

NEW AUSTRALIAN FISHES. PART 17.  
NEW SPECIES OF *GADELLA* AND *PHYSICULUS* (MORIDAE)

By C. D. PAULIN

Department of Ichthyology, National Museum of New Zealand,  
Private Bag, Wellington, New Zealand

Abstract

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The following species are here described: *Gadella norops* and *Physiculus therosideros*. *G. norops* has a very small light organ placed closer to the anus than the interventral line, elongate ventral fins, second dorsal ray count more than 72 and an inter-orbital width greater than 7.9% SL. *P. therosideros* has a large light organ placed closer to the anus than the interventral line, equal sized teeth and a lateral line reaching the origin of the second dorsal fin.

Introduction

Morid fishes of the genera *Gadella* and *Physiculus* are distributed in all tropical, subtropical and warm temperate regions of the world's oceans, in depths of 40-1500 m, usually 100-600 m. Both genera are currently being revised on a worldwide basis: *Gadella* is represented by six nominal and two undescribed species; *Physiculus* is represented by 25 nominal and nine undescribed species (Paulin, in prep). One new species of *Gadella*, and one new species of *Physiculus* which form the basis of the present account, are found in Australia in addition to four known species of *Physiculus*: *P. longifilis* Weber, *P. luminosa* Paulin, *P. nigrescens* Smith & Radcliffe and *P. roseus* Alcock.

Species of these genera can be identified by measurements of the size and position of the dermal fossa of the ventral light organ, expressed as a percentage of ventral fin base to anal fin origin distance (InV-af) (Paulin, in prep).

Material is lodged in these institutions: Australian Museum, Sydney (AMS); Queensland Museum, Brisbane (QM); Muséum National d'Histoire Naturelle, Paris (MNHN); National Museum of Natural History (USNM); Zoologisk Museum, Copenhagen (ZMC).

*Gadella norops* sp. nov.

*Physiculus edelmanni*-Paulin 1983: 116 (not Brauer, 1908).

*Material examined.* Holotype: Western Australia, Port Hedland (18°41'S, 116°46'E), 506-508 m, 13 Apr 1982, AMS I. 22827-003.

Paratypes: New South Wales. off Sydney (33°45'S, 151°5.5'E), AMS I. 17857-008; east of Clarence River (29°26'20"S, 153°49'-59'E), 450 m; AMS I.19096-005.

Queensland. Off Tweed Heads, (28°3'S, 154°4'E), 731 m, 6 Nov 1978, AMS I.21795-003.

Non-type material: Queensland. Off Brisbane (27°19'S, 153°54'E), 535 m, QM I.21030.

New South Wales. Newcastle (33°8'S, 157°27'E), 586 m, AMS I.21805-001. Ballina-Tweed Heads (28°17'S, 153°53'E), 200 m, AMS I.23993.

Western Australia. Port Hedland (17°59'S, 118°17'E), 404-420 m, 3 Apr 1982, AMS I.22808-024. Port Hedland (18°29'S, 116°36'E), 696-704 m, 6 Apr 1982, AMS I.22814-017. Northeast of Bluff Point (27°9'16"S, 112°7'50"E), 294-297 m, 22 Aug 1979, USNM 262075; (27°9'16"S, 112°47'50"E), 294-297 m, 22 Aug 1979, USNM 262073; (27°32'41"S, 112°58'59"E), 226-302 m, 27 Jul 1979, USNM 262074.

New Zealand. Bay of Plenty, NMNZ P20267.

New Caledonia?. USNM 262076.

*Diagnosis.* Barbel absent; light organ very small, 4.0% (1.4-6.4% InV-af and placed closer to anus than interventral line; distance from interventral line to anterior margin of light organ 39.6% (36.2-42.5%) InV-af; distance from posterior margin of light organ to anterior margin of anus 30.6% (25.9-35.6%) InV-af; gular scales absent; ventral fins reaching 10th anal ray; first dorsal

fin rays not elongated; second dorsal fin ray counts more than 72; interorbital width greater than 7.9% SL.

*Description.* Dorsal rays 8-10, 72-77; anal rays 71-78; pectoral rays 21-27; scales in longitudinal series about 120, scales between base of first dorsal fin and lateral line 9-12; gill rakers 2-5 + 9-12; vertebrae 62-63.

*Measurements.* (Mean with range in parenthesis) as percent standard length. Greatest depth of body 17.6(12.8-20.9); least depth of caudal peduncle 1.9(1.6-2.0); length of head 22.3 (20.6-26.0); width of head 18.7(16.8-20.1); horizontal diameter of orbit 4.4 (3.4-5.6); length of snout 5.4(4.6-6.0); length of maxilla 11.5 (10.7-13.5); width of bony interorbital 9.0(7.9-10.5); predorsal length 26.1(23.4-29.8); length of pectoral fin 18.0(16.3-20.1). Body elongate, compressed, greatest depth below first dorsal fin. Head wider than deep. Maxilla extending to beyond hind margin of orbit. Teeth in upper jaw equal sized, in villiform bands 4-5 teeth wide. Lower jaw with slightly larger subequal teeth in 3-4 rows. Gular region without scales. Gill membranes joined to each other and to isthmus far forward. Gill rakers long, slender, equal in length to opposite gill filaments.

