

Description of a New Gobiesocid Fish from South-Western Australia, with a Key to the Species of *Aspasmogaster*

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Abstract

A new species of clingfish, *Aspasmogaster occidentalis*, is described from south-western Australian seas. It is distinguished from other members of *Aspasmogaster* by the absence of anterior skin folds on the ventral surface of its lower lip. *Aspasmogaster liorhynchus* Briggs, originally described from New South Wales is recorded for the first time from Tasmania, Victoria, South Australia and Western Australia. *Aspasmogaster costatus* (Ogilby) from New South Wales, previously united with *A. tasmaniensis* (Günther) is recognized as a distinct species. A key is provided for the species of the genus.

Introduction

The clingfish genus *Aspasmogaster* consists of small fishes which inhabit rocky bottoms in intertidal and shallow subtidal areas of temperate Australian seas and estuaries. The genus was last reviewed by Briggs (1955), who recognized two species, *A. tasmaniensis* (Günther) from southern Australia and *A. liorhynchus* Briggs from New South Wales. Recent collections by the present author have led to the discovery of a third species which is thus far known only from south-western Australia. These collections have also extended the known range of *A. liorhynchus* to Tasmania and west to the Archipelago of the Recherche in Western Australia. Furthermore, the common New South Wales species originally described as *A. costatus* (Ogilby), but synonymized by Briggs with *A. tasmaniensis* is considered to be significantly distinct to warrant specific recognition. The purpose of this paper is to describe the new Western Australian species, to present details regarding the above observations of its congeners, and to provide a key to the genus *Aspasmogaster*.

The methods used follow Hutchins 1983. The material examined is housed at the following institutions: Australian Museum Sydney (AM); British Museum (Natural History), London (BMNH); National Museum of Victoria, Melbourne (NMV); Queen Victoria Museum, Launceston, Tasmania (QVM); South Australian Museum, Adelaide (SAM); and the Western Australian Museum, Perth (WAM).

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Systematics

Key to the Species of *Aspasmogaster*

- 1a Lower lip smooth-edged, without anterior fold of skin on each side (Figure 1); colour in life either pale yellowish-brown, pinkish-brown or dusky brown, adults with small brownish spots on dorsal surface of head, juveniles dorsally with orange lines and spots across head and body, becoming fainter posteriorly (Western Australia) *A. occidentalis* sp. nov.
- 1b Ventral surface of lower lip with obvious anterior fold of skin on each side (Figure 2); colour not as above 2
- 2a Snout smooth, no skin fold across its dorsal surface (Figure 2a); colour in life either pale greenish-brown, pale brown or dusky brown, head and body usually covered with many very small darker spots, some of which join together forming short irregular lines (New South Wales, Victoria, Tasmania, South Australia and Western Australia) *A. liorhynchus* Briggs, 1955
- 2b Prominent skin fold across dorsal surface of snout (Figures 2b and 2c); colour not as above 3
- 3a Pectoral fin rays usually 23 (21-25); dorsal fin rays 8-9; anal fin rays 6-8; vertebrae 30; maximum size 51 mm SL; colour in life pale pinkish-brown with darker irregular cross bars, those anteriorly often merging together to form a complex pattern of irregular blotches (after death this pattern usually disappears) (New South Wales) *A. costatus* (Ogilby, 1885)
- 3b Pectoral fin rays usually 25 (24-26); dorsal fin rays 8-10; anal fin rays 7-9; vertebrae 32; maximum size 67 mm SL; colour in life either yellowish, brownish, pinkish or greenish with darker cross bars, mostly regular in shape and numbering 17-25; rarely body bars fade posteriorly to form scattered pale spots (colour pattern generally remains distinct while specimens reasonably fresh) (Victoria, Tasmania, South Australia and Western Australia) *A. tasmaniensis* (Günther, 1861)

Aspasmogaster occidentalis sp. nov.

Figures 1, 3, 4 and 5; Table 1

Aspasmogaster tasmaniensis – Hutchins, 1977: 36 and 174 (part)

Aspasmogaster species – Hutchins and Thompson, 1983: 76 and Fig. 66.

Holotype

WAM P.27882-001, 66 mm SL, Bunker Bay, Cape Naturaliste, Western Australia (33°32'S, 115°02'E), collected with rotenone at 0.5 m, J.B. Hutchins, 8 December 1982.

