

A new species of freshwater goby from Pohnpei, Micronesia (Gobioidei: Sicydiinae)

by

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During the past 35 years many freshwater gobies, including those of the subfamily Sicydiinae Gill, 1860 (Gobioidei), have been collected and identified from freshwater streams throughout the tropical Indo-Pacific. Indeed, approximately 50 new species of Sicydiinae have been described from the Pacific region since 1979 (Watson *et al.*, 2007; Keith *et al.*, 2010).

Pohnpei is a tropical island (355 km²) in the western Pacific Ocean. It is the largest island in the Federated States of Micronesia (FSM). The interior is mountainous with much of the native rainforest still intact. According to Merlin *et al.* (1992), Pohnpei is characterized by heavy annual rainfall with estimates of the mountainous interior of the island receiving more than 1,000 cm annually. Maciolek and Ford (1987) conducted the first comprehensive surveys of river macrofauna in Pohnpei. This initial work led to descriptions of four endemic species (in three genera) of sicydiines (Parenti and Maciolek, 1993). Only later (Buden *et al.*, 2001) was the presence of an unknown *Lentipes* species confirmed,

Abstract. – *Lentipes caroline* n. sp., a freshwater goby, is described on the basis of 21 specimens (12 males, 9 females) collected from high gradient streams on the island of Pohnpei, Federated States of Micronesia. It differs from other species of the genus by a combination of characters including a urogenital papilla lacking lateral lobes and being not retractable into a sheath-like groove, 16 pectoral fin rays, pore O generally lacking, a small head (head length 18-24% of SL), many tricuspid teeth in the upper jaw in females (23-39), and a greyish body colour in both sexes, with only hints of brighter colours including occasional blue anal fin margining and gold blotching across the dorsum of many individuals.

Résumé. – Une nouvelle espèce de gobie d'eau douce de Micronésie (Gobioidei : Sicydiinae).

Lentipes caroline n. sp., un gobie dulçaquicole, est décrit à partir de 21 exemplaires (12 mâles, 9 femelles) collectés dans les rivières de l'île de Pohnpei (Micronésie). Il diffère des autres espèces du genre par plusieurs caractères dont une papille urogénitale non rétractable dans une cavité et sans lobes latéraux, 16 rayons aux nageoires pectorales, le pore O généralement absent, une tête courte (longueur de la tête 18-24% de la LS), de nombreuses dents tricuspides sur la mâchoire supérieure des femelles (23-39) et une coloration générale grise chez les mâles et les femelles avec parfois une marge bleue sur la nageoire anale et des taches dorées le long du dos.

the first record of this genus from Micronesia.

Compared with other sicydiine genera, *Lentipes* Günther, 1861, is unique in having tricuspid premaxillary teeth in both males and females, but with generally 0-6 canine teeth at the posterior tip of the premaxilla in males. The ascending process on the premaxilla is narrow at the dorsal tip. The tongue is fused to the floor of mouth. The pelvic disc is adherent to the belly between all five rays and scales are never present on the nape and the belly in adults (Keith and Lord, 2011). *Lentipes* also exhibits considerable morphological variation in the form of the urogenital papilla.

Lentipes is currently known by 13 species, and is distributed in the Pacific Ocean from Indonesia and Papua New Guinea, and from southern Japan to Hawaii and the Marquesas islands (Watson *et al.*, 2002; Keith *et al.*, 2006, 2011). The purpose of this paper is to provide a description of *Lentipes caroline* n. sp., a freshwater goby known only from Pohnpei, FSM and the only species of *Lentipes* known to Micronesia.

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METHODS

Methods follow Watson *et al.* (2002) and Keith and Marquet (2005). Measurements were taken with a dial calliper to the nearest tenth of a millimetre. All counts were taken from the right side. The size is given in standard length (SL). Teeth were counted to the right of the premaxillary symphysis. Abbreviations for institutions and collections cited follow Leviton *et al.* (1985). Abbreviations for the cephalic sensory pore system follow Akihito (1986).

