



Three new Praociini (Coleoptera: Tenebrionidae) from Peninsula Valdés (Argentina), with zoogeographical and ecological remarks

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Abstract

Three new taxa from Peninsula Valdés (Argentina) are described for the tribe Praociini (Pimeliinae): *Calymmophorus peninsularis* **sp. nov.** and two subspecies of *Praocis* (*Hemipraocis*) *sellata* Berg 1889: *P. (H.) sellata peninsularis* **ssp. nov.** and *P. (H.) sellata granulipennis* **ssp. nov.** The first two taxa are endemic to the peninsula and the third one is distributed in and outside the peninsula. Distribution maps, habitat records and habitus photographs for these three new taxa are included, with comparisons to other known species of the genera. An identification key to the five subspecies of *Praocis* (*Hemipraocis*) *sellata* is provided. A discussion is presented on endemism and sympatry of two species of *Calymmophorus* Solier 1840, and non-sympatry of two subspecies of *Praocis* (*Hemipraocis*) *sellata*. The following synonymy is reported and illustrated: *Praocis sellata bruchi* Kulzer 1958 = *Praocis sellata topali* Kaszab 1964 syn. nov.

Key words: Coleoptera, Tenebrionidae, Praociini, new taxa, endemism, sympatry

Introduction

Peninsula Valdés is located on the Atlantic coast of Chubut province, Argentina. It is considered part of different biogeographic provinces by different authors; some include it in Patagonia (Soriano 1956; Morrone *et al.* 2002) while others place it in the Monte (Cabrera & Willink 1980; Roig-Juñent *et al.* 2001; Roig *et al.* 2009). One characteristic of the ground-beetle fauna of Patagonian steppes is the dominance of Curculionidae, Carabidae and Tenebrionidae; the last family is mainly represented by the Neotropical tribes Nycteliini, Praociini and Scotobiini (Kuschel 1969). A recent pit-fall trap study of the ground-dwelling arthropod community in Peninsula Valdés revealed that the most abundant family both in number of individuals and species is Tenebrionidae (43.1 % of the individuals and 43.2 % of the species of Coleoptera) (Cheli *et al.* 2010). Human activities, especially cattle farming and grazing, have caused significant changes in Peninsula Valdés in both flora (Bertiller *et al.* 1981; Elissalde & Miravalles 1983) and soil features (Rostagno 1981; Bouza *et al.* 2008). Despite the inclusion of this natural area in UNESCO's World Heritage List since 1999, these human-induced disturbances continue to this day. Vertebrate and invertebrate fauna have likewise been altered (Cheli 2009; Nabte 2010). In the case of terrestrial arthropods, clear signs of serious alterations have been recorded both in the composition of their species assemblages and in their trophic structure, particularly from grazing (Cheli 2009; Cheli *et al.* 2010). For these reasons, those species inhabiting the soil need to be known to achieve a complete inventory of the biota and to elucidate the species richness and composition of ground-dwelling arthropod communities.

Praociini (Tenebrionidae: Pimeliinae) is a tribe endemic to Southern South America. The tribe includes 14 genera and 148 known species (Flores & Chani-Posse 2005; Flores & Vidal, 2009). Praociini is distributed from central Peru to Southern Argentina and Chile, and beetles from this tribe inhabit arid and semiarid lands. Endemic genera or subgenera to Patagonian steppes are *Platesthes* Waterhouse, *Praocis* (*Hemipraocis*) Kulzer, *Praocis* (*Praonoda*) Kulzer, *Patagonopraocis* Flores & Chani-Posse, and the monotypic *Neopraocis* Kulzer and *Asidelia* Fairmaire (Flores & Chani-Posse 2005). Since 2005 we have conducted several trips to Peninsula Valdés and col-

lected specimens of 25 species of epigean Tenebrionidae, of which seven are included in Praociini (Carrara *et al.*, in press).

The genus *Praocis* Eschscholtz 1829 (Praociini) comprises 77 species and 7 subspecies arranged in ten subgenera, distributed from central Peru to the southern part of Patagonia in Argentina and Chile (Kulzer 1958). The subgenus *Hemipraocis* comprises four known species (Kulzer 1958; Flores 2007, 2009) of which *Praocis* (*Hemipraocis*) *sellata* Berg 1889 includes four subspecies, one of which is synonymized here. These species inhabit the southern Monte and Patagonia biogeographic provinces (Flores & Chani-Posse 2005) surrounding Peninsula Valdés.

Calymmophorus Solier 1840 (Praociini) is comprised of five species (Kulzer 1958), all of which are endemic to Argentina (Flores 1998). Among these five species, four are distributed in the Monte biogeographic province which surrounds Peninsula Valdés and the remaining species inhabits the Chacoan Plain (Roig Juárez *et al.* 2003).

The objectives of this study are to describe three new taxa of Praociini from Peninsula Valdés: a new species of *Calymmophorus* and two new subspecies of *Praocis* (*Hemipraocis*) *sellata* Berg, to provide both distributional and habitat records together with biogeographic comments on these species, and to report these two genera for Peninsula Valdés for the first time. In addition, a new synonym in the genus *Praocis* is proposed.

Material and methods

Type material from our collecting trips is deposited in the following collections:

ENTCNP	Colección Entomológica, Centro Nacional Patagónico (CENPAT), Puerto Madryn, Argentina,
FMNH	Field Museum of Natural History, Chicago, United States of America,
HNHM	Hungarian Natural History Museum, Budapest, Hungary,
IADIZA	Instituto Argentino de Investigaciones de las Zonas Áridas, Mendoza, Argentina,
MACN	Museo Argentino de Ciencias Naturales Bernardino Rivadavia, Buenos Aires, Argentina,
MLPA	Museo de La Plata, La Plata, Argentina,
NHMB	Natural History Museum, Basel, Switzerland

Additional type and non-type material in the present study was borrowed from the Field Museum of Natural History, Chicago, USA (FMNH, Margaret Thayer), the Hungarian Natural History Museum, Budapest, Hungary (HNHM, Otto Merkl), and Museo de La Plata, La Plata, Argentina (MLPA, Analía A. Lanteri, Nora Cabrera).

