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A NEW GENUS AND SPECIES OF FLOUNDER (F. PLEURONECTIDAE)
WITH NOTES ON OTHER TASMANIAN SPECIES

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(with two tables and one plate)

ABSTRACT

Six species of pleuronectids, *Ammotretis liturata* (Richardson), *A. macrolepis* McCulloch, *A. rostratus* Günther, *Azygopus pinnifasciatus* Norman, *Rhombosolea tapirina* Günther and *Taratretis derwentensis* gen. et. sp. nov., are found in Tasmanian waters and a key for their identification is given. The new genus is defined and the species described. In addition, *Ammotretis tudori* McCulloch is placed in synonymy with *A. liturata* and notes on *R. tapirina* are provided. A second known specimen of *A. macrolepis* is described and the features which distinguish it from *A. liturata* are noted.

INTRODUCTION

The family Pleuronectidae is represented in Australia by two subfamilies. One of these, the Samarinae, is represented by a single species recorded only from Queensland. The second subfamily, the Rhombosoleinae, is exclusively a Southern Ocean group with six of the eight known genera recorded from Australia and New Zealand (Norman 1934).

Johnston (1883, 1891) listed four species of pleuronectids from Tasmania, *Ammotretis rostratus* Günther, *Rhombosolea monopus* Günther, *Rhombosolea tapirina* Günther, and *Solea liturata* Richardson. McCulloch (1914) added *Ammotretis macrolepis* McCulloch and *A. tudori* McCulloch to this list. Lord and Scott (1924) add *Rhombosolea flesoides* Günther but omit *R. monopus* and *S. liturata*.

In his revision of the subfamily Rhombosoleinae, Norman (1926) recognized five species; all three *Ammotretis* species, *R. tapirina* and a new species, *Azygopus pinnifasciatus* Norman. *R. flesoides* and *R. monopus* were made junior synonyms of *R. tapirina* and a New Zealand species, *R. plebia* Richardson, respectively. However he doubted the validity of Australian records of *R. plebia* and suggested that they were misidentifications of *R. tapirina*. Uncertain of the true position of *S. liturata*, Norman tentatively placed the species in synonymy with *A. tudori*.

These species are accepted by subsequent authors (Munro 1957, Scott 1962). However, McCulloch (1929) retained *S. liturata* as an *Ammotretis* species, distinct from *A. tudori*. The validity of *A. macrolepis* and its consequent exclusion from *A. tudori* has been questioned (Norman 1934), but the species which was described from a single specimen was retained.

In the following paper a new rhombosolein fish is added to the Tasmanian records. The validity of *A. macrolepis* and *A. liturata* are also discussed.

METHOD

A total of 26 measurements (table 1) was recorded from specimens of *Ammotretis macrolepis*, *A. liturata* and the new species. Most of these are standard measurements used by Lagler, Bardach and Miller (1962) but some require clarification.

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The upper and lower snout measurements refer to the direct lengths from the tip of the snout to the anterior margins of the upper and lower eyes respectively; the eye length being the longitudinal diameter of the upper eye. Apart from fin ray heights, all measurements were direct; the maximum length of the longest ray of the appropriate fin was used for each fin ray measurement.

Measurements presented in tables 1 & 2 are expressed as thousands of standard length (S.L.); the standard lengths being given in millimetres.

The transverse scale count (Tr) was taken from the dorsal border above the pectoral fin origin, transversely to the anal fin.

Means and modal values for measurements and fin counts, respectively, are bracketed in the species description.

The range (R) of a ratio of the number of rays in the right and left pelvic fins, Pr and Pl respectively, was used as a key character. This pelvic ratio (P.R.) was designated by:

$$P.R. = \frac{Pr}{Pl} \text{ and } R = P.R._{\text{minimum}} - P.R._{\text{maximum}} \text{ where}$$

$$P.R._{\text{minimum}} = \frac{Pr_{\text{minimum}}}{Pl_{\text{maximum}}} \text{ and } P.R._{\text{maximum}} = \frac{Pr_{\text{maximum}}}{Pl_{\text{minimum}}}$$

RESULTS AND DISCUSSION

Six species of pleuronectids are hereby recognized as occurring in Tasmania and a key for their identification is given below.