Paratypes

Seventeen specimens from Western Australia, 22-93 mm SL (unless otherwise designated, all specimens at WAM): P.25770-022, 3 specimens, 22-80 mm SL (52 mm specimen cleared and stained), Sandy Hook Island, Archipelago of the Recherche, rotenone at 13 m, J.B. Hutchins and C.W. Bryce, 11 April 1977; P.25774-008, 55 mm SL, Gull Island, Archipelago of the Recherche, rotenone at 10 m, C.W. Bryce, 15 April 1977; P.26000-013, 23 mm SL, Lucky Bay, east of Esperance, rotenone at 10 m, J.B. Hutchins, 12 March 1978; P.26002-007, 25 mm SL (cleared and stained), unnamed island in eastern Lucky Bay, rotenone at 4 m, J.B. Hutchins, 14 March 1978; P.26007-006, 70 mm SL, Rob Island (off Lucky Bay), rotenone at 10 m, J.B. Hutchins, 20 March 1978; P.26009-003, 68 mm SL, Lucky Bay, rotenone at 13 m, J.B. Hutchins and R.H. Kuiter, 22 March 1978; P.26546-005, 62 mm SL, Saddle Island (off Walpole), rotenone at 3 m, J.B. Hutchins, 5 February 1979; P.26620-004, 26 mm SL, Geordie Bay, Rottneest Island, rotenone at 5 m, J.B. Hutchins and N.O. Sinclair, 14 June 1980; P.27880-003, 3 specimens, 67-93 mm SL, collected with holotype; AM I.20219-024, 58 mm SL, Rob Island (off Lucky Bay), rotenone, B.C. Russell, 20 March 1978; AM I.20222-018, 2 specimens, 31-85 mm SL, Mondrain Island, Archipelago of the Recherche, rotenone, B.C. Russell and R.H. Kuiter, 21 March 1978; BMNH 1983.3.1.2, 69 mm SL, collected with holotype; NMV A.2831, 54 mm SL, collected with P.26000-013.

Diagnosis

This species is placed in the genus *Aspasmogaster* as it lacks the posterior patch of papillae on the anterior half of its ventral sucking disc, as well as having three pores in its lacrymal series, a character combination unique amongst Australian temperate gobiesocids. It is distinguished from all other *Aspasmogaster* species by the absence of two prominent anterior skin folds on the ventral surface of the lower lip.

Description

Measurements and counts of the holotype and selected paratypes are presented in Table 1. The following counts and proportions in parentheses represent the ranges for the paratypes when they differ from those of the holotype.

Dorsal fin rays 9 (8-10; three with 8 and four with 10); anal fin rays 8 (7-9; one with 7 and two with 9); pectoral fin rays 27 (24-27, usually 25); pelvic fin rays I, 4; caudal fin rays 10-12 (from cleared and stained material); vertebrae 32; branchiostegals 6.

Body robust, moderately depressed anteriorly and compressed posteriorly, depth 5.5 (6.2-7.2) and width 5.1 (4.8-5.6), both in SL; caudal peduncle very

short, length 1.9 (1.9-3.3) in its depth; head wide posteriorly and moderately depressed, tapering to a rather pointed snout, head length 2.6 (2.4-2.7) in SL and head width 1.7 (1.6-1.8) in its length; snout triangular in shape (dorsal view), length about equal to width (usually somewhat narrower in females) and 3.2 (3.1-3.6) in head length; nostrils relatively small, anterior one located above or just in front of anterior margin of eye, posterior nostril a short distance behind anterior margin of eye; both nostrils tubular, anterior one more prominent with a simple to multilobed flap on posterior half of rim; eye moderate, diameter 4.9 (4.4-5.2) in head length; bony interorbital narrow, width 8.6 (7.0-8.6) in head length.

Table 1 Measurements (mm) and counts of the holotype and selected paratypes of *Aspasmogaster occidentalis*.

