Eur. J. Entomol. **95**: 263–268, 1998
ISSN 1210 – 5759

A new subgenus and two new species of *Sphaericus* (Coleoptera: Ptinidae) from Western Australia

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Coleoptera, Ptinidae, *Sphaericus*, new subgenus, new species, Australia

Abstract. A new subgenus *Leasphaericus* (of *Sphaericus*) with two new species, *S. (L.) flavipennis* and *S. (L.) diversevillosus*, are described from North West Cape and Barrow Island, in Western Australia. With the exception of one anthropophilous and paracosmopolitan species, the genus *Sphaericus* had been recorded only from the southern Palaearctic area. The discovery of Australian autochthonous *Sphaericus* suggests that this genus may be more diversified in other areas, namely in Africa.

INTRODUCTION

The Australian fauna of ptinid beetles presently known contains 55 endemic species distributed among the genera *Ptinus* L. (18 species: Lea, 1917), *Pitnus* Gorham (1 species: Lea, 1923; Bellés, 1992), *Neoptinus* Gahan (1 species: Bellés & Lawrence, 1990) and the myrmecophilous *Diplocotes* Westwood (19 species), *Polyplocotes* Westwood (11 species), *Enasiba* Olliff (2 species), and *Ectrephes* Pascoe (3 species) (Lawrence & Reichardt, 1969). Moreover, some 10 introduced species have been recorded within the genera *Ptinus* L., *Niptus* Boieldieu, *Trigonogenius* Solier, *Sphaericus* Wollaston, *Mezium* Curtis, and *Gibbium* Scopoli (Lea, 1911; Pic, 1912; Hinton, 1941; Matthews, 1985).

The present paper describes two Australian Ptinidae belonging to the genus *Sphaericus* Wollaston. At present, the genus *Sphaericus* contains 27 species clearly concentrated in the Macaronesian area (Bellés, 1994a). In Australia, only the anthropophilous and paracosmopolitan species *Sphaericus gibboides* (Boieldieu) had been recorded from Adelaide (Matthews, 1985). The discovery of native species of *Sphaericus* in Australia, in addition to being a new contribution to the knowledge of the Australian fauna, sheds new light on the geographical history of this genus.

THE GENUS *SPHAERICUS* WOLLASTON

The genus *Sphaericus* is included in the tribe Sphaericini, along with the genera *Pitnus* Gorham (Bellés, 1992), *Neoptinus* Gahan (Bellés & Lawrence, 1984, 1990), and *Stereocaulophilus* Bellés (1994b).

In a recent revision of the genus *Sphaericus* (Bellés, 1994a) 27 species were recorded, of which 23 are endemic to Macaronesian islands, 3 are Mediterranean and 1 is anthropophilous and paracosmopolitan. In this revision, the genus was divided into three subgenera (*Sphaericus* Wollaston, with 18 species, *Nitpus* Jacquelin du Val, with 2 species, and *Doramasus* Bellés, with 7 species), whereas the former genus *Wollastonella* Lucas (see Bellés, 1982) was considered to be synonymous with *Sphaericus*.

THE NEW AUSTRALIAN SUBGENUS AND SPECIES

One of the most peculiar features of the *Sphaericus* collected in Australia is that the scutellum is clearly distinct, subtriangular in shape, whereas all other known species of this genus have the scutellum very reduced, not visible from above. Given that scutellar features are important in basic Ptinidae systematics (see, for example, Hinton, 1941), both Australian species may be included in a new subgenus, which is described as follows.

Genus *Sphaericus* Wollaston, 1854
Subgenus *Leasphaericus* subg. n.

TYPE SPECIES: *Sphaericus* (*Leasphaericus*) *flavipennis* sp. n.

Eyes small and convex; antennae 11-segmented, space between antennal insertions very narrow, reduced to an acute keel; maxillary and labial palps with last segment subacuminate. Prothorax subcylindrical, not posteriorly constricted; hindwings absent; legs rather slender, with femora slightly thickened at distal end, all tarsi 5-segmented in both sexes; scutellum clearly distinct and subtriangular in shape; elytra longer than wide, disc convex and diversely punctated and pubescent depending on species. Visible portion of abdomen with sides rounded and with 5 apparent sterna, the 4th being much shorter than the others. Aedeagus subsymmetrical; genital segment open and V-shaped, composed of two external branches fully sclerotized, and two internal branches membranous.

