Bull. Natl. Mus. Nat. Sci., Ser. A, Suppl. 4, pp. 21–29, March 29, 2010

A New Species of the Flathead Genus *Inegocia* (Teleostei: Platycephalidae) from East Asia

Hisashi Imamura[1,2]

[1] Fisheries Science Center, the Hokkaido University Museum,
3–1–1 Minato-cho, Hakodate, Hokkaido 041–8611, Japan
[2] Present address: Laboratory of Marine Biology and Biodiversity (Systematic Ichthyology),
Faculty of Fisheries Sciences, Hokkaido University,
3–1–1 Minato-cho, Hakodate, Hokkaido 041–8611, Japan
E-mail: imamura@fish.hokudai.ac.jp

Abstract A new species of platycephalid, *Inegocia ochiaii*, is described based on specimens, ranging from 47.2–444.0 mm SL, collected from southern Japan and Taiwan. *Inegocia ochiaii* differs from other platycephalids in having the following combination of characters: I+VIII first dorsal-fin rays, usually 11 second dorsal and anal-fin rays, 63–76 oblique body scale rows slanting downward and backward above the lateral line, a long snout (31.7–34.9% HL), a long and branched iris lappet, the posterior margin of the orbit lacking distinct pit, the suborbital ridge with 2 spines (preorbital spine absent), a single large interopercular flap present, sensory tubes from the suborbitals and preopercle not covering cheek region, and scales anteriorly on the lateral line with either single posterior opening or with 2 openings and scales posteriorly on the lateral line with 2 openings.

Key words : Platycephalidae, New species, *Inegocia*, East Asia.

Cuvier in Cuvier and Valenciennes (1829) originally described a platycephalid, *Platycephalus guttatus*, based on a single specimen collected from Nagasaki, Japan. After the original description, Temminck and Schlegel (1843) also described the species and illustrated the species, indicating many small dark dots on the dorsal surface of the head and body. Matsubara and Ochiai (1955) gave detailed description the species based on Japanese specimens and placed it into the genus *Inegocia* Jordan and Thompson, 1913, owing to the long and branched iris lappet and well developed interopercular flap. Many authors (e.g., Anonymous, 1962; Ochiai, 1984; Nakabo, 1993; Imamura, 1997; Kim *et al*., 2005) subsequently reported the species from southern Japan to the East and South China seas under the name *I. guttata*. However, others considered that the species is a junior synonym of *Cociella crocodila* (Cuvier, 1829) (e.g., Jordan and Richardson, 1908; de Beaufort and Briggs, 1962). Recently, Imamura and Yoshino (2009) demonstrated the conspecificity of *C. crocodila* and *P. guttatus*, and that the species from southern Japan to the East and South China seas commonly recognized as *I. guttata* was undescribed. The species previously misidentified as *I. guttata* is herein described as new.

Materials and Methods

Counts and measurements were made according to Hubbs and Lagler (1958) and were routinely taken from the left side, while gill rakers were counted on the right side. A small first dorsal spine was expressed by using plus sign. Measurements were made with calipers to the nearest 0.1 mm accuracy. Terminology of head spines follows Knapp *et al*. (2000). Institutional acronyms are from Eschmeyer (1998), except for Hokkaido University Museum, Hakodate (HUMZ) and National Museum of Nature and

Science, Tokyo (NSMT). Standard and head lengths are abbreviated as SL and HL, respectively.

Inegocia ochiaii sp. nov.

[Japanese name: Wani-gochi]

(Figs. 1–4)

Inegocia guttata (not Cuvier in Cuvier and Valenciennes, 1829): Matsubara and Ochiai, 1955: 82, pl. 1 [southern Japan, including Maizuru (Kyoto Prefecture), Nobeoka (Miyazaki Prefecture), Urado (Kochi Prefecture) and East China Sea]; Matsubara, 1955: 1121 (southern Japan, including Maizuru, Nobeoka, Urado, Nagasaki and East China Sea); Anonymous, 1962: 256, fig. 64-7 (Haimen, China, South China Sea); Masuda *et al*., 1975: 342, pl. 146-E (central Honshu southward to China Sea); Ochiai, 1984: 321, pl. 288-K (Tosa and Wakasa Bays, Japan, to the South China Sea); Yamada, 1986: 331 (East China Sea); Lindberg and Krasyukova, 1987: 153, fig. 90 (Sea of Japan); Shao and Chen, 1987: 88, fig. 27 (Taiwan); Shao and Chen, 1993: 256, fig. 64-7 (Taiwan); Nakabo, 1993: 537, unnumbered fig. (Tosa Bay and Wakasa Bay, Japan, southward to East China Sea); Masuda and Kobayashi, 1994: 91, fig. 5 (Sagami and Wakasa Bays, Japan, to South China Sea); Lee and Joo, 1995: 115, figs. 1–2 (Cheju Island, Korea); Yamada *et al*., 1995: 119, fig. (southern Japan, East and South China seas); Imamura, 1997: 219 (southern Japan to South China Sea); Lee and Joo, 1998: 222, fig. 8 (Pusan and Cheju Island, Korea); Nakabo, 2000: 617, unnumbered fig. (Tosa Bay and Wakasa Bay southward to East China Sea); Nakabo, 2002: 617, unnumbered fig. (Tosa Bay and Wakasa Bay southward to East China Sea); Kim *et al*., 2005: 235, fig. (Cheju Island, Korea).

