

Article

Callionymus alisae, a new species of dragonet from New Ireland, Papua New Guinea, western Pacific Ocean (Teleostei: Callionymidae)

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Abstract

A new species of dragonet, *Callionymus alisae* from off New Ireland, Papua New Guinea, is described on the basis of a single male specimen collected with a grab dredge at 90-228 m depth, southwest of Kavieng. The new species is characterised within the subgenus *Callionymus* (*Spinicapitichthys*) by preopercular spine with a very short, straight main tip, four to five curved points on its dorsal margin, a strong antrorse spine at its base, and five to eight small serrae at its ventral margin; the dorsal margin of the eye with a tentacle, the dorsal fin in the male without filaments, the first spine longest; a total of 8 rays in the second dorsal fin and 7 rays in the anal fin; and the first dorsal fin in the male zebra-striped, with 4 vertical dark bands on 1st-4th membranes. The new species is compared with similar species. Revised keys to callionymid fish species of New Guinea, as well as of the subgenus *Spinicapitichthys*, are presented.

Keywords: Fishes, Dragonets, New species, Identification key, New Guinea.

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Introduction

Dragonets of the family Callionymidae are a group of benthic living fishes occurring in the upper 900 metres of all temperate, subtropical and tropical oceans of the world, and a few species found in estuarine and freshwater habitats. They are characterised by a depressed body, a triangular head when seen from above, the eyes large, situated dorsally on the head, the presence of a preopercular spine which is bearing additional points and/or serrae, the gill opening reduced to a small pore, swim bladder absent, two dorsal fins, the first with thin, flexible spines, the second with soft rays, and jugular pelvic fins which are separated from each other, but each connected with the pectoral-fin base by a membrane. The Indo-Pacific species of the family were revised by Fricke (1983a), who distinguished 126 valid species from the area, including three species from the Mascarenes. Fricke (2002), in a checklist of the callionymid fishes of the world, listed a total of 182 valid species in 10 genera. Subsequently, eight additional species were described *Callionymus kanakorum* and *Protogrammus antipodum* from New Caledonia (Fricke 2006), *Tonlesapia tsukawakii* from Cambodia (Motomura and Mukai 2006), *T. amnica* from Vietnam (Ng and Rainboth 2011), *Synchiropus tudorjonesi* from Papua, Indonesia (Allen and Erdmann 2012), *C. profundus* from the northern Red Sea (Fricke and Golani 2013), *Diplogrammus paucispinis* from the eastern Red Sea (Fricke et al. 2014b), *C. omanensis* from the northwestern Indian Ocean (Fricke et al. 2014c), *C. madangensis* from Papua New Guinea by Fricke (2014), and *Eleutherochir mccaddeni* Fowler 1941 was removed from the synonymy of *E. opercularis* by Yoshigou et al. (2006), bringing the worldwide total to 192 species in the family.

Fricke (1980: 60) described the subgenus *Spinicapitichthys* within the genus *Callionymus* as characterised by having a preopercular spine with an antrorse point at its base, a straight main tip, and additional points and/or serrae on the dorsal and ventral margins, as well have numerous spines on the head. Nakabo (1982: 106) treated *Spinicapitichthys* as a valid genus, while Fricke (1983a) retained it as a subgenus and revised it; he distinguished 6 valid species, *Callionymus csiro* Fricke 1983 from Western Australia, *C. draconis* Nakabo 1977 from southern

Japan, *C. io* Fricke 1983 from Myanmar, *C. muscatensis* Regan 1905 from the southern Red Sea and the northwestern Indian Ocean, *C. oxycephalus* Fricke 1980 from the Gulf of Suez, northern Red Sea, and *C. spiniceps* Regan 1908 from the Saya de Malha Bank and Seychelles. Nakabo et al. (1992) discovered a female of *C. draconis* which was previously known only from a single male specimen, and synonymised *C. csiro* with that species. Fricke (1989) described another member of this subgenus, *Callionymus obscurus*, from Ambon, Maluku, Indonesia. Fricke (2002: 7, 101) treated *Spinicapitichthys* as a valid subgenus of the genus *Callionymus*, and distinguished 6 species.

Species of the subgenus *Spinicapitichthys* live on to moderately deep soft bottoms on the continental shelf, mainly on the continental shelf; they bury in the substrate, usually only leaving the eyes visible. Callionymid fishes typically occur in harem groups, with one male controlling a larger home range living together with several females. Spawning usually takes place around dusk; the courting pair ascends and releases the eggs well above the ground, following a complex courtship behaviour where the spreading of the first dorsal fin or flashing blue 'lights' (iridescent blue spots) are frequent motor patterns. The eggs and larvae are pelagic; during transformation into juveniles they shift to a benthic life style (Fricke et al. 2014c).

A single specimen of an undescribed species of the subgenus was collected during the KAVIENG 2014 expedition in northern New Ireland Province, Papua New Guinea. As the species is apparently extremely rare, and appears to be locally endemic in New Ireland, it is described herein, bringing the total number of species known in the subgenus to 7.

Material and Methods

The holotype of the new species is deposited in the National Taiwan University, University Museum, Taipei, Taiwan (NTUM). Comparative materials are listed below. Abbreviations of museum collections (see below) follow Fricke and Eschmeyer (2015a).

