

Three Juvenile Snappers of the Genus *Lutjanus* (Perciformes: Lutjanidae) Collected from Jeju Island, Korea

Byung-Jik Kim*, Kazuhiro Nakaya¹ and Hiromitsu Endo²

Marine and Environmental Research Institute, Cheju National University, Jeju 690-968, Korea

¹Graduate School of Fisheries Sciences, Hokkaido University, Hakodate 041-8611, Japan

²Department of Natural Environmental Science, Faculty of Science, Kochi University, Kochi 780-8520, Japan

Based on four juvenile specimens of *Lutjanus* collected from the southern coast of Jeju Island, three species, *L. argentimaculatus*, *L. fulviflamma*, and *L. quinquelineatus*, are described as the first record from Korea. The first species is easily differentiated from other lutjanid juveniles by distinct coloring of the dorsal, pelvic, and anal fins as well as two blue lines below the eye; the second species is characterized by having six yellowish brown stripes below the lateral line and a black spot on the side; the third species is identified by five longitudinal blue stripes and a black spot on the side when fresh. The new Korean names “Bul-geun-tung-dom,” “Yuk-seon-jeom-tung-dom,” and “O-seon-tung-dom” are proposed for *L. argentimaculatus*, *L. fulviflamma*, and *L. quinquelineatus*, respectively.

Key words: New Korean record, *L. argentimaculatus*, *L. fulviflamma*, *L. quinquelineatus*, Jeju Island, Juvenile snapper

Introduction

The snapper genus *Lutjanus* (Bloch, 1790), the largest genus with approximately 64 species in the family Lutjanidae worldwide, is represented in the Indo-West Pacific Ocean by 39 species (Allen and Talbot, 1985; Nelson, 2006). Snappers are important food fishes, primarily inhabiting shallow coral reefs, although some species range into deeper marine waters or freshwaters. Snappers are described as having a slender to deep-body with a truncate to deeply forked caudal fin, scaly sheaths at the bases of the dorsal and anal fins, vomerine teeth, and the absence of filamentous soft dorsal and anal fin rays (Allen, 1985).

From Korean waters, four species of the genus *Lutjanus*, *L. monostigma* Cuvier in Cuvier and Valenciennes, 1828, *L. rivulatus* (Cuvier in Cuvier and Valenciennes, 1828), *L. russellii* (Bleeker, 1849), and *L. vitta* (Quoy and Gaimard, 1824) have been reported to date (Chyung, 1977; Kim et al., 2005).

During a recent investigation in the coastal fishes of Jeju Island, Korea, we collected four juvenile specimens belonging to the genus *Lutjanus* from

the southern coast of the island. They were identified as *L. argentimaculatus* (Forsskål, 1775), *L. fulviflamma* (Forsskål, 1775), and *L. quinquelineatus* (Bloch, 1790), representing new Korean records. In this paper, we describe the three lutjanids mentioned above as the first records from Korea, although it is uncertain whether adults of these species occur in Korean waters at present.

Counts and measurements follow those of Allen and Talbot (1985). Voucher specimens were deposited in the Marine and Environmental Research Institute, Cheju National University (MRIC), Korea.

Systematic accounts

Lutjanus argentimaculatus (Forsskål, 1775)

(New Korean name: Bul-geun-tung-dom)

(Fig. 1A; Table 1)

Sciaena argentimaculata Forsskål, 1775: 47, xi, (Type locality: Arabia, Red Sea)

Lutjanus argentimaculatus: Kyushin et al., 1977: 74 (East Burma Sea); Allen and Talbot, 1985: 18 (East Africa to Central Pacific); Aramata et al., 2004: 58 (Japan).

