



## A new species of marine gobiid fish genus *Lubricogobius* (Teleostei: Gobiidae) from the Philippines

I-SHIUNG CHEN<sup>1,2,\*</sup>, YUN-CHIH LIAO<sup>3,4,#</sup>, LIN-TAI HO<sup>1</sup> & KWANG-TSAO SHAO<sup>1,3,\*</sup>

<sup>1</sup>Institute of Marine Biology, National Taiwan Ocean University, Keelung, 202301, Taiwan, R.O.C.

✉ [iscfish@gmail.com](mailto:iscfish@gmail.com); <https://orcid.org/0000-0002-4190-7720>

✉ [zoskt@gate.sinica.edu.tw](mailto:zoskt@gate.sinica.edu.tw); <https://orcid.org/0000-0002-4807-7539>

<sup>2</sup>Center of Excellence for the Oceans, National Taiwan Ocean University, Keelung, 202301, Taiwan, R.O.C.

<sup>3</sup>Research Center for Biodiversity, Academia Sinica, Taipei, 100060, Taiwan, R.O.C.

✉ [fish1715@utapei.edu.tw](mailto:fish1715@utapei.edu.tw); <https://orcid.org/0000-0002-9158-1159>

<sup>4</sup>Department of Earth and Life Science, University of Taipei, Taiwan, R.O.C.

\*Corresponding authors

#The author shares equal contribution of first author

### Abstract

A new marine goby of genus, *Lubricogobius* Tanaka, 1915 was collected from the Philippines. This new species, *Lubricogobius rubrofasciatus* n. sp., can be distinguished from other congeneric species by following unique combination of features: (1) second dorsal fin I/10; anal fin I/7; pectoral fin 18; (2) head and trunk entirely naked; (3) both anterior and posterior nostrils as short tubes; (4) gill opening large, extending ventrally beyond the rear vertical of opercle; (5) infraorbital papillae all belonging to longitudinal pattern; and (5) colouration in life: body and head creamy white to yellow; iris bright orange; an oblique bright red orange stripe from nape to upper lip through eye; dorsal, anal, pelvic and caudal fins all with yellow to orange with wide, distal deep black margin. The description of new species and a diagnostic key to all congeners in the Indo-Pacific region will be reported in this paper.

**Key words:** *Lubricogobius*, new fish, marine goby, fish taxonomy, the Philippines

### Introduction

Gobiid fishes of the family Gobiidae form the largest species group of the teleost fishes (Miller 1988, 1993). In the Indo-Pacific region, the great diversity of marine fish fauna has yielded the highest number of generic and specific diversity of gobies especially around coral reef habitat while compared to all the other marine habitats.

A small body-size naked goby, *Lubricogobius* Tanaka, 1915, is based on the new genus and species description from a single holotype of *Lubricogobius exiguus* Tanaka, 1915 from Nakasaki, Japan. After the publication of Tanaka (1915), another new goby, *Gobiodonella macrops* Lindberg, 1934, was collected from Misaki, Japan. Later on, a goby described as *Lubricogobius gnathus* Tomiyama, 1934 was also found around Misaki, Japan. However, both described species in 1934 have been regarded as junior synonyms of Tanaka's species: *Lubricogobius exiguus* (Tomiyama, 1936; Randall & Senou, 2001). A second valid species, *Lubricogobius ornatus* Fourmanior, 1966, was described based on two specimens from a market at Nha Trang, Vietnam.

After 2000, Randall & Senou (2001) have documented a new goby as the third congeneric species: *Lubricogobius dinah* Randall & Senou, 2001 and they also created a new genus, *Larsonella* Randall & Senou, 2001, based on the single type of *L. pumilus* (Larson & Hoese, 1980). More recently, Prokofiev (2009) documented a new congeneric one: *Lubricogobius tre* Prokofiev (2009) from Nha Trang Bay, Vietnam.

More recently, two more rare species turned to science: *Lubricogobius nanus* Allen, 2015 and *Lubricogobius tunicatus* Allen & Erdmann, 2016 which both come from Papua New Guinea.

