

Bledius Leach from southern Brazil (Coleoptera, Staphylinidae, Oxytelinae)¹

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ABSTRACT. *Bledius* Leach from southern Brazil (Coleoptera, Staphylinidae, Oxytelinae). Three species of *Bledius* Leach, 1819 are recognized from southern Brazil. A new species is described, *B. hermani* n. sp., from Paraná and Rio Grande do Sul States and *B. fernandesi* Bernhauer, 1939 is redescribed. The geographical distribution of *B. bonariensis* Bernhauer, 1912 and *B. fernandesi* are extended. A key to identification of *Bledius* from southern Brazil is also provided.

KEYWORDS. Neotropical region; new species; ocean beaches; rove beetles; taxonomy.

RESUMO. *Bledius* Leach do sul do Brasil (Coleoptera, Staphylinidae, Oxytelinae). Três espécies de *Bledius* Leach, 1819 são reconhecidas do sul do Brasil. Uma nova espécie é descrita, *B. hermani* sp. nov., proveniente dos estados do Paraná e Rio Grande do Sul e *B. fernandesi* Bernhauer, 1939 é redescribida. A distribuição geográfica de *B. bonariensis* Bernhauer, 1912 e *B. fernandesi* são estendidas. Uma chave para identificação de *Bledius* do sul do Brasil também é apresentada.

PALAVRAS-CHAVE. Espécie nova; estafilinídeos; praias oceânicas; região Neotropical; taxonomia.

The species of *Bledius* Leach, 1819 live in unvegetated, sunny and moist sand adjacent to rivers, lakes and oceans, where they feed on algae and diatoms. Both adults and larvae make burrows in the soil and can be detected by the cast or tumulus left on surface above the entrance of the burrows. Some seacoastal species live in the intertidal zone, and they remain in the burrow during high tide, in an air bubble. An extensive report about the natural history of the genus is found in Herman (1986).

Bledius comprises 462 species worldwide (Herman, pers. comm.) placed in 34 species groups, of which seven are in the Neotropical region (*mandibularis*, *aequatorialis*, *emarginatus*, *semiferrugineus*, *forcipatus*, *punctatissimus* and *bonariensis* groups) (Herman 1986).

Herman (2001), in his world catalog of the Staphylinidae, listed ten *Bledius* species from Brazil, but only *B. bonariensis* Bernhauer, 1912 was reported from southern Brazil, Rio Grande do Sul; the other nine species are from the north and west in Amazonas and Mato Grosso States. However, in studies focusing on the ecology of the Atlantic beaches in southern Brazil, three species (*B. bonariensis*, *B. fernandesi* Bernhauer, 1939, and *B. microcephalus* Fauvel, 1901) have been reported (Gianuca 1997; Barros *et al.* 2001; Schreiner & Ozorio 2003).

The aim of this paper is to characterize the *Bledius* fauna from southern Brazil and to provide a key. This paper also includes a description, a redescription and new geographical records for *Bledius*.

MATERIAL AND METHODS

Specimens are deposited in the American Museum of Natural History, New York, United States (AMNH); The Natural History Museum, London, England (BMNH); Coleção de

Entomologia Pe. J.S. Moure, Departamento de Zoologia, Universidade Federal do Paraná, Curitiba, Brazil (DZUP); Field Museum of Natural History, Chicago, United States (FMNH); Museu de Ciências Naturais da Fundação Zoo-Botânica do Rio Grande do Sul, Porto Alegre, Brazil (MCNZ); Museo de La Plata, La Plata, Argentina (MLP); Museu Nacional, Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil (MNRJ); and Museu de Zoologia, Universidade de São Paulo, São Paulo, Brazil (MZSP).

