
| | | Choros | | Damas | |
| Tribe | Species | n | % | n | % |
| Nycteliini | <i>Gyriosomus elongatus</i> Waterhouse | 0 | 0 | 2 | 1.9 |
| | <i>Gyriosomus granulipennis</i> Pizarro-Araya and Flores | 15 | 10.5 | 0 | 0 |
| | <i>Psectrascelis elongata</i> Solier | 0 | 0 | 0 | 0 |
| Physogasterini | <i>Entomochilus pilosus</i> Solier | 0 | 0 | 0 | 0 |
| | <i>Entomochilus</i> sp. | 4 | 2.8 | 0 | 0 |
| Praocini | <i>Praocis (Praocis) spinolai</i> Gay and Solier | 45 | 31.5 | 7 | 6.7 |
| | <i>Praocis (Mesopraocis) pilula</i> Laporte | 1 | 0.7 | 17 | 16.2 |
| | <i>Praocis (Mesopraocis) flava</i> Kulzer | 0 | 0 | 0 | 0 |
| | <i>Praocis (Postpraocis) curtisi</i> Solier | 3 | 2.1 | 11 | 10.5 |
| Thinobatini | <i>Thinobatis melcheri</i> Freude | 0 | 0 | 3 | 2.9 |
| | <i>Thinobatis simplex</i> Peña | 32 | 22.4 | 1 | 1.0 |
| Scotobiini | <i>Diastoleus girardi</i> Peña | 17 | 11.9 | 11 | 10.5 |
| | <i>Scotobius bullatus</i> Curtis | 15 | 10.5 | 22 | 21.0 |
| Eleodini | <i>Nycterinus (Paranycterinus) rugiceps</i> Curtis | 11 | 7.7 | 27 | 25.7 |
| Unknown Tribe | Unidentified larvae | 0 | 0 | 4 | 3.8 |
| Total | | 143 | 100 | 105 | 100 |

bo Region, Chile) and the geographic distribution in the continent.

| Gaviota | | Total and Percentage for the Sampling Period | | Distribution | Geographic location Continental Chile |
|------------|------------|--|------------|------------------------------------|--|
| | | n | % | | |
| 0 | 0 | 2 | 0.4 | Chañaral de Aceituno to Los Choros | 29° 02' 00" - 29° 21" S |
| 0 | 0 | 15 | 2.7 | Choros Island | 29° 15' S, 71° 32' W |
| 2 | 0.6 | 2 | 0.4 | Huasco to Socos | 28° 13' 00" - 30° 42' 32" S |
| 1 | 0.3 | 1 | 0.2 | Copiapó to Santiago | 27° 27' 30" - 33° 28' 0.6" S |
| 0 | 0 | 4 | 0.7 | Choros Island | 29° 15' S, 71° 32' W |
| 43 | 13.8 | 95 | 17.0 | Huasco to Socos | 28° 13' 00" - 30° 42' 32" S |
| 15 | 4.8 | 33 | 5.9 | Copiapó to Totalillo | 27° 27' 30" - 29° 30' 47" S |
| 1 | 0.3 | 1 | 0.2 | Gaviota Island to Caleta Limarí | 29° 15' 40"- 30° 39' 08" S |
| 19 | 6.1 | 33 | 5.9 | Caldera to Totalillo | 27° 03' 00" - 29° 30' 47" S |
| 0 | 0 | 3 | 0.5 | Huasco to Choros Bajos | 28° 13' 00" - 29° 17' 00" S |
| 24 | 7.7 | 57 | 10.2 | Quebrada Honda to La Pampilla | 29° 35' 07" - 29° 57' 15" S |
| 1 | 0.3 | 29 | 5.2 | Las Lozas to Choros Bajos | 28° 34' 12" - 29° 17' 00" S |
| 34 | 10.9 | 71 | 12.7 | Los Choros to Concepción | 29° 21' 00" - 36° 49' 43" S |
| 167 | 53.5 | 205 | 36.6 | Caldera to Talca | 27° 03' 00" - 35° 25' 21" S |
| 5 | 1.6 | 9 | 1.6 | | |
| 312 | 100 | 560 | 100 | | |

dae for the TCD is limited to the report by Cepeda-Pizarro et al. (2005a), who documented the presence of 20 species belonging to 14 genera in the northern area between 27-30° S. Because these islands represent one insular ecological unit within the TCD, the objective of this paper is to record the taxonomic diversity of epigeal tenebrionids in the Choros Archipelago.

METHODS

The study was conducted in the Choros Archipelago (Fig. 1). Insects were captured with pitfall traps, containing formaline and water, that operated for three consecutive days during August, October, and December of 2006. On each island we sampled by means of three groups of 20 pitfalls, each arranged according to Cepeda-Pizarro et al. (2005a, 2005b). The collected material was preserved in alcohol (70%) until it was processed, mounted, and later deposited in the following collections: Laboratorio de Entomología Ecológica, Universidad de La Serena, Chile (LEULS) and Laboratorio de Entomología, Instituto Argentino de Investigaciones de Zonas Áridas, Mendoza, Argentina (IADIZA).