	Holotype		Paratypes		
	WAM P.27882-001	WAM P.27880-003	WAM P.25770-014	WAM P.25774-008	AM I.20222-018
Standard length	66	93	80	55	31
Head length	25	34	30	22	13
Head width	15	21	17	12	7.1
Body depth	12	13	13	8.8	5.0
Body width	13	17	15	10	6.5
Snout length	7.9	11	8.7	7.0	3.6
Eye diameter	5.1	6.8	6.2	4.6	2.9
Bony interorbital width	2.7	4.5	4.3	2.6	1.8
Snout to origin of dorsal fin	51	71	62	43	23
Caudal peduncle length	3.3	3.0	2.3	2.1	1.7
Caudal peduncle depth	6.3	8.6	7.5	5.3	3.2
Caudal fin length	9.8	13	12	8.3	5.0
Ventral disc length	17	23	19	13	7.3
Ventral disc width	15	19	17	12	6.4
Dorsal base length	13	20	18	12	7.0
Anal base length	11	18	16	10	5.6
Dorsal fin ray count	9	9	10	9	10
Anal fin ray count	8	8	9	8	8
Pectoral fin ray count	27	26	25	26	25

Skin smooth and scaleless, usually covered with a thick mucous layer (a series of transverse skin ridges on body is probably due to shrinkage during preservation); two lateral line systems present; first consists of well developed open pores

found only on head (Figure 1); each pore usually has a short tubular opening slightly longer than thickness of mucous and served by a canal in the underlying bones (outlines of canals indicated in Figure 1); a total of 11 open pores on each side of head is made up of three lacrymal pores, two nasal pores, two postocular pores and four preoperculomandibular pores; second system consists of minute papillae arranged in consistent patterns on head and body, those on latter in two longitudinal series (due to the difficulty in detecting these papillae, they are not described further here).

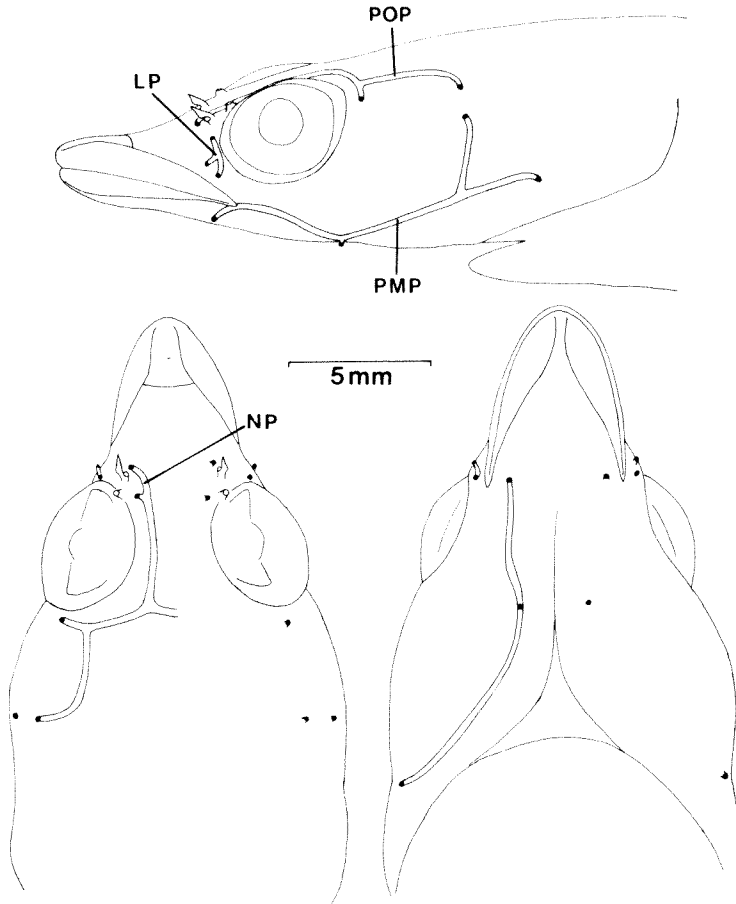


Figure 1 Diagram of the cephalic pore system of *Aspasmogaster occidentalis* sp. nov., WAM P.25774-008, 55 mm SL (pores represented by black dots, the underlying canals on one side outlined by solid lines), lateral, dorsal and ventral views. (Abbreviations: LP, lacrymal pore canal; NP, nasal pore canal; PMP, preoperculomandibular pore canal; POP, postocular pore canal.)