Till present, the newly collected, undescribed species can be defined within *Lubricogobius* in the Indo-Pacific. A new discovery of such a new member of bright-color *Lubricogobius* which found from the marine expedition in the Philippines by one of us (KTS) in 2007. Here we describe this very rare, new gobiid species based on the only assignable holotype from the Philippines and provide a diagnostic key to all congeners in the Indo-Pacific region.

## Materials and Methods

All counts and measurements were made from specimens preserved in 70% ethanol after 10% formalin fixation. The counting methods followed Akihito *et al.* (1984) and Chen *et al.* (1999; 2006). The measurements followed Chen *et al.* (1999; 2006) and Chen & Fang (2003). Terminology of cephalic sensory system in general followed Miller (1988) and Wongrat & Miller (1991) based on Sanzo (1911). Vertebrae and dorsal pterygiophore formula (sensu Akihito *et al.* 1984) were counted from X-ray radiographs. Standard length (SL) was used throughout. The type specimen is deposited at the National Museum, Manila (NMI).

## Systematics

### *Lubricogobius* Tanaka, 1915

*Lubricogobius* Tanaka, 1915: 567 (type species, *L. exiguus* Tanaka, 1915).

*Gobiodonella* Lindberg, 1934: 437 (type species, *G. macrops* Lindberg, 1934).

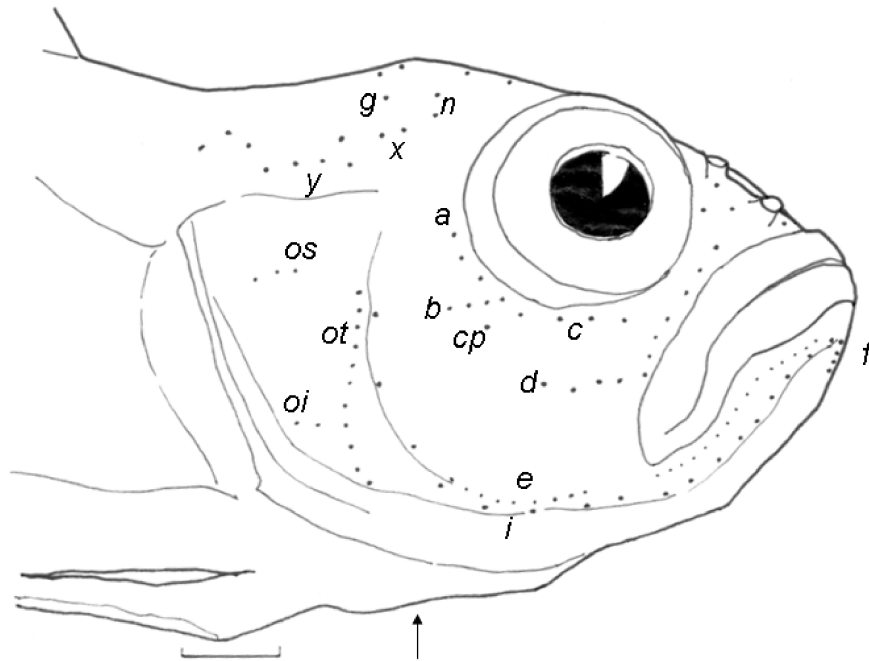
### *Lubricogobius rubrofasciatus* sp. n.

(紅帶短鰕虎)

(Figs. 1–2)

### Material examined

**Holotype.**—NMI-17004 (originally from ASIZP-0070001), 18.8 mm SL, 40–45 m depth, Malina Bay, South China Sea, 2007 marine expedition, the Philippines.



**FIGURE 1.** Head papillae pattern of *Lubricogobius rubrofasciatus*, holotype, 18.8 mm SL, the Philippines. The arrow below head indicates the ventral extension of gill opening. Bar = 1 mm.



FIGURE 2. *Lubricogobius rubrofasciatus*, holotype, 18.8 mm SL, the Philippines.

