

## A new species of a goby with a synopsis of the species of the Genus *Luciogobius* Gill and its two allied genera

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<https://doi.org/10.5109/22676>

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出版情報：九州大学大学院農学研究院紀要. 11 (1), pp.69-76, 1957-08. Kyushu University  
バージョン：  
権利関係：

A new species of a goby with a synopsis of the species of the  
Genus *Luciogobius* Gill and its two allied genera<sup>1,2</sup>

YOSIE DÔTU

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The author collected over one hundred specimens of a gobioid fish on the coasts of the Amakusa Islands, Kumamoto Prefecture, and the Tusima Islands, Nagasaki Pref. both in Kyūshū, which seemed to belong to the Genus *Luciogobius* Gill, and to be new to Science.

In this paper is given an account of the new species above mentioned with a synopsis of seven species of gobies belonging to the Genus *Luciogobius* Gill and its allied genera, *Inu* Snyder and *Expedio* Snyder.

Before going further, the author wishes to express his gratitude to Prof. Keitaro Uchida for his kind guidance and advice in this research and the preparation of this paper. Acknowledgements are also due to Dr. Ichiro Tomiyama and Dr. Tokiharu Abe who kindly offered facilities for consulting important literature and for the reexamination of the related specimens preserved in the Faculty of Science of Tokyo University: to Prof. Kiyomatsu Matsubara for facilities for consulting important literature: to Mr. Hiromu Ohashi and Mr. Satoshi Mito for their kind assistance in collecting specimens: and to Mr. Yoichi Syojima in the preparation of photographs.

Genus *Inu* Snyder

*Inu koma* Snyder

Snyder, J. O. 1909; Koumans, F. P. 1931; Matsubara, K. 1955.

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<sup>1)</sup> Contribution from Fisheries Laboratory, Faculty of Agriculture, Kyūshū University.

<sup>2)</sup> A part of this research is owing to the Aid for Fundamental Scientific Research of the Ministry of Education. (Keitaro Uchida)

Genus *Luciogobius* Gill*Luciogobius guttatus* Gill

Gill, T. 1859; Günther, A. 1861; Jordan, D. S. and Snyder, J. O. 1901;  
Regan, C. T. 1905; Koumans, F. P. 1931; Tomiyama, I. 1936; Regan, C. T.  
1940; Matsubara, K. 1955.

Genus *Expedio* Snyder*Expedio parvulus* Snyder

Snyder, J. O. 1909; Matsubara, K. 1955.

Key to the seven species belonging to three allied genera

- A. Ventral fin present  
 B. Posterior part of body scarly—Genus *Inu* Snyder  
 C. No. dermal ridge on head .....*Inu ama* Snyder  
 CC. Dermal ridge on head .....*Inu koma* Snyder  
 BB. Scale absent—Genus *Luciogobius* Gill  
 D. Ventral fin moderate  
 E. Eye normally developed, numerous dark spots on body  
 F. Fleshy barbels under eye.....*Luciogobius saikaiensis* n. sp.  
 FF. No. fleshy barbel under eye.....*Luciogobius guttatus* Gill  
 EE. Eye reduced, not or slightly pigmented  
 .....*Luciogobius albus* Regan  
 DD. Ventral fin a small flap.....*Luciogobius elongatus* Regan  
 AA. Ventral fin absent—Genus *Expedio* Snyder .....  
 .....*Expedio parvulus* Snyder

Table 1. Measurements of the seven species of the three genera.

Specific name	Head in length	Depth in length	Dorsal fin rays	Anal fin rays	Pectoral fin rays	Vertebrae*
<i>Inu ama</i> Snyder	3.3	5.6	9	10	—	—
<i>Inu koma</i> Snyder	3.4~4.0	6.0~7.5	11~12	10~11	17~20	30~31
<i>Luciogobius saikaiensis</i> n. sp.	3.5~4.0	8.0~9.5	8~10	9~10	18	32
<i>L. guttatus</i> Gill	4.5~6.0	6.5~10.5	11~15	8~10	17~18	35~38
<i>L. albus</i> Regan	3.5~5.5	8.0~13.0	10~11	10~12	12~14	31~34
<i>L. elongatus</i> Regan	7.0~8.0	10.0~12.0	7~9	8~10	12	42
<i>Expedio parvulus</i> Snyder	5.5~6.5	11.0~15.0	9~10	11~12	12~13	42~44

\* counted on the X-ray photographs.

*Inu ama* Snyder

(Japanese name, Ama-haze)

Snyder, J. O. 1909; Matsubara, K. 1955,

Synonym—*Luciogobius guttatus ama* (Snyder), Tomiyama, I. 1936.

Locality—Misaki, Kanagawa Pref. (Snyder, J. O. 1909); Sirahama, Tiba Pref. (Sakamoto, K. 1932).