Dried specimens were first macerated in boiling water for five minutes then cleared in boiling 10% KOH for two minutes. The dissection was carried out under the stereoscopic microscope Zeiss Stemi SV6 and the drawings made with the same equipment and also with an optical microscope Zeiss Standard 20 with a drawing tube attached. Photographs were taken using a stereoscopic microscope Leica MZ 16 with a Leica DFC 500 digital camera. The images were captured with computer software IM 50 (Image Manager) and combined using the image processing software Auto-Montage Pro (Syncrosopy). The final art of drawings and photographs were performed in Adobe Photoshop software, version 7.0.

Measurements were done using the micrometric ocular in the stereoscopic microscope Wild M5. The following abbreviations were used: BL, body length (from anterior margin of head to posterior margin of tergite VIII); BW, body width (across humeral region); PL, pronotum length (maximum); PW, pronotum width (maximum); EL, elytron length (maximum).

The terminology adopted was that of Blackwelder (1936) and Herman (1970, 1986).

RESULTS AND DISCUSSION

There are three species of *Bledius* from southern Brazil,

which belong to *bonariensis* and *punctatissimus* groups following Herman's classification (Herman 1986).

Key to the species of *Bledius* from southern Brazil

1. Head with supraantennal ridge extended anteriorly into a broad horn (male longer than female) (Figs. 1, 2, 8); pronotum with an abrupt constriction near the base (Figs. 1, 9)
..... (*bonariensis* group) *B. bonariensis* Bernhauer, 1912
Head with supraantennal ridge not extended anteriorly (Figs. 3-7, 10, 17); pronotum without abrupt constriction near the base (Figs. 13, 19) (*punctatissimus* group) 2
2. Procoxal fissure closed (Fig. 14); elytra golden yellow with basal dark brown spot extending postero-medially into a lighter color (Fig. 3); tergum VIII with posterior margin emarginated (Fig. 15) *B. fernandezi* Bernhauer, 1939
Procoxal fissure open (Fig. 20); elytra pale yellow with basal and usually subapical median brownish spot (Figs. 5, 7); tergum VIII with posterior margin truncate (Fig. 22) *B. hermani* n. sp.

Bledius bonariensis Bernhauer, 1912
(Figs. 1, 2, 8, 9, 24)

Bledius (Hesperophilus) bonariensis Bernhauer, 1912: 168 (original description).

Bledius bonariensis Scheerpeltz, 1933: 1112 (world catalog); Blackwelder, 1944: 106 (Neotropical checklist); Herman, 1970: 376 (world checklist); Herman, 1986: 228-231 (redescription, illustrations, map distribution, *bonariensis* group), 300 (world checklist); Herman, 2001: 1545 (world catalog).

Description. See Herman (1986).

Distribution (Fig. 24). Old records: ARGENTINA: Buenos Aires, San Clemente; URUGUAY: Rocha, Atlantica; and BRAZIL: Rio Grande do Sul, Rio Grande (Praia do Cassino) (Herman 1986).

New records: BRAZIL: Paraná, Guaraqueçaba (Ilha das Peças and Ilha do Superagui).

Examined Material. BRASIL, Paraná, Guaraqueçaba, Ilha das Peças, 23-III-2005, Rosa col. (3 DZUP); same locality, 12.IV.2005, Matuella col. (3 DZUP); Guaraqueçaba, Ilha do Superagui, 02-VII-2007, Caron & Martins col. (27 DZUP). Rio Grande do Sul, Rio Grande, Praia do Cassino, 26-IV-1991, Gianuca col. (1 DZUP); same locality and collector, 6-I-1993 (15 MZSP); 13-I-1993 (22 DZUP); 20-I-1993 (10 DZUP); 27-I-1993 (32 DZUP); 3-II-1993 (6 DZUP); 10-II-1993 (43 DZUP); 13-III-1993 (1 DZUP).

Remarks. The *bonariensis* group includes only *B. bonariensis*, which is distinguished from other species of the genus mainly by head with subantennal pockets (Herman 1986: 230, Fig. 441). From the Southern Brazilian species, *B. bonariensis* also can be separated by the supraantennal ridge of the head that is extended anteriorly into a broad horn (Figs. 1, 2, 8), pronotum with an abrupt constriction near the base (Figs. 1, 9), labrum with a median incision (Herman 1986: 230, Fig. 442), closed procoxal fissure (Herman 1986: 230, Fig. 449),

truncate posterior margin of tergum VIII and the absence of lateral lobes of the aedeagus (Herman 1986: 231, Figs. 451, 452).