KEY TO THE TASMANIAN PLEURONECTIDAE

1. One pelvic fin.....*Rhombosolea tapirina* Günther
- Two pelvic fins.....2
2. Right pelvic free from anal (R = 1.67 - 2.20).....*Azygopus pinnifasciatus* Norman
- Right pelvic joined to anal.....3
3. Sum of ray elements of both pelvics less than 13 (10-12).....4
- Sum of ray elements of both pelvics greater than 13 (15-17).....5
4. Pelvic Ratio less than 1.50 (1.00-1.20). Dorsal and anal fins naked. Snout not produced into fleshy hook. Anterior dorsal and right pelvic rays bifurcated, without blunt serrations.....*Taratretis derwentensis* gen. et. sp. nov.
- Pelvic Ratio greater than 1.50 (1.75-2.33). Dorsal and anal fins scaled on ocular side. Snout produced into long fleshy hook. Anterior dorsal and right pelvic rays simple, serrated.....*Ammotretis rostratus* Günther
5. Pelvic Ratio less than 2.00 (1.50-1.67). Left pectoral with fleshy tubercle; less than 0.65 length of right.....*Ammotretis liturata* (Richardson)
- Pelvic Ratio greater than 2.00 (2.4). Left pectoral without tubercle; greater than 0.65 length of right.....*Ammotretis macrolepis* McCulloch

Sub-family RHOMBOSOLEINAE

Genus *TARATRETIS* gen. nov.

Genotype: *Taratretis derwentensis* sp. nov.

Diagnosis.

Body ovate, compressed. Eyes on right side; eyeballs not scaled. Interorbital space scaled. Jaws almost symmetrical. Snout not produced into a fleshy hook. Nasal organ of blind side nearly opposite to that of ocular side; olfactory laminae few, parallel to one another and to axis of the body, without central rachis. Dorsal fin commencing some distance from extremity of snout; anterior rays branched, not free and without distal serrations. Dorsal and anal fins scaleless, no basal sheath. Ventral rays branched.

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Affinities.

The position and structure of the nasal organ is important in the classification of the Heterosomata (Norman 1926, 1934). The median rachis of the nasal organ has been lost in the following four genera of Rhombosoleinae: *Rhombosolea*, *Taratretis* and the sole-like genera, *Ammotretis* and *Peltoramphus*.

Taratretis resembles *Rhombosolea* and differs from the sole-like genera in the anterior vertical fin ray structure and in the absence of a rostral hook. However the genus parallels *Ammotretis* and *Peltoramphus* in the other sole-like features outlined by Norman (1926). Most of these characters plus the presence of a left pelvic fin, are markedly different from those in *Rhombosolea*. Thus, in form, *Taratretis* would appear to be intermediate between *Rhombosolea* and the sole-like genera but possibly with an independent phylogeny.

Taratretis derwentensis sp. nov.

Plate 1

Material.

Holotype: 61.0 mm S.L., female, collected by author in Derwent Estuary off Nutgrove Beach (147°21'E, 42°55'S), seined in 3 metres, 30.3.77. Tasmanian Museum Reg. No. D1305.

Paratypes: 18 specimens, all collected by author from Derwent Estuary: 2 specimens, 46.6, 51.7 mm S.L., Blackmans Bay (147°20'E, 43°00'S), seined, 13.4.76; 16 specimens, 27.0-62.6 mm S.L., Nutgrove Beach, seined, 16.1 - 14.2 - 28.2 - 30.3 - 15.4 - 27.4.77 (Specimens to be distributed between the Australian Museum, Queen Victoria Museum and the Tasmanian Museum).

Other material: 2 specimens, 48.6, 62.1 mm S.L., West Beach, Stanley (145°15'E, 40°45'S), seined by author 16.2.78; 1 specimen, 66.9 mm S.L., Hawley Beach, Port Sorell (146°32'E, 41°09'S), seined by author, 18.2.78; 1 specimen, 86.2 mm S.L., Tinderbox Bay (147°20'E, 43°04'S), dredged by Mr. M. Jacobson, 21.3.78.

Description.

