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Validity of a Lutjanid Fish, *Lutjanus ophuysenii* (Bleeker) with a Related Species, *L. vitta* (Quoy et Gaimard)

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Abstract A valid lutjanid fish, *Lutjanus ophuysenii* (Bleeker) is, herein, described. This species has been synonymized with *L. vitta* (Quoy et Gaimard) but differs in several important characters including squamation, color pattern, and geographic distribution. *L. ophuysenii* has 46–49 lateral line scales, no small scales on the lower preopercular flange, a black spot superimposed on the mid-lateral stripe in all stages, higher dorsal (first and sixth) and anal (first and fourth) soft rays lengths ratios in the eye diameter, and the pectoral and pelvic fins entirely yellow in life. In contrast, *L. vitta* has 49–52 lateral-line scales, small scales on the lower preopercular flange, lower dorsal (first and sixth) and anal (first and fourth) rays lengths ratios in the eye diameter, whitish pelvics and transparent pectorals with light yellow dorsally in life. *L. ophuysenii* is restricted to the Eastern Asian Shelf of the western North Pacific, including southern Japan (except the Ryukyu Ids.), southern Korea, Yellow Sea, western region of Taiwan and the vicinity of Hong Kong. *L. vitta* is widely distributed in the Indo-West Pacific region except in the Eastern Asian Shelf. However, the species are sympatric at southwestern Taiwan and in the vicinity of Hong Kong.

Thirty-nine snappers of the genus Lutjanus in the Indo-West Pacific region were recently reviewed by Allen and Talbot (1985). Their excellent work facilitated the identification of most members of this genus. However, one species, presumably belonging to the yellow-lined snapper complex (table 5 in Allen and Talbot, 1985), did not correspond well with their descriptions.

They stated, in *L. vitta*, "The midlateral stripe of juveniles and subadults is frequently intensely black with an oval black spot, eye size or greater, lying in the middle of the stripe below the last dorsal spines." Allen (1985) also mentioned these features. However, we have observed that all the specimens from southern Japan possessed the spot even in larger adult fish exceeding 30 cm in standard length. These specimens seem to agree with the type of *Mesoprion ophuysenii* Bleeker, which we believe to be a valid species of the genus *Lutjanus*. Its distribution is southern Japan (except the Ryukyu Ids.), southern Korea, Yellow Sea, western Taiwan, and the vicinity of Hong Kong.

The purpose of this study is to clarify the distinction between *L. ophuysenii* (Bleeker, 1860) and *L. vitta* (Quoy and Gaimard, 1824), a closely related species with which it has been confused.

Materials and Methods

Institutional codes followed Leviton et al. (1985). Specimens examined are deposited in the following institutions; AMS, CAS, FRSKU, MNHN, Fisheries Science Course, Department of Animal Science, Miyazaki University, Miyazaki, Japan (MUFS), RMNH, URM, and WAM.

All material examined in this study is listed below and includes institutional catalogue number [the number of specimen(s): standard length (SL, mm)], locality and collection date. Counts and measurements follow those of Allen and Talbot (1985). CDU and LU mean "collection date unknown" and

"locality unknown," respectively.

Lutjanus ophuysenii (Bleeker)
(New English name: Spotstripe snapper)
(Japanese name: Yokosuji-fuedai)
(Figs. 1A, B, 3A, C, E, G)

Diacope vitta (not of Quoy and Gaimard): Temminck and Schlegel, 1843: 13 (Nagasaki, Japan); Temminck and Schlegel, 1845: pl. 6, fig. 1.

Serranus vitta (not of Quoy and Gaimard): Richardson, 1846: 234 (Hong Kong).

Mesoprion vitta (not of Quoy and Gaimard): Günther, 1859: 207 (*L. ophuysenii*?) (Chinese seas and Hong Kong); Günther, 1880: 55 (*L. ophuysenii*?) (Hong Kong); Nyström, 1887: 7 (Nagasaki, Japan); Ishikawa and Matsuura, 1897: 56 (Tokyo, Japan).

Mesoprion Ophuysenii Bleeker, 1860: 84 (type locality Benkulen, Sumatra, Indonesia, RMNH 31734 and Nagasaki, Japan, RMNH 31733 but Sumatra probably wrong from present distribution evidence).