Methods follow Fricke (1983a); fin-ray counts follow Fricke (1983b). The starting point for length measurements is the middle of the upper lip. The standard length (measured from the tip of the upper lip to the middle of the urohyal/caudal fin base) is abbreviated SL. The predorsal (1) length is measured from the middle of the upper lip to the base of the first spine of the first dorsal fin; the predorsal (2) length correspondingly to the base of the first ray of the second dorsal fin. The last ray of the second dorsal and anal fins is always divided at its base; counts in the key include this divided ray as one. In the identification keys, males and females are keyed out separately only if there are significant differences between male and female morphology and colouration, and if females of two different species are more similar to each other than to the males of the same species.

Species classification is based on Fricke (2002). Nomenclature follows Eschmeyer et al. (2016). References and journals follow Fricke (2016) and Fricke and Eschmeyer (2016b). The distribution map was composed using QGIS 2.12.2.

Comparative material (subgenus *Spinicapitichthys*): *Callionymus draconis* Nakabo 1977: FAKU 48882 (holotype), Japan, Kochi Prefecture; WAM P.11212-001 (holotype of *Callionymus csiro*), Western Australia, Carnarvon; *Callionymus io* Fricke 1983: ZSI F38312 (holotype), Myanmar; *Callionymus muscatensis* Regan 1905: BMNH 1904.5.25.145-150 (2 syntypes), Oman, Muscat; HUI 9936 (1), Red Sea, Eritrea; ZMH 5530 (11), Red Sea, Yemen; ZMH 5531 (1), Red Sea, Yemen; *Callionymus obscurus* Fricke 1989: BPBM 18519 (holotype), Indonesia, Maluku, Ambon; *Callionymus oxycephalus* Fricke 1980: MNHN 1966-0159 (holotype), Red Sea, Gulf of Suez; MNHN B.2904 (9 paratypes), Red Sea, Gulf of Suez; *Callionymus spiniceps* Regan 1908: BMNH 1908.3.23.262 (holotype), Seychelles, Amirante Island; SMNS 9916 (1), Seychelles, Mahé.

Comparative material (New Guinea): *Anaora tentaculata* Gray 1835: CAS 92051 (1), Madang; NTM S.13680-024 (2), Madang; *Callionymus* sp. 1 (to be described by R. Fricke): MNHN 2016-0005 (1), New Ireland; NTUM 11332 (1), New Hanover; NTUM 11192 (2), New Ireland; NTUM 11229 (2), New Ireland; NTUM 11487 (1), New Ireland; NTUM 11252 (1), New Ireland; NTUM 11479 (1), New Ireland; *Callionymus* sp. 2 (to be described by R. Fricke): NTUM 11243 (1), New Ireland; *Callionymus afilum* Fricke 2000: KFRS F.01705 (1), Bramble Cay; KFRS F.02709 (1), Yule Island; *Callionymus belcheri* Richardson 1844: BMNH 1879.5.14.570 (1); KFRS 0969 (2), Kinikini Bay; USNM 243034 (2), Sepik; *Callionymus brevianalis*: WAM P.29595-021 (1), Madang; *Callionymus colini* Fricke 1993: SMNS 12260 (holotype), Port Moresby; BPBM 34754 (2 paratypes), Port Moresby; SMNS 12261 (1 paratype), Port Moresby; SMNS 12263 (2 paratypes), Port Moresby; *Callionymus enneactis* Bleeker 1879: CAS 63291 (2), Madang; CSIRO B.1583 (1), Sek; SMF uncat. (1), Madang; SMNS 8541 (4), Port Moresby; SMNS 8548 (5), Port Moresby; SMNS 8553 (1), Port Moresby; SMNS 11564 (2), Port Moresby; SMNS 11566 (3), Port Moresby; SMNS 11567 (1), Port Moresby; SMNS 11568 (1), Port Moresby; SU 39953 (1), East Sepik; USNM 228958 (6), Milne Bay; USNM 228964 (1), Port Moresby; USNM 236385 (21), Hermit Islands; USNM 236390 (1), Madang; USNM 243037 (1), Trobriand Islands; USNM 243040 (4), Port Moresby; *Callionymus filamentosus* Valenciennes in Cuvier & Valenciennes 1837: KFRS F.1709 (3), Yule Island; KFRS 3050 (2), Oreke; *Callionymus keeleyi* Fowler 1941: KFRS F.2151 (1), Port Moresby; *Callionymus macdonaldi* Ogilby 1911: SMNS 21194 (1), West Papua, mouth of Ajkwa River; SMNS 21195 (2), West Papua, mouth of Minajerwi River; *Callionymus madangensis* Fricke 2014: NTUM 10146 (holotype), Madang; NTUM 11405 (1), New Ireland; NTUM 11431 (1), New Ireland; NTUM 11441 (1), New Ireland; *Callionymus neptunius* (Seale 1910): ZMB 12674 (2), New Britain; *Callionymus octostigmatus* Fricke 1981: USNM 243033 (1), Cape Ward Hunt; USNM 243041 (2), Cape Ward Hunt; *Callionymus pleurostictus* Fricke 1982: WAM P.30366-016 (1), Madang; *Callionymus russelli* Johnson 1976: USNM 232259 (3), Daru; *Callionymus zythros* Fricke 2000: BPBM 38532 (holotype), Madang; NTUM uncat. (3), Madang; *Diplogrammus goramensis* (Bleeker 1858): SMF 34879 (1), Madang; USNM 236387 (2), Ninigo Islands; USNM 236388 (1), Ninigo Islands; WAM P.30366-011 (1), Madang; *Eleutherochir opercularis* (Valenciennes in Cuvier & Valenciennes 1837): BPBM 15731 (3), New Britain; KFRS 1766 (1), Bougainville; KFRS 3749 (1), Yule Island; *Synchiropus* sp. (to be described by R. Fricke): NTUM 11377 (1), New Ireland, NTUM 11376 (1), New Ireland; *Synchiropus bartelsi* Fricke 1981: BMNH 1982.6.18.2 (1), New Britain; WAM P.30365-005 (1), Madang; *Synchiropus circularis* Fricke 1984: WAM P.30633-002 (1), Madang; *Synchiropus claudiae* Fricke 1990: SMNS 9048 (holotype), Madang; SMNS 8466 (1), Port Moresby; SMNS 8479 (1), Port Moresby; SMNS 9049 (2), Madang; *Synchiropus ocellatus* (Pallas 1770): AMS I.17504-012 (2), New Britain; SMNS 8473 (1), Port Moresby; SMNS 8475 (1), Port Moresby; SMNS 8476 (1), Port Moresby; USNM 236386 (3), Ninigo Islands; WAM P.30358-007 (1), Madang; ZMB 13291 (1), Finschhafen; *Synchiropus orstom* Fricke 2000: NTUM 10611 (2), Sandaun; NTUM 10691 (1), West Sepik; NTUM 11101 (1), New Hanover; *Synchiropus picturatus* (Peters 1876): ZMB 4770 (1), Salawaty; *Synchiropus splendidus* (Herre 1927): BMNH 1974.5.25.3557 (1), Madang; USNM 236383 (2), Hermit Islands; USNM 236384 (2), Ninigo Islands.