No. specimen was examined in this study.

### *Inu koma* Snyder

(Japanese name, Koma-haze)

Snyder, J. O. 1909; Matsubara, K. 1955.

Synonym—*Luciogobius guttatus koma* (Snyder), Tomiyama, I. 1936.

Locality—Misaki, Kanagawa Pref.; Oosima, Tokyo Capt.; Simoda, Sizuoka Pref. (Tomiyama, I. 1936); Kominato, Tiba Pref. (The author's collection); Fusan, Korea (Mori, T. 1952).

Eighteen specimens, 12~40 mm in total length, were examined in this study. Some of them had been studied by I. Tomiyama (1936).

The life history and bionomics will be reported in another paper.

### *Luciogobius saikaiensis* n. sp. (Fig. 1 and Plate 2)

(Japanese name, Hige-mimizu-haze)

Head 3.5 in standard length, depth 8.3, depth of caudal peduncle 11, length of caudal peduncle 5; eye 8 in head, snout 4, interorbital space 5.4, width of head 1.4; width of body 1.2 in depth; dorsal 10; anal 10; pectoral 18. Vertebrae 32.

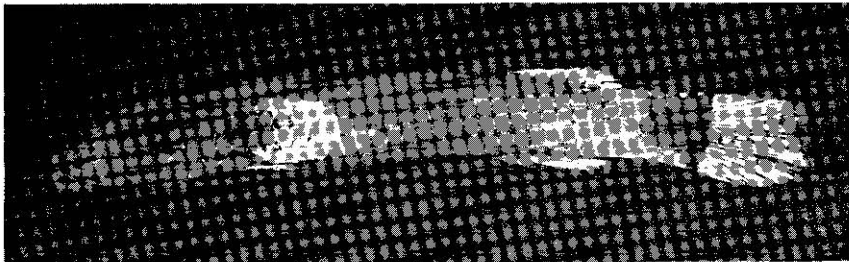


Fig. 1. *Luciogobius saikaiensis* n. sp.

Male adult, 35 mm in total length, one of the paratype specimens.

Body cylindrical anteriorly and moderately compressed posteriorly. Head broader than the body and considerably depressed, and muscles of side and top of head greatly bulging, thus forming a deep trough behind eye on the occiput. Interorbital space broad, slightly concave with narrow transverse fleshy ridge. Maxillary extending backward to a point beneath posterior part of eye. Mouth-cleft almost vertical anteriorly, but horizontal posteriorly. Teeth very small, arranged in

narrow bands on both jaws, outmost ones enlarged. Tongue broad, deeply notched and free anteriorly. Gill-cleft restricted to the side. Five fleshy barbels below eye, and a large one in front of eye. A pair of barbels at the snout. Nasal canal tubular, posterior one near eye. A ridge with a row of large sensory organs across the snout and along the side of head backward to below eye. A similar organ on the lower jaw, cheek, and occiput. Head and body wholly naked. Spinous dorsal absent. A slight median depression on the back before the dorsal with a row of minute plicae on its sides, those plicae being preceded by a slight, median ridge. Dorsal and anal opposite, inserted midway between bases of ventral and caudal; base of dorsal short and subequal to anal, both lengths about 2 in head. Dorsal somewhat higher than anal, both fins never reaching to the base of caudal when depressed. Membranes of dorsal and anal fleshy. Caudal rounded, 1.5 in head. Pectoral rounded, slightly pigmented, with 18 rays, the uppermost and lowest rays free and serrated. Ventral I, 5; anterior part thickened, posterior part with weak rays and fleshy membrane, and free posteriorly. A small genital papilla closely behind anus.

Color in spirit blackish, ventrally and caudad with white spots, vertical fins whitish with dark stripes across fin rays.

Holotypes—41 mm in total length, 35 mm in standard length male adult; from the sea-shore of Tomioka, the Amakusa Islands, Kumamoto Pref., Kyūshū.

Paratypes—Over 140 specimens, 5~41 mm in total length; from the sea-shores of Tomioka and Tuzizima, both in the Amakusa Islands, and Sasuna and Hidakatu, both in the Tusima Islands, Nagasaki Pref.

The type specimens are deposited in the Fisheries Laboratory, Faculty of Agriculture, Kyūshū University.

The life history and bionomics of this species will be reported in another paper.

(*Saikaiensis* means from West Sea District of Japan.)

### *Luciogobius guttatus* Gill

(Japanese name, Mimizu-haze)

Gill, T. 1859; Günther, A. 1861; Jordan, D. S. and Snyder, J. O. 1901; Tomiyama, I. 1936; Regan, C. T. 1940; Matsubara, K. 1955.

Synonym—*Luciogobius guttatus guttatus* Gill (part), Tomiyama, I. 1936.