Lutjanus vitta (not of Quoy and Gaimard): Bleeker, 1873: 25 (RMNH 31733, Nagasaki; RMNH 31734, Sumatra?); Bleeker, 1876–1877: 51, pl. 340, fig. 5 (RMNH 31733, Nagasaki; RMNH 31734, Sumatra?); Steindachner and Döderlein, 1883: 236 (Japan); Fowler and Bean, 1922: 30 (Takao=Gaoxiong, Taiwan in one of two examples); Fowler, 1929a: 608 (Japan); Wang, 1935: 421, fig. 17 (Shangtung=Shandong, China); Weber and de Beaufort, 1936: 250 (*L. ophuysenii*?) (Indo-West Pacific including Japan); Boeseman, 1947: 30 (Nagasaki, Japan); Mori, 1952: 102 (Tongyong, southern Korea); Matsubara, 1955: 661 (southern region from Tokyo, Japan); Katoh et al., 1956: 320 (Sea of Japan); Tomiyama et al., 1958: 181, fig. 536 (southern Japan); Hiyama and Yasuda, 1961, 67, pl. 96 (No. 142) (Wakanoura and Kochi, Japan); Chu et al., 1962: 476, fig. 393 (South China Sea); Honma, 1955: 219 (Sado I., Sea of Japan); Akazaki, 1965: 301 (southern Japan); Lindberg and Krasyukova, 1971: 227, fig. 242 (Tsuruga, Wakasa Bay, Sea of Japan); Masuda et al., 1975: 238, pl. 64F (southern Japan); Kimura and Suzuki, 1980: 25 (Ago, Mie, Japan); Shen, 1984: 59, pl. 59, fig. 323–11 (Penghu Liedao, southwestern Taiwan); Mori, 1984: 374, fig. 2A–F (Yuya Bay, Yamaguchi, Sea of Japan); Akazaki, 1984: 164 in Japanese ed. and 169 in English ed., pl. 157I (southern Japan); Allen, 1985, 123, pl. 22 (81a, *L. ophuysenii*?) (Indo-West Pacific including Japan); Allen and Talbot, 1985: 76, pl. 10 (*L. ophuysenii*?) (Indo-West Pacific including Japan); Abe, 1987: 571, fig. 2282 (southern Japan); Iwatsuki et al., 1989: 474, fig. 3I (Shimonoseki, Japan); Iwatsuki et al., 1992: 95, Fig. 1C (Miyazaki, Japan).

Lutianus vitta (not of Quoy and Gaimard): Rütter, 1897: 74 (Swatow, China, probably Shandong area); Jordan and Seale, 1905: 264 (Hong Kong); Jordan and Thompson, 1911: 448, fig. 2 (Onomichi, Wakanoura, Nagasaki and Kobe, Japan); Jordan et al., 1913: 164 (No. 484), fig. 121 (Japan); Izuka and Matsuura, 1920: 151 (Takamatsu, Japan); Kamohara, 1954: 110 (*L. ophuysenii*?) (Kochi, Japan); Chu et al., 1963: 305, fig. 232 (East China Sea).

Materials. FRSKU 34935 (1: 181.5), Yahatahama, Ehime, Japan, Mar., 1962; FRSKU 40336 (1: 224.5), LU, CDU; FRSKU S4737 (1: 158.0), Nishimaizuru, Kyoto, Japan, CDU; FRSKU W 193 (1: 238.0), LU, CDU; FRSKU W85-W89 (5: 56.5–93.1), Nishimaizuru, Kyoto, Japan, Oct. 17, 1976; MUFS 2247 (1: 129.8), Hong Kong, Mar. 2, 1973; MUFS 2644 (1: 182.0), Kaoshiung, Taiwan, Feb. 24, 1973; MUFS 8645–8650 (6: 73.0–118.2), Nishimaizuru, Kyoto, Japan, Oct. 28, 1990; MUFS 8656–8657 (2: 101.5–106.9), Nagasaki, Japan, July 27, 1991; MUFS 8659–8661 (3: 40.3–43.6), Take I.(Takeshima), Sea of Japan, Sept. 7, 1977; MUFS 8795 (1: 82.0), Kumanoe, Nobeoka, Miyazaki, Japan, Oct. 23, 1983; MUFS 8797–8803 (7: 106.9–206.0), Akamizu, Nobeoka, Miyazaki, Japan, Nov. 9, 10 and 11, and Dec. 2, 14 and 17, 1991; MUFS 8808–8809 (2: 148.0–153.2), Kaminoura, Ooseto, Nagasaki, Japan, Sept. 23, 1991; MUFS 8810 (1: 183.0), Meitsu, Nango, Miyazaki, Japan, Nov. 9, 1991; MUFS 8813–8817 (5: 84.0–103.5), Ushitsu and Etsume, Noto-cho and Notojima-cho, Ishikawa, Japan, Oct. 23, Nov. 9, Dec. 4, Dec. 26, 1985 and Oct. 4, 1986; MUFS OP001-005 (5: 222.0–337.5), Meitsu, Miyotoura, Ooshima and Akamizu, Nango and Nobeoka, Miyazaki, Japan, Apr. 26, May 23, May 28, June 2 and June 16, 1990; RMNH 31733 (lectotype, herein designated) (1: 154.5), Nagasaki, Japan, CDU; RMNH 31734 (paralectotype) (1: 94.0), Benkulen, Sumatra, Indonesia (Sumatra probably wrong from present distribution evidence), CDU.