Counts of scales and fin rays are reported as: A, anal fin elements (includes flexible spine and segmented rays); D, dorsal fins (D1, first dorsal fin spines; D2, second dorsal fin elements); P, pectoral fin rays; C, caudal fin rays (only branched rays are reported); LS, scales in lateral series counted from upper pectoral fin base, or anteriormost scale along lateral midline, to central hypural base; PD, predorsal midline scales counted from scale directly anterior to first dorsal fin insertion to the anteriormost scale; TRB, transverse series backward, refers to scales counted from the first scale anterior to second dorsal fin origin, in a diagonal manner, posteriorly and ventrally to the anal fin base or ventralmost scale; TRF, transverse series forward, refers to scales counted from the first scale anterior to second dorsal fin origin, in a diagonal manner, anteriorly and ventrally to the centre of abdomen or ventralmost scale; ZZ, zigzag series, refers to scales on the narrowest region of the caudal peduncle counted from the dorsalmost scale to the ventralmost scale in a zigzag (alternating) manner.

***Lentipes caroline*, n. sp.**
(Figs 1-3, Tabs I-IV)

Material examined

Twenty-one specimens from Pohnpei, Federated States of Micronesia, totalling 12 males, 9 females; size range 34-46 mm SL [40-55 mm, total length (TL)], largest male 46 mm SL, largest female 45 mm SL.

Holotype. - MNHN 2012-0213, male (34 mm SL), Nanpil River (Pahn-Pwet), elevation 236 m, Pohnpei, FSM, 13 Mar. 2012, Lynch, Keith, Taillebois, Marquet, Castelin, coll.

Paratypes. - MNHN 2012-0214, 1 male (38 mm SL), 6 females (38-44 mm SL), same data as holotype. AMNH 259433, male (45 mm SL), Nanpil River, elevation 280 m, Pohnpei, FSM, 20 Nov. 1999, B. Lynch, coll. AMNH 259434, female (45 mm SL), Nanpil River, elevation 219 m, Pohnpei, FSM, 28 Aug. 1999, B. Lynch, coll. CAS 235705, female (42 mm SL, C&S), Nanpil-Kiepw River, 2.3 km SSW of weir, Pohnpei, FSM, 16 Oct. 1999, D.B. Lynch, coll. CAS uncat., female (39 mm SL), Nanpil-Kiepw River, 2.3 km SSW of weir, Pohnpei, FSM, 16 Oct. 1999, D.B. Lynch, coll. USNM 410585, male (45 mm SL), Nanpil River, stn.

Table I. - Number of pectoral rays in species of *Lentipes* (adapted from Watson *et al.*, 2002)

	15	16	17	18	19	20
<i>L. caroline</i>		21				
<i>L. adelphizonus</i>		1	1	1		
<i>L. armatus</i>			1	12	8	
<i>L. concolor</i>	1	21	27	7		
<i>L. crittersius</i>					1	
<i>L. dimetrodon</i>	5	1				
<i>L. kaaea</i>			24	4		
<i>L. multiradiatus</i>			3	20	13	2
<i>L. mindanaoensis</i>		1				
<i>L. rubrofasciatus</i>	2	5	1			
<i>L. solomonensis</i>		6	4			
<i>L. venustus</i>			1	5	1	
<i>L. watsoni</i>		3	7			
<i>L. whittendorum</i>			3	5	2	

31, 14 Jun. 2001, D. Buden and D. B. Lynch, coll. USNM 410586, male, (44 mm SL, C&S), Nanpil River, stn. 31, 14 Jun. 2001, D. Buden and D. B. Lynch, coll. BPBM uncat. males (41, 42 mm SL), Nanpil River, elevation 219 m, Pohnpei FSM, 23 Dec. 2008, B. Lynch, coll. BPBM uncat. males (36, 43 mm SL), Nanpil River, elevation 280 m, Pohnpei, FSM, 28 Feb. 2010, D. Buden and B. Lynch, coll. BPBM uncat. male (37 mm SL), Nanpil River, elevation 237 m, Pohnpei FSM, 29 Jul. 2009, B Lynch, B. Holland, and D. Buden coll.

Non type. - CAS 94343, female (27 mm SL); Caroline Islands: Pohnpei (Ponape): Lehn Mesi River, elevation 80 m; 9 Jul. 1986. College of Micronesia-FSM collections uncat. males (44-46 mm SL), Nanpil River, elevation 220 m, Pohnpei, FSM, 7 Mar. 2010, B. Lynch D. Buden coll.

