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A new species of *Gastrosaccus* (Mysidacea) from Western Australia

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Abstract

A new species of *Gastrosaccus* (Crustacea, Mysidacea) from Western Australia is described and illustrated. *Gastrosaccus sorrentoensis* sp. nov. is readily characterised by the fringe of filaments on the posterodorsal edge of the carapace and the prominent spinous process on the posterodorsal edge of the fifth abdominal somite. *Gastrosaccus spinifer* (Göes, 1864) is the only other member of the genus possessing both these characteristics, but in *G. sorrentoensis* the fringe of filaments extends around the entire border of the carapace emargination. Other morphological features separating the two species are noted.

Introduction

In a recent review on the biology of mysids, Mauchline (1980) commented on the general paucity of information on distributions in southern latitudes and noted that many new species probably remained to be described. This was demonstrated by Băcescu and Udrescu (1982) who recorded eight species in samples collected from coastal waters of Queensland and New South Wales, Australia, five of which were new to science.

Recent work by the second author (McLachlan and Hesp 1985) on sandy beaches near Perth in Western Australia has revealed a further undescribed species. It was collected in large numbers in the surf zone of Sorrento beach using a hand net in water of about 1 m depth.

Systematics

Gastrosaccus sorrentoensis sp. nov.

Figures 1-4

Holotype

WAM 343-86. Adult male collected November 1983 off Sorrento Beach near Perth by A.M. Length 9.3 mm.

Paratypes

WAM 344-86. Males and females. Collection data as for holotype.

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Diagnosis

The only Australian species of *Gastrosaccus* with a fringe of spine-like filaments extending around the posterodorsal edge of the carapace and with a prominent spinous process on the posterodorsal edge of the fifth abdominal somite. The only other member of the genus possessing both these characteristics is *G. spinifer,* but in *G. sorrentoensis* the fringe of filaments extends around the entire border of the carapace emargination. (See Table 1 for summary of features distinguishing these two species and comments under Remarks.)

Description

The morphological characteristics described below refer to both sexes, unless otherwise stated.

Total length of adult females 8.5-11.3 mm (20 specimens); adult males, 7.0-9.3 mm (20 specimens). Carapace short, leaving last thoracic somites exposed in dorsal view. Anterior margin of carapace produced into blunt rostrum between bases of eyestalks (Figure 1A). Posterior dorsal margin of carapace deeply emarginate, each side of emargination split with posterior margin overlapping the anterior. Emarginated border fringed with many slender spine-like filaments; these number about 25 along edge of carapace between lobes (Figure 1A). Further fringe of smaller filaments posterior to each lobe which decrease progressively in size away from the split. Towards extremity of carapace fringe represented by small undulations only. In lateral view carapace extends posteriorly to cover whole of thorax.

Abdominal somites almost cylindrical with no marked indication of lateral compression and without ridge or keel along mid-dorsal line of any somites. Fifth somite bears a prominent spinous process on posterodorsal edge (Figure 1B). Antennule (Figure 1C), first segment of peduncle equal in length to second and third combined, second with two strong spines set obliquely across outer lateral margin. Third segment bears a finger-shaped process on dorsal side near origin of outer flagellum. This flagellum swollen at the base and in the female, fringed with a row of setae. In the male this lobe extremely hirsute.

Antennal scale (Figure 1D) slightly more than three times as long as broad and almost reaching anterior edge of second segment of its peduncle. Lateral margins of scale straight, outer edge terminating in strong spine which does not extend beyond rounded apex. Inner margin bears *c.* 20 plumose setae. Setation of peduncle as shown (Figure 1D).

Mandible (Figure 1E) with three-segmented palp, proximal segment short and without setae. The second and third segments bear spinous setae as illustrated. Distal end of last segment with a comb-like process.

Maxillule (Figure 1F) bearing three long and two shorter spines on lobe of first segment. Shorter spines armed with spinules along entire length; longer

spines bear spinules in distal half only. Basal endites with *c.* 18 stout and serrate spines.

Maxilla (Figure 2A) similar in form to that of other members of genus with exopodite bearing 13 plumose setae along outer border. Terminal segment of endopod spinose along inner and distal margins. Palp, coxal and basal endites heavily spinose as illustrated.

Endopod of first thoracic limb (Figure 2B) short and densely setose, particularly along inner lateral margin. First exopod segment expanded, outer distal angle without a tooth. Remaining 13 segments bear one or two long plumose setae. Second thoracic limb similar in structure although endopod is larger and setation appears less dense. First exopod segment with small tooth on outer distal angle.