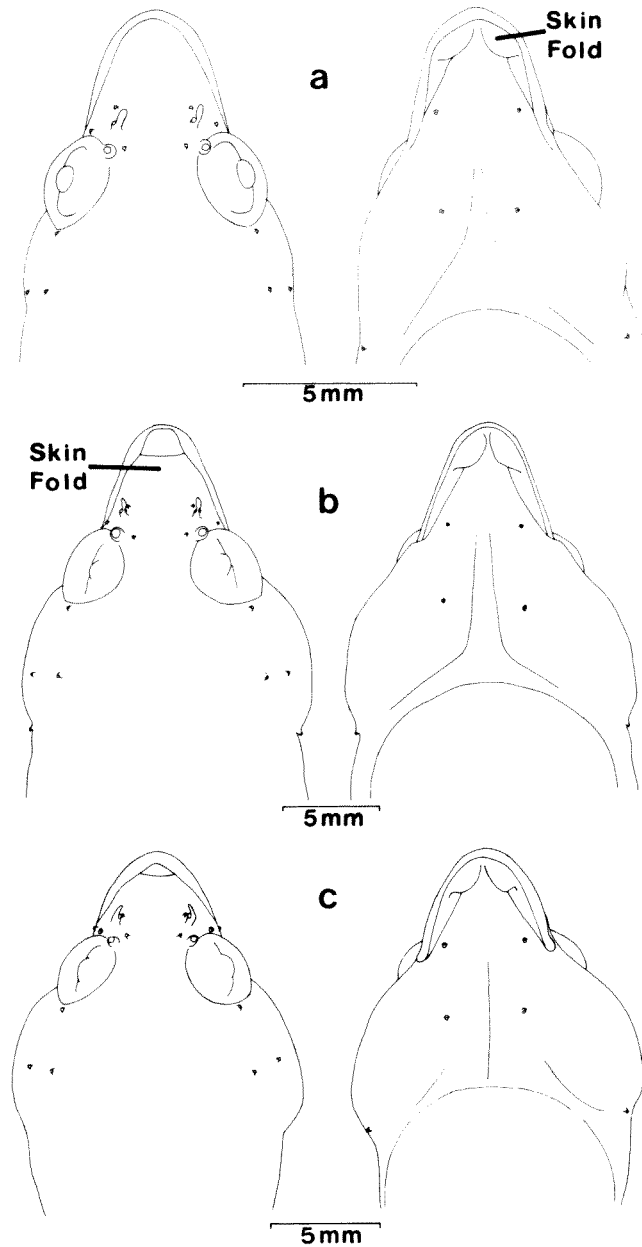


Figure 2 Dorsal and ventral view diagrams of the heads of three species of *Aspasmogaster* showing skin folds on the snouts and lower lips: (a) *A. liorhynchus*, WAM P.27569-020, 34 mm SL; (b) *A. tasmaniensis*, WAM P.27580-005, 60 mm SL; (c) *A. costatus*, NMV A.2997, 42 mm SL.

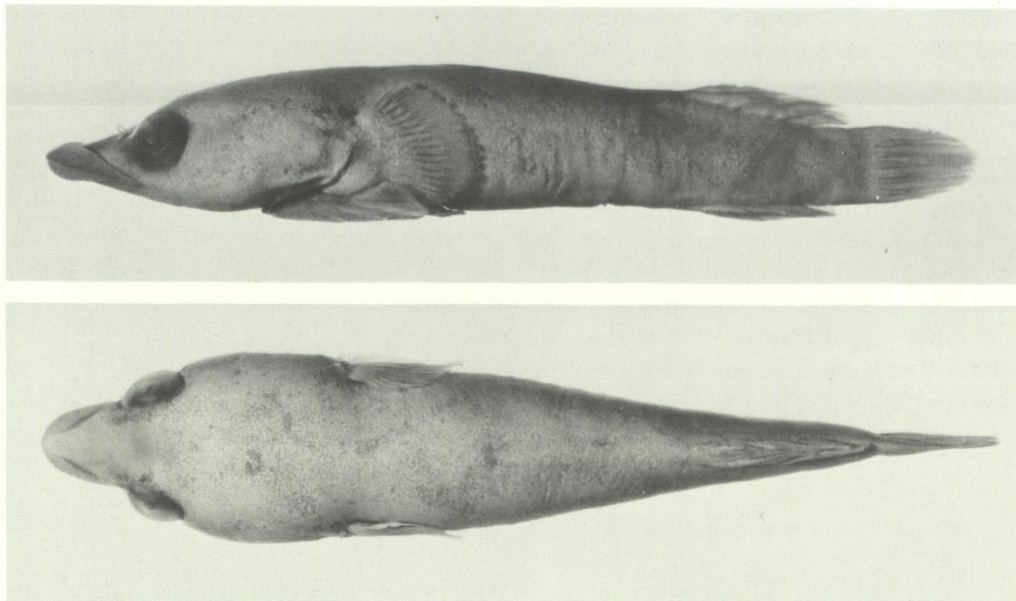


Figure 3 *Aspasmogaster occidentalis* sp. nov., holotype, WAM P.27882-001, 66 mm SL, lateral and dorsal views.