Material examined

MRIC 4723, 45.8 mm in standard length (SL),

*Corresponding author: kimbyungjik@cheju.ac.kr

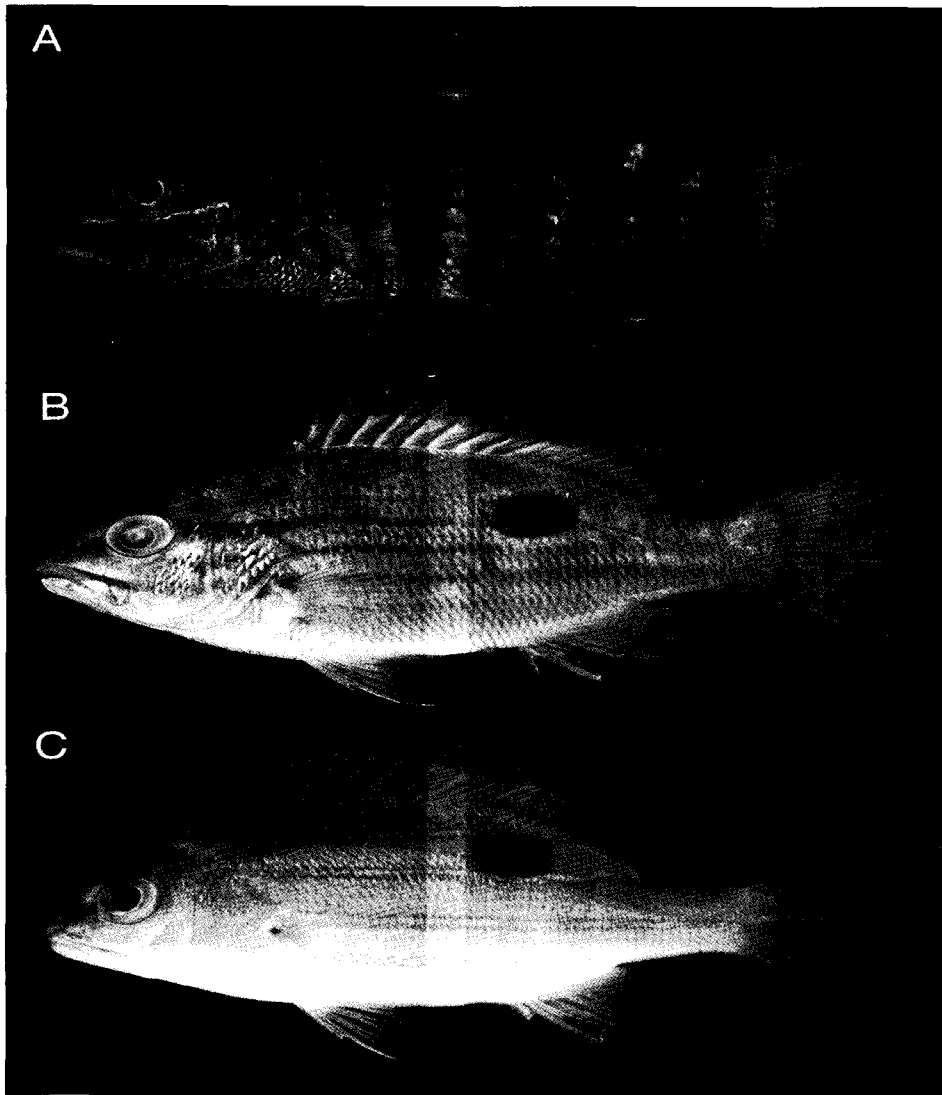


Fig. 1. Juveniles of *Lutjanus argentimaculatus* (MRIC 4753, 45.8 mm SL), *L. fulviflamma* (MRIC 4776, 69.1 mm SL), and *L. quinquelineatus* (MRIC 4779, 80.9 mm SL) collected from southern coast of Jeju Island, Korea.

Table 1. Comparison of meristic counts between three lutjanids of *L. argentimaculatus*, *L. fulviflamma*, and *L. quinquelineatus* from Jeju Island, Korea and those by Allen and Talbot (1985)

	<i>L. argentimaculatus</i>		<i>L. fulviflamma</i>		<i>L. quinquelineatus</i>	
	Present study	Allen & Talbot (1985)	Present study	Allen & Talbot (1985)	Present study	Allen & Talbot (1985)
Standard length (mm)	45.8 (n=1)	94.0-545.0 (n=20)	69.1 (n=1)	134.0-266.0 (n=16)	80.9-93.6 (n=2)	103.0-199.0 (n=25)
Dorsal fin rays	X, 14	X, 13-14	X, 13	X, 12-14	X, 14	X, 13-15
Anal fin rays	III, 8	III, 8	III, 8	III, 8	III, 8	III, 8
Pectoral fin rays	16	16-17	17	15-17	16	16-17
Pelvic fin rays	I, 5	I, 5	I, 5	I, 5	I, 5	I, 5
Lateral line scales	47	44-48	47	46-49	47-49	47-50
Scales on cheek	7	6-8	ca. 6	5-7	11-12	8-11
Total gill rakers	14	16-20	17	16-19	21	20-23