Diagnosis. Lateral-line scales 46–49 (49 in two of 36 specimens); no small scales on lower preopercular flange (Fig. 2A); oval black spot (Fig. 1A, B; Fig. 2A, C, E, G) superimposed on longitudinal stripe below dorsal junction between spines and rays in all stages, also evident in preserved specimens (upper and/or lower portion of the spot rarely obscure, but spot still visible as a darker blotch); broad longitudinal dark stripe present in all stages (Fig. 2A, C, E, G); the width almost same in pupil diameter in specimens less than 20 cm SL and slightly narrower than pupil in specimens more than 20 cm SL; anterior portion of stripe dark brown or yellowish black, but posterior portion behind spot to upper caudal peduncle yellowish in life (stripe on caudal peduncle indistinct in preserved specimens); all fins

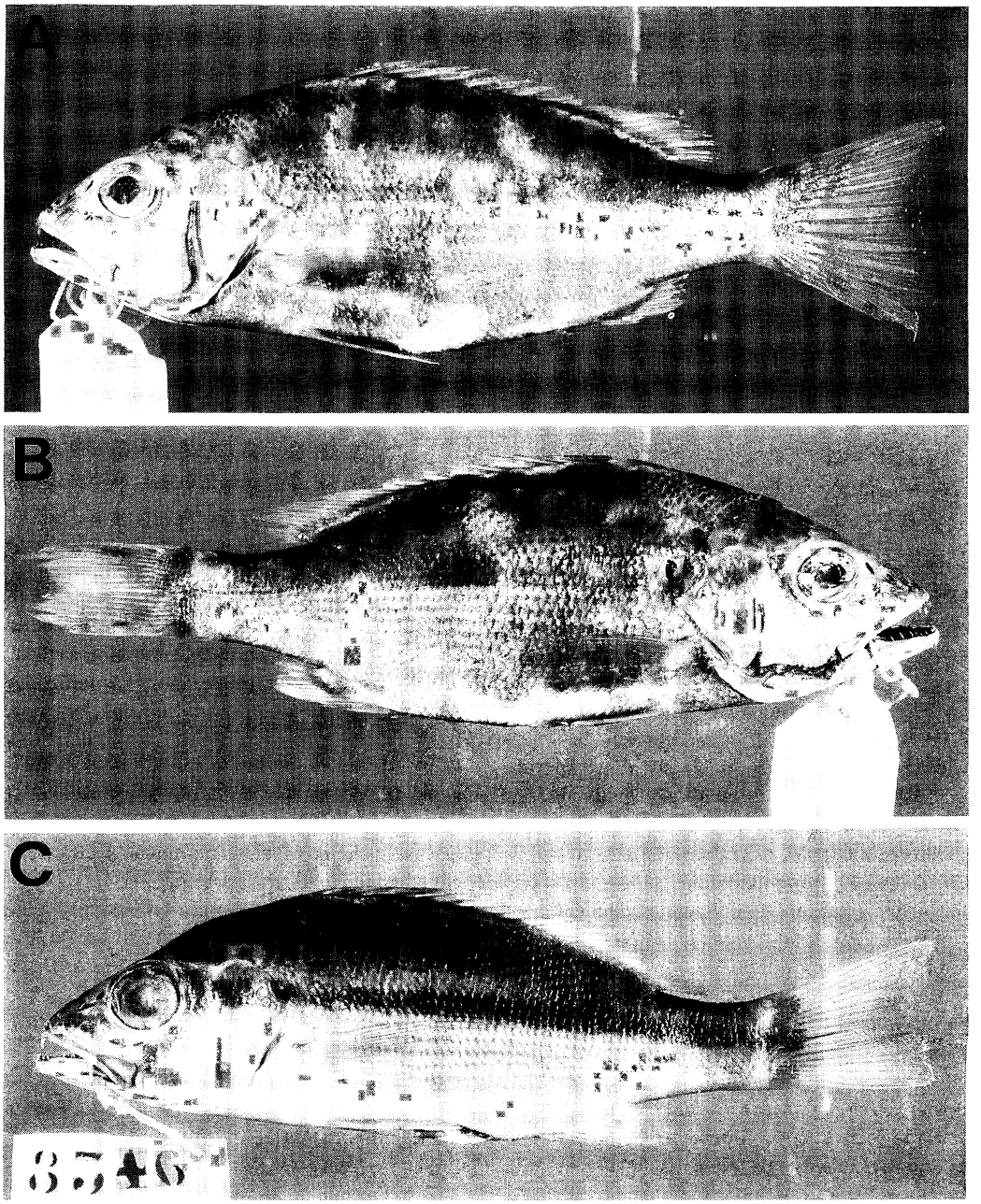

Fig. 1. Lectotype of *Lutjanus ophuysenii* (RMNH 31733, 154.5 mm SL) and holotype of *L. vitta* (MNHN 8346, 91.0 mm SL). A) left side of *L. ophuysenii*; B) right side of *L. ophuysenii*; C) left side of *L. vitta*.