Gill opening wide, membranes joined across isthmus but not attached to it, upper attachment of gill membrane opposite second (1st-2nd) pectoral fin ray; upper attachment of pelvic fin membrane opposite seventeenth (16th-18th) pectoral fin ray; upper attachment of axial dermal flap opposite twelfth (11th-15th) pectoral fin ray; ventral disc double, moderately large in size, length 3.9 (3.7-4.4) and width 4.4 (4.6-5.4), both in SL; disc papillae arranged as in Figure 4, those in peripheral series usually increasing in number with increasing SL.

Mouth terminal, upper lip projecting a little forward of lower lip; lips large, the lower without a prominent fold anteriorly on each side (compare Figures 1 and 2); teeth in both jaws conical and posteriorly curved; lateral teeth uniserial and moderately large, enclosing anteriorly a patch of smaller teeth on each side of symphysis; palatine and vomerine teeth absent; three gills on each side; second gill arch with 11 short slender gill rakers.

Bases of dorsal and anal fins short, that of dorsal somewhat longer than and originating slightly more anterior to that of anal fin; snout to origin of dorsal fin 1.3 (1.3-1.4) in SL.

Subopercular element present, forming terminal bone posteriorly on side of head, but not spine-like; dorsal postcleithral bone reaches as high as twelfth pectoral fin ray; ventral postcleithral bones shaped as in Figure 5a, with a bone fragment near posterior edge of each element.

Colour of holotype in alcohol: head, body and fins a pale pinkish-brown, the ventral surface more whitish; upper lip and anterior rim of eye more reddish. The paratypes are similarly coloured although some have faded to an overall pale brown.

Colour when fresh (based on colour transparencies of freshly collected material): ground colour pale yellowish-brown to pale pinkish-brown, occasionally dusky brown; adults generally possess many small brown to orange spots on snout, lips and dorsal surface of head (those behind orbital region become progressively more indistinct posteriorly); very small juveniles usually have large reddish-brown blotches which tend to form cross-bands on the back, these fading in larger individuals, and also possess orange lines across dorsal surface of head and body which break up into spots with age; juveniles with a dark stripe on each side of snout adjacent to the lip.

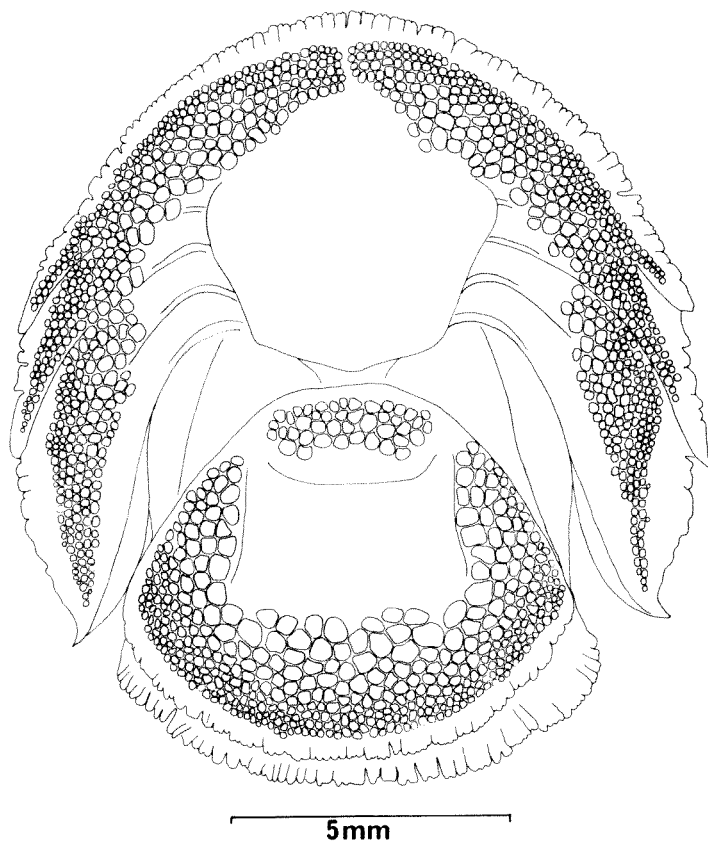


Figure 4 Ventral sucking disc of *Aspasmogaster occidentalis* sp. nov., WAM P.25774-008, 55 mm SL, showing arrangement of papillae (anterior end faces top of page).