Body length was measured dorsally along the midline, from anterior margin of labrum in *Praocis* and of clypeus in *Calymmophorus* to elytral apex. Terminology for the external morphology follows recent papers dealing with the Praociini (Flores & Chani Posse 2005; Flores & Vidal, 2009). Morphological terms for the forelegs were taken from Doyen (1984: Fig. 41). Digital photographs of holotypes and paratypes were taken with a Canon S50 adapted to a Leica MZ6 stereomicroscope. Final images of holotypes and paratypes (Figs 1–6) were montaged with image stacking freeware CombineZM (Hadley 2006). Type material information is cited on separate labels, indicated in brackets.

Regarding the distribution and habitat of these new taxa within Peninsula Valdés, we followed Bertiller *et al.* (1981) because this is the only paper which characterized the physiognomy and vegetation of the peninsula at local level. The distribution maps (Figs. 7, 8) were created using latitude and longitude coordinates and plotting them in a map using the freeware DIVA-GIS 7.1.6 (Hijmans *et al.* 2005).

Results

New synonymy in the genus *Praocis* Eschscholtz, 1829

Subgenus *Hemipraocis* Kulzer, 1958

***Praocis sellata bruchi* Kulzer, 1958**

(Figs. 1–2)

Praocis sellata bruchi Kulzer, 1958: 61.*Praocis sellata topali* Kaszab, 1964: 358. NEW SYNONYMY.

Type material. Paratypes of *Praocis sellata bruchi* (Fig. 1): [Santa Cruz/ Bruch leg] [Paratypus/ *Praocis sellata bruchi* m./ H. Kulzer 1957] (HNHM); [Patag.(onia) Bahia/ de las Nodales/ Dade leg] [Paratypus/ *Praocis sellata bruchi* m./ H. Kulzer 1957] (FMNH).

Holotype of *Praocis sellata topali* (Fig. 2): [S. Arg. Rio Negro/ Norquinco, Topál] [Nr. 238/ 22.I.1961] [Holotypus 1964/ *Praocis (Hemi-/ praocis) sellata/ ssp. topali/ ssp. nov.* Kaszab] (HNHM).

Discussion. Kaszab (1964) described *Praocis sellata topali* based upon a single specimen from Ñorquinco, Rio Negro, Western Patagonia (Argentina). After studying the type specimens of subspecies of *Praocis sellata*, we found that *P. sellata topali* is a synonym with *P. sellata bruchi* based on the characters shared by both nominal subspecies: clypeus sparsely punctured, with sparse setae, with two depressions in anterior angles; frons with sparse punctures; pronotum shiny, disc smooth, lateral quarters with small, sparse punctures; elytron with a main carina raised, lacking secondary carinae, lateral margin carina-shaped. According to Kaszab (1964), *P. sellata topali* only differs from *Praocis sellata bruchi* by having the elytral area between main carinae and suture less concave and smooth. We conclude that in this subspecies the elytral surface between main carinae and suture is either smooth or with few protuberances, and the concavity may vary between individuals. This was also confirmed after studying abundant material of *P. sellata bruchi* (Appendix 1). New and constant characters are used in the key to the five subspecies of *Praocis (Hemipraocis) sellata* presented below.

Taxonomy**Descriptions of three new Praociini from Peninsula Valdés**

Tribal characteristics. Body shape among the Praociini is heterogeneous but some characters common to all species are: oval metacoxae, elytra embracing the body ventrally, antennae short, reaching 3/4 along lateral margin of pronotum or shorter, with the last three antennomeres broadened (Kulzer 1958). Flores (2001) added the following constant characters at the tribe level: base of mandible two times higher with respect to apex, prothorax semi-mobile, and distance between meso- and metacoxae exceeding half mesocoxal length.

Genus *Praocis* Eschscholtz, 1829

Generic characteristics. Species of *Praocis* can be recognized by having maxillary palps with last segment axe-shaped; pronotum with anterior margin concave, width of posterior margin exceeding width of anterior margin, single lateral margin slender, expanded, remote from disc, and anterior angles rounded; mesosternum inclined forward, separated from prosternum; elytron with punctuate surface, very variable among the subgenera and species in features such as with or without carinae, lateral margin rounded, well demarcated with a finer edge or carina-shaped, single or double.

Subgenus *Hemipraocis* Kulzer, 1958

Subgeneric characteristics. Species of *Praocis (Hemipraocis)* are characterized by a wider body shape, conspicuously convex, clypeal suture not covered by frons; prosternum horizontal, with anterior margin wider, rounded, lacking edge; width of pronotum twice its length and widest at base; lateral margin of pronotum and elytron with one row of long setae, suture flat (Kulzer 1958).

***Praocis (Hemipraocis) sellata* Berg, 1889**

This species is characterized by its round shape, width of elytra equal to length, and lateral margin of pronotum and elytron with long, black setae (Kulzer 1958). The most recent key for the subgenus *Hemipraocis* is that by Kulzer (1958) to separate three subspecies of *Praocis (Hemipraocis) sellata* Berg and other five species. Later, Kaszab (1964) described *Praocis (Hemipraocis) sellata topali* which is synonymized in this paper with *P. (H.) sellata bruchi*. Flores (2007, 2009) established three synonymies within the subgenus. A new key to identify the current five subspecies of *Praocis (Hemipraocis) sellata* is herein provided. Type material examined in the present study for *Praocis (Hemipraocis) sellata sellata* Berg and *P. (Hemipraocis) sellata bergi* Kulzer 1958 is listed in Appendix 2 and for *P. (Hemipraocis) sellata bruchi* in the previous section.