Results

Systematic ichthyology: The present paper follows the classifications provided by Nelson (2006) and Fricke (2002):

Class Actinopterygii

Subclass Neopterygii

Division Teleostei

Subdivision Euteleostei

Superorder Acanthopterygii
 Order Perciformes
 Suborder Gobiesocoidei
 Family Callionymidae
 Genus *Callionymus* Linnaeus 1758
 Subgenus *Spinicapitichthys* Fricke 1980

***Callionymus alisae* new species**

(Fig. 1)

Common name: Alis dragonet

Holotype: NTUM 11265, 32.1 mm SL, male, Bismarck Sea, Papua New Guinea, New Ireland Province, Kavieng District, off southeast coast of Baudissou Island, 28 km southwest of Kavieng, 02°42.64'S 150°36.14'E - 02°43.21'S 150°35.55'E, 90-228 m depth, grab dredge, R/V Alis, St. DW4465-3 (PNG 3271), 3 Sept. 2014, 11:10-11:33 h.

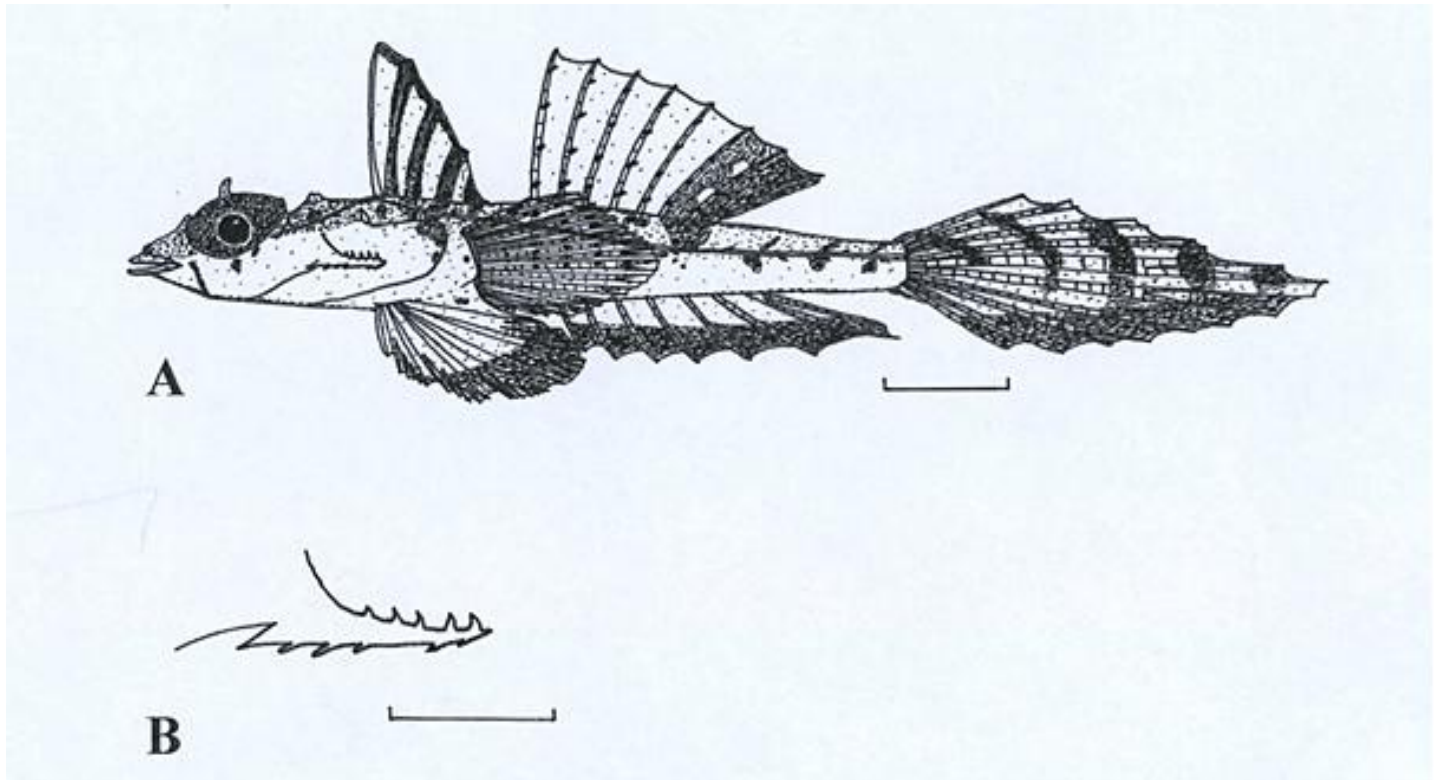


Figure 1. *Callionymus alisae* n. sp., NTUM 11265, holotype, male, 32.1 mm SL, Papua New Guinea, New Ireland Province, Kavieng District. (A) Lateral view, left side (scale indicates 15 mm) and (B) Left preopercular spine (scale indicates 2 mm).

Diagnosis: A species of the subgenus *Callionymus* (*Spinicapitichthys*) with the preopercular spine bearing a very short, straight main tip, four to five curved points on its dorsal margin, a strong antrorse spine at its base, and five to eight small serrae at its ventral margin; the dorsal margin of the eye with a tentacle, the dorsal fin in the male without filaments, the first spine longest; a total of 8 rays in the second dorsal fin and 7 rays in the anal fin; and the first dorsal fin in the male zebra-striped, with 4 vertical dark bands on 1st-4th membranes.

Description: D IV + vii,1; A vi,1; P1 ii,14,ii (total 18; right pectoral fin damaged); P2 I,5; C (ii),i,7,ii,(iii). Proportions are given in Table 1.

Table 1. *Callionymus alisae* n. sp., NTUM 11265, holotype, 32.1 mm SL, Papua New Guinea, New Ireland: Meristic data and proportions.

	Measurement (mm)	Proportion of standard length	Proportion as percentage of standard length
Standard length	32.1	--	--