Locality—Japan throughout, Korea, and North China.

Over one thousand specimen, 7~72 mm in total length, from sea-shores of various districts of Japan, were examined in this study.

The life history and bionomics were reported in another paper (Dōtu, Y. 1957).

*Luciogobius albus* Regan<sup>3</sup>

(Japanese name, Dōkutu-mimizu-haze)

Regan, C. T. 1940; Matsubara, K. 1955.

Synonym—*Luciogobius guttatus guttatus* Gill (part), Tomiyama, I. 1936.*Luciogobius pallidus* Regan, C. T. 1940.

Locality—Daikoniza, Shimane Pref., from a subterranean cave and wells; Gobō, Wakayama Pref., from wells; Uwazima City, Ehime Pref., from a well; Misaki, Kōti Pref. from a well (Tomiyama, I. 1936).

Head 4 in length; depth 9; depth of caudal peduncle 12; D. 10; A. 10; P. 13, V. I, 5; Vertebrae 32.

Body cylindrical anteriorly, caudal peduncle moderately compressed. Head depressed. Eyes vestigial beneath skin. Tactile organs of head not so highly developed as the North American Blind Goby, *Typhlogobius californensis* Steindachner (Hubbs, C. L. 1927) and *Lethops connectens* Hubbs (Hubbs, C. L. 1920). Mouth large, teeth minute, in narrow bands on both jaws. Head and body naked, anterior nostril with a short tube. No barbel. All fins large. Anal fin inserted directly below the second ray of the dorsal. Dorsal fin higher than depth. Anterior fraenum of ventral making a deep pocket. No free ray in pectoral fin. Color in spirit yellowish white, unpigmented.

Holotype—43 mm in total length, 37 mm in standard length, from Daikonzima. Preserved in the Faculty of Science, Tokyo University. Specimen No. 25,693.

Paratypes—Thirteen specimens, 27~87 mm in total length, from above mentioned various localities. All the specimens are deposited in the Faculty of Science, Tokyo University.

I. Tomiyama (1936) figured two individuals of this goby as the blind forms of *Luciogobius guttatus guttatus* Gill. From the Tomiyama figures, C. T. Regan (1940) erected two new species, *Luciogobius pallidus* and *Luciogobius albus* separate from *Luciogobius guttatus* Gill.<sup>4</sup> In

<sup>3</sup> The author kept alive one of these blind gobies for 24 days, from 28th August, 1952, to 20th September. The goby was obtained in the cave in Daikonzima, Simane Pref., on 21st August, 1952. It was kept in a glass-jar at the laboratory, but was lost by careless management. During the period kept the water-temperature was from 22°C to 24°C, while at the natural habitat the temperature was 11.5°C. During that period the goby took no food, and became thinner day by day. It was about 55 mm in total length, and light pink in color. Generally no dark pigment appeared on the body, excepting a little which occasionally appeared on the posterior part of the body. From the observations upon the alive goby, it was supposed that the individual variation of body-form observed in the preserved specimens largely depended on the duration of the keeping-period after they were caught and the variation of pigmentation of body depended on the condition of pigmentation when they were thrown in the preservative.

<sup>4</sup> K. Matsubara (1955) accepted Regan's two species, *Luciogobius pallidus* Regan (Japanese name, Ido-mimizu-haze) and *Luciogobius albus* Regan (Japanese name, Dōkutu-mimizu-haze).

this study, the author reexamined fourteen specimens, which had been studied by I. Tomiyama (1936). The examined specimens exhibited remarkable individual variation of body-form in proportion of head and body-depth to length, pigmentation, forms of dorsal, ventral, anal and pectoral fins, etc. (Table 1). C. T. Regan (1940) regarded these differences as the specific characteristics. But these differences appeared in each specimen in various degrees, so that the author could not recognize two separate species in those specimens as Regan did. From the reexamination of the preserved specimens and the observation of the above-mentioned alive fish (Foot Note 3), he came to the opinion that all these specimens belong to a single quite polymorphic, albinous *Luciogobius albus* Regan separate from *Luciogobius guttatus* Gill.

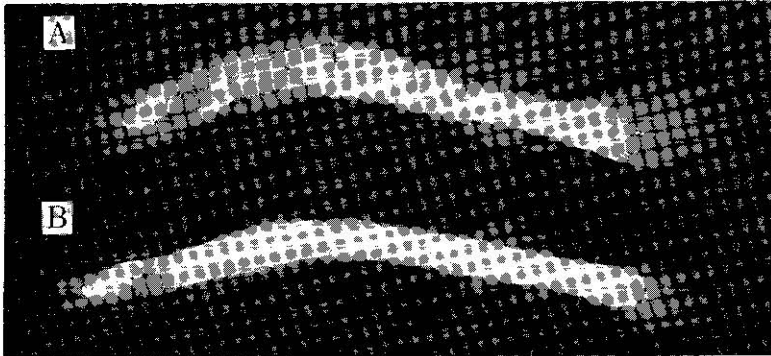


Fig. 2. *Luciogobius albus* Regan.