Third to eighth thoracic limbs similar in form, carpus and propodus of endopods fused and divided into subsegments. Number of subsegments varies between 14 and 16 in the eighth pair (Figure 2C) and decreases progressively in the more anterior limbs. In third pair there are *c.* eight subsegments. Each subsegment bears a brush of small setae and two small spines. No nail on terminal segment. First exopod segment of third to eighth thoracic appendages expanded and armed with small tooth on outer distal corner on all except the eighth pair. Exopod flagella with 14 to 16 segments, each segment with two long, plumose setae.

First pleopod of female (Figure 3A) with long slender sympod, armed proximally with one plumose seta and distally with six spinose setae. Exopod about three times as long as broad, bearing three spine-like setae and two small plumose setae distally. Lateral margins fringed with five or six plumose setae. Endopod nearly four times as long as its mid-width, tapering distally and bearing row of five spinose setae. Second pleopod of female (Figure 3B) in form of an unjointed plate, five times as long as wide. Margins of distal half armed with nine spinose setae and *c.* five plumose setae which vary in length. Remaining pleopods of female small and similar in form to second pair.

Male first pleopod (Figure 3C) with swollen sympod, outer margin fringed with 11 plumose setae. Endopod small and un-segmented, bearing three spine-like setae at distal end. Remaining setation as shown. Exopod 10-segmented, each segment bearing two long plumose setae.

Second male pleopod (Figure 3D) with rectangular sympod. Endopod nine-segmented, slightly shorter than sympod and bearing well developed pseudobranchial lobe on first segment. Lobe bearing eight setae as shown. Remaining endopod segments each with two setae. Exopod more robust, 10-segmented and longer than endopod. Setae on outer margin longer than those along inner border. Outer setae on segments two to five are distinctly thicker proximally, their profiles irregular in form along the thickened part.

Endopod of third male pleopod (Figure 3E) nine-segmented and as long as rectangular sympod. Pseudobranchial lobe on first segment, setation as shown. Exopod eight-segmented, slightly more than three times length of endopod.