Depth of body 2.02 - 2.34 (2.22) in the length, head length 3.64 - 4.07 (3.87). Snout short, not produced to form a hook, extending to level of middle lower eye. Lower eye slightly in advance of upper eye, each almost equidistant to ventral and dorsal profiles respectively. Longitudinal diameter of upper eye 3.0 - 4.2 (3.6) head length; approximately equal to upper snout length; greater than eight times inter-orbital width. Mouth small, almost symmetrical, jaws equally curved on each side; lower lip on ocular side fringed. Teeth small, acutely pointed; in bands on jaws of blind side and anterior part of mandible on ocular side. Maxillary extension variable, usually reaching to below anterior margin of lower eye. Nasal organs symmetrical, with pair of small pores on each side; anterior pores with simple tentacles on their posterior borders; 4 - 5 olfactory laminae parallel to each other and to main axis of body; no central rachis. Upper angle of gill opening just above base of pectoral fins, gill rakers short, tubercular, 9 - 13 (12) on lower part of anterior arch. Scales small, ctenoid, more denticulate on ocular side; entire over head and body; imbricated in distinct longitudinal rows; 75 - 83 (79) in lateral line; Tr 48 - 56 (51); eyeballs, dorsal and anal fins naked. Lateral line with a low curve above pectoral fin; a short supratemporal branch not reaching dorsal fin. Dorsal fin commencing away from snout apex, directly anterior to nasal organs; no basal sheath; rays bifid, not free or serrated, 70 - 80 (75); membraneous folds on blind side well developed. Anal similar to dorsal, 51 - 59 (53) rays. Right pelvic originating over or behind mid-orbital level of lower eye; rays bifid, last two longest. Left pelvic shorter than right; 5 - 6 (6) rays, first opposite the fifth on ocular side. Right pectoral 8 - 11 (10) rays. Left pectoral 1.1 - 1.5 (1.26) in right; 7 - 9 (7) rays. Caudal rounded, all

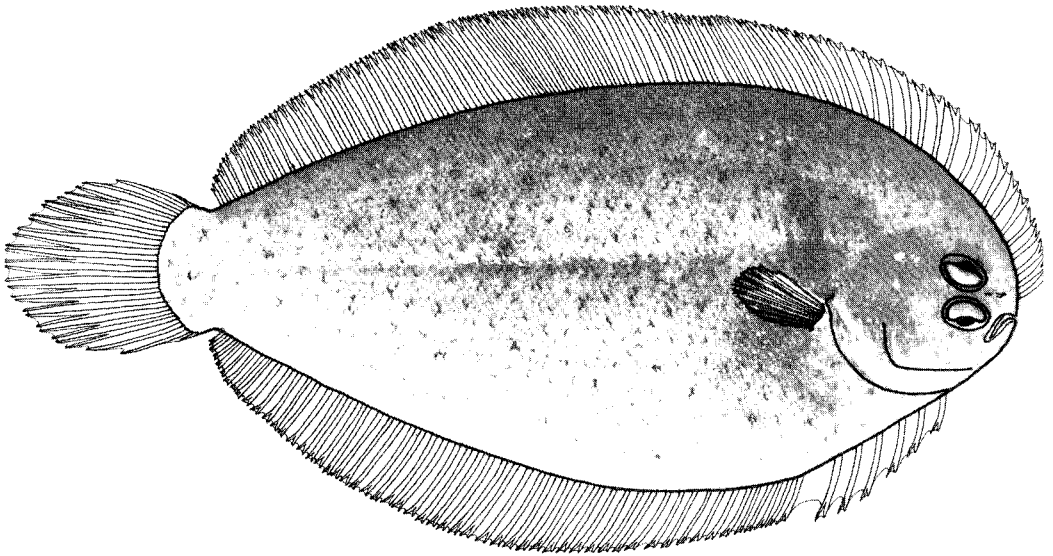


PLATE 1.- *Taratretis derwentensis* gen. et sp. nov.; holotype; 61.0 mm S.L.; seined in 3 m at Nutgrove Beach in the Derwent Estuary; 30.3.77. Tasmanian Museum Reg. No. D1305.

rays scaled on both sides to approximately half length of median rays; rays 18, middle branched 10 - 13 (12), outer simple 4 - 8 (6). Caudal peduncle short. Intestine elongate, about 3 times length of head (0.78 of S.L.).

Dimensions.

As given in table 1.

Coloration.

Natural - Ocular side sandy with numerous scattered light and dark areas each covering about 2 - 6 scales. Scale edges darker. Fin rays lighter interdispersed with orange and black markings; membranes transparent with irregular white areas over quarter of total area. Blind surface white. Formalin - Preserved specimens lighter, with pattern as above. Fins uniform light grey.

Size.

Largest specimen collected 102.4 mm total length.

Distribution.

Evidence from initial sampling indicated that the species may be endemic to beaches in the vicinity of the Derwent Estuary, however specimens recently produced from two Bass Strait localities indicate a wider distribution pattern than first expected.

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TABLE 1

TARATRETIS DERWENTENSIS GEN. ET SP. NOV.