Caudal-fin length	17.5	1.8	54.5
Predorsal(1) length	10.0	3.2	31.1
Predorsal(2) length	16.5	1.9	51.4
Preanal length	17.5	1.8	54.5
Prepelvic fin length	9.8	3.3	30.5
Prepectoral fin length	14.1	2.3	43.9
Length from tip of snout to end of preopercular spine	10.0	3.2	31.1
Head length	9.8	3.3	30.5
Body depth	4.2	7.6	13.1
Body width	5.8	5.5	18.1
Orbit diameter	4.1	7.8	12.8
Preorbital length	2.1	15.2	6.5
Bony interorbital	0.8	40.1	2.5
Caudal peduncle length	6.5	4.9	20.2
Caudal peduncle depth	1.8	17.8	5.6
Upper-jaw length	2.5	12.8	7.8
Urogenital papilla length	0.4	80.2	1.2
Length of left preopercular spine	3.1	10.3	9.7
Length of supraorbital tentacle	0.6	53.5	2.2
Length of first spine of first dorsal fin	6.7	4.8	20.9
Length of second spine of first dorsal fin	5.9	5.4	18.3
Length of third spine of first dorsal fin	3.8	8.4	11.8
Length of fourth spine of first dorsal fin	2.4	13.4	7.5
Length of first ray of second dorsal fin	6.5	4.9	20.2
Length of last ray of second dorsal fin	4.6	7.0	14.3
Length of first anal-fin ray	2.2	14.6	6.8
Length of last anal-fin ray	6.0	5.4	18.7
Pectoral-fin length (left side)	7.6	4.2	23.7
Length of first pelvic-fin spine	2.2	14.6	6.8
Pelvic-fin length	9.0	3.6	28.0

Body elongate and slightly depressed. Head moderately depressed. Eye large. Interorbital narrow, 5.1 in eye diameter. Preopercular spine with a very short, straight main tip, four to five curved points on its dorsal margin, a strong antrorse spine at its base, and five to eight small serrae at its ventral margin, which is slightly convex; preopercular spine formula $1 \frac{4-5}{5-8} 1$. Cephalic lateral-line system with a short suborbital branch, a disconnected preopercular branch, and a supraoccipital commissure connecting lines of opposite sides. Occipital region smooth, with two moderate bony protuberances bearing small spines. A few additional spines before and behind the eye and dorsally on snout. Supraorbital tentacle present, slightly in advance of centre of orbit. Body lateral-line system with many short branches. Urogenital papilla moderately long.