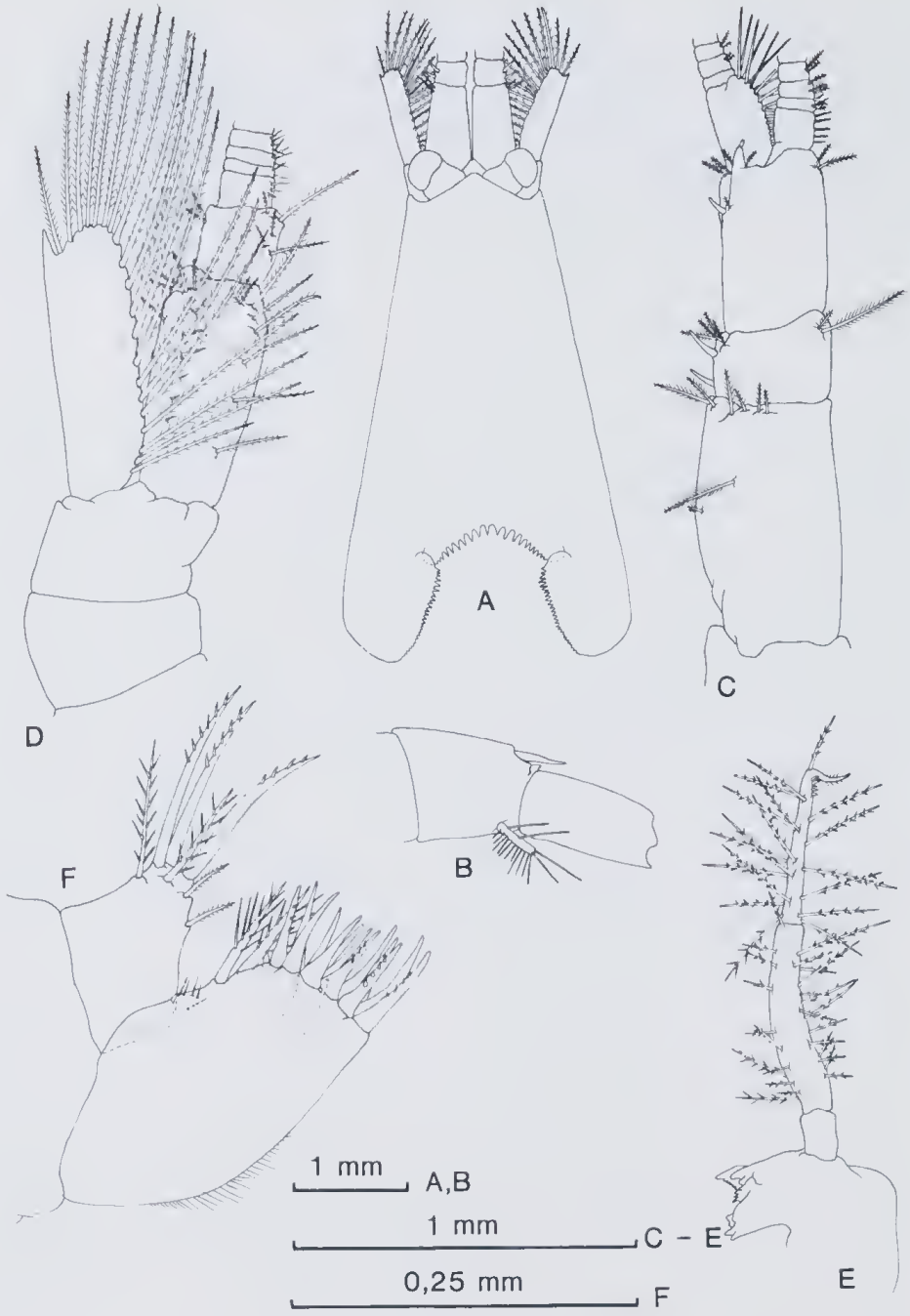

Figure 1 *Gastrosaccus sorrentoensis* sp. nov. A. Carapace in dorsal view. B. Fifth abdominal somite in lateral view. C. Female antennule. D. Antennal peduncle and scale. E. Mandible. F. Maxillule.