ETYMOLOGY. The subgeneric name has been chosen to honour the memory of Arthur M. Lea, outstanding entomologist and discoverer of many Australian ptinid beetles.

The following key permits the distinction of the four subgenera of *Sphaericus* presently known.

Key to the subgenera of *Sphaericus* Wollaston

1 Antennae 11-segmented. Male metatarsi 5-segmented 2
– Antennae 9-segmented. Male metatarsi 4-segmented ..... *Nitpus* Jacquelin du Val
2 Scutellum very reduced, not visible from above 3
– Scutellum clearly distinct, subtriangular in shape ..... *Leasphaericus* subg. n.
3 Disc of prothorax usually simple or, exceptionally, with two discrete and symmetrical protuberances; parameres of aedeagus as wide as median lobe and showing pubescence restricted to apical region ... . *Sphaericus* Wollaston
– Disc of prothorax with two symmetrical eminences that form in median part and project backward; parameres of aedeagus much wider than median lobe and showing pubescence that covers all anterior half ..... *Doramasus* Bellés

The two Australian species are also new and are described below.

Sphaericus (*Leasphaericus*) *flavipennis* sp. n.

Length 2.3–3.4 mm. Head covered with white, dense and decumbent pubescence; antennae black, filiform, segments from 1 to 9 subequal in length, covered by pubescence formed by black and white hairs, two last segments somewhat longer than others and lacking white pubescence (Fig. 1). Prothorax black, slightly rounded at sides, coarsely punctated, with pubescence formed by sparse and erect black hairs, gold-red hairs covering discal area, and U-shaped fascia of white and squamiform setae on pronotal base; legs

black and slender, with pubescence formed by sparse and erect black hairs, and white, squamiform setae irregularly distributed; scutellum subtriangular, covered with white, dense and decumbent pubescence; elytra pale red, globose and very convex, with large and quite superficial punctures densely and irregularly distributed, pubescence formed by scarce erect black hairs sparsely inserted in intervals, and one spot of white decumbent squamiform setae on posterior third (Fig. 1). Aedeagus slender, with median lobe somewhat sinuous and narrowed from median region to apex; parameres enlarged, and bearing several moderately long setae distally (Fig. 2); genital segment as in Fig. 3. Females have antennae somewhat more robust, especially last two segments.

TYPE MATERIAL. Holotype ♂. "22.09S 113.59E WA, Cape Range, outside cave C118, 3.viii.1989, E, Pryor / BES: 1440". Paratypes: 1♀, "20.43S 155.24E WA, Barrow I., outside cave B2 litter, 26.iv.1992, BES 883, W.F. Humphreys and B. Vine coll." 1♀, "WA: N-W Cape Penin. Site TL-8, 22.15S, 114.02E, 20.v.–4.vi.1990, J.M. Waldock, Pitfall traps / Cape Range 1990: 688". Type material in Western Australian Museum, Perth.

ETYMOLOGY. The specific name suggests the elytral coloration.

S. (*L.*) *flavipennis* was collected in litter and with pitfall traps in the Cape Range area on North West Cape peninsula, and on Barrow Island, which lies off the coast and north of this peninsula (Western Australia).

