



New Zealand exports: *Pseudosphaeroma* Chilton, 1909 (Isopoda: Sphaeromatidae), a Southern Hemisphere genus introduced to the Pacific coast of North America

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Abstract

Collections made along the coast of California have revealed the presence of a species of *Pseudosphaeroma* Chilton, 1909, a genus common in New Zealand coastal waters. The genus is entirely Southern Hemisphere in distribution, and this record reports the introduction of a species of *Pseudosphaeroma* into the San Francisco and Central Coast region of California, the first reported occurrence of the genus as an invasive taxon, and the first record of the genus from the Northern Hemisphere. The genus is also recorded for the first time from the Galapagos and Argentina.

Key words: California, Isopoda, Sphaeromatidae, *Pseudosphaeroma*, New Zealand

Introduction

Pseudosphaeroma Chilton, 1909 is a small genus of Southern Hemisphere sphaeromatid isopods, most recently reviewed by Harrison (1984). A diagnostic and unique character of this genus is the upturned apex to the posterior margin of the pleotelson in males, and the uropodal exopod is distinctly shorter than the endopod. Harrison (1984) placed three species into the genus, and excluded a further three species, these lacking the diagnostic upturned pleotelson. The species are the type species *Pseudosphaeroma campbellense* Chilton, 1909, a species purportedly commonly encountered around New Zealand; *Pseudosphaeroma lundae* Menzies, 1962, which occurs on the Chilean coast between Coquimbo and Archipiélago de los Chanos (*c.* 30–45°S); and *Pseudosphaeroma tuberculatum* (Sivertsen & Holthuis, 1980), described from Tristan da Cunha.

This discovery of a species of *Pseudosphaeroma* in Californian harbours has, again (e.g. see Poore 1996 in response to Chapman & Carlton 1991, 1994), highlighted the need for sound and rigorous taxonomy in order to be able to identify marine organisms that may or may not have been introduced by trans-oceanic shipping. The common New Zealand ‘species’ that has been recorded under the name *Pseudosphaeroma campbellense* appears to be at least three species, and all other records of that species have to be considered as doubtful. The species from San Francisco Bay does appear to be one of the common New Zealand species, but is not a named species. Given the known Southern Hemisphere distribution of the genus, the abundance of *Pseudosphaeroma* species in New Zealand, its occurrence only in San Francisco harbour and Morro Bay in the United States, we are confident that the species has been introduced to California.

Only one isopod species is believed to have been translocated from New Zealand — *Euryllana arcuata* (Hale, 1925), which has been introduced to Australia and San Francisco (Bruce, 1986, Bowman *et al.*, 1981).

Unless otherwise stated material is held at: Natural History Museum of Los Angeles County, California

(Wetzer collection RW numbers) and at the National Institute of Water and Atmospheric Research Ltd, Wellington, New Zealand (NIWA numbers).

Family Sphaeromatidae Latreille, 1825

Genus *Pseudosphaeroma* Chilton, 1909

Remarks. The genus *Paradynamenopsis* Menzies, 1962 was placed in synonymy with *Pseudosphaeroma* by Harrison (1984).

Pseudosphaeroma sp.

(Fig. 1)

Pseudosphaeroma campbellensis.— Hurley & Jansen, 1977: 67, fig. 62.— Poore, 1981: 346, fig. 10 [part] [not *Pseudosphaeroma campbellensis* Chilton, 1909].

Not *Pseudosphaeroma campbellense*.— Harrison, 1984: 274, fig. 6.— Poore, 1994: 211, 212, fig. 11.13B [misidentifications].

Material examined. **Type series** of *Pseudosphaeroma campbellensis* Chilton, 1909. 4 tubes plus microslides of approx. 100 syntypes. Additional material identified by Chilton as this species from Auckland Island and Stewart Island, New Zealand (Canterbury Museum, Christchurch, New Zealand; unregistered).

California: ♂ (5.2 mm), Coyote Point Marina, Coyote Point, San Mateo County, San Francisco Bay, 14 Sep 2000, on rope, outer floating dock, gate 1, coll. B. Van Soyc & R. Mooi (California Academy of Sciences, San Francisco, IZ 145918). ♂ (4.2 mm), Marina Bay Yacht Harbor, Richmond, Contra Costa County, San Francisco Bay, 37.91°N, 122.35°W, 31 Mar 2001, on concrete, inner floating dock G, coll. K. Soave & O. Lau (Cal Acad, IZ 163490). ♂ (3.6; imm 2.9 mm), 11 ♀ (non-ovig. 2.4–3.5 mm), Brisbane Marina, Brisbane, San Mateo County, San Francisco Bay, 37.67°N, 122.38°W, 15 Nov 2001, on rope, outer floating dock, gate 1, coll. B. Van Soyc, R. Mooi, R. Ayres & C. Piotrowski (Cal Acad, IZ 163440). Many, Alan Sieroty State Park, Millerton Point, Marin County, Tomales Bay, off Hwy. 1, 38.1089°N, 122.8510°W, 4 Jun 2002, coll. R. Wetzer, S. Boyce and T. Haney (RW02.022). 8 ♂ (3.5–5.1 mm), 5 ♀ (non-ovig. 3.5–3.8 mm), 7 juv. (unmeasured), inner harbour, Morro Bay, San Luis Obispo County, California, 35.357°N, 120.848°W, 14 Aug 2008, high tide, from decaying wooden ladder with barnacles and bivalves, coll. R. Wetzer and N. D. Pentcheff (RW08.044).