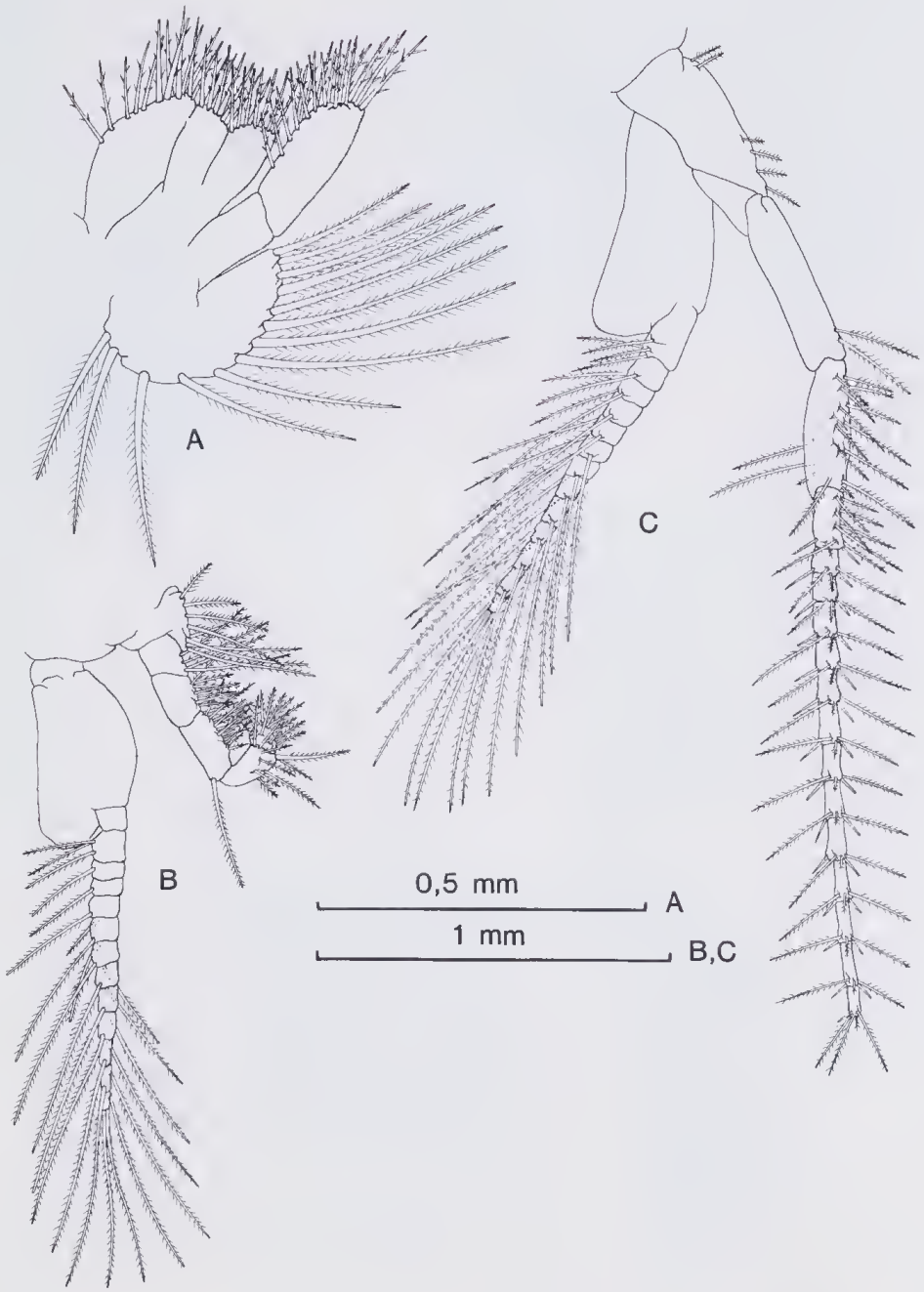

Figure 2 *Gastrosaccus sorrentoensis* sp. nov. A. Maxilla. B. First thoracic appendage. C. Eighth thoraci appendage.