First dorsal fin about same height as second. Vertical fin membranes without scales. Ventral fins reaching well beyond anal fin origin.

Lateral line commences above upper angle of opercle, reaches only to anterior third of second dorsal. A distinct continuous tube slightly behind first dorsal fin origin, thereafter a series of short discontinuous tubes.

*Colour.* (Fresh, from colour transparency kindly provided by Ken Graham). Head and body pinkish. Abdomen and sides of body just above pectoral fin insertion blue. Gular region, branchiostegal membranes, lips, and tips of vertical fins black.

*Etymology.* From the Greek *norops* (flashing) referring to the light organ in the belly.

*Distribution.* Australian coasts and the Bay of Plenty, New Zealand in depths of 200-750 m.

*Remarks.* *Gadella norops* is distinguished from other species in the genus by gill raker counts;

interorbital width, snout length, number and length of dorsal rays and in size of the ventral fossa of the light organ (Paulin, in prep). The species has previously been recorded from Australia as *Physiculus edelmanni* Brauer (Paulin, 1983).

### *Physiculus therosideros* sp. nov.

*Material examined.* Holotype: New South Wales. Scott Point, (30°43'S, 153°16'E), 134-151 m, 10 Oct 1978, AMS 1.23685.

Paratypes: Queensland. Off Caloundra, (26°31'S, 153°50'E), 240-330 m, AMS 1.15550-003. Off Southport (27°52'S, 153°55'E), 245 m, QM 1.21060.

Non-type material: Queensland. Off Southport (28°7'S, 153°54'E), 274 m, QM 1.21145.

New Caledonia. MNHN 1980-335, 1980-560.

New Zealand. Raoul Island, Kermadecs (29°15'S, 177°57'W), 83 m, 3 Mar 1952, ZMC 676.

*Diagnosis.* Barbel present; light organ large, 13.7% (11.2-18.6%) InV-af and placed closer to anus than interventral line; distance from interventral line to anterior margin of light organ 27.2% (24.7-28.3%) InV-af; distance from posterior margin of light organ to anterior margin of anus 14.4% (11.2-18.6%) InV-af. Teeth equal sized; gular scales present; scales present on dorsal fin membrane; gill rakers of moderate length, slender; continuous tube of lateral line reaching origin of second dorsal fin.

*Description.* Dorsal rays 8-9, 60-63; anal rays 62-66; pectoral rays 24-25; scales in longitudinal series c118-120, scales between first dorsal base and lateral line 8-9; gill rakers 2-3 + 7-9; vertebrae 52-55.

*Measurements.* (Mean with range in parenthesis), as percent standard length. Greatest depth of body 18.4(16.0-21.1); least depth of caudal peduncle 2.5(2.4-2.6); length of head 25.4(22.1-26.6); width of head 17.9(15.2-20.1); horizontal diameter of eye 6.0(5.4-6.4); length of snout 5.7(5.1-6.8); length of maxilla 11.7(10.1-12.7); width of bony interorbital 5.3(4.1-6.6); barbel length 5.1(4.3-7.2); predorsal length 29.7 (27.8-31.8); pectoral length 15.5(14.9-16.2).

Body elongate, compressed, greatest depth below first dorsal. Head slightly wider than deep. Maxilla extending to about hind margin of eye. Teeth in villiform bands, 6-7 teeth wide in upper jaw, 4-5 in lower. Barbel slightly less than diameter of eye. Gular region with scales. Gill membranes joined to each other and to isthmus.

Gill rakers of moderate length, slender, not spiny, about two-thirds as long as opposite gill filaments.

First dorsal fin about same height as second. Vertical fin membranes with small scales. Ventral fins reaching just beyond anal fin origin to about third anal ray.

Lateral line commences above upper angle of opercle, straight, gradually descending beyond origin of anal fin to mid-line of body. A distinct continuous tube for a distance equal to length of head, thereafter interrupted, not visible beyond mid-point of anal fin.

*Colour.* (preserved). Head and body pinkish or yellowish tan. Abdomen blue-black. Gular region, branchiostegal membranes, lips and tips of vertical fins dark brownish black.

*Etymology.* From the Greek *theros* (summer) and *sideros* (iron). Named for the vessel "Iron Summer" which conducted a deepwater survey for Queensland Fisheries Research between July 1982

and June 1983 and collected specimens of this species.

*Distribution.* *Physiculus therosideros* is known from New South Wales and Queensland, Australia, New Caledonia and the Kermadec Islands in depths of 83-330 m.

*Remarks.* *Physiculus therosideros* is distinguished from all species of the genus by the size and position of the ventral fossa of the light organ, the presence of scales on both the gular region and the vertical fin membranes, scale size, length of the lateral line and equal sized teeth (Paulin, in prep).

### References

- Paulin, C.D. 1983. A revision of the family Moridae (Pisces: Anacanthini) within the New Zealand region. *Rec. natl. Mus. N.Z.* 2: 81-126.
- Paulin, C.D. (in prep). Revision of the morid genera *Gadella*, *Physiculus* and *Salilota* (Pisces: Gadiformes) with descriptions of eleven new species.