New Zealand: Abundant samples, all collected by NIWA Ports & Harbours Survey; sub-sampled for adult males: *Nodular form*: ♂ (3.2 mm), Marsden Point, Whangarei, North Island, 35.839°S, 174.640°E, 12 Nov 2002, WRE014, stn Z15130 (NIWA 25864); ♂ (3.6 mm), Bluff, South Island, 46.593°S, 168.335°E, 21 Mar 2003, BLU099 (NIWA 25865); 2 ♂ (5.1, 5.2 mm, plus 7 ♂ and juv. unmeasured), Lyttelton, 43.607°S, 172.715°E, 4 Nov 2004, 2LYT105 (NIWA 25866). *Smooth form*: 5 ♂ (3.6, 3.8, 4.1, 4.2, 5.2 mm, plus 17 ♂, ♀ unmeasured) Timaru, South Island, 44.394°S, 171.257°E, 22 Nov 2005, 2TIU 010 (NIWA 25867).

Also examined: *Pseudosphaeroma lundae* Menzies, 1962. **Chile:** ♀ (non-ovig. 3.7, 2.6 mm), Coquimbo, La Pampilla, 29.956°S, 71.361°W, 19 Jul 2006, high exposure rocky shore, coll. N.L. Bruce & M. Thiel (NIWA 25868). 18, near Concepcion, Chome, ~36.5°S ~73.03°W, 14 Mar 2004, intertidal, under boulder, coll. M. Thiel (RW04.200).

Pseudosphaeroma spp. (not *P. campbellense*). **Argentina:** ♂ (5.0 mm), 3 ♀ (ovig. 4.9, non-ovig. 3.0, 4.3 mm), Patagonia, Cabo dos Bahias, ~49°S, ~68°W, 2003, mid-intertidal, exposed shore, coll. E. Schwindt (RW03.12). 2 ♂ (5.0, 5.3 [broken] mm), ♀ (ovig. 4.0 mm), Patagonia, Cabo dos Bahias, ~49°S, ~68°W, 2003,