A, holotype, 43 mm in total length. B, one of the paratypes, 44 mm from Misaki, Kôti Pref.

Tomiyama's figures (1936) were drawn from these specimens, A and B. C. T. Regan (1940) erected *Luciogobius albus* from the figure of A and *L. pallidus* from the figure of B respectively.

B is damaged in anal, dorsal, and ventral fins.

### *Luciogobius elongatus* Regan (Fig. 3)

(Japanese name, Naga-mimizu-haze)

Regan, C. T. 1905, 1940; Matsubara, K. 1955.

Synonym—*Luciogobius guttatus guttatus* Gill (part), Tomiyama, I. 1936.

Locality—Seto Inland Sea (Regan, C. T. 1905); Tanegasima, Kagosima Pref. (Snyder, J. O. 1912); Matugaura, Kagosima Pref. (The author also collected from Kagosima Pref.).

N. Kuroda (1953) recorded this goby as coming from Lake Biwa, the largest fresh-water lake in Japan, Siga Pref. But it seems to be erroneous as this goby has so far been collected only from the sea-shore.

C. T. Regan gave no figure of this species in his papers. The figure given here from a specimen, collected from Matugaura, is the first one published (Fig. 3).

Only one specimen, collected from a tide pool on the coast of Matugaura, was examined in this study.



Fig. 3. *Luciogobius elongatus* Regan.  
40 mm in total length.

***Expedio parvulus* Snyder**

(Japanese name, Nansen-haze)

Snyder, J. O. 1909; Matsubara, K. 1955.

Synonym—*Luciogobius guttatus parvulus* (Snyder), Tomiyama, I. 1936.

Locality—Misaki, Kanagawa Pref. (Snyder, J. O. 1909); Sirahana, Tiba Pref. (Sakamoto, K. 1932).

Three specimens, 37~48 mm in total length, were examined in this study. Those specimens had been studied by I. Tomiyama (1936).

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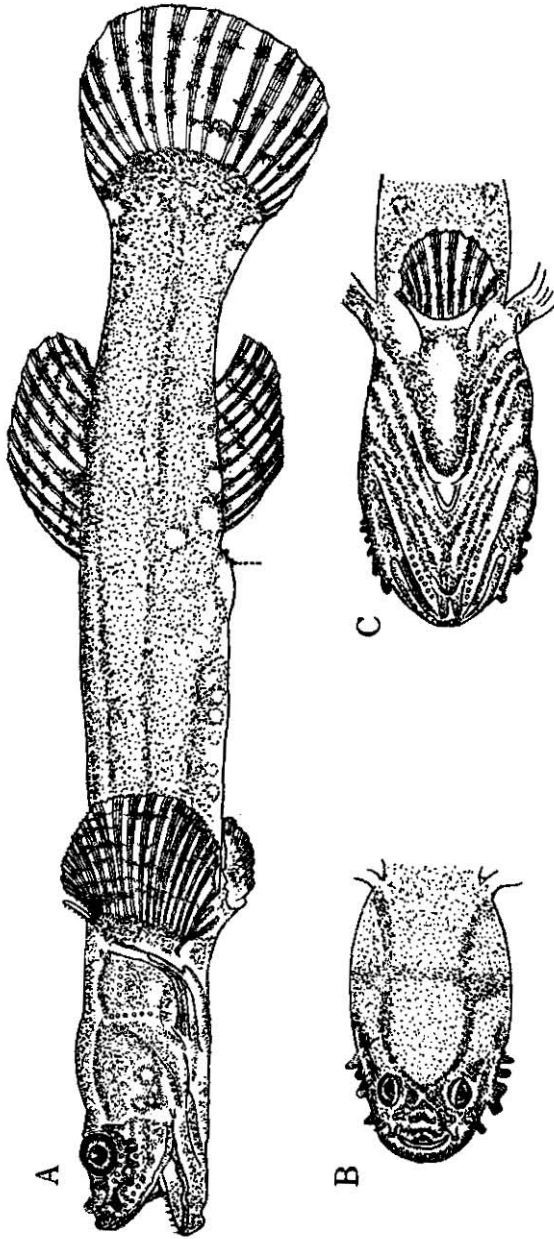
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\*\* original paper not referable to in this study.

#### EXPLANATION OF PLATE 2

*Luciogobius saikaiensis* n. sp.

- Fig. A. Holotype, 41 mm in total length.
- Fig. B. Dorsal side of A.
- Fig. C. Ventral side of A.



*Luciogobius saikaiensis* n. sp.