First dorsal fin as high as second dorsal fin in the male, without filaments, the first spine longest (sexual dimorphism of the first dorsal fin presumed, judging from the situation in the other species of the subgenus). Second dorsal fin distally slightly convex, rays unbranched, the last divided at its base. Anal fin beginning on

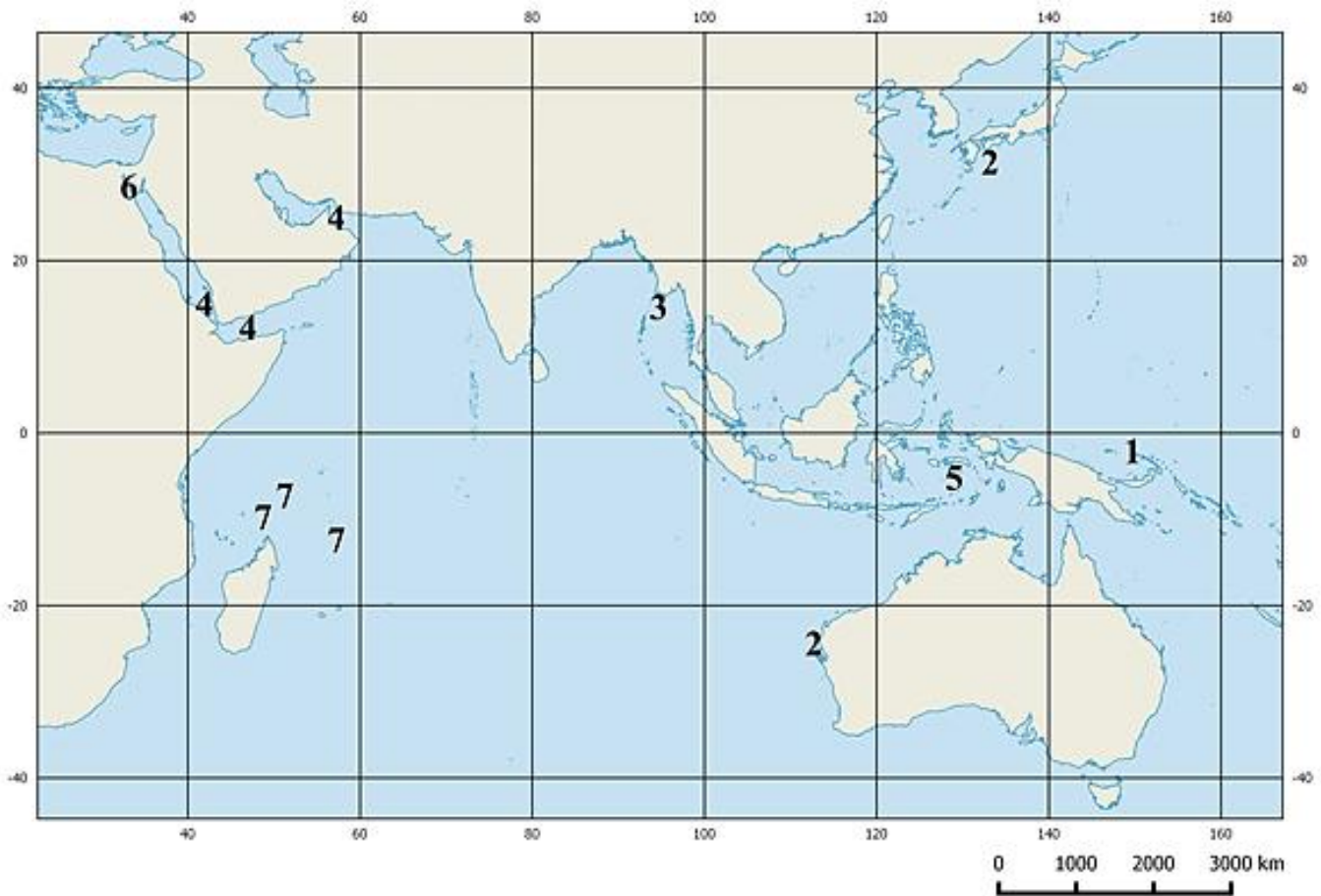


Figure 2. Geographical distribution of the species of the subgenus *Callionymus* (*Spinicapitichthys*) in the Indo-West Pacific. 1. *Callionymus alisae* n. sp.; 2. *C. draconis*; 3. *C. io*; 4. *C. muscatensis*; 5. *C. obscurus*; 6. *C. oxycephalus*; 7. *C. spiniceps*.

vertical through second ray of second dorsal fin. Anal fin distally slightly convex; anal-fin rays unbranched, the last divided at its base. Pectoral fin reaching to base of fourth anal-fin membrane when adpressed. Pelvic fin reaching to base of second anal fin ray when adpressed. Membrane connecting 5th pelvic-fin ray with pectoral fin base ending opposite seventh pectoral-fin ray (counted from above). Caudal fin in male elongate, symmetrical, without filaments.