Males of *B. bonariensis* have a more strongly developed supraantennal ridge than females, the mandibles are tridentate and the second denticle is enlarged (Herman 1986: 230, Fig. 445). The mandibles of the females are quadridentate (Herman 1986: 230, Fig. 443).

Bledius fernandezi Bernhauer, 1939
(Figs. 3, 4, 10-16, 24)

Bledius (Hesperophilus) fernandezi Bernhauer, 1939: 234 (original description).

Bledius fernandezi Blackwelder, 1944: 106 (Neotropical checklist); Herman, 1970: 377 (world checklist); Herman, 1986: 216 (*punctatissimus* group), 307 (world checklist); Herman, 2001: 1545 (world catalog); Fernandez *et al.* 2007: 29 (catalog of types at Museo de La Plata).

Redescription. Male. BL: 2.36-2.80 mm, BW: 0.52-0.60 mm.

Body dark brown with antennae and legs yellowish brown (Figs. 3, 4); antenna with scape and segments 8-11 dark brown; elytra golden yellow with basal dark brown spot extending postero-medially into a lighter color. Body subcylindrical and densely covered with vestiture of fine microsetae. Dorsum of head, pronotum and elytra with microgranulate sculpturing.

Clypeus with anterior margin slightly rounded (Fig. 10). Epistomal suture broadly arcuate. Antenna with segments 7-11 increasingly wide and forming somewhat a club (Fig. 11), last segment two times the length of 10. Labrum transverse, anterior margin deeply sinuate, each cuticular process of internal fringe of epipharyngeal lobes with serrated apex (Fig. 12). Mandibles tridentate. Submentum extending onto venter of head, posterior margin slightly V-shaped. Pronotum convex (Fig. 4), wider than long (PW/PL: 1.23) (Fig. 13), anterior angles produced, posterior margin curved, prototergosternal suture present (Fig. 14), procoxal fissure closed, protrochantin concealed. Elytra longer than wide (El/BW: 2.33), elytral epipleural ridge complete. Sternite VII with posterior margin truncate. Tergite VIII with posterior margin broadly emarginated (Fig. 15). Aedeagus follows pattern of *punctatissimus* group with lateral lobes slender, cylindrical and reaching apex of median lobe; median lobe bulbous.

Female. Similar to male. Spermatheca with base wider than apex (Fig. 16).

Type material: The type material of *B. fernandezi* is deposited in the FMNH and was seen by Dr Alfred F. Newton who confirmed the material here studied is similar to the type specimen of *B. fernandezi*. There is also one type specimen deposited at MLP (Fernandez *et al.* 2007).

Distribution (Fig. 24). Old records: URUGUAY: Canelones (Herman 1986).

New Records: BRAZIL: Paraná, Guaraqueçaba (Ilha do Superagui); Rio Grande do Sul, Rio Grande (Praia do Cassino).

Examined material. BRASIL, Paraná, Guaraqueçaba, Ilha do Superagui, 02-VII-2007, Caron & Martins col. (3 DZUP). Rio Grande



Figs. 1-7. *Bledius* from Southern Brazil. 1, 2. *B. bonariensis*: 1. dorsal view; 2. lateral view. 3, 4. *B. fernandesi*: 3. dorsal view; 4. lateral view. 5-7. *B. hermani* n. sp.: 5, 7. dorsal view; 6. lateral view.

do Sul, Rio Grande, Praia do Cassino, 26-IV-1991, Gianuca col. (26 DZUP); same locality and collector, 29-V-1991 (7 AMNH); 6-I-1993 (15 DZUP); 13-I-1993 (11 MZSP); 20-I-1993 (41 DZUP); 27-I-1993 (29 DZUP); 10-II-1993 (43 DZUP); 13-III-1993 (61 DZUP).