Key to subspecies of *Praocis (Hemipraocis) sellata* Berg

1. Elytron with one main raised carina and three weakly demarcated secondary carinae between main carina and lateral margin; spaces between secondary carinae with protuberances arranged longitudinally 2
Elytron with one main raised carina, lacking secondary carinae; space between main carina and lateral margin smooth or with protuberances not arranged 3
2. Pronotum with punctures the same size or larger than elytral protuberances; elytron with three dull secondary carinae in space between main carina and lateral margin; area between main carina and suture with not arranged protuberances, lacking secondary carinae; main carina weakly raised, same height as suture, area between main carinae and suture flat
. *(Hemipraocis) sellata peninsularis* **ssp. nov.** (Fig. 3)
- Pronotum with punctures smaller than elytral protuberances; elytron with three shiny secondary carinae in space between main carina and lateral margin; area between main carina and suture with one secondary carina and two spaces with longitudinally arranged protuberances; main carina very raised, higher than suture, area between main carinae and suture concave
. *P. (Hemipraocis) sellata bergi* Kulzer (Fig. 4)
3. Pronotum shiny, disc smooth, lateral quarters with small, sparse punctures; elytral surface smooth or with sparse protuberances, more abundant over lateral margin; lateral margin separated of elytron, carina-shaped
. *P. (Hemipraocis) sellata bruchi* Kulzer (Fig. 1)
- Pronotum dull, disc and lateral quarters with large, abundant punctures; elytral surface with abundant protuberances not arranged; lateral margin adjacent to elytron 4
4. Pronotum with punctures same size or larger than elytral protuberances, dorsal surface of lateral margin with punctures; elytra with main carinae parallel to each other *P. (Hemipraocis) sellata sellata* Berg
- Pronotum with punctures smaller than elytral protuberances, dorsal surface of lateral margin with protuberances; elytra with main carinae converging at apex *P. (Hemipraocis) sellata granulipennis* **ssp. nov.** (Fig. 5)

Praocis (Hemipraocis) sellata peninsularis* Flores and Carrara **ssp. nov.*

(Figs. 3, 7)

Diagnosis. *Praocis (Hemipraocis) sellata peninsularis* **ssp. nov.** may be identified by the pronotum with punctures the same size or larger than elytral protuberances, elytron with three dull secondary carinae, surface between main carina and suture with protuberances not arranged, and main carinae weakly raised, same height as suture (Fig. 3). It differs from *P. (Hemipraocis) sellata bergi* Kulzer which has pronotum with punctures smaller than elytral protuberances, elytron with three shiny secondary carinae, surface between main carina and suture with one secondary carina and two spaces with protuberances arranged longitudinally, and main carinae very raised, higher than suture (Fig. 4).

Description. Length 8-10 mm. Rounded habitus, body colour dull black, antennae and legs black to dark brown. Head. Clypeus densely punctured, with abundant setae, without depressions in anterior angles; frons higher than clypeus, with sparse punctures; antennae reaching midpoint of lateral margin of pronotum; antennomeres 9, 10 and 11 wider than long; tomentose sensory patches on apical surface of antennomere 11. Pronotum with large punctures, more abundant on lateral quarters, punctures same size or larger than elytral protuberances; dorsal surface of lateral margin with punctures, each bearing one long black seta, forming a row; anterior angles rounded, posterior angles acute (Fig. 3); prosternal process subrectangular forming a right angle, not produced backwards. Elytron (Fig. 3) with one main raised carina and three dull, weakly demarcated, secondary carinae, between main carina and lateral margin; spaces between secondary carinae with longitudinally arranged protuberances, some of them bearing

one seta; secondary carinae wider than spaces; main carina the same height as suture; area between main carinae and suture flat, with protuberances not arranged; main carinae converging at apex of elytra; lateral margin broad, rounded, adjacent to elytron, with a row of black setae arising from protuberances; pseudopleuron with abundant setae arising from protuberances. Legs. Protibiae with apical process equal to length of protarsomeres 1–4; meso and metatibiae with a row of long, black setae on inner margin.

Type material. Holotype, male (Fig. 3): [Argentina, Chubut, Península/ de Valdés, Pto. Pirámides/ 16-I-2008, G. y L. Flores/ G. Cheli, F. Flores] [42° 34' 24.4"S/ 64° 16' 59.8"W/ 0 m] [*Praocis (Hemipraocis) sellata peninsularis* **ssp. nov.**/ HOLOTYPE male/ Det. G. Flores and/ R. Carrara 2011] (IADIZA). Allotype, female: [Pa. Valdés, Chubut/ II-1971, Arg.] [Leg.: J.H. Molinari] (IADIZA). All paratypes with data: Argentina, Chubut, Península Valdés: 2 paratypes with the same data as holotype (1 MACN, 1 IADIZA); Puerto Pirámides, 20-IX-2010, 42° 34' 30.36"S/ 64° 16' 11.28"W/ 37 m, G. Cheli, 1 (ENTCNP), 9-III-1940, R. Maldonado, 1 (MLPA), D. Rojas, 28-III-1997, 1 (IADIZA), S. Roig, 1-5-XI-1983, (3 IADIZA, 1 HNHM, 1 NHMB); 4 km N Playa Pardelas/ 42° 37' 05.5"S, 64° 16' 11.3"W, 38 m/ 10-I-2010, G. Flores, G. Cheli, R. Carrara, 1 (IADIZA); 16-II-1997, D. Rojas Lanús, 1 (IADIZA); Ea. Los Médanos/ 29-XI-2007, G. Cheli/ 42° 42' 12.6"S/ 64° 06' 03.8"W/ 76 m, 1 (ENTCNP), same data except: 3-XI-2006, G. Cheli, 1 (ENTCNP).

Etymology. We named this new subspecies *peninsularis* because it is endemic to Peninsula Valdés.

Distribution and habitat. *Praocis (Hemipraocis) sellata peninsularis* inhabits the southern half of Peninsula Valdés (Fig. 7) and can be found in sandy places. It shares the habitat with other tenebrionid species such as *Emmallodera crenatocostata crenatocostata* Blanchard, *E. hirtipes* Kulzer, *Epipedonota cristallisata* (Lacordaire), *Nyctelia circumundata* Lesne, *N. dorsata* Fairmaire, *Patagonogenius collaris* (Kulzer), *Platesthes kuscheli* (Kulzer), *Psectrascelis sulcicollis* (Waterhouse), *Salax lacordairei* Guérin-Méneville, and *Leptynoderes strangulata* Fairmaire.