Colour immediately after collection: Head and anterior body yellowish, posterior body pale, dorsally darker. Thorax, belly and lower sides of body white. Back with irregularly arranged grey spots; a row of larger grey spots along the side below the lateral line. Eye dark blue. First dorsal fin in the male pale, with vertical blackish bands. Second dorsal fin pale, with four small brown spots on each ray, posterior two membranes dark grey, Anal fin basally pale, distal half blackish. Caudal fin pale, upper two thirds with five oblique dark grey bands, lower one-fifth blackish. Pelvic fin distally blackish. Pectoral fin yellowish, dorsal half with vertical rows of faint brown spots.

Colour in preservative: Similar to fresh colouration, except that the yellowish colour fades to pale grey.

Sexual dimorphism: Unknown (only the male holotype known).

Distribution: The species is only known from the type locality, off the Bismarck Sea shore of Kavieng District, New Ireland Province, Papua New Guinea (Fig. 2). The species was collected at a depth of 90-228 m, probably in the shallower part of that range.

Etymology: The name of the new species refers to the French research vessel R/V Alis, who was used to collect the holotype and many other interesting fish specimens in the western and central Pacific.

Comparisons: The new species is a member of the subgenus *Callionymus* (*Spinicapitichthys*) as defined by Fricke (1983: 456; 2002: 7, 101) and Nakabo (1982: 106) (see above in the introduction). It is similar to *Callionymus muscatensis* Regan 1905 from the northwestern Indian Ocean in having a supraorbital tentacle and less than 7 antrorse serrae on the dorsal margin of the preopercular spine, but differs in having 5-8 small serrae on the ventral margin of the preopercular spine (1-3 in *C. muscatensis*), a total of 7 anal-fin rays (8 in *C. muscatensis*), the absence of filaments in the dorsal fin of the male (second and third spines filamentous in *C. muscatensis*), and the zebra stripe pattern with four vertical stripes (membranes 1-4) on the first dorsal fin of the male (*C. muscatensis*: only 2 vertical stripes on membranes 3-4). From the other species in the subgenus, the new species is distinguished by the zebra stripe pattern with four vertical stripes (other species have different colour patterns, none has four vertical stripes on membranes 1-4), the presence of a supraorbital tentacle (absent in *C. io* and *C. oxycephalus*), the four to five curved points on the dorsal margin of the preopercular spine (2-10 small, straight serrae in *C. draconis*, *C. io*, *C. muscatensis*, *C. oxycephalus*, 8-15 small, straight serrae in *C. spiniceps*, and 3 curved points in *C. obscurus*), the 5-8 small serrae on the ventral margin of the preopercular spine (2 small serrae in *C. obscurus*; 4-9 large, curved points in *C. oxycephalus*), and a total of 7 anal-fin rays (8 in *C. draconis*, *C. io* and *C. spiniceps*, usually 8 in *C. oxycephalus*).

A key to callionymid fish species of New Guinea is presented below to distinguish *Callionymus alisae* n. sp. from potentially co-occurring species. Also, a revised key to species of the subgenus *Spinicapitichthys* is provided to characterise the new species among other related species (updated, based on a key presented by Fricke 1983). So far, eight species endemic to New Guinea are known to science: *Callionymus colini* from Port Moresby region, *C. madangensis* and *C. zythros* from Madang, *Synchiropus claudiae* from eastern New Guinea (Madang and Port Moresby), *Callionymus alisae* n. sp. as well as two additional undescribed species of *Callionymus* and one species of *Synchiropus* from New Ireland (descriptions of the three latter species are in preparation by the author of the present paper). As New Guinea harbours a total of 27 callionymid fish species, the callionymid endemism rate amounts to 29.6%, which is exceptionally high. New Ireland plays a special role for callionymids as an endemism centre; five of the eight callionymids endemic to New Guinea occur at New Ireland, four even exclusively. The total fish endemism rate at New Ireland is currently under study.

Key to species of the family Callionymidae of New Guinea:

- 1 Opercle with a free flap of skin. 2
- Opercle without a free flap of skin. 3
- 2 Body with lateral fold of skin below LL; lower lip without fleshy papillae; A rays unbranched. *Diplogrammus goramensis* (Bleeker 1858)
- Body without lateral fold of skin below LL; dorsal margin of lower lip with a row of erect fleshy papillae; A rays branched. *Eleutherochir opercularis* (Valenciennes in Cuvier & Valenciennes 1837)
- 3 Sides of body with a number of small dermal cirri; few but relatively large teeth on the jaws *Anaora tentaculata* Gray 1835
- Sides of body without small dermal cirri; many small villiform teeth in bands in the jaws. 4
- 4 Snout shorter than eye diameter; soft D rays branched (in specimens longer than three cm); gill opening sublateral; no antrorse spine present at preopercular spine base. (*Synchiropus*) 5
- Snout equal to, or longer than, eye diameter; soft D rays unbranched; gill opening dorsal; antrorse spine at base of preopercular spine. (*Callionymus*) 15
- 5 Colour in life bright red with black pectoral-fin base; first dorsal fin in male without ocelli, but with four oblique ocellated bands reaching from first to third membranes; first dorsal fin in female mainly black. *Synchiropus tudorjonesi* Allen & Erdmann 2012
- Colour in life not bright red with black pectoral-fin base; first dorsal fin in males not as described above, if ocellated bands are present they would not reach the first membrane; first dorsal fin in female not mainly black. 6
- 6 Preopercular spine with one or two dorsal points additional to main tip. 7