yellow; a narrow white or transparent margin on soft dorsal and anal fins; first and sixth dorsal soft rays lengths ratios in eye diameter 1.21–2.03 and 1.26–1.76, respectively (Fig. 5A); first and fourth anal soft rays lengths ratios in eye diameter 1.50–2.16 and 1.24–2.05, respectively (Fig. 5A).

Description. Dorsal X, 12–13; anal III, 8; pectoral rays 16–17; lateral-line scales 46–49 (49 in two of 36 specimens); horizontal scale rows above and

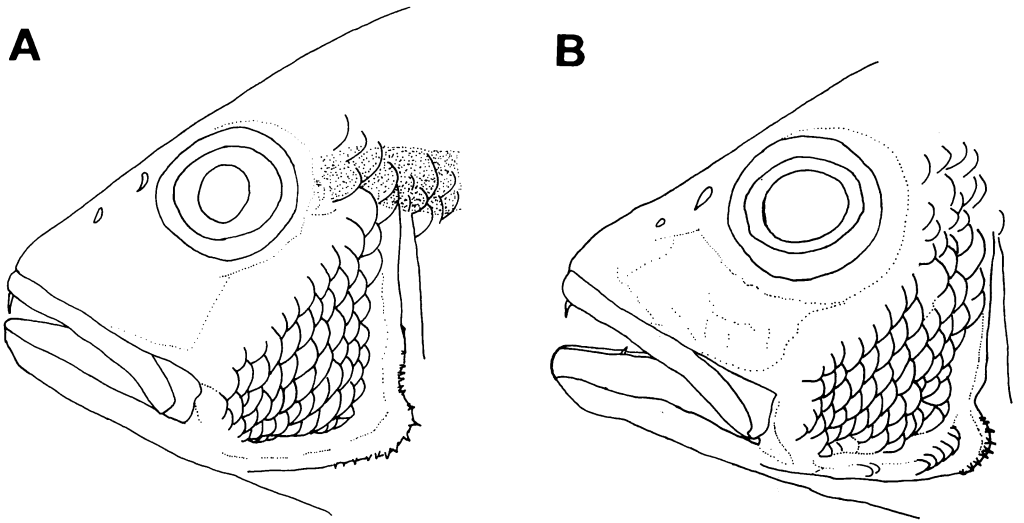

Fig. 2. Head of A) *Lutjanus ophuysenii* (MUFS 8650, 118.2 mm SL) and B) *L. vitta* (MUFS 8655, 114.3 mm SL).

below lateral-line scales 8–9 and 15–18, respectively; scale rows on cheek 5–7; total gill rakers on first gill arch 6–7+13–16=19–23 (including 4–6+1–6 rudiments). Body depth 2.12–3.17, head length 2.15–3.31, both in SL. Snout 2.78–3.70, eye 3.38–5.74, interorbital 3.57–5.72, maxillary 2.07–2.82 and preorbital depth 4.29–7.45, all in head length.