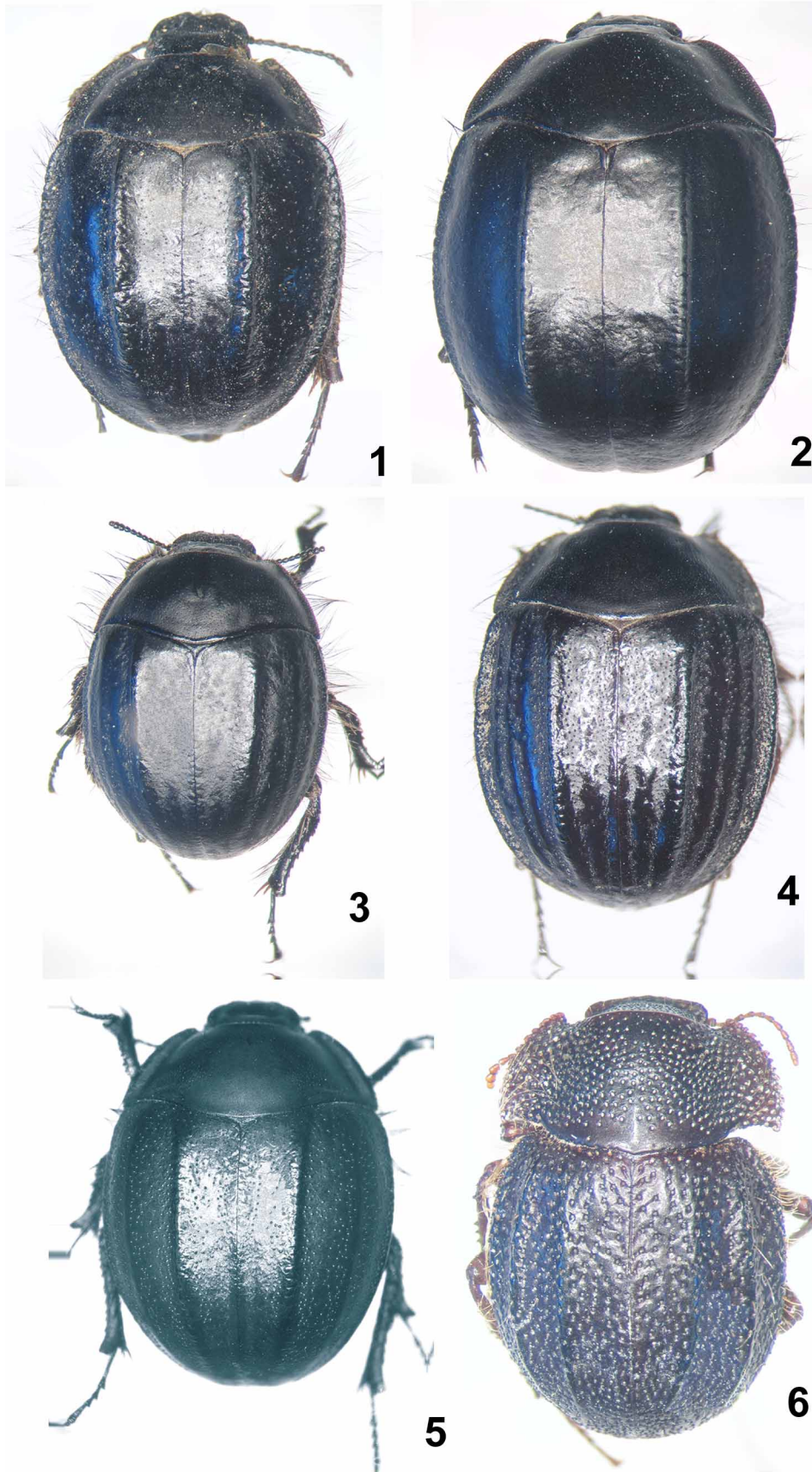
Ecological notes. This species inhabits the southern part of Peninsula Valdés, where eolian dunes are developed on deep, salt-free, loose sandy soils (Rostagno 1981). These dunes are fixed by dense herbaceous steppe vegetation with *Sporobolus rigens*, *Nassella tenuis*, and *Hyalis argentea* (Bertiller *et al.* 1981). We observed adults of this subspecies walking on coastal dunes of Puerto Piramides at twilight during the summer and in the afternoon in early spring.

Praocis (Hemipraocis) sellata granulipennis Flores and Carrara **ssp. nov.**

(Figs. 5, 7)

Diagnosis. *Praocis (Hemipraocis) sellata granulipennis* **ssp. nov.** may be identified by the pronotum with punctures smaller than elytral protuberances, dorsal surface of lateral margin with protuberances, and elytra with main carinae converging at apex (Fig. 5). It differs from *P. (Hemipraocis) sellata sellata* Berg which has pronotum with punctures the same size or larger than elytral protuberances, dorsal surface of lateral margin with punctures, and elytra with main carinae parallel to each other.

Description. Length 9–13 mm. Rounded habitus, body colour glossy black, antennae and legs black to dark brown. Head. Clypeus sparsely punctured, with sparse setae, with two depressions in anterior angles; frons higher than clypeus, with sparse punctures; antennae reaching 3/4 of lateral margin of pronotum; antennomeres 9, 10 and 11 wider than long; tomentose sensory patches on distal third of antennomere 11. Pronotum with small punctures, more abundant on lateral quarters, punctures smaller than elytral protuberances; dorsal surface of lateral margin with protuberances each bearing one long black seta, forming a row; anterior angles rounded, posterior angles acute (Fig. 5); prosternal process produced backwards. Elytron (Fig. 5) with one main raised carina the same height as suture; area between main carinae and suture flat, with large protuberances not arranged; main carinae converging at apex of elytra; lateral margin broad, rounded, adjacent to elytron, with a row of black setae arising from protuberances; pseudopleuron with abundant setae arising from protuberances. In some specimens from outside Peninsula Valdés there is sometimes a smooth longitudinal area not elevated in space between main carina and lateral margin of elytron (Fig. 5). Legs. Protibiae with apical process equal to length of protarsomeres 1–2 or 1–3; meso and metatibiae with a row of long, black setae on inner margin.