Dimensions of Holotype and 18 Paratypes from the Derwent Estuary, southern Tasmania.
 First Line: standard length, absolute dimensions, mm; other lines: relative dimensions,
 thousandths of standard length.

	Holotype		Paratypes	
	x	Range	\bar{x}	S.D.
Standard length	61.0	27.0 - 62.6	39.07	-
Total length	1256	1215 - 1255	1236.0	2.99
Head	246	248 - 275	258.3	1.73
Snout, upper	64	60 - 78	70.3	1.00
Snout, lower	56	41 - 66	49.5	1.21
Eye	64	60 - 85	71.3	1.61
Interorbital	5	3 - 7	5.2	0.28
Length base left pectoral fin	26	19 - 27	23.6	0.57
Length left pectoral fin	89	72 - 103	89.0	1.57
Length base right pectoral fin	28	25 - 32	28.2	0.46
Length right pectoral fin	118	101 - 118	112.0	1.14
Length base left pelvic fin	30	27 - 44	33.4	0.94
Height left pelvic fin	62	58 - 89	74.4	1.55
Length base right pelvic fin	153	137 - 182	156.1	2.75
Height right pelvic fin	85	84 - 104	93.0	1.21
Length base dorsal fin	982	943 - 986	966.8	2.59
Height dorsal fin	118	106 - 145	123.4	1.89
Length base anal fin	749	693 - 805	752.0	6.73
Height anal fin	116	107 - 141	123.0	1.61
Length unbranched caudal rays	157	146 - 176	158.8	1.93
Length branched caudal rays	241	213 - 267	235.2	3.19
Depth vent	410	354 - 417	378.0	3.57
Depth maximum	494	425 - 489	449.5	4.95
Depth caudal peduncle	138	125 - 137	131.7	0.86
Length maxillary	59	54 - 70	61.9	0.84
Length snout to vent	257	253 - 319	285.1	4.42

Genus *AMMOTRETIS* Günther, 1862*Ammotretis liturata* (Richardson, 1843)Synonym: *Ammotretis tudori* McCulloch, 1914

Material.

Seventeen specimens all collected by author and held in personal collection :
 2 specimens, 156.0, 241.4 mm S.L., St. Helens Point (148°22'E, 41°16'S), speared,
 5.12.76; 6 specimens, 54.2 - 114.1 mm S.L., Nine Mile Beach, Swansea (148°08'E,
 42°06'S), seined, 8.3.77; 1 specimen, 70.3 mm S.L., Kingston Beach (147°20'E, 42°58'S),
 seined 16.3.77; 2 specimens, 73.3, 77.4 mm S.L., Safety Cove, Port Arthur (147°51'E,
 43°10'S), seined, 30.3.77; 5 specimens, 54.9 - 62.5 mm S.L., Point Bagot, Swansea
 (148°14'E, 42°06'S), seined, 8.6.77; 1 specimen 265.3 mm S.L., Point Bagot, Swansea
 (148°14'E, 42°06'S), seined, 17.1.78.

Comments.

McCulloch (1914) described *Ammotretis tudori* from Bass Strait and provided a
 key to the known members of the genus, which however did not include *A. liturata*

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(Richardson). Norman (1926) was first to recognize Richardson's species as an *Ammotretis* and considered it as possibly conspecific with *A. tudori* but failed to give reasons. Specimens collected from several localities around Tasmania, including Port Arthur the assumed type locality of *A. liturata*, fit the description of that species and are also conspecific with the holotype of *A. tudori*. These findings support Norman's sentiments, hence the two species are treated here as synonymous, with the older name *A. liturata* taking precedence.

The question of synonymy would have been more reliably elucidated had the holotype of Richardson's species been examined. However a detailed literature search, followed by an investigation of the holdings of the Tasmanian, Queen Victoria and Australian Museums failed to locate the type and have raised doubts about its current existence.

Ammotretis macrolepis McCulloch, 1914

Material.

One specimen 55.1 mm S.L., off Flinders Island, Bass Strait, J. Grant, dredged from Tasmanian Sea Fisheries vessel 'Challenger', May 1977. Tasmanian Museum Reg. No. D1306.

Comments.

A comparison of Mr. Grant's specimen with the holotype indicates their similarity except that McCulloch's specimen exhibits a greater number of vertical fin rays; 90 dorsal and 59 anal rays compared with 80 and 52 rays respectively. Although the variation is considerable, it is not atypical for this group of fish. In comparison two less intraspecifically variable characters, namely the pelvic fin ray counts, are both identical for both specimens and unique to the genus.