–	Preopercular spine with three to five dorsal points additional to main tip.	12
7	Preopercular spine with one dorsal point additional to main tip.	8
–	Preopercular spine with two dorsal points additional to main tip.	<i>Synchiropus bartelsi</i> Fricke 1981
8	Sides of body with a series of large ocelli	<i>Synchiropus circularis</i> Fricke 1984
–	Sides of body without ocelli	9
9	Lateral line with two ventral branches below the occipital region; in males first dorsal fin with ocelli on second and third embranes	<i>Synchiropus stellatus</i> Smith, 1963
–	Lateral line without ventral branches below the occipital region; in males first dorsal fin with ocelli on first and second membranes	10
10	Anal-fin rays unbranched, the last divided at its base; first spine of first dorsal fin in male much longer than 4th spine.	<i>Synchiropus orstom</i> Fricke 2000
–	Anal-fin rays branched (occasionally except for the first), the last divided at its base; first spine of first dorsal fin in male not much longer than 4th spine.	11
11	Body colour overall red in life; first dorsal fin in male usually with 2 (rarely 3) ocelli; caudal fin with irregular blotches in 3-4 vertical bands.	<i>Synchirus moyeri</i> Zaiser & Fricke 1985
–	Body colour overall brown in life; first dorsal fin in male usually with 4 (rarely 3-6) ocelli; caudal fin blotches in 2 vertical bands.	<i>Synchirus ocellatus</i> (Pallas 1770)
12	Distal margin of second dorsal fin straight or concave; rays of second dorsal fin unbranched (except last which is divided at base)	<i>Synchiropus claudiae</i> Fricke 1990
–	Distal margin of second dorsal fin convex; rays of second dorsal fin branched (last divided at base).	13
13	Pectoral-fin rays 21; first spine of first dorsal fin in male without a filament.	<i>Synchiropus</i> sp. (to be described by R. Fricke)
–	Pectoral-fin rays 28-35; first spine of first dorsal fin in male with a long filament.	14
14	Caudal peduncle depth less than 5.6 in SL; interorbital more than 1.8 in eye; brown, with blue lines and spots.	<i>Synchiropus splendidus</i> (Herre 1927)
–	Caudal peduncle depth more than 5.7 in SL; interorbital less than 1.5 in eye; olive green (preserved: light blue), with large ocellate dark olive blotches	<i>Synchiropus picturatus</i> (Peters 1877)
15	Lower margin of preopercular spines with antrorse serrae.	<i>Callionymus alisae</i> n. sp.
–	Lower margin of preopercular spines without antrorse serrae.	16
16	Upper margin of preopercular spine with small antrorse serrae.	17
–	Upper margin of preopercular spine with large curved points.	26
17	Second dorsal fin with seven or eight rays (the last divided at base).	18
–	Second dorsal fin with nine rays (the last divided at base).	20
18	Second dorsal fin with seven rays (the last divided at base); anal fin with six rays (the last divided at base).	<i>Callionymus brevianalis</i> Fricke 1983
–	Second dorsal fin eight nine rays (the last divided at base); anal fin with seven rays (the last divided at base).	19
19	Caudal fin in male nearly not asymmetrical, length of upper rays similar to lower rays; first dorsal fin in male plain dark grey.	<i>Callionymus madangensis</i> Fricke 2014
–	Caudal fin in male strongly asymmetrical, upper rays much shorter than lower rays; first dorsal fin in male light, with a few indistinct dark spots.	<i>Callionymus pleurostictus</i> Fricke 1982
20	Anal fin with nine rays (the last divided at its base).	21
–	Anal fin with eight rays (the last divided at its base).	22
21	First spine of first dorsal fin in male detached from second spine, with a long filament; ventral margin of preopercular spine convex.	<i>Callionymus filamentosus</i> Valenciennes in Cuvier & Valenciennes 1837
–	First spine of first dorsal fin in male connected with second spine, not filamentous; ventral margin of preopercular spine concave.	<i>Callionymus belcheri</i> Richardson 1844
22	Caudal fin in male extremely elongate, at least nearly as long as standard length.	23
–	Caudal fin in male relatively short, at most half of standard length.	<i>Callionymus colini</i> Fricke 1993
24	First to third dorsal spines in male with filaments.	<i>Callionymus neptunius</i> (Seale 1910)
–	At most one filament in first dorsal fin may be lacking).	24
24	First dorsal spine in male with filament.	<i>Callionymus</i> sp. 1 (to be described by R. Fricke)
–	Dorsal fin without filaments in both sexes.	25
25	Dorsal margin of preopercular spine with 7-10 antrorse serrae; third membrane of first dorsal fin with large black blotch.	