FIGURES 1–6. 1. *Praocis sellata bruchi*, holotype HNHM; 2. *P. sellata topali*, paratype HNHM; 3. *Praocis sellata peninsularis* ssp. nov., holotype; 4. *Praocis sellata bergi*, paratype HNHM; 5. *P. sellata granulipennis* ssp. nov., paratype; 6. *Calymmophorus peninsularis* sp. nov., paratype.

Type material. Holotype, male: [Argentina, Chubut/ Península de Valdés Estancia/ El Salitral 42° 24' 18"S/ 63° 57' 24"W 16-XII-2007/ M. Nabte, G. Cheli] [*Praocis (Hemipraocis) sellata granulipennis* ssp. nov./ HOLOTYPUS male/ Det. G. Flores and/ R. Carrara 2011] (IADIZA). Allotype, female: [Argentina, Chubut/ Península de Valdés/ Estancia La Irma 42° 16' 26"S/ 63° 41' 21"W 18-XII-2006/ M. Nabte - G. Cheli] (IADIZA). Paratypes with data: Argentina, Chubut, Península Valdés: 25-I-1971, A. Kovaks, 1 (HNHM); 1 km W Playa Pardelas/ 42° 37' 05.5"S, 64° 16' 11.3"W, 24 m/ 13-I-2010, G. Flores, G. Cheli, R. Carrara, (1 MACN, 1 ENTICNP); 14 km E Punta Buenos Aires/ 42° 13' 32"S, 64° 13' 45.2"W, 7 m/ 8-I-2010, G. Flores, G. Cheli, R. Carrara, 1 (MLPA). Paratypes with data: Argentina, Chubut: Dto. Rawson, Trelew, circuito/ Mar y Valle, 43° 17' 50.26"S, 65° 15' 45.06"W, 13-XI-1997/ D. Rojas Lanús, 1 (IADIZA); Dto. Gaiman Dique Ameghino/ 27-IX-1997/ D. Rojas Lanús, 1 (IADIZA; Fig. 5); Trelew, 4-X-1997/ D. Rojas Lanús, 1 (IADIZA); Puerto Madryn, 28-XI-1998/ D. Rojas Lanús, 1 (NHMB); Cerro Avanzado, 17 km SE/ Puerto Madryn, 15-I-2008/ G. L. y F. Flores/ 42° 49' 47"S, 64° 53' 0.5"W, 102 m/, 1 (IADIZA); Las Plumas/ (47 km W)/ 10-XI-1985/ L.E. Peña 1 (FMNH). One paratype: Argentina, Rio Negro, Dto. Valcheta/ Meseta Somuncurá, Pto. San Nicolás/ 15-XI-2009, G. Cheli/ 41° 43' 50.19"S/ 66° 26' 15.86"W/ 898 m, 1 (ENTICNP).

Other material examined (without head): six specimens from Argentina, Chubut, Peninsula Valdés: Estancia Los dos Hermanos, 42° 48' 57"S, 64° 02' 03"W, 55 m, 9-I-2010, G. Flores, G. Cheli, R. Carrara, 1 (IADIZA); ruta provincial N° 47, inicio Caleta Valdés, 42° 16' 23.4"S, 63° 41' 13"W, 8 m, 13-I-2010, G. Flores, G. Cheli, R. Carrara, (3 IADIZA, 1 ENTICNP); 14 km E Punta Buenos Aires/ 42° 13' 32"S, 64° 13' 45.2"W, 7 m/ 8-I-2010, G. Flores, G. Cheli, R. Carrara, 1 (IADIZA).

Etymology. We named this new subspecies *granulipennis* to emphasize the protuberances covering the dorsal surface of elytra, which are larger than pronotal punctures (Fig. 5).

Distribution and habitat. *Praocis (Hemipraocis) sellata granulipennis* is widespread in Peninsula Valdés (Fig. 7) and shares the habitat with other tenebrionid species such as *Ecnomoderes bruchi* Gebien, *Emmallodera crenatocostata crenatocostata* Blanchard, *E. hirtipes* Kulzer, *Epipedonota cristallisata* (Lacordaire), *Mitragenus araneiformis* Curtis, *Nyctelia dorsata* Fairmaire, *N. nodosa* (Germar), *Patagonogenius collaris* (Kulzer), *Psectrascelis sulcicollis* (Waterhouse), *Leptynoderes tuberculata* Curtis, *L. strangulata* Fairmaire, *Hylithus tentyroides* (Lacordaire), and *Blapstinus punctulatus* Solier. This subspecies is also distributed outside the peninsula in the biogeographic province of Monte (Fig. 7).

Ecological notes. This subspecies lives in: 1) herbaceous-shrub steppes of the southern part of Peninsula Valdés, where *Chuquiraga avellanadae*, *Ch. erinacea* ssp. *hystrix*, *Piptochaetium napostaense*, *Nassella tenuis*, and *Plantago patagonica* are dominant; 2) clayey, poorly-permeable and salty soils in central PV (closed basins) with scarce grass cover, where small *Ch. avellanadae* shrubs dominate the landscape; 3) the northern part of PV (Sediplains of "Rodados Patagónicos") with dense grass cover and large bushes, the latter represented by *Ch. avellanadae*, *Condalia microphylla*, and *Schinus johnstonii* among others (Bertiller *et al.* 1981, Rostagno 1981).