Wimi fishing port, Namwon-eup, Seogwipo-si, Jeju-do, Korea, 23 October 2006, coll. by H. Endo, H. Imamura, R. Inagawa, and B. J. Kim, angling, ca. 1-2 m depth.

Description

Counts are given in Table 1. Proportions are presented as % SL: head length 41.9; body depth 40.0; snout length 14.0; upper jaw length 18.8; eye diameter 10.9; interorbital width 9.2; predorsal length 46.9; prepectoral length 40.2; preanal length 69.2; caudal peduncle depth 13.5; caudal peduncle length 17.5; dorsal fin base 53.3; anal fin base 18.8; pectoral fin length 24.5; pelvic fin length 21.8.

Body oblong, compressed, covered with ctenoid scales aligned in horizontal rows below lateral line and in oblique rows above lateral line. Lateral line continuous and slightly curved. Head moderate, pointed, upper profile steeply sloped and lower profile flattened. Snout, preorbital, suborbitals and jaws naked. Eye large, positioned closer to upper profile; interorbital region broad and slightly convex. Mouth terminal, posterior tip of maxilla extending below to center of pupil. Teeth on upper and lower jaws small conical in 3-4 rows. Vomerine teeth in a crescentic patch without posterior extension. Palatines with narrow bands of small villiform teeth. Posterior margin of preopercle serrate without preopercular notch. Interopercular bony knob absent. Dorsal fin continuous, posterior profile of soft dorsal and anal fins rounded; base of soft dorsal and anal fins scaly. Pectoral fin pointed with posterior tip reaching below 9th dorsal spine. Caudal fin truncate.

Color when fresh

Head dark green, body dark with eight dark vertical bands. Spinous dorsal bright reddish with black margin, soft dorsal pale greenish with reddish small dots. Spinous anal reddish with broad black margin, soft anal pale reddish. Pelvic fin bright reddish with black margin. Pectoral and caudal fins pale pink.

Distribution

Known from East Africa to the Central Pacific Ocean: East Africa to Samoa and the Line Islands, south to Australia, and north to southern Japan (Allen, 1985; Shimada, 2002) and Korea (only juvenile, present study).

Remarks

The juveniles of *L. argentimaculatus* have a distinctive color pattern, especially when alive or fresh; the fish have a series of 7-8 whitish bars on their sides, 1 or 2 blue lines across their cheeks (Allen, 1985;

Aramata et al., 2004), and reddish pelvic fins. The color pattern of the present specimen collected from Jeju Island, Korea, agrees well with the color photographs of the previous works (for example, Aramata et al., 2004) on *L. argentimaculatus*, and the meristic counts were also within the range for the species, except for the gill rakers (Table 1). The difference in the number of gill rakers seems to be an infraspecific variation related to the size of the specimen examined, although clarification of this difference using larger samples is required. Thus, we identified the present specimen as a juvenile of *L. argentimaculatus*.

Adults of *L. argentimaculatus*, widely distributed in the Indo-West Pacific Ocean (Allen, 1985; Allen and Talbot, 1985), have not yet been recorded from Korean waters. Although *L. argentimaculatus* is basically a marine fish, juveniles are commonly found in brackish mangrove estuaries, the lower reaches of freshwater streams, and under drifting seaweed (Allen and Talbot, 1985; Kozima, 1988; Aramata et al., 2004). Although the present specimen was collected at a fishing port located on the southern coast of Jeju Island, Korea, several juveniles of less than 10 cm in length were observed at the lower reach of the Jungmun River, located on the southern coast of the island, from September 2006 to January 2007 (Kim, personal observation). We propose the new Korean name of "Bul-geun-tung-dom" for this species.