Comparative material

The new species is compared with *Lentipes* species having no enlarged lobes associated with the urogenital papillae in females or elongate finger like projections in males, having a urogenital papilla in both sexes that is not retractable into a sheath-like groove, and possessing 16-17 pectoral fin rays. These species are *Lentipes concolor* (Gill, 1860), *Lentipes watsoni* Allen, 1997 and *Lentipes mindanaoensis* Chen, 2004.

Lentipes concolor (Gill, 1860). - BPBM 35638, male (48 mm SL); **Molokai**: Waiakeakua Stream; 19 Aug. 1991, G. Hagashi. USNM 83078, female (68 mm SL); 1838-1842, Wilkes Exploring Expedition. Hawaii: UMMZ 188844, 1 male, 5 females (42-64 mm SL); Kalakao Stream, ca. 150 m above Akaka Falls, elev. 370 m, 7.25 km west southwest of Honolulu; 28 Dec. 1968, J.M. Fitzsimons. UMMZ 188845, female (48 mm SL); Kalakao Stream, 2.5 km above Akaka Falls, elev. 670 m; 31 Dec. 1968, J.M. Fitzsimons. USNM 50655, holotype for *Vitraria clarescens*, female (23 mm SL), USNM 126696, paratype for *V. clarescens*, juvenile (21 mm

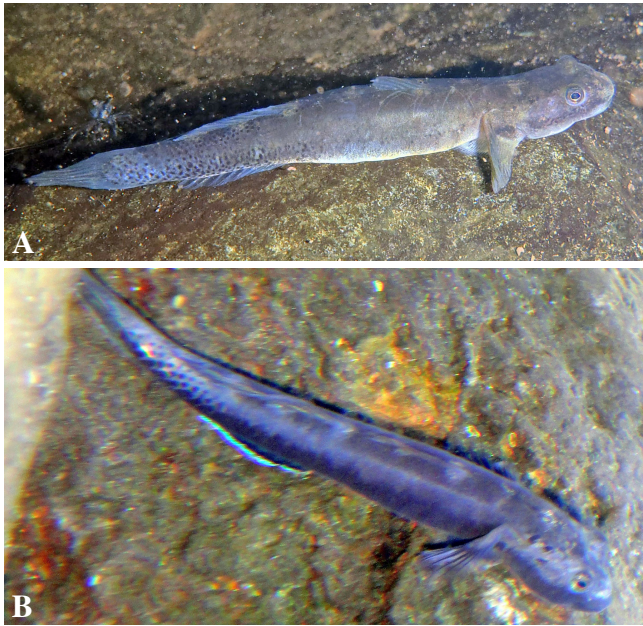


Figure 1. - *Lentipes caroline*, Pohnpei. **A:** Female, Nanpil River (picture by P. Keith); **B:** Male, Nanpil River (picture by B. Lynch).

SL); Hilo; 16 Jul. 1902, Albatross Expedition. **Kauai:** BPBM 21009, 3 males, 3 females (49-59 mm SL); Maunapulo Stream, elev. 100 m, above Haena; 1 Sep. 1977, J.A. Maciolek. CAS 67555, 3 males, 4 females (30-46 mm SL); Maunapulo Stream; 15 Apr. 1976, J.A. Maciolek. UMMZ 196860, 1 female, 1 juvenile (19-43 mm SL); Wainiha River, 2 km above mouth at powerhouse, elev. 33 m; 15 Sep. 1974, R.M. Bailey *et al.* **Maui:** BPBM 35636, 4 post larval fry (13-14); Wailohe Stream; 18 Aug. 1991, S. Hau. BPBM 35653, 4 females (55-74 mm SL); Kaukauai Stream, elev. 240 m; 7 Apr. 1992, S. Hau. BPBM 35663, 1 male, 7 juveniles (19-47 mm SL); Hanawi Stream, elev. 60 m, below first waterfall; 8 Oct. 1992, R. Englund. BPBM 35674, female (43 mm SL); West Maui: Wailua Nui Stream; 20 Jan. 1993, S. Hau. BPBM 35677, 2 males, 1 female (30-42 mm SL); West Maui: Kahakuloa Stream; 9 Feb. 1993, S. Hau. CAS 67552, 19 juveniles (13-18 mm SL); Hanawi Stream; 2 Nov. 1976, J.A. Maciolek. MRAC 74-37-P-9-12, 4 males (24-59 mm SL); West Maui: Kahakuloa Stream; 14 Oct. 1974, J.A. Maciolek. **Molokai:** BPBM 35632, 6 males, 10 females (20-48 mm SL); Waikolu Stream, elev. 215 m; 2 Apr. 1991, S. Hau & W. Puleloa. BPBM 36447, 2 females (39-55 mm SL); same data as holotype. **Oahu:** USNM 226905, female (22 mm SL); Kaipapau Stream at Hauula in shallow rapids ca. 50 m from sea; 4 Jul. 1980, R.E. Watson.