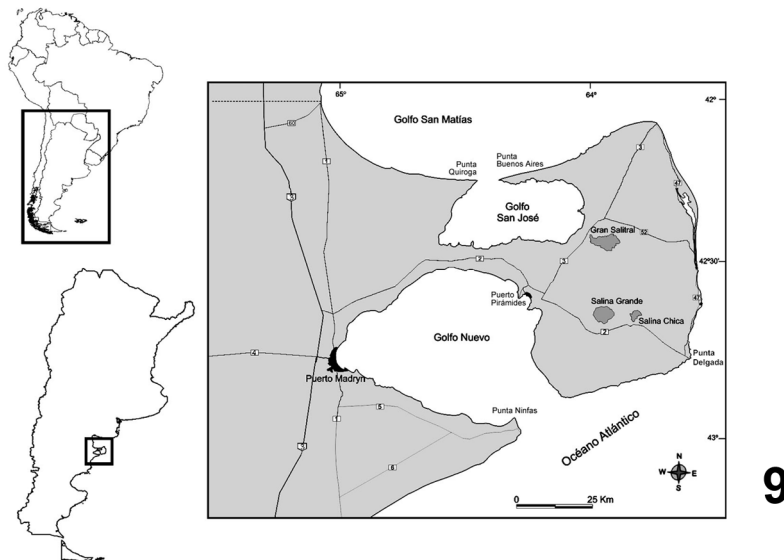
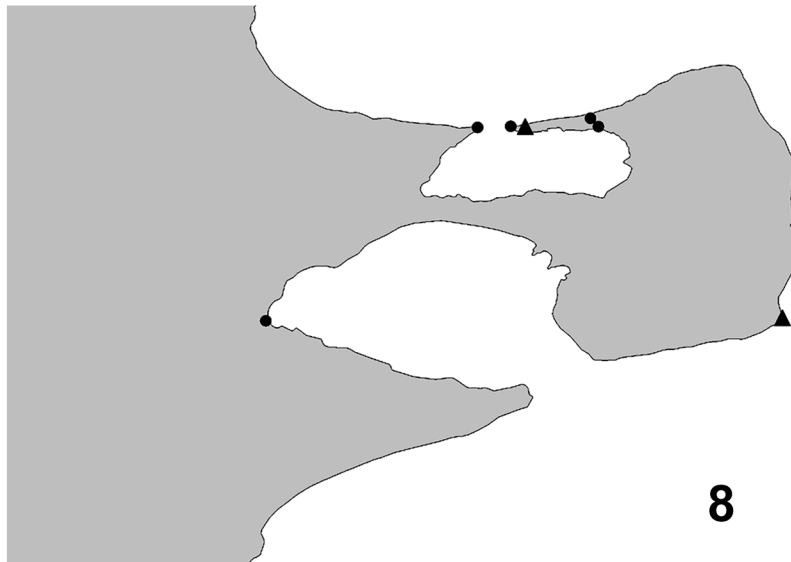
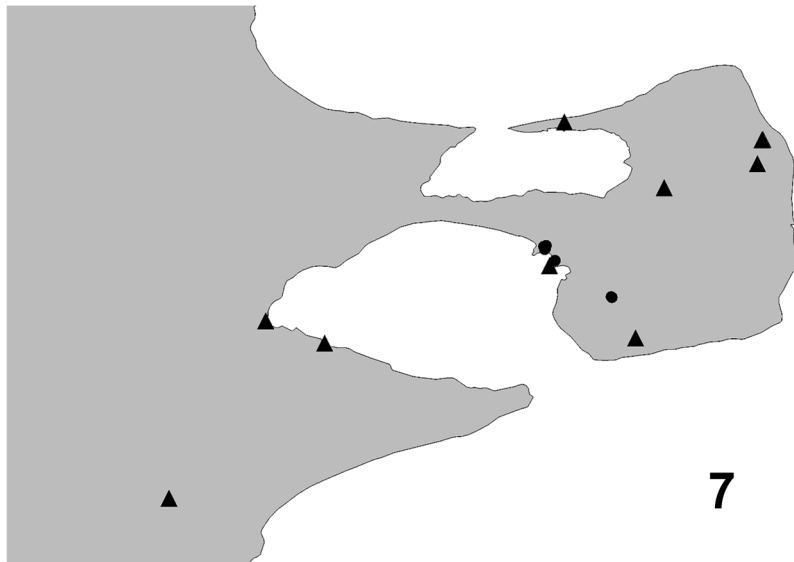
Genus *Calymmophorus* Solier, 1840

Generic characteristics. The five known species of *Calymmophorus* are characterized by head hypognathus; antennae reaching 3/4 along lateral margin of pronotum; anterior area of clypeus bent downwards forming a right angle, with margin broadened; genae fused with clypeus; pronotum with anterior margin hood-shaped, produced anteriorly over the head; anterior angles acute; lateral margin at a lower level than disc; prosternum horizontal, posteriorly subrectangular, not expanded, with distinctive anterior margin projected anteriorly covering mouthparts ventrally; each elytron with two carinae halfway between suture and lateral margin (Kulzer 1958).

Calymmophorus peninsularis Flores and Cheli sp. nov.

(Figs 6, 8)

Diagnosis. *Calymmophorus peninsularis* sp. nov. can be easily distinguished from its congeners by the following combination of characters: clypeus and frons with protuberances, width of pronotum twice its length, with punctures smaller than elytral punctures, in lateral quarters with an elevated ridge surrounding each puncture posteriorly, pronotum with anterior margin concave and located behind anterior angles, not produced anteriorly over the head; elytron with protuberances in posterior half, outer intercostal space, and pseudopleuron (Fig. 6). On the other



FIGURES 7–9. 7. Geographical distribution of two subspecies of *Praocis sellata* in and outside Peninsula Valdés: *P. sellata peninsularis* (circles), *P. sellata granulipennis* (triangles). 8. Geographical distribution of two species of *Calymmophorus* in and outside Peninsula Valdés: *C. peninsularis* (triangles), *C. patagonicus* (circles). 9. Location map of Peninsula Valdés, Argentina.

hand, all other five species of *Calymmophorus*, that is, *C. cucullatus* (Lacordaire 1830), *C. ursinus* (Lacordaire 1830), *C. dasypoides* (Lacordaire 1830), *C. uspallatensis* Berg 1883, and *C. patagonicus* Bruch 1916, have clypeus and frons with punctures; width of pronotum 1.5 times its length, with punctures larger than elytral punctures, punctures in lateral quarters lacking elevated ridge behind the puncture, anterior margin hood-shaped, produced over the head, located anteriorly to anterior angles; elytra with punctures, lacking protuberances.