Scale rows on back rising obliquely above lateral-line scales. Preopercular notch very shallow (Fig. 2A); interopercular knob very weak or absent. Vomerine teeth in a triangular or diamond-shaped patch with a medial posterior extension. Tongue with a patch of a fine granular teeth. Small ossified patch in front of the lingual tooth patch absent (see Comparison on this species). Caudal fin slightly emarginate.

Color in life.—Generally yellowish or reddish dark brown on body with dark brown or yellowish black lines (one per scale row) on side, those above lateral line slanted posteriorly toward dorsal-fin base and often whitish on abdomen; an oval black spot superimposed on stripe, below dorsal junction between spines and rays in all stages (Fig. 1A, B; Fig. 3A, C, E, G) (upper and/or lower portion of the spot rarely obscure, but spot still visible as a darker blotch); a narrow white or transparent margin on soft dorsal and anal fins; a broad, dark brown to yellowish black stripe, along middle of side to posterior upper half of caudal peduncle; snout dark brown or yellowish brown; all fins yellow; iris reddish yellow.

Body color change with growth.—Stripe on body present in all stages; width of longitudinal stripe almost same as pupil diameter in specimens less than 20 cm SL, but very slightly narrower than pupil in specimens over 20 cm SL; width of stripe behind eye on upper part of operculum also same as width of stripe on body with growth; color of anterior portion of stripe dark brown to yellowish black, but posterior to spot stripe always strong yellowish dark brown in life; posterior portion of stripe ending directly on or above the lateral line scales of the peduncle in specimens exceeding 20 cm SL; mid-lateral stripe of smaller individuals usually continuous from the front edge of the eye to the snout tip.

Color in preserved specimens.—Generally yellowish tan, including fins, with longitudinal brown lines on side and oblique lines above lateral line as described above. Juveniles smaller with a single dark stripe along middle of side with a spot which remains as a darker blotch.

Body color change with growth in preserved specimens.—Stripe behind spot on caudal peduncle is unclear in all stages.

Distribution. Descriptions in the literature and collected specimens indicate that *Lutjanus ophuysenii* is found in southern Japan (except the Ryukyu Ids.), southern Korea, the Shoutoung (=Shandong) region of China (Yellow Sea), the western part of Taiwan, and in the vicinity of Hong Kong (Fig. 4). Thus, we conclude that this species is distributed only in a limited section of the northwestern Pacific region, the Eastern Asian Shelf.