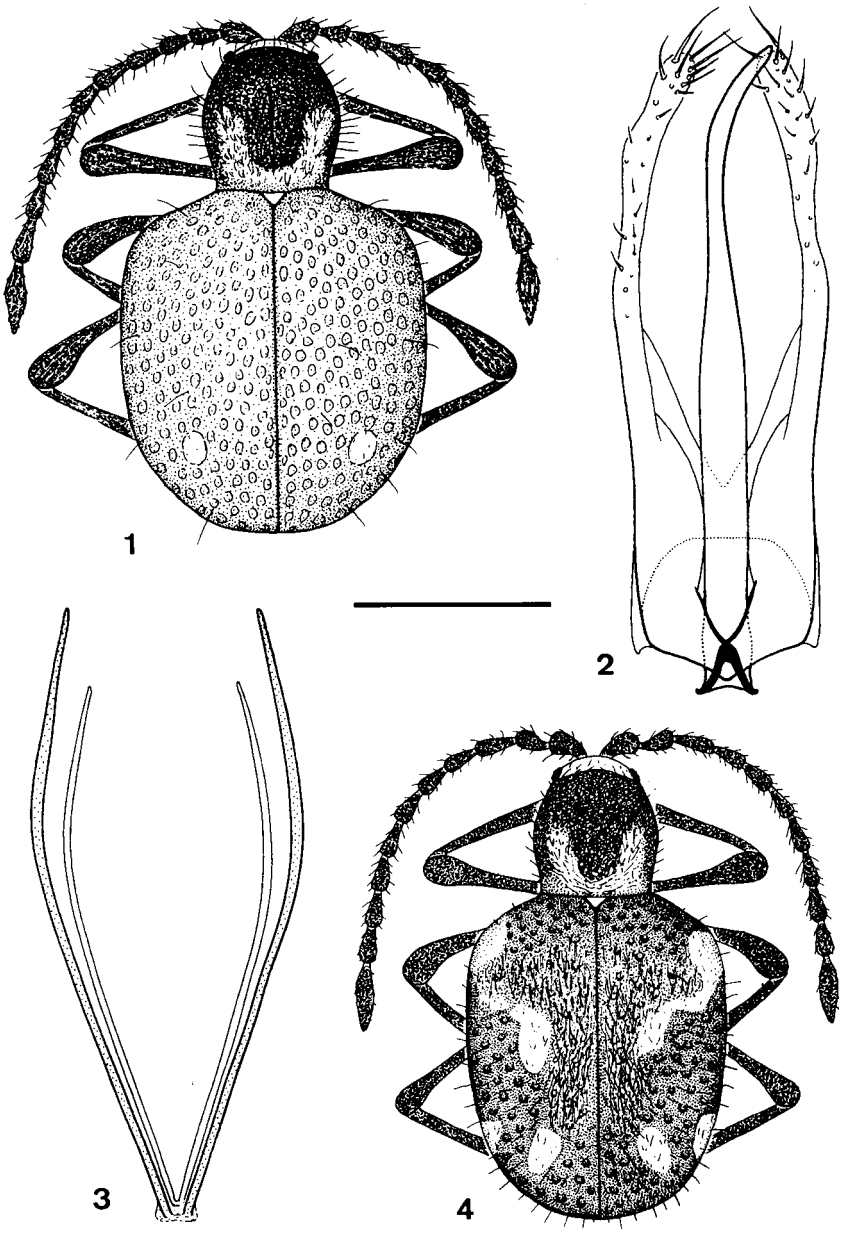
The large, convex and somewhat cordiform elytra of this species superficially resemble those of the *Sphaericus dawsoni* group (formed by *S. dawsoni* Wollaston, *S. orbatus* Wollaston and *S. nodulus* Wollaston, within the subgenus *Sphaericus* s. str.: Bellés, 1994a). However, *S. flavipennis* differs from these Madeiran species in having the elytra broader and differently coloured, the legs and antennae more slender and the pronotum with a different punctation and pubescence. In addition, and as indicated in the description of the subgenus, the clearly distinct scutellum easily discriminates *S. flavipennis* from all *Sphaericus* previously known.

Sphaericus (*Leasphaericus*) *diversevillosus* sp. n.