Remarks. *Bledius fernandesi* is included in the *punctatissimus* group together with other 25 species worldwide

(Herman 1986). This species is very similar to Nearctic and Neotropical *B. punctatissimus* LeConte, 1877; for both each cuticular process of the internal fringes of the epipharyngeal lobes has a serrated apex (compare Fig. 12 with Herman 1972: 142, Fig. 78), the procoxal fissure is closed (Fig. 14), the posterior margin of tergite VIII is broadly emarginate (Fig. 15)

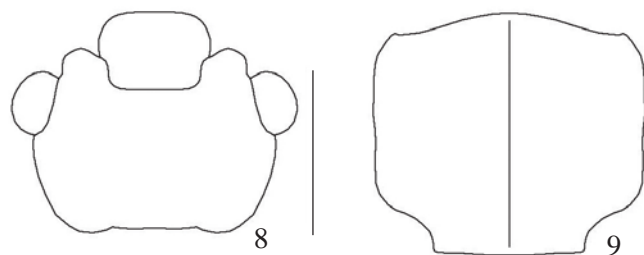
and the posterior margin of sternite VII of males is truncate (absence of the sexual dimorphism). *Bledius fernandesi* differs from *B. punctatissimus* mainly by body size, *B. punctatissimus* is longer, 2.6-3.7mm (Herman 1972); the anterior margin of the clypeus is slightly rounded (Fig. 10), but in *B. punctatissimus* the clypeus is shallowly emarginate (Herman 1972); and the anterior pronotal angles are produced (Fig. 13), but not in *B. punctatissimus* (Herman 1972).

Bledius fernandesi differs from *B. hermani* n. sp., another species of the *punctatissimus* group from Southern Brazil, mainly by the closed procoxal fissure (Fig. 14), which is open in *B. hermani* n. sp. (Fig. 20); the golden yellow elytra with the basal dark brown spot extending postero-medially into a lighter color (Fig. 3), the elytra of *B. hermani* n. sp. are pale yellow with a basal and usually subapical median brownish spot (Fig. 5, 7); and the posterior margin of tergite VIII is broadly emarginate (Fig. 15), but truncate in *B. hermani* n. sp. (Fig. 22). Moreover, for *B. fernandesi* the apex of each cuticular process of the internal fringe of the epipharyngeal lobes is serrated (Fig. 12), in *B. hermani* n. sp. they are not serrated (Fig. 18); and in males the posterior margin of sternite VII is truncate (absence of the sexual dimorphism), in *B. hermani* n. sp. sternite VII of the males has a median lobe on the posterior margin (Fig. 21).

Bledius hermani n. sp.

(Figs. 5-7, 17-24)