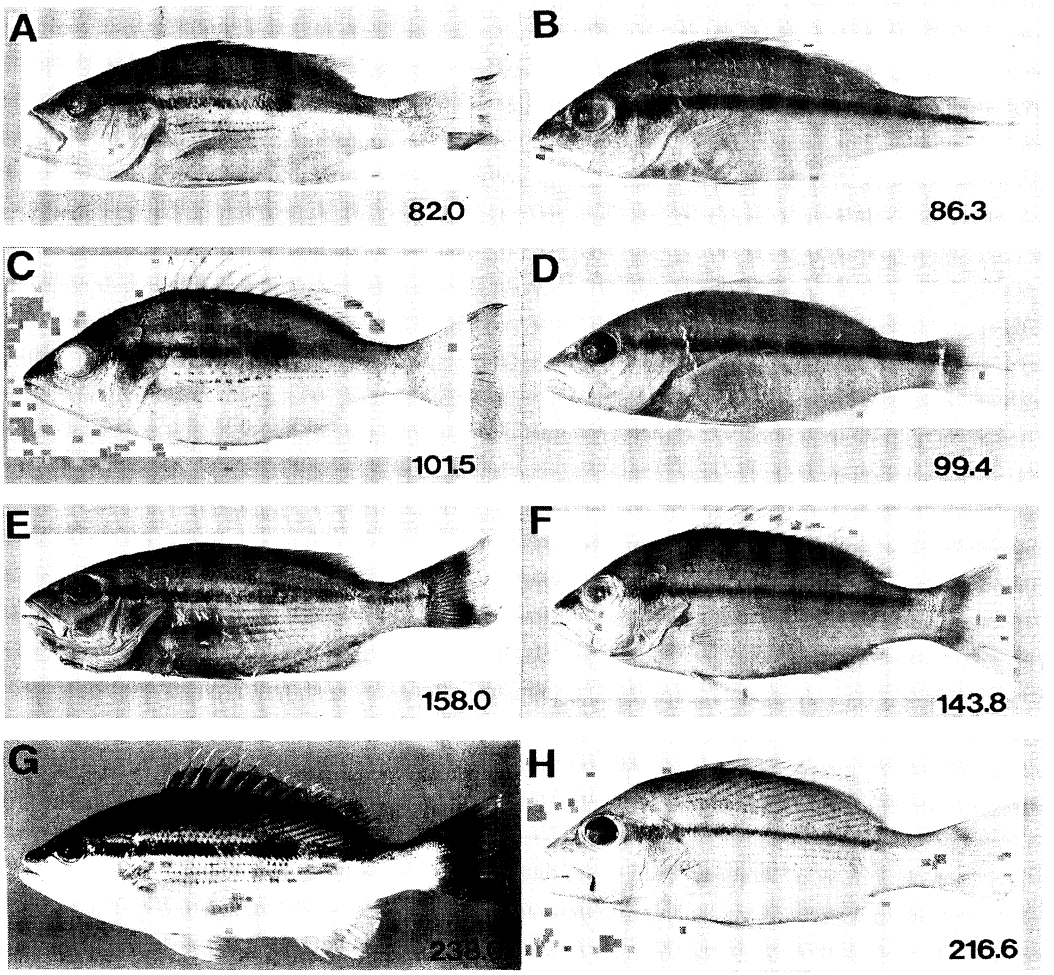

Fig. 3. Color pattern changes with growth in preserved specimens of *Lutjanus ophuysenii* (A, C, E, G) and *L. vitta* (B, D, F, H). Fresh specimen of *L. ophuysenii* (G). Standard length (mm) is shown at lower right for each photograph. A) MUFS 8795; B) MUFS 8651; C) MUFS 8656; D) FRSKU 107533; E) FRSKU S4737; F) MUFS 7461; G) MUFS OP-001; H) URM-P 14456.

Furthermore, the distribution pattern of this species is basically similar to that of *L. stellatus* (Akazaki, 1983; Allen and Talbot, 1985; Allen, 1985; Iwatsuki et al., 1992) which occurs in southern Japan (including Ryukyu Ids.), Taiwan, and the vicinity of Hong Kong.

Ecological notes. Smaller juveniles, ca. 20–30 mm SL, of this species do not occur in tide-pools or along rocky shores of Miyazaki Prefecture, southern Japan (Iwatsuki et al., 1992). However, 5–10 cm SL fish were observed on rare occasions at depths of 10 m or less in Miyazaki Prefecture. Furthermore, according to Mori (1984), pre-settlement pelagic larvae and recently settled juveniles of ca. 13 cm SL were collected in Zostera beds at less than 10 m depth in Yuya Bay, Sea of Japan.

Iwatsuki et al. (1992) reported that specimens over 25 cm SL (probably spawning adults based on their higher gonadosomatic index) occurred only from April to June at depths of 30–40 m in set net catches during a one year observation period. However, subadults to 20 cm SL were observed from spring to early winter. This indicates that adults might spawn in shallow water in spring, probably migrating from deeper areas. The species therefore seems to ontogenetically and seasonally migrate between shallow and deep waters.