Length 2.2 mm. Head covered with white, dense and decumbent pubescence; antennae black, filiform, segments subequal in length except the terminal, which is longer than others, from 1 to 9 covered by pubescence formed by black and white hairs, whereas two last segments do not show white pubescence. Prothorax black, slightly rounded at sides, coarsely punctated, with pubescence formed by sparse and erect black hairs, gold-red hairs covering discal area, and U-shaped fascia of whitish and squamiform setae on pronotal base; legs black and slender, with pubescence formed by sparse and erect black hairs, and white, squamiform setae irregularly distributed; scutellum subtriangular, covered with white, dense and decumbent pubescence; elytra black, approximately ellipsoidal, with small punctures densely and irregularly arranged, pubescence formed by erect black hairs sparsely inserted in intervals, short and gold-red hairs covering discal area, and patches of white and decumbent squamiform setae that cover humeral region projecting towards disc and form two compact spots on posterior third: one lateral and the other discal (Fig. 4). In order to preserve the integrity of the holotype, which is the only specimen presently available, the genital structures were not dissected.

TYPE MATERIAL. Holotype ♂, "WA: N-W Cape Penin. Site TL-7, 22.15S, 114.04E, 20.v.–4.vi.1990, J.M. Waldock, Pitfall traps / Cape Range 1990: 52". Holotype in Western Australian Museum, Perth.

ETYMOLOGY. The specific name suggests the variegated pubescence, especially on the elytra.



Figs 1–4. 1–3: *Sphaericus* (*Leasphaericus*) *flavipennis* sp. n. 1 – habitus; 2 – aedeagus, ventral view; 3 – male genital segment, ventral view. 4 – *Sphaericus* (*Leasphaericus*) *diversevillosus* sp. n., habitus. Scale bar: Figs 1, 4 – 1 mm; Figs 2, 3 – 0.1 mm.

S. (L.) diversevillosus was collected with pitfall traps in the Cape Range area on North West Cape peninsula (Western Australia), relatively close to one of the localities of *S. (L.) flavipennis*.

This species is relatively close to *S. (L.) flavipennis*, but differs from it mainly in having the elytra less broad, rounded at sides and showing a very different coloration, punctation and pubescence.

GEOGRAPHICAL REMARKS

The distribution of the genus *Sphaericus* is very peculiar. Of the 27 species recorded in the last revision (Bellés, 1994a), one is the anthropophilous and paracosmopolitan *Sphaericus gibboides* (Boieldieu) (see Hinton, 1941; Bellés, 1991; Matthews, 1985), 3 are Mediterranean, and 23 are endemic to the Macaronesian islands (mainly the Canaries and Madeira archipelagos, but also Cape Verde, Azores and Selvagens islands). These data had suggested that the different Macaronesian archipelagos acted as active centres of diversification of this genus, from successive colonising stocks coming from the adjacent African mainland (Bellés, 1994a). However, the apparent low diversity of *Sphaericus* in continental Africa (only two species are recorded in the Mediterranean area, in addition to the paracosmopolitan *S. gibboides*) appeared to contradict the above hypothesis.

The present discovery of native *Sphaericus* in Western Australia is especially relevant from a biogeographical point of view. Indeed, it suggests that this genus may be more diversified in other regions, namely in tropical and southern Africa, where peculiar faunistic affinities with Western Australia have been recorded. The distributions of some sister groups within the beetle family Boganiidae are illustrative of these relationships, for example those of the genera *Paracucujus* Sen Gupta & Crowson (with *P. rostratus* Sen Gupta & Crowson, found in Western Australia in the male cones of *Macrozamia riedlei*, Cycadaceae) and *Metacucujus* Endrödy-Younga & Crowson (with *M. encephalarti* Endrödy-Younga, living in South Africa in the male cones of another cycad *Encephalartos lanatus*), or of the genera *Boganium* Sen Gupta & Crowson (occurring in flowers of Myrtaceae in Australia) and *Afroboganium* Endrödy-Younga & Crowson (living in flowers in south Africa) (see Endrödy-Younga & Crowson, 1986; Crowson, 1990, and references cited therein).

ACKNOWLEDGEMENTS. Thanks are due to J.F. Lawrence (Division of Entomology, CSIRO, Canberra) for the loan of specimens of Australian *Sphaericus*, and for his valuable comments on an earlier version of the manuscript. The specimens were collected as part of the Cape Range and Barrow Island Survey conducted by the Western Australian Museum (Perth) under the direction of W.F. Humpreys.

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Received June 6, 1997; accepted August 6, 1997