### Diagnosis

This new goby can be distinguished from other congeners by following unique combination of features: (1) second dorsal fin I/10; anal fin I/7; pectoral fin 18; (2) head and trunk entirely naked; (3) anterior and posterior nostrils as short tubes; (4) gill opening large, extending ventrally beyond the rear vertical of peropercle; (5) infraorbital papillae all longitudinal; and (5) coloration in life: body and head creamy white to yellow; iris bright orange; an oblique bright red orange stripe from nape to upper lip through eye; dorsal, anal, pelvic and caudal fins all with yellow to orange with distal deep black margin on fin membrane.

### Description

Head and body compressed. Head moderate large. Eye high and large. Snout rounded and very short. Mouth moderately large and strongly oblique, about 50 degree to horizontal axis. Interorbital region very narrow. Both anterior and posterior nostrils as a short tubes. Upper jaw with an outer row of large well-spaced canine teeth and two to three inner rows of conical teeth; front of lower jaw with outer row of large canines and one to two inner rows of small conical teeth. Tongue truncate and slightly bi-lobed. Gill opening large, extending ventrally beyond the rear vertical of peropercle. Vertebral count 25. Dorsal pterygiophore formula 3/II II I I 0/9.

Morphometric proportions were listed as follows. Head length 34.6; predorsal length 40.0; snout to second dorsal fin origin 61.1; snout to anus 67.6; snout to anal fin origin 68.7; prepelvic length 32.4; caudal peduncle length 20.8; caudal peduncle depth 11.5; first dorsal fin base 21.8; second dorsal fin base 23.8; anal fin base 16.6; caudal fin length 30.4; pectoral fin length 30.5; pelvic fin length 27.9; body depth at pelvic fin origin 24.3; body depth at anal fin origin 20.9; maximal body depth 27.2; body width at anal fin origin 7.4; and pelvic fin origin to anus 35.9 all in % of SL. Snout length 21.5; eye diameter 34.2; cheek depth 31.1; postorbital length 39.3; maximal head width 59.8; head width at upper gill-opening 46.6; bony interorbital width 12.3; fleshy interorbital width 27.0; and lower jaw length 48.9 all in % of head length. Caudal peduncle depth 55.4 in % of caudal peduncle length.

**Fins.**—First dorsal fin VI; second dorsal fin I/10; pectoral fin 18; anal fin I/7; pelvic fin I/5+I/5. The selected fin rays counts which compared to other 3 valid species were listed in Table 1. First dorsal fin with third and fourth rays slightly longer than other. Second dorsal fin higher than first dorsal fin. The fin-membranes of both dorsal fins well separated. Anal fin smaller than second dorsal fin which origin inserted below between third and fourth branched rays of second dorsal fins. Caudal fin large and rounded. Pectoral fin moderate large, with upper and lower two unbranched rays and the rear extending near the vertical of anus. Pelvic fin large, with complete frenum and well-developed connecting membrane.

**TABLE 1.** Fin-rays counts of seven nominal species of *Lubricogobius* from Indo-Pacific.

	Second dorsal rays					Pectoral rays					
	8	9	10	11	M	16	17	18	19	20	M
<i>Lubricogobius rubrofasciatus</i> n. sp.	-	-	1	-	10.0	-	-	2	-	-	18.0
<i>Lubricogobius dinah</i>	-	-	3	1	10.3	1	1	1	1	-	17.5
<i>Lubricogobius exiguus</i>	3	39	10	-	9.1	8	22	18	-	-	17.2
<i>Lubricogobius nanus</i>	-	-	1	2	10.7	-	-	-	6	-	19.0
<i>Lubricogobius orantus</i>	2	19	3	-	9.0	-	-	9	14	2	18.7
<i>Lubricogobius tre</i>	-	1	-	-	9.0	-	-	-	1	-	19.0
<i>Lubricogobius tunicatus</i>	-	1	-	-	9.0	-	-	2		-	18.0

PS. Meristic data of congeneric species from review and new species papers from Randall & Senou (2001), Prokofiev (2009), Allen (2015), Allen & Erdmann (2016).

**Scales.**—LR 25, TR 9, PreD 0. Head and predorsal scales entirely without any scales. Body with large cycloid or ctenoid scales. Belly naked.