Lutjanus fulviflamma (Forsskål 1775)

(New Korean name: Yuk-seon-jeom-tung-dom)
(Fig. 1B, Table 1)

Sciaena fulviflamma Forsskål, 1775: 45, xi (type locality: Red Sea).

Lutjanus fulviflamma: Allen, 1985: 80 (Indo-Pacific); Allen and Talbot, 1985: 37 (East Africa to Central-South Pacific); Iwatsuki et al., 1989: 476 (Japan); Aramata et al., 2004: 59 (Japan).

Material examined

MRIC 4776, 69.1 mm SL, Jungmun fishing port, Seogwipo-si, Jeju-do, Korea, 21 November 2006, collected by B. J. Kim, angling, ca. 1-2 m depth.

Description

Counts are given in Table 1. Proportions are presented as % SL: head length 39.9; body depth 39.8; snout length 12.3; upper jaw length 16.5; eye diameter 10.3; interorbital width 9.0; predorsal length 43.1; prepectoral length 36.8; preanal length 70.2; caudal peduncle depth 14.2; caudal peduncle length 17.9; dorsal fin base 51.8; anal fin base 19.0; pectoral

fin length 27.2; pelvic fin length 22.7.

Body oblong, compressed, covered with ctenoid scales aligned in horizontal rows below lateral line and in oblique rows above lateral line. Lateral line continuous and slightly curved. Head moderate, pointed, upper profile steeply sloped and lower profile flattened. A continuous band of scales across forehead in temporal region interrupted by small gap. Snout, preorbital, suborbitals, and jaws naked. Eye large, positioned closer to upper profile; interorbital region nearly flat. Mouth terminal, posterior tip of maxilla extending below to center of pupil. Teeth on upper and lower jaws small conical in 3-4 rows. Vomerine teeth in a triangular patch without posterior extension. Palatines with narrow bands of small villiform teeth. Posterior margin of preopercle serrate without preopercular notch. Interopercular bony knob absent. Dorsal fin continuous, posterior profile of soft dorsal and anal fins rounded; base of soft dorsal and anal fins scaly. Pectoral fin pointed, its posterior tip reaching below 9th dorsal spine. Caudal fin emarginated.

Color when fresh

Head and body nearly uniformly brownish. A series of 6 yellowish brown stripes on side below lateral line. Ventral portion of head and abdomen pale yellowish. All fins yellowish, except for transparent pectoral fin. Distal tip of spinous dorsal orange. A prominent black spot, larger than eye diameter, at level of lateral line below base of anterior portion of soft dorsal.

Distribution

Known from East Africa to the Central-South Pacific (Allen and Talbot, 1985): from Samoa to East Africa, and from Australia north to Japan (Allen, 1985; Allen and Talbot, 1985) and Korea (only juvenile, present study).

Remarks

The present juvenile specimen collected from Jeju Island, Korea, agrees well with the descriptions of *L. fulviflamma* by Allen (1985) and by Allen and Talbot (1985), and with the color photographs of *L. fulviflamma* by Iwatsuki (1997). The meristic counts of the specimen were within the range for the species presented by Allen and Talbot (1985) (Table 1). Thus, we identified the present specimen as a juvenile of *L. fulviflamma*.

The juvenile of *L. fulviflamma* is easily confused with that of *L. ehrenbergii* Peters, 1869, because juveniles of both species have 4-6 yellow stripes on the side below the lateral line and a black spot below the anterior soft dorsal (Allen and Talbot, 1985;

Iwatsuki et al., 1989). However, the former differs from the latter by the oblique arrangement of the scale row above the lateral line (vs. horizontal for *L. ehrenbergii*) and a smaller black spot whose dorsal margin does not reach to the base of the soft dorsal fin in less than 100 mm SL (vs. larger and its dorsal margin reaching the dorsal fin base) (Iwatsuki et al., 1989).

Although the adults of *L. fulviflamma* inhabit coral reefs in large aggregations with *L. kasmira* (Forsskål 1775) and *L. lutjanus* (Bloch 1790), juveniles of *L. fulviflamma* are found in brackish waters of mangrove estuaries or in the lower reaches of freshwater streams (Allen and Talbot, 1985; Iwatsuki, 1997). In the present study, we also collected juvenile *L. fulviflamma* from a fishing port located in the lower reach of the Jungmun River, Jeju Island, Korea. We propose the new Korean name of "Yuk-seon-jeom-tung-dom" for this species.