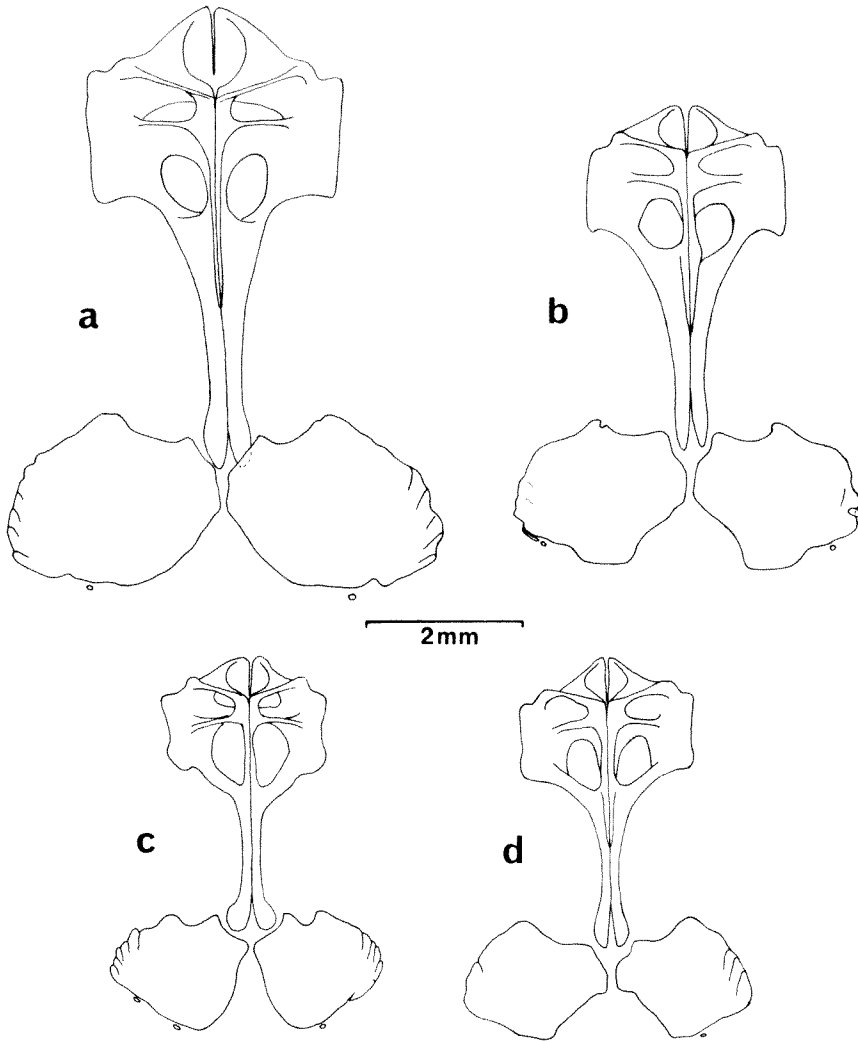


Figure 5 Pelvic and ventral postcleithral bones (ventral view) of (a) *Aspasmogaster occidentalis* sp. nov., WAM P.25770-022, 52 mm SL, (b) *A. tasmaniensis*, WAM P.27559-004, 43 mm SL; (c) *A. liorhynchus*, WAM P.26009-023, 34 mm SL, and (d) *A. costatus*, WAM P.27073-004, 34 mm SL (anterior ends face top of page).

Distribution

Aspasmogaster occidentalis is known only from Western Australia, ranging from the Archipelago of the Recherche ($34^{\circ}08'S$, $122^{\circ}15'E$) to Port Denison ($29^{\circ}16'S$, $114^{\circ}55'E$).