### Head lateral-line system

**Canals.**—No any canal and head pore.

**Head papillae.**—Left side of head papillae almost abraded, and the following description only from the right side. Row *a* short. Row *b* short and longitudinal, but located rather high around the horizon of lower margin of orbit. Row *cp* single papilla. Row *c* short and longitudinal which just below orbit. Row *d* with four to five large papillae on cheek. Row *f* longitudinal as a pair of rows with four papillae. Row *z* not seen, but possibly abraded. Opercular rows seriously abraded, rows *os* and *oi* only seen as two to three papillae.

**Coloration in fresh and preservative.**—Body and head somewhat semi-transparent, generally with creamy white to yellow background. Iris bright orange. Head with an oblique bright red orange stripe from nape to upper lip through eye. The dorsal region of red orange stripe forming as a V shape mark on anterior nape. Both dorsal and anal fins with basal bright yellow, and distal half region with bright orange and deep black on distal fin membrane. Caudal fin base with creamy-white basal region, bright yellow in the middle and orange to deep black on the distal margin. Pectoral orange yellow with distal grayish region of fin membrane. Pelvic fin yellow, with distal orange to deep black margin. While the fresh specimen transferred into formalin preservative, all bright yellow and orange have faded to snow white to pale white. The marginal, deep black pattern on fins is still remained similar to fresh specimen.

**Distribution.** So far, this species had been only recorded in the Philippines.

**Etymology.** The specific name is referred to Latin “*rubro*” + “*fasciata*” means “orange red” + “stripe” as the characteristic feature of head.

### Remarks

This new species, *Lubricogobius rubrofasciatus*, was merely collected from the Philippines. However, it is still possible to find it in more localities around other tropical or subtropical regions of the Indo-Pacific. In morphological comparison, *L. rubrofasciatus* can be well distinguished from both species of *L. exiguus* and *L. ornatus* by the following features: (1) second dorsal rays 10 vs. modally 9; (2) coloration in live: dorsal, anal and caudal fins with distal black margin vs. all uniform yellow to orange which turned to pale white while preserved. Furthermore, *L. rubrofasciatus* can also be well separated from *L. dinah* by following features: (1) anterior nostril present vs. absent; and (2) color in live: head with an oblique orange red stripe through eye and trunk yellow to creamy white with fin membranes of dorsal, anal and caudal fins with distal deep black margin vs. dorsum with snow white, ventral side

with bright yellow and all fins yellow and unmarked. In comparison with recently described one, *Lubricogobius rubrofasciatus* can be easily distinguished from *Lubricogobius tre* by the following features: (1) second dorsal fin rays 10 vs. 9; and (2) color in live: head with an orange red stripe and caudal fin with distal black margin vs. head and caudal unmarked.

### A diagnostic key to the 7 species of *Lubricogobius* in the Indo-Pacific

1a	Anterior nostril absent, color of body in life white dorsally, abruptly orange ventrally . . . . .	<i>L. dinah</i>
1b	Anterior nostril present, color of trunk in life uniformly pinkish, creamy white, yellow or orange . . . . .	2
2a	Second dorsal rays modally 10–11. . . . .	3
2b	Second dorsal rays modally 9. . . . .	4
3a	Pectoral fin ray modally 19; head and body uniformly light brown to brown. . . . .	<i>L. nanus</i>
3b	Pectoral fin rays 18; color of head with an oblique orange red stripe through eyes, and caudal fin with wide, distal deep black margin. . . . .	<b><i>L. rubrofasciatus</i> sp. n.</b>
4a	Pectoral rays modally 17; anal rays modally 6. . . . .	<i>L. exiguus</i>
4b	Pectoral rays modally 18–19; anal rays 7–8. . . . .	5
5a	Pectoral fin modally 18 . . . . .	<i>L. tunicatus</i>
5b	Pectoral fin modally 19 . . . . .	6
6a	anal fin rays modally 7; color orange with several light blue lines radiating from eye and two lines on operculum (Ryukyu Islands, Vietnam, Arafura Sea, and New Caledonia) . . . . .	<i>L. ornatus</i>
6b	anal fin rays 8; color of body pinkish and first dorsal fin entirely black . . . . .	<i>L. tre</i>

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