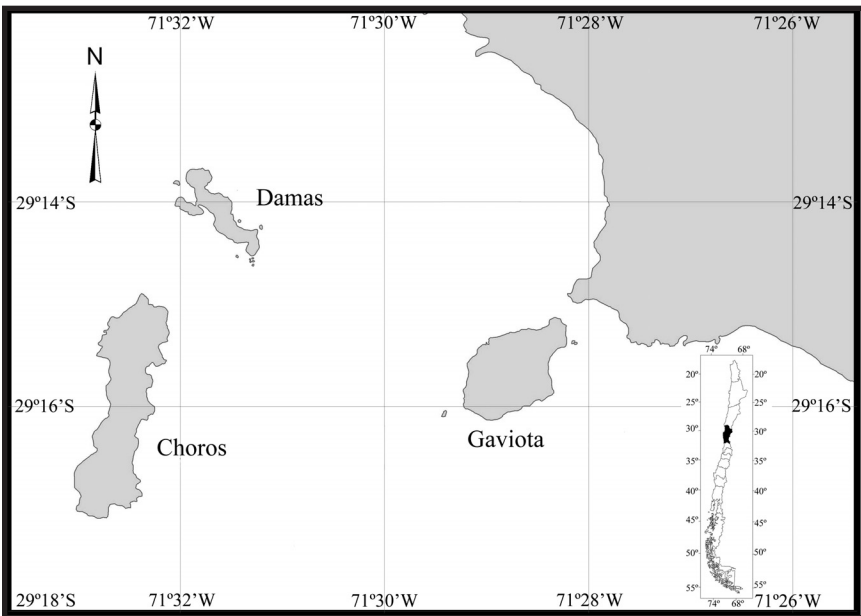


Fig. 1. Geographic location of the Choros Archipelago in the transitional coastal desert of Chile: Choros Island (29° 15' S, 71° 32' W), Damas Island (29° 13' S, 71° 31' W), and Gaviota Island (29° 15' S, 71° 28' W).

RESULTS AND DISCUSSION

A total of 560 specimens were collected, belonging to 14 wingless species arranged in 8 genera and 6 tribes (Table 1). Five genera are reported for the first time as occurring in islands: *Psectrascelis* Solier, *Entomochilus* Solier, *Diastoleus* Solier, *Scotobius* Germar, and *Thinobatis* Eschscholtz. These islands share seven species, of which *Nycterinus* (*Paranycterinus*) *rugiceps* Curtis and *Praocis* (*Praocis*) *spinolai* Gay and Solier (Figure 2, back cover) were the most abundant, making up 53.6% of the total capture (Table 1). *Praocis* Eschscholtz was the most diverse genus of Tenebrionidae, with four sympatric species arranged in three subgenera for all three islands, associated mainly with dune systems. *Gyriosomus* Guérin-Méneville was represented by two species: *G. elongatus* Waterhouse, captured only in sandy substrates on Damas Island, and *G. granulipennis* Pizarro-Araya and Flores, collected only in dune systems of Choros Island, which represents the only endemic species of these islands. This agrees with Pizarro-Araya and Flores (2004), who described this species as endemic to Choros Island. The presence of this species of Nycteliini reinforces the idea of considering TCD as a biogeographic area with a unique fauna in terms of diversity and endemisms (Jerez 2000, Pizarro-Araya and Jerez 2004, Cepeda-Pizarro et al., 2005a, 2005b).

The 14 species inhabiting these three islands belong to the group of tenebrionids associated with soil or sand mentioned by Sánchez-Piñero and Aalbu (2002). In the Choros Archipelago there are not species belonging to the second group, tenebrionid associated with trees. Studying the tenebrionid fauna of desert islands in the Sea of Cortez (Mexico), Sánchez-Piñero and Aalbu (2002) distinguished three groups according to their adaptation to arid conditions. Most of the species found in the Choros Archipelago (Pimeliinae: Nycteliini, Physogasterini, Praocini and Thinobatini) (Table 1) belong to the first group, named most highly adapted to arid conditions (wingless and lacking defensive glands), and few species (Tenebrioninae: Scotobiini and Eleodini) belong to a second group named highly adapted, which are wingless but have retained defensive glands (Table 1).

In dune systems of the archipelago we captured larvae of the genera *Praocis* and *Gyriosomus* in different stages. The preference for sandy places by species belonging to these two genera agrees with observations by Pizarro-Araya et al. (2005, 2007) in that such habitats allow for deeper ovipositions.

The limited distribution of these endemic taxa allows for a greater likelihood of extinction (Myers et al., 2000); for this reason, the establishment of areas of endemism is a basic tool for the conservation of biodiversity (Szumik et al., 2002). Knowledge of the taxonomic records resulting from the present study is essential for the general recording of the insect fauna of the archipelago. The restricted distribution of certain tenebrionid species in an archipelago can be a rarity indicator, which provides a basic criterion to identify species in need of conservation (Fattorini 2008).

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