.....	<i>Callionymus afilum</i> Fricke 2000
– Dorsal margin of preopercular spine with 5-6 antrorse serrae; third membrane of first dorsal fin without black blotch.	<i>Callionymus zythros</i> Fricke 2000
26 Anal fin with seven rays.	27
– Anal fin with 8-10 rays.	28
27 First dorsal fin in male low, first spine at most with a short filament.	<i>Callionymus russelli</i> Johnson 1976
– First dorsal fin in male very high, first spine with a long filament.	<i>Callionymus enneactis</i> Bleeker 1879
28 Preopercular spine dorsally with a small antrorse barb followed by two large, curved points; median two caudal-fin rays unbranched.	<i>Callionymus</i> sp. 2 (to be described by R. Fricke)
– Preopercular spine dorsally without an antrorse barb but with several large curved points; median caudal-fin rays branched. .	29
29 At least first and second spines of first dorsal fin in male with long filaments.	30
– First dorsal fin without filaments.	<i>Callionymus macdonaldi</i> Ogilby 1911
30 Only first and second spines of first dorsal fin filamentous in male.	<i>Callionymus keeleyi</i> Fowler 1941
– First dorsal fin high in male, all four spines filamentous.	<i>Callionymus octostigmatus</i> Fricke 1981

Key to the species of the subgenus *Callionymus* (*Spinicapitichthys*)

1 Dorsal margin of eye bearing a tentacle.	2
– Dorsal margin of eye without a tentacle.	5
2 Dorsal (or inner) margin of preopercular spine with 3-6 points or serrae; spines of first dorsal fin not filamentous or with 3 very short filaments of nearly equal length.	3
– Dorsal (or inner) margin of preopercular spine with 9-15 antrorse serrae; first dorsal fin with 1 long filament (first spine).	<i>Callionymus spiniceps</i> Regan 1908
3 Total anal-fin rays 8 (the last branched at base); first dorsal fin in male not zebra-striped, but 1-2 blotches or stripes on membranes 3-4.	4
– Total anal-fin rays 7 (the last branched at base); first dorsal fin in male zebra-striped, 4 vertical dark stripes on membranes 1-4 .	<i>Callionymus alisae</i> n. sp.
4 Male first dorsal fin without filaments; male first dorsal fin with a thin, elongate black blotch on 3rd membrane.	<i>Callionymus draconis</i> Nakabo 1977
– Male first dorsal fin with 2nd and 3rd spines filamentous; male first dorsal fin with two vertical dark streaks on 3rd and 4th membranes.	<i>Callionymus muscatensis</i> Regan 1905
5 Dorsal margin of preopercular spine with 3 small serrae; ventral margin of preopercular spine with 1-2 small serrae; male: first dorsal fin without filaments.	<i>Callionymus obscurus</i> Fricke, 1989
– Dorsal margin of preopercular spine with 5-10 small serrae; ventral margin of preopercular spine with 4-6 points or serrae; male: First dorsal fin with 1-2 filaments.	6
6 Male: Second spine of first dorsal fin elongate filamentous, first spine not filamentous; anal fin distally black.	<i>Callionymus oxycephalus</i> Fricke 1980
– (Only male known): First spine of first dorsal fin elongate filamentous, second spine not filamentous; anal fin translucent, without pigment.	<i>Callionymus io</i> Fricke 1983

Discussion

The exact depth of collection of the new species *Callionymus alisae* is unknown, as the dredging station where the holotype and only known specimen was collected ranged from 90-228 m depth. It is likely that it originates from, the shallower part of that range. Most probably, the holotype was collected at depths around 90-110 m.

Most of the species of the subgenus *Spinicapitichthys* have narrow, restricted distribution ranges, while only two are more widespread (*Callionymus muscatensis* in the southern Red Sea and northwestern Indian Ocean, *C. draconis* antitropically off southern Japan and northwestern Australia. The typical habitat includes soft bottom on the continental or insular slope. Ecologically, the species either live in nutrient-rich or nutrient-poor oceanic habitats. Most species (including *C. alisae* n. sp.) live exclusively in nutrient-rich waters of continents or high islands, while *C. spiniceps* (Seychelles and Saya de Malha Bank) lives on offshore seamounts with few nutrients.

Though the deeper waters around northern New Ireland and New Hanover were extensively sampled, only a single specimen of the new species was collected. All species of the subgenus *Spinicapitichthys* except for *C. muscatensis*, and probably *C. oxycephalus*, are very rare. The reason for the obvious rarity of the new species is unknown, though it is hypothesized that rarity of tropical marine fish species may be a strategy for avoidance of parasites. Rare fish species are often devoid of parasites, while more common species often harbour a larger number of different parasite species (J.-L. Justine, MNHN, personal communication).

The new species is most similar to species from the northwestern Indian Ocean (*C. muscatensis*) and southern Japan/northwestern Australia (*C. draconis*). There are wide gaps separating the distribution ranges of *C. alisae* n. sp. from the next species *C. draconis*, and even the neighbouring species *C. obscurus*. Information on the depth distribution of members of the subgenus *Spinicapitichthys* is scarce; only of one of the three known specimens of *C. draconis* we know a depth (ca. 150 m), while *C. muscatensis* is known from 27-75 m, and *C. obscurus* from 40 m.

In an alternative classification by Nakabo (1982), *Callionymus alisae* n. sp. would be a member of the genus *Spinicapitichthys* Fricke 1980. Here, *Spinicapitichthys* is treated as a subgenus of *Callionymus* (see introduction).

The callionymid fish fauna of New Guinea now includes 27 species; 10 of these are known from Madang District (data taken from a checklist of the fishes of New Ireland which is in preparation by the author of the present paper and collaborators).

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