Colour on the ocular side is light grey and white with faint evidence of darker ocelli. The blind side is white.

This species is most similar to *A. liturata* and its distinctness from that species has been questioned by Norman (1926, 1934). *A. macrolepis* differs primarily by the absence of blunt serrations on the edges of the anterior dorsal and right ventral rays, the absence of a fleshy tubercle on the right pelvic fin and the unique pelvic ratio.

A comparison of a number of different proportions (Table 2) made on similar sized specimens of the two species is of limited use because of small sample sizes, however some trends are evident. The relative eye diameters, the lengths of the longest unbranched caudal rays and the length and base lengths of the right pectoral fins show differences. The relative lengths of the bases of the anal and left pectorals are significantly different at the 0.01 level. The ratios of the pectoral lengths are very different for the two species (P less than 0.005). The left pectoral of *A. macrolepis* is slightly shorter than the right, however for *A. liturata* a reduction in the left pectoral length has been accompanied by a comparative elongation of the right.

Genus *RHOMBOSOLEA* Günther, 1862

Rhombosolea tapirina Günther, 1862

Those specimens previously identified as *Rhombosolea* sp. (Scott 1976), *R. monopus* (Johnston 1883, 1891) and *R. flesoides* (Lord and Scott 1924), appear to be misidentifications of the very variable species *R. tapirina*. Some specimens have assumed a very rhomboidal shape similar to *R. plebia*, whereas other adult characters including the form of the snout, are typical of *R. tapirina*. To complicate the issue the fleshy snout is usually reduced in juveniles. Clearly, if a second species does exist, it must be very similar externally to *R. tapirina*.

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TABLE 2

COMPARATIVE MORPHOMETRY OF SMALL SAMPLES OF *AMMOTRETIS LITURATA*
(RICHARDSON) AND *A. MACROLEPIS* MCCULLOCH

First line: standard length, absolute dimensions, mm; other lines relative dimensions, thousandths of standard length.

	<i>Ammotretis liturata</i> (n=5)			<i>Ammotretis macrolepis</i> (n=1)			Signif.
	Range	\bar{x}	S.D.	x	t ₄		
Standard length	54.9 - 62.5	59.04	-	55.1	-	-	
Total length	1207 - 1244	1223.4	13.70	1193	1.996	-	
Head	270 - 284	275.6	5.13	267	1.531	-	
Snout, upper	110 - 119	115.0	4.18	111	0.873	-	
Snout, lower	72 - 81	78.8	3.84	73	1.381	-	
Eye	57 - 62	59.8	1.92	69	4.366	*	
Interorbital	5 - 11	7.4	2.19	4	1.417	-	
Length base left pectoral fin	26 - 30	28.6	1.52	17	6.982	**	
Length left pectoral fin	54 - 62	58.4	3.35	68	2.607	-	
Length base right pectoral fin	33 - 38	34.0	2.24	26	3.266	*	
Length right pectoral fin	107 - 120	113.0	4.94	95	3.320	*	
Length base left pelvic fin	27 - 35	30.2	3.35	40	2.673	-	
Height left pelvic fin	54 - 80	69.4	9.77	57	1.157	-	
Length base right pelvic fin	182 - 234	203.4	18.98	189	0.692	-	
Height right pelvic fin	97 - 109	105.0	5.10	120	2.685	-	
Length base dorsal fin	959 - 976	968.0	6.42	951	2.469	-	
Height dorsal fin	132 - 144	137.4	4.65	129	1.642	-	
Length base anal fin	745 - 754	749.0	4.18	715	7.641	**	
Height anal fin	130 - 148	138.6	7.11	131	0.973	-	
Length unbranched caudal rays	157 - 170	164.2	5.48	191	4.452	*	
Length branched caudal rays	218 - 235	227.6	6.26	236	1.223	-	
Depth vent	396 - 438	421.4	17.93	409	0.631	-	
Depth maximum	463 - 497	480.6	12.41	461	1.440	-	
Depth caudal peduncle	122 - 131	125.8	3.55	115	2.767	-	
Length maxillary	49 - 54	51.2	1.92	51	0.095	-	
Length snout to vent	239 - 304	276.4	25.76	249	0.971	-	
Right pelvic ray count	9 - 10	9		12			
Left pelvic ray count	6	6		5			

A detailed study of the anatomy and morphometrics of Australian collections is necessary before this problem can be elucidated.

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