Lutjanus quinquelineatus (Bloch, 1790)

(New Korean name: O-seon-tung-dom)

(Fig. 1C; Table 1)

Holocentrus quinquelineatus Bloch, 1790: 84, pl. 239 (type locality: Japan).

Lutjanus quinquelineatus: Kyushin et al., 1982: 60; Allen, 1985: 111; Iwatsuki et al., 1989: 476; Randall et al., 1990: 182; Randall, 1995: 205; Iwatsuki, 1997: 334 (Japan); Shimada, 2002: 820 (Japan).

Material examined

MRIC 2818, 93.6 mm SL, Wimi fishing port, Namwon-eup, Seogwipo-si, Jeju-do, Korea, 3 December, 2005, collected by K. Nakaya, M. Shimazaki, and B. J. Kim, angling, ca. 5 m depth; MRIC 4779, 80.9 mm SL, Wimi fishing port, Namwon-eup, Seogwipo-si, Jeju-do, Korea, 6 December 2006, collected by K. Nakaya, M. Uyeki, and B. J. Kim, angling, ca. 5 m depth.

Description

Counts are given in Table 1. Proportions are presented as % SL: head length 38.7-39.7; body depth 41.0-41.2; snout length 12.1-12.9; upper jaw length 15.4-15.6; eye diameter 10.1-11.0; interorbital width 9.8-10.0; predorsal length 41.1-42.4; prepectoral length 40.3-41.1; preanal length 69.5-70.3; caudal peduncle depth 13.0-13.2; caudal peduncle length 18.4-19.5; dorsal fin base 55.7-56.4; anal fin base 16.5-16.9; pectoral fin length 27.1-28.4; pelvic fin length 24.1-24.5.

Body oblong, compressed, covered with ctenoid scales aligned in horizontal rows below lateral line and in oblique rows above lateral line. Lateral line

continuous and slightly curved. Head moderate, pointed, upper profile steeply sloped and lower profile flattened. Snout, preorbital, and jaws naked. Eye large, positioned more or less closer to upper profile; interorbital region slightly convex. Mouth terminal, posterior tip of maxilla extending below to center of pupil. Teeth on upper and lower jaws small, conical, in 4-5 rows. Vomerine teeth in a crescentic patch without posterior extension. Palatines with narrow bands of small villiform teeth. Posterior margin of preopercle serrate with a well-developed preopercular notch. Interopercular bony knob present. Dorsal fin continuous, posterior profile of soft dorsal and anal fins rounded; base of even-numbered dorsal spine, except for second one soft dorsal and anal fins scaly. Pectoral fin pointed, its posterior tip reaching below first ray of soft dorsal. Caudal fin emarginated.

Color when fresh

Head and body nearly uniformly yellowish. A series of 5 blue stripes on side. Ventral portion of head, abdomen, and ventral portion of caudal peduncle whitish. Dorsal fin yellowish, its spinous distal tip orange. Pectoral fin pale yellowish. Pelvic, anal, and caudal fins yellowish. A prominent black spot between second and third blue stripes below anterior portion of soft dorsal.

Distribution

Known from the Northwestern Indian Ocean to the Western Pacific: Persian Gulf and the Gulf of Oman to Fiji, north to the Pacific coast of southern Japan (Allen, 1985; Shimada, 2002) and Korea (only juvenile, present study).

Remarks

The present specimens collected from Jeju Island, Korea, agree well with the description of *L. quinquelineatus* by Allen (1985) and by Allen and Talbot (1985). As shown in Table 1, the meristic counts of the present specimens were within the range of those given by Allen and Talbot (1985) for *L. quinquelineatus*. The diagnostic color pattern for the species is the presence of 5 blue stripes and a black spot on the body when alive (Allen and Talbot, 1985; Iwatsuki, 1997); the present specimens showed the same color pattern when fresh (Fig. 1C). Thus, we identified the present specimens as juveniles of *L. quinquelineatus*.