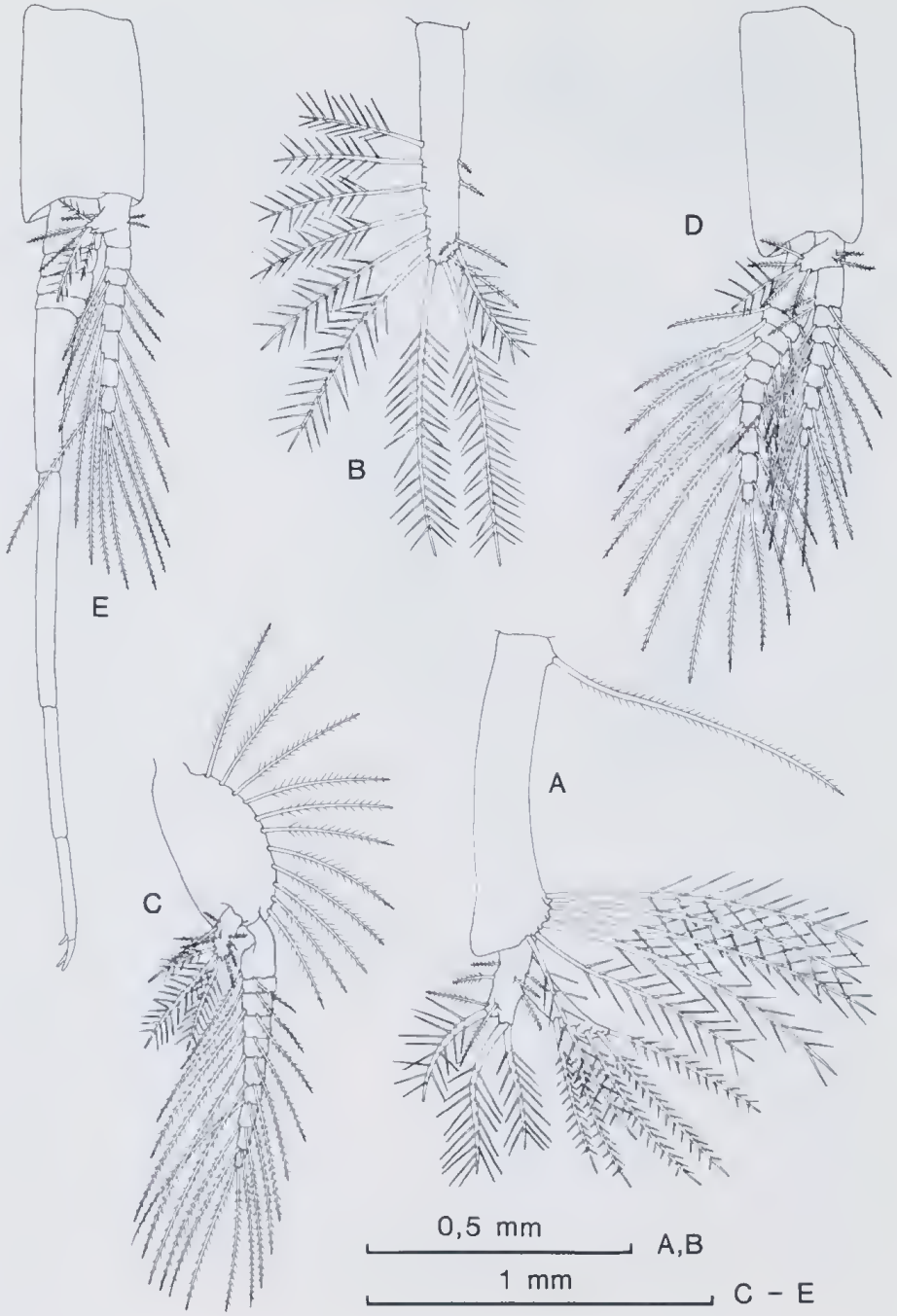

Figure 3 *Gastrosaccus sorrentoensis* sp. nov. A. First pleopod of female. B. Second pleopod of female. C. First pleopod of male. D. Second pleopod of male. E. Third pleopod of male.

First four segments extend to midlength of the endopod. Fifth segment shorter than sixth which is equal to combined length of remaining segments. Apex armed with two strong claws and a smaller spine sub-terminally.

Uropod (Figure 4A) extending beyond telson, exopod subequal in length to endopod and bearing 14 robust spines which are finely plumose along posterior margin. Apex of these spines with short, curved protrusion. Endopod tapering distally, inner border armed with five or six spines irregularly spaced among the setae, first located opposite edge of statocyst. Two groups of *c.* four and eight small setae near base and on inner and outer edge of endopod respectively.

Telson (Figure 4B) two and a half times as long as basal width. Margins armed with seven and occasionally eight strong spines on either side. Terminal spines markedly longer than others. Cleft one-sixth length of telson and armed with 15 to 18 small graduated spines on either side. In females a small pigment spot opposite each of the fifth lateral spines. A single robust spine on median antero-ventral line of telson (Figure 4C).

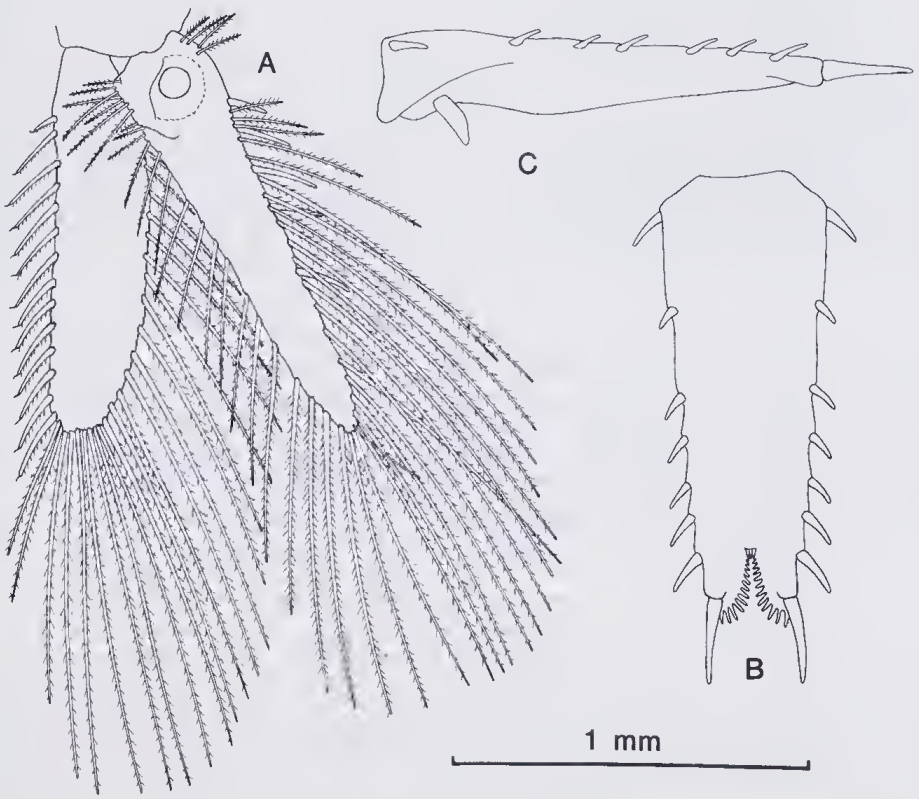

Figure 4 *Gastrosaccus sorrentoensis* sp. nov. A. Uropod. B. Telson in dorsal view. C. Telson in lateral view.