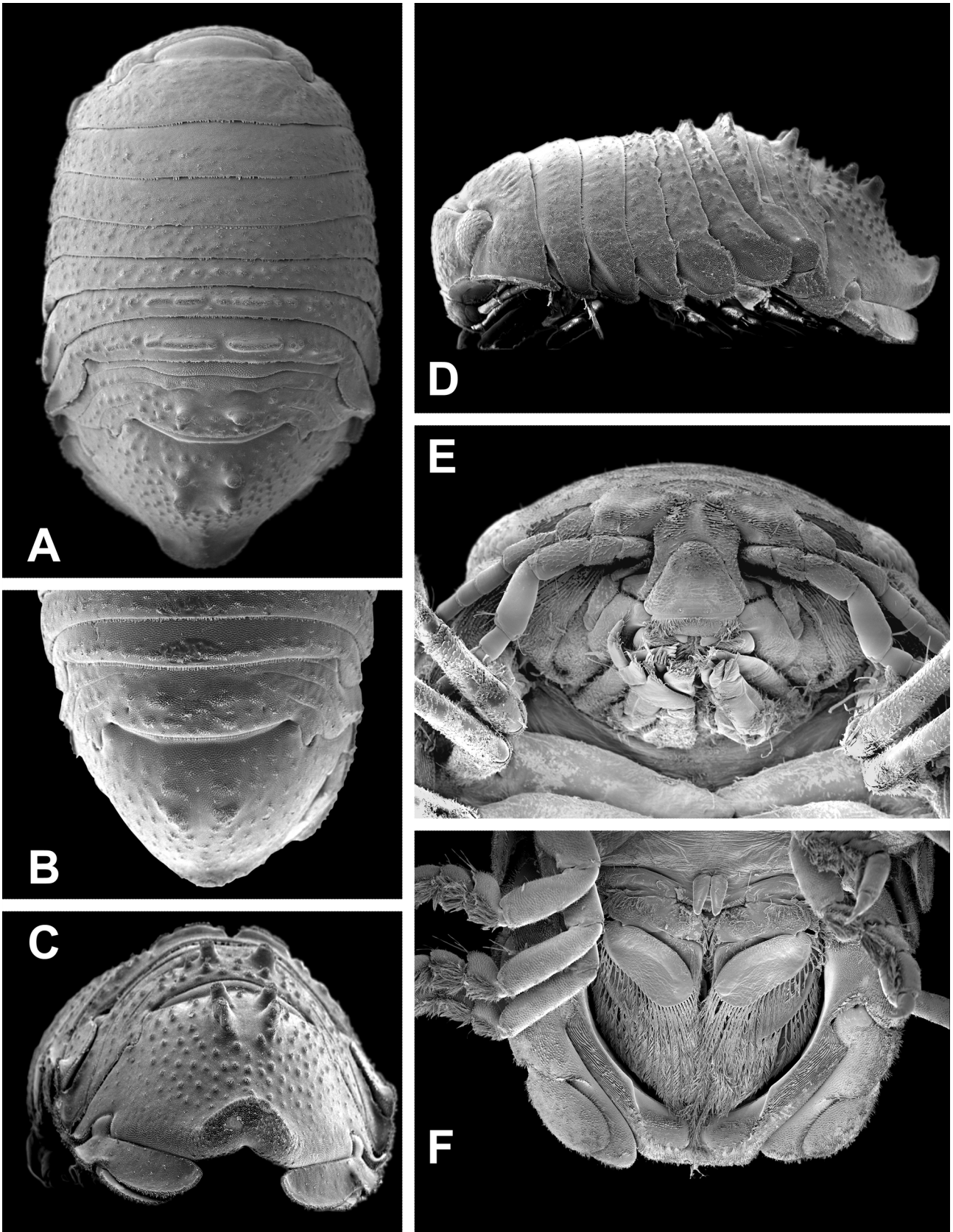


FIGURE 1. *Pseudosphaeroma* sp. All figs of specimens from Millerton Point, Tamales Bay, Marin County, California (RW02.022). All figs of male except B and E, female.