Lentipes dimetrodon Watson & Allen, 1999. - MZB 8001 (holotype), male (22 mm SL); **Indonesia:** Papua: Omamerwai Creek; 9 Aug. 1995, G.R. Allen. MZB 8002 (paratype), male (19 mm SL), same data as holotype. WAM P.31059-002 (paratypes), 3 males, 1 female (19-24 mm SL), same data as holotype.

Lentipes mindanaoensis Chen, 2004. - Data extracted from Chen (2004): NMMB P 4821 (holotype), male (46 mm SL); **Phil-**

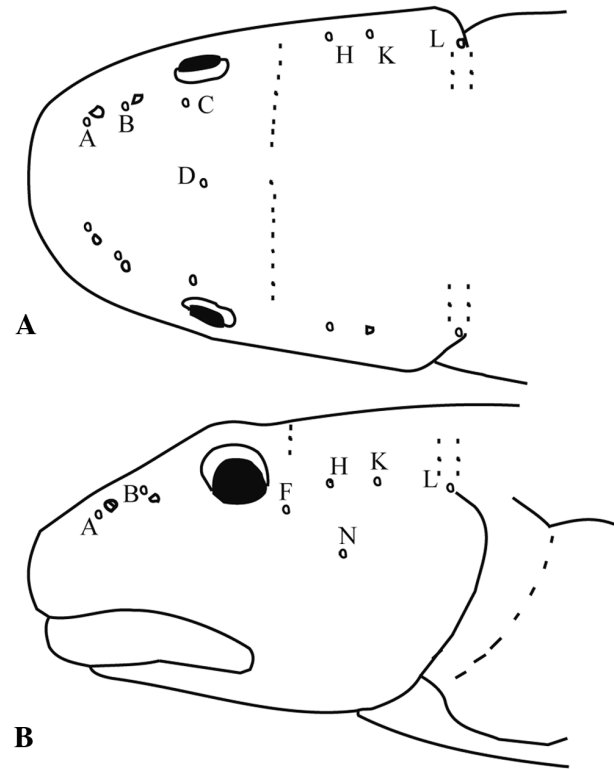


Figure 2. - Diagrammatic illustration of head in *Lentipes caroline* (male) showing head pores and sensory papillae. **A:** Dorsal view; **B:** Lateral view.

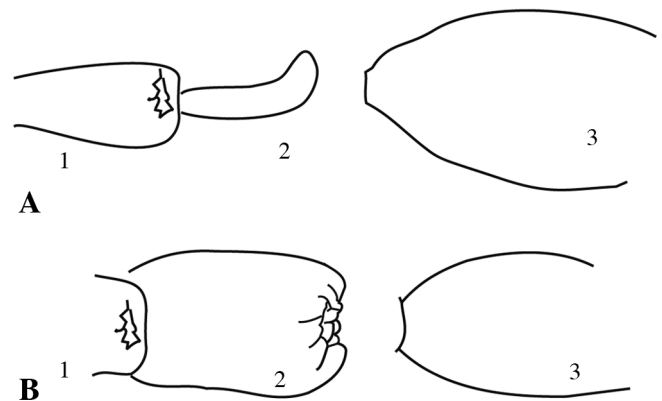


Figure 3. - Diagrammatic illustration of urogenital papilla in *Lentipes caroline*. **A:** Male; **B:** Female. 1: anus; 2: urogenital papilla; 3: anal fin.

ippines: Mindanao; A.P. Porpetcho.

Lentipes watsoni Allen, 1997. - WAM P.31221-001 (holotype), male, 48 mm SL, **Papua New Guinea:** Gulf Province, Sapoi River; 12-19 Nov. 1996; G.R. Allen. WAM P.31221-002 (paratypes), 3 males, 3 females (45-64 mm SL), same data as holotype.

Other material

Lentipes armatus Sakai & Nakamura, 1979. - MNHN, uncat-

Table II. - Number of upper jaw teeth in studied species of *Lentipes*.