Although *L. quinquelineatus* is very similar to *L. kasmira* in having a black spot and 4-5 distinct longitudinal stripes on the body in addition to their general appearance, the former differs from the latter by 5 broad stripes on the body (vs. 4 for *L. kasmira*)

and 3 blue lines below the eye when alive (vs. 2 lines). We propose the new Korean name of "O-seontung-dom" for this species.

Acknowledgments

This study was supported by a Korea Research Foundation Grant (KRF-2004-075-C00011).

References

- Allen, G.R. 1985. FAO Species Catalogue. Vol. 6. Snapper of the World. An annotated and illustrated catalogue of lutjanid species known to date. FAO Fish. Synop. No. 125, 6, 1-208.
- Allen, G.R. and F.H. Talbot. 1985. Review of the snappers of the genus *Lutjanus* (Pisces: Lutjanidae) from the Indo-Pacific, with the description of a new species. Indo-Pac. Fishes No. 11, 1-87, col. pls. 10.
- Aramata, H. S. Sato and Y. Aramata. 2004. A Guide to the Collecting of Sea Fishes in Japanese Estuary and Coral Reef. In search for migratory coral fishes brought by Kuroshio Sea Current. Osaka Communication, Tokyo, 1-235.
- Bleeker, P. 1849. Bijdrage tot de kennis der Percoiden van den Malayo-Molukschen Archipel, met beschrijving van 22 nieuwe soorten. Verh. Batav. Genootsch. Kunst. W et., 22, 1-64.
- Bloch, M.E. 1790. Naturgeschichte der Ausländischen Fische. Berlin, Vol. 4, 1-128, pls. 217-252.
- Chyung, M.K. 1977. The Fishes of Korea. Ilji-Sa, Seoul, 1-727.
- Cuvier, G. and A. Valenciennes. 1828. Histoire Naturelle des Poissons. Tome second. Livre Troisième. Des poissons de la famille des perches, ou des percoïdes, 1-490, pls. 9-40.
- Forsskål, P. 1775. Descriptiones Animalium Avium, Amphibiorum, Piscium, Insectorum, Vermium; quae in itinere orientali observavit...Post mortem auctoris edidit Carsten Niebuhr. Hauniae, 1-164.
- Iwatsuki, Y. 1997. Lutjanidae. In: Sea Fishes of Japan, Okamura, O., K. Amaoka, eds. Yama-Kei Publisher Co., Tokyo, pp. 329-339.
- Iwatsuki, Y., H. Senou and T. Suzuki. 1989. A record of the lutjanid fish, *Lutjanus ehrenbergii*, from Japan with reference to its related species. Jap. J. Ichthyol., 35, 469-478.
- Kim, I.S., Y. Choi, C.L. Lee, Y.J. Lee, B.J. Kim and J.H. Kim. 2005. Illustrated Book of Korean Fishes. Kyohak-Publishing, Seoul, 1-615.
- Kozima, J. 1988. Lutjanidae. In: An Atlas of the Early Stage Fishes in Japan, Okiyama, M., ed. Tokai University Press, Tokyo. pp. 511-517.
- Kyushin, K., K. Amaoka, K. Nakaya, H. Ida, Y. Tanino and

- T. Senta. 1982. Fishes of the South China Sea. Japan Marine Fishery Resource Research Center, 1-333, pls. 291.
- Nelson, J.S. 2006. Fishes of the World. Fourth Edition. John Wiley & Sons, Hoboken, New Jersey, 1-601.
- Quoy, J.R.C. and J.P. Gaimard. 1824-25. Description des Poissons. Chapter IX. In: Freycinet, L. de, Voyage autour du Monde...exécuté sur les corvettes de L. M. "L'Uranie" et "La Physicienne," pendant les années 1817, 1818, 1819 et 1820. Paris. Voyage Uranie, Zool., 192-401, Atlas pls. 43-65.
- Shimada, K. 2002. Lutjanidae. In: Fishes of Japan with Pictorial Keys to the Species, English edition, Nakabo T. ed. Tokai University Press, Tokyo, pp. 819-832, 1553.

(Received March 2007, Accepted June 2007)