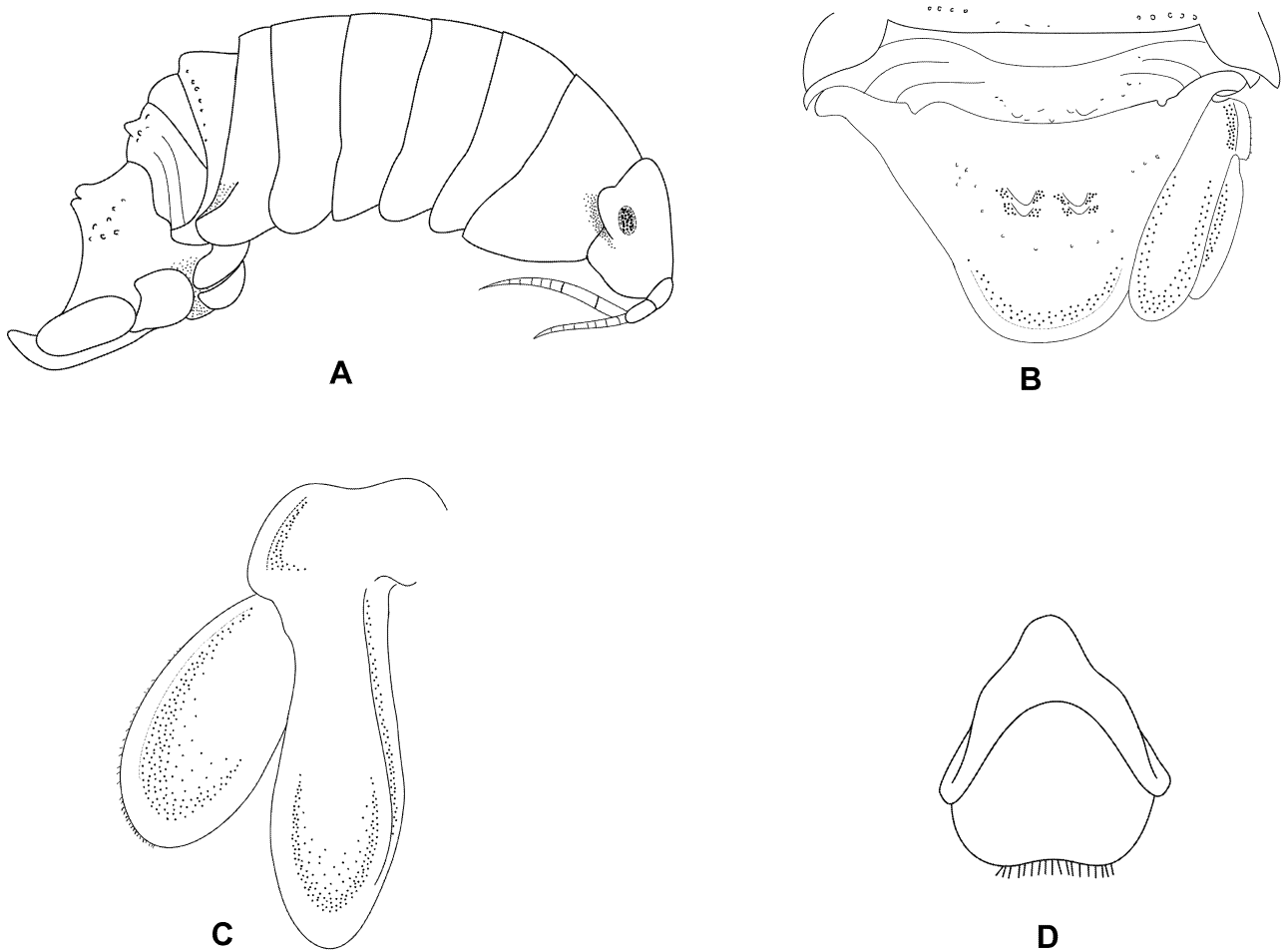


FIGURE 2. *Pseudosphaeroma campbellense*. Male (6.2 mm) syntype. A, lateral view; B, dorsal view of pleon and pleotelson; C, epistome; D, uropod.

mid-intertidal, exposed shore, MEV 15, coll. E. Schwindt (RW03.12). 4, same data, MLB210 (RW03.015). **Galapagos:** imm. (2.9 mm), Isla Bartolomé, 00.20°S, 90.833°W, 23 Sep 1966, intertidal, *Anton Bruun* stn 794-A (USNM acc. no. 2028146, RW03.077). **Australia:** 27 ♂ and ♀, St Leonards jetty, Port Philipp, Victoria, 3 Sep 1983, intertidal at water level (Museum Victoria, Melbourne, NMV J6779).

Remarks. We consider that the present concept of *Pseudosphaeroma campbellense* includes more than one species. Hurley & Jansen (1977) and later Poore (1981) commented that the species was highly variable, Poore (1981) being of the opinion that such variation was likely to be clinal, but later (Poore 1994), as part of a general biogeographic discussion, expressed the opinion that the separate populations were different species. Observations on approximately one hundred specimens of ‘*P. campbellense*’ from New Zealand suggest that there are probably two sibling species in New Zealand, corresponding to the two ‘forms’ figured by Hurley & Jansen (1977), a ‘smooth form’ and a ‘nodular form’. Hurley & Jansen (1977) themselves considered that observed variation ‘may indicate the existence of geographic races or subspecies, or of separate species’ and referred to the species as a ‘species-complex’.

The type material of *Pseudosphaeroma campbellense* Chilton, 1909 (Fig. 2) was examined, and that species is not the same as material being recorded under that name from the North Island and South Island, and is not the species recently collected from San Francisco Bay. The type material, from Campbell Island (Fig. 2) has little ornamentation, has an anteriorly narrowed epistome, the posterior margins of coxae 6 and 7 form a

point and the turned-up pleotelson posterior margin of the males is far wider than in other species. In contrast the other species from New Zealand's big islands both differ in having an anteriorly wide epistome and narrower pleotelson posterior margin, rounded coxae 6 and 7; the smooth-bodied species has a shorter uropodal exopod and the males of the nodular species is more highly ornamented than *P. campbellense*.

The specimens from San Francisco are identified here as *Pseudosphaeroma* sp. [sensu *campbellense* Hurley & Jansen (1977)], belonging to the New Zealand nodular species and may be readily identified by the anteriorly broadly rounded epistome, rounded posterior margins of coxae 6 and 7, adult males with the nodules on the posterior margins of pereonites 6 and 7 forming a broken transverse ridge and on the dorsal surface of the pleotelson with two separate pairs of prominent tubercles.

The specimen figured by Harrison (1984) from southern Australia in Port Philip Bay, Victoria has far more nodulose pereonites than the New Zealand species, these nodules not forming transverse ridges, and is closer in appearance to *P. tuberculatum*. The genus is known in Australia only from Port Phillip Bay, and it is our opinion that it is possibly an introduced species.

The specimen examined here from the Galapagos is of an undescribed species, with prominent nodules spread across the dorsum of the pleotelson; although the pleotelson apex is strongly upturned the specimen is not a mature male. Material from Patagonia is most similar to the 'smooth form' of *P. campbellense*, but we cannot confirm identity at this point; it appears to differ from the New Zealand 'smooth form' in having a pair of submedian low irregular ridges on the pleotelson and a wider upturned pleotelson margin. The genus has not previously been reported from these locations.

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