	Tricuspid teeth																													
	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30				
<i>L. caroline</i> males	2	3																												
<i>L. caroline</i> females																			1	-	-	-	1	-	1	1				
<i>L. concolor</i> males		1	2	4	3	3	6	3	1																					
<i>L. concolor</i> females							3	1	4	5	7	8	3	1	1	-	1													
<i>L. watsoni</i> males																1	-	-	1	-	1									
<i>L. watsoni</i> females																														
		Tricuspid teeth (continued)																												
		31	32	33	34	35	36	37	38	39	40	41	42	43	44															
<i>L. caroline</i> males																														
<i>L. caroline</i> females		-	2	1	1	-	-	-	-	1																				
<i>L. concolor</i> males																														
<i>L. concolor</i> females																														
<i>L. watsoni</i> males																														
<i>L. watsoni</i> females											1	-	1	-	1															
		Conical teeth																												
		0	1	2	3	4	5	6	7	8	9																			
<i>L. caroline</i> males					1	-	1	-	2	-	1																			
<i>L. caroline</i> females		9																												
<i>L. concolor</i> males			5	4	7	1	5	-	-	-	1																			
<i>L. concolor</i> females		15	15	2	-	1																								
<i>L. watsoni</i> males					1	1	-	1																						
<i>L. watsoni</i> females		3																												

Table III. - Zigzag scale counts in studied species of *Lentipes*

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
<i>L. caroline</i>								1	3	4								
<i>L. concolor</i>	2	-	1	-	5	3	6	5	7	6	3	5	2	4	1	2	-	1
<i>L. mindanaoensis</i>										1								
<i>L. watsoni</i>								1	3	2								

alogued, 3 males, Okinawa, Ryukyus, **Japan**; 12 Jul. 2006; K. Maeda.

Lentipes multiradiatus Allen, 2001. - MNHN, uncatalogued 3 males, 3 females, **Sulawesi**, Masembo; Jul. 2011; Hadiaty *et al.*

Lentipes venustus Allen, 2004. - MNHN, uncatalogued, 3 males, 1 female, **Papua**, crique Bichain; 19 Oct. 2010; P. Keith *et al.*

Diagnosis

The new species has 16 pectoral rays. The urogenital papilla is not retractable into a sheath-like groove and is without lobes or other expanded tissue. The pore O is generally lacking. The cycloid scales are generally restricted to caudal peduncle but may extend to mid flank. The head is small (head length 18-24 % of SL) and there are many tricuspid teeth in the upper jaw in females (23-39). The general pattern of both males and females is greyish, with little bright coloration.

Description

Number of pectoral rays in species of *Lentipes* are given in table I, number of upper jaw teeth in table II, zigzag scale counts in table III, and morphometrics expressed to the nearest whole percent of standard length in table IV.

Below, the holotype counts are given first, followed in brackets if different, by paratype counts.

First dorsal fin (D1) with six flexible spines, second dorsal fin (D2) with one flexible spine and ten segmented rays (D VI-I,10). Anal fin with one flexible spine and ten segmented rays (A I,10) and directly opposite to second dorsal fin. Membrane on first dorsal fin not reaching base of second dorsal fin origin in female, touching in male; spines not filamentous in females, slightly filamentous in males. Pelvic fins a strong adhesive disc adherent to abdomen between all five rays. Pectoral fin with 16 rays, ventral most 1 or 2 rays simple; posterior margin slightly pointed. Lateral scales (LS), 7-9 in males, 10-13 in females, lightly embed-

Table IV. - Morphometrics in studied species of *Lentipes* expressed to the nearest whole percent of standard length.