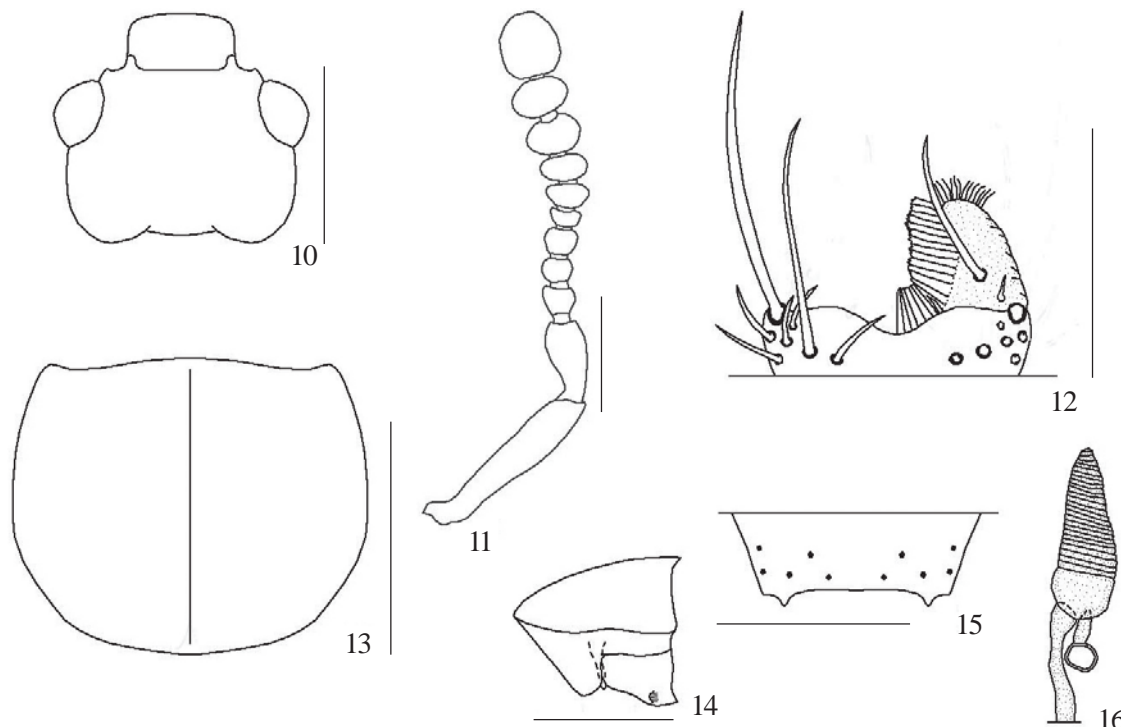
Description. Male. BL: 1.76-1.84 mm, BW: 0.50-0.58 mm.
Body reddish brown to dark brown with antennae, maxilla,



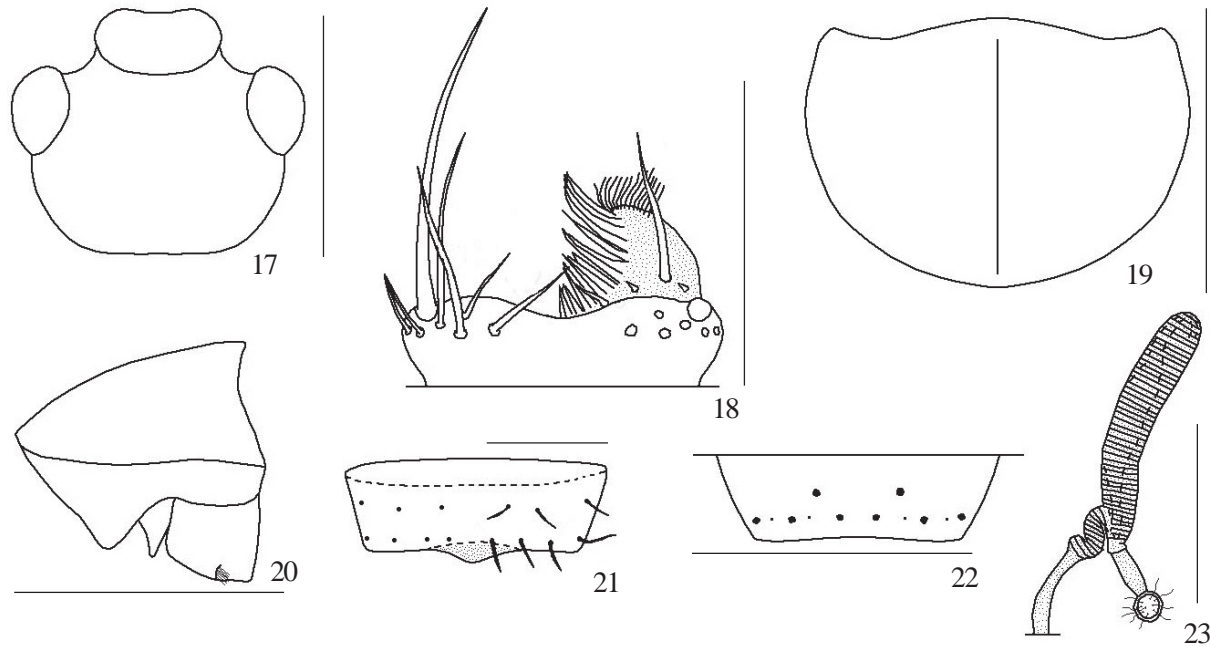
Figs. 8-9. *Bledius bonariensis*: 8. head, setae removed; 9. pronotum, setae removed. Scales. 0.25 mm.