Description. Length 6–7 mm. Oval habitus; head, pronotum and elytra black; mouth parts, venter, antennae and legs dark brown. Head. Clypeus with sparse protuberances; frons with abundant protuberances, lacking setae in central area; antennae reaching 3/4 of lateral margin of pronotum; antennomere 9 wider than long; tomentose sensory patches on apical third of antennomere 11. Thorax. Width of pronotum (Fig. 6) twice its length, with abundant punctures smaller than elytral punctures, separated from one another by a distance greater than diameter of one puncture; disc with punctures, some of them bearing one seta arising from their posterior margin, in lateral quarters with an elevated ridge surrounding each puncture posteriorly, with one seta arising in between posterior margin of puncture and base of ridge; anterior margin slender, concave, lacking scaly setae, located behind anterior angles, not produced anteriorly over the head; anterior and posterior angles right; lateral margin serrated; prosternum horizontal, with process forming a right angle, not produced backwards. Elytron (Fig. 6) with two raised carinae halfway between suture and lateral margin, with abundant punctures, separated by a distance greater than diameter of one puncture; on anterior half of inner and medial intercostal spaces each puncture bears one short seta arising from its posterior margin; outer intercostal space, posterior half of elytron and pseudopleuron with a protuberance behind each puncture, with short setae arising in between each puncture and its posterior protuberance; lateral margin rounded, with a row of long golden setae; epipleuron conspicuous in posterior 4/5, with edge, anterior quarter twice as wide as posterior half. Legs. Protibiae with apical process equal to length of protarsomeres 1–3, outer margin with 3–4 spinae, each one bearing a stout seta.

Type material. Holotype, female: [Argentina: Chubut, Dto. Biedma/ Península Valdés, Punta Buenos/ Aires 42° 14' 14" S, 64° 22' 31" W, 2 m/ 08-I-2010, Coll: G. Flores, G. Cheli,/ R. Carrara] [*Calymmophorus/ peninsularis* sp. nov./ HOLOTYPUS female/ Det. G. Flores and/ G. Cheli 2011] (IADIZA). Paratype female (Fig. 6): [Argentina. Chubut/ Península Valdés/ Punta Delgada/ D. Rojas, 25-I-1997] (IADIZA).

Etymology. We named this new species *peninsularis* because it is endemic to the Peninsula Valdés.

Remarks. In spite of these differences with the so far known species of *Calymmophorus*, *C. peninsularis* sp. nov. should be included in this genus because it shares with all the above mentioned species the following character states: anterior area of clypeus bent downwards forming a right angle, with the margin broadened, genae fused with clypeus, and prosternum with distinctive anterior margin produced anterad and covering mouthparts ventrally.

Distribution and habitat. This species is only known from two places within Peninsula Valdés: Punta Buenos Aires and Punta Delgada (Fig. 8). In both places it was observed sharing the habitat with other tenebrionid species such as *Emmallodera hirtipes* Kulzer, *Epipedonota cristallisata* (Lacordaire), *Mitragenius araneiformis* Curtis, *Nyctelia circumundata* Lesne, *N. nodosa* (Germar), *Patagonogenius quadricollis* (Fairmaire), *P. collaris* (Kulzer), *Platesthes kuscheli* (Kulzer), *Psectrascelis sulcicollis* (Waterhouse), *Hylithus tentyroides* (Lacordaire), and *Blapstinus punctulatus* Solier. In Punta Buenos Aires *Calymmophorus peninsularis* sp. nov. was recorded in sympatry with *C. patagonicus*.

Ecological notes. Punta Buenos Aires shows shrubby vegetation composed mainly of *Ch. avellanadae*, *Ch. erinacea* ssp. *hystrix*, *Suaeda divaricata*, and *Atriplex lampa*. Surface soils are fine sand, calcareous, without gravel, and salty at depth. In Punta Delgada the vegetation is arranged in a mosaic of shrubs (*Ch. avellanadae*, *Ch. erinacea hystrix*, and *Mulinum spinosum*) and grass steppe (*Piptochaetium napostaense*, *Nassella tenuis* and *Plantago patagonica*). Surface soils are sandy and loose over a clay-sandy substrate with gravels. Both zones share more than 50% of their vegetation species, and are located in the rainiest area of PV next to the sea. This last characteristic contributes to higher humidity levels and to mitigation of thermal fluctuations (Bertiller *et al.* 1981; Ros-tagno 1981).

Zoogeographical and ecological remarks

Two subspecies of *Praocis* (*Hemipraocis*) *sellata* were recorded in Peninsula Valdés (Fig 7): *P. (H.) sellata peninsularis* ssp. nov. is endemic to the peninsula and *P. (H.) sellata granulipennis* ssp. nov. is widely distributed in and

outside the peninsula in the provinces of Rio Negro and Chubut, inhabiting the Southern Patagonian subdistrict of Monte (Roig *et al.* 2009). While *P. (H.) sellata peninsularis* **ssp. nov.** can only be found in sandy soils in the southern part of the peninsula, *P. (H.) sellata granulipennis* **ssp. nov.** inhabits environments of clayey, poorly-permeable soils. The distribution of these subspecies in habitats with different kinds of soil could be related to their development since the type of substrate may influence the laying of eggs (Tschinkel & Doyen 1980) and selection of oviposition sites by adults, given that the range of movement of the larvae is limited (Calkins & Kirk 1973). At a small scale, soil texture has been considered one of the major factors influencing the distribution of tenebrionid species (de los Santos *et al.* 2002).