Remarks

Aspasmogaster occidentalis has been collected with rotenone from rocky bottoms at depths between 0.5 and 13 m, usually in association with *A. tasmaniensis* and/or *A. liorhynchus*. However, because of their similar overall morphology and the intraspecific variability of colour patterns, the three are easily confused. They can be readily distinguished by careful examination of the snout for the presence or absence of dorsal and ventral skin folds (see Key to Species). Based on ventral disc papillae patterns, overall head and body morphology and the shapes of the pelvises and postcleithral bones (Figure 5), *A. occidentalis* appears to be most closely related to *A. tasmaniensis*.

This species is named *occidentalis* with respect to its geographical distribution.

Additional Material Examined

(unless otherwise designated, all at WAM)

Aspasmogaster costatus, 20 specimens from New South Wales, 9.8-51 mm SL: P.27073-004, 3 specimens, 22-34 mm SL (largest cleared and stained), Julian Rocks, Byron Bay, 20 December 1980; P.27079-003, 20 mm SL (cleared and stained), North West Solitary Island, off Arrawarra, 26 December 1980; P.27082-003, 19 mm SL, North West Solitary Island, 29 December 1980; P.27109-003, 4 specimens, 22-34 mm SL, Bowen Island, Jervis Bay, 8 February 1981; P.27112-002, 3 specimens, 19-37 mm SL (24 mm specimen cleared and stained), Summercloud Bay, south of Jervis Bay, 9 February 1981; AM B.7140, holotype, 51 mm SL, Port Jackson, June 1885; AM B.7141, paratype, 46 mm SL, apparently collected with holotype; AM IB.3641, 42 mm SL, Long Reef, north of Sydney Harbour, 6 September 1956; AM IB.3642, 32 mm SL, collected with previous specimen; AM I.15352-003, 41 mm SL, Bottle and Glass Rocks, Sydney Harbour, 23 October 1968; AM I.19504-001, 9.8 mm SL, Long Reef, 28 August 1976; AM I.23612-002, 24 mm SL, Coogee, December 1921 (removed from AM I.23612-001, paratypes of *A. liorhynchus*); NMV A.2997, 2 specimens, 33-42 mm SL, Montague Island, 15 September 1981.

Aspasmogaster liorhynchus, 41 specimens, 15-41 mm SL. New South Wales: AM IA.695, holotype, 41 mm SL, Coogee, December 1921; AM I.23612-001, paratypes, 7 specimens, 25-39 mm SL, collected with holotype (Briggs 1955: 51, listed 8 specimens [as AM IA.695] in this lot of paratypes, however one of these is *A. costatus* and has thus been removed, see AM I.23612-002).

Victoria: P.27123-015, 34 mm SL, Norman Point, Wilsons Promontory, 25 February 1981; P.27125-014, 3 specimens, 31-36 mm SL, Norman Island, Wilsons Promontory, 27 February 1981; NMV A.2367, 39 mm SL, Oberon Bay, Wilsons Promontory, 6 February 1982; NMV A.2558, 4 specimens, 27-36 mm SL, Leonard Bay, 20 February 1982; NMV A.2998, 2 specimens, 18-35 mm SL, Merricks, Western Port, no other data.

Tasmania: P.27560-014, 5 specimens, 25-32 mm SL, Sanderson Rocks, east of Bridport, 27 February 1982; P.27564-015, 2 specimens, 31-34 mm SL, East Sandy Point, north of Bridport, 3 March 1982; P.27569-020, 4 specimens, 31-39 mm SL, Rocky Cape, 9 March 1982.

South Australia: P.27136-017, 33 mm SL, West Island, Victor Harbour, 28 March 1981; SAM F.3847, 36 mm SL, Cape Elizabeth, no other data; SAM F.4669, 31 mm SL, Port McDonnell, November 1969; SAM F.4709, 37 mm SL, St Vincents and Spencer Gulfs, 11 November 1919.

Western Australia: P.26000-026, 2 specimens, 15 mm SL, Lucky Bay, east of Esperance, 12 March 1978; P.26001-005, 2 specimens, 31-33 mm SL, Lucky Bay, 13 March 1978; P.26008-009, 19 mm SL, Mondrain Island, Archipelago of the Recherche, 21 March 1978; P.26009-

023, 34 mm SL (cleared and stained), Lucky Bay, 22 March 1978; AM I.20219-028, 2 specimens, 33-36 mm SL, Rob Island (off Lucky Bay), 20 March 1978.