labium and legs yellowish (Figs. 5-7); antenna with scape and 9-11 or only last segment brownish; elytra pale yellow with basal and usually subapical median brownish spot. Body subcylindrical and densely covered with vestiture of fine microsetae. Dorsum of head, pronotum and elytra with microgranulate sculpturing.

Clypeus with anterior margin slightly sinuate (Fig. 17). Epistomal suture broadly arcuate. Antennae with segments 7-11 increasingly wide and forming somewhat a club, last segment two times the length of 10. Labrum transverse (Fig. 18), anterior margin slightly sinuate. Mandibles tridentate. Submentum extending onto venter of head, posterior margin strongly V-shaped. Pronotum convex (Fig. 6), wider than long (PW/PL: 1.45) (Fig. 19), anterior angles produced, posterior margin curved, prototergosternal suture present (Fig. 20), procoxal fissure open, protrochantin exposed. Elytra longer



Figs. 10-16. *Bledius fernandesi*: 10. head, setae removed; 11. antenna, setae removed; 12. labrum, left epipharyngeal lobe and right setae of labrum removed; 13. pronotum, dorsal view, setae removed; 14. prothorax, lateral view, setae removed; 15. tergite VIII, setae removed; 16. spermatheca. Scales. 10, 13-15: 0.25 mm; 11, 12, 16: 0.15 mm.



Figs. 17-23. *Bledius hermani* n. sp.: 17. head, setae removed; 18. labrum, left epipharyngeal lobe and right setae of labrum removed; 19. pronotum, setae removed; 20. prothorax, lateral view, setae removed; 21. sternite VII, male, fine microsetae and left prominent setae removed; 22. tergite VIII, setae removed; 23. spermatheca. Scales. 17, 19-22: 0.25 mm; 18, 23: 0.15 mm.

than wide (El/BW: 1.86), elytral epipleural ridge present and complete. Sternite VII with median lobe on posterior margin (Fig. 21). Tergite VIII with posterior margin truncate (Fig. 22). Aedeagus follows pattern of *punctatissimus* group (see *B. fernandesi*).

Female. Similar to male except posterior margin of sternite VII truncate, without median lobe. Spermatheca with annelidoid form and fine setae around of the apex of the accessory gland (Fig. 23).

Distribution. BRAZIL: Paraná, Guaraqueçaba (Ilha do Superagui, Ilha da Peças, Ilha do Mel) and Rio Grande do Sul, Rio Grande (Praia do Cassino) (Fig. 24).

Type Material. Holotype. Male. BRASIL, Paraná, Guaraqueçaba, Superagui, 20-IX-2006, Borzone col. (DZUP). 434 paratypes: 1 male, 1 female and 274 sex undetermined with the same label information of the holotype (10 sex undetermined, AMNH; 10 sex undetermined, BMNH; 1 male, 1 female and 204 sex undetermined, DZUP; 10 sex undetermined, FMNH; 10 sex undetermined, MCNZ; 10 sex undetermined, MLP; 10 sex undetermined, MNRJ; 10 sex undetermined, MZSP); 79 sex undetermined differing only by the date, 21-XI-2006 (DZUP); 10 sex undetermined differing only by the date, 02-VII-2007, Caron & Martins col. (DZUP). Guaraqueçaba, Ilha das Peças, 12.IV.2005, Matuella col. (1 sex undetermined, DZUP); same locality, 22.III.2005, da Rosa col. (1 sex undetermined DZUP); Guaraqueçaba, Ilha do Mel (Brasília), 04.VIII.2005, Aluizio col. (6 sex undetermined, DZUP); same locality and collector, 04.X.2005 (1 sex undetermined, DZUP). Rio Grande do Sul, Rio Grande, Praia do Cassino, 13-I-1993, Gianuca col. (5 sex undetermined, AMNH; 5 sex undetermined, BMNH; 1 male, 3 females and 21 sex undetermined, DZUP; 9 sex undetermined, FMNH; 5 sex undetermined, MNRJ; 5 sex undetermined, MZSP); and 3 differing only by date, 10-II-1993 (1 male, 1 female and 1 sex undetermined, DZUP).