Other two tenebrionid species, belonging to the genus *Calymmophorus*, were recorded in Peninsula Valdés (Fig 8): *C. peninsularis* **sp. nov.** is endemic to the peninsula and *C. patagonicus* is distributed in the northern part of the peninsula and outside, in the provinces of Rio Negro and Chubut, inhabiting the Southern Patagonian subdistrict of Monte (Roig *et al.* 2009). Sympatry of both species was recorded from Punta Buenos Aires, in the northwestern end of the peninsula (Fig 8). In the mainland, *C. patagonicus* was found in Punta Quiroga, located in the far end of San José Gulf. Punta Buenos Aires and Punta Quiroga are geographically opposed and separated by 9 km (Fig. 9) but currently share floristic elements (Bertiller *et al.* 1981). These areas were formerly a continuous land mass which was split during the Holocene by the opening of San José Gulf that originated from the melting of ice after the last glaciation and subsequent elevation of the sea level (Codignotto 2008). This historical event could explain in part the sympatry of both *Calymmophorus* species in the northwestern end of the peninsula (Fig 8). The current record of *C. patagonicus* in Punta Quiroga and Punta Buenos Aires is probably the consequence of a relictual distribution which was continuous prior to the opening of San José Gulf. Such distribution might have extended through all the northern margin of the salt flat that occupied the current place of San José Gulf (Codignotto 2008).

Although the entire Peninsula Valdés is a protected area, livestock grazing is allowed in most of the area. This reserve also includes at least seven smaller reserves, both public and private. *Calymmophorus peninsularis* **sp. nov.** was found in two capes, situated on the east and west coasts of the peninsula and 100 kilometers distant from each other. Both capes are included in these small reserves: Punta Delgada is under private administration and Punta Buenos Aires belongs to the Administration of National Parks of Argentina. *Praocis (Hemipraocis) sellata peninsularis* inhabits the southern half of the peninsula, on sand dunes fixed by vegetation. Due to the coarse texture and loose nature of their surface soil, the vegetation cover can easily be deteriorated by overgrazing (Rostagno 1981). If this change occurs, the effects of eolian erosion on these soils will significantly increase. Therefore, a great amount of sand could be relocated by wind, creating sand dune fronts that move very fast and leave eroded soils behind. These soils are inappropriate for the subsistence of tenebrionid beetles. Activities that may promote soil erosion in Peninsula Valdés are a real threat for the local insect fauna, in particular for endemic species, such as *Praocis (Hemipraocis) sellata peninsularis* **ssp. nov.**

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APPENDIX 1. Examined specimens of *Praocis sellata bruchi* Kulzer.

Argentina: Rio Negro: Dto. 25 de Mayo: Ing. Jacobacci, 41° 20.25' S, 69° 33.26" W, 919 m, 06-I-2005, G. Flores (1 IADIZA). **Chubut:** Dto. Cushamen: Leleque, 19-XI-1966, L.E. Peña (1 FMNH); Dto. Languineo: Manantiales, 6-XI-1985, L.E. Peña (1 FMNH), Tecka, 6-XI-1985, L.E. Peña (2 FMNH), 30 km N Tecka, 6-XI-1985, L.E. Peña (1 FMNH); Dto. Tehuelches: 62 km N Alto Rio Senguer, 44° 31' 0.7" S, 70° 36' 47" W, 663 m, 07-I-2005, S. Roig, G. Flores, F. Ocampo (1 IADIZA); Dto. Rio Senguer: 20 km W Alto Rio Senguer, 45° 04' 20" S, 71° 01' 39" W, 693 m, 07-I-2005, S. Roig, G. Flores, F. Ocampo (1 IADIZA); Ruta 40, Pastos blancos, 45° 19.2' S, 70° 29.47' W, 587 m, 08-I-2005, S. Roig, G. Flores, F. Ocampo (2 IADIZA); Rio Mayo, 16-II-2000, P. Vidal (3 IADIZA); Valle Del Lago Blanco (1 MACN); Cerro Negro, 25-II-1926 (1 MACN). **Santa Cruz:** Dto. Lago Buenos Aires: Rio Pinturas, 46° 36' 57.2" S, 70° 16' 2.8" W, 299 m, 10-XI-2004, V. Corbalán (1 IADIZA); Cañadon Mallin, 46° 36' 42.7" S, 70° 17' 09.8" W, 400 m, 11-XI-2004, V. Corbalán (1 IADIZA); Los Antiguos, 46° 34.5' 38" S, 71° 34' 27.33" W, 2-III-2010, G. Cheli (1 ENTCPN, 1 IADIZA), XII-1982, J. Carreras (1 MACN); Cueva de las Manos, 29-II-2010, G. Cheli (1 ENTCPN, 1 IADIZA); Dto. Deseado: Ea. La Madrugada, 24-XI-1985, L.E. Peña (10 FMNH); Dto. Magallanes: N San Julian, 10-XII-1966, L.E. Peña (1 FMNH); Dto. Rio Chico: S Gobernador Gregores, 24-XI-1966, L.E. Peña (1 FMNH). **Chile: Aysen:** Chile Chico, 13-XII-1960, L.E. Peña (8 FMNH), 23-XI-1966, L.E. Peña (5 FMNH), 13-II-1982, J. Escobar (2 FMNH), X-1985, S. Ocare (6 FMNH).

APPENDIX 2. Type material examined for *Praocis (Hemipraocis) sellata sellata* Berg and *P. (Hemipraocis) sellata bergi* Kulzer.

Praocis (Hemipraocis) sellata sellata Berg. Lectotype (MLPA): [Typus] [St. Cruz/ Patag] [*Praocis/ sellata/* 1889 Berg (handwritten by Berg)] [Lectotypus/ *Praocis sellata/* Berg, 1889/ Des. G. Flores 2006]. Note: Flores (2007: 420) designated lectotype.

Praocis (Hemipraocis) sellata bergi Kulzer. Two paratypes (HNMH) : [Patagonia/ Tehuelches] [Paratypus/ *Praocis sellata/* ssp. bergi nov./ Det. H. Kulzer 1957]; [Patagonia/ Neuquén/ E. Weiske] [Paratypus/ *Praocis sellata/* ssp. bergi m./ H. Kulzer 1957].