Aspasmogaster tasmaniensis, 70 specimens, 13-67 mm SL. Victoria: P.27119-012, 36 mm SL, Mallacoota, 20 February 1981; P.27123-004, 2 specimens, 41-51 mm SL, Norman Point, Wilsons Promontory, 25 February 1981; P.27125-001, 2 specimens, 42-64 mm SL, Norman Island, Wilsons Promontory, 27 February 1981; AM I.19248-003, 47 mm SL, Portsea Pier, Port Phillip Bay, 16 June 1976; AM I.19776-006, 62 mm SL, Flinders, Western Port, 13 April 1977; AM I.21977-001, 57 mm SL, Flinders, Western Port, 16 June 1977; NMV A.2999, 8 specimens, 45-68 mm SL, Beaumaris, Port Phillip Bay, 9 June 1967; NMV A.3000, 3 specimens, 51-60 mm SL, Beaumaris, 26 June 1967.

Tasmania: P.27547-001, 25 mm SL, Hope Island, Port Esperance, 10 February 1982; P.27549-001, 2 specimens, 47-48 mm SL, Point Puer, Port Arthur, 14 February 1982; P.27554-019, 51 mm SL, Spring Bay, 20 February 1982; P.27555-002, 2 specimens, 44-45 mm SL, Skeleton Bay, St Helens, 24 February 1982; P.27559-004, 2 specimens, 13-43 mm SL (larger cleared and stained), St Helens Point, 25 February 1982; P.27564-004, 40 mm SL, East Sandy Point, north of Bridport, 3 March 1982; P.27568-001, 47 mm SL, Boat Harbour, 8 March 1982; P.27569-001, 1 specimen 47 mm SL, Rocky Cape, 9 March 1982; P.27580-005, 2 specimens, 33-60 mm SL, Low Head, 21 March 1982; AM I.17545-011, 50 mm SL, Eaglehawk Neck, 29 November 1972; AM I.20085-001, 45 mm SL, Mills Reef, Bruny Island, 14 December 1977; QVM 1979/5/134, 11 specimens, 21-52 mm SL, north of Greens Beach, mouth of Tamar River, 21 April 1976.

South Australia: P.27136-001, 30 mm SL, West Island, Victor Harbour, 28 March 1981; AM I.20160-025, 3 specimens, 53-59 mm SL, West River Cove, Kangaroo Island, 3 March 1978; SAM F.1453, 32 mm SL, Victor Harbour, 4 March 1930; SAM F.2788, holotype of *Aspasmogaster patella* Scott, 1954, 55 mm SL, Kingston Park, 26 September 1953; SAM F.2789, 3 specimens, 49-60 mm SL, taken with previous specimen; SAM F.2935, 39 mm SL, Cape Jervis, 6 November 1956; SAM F.3624, 33 mm SL, Goose Island, 23 September 1971; SAM F.3669, 52 mm SL, Rapid Bay Jetty, 27 February 1972; SAM F.3842, 49 mm SL, Edithburgh, Yorke Peninsula, no other data; SAM F.4223, 47 mm SL, Glenelg Beach, 27 December 1975; SAM F.4393, 20 mm SL, Marion Bay, Yorke Peninsula, 28 January 1979.

Western Australia: P.4897, 2 specimens, 42-46 mm SL, Bunker Bay, 29 December 1957; P.15874, 66 mm SL, Cape Naturaliste, 29 December 1967; P.25149-001, 57 mm SL, Doubtful Island, east of Albany, January 1975; P.25195-023, 2 specimens, 21-67 mm SL, Bunker Bay, 16 December 1974; P.25770-014, 33 mm SL (cleared and stained), Sandy Hook Island, Archipelago of the Recherche, 11 April 1977; AM IA.677, 2 specimens, 19-21 mm SL, syntypes types of *Volgiolus interorbitalis* Whitley, 1943, Albany, 15 November 1921.

Acknowledgements

The following persons kindly provided specimens on loan from the collections housed at their respective institutions: C.J.M. Glover (SAM); M.F. Gomon (NMV); R.H. Green (QVM); and J.R. Paxton (AM). I am particularly grateful to R.H. Kuitert (NMV) for the loan of colour transparencies of some eastern Australian clingfishes. Finally I wish to thank G.R. Allen (WAM) for his comments on the manuscript.

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