	Predorsal length										Body depth in males at second dorsal origin										
	33	34	35	36	37	38	39	40	41	11	12	13	14	15	16						
<i>L. caroline</i>	3	1	2	8	3	3	1			3	5	4									
<i>L. concolor</i>	1	4	9	17	7	6	1				2	8	4	3	1						
<i>L. mindanaoensis</i>								1						1							
<i>L. watsoni</i>			1	4	-	-	-	-	1				3								
	Prenatal length										Head length										
	55	56	57	58	59	60	61	62	63	64	65	18	19	20	21	22	23	24	25	26	
<i>L. caroline</i> males	1	3	2	2	2	1	1							2	7	2	1				
<i>L. caroline</i> females			1	1	2	1	1	2	1		1	1	2	2	2	1					
<i>L. concolor</i> males	1	-	2	1	9	4	2							1	4	7	4	3			
<i>L. concolor</i> females	1	1	1	2	5	6	5	7	2	-	1				3	10	11	6	-	1	
<i>L. mindanaoensis</i> male								1											1		
<i>L. watsoni</i> males				1	-	1	-	1											1	2	
<i>L. watsoni</i> females								3									2	1			
	Jaw length																				
	7	8	9	10	11	12	13	14	15												
<i>L. caroline</i> males			3	4	4	1															
<i>L. caroline</i> females	1	4	3																		
<i>L. concolor</i> males			2	5	12																
<i>L. concolor</i> females	2	7	12	9	1			2	1												
<i>L. watsoni</i> males																					
<i>L. watsoni</i> females				1	2																
	Caudal peduncle length										Caudal fin length										
	12	13	14	15	16	17	18	19	20	21	22	17	18	19	20	21	22	23	24	25	
<i>L. caroline</i> males	2	2	2	4	2								1	1	3	3	1	2	1		
<i>L. caroline</i> females	4	1	1	-	3							1	1	4	1	-	2				
<i>L. concolor</i> males				1	6	7	2	2	-	1			3	8	3	3	1				
<i>L. concolor</i> females					1	9	3	14	3	2	1	6	2	10	9	3					
<i>L. mindanaoensis</i> male								1												1	
<i>L. watsoni</i> males						1	1	1							1	-	2				
<i>L. watsoni</i> females									2	-	1	1	1	-	1						
	Caudal peduncle depth																				
	7	8	9	10	11																
<i>L. caroline</i> males		1	3	5	1																
<i>L. caroline</i> females		2	5	1																	
<i>L. concolor</i> males	1	6	6	5																	
<i>L. concolor</i> females	5	18	9																		
<i>L. mindanaoensis</i> male					1																
	Second dorsal fin length																				
	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
<i>L. caroline</i> males								1	-	1	1	1	1	1	2	1	1	-	-	-	1
<i>L. caroline</i> females				1	1	1	2	1	3												
<i>L. concolor</i> males						2	-	-	1	4	4	3	2	2	1						
<i>L. concolor</i> females		1	1	1	5	5	10	6	1												
<i>L. mindanaoensis</i> male							1														
<i>L. watsoni</i> males					1	2															
<i>L. watsoni</i> females	1	1	1																		

Table IV. - Continued.

	Anal fin length																	
	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
<i>L. caroline</i> males												2	4	2	2	1	-	1
<i>L. caroline</i> females			1	-	-	1	3	3	1									
<i>L. concolor</i> males							1	4	6	3	3	2						
<i>L. concolor</i> females	1	-	1	6	6	10	4	1	1									
<i>L. mindanaoensis</i> male					1													
<i>L. watsoni</i> males						1	1	1										
<i>L. watsoni</i> females			1	2														

ded, thin cycloid, generally limited to caudal peduncle, few may extend anteriorly along midline between second dorsal and anal fins; one female with 27. Caudal fin (C) 13(13-15) branched rays. No scales in transverse backwards (TRB) and in transverse forward series (TRF) in most, including holotype, observed TRB scales in two females with rows of variable completion, a few TRF scales in partial row in one female. Zigzag scales (ZZ) 8(7-9). Head, breast, nape and belly without scales. Upper jaw teeth distinctly tricuspid anteriorly, males 6(5-6), females (23-39). Premaxilla in males with 3(3-9) recurved canines posterior to tricuspid teeth; females usually without teeth posterior to tricuspid teeth. Teeth in lower jaw recurved and canine in males 5(4-8), small and conical in females (0-3). Head small (22(18-24)% of SL); jaw short in males (9(9-10) % of SL). Cephalic sensory pore system A, B, C, D, F, H, K, L; pores N and O generally absent in females; few males with pore N, generally without pore O; pore D singular with all others paired (Fig. 2); oculoscapular canal divided into anterior and posterior canal between pores H and K. Some cutaneous sensory papillae present on head, but not well developed. Sensory papillae generally absent on infraorbital region, preopercle, opercle, trunk or caudal peduncle. Urogenital papilla in males slender and pointed distally without associated lobes or expanded tissue (Fig. 3A), urogenital papilla not retractable into a sheath-like groove; in females urogenital papilla rectangular in appearance (Fig. 3B) and also not retractable into a sheath-like groove.