Etymology. The species name is in honor to Dr Lee Herman, from AMNH, for his valuable contributions to the knowledge of *Bledius*.

Remarks. Intraspecific variation was observed in material collected from Paraná and Rio Grande do Sul States. Specimens from Paraná are usually darker (Figs. 5, 6), antennal segments 9-11 are brownish and the elytra have basal and subapical median brownish spots. In contrast, specimens from Rio Grande do Sul are lighter (Fig. 7), the antenna has only the last segment

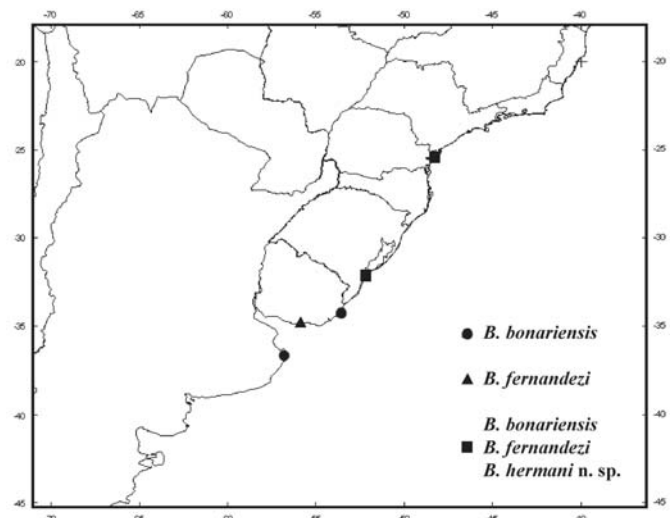


Fig. 24. Distribution of *Bledius* species from southern Brazil.

brownish and the elytra have a smaller and evanescent subapical spot that is lighter than the basal.

The annelidoid spermatheca of *B. hermani* n. sp. places it within the *punctatissimus* group, and among all species of this group it is very similar to *Bledius caribbeanus* Blackwelder, 1943, from West Indies. Differences can be found mainly in body size, *B. caribbeanus* is longer, 1.7-2.5mm (Herman 1972); the pale yellow elytra with a basal and usually subapical median brownish spot (Figs. 5, 6), whereas the elytra are entirely black in *B. caribbeanus* (Herman 1972); and sternite VII has eight prominent setae arranged in a transverse row near the apex, but *B. caribbeanus* has only two (compare Fig. 21 with Herman 1972: 143, Fig. 93).

Differences between *B. hermani* n. sp. and *B. fernandezii* are listed under remarks of *B. fernandezii*.

Final Considerations. This study reports three species, *B. bonariensis*, *B. fernandezii* and a new species, *B. hermani* n. sp. from southern Brazil. All of them occur in the Atlantic beaches and have similar distribution (Fig. 24). During July 2007, *B. bonariensis*, *B. fernandezii* and *B. hermani* n. sp. were sympatric at Ilha do Superagui, Paraná State (pers. obs. of the first author).

Gianuca (1997) was the only author to record *B. microcephalus* for southern Brazil, Rio Grande do Sul. Herman (2001) registered this species in Colombia and Trinidad, on the Caribbean seacoast. The specimens that Gianuca (1997) called as *B. microcephalus* probable were a misidentification of *B. hermani* n. sp. since he had already recognized *B. bonariensis* and *B. fernandezii* in his samples.

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