Remarks

The genus *Gastrosaccus* from Australian waters is currently represented by seven species, four of these being endemic to the continent. Those with a wider geographical range are *G. australis* W. Tattersall, 1923 which has been recorded from Spirits Bay, New Zealand (Tattersall 1923); *G. indicus* Hansen, 1910 recorded from the East Indian Archipelago, the north-east of Madagascar, the coasts of India, the Philippine Islands, Java and Port Stephens in New South Wales (Tattersall 1940, Ii 1964); *G. bengalensis* Hansen, 1910 (synonymous with *G. philippinensis* [Ii 1964, Pillai 1972]) from the Bay of Bengal, the Andaman Islands, between Ceylon and New Guinea, off Formosa, Taiwan and from Moreton Bay in Queensland (Băcescu and Udrescu 1982).

Gastrosaccus dakani W. Tattersall, 1940 is known from Australian waters only and was originally recorded from Lake Illawarra and from the estuary of the Brisbane river (Hodge 1963). Descriptions of *G. daviei, G. brisbanensis* and *G. queenslandiensis* were published only recently (Băcescu and Udrescu 1982),

Table 1 Summary of the morphological characteristics which separate *G. spinifer* (from Tattersall and Tattersall, 1951) and *G. sorrentoensis* sp. nov.

Gastrosaccus spinifer	*Gastrosaccus sorrentoensis*
Eight or nine spine-like filaments along posterodorsal edge of carapace. No filaments posterior to overlapping lobes on either side of emargination.	Spine-like filaments anterior to overlapping lobes on either side of emargination are closely set and number about 25. Posterior to lobes a further 50 smaller filaments or undulations on either side. These decrease progressively in size posteriorly.
Marked lateral compression of fourth and fifth abdominal somites.	No marked lateral compression of fourth and fifth abdominal somites.
Longitudinal keel along mid-dorsal line of fourth and fifth abdominal somites.	No keel along mid-dorsal line of fourth and fifth abdominal somites.
Three spines on outer margin of second segment of antennular peduncle.	Two spines on outer margin of second segment of antennular peduncle.
Inner margin of endopod of uropod armed with about 10 long slender spines.	Inner margin of endopod of uropod armed with five or six spines.
Spines arming outer margin of exopod of uropod set in distal two-thirds of segment.	Spines arming outer margin of exopod of uropod set along entire length of segment.
Terminal spines of telson not markedly longer than others. Cleft more than one-quarter length of telson.	Terminal spines of telson markedly longer than others. Cleft one-sixth length of telson.

while Dexter (1984) recorded an undescribed species of *Gastrosaccus* from the eastern regions of the continent. Future research will undoubtedly reveal further new species as well as wider geographical ranges.

Gastrosaccus sorrentoensis is the first recorded member of the genus from Western Australia and shows distinct characteristics which separate it from other Gastrosaccinae. Of particular significance is the fringe of filaments along the posterodorsal edge of the carapace and the spine located on the fifth abdominal somite. No other species of *Gastrosaccus* currently known from Australia possesses this fringe, although *G. brisbanensis* has the spine on the fifth abdominal somite. Of the remaining 36 species known worldwide (Mauchline and Murano 1977, Wooldridge 1978, Băcescu and Udrescu 1982, Wooldridge and McLachlan 1986), only four have the fringe of filaments — *G. muticus* W. Tattersall, 1915, *G. simulans* W. Tattersall, 1915, *G. spinifer* (Göes, 1864) and *G. namibensis* Wooldridge and McLachlan, 1986. *G. spinifer* is the only one with both a fringe and a spine on the fifth segment of the abdomen, although this spine is apparent in immature *G. simulans* (Tattersall, 1915). The former species is widespread in waters around Britain and Europe, and more recently, from West Africa (Tattersall and Tattersall 1951).

Finally, the prominent spine present on the anteroventral surface of the telson should be noted. No reference to this spine could be found in the literature for other members of the genus, although observations have shown it to be present in *Gastrosaccus psammodytes* O. Tattersall, 1958, a mysid common along sandy beaches in South Africa (Brown and Talbot 1972; Wooldridge 1983). It is possible that the presence of this spine has been overlooked by many authors and that it is not unique to *G. sorrentoensis* and *G. psammodytes.*

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