Colour in preservation

Male. - Background of body greyish to blackish. Dorsal to midline light dusky. Background of head blackish. Snout dusky. Head ventrally with black pigment, except on isthmus. Lateral midline with a well-marked black subcutaneous band. All scales on caudal peduncle with brown blotches. Anterior half and dorsal margin of upper lip dusky. Brown band posterior to eye extending across preopercle onto opercle. Nape greyish. Caudal fin rays dusky. Dorsal and anal fins blackish. Pelvic disk without pigment. Pectoral rays greyish. Pectoral fin base with black medial band.

Female. - Background of body and head greyish. Snout

dusky. Head ventrally without pigment. Anterior half and dorsal margin of upper lip dusky. Lateral midline with a black subcutaneous band terminating as a brownish spot at caudal fin base. Most scales on caudal peduncle with greyish blotches. Brownish band posterior to eye extending across preopercle onto opercle. Nape with numerous tiny brownish blotches. Caudal fin rays slightly dusky, dorsal and ventral margins clear. Anal fin and pelvic disk without pigment. Pectoral fin rays greyish, brownish blotch on dorsal half of fin basally. Pectoral fin base with blackish medial band.

Colour in life (Fig. 1)

Male. - Colour somewhat variable, but generally appears bluish grey to darker grey, lighter on the belly with some rectangular lighter blotching across the dorsum and black spotting running laterally across the body from the caudal peduncle to mid-body, spotting fainter towards the anterior. Bright blue anal fin margin sometimes present.

Female. - Colour less variable in females. Body grey to olive, darker across the dorsum. Six to eight gold rectangular blotches are frequently present across the dorsal median evenly spaced starting at the tip of the snout. Lateral black spots on scales starting with the anterior of the anal and second dorsal fins running to the caudal peduncle. Black horizontal band running from operculum across the head below eye and around the snout above the mouth.

Distribution

Currently known only from the Nanpil and Lehn Mesi Rivers, Pohnpei, FSM.

Ecology

Lentipes caroline was collected in a swift, clear high gradient stream with a rocky and boulder-strewn bottom. It has been observed resting on the rocks between 120 and 236 m in altitude in the northern facing Nanpil River. It is presumed to be amphidromous as with other members of the subfamily (Radtke *et al.*, 2001; Keith, 2003; McDowall, 2007). *Lentipes caroline* was frequently observed swimming in the upper water column of deep pools moving from one point to another. The species also tends to share the uppermost

elevations of streams in Pohnpei with *Sicyopus nigriradiatus* Parenti & Maciolek, 1993, though the range of the latter species extends further into lower elevations.

Comparison

Lentipes caroline differs from all other *Lentipes* in generally lacking pore O. It differs from *L. kaaea*, *L. rubrofasciatus*, *L. solomonensis* and *L. whittendorum* in not having enlarged lobes associated with the urogenital papilla in males. It differs from *L. adelphizonus* in not having elongate finger like projections anterior to the urogenital papillae in males. From *L. armatus*, *L. multiradiatus*, *L. venustus* and *L. dimetrodon* it differs in having a non-retractable urogenital papilla in both sexes vs. a urogenital papilla that retracts into a sheath-like groove, and in having 15-16 pectoral fin rays vs. 18-19.

Furthermore, it differs in particular from *L. concolor* in having more tricuspid teeth in the upper jaw in females (23-39 vs. 11-21), fewer in males (5-6 vs. 6-13), and a shorter caudal peduncle length (12-16 vs. 15-21% SL); from *L. crittersius* in having 16 pectoral fin rays vs. 19. Finally, it differs from *L. watsoni* in having fewer tricuspid teeth in the upper jaw in males (5-6 vs. 20-25) and females (23-39 vs. 40-44), and a shorter jaw length in males (9-12 vs. 14-15% SL), and from *L. mindanaoensis* in having a shorter predorsal length (33-39 vs. 41% SL) and longer second dorsal (32-45 vs. 26% SL) and anal fin length (32-38 vs. 25% SL) in males.

Etymology

The new species is named for both the first author's daughter and the beautiful islands of Micronesia for which she was named, the Caroline Islands. The name is a noun in apposition.

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