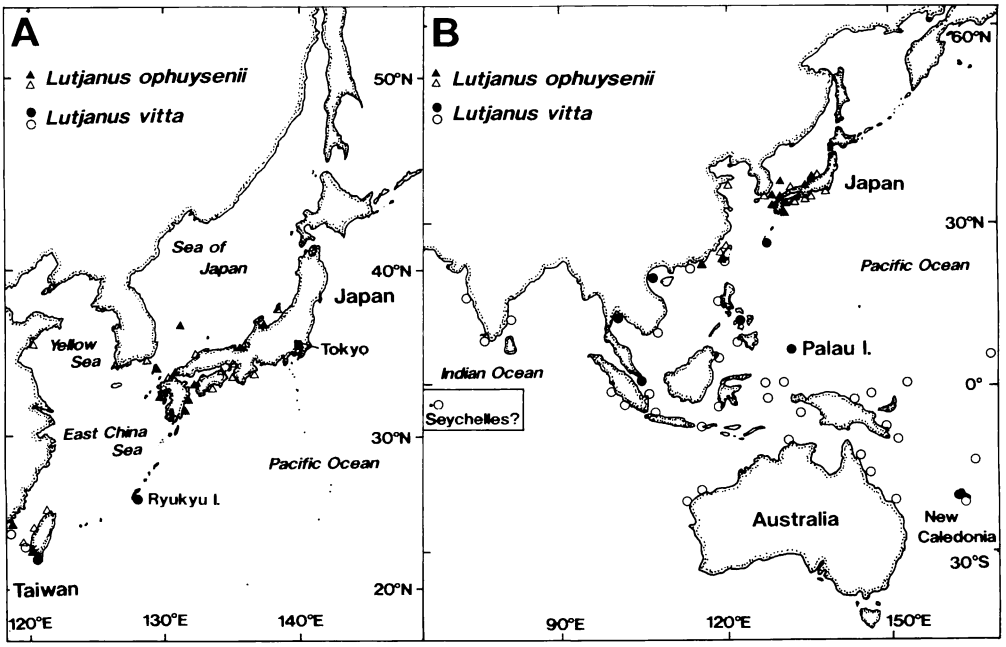

Fig. 4. Distribution of *Lutjanus ophuysenii* (▲/△) and *L. vitta* (●/○). Solid figures are based on our examined material; open figures are referred to Allen and Talbot (1985) and other literature records.

Comparison. In overall appearance, this species is most similar to *Lutjanus vitta*. However, some differences can be clearly observed. *L. ophuysenii* consistently has a spot superimposed on the mid-lateral stripe in all growth stages (Fig. 3A, C, E, G) and 46–49 lateral-line scales. In contrast, *L. vitta* never has such a spot or blotch at any stage (Fig. 3B, D, F, H) and 49–52 lateral-line scales.

In *L. ophuysenii*, the width of the stripe on the body does not significantly change but, in *L. vitta*, the body stripe becomes narrower at about 15 cm SL and sometimes disappears in fish larger than 20 cm SL. In the preserved specimens, the posterior part of the stripe on the caudal peduncle is indistinct in all stages of *L. ophuysenii* while *L. vitta* has a very vivid stripe throughout its entire length in fish less than ca. 10 cm SL (Fig. 3B, D), but is indistinct in specimens over ca. 15 cm SL (Fig. 3F, H). This difference results from the discrepancy in live coloration. *L. ophuysenii* has a strong yellowish dark brown stripe with fewer melanophores on the peduncle. In comparison, *L. vitta* has a dark brown stripe with many melanophores on the peduncle. Finally, *L. ophuysenii* has yellow fins including the dorsal, pectoral, caudal, anal and pelvics. *L. vitta* has a translucent pectoral fin with light yellow on the upper portion, and white pelvic fins.

L. ophuysenii has no small scales on the lower preopercular flange (Fig. 2A), which are typically present in *L. vitta* (Fig. 2B). Furthermore, *L. ophuysenii* exhibits a higher length ratio of the dorsal and anal rays in the eye diameter, than *L. vitta* (Fig. 5). There is some overlap between the two species at about 10 cm SL, but *L. ophuysenii* has an increasingly higher ratio with growth.

There are two other subtle differences between the two species. *L. ophuysenii* lacks a small ossified patch in front of the lingual tooth patch. However, this feature is often present in *L. vitta*. The holotype of *S. vitta* lacks this patch as well as specimens less than about 10 cm SL. Finally, the position of the greatest body depth differs between the two species, although this difference is not always consistent. The position of the greatest body depth in *L. ophuysenii* is at the midpoint of the standard length, posterior to the base of the pelvic fin, whereas in *L. vitta* it is at the base of the pelvic fin. This difference is reflected in the strongly convex abdomen often seen in specimens of *L. ophuysenii* (Fig. 3C). In comparison *L. vitta* has a weakly convex abdomen.

L. ophuysenii belongs to the yellow-lined snapper complex of (table 5 in Allen and Talbot, 1985).