Platycephalus guttatus (not Cuvier in Cuvier and Valenciennes, 1829): Temminck and Schlegel, 1843: 39, pl. 15, fig. 2 (bay of Nagasaki, Japan).

Holotype. BSKU 48578, 272.4 mm SL, Kashiwa-jima Island, Kochi Prefecture, Japan (35.2°N, 132.7°E), hand net, 28 Nov. 1990.

Paratypes. 8 specimens. BSKU 4176, 138.1 mm SL, Usa, Tosa, Kochi Prefecture, Japan, Aug. 1954; BSKU 37647, 258.8 mm SL, Mogi Bay, Nagasaki Prefecture, Japan, 16 Oct. 1982; BSKU 60856, 94.5 mm SL, Uranouchi Bay, Tosa, Kochi Prefecture, Japan, 4 m depth, 8 Dec. 2002; BSKU 94659, 423.1 mm SL, fish market, Mimase, Kochi Prefecture, Japan, 25 Apr. 2009; BSKU 95332, 444.0 mm SL, fish market, Mimase, Kochi Prefecture, Japan, 7 March 2008; HUMZ 193076, 329.3 mm SL, fish market, Taipei, Taiwan, 19 May 2005; NSMT-P 5772, 236.2 mm SL, Aso Bay, Tsushima Islands, Nagasaki Prefecture, Japan, 12–14 July 1968; NSMT-P 54160, 261.8 mm SL, Suno-saki Point, southern part of Boso Peninsula, Chiba Prefecture, Japan, 3 m depth, hand net, 15 July 1992.

Non type. NSMT-P 35729, 47.2 mm SL, Sokodo, northeast coast of Hachijo-jima Island, Izu Islands, Japan (33°7′N, 139°49′E), 3 m depth, hand net, 15 July 1992.

Diagnosis. A new species of *Inegocia* with I+VIII first dorsal-fin rays, usually 11 second

Fig. 1. Dorsal (upper) and lateral (lower) views of *Inegocia ochiaii* sp. nov., BSKU 48578, 272.4 mm SL, Kashiwa-jima Island, Kochi Prefecture, Japan (ethanol preserved condition) (photos by H. Imamura).

dorsal-fin rays, 11 anal-fin rays, 63–76 oblique body scale rows slanting downward and backward above lateral line, a long snout (31.7–34.9% HL), a long and branched iris lappet, posterior portion of orbit lacking distinct pit, suborbital ridge with 2 spines (preorbital spine absent), a single large interopercular flap present, sensory tubes from suborbitals and preopercle not covering cheek region, and scales anteriorly on lateral line with either single posterior opening or with 2 openings, scales posteriorly on lateral line with 2 openings.

Description. Data for the holotype are presented first, followed by paratype data in parentheses or brackets (occasionally non type data also shown when necessary): first dorsal-fin rays I+VIII (I+VIII); second dorsal-fin rays 11 (11); anal-fin rays 11 (10 in 1, 11 in 7); pectoral-fin rays 2 (upper, unbranched)+13 (middle, branched)+8 (lower, unbranched)=23 [1–3 (usually 2)+10–14+7–9=21–22 (1 paratype, BSKU 4176, abnormally with 3+7+6=16; 1 non type with 20 unbranched rays)]; pelvic-fin rays I, 5 (I, 5); branched caudal-fin rays 6 (upper)+6 (lower)=12 (5 or 6+4–6=10–12); scales in lateral line 53, anterior 2 scales with spine [52–54, 2 or 3 with spine]; oblique body scale rows slanting downward and backward above lateral line 74 (66–76); oblique body scale rows slanting downward and forward above lateral line 105 (95–107); gill rakers 1+5=6 (1+4=5 in 1, 1+5=6 in 7). Proportions as % SL: HL 35.8 (35.4–38.0); predorsal length 36.9 (36.8–39.1); length of first dorsal-fin base 19.0 (18.5–20.6); length of second dorsal-fin base 26.2 (25.8–27.7); length of anal-fin base 28.2 (27.2–29.7); caudal peduncle length 10.2 (9.1–10.8); caudal peduncle depth 4.7 (4.6–5.1); snout length 11.5 (11.7–12.6); orbital diameter 6.6 (6.3–8.3); upper jaw length 13.1 (12.8–13.9); lower jaw length 20.4 (20.0–21.9); interorbital width 3.0 (2.2–4.0); pectoral-fin length 14.2 (13.4–16.3); pelvic-fin length 25.1 (23.5–28.0); caudal-fin length 18.9 (17.2–22.1); length of first spine of first dorsal fin 2.9 (2.1–3.5); length of second spine of first dorsal fin 13.2 (13.9–15.3); length of first ray of second dorsal fin 12.7 (11.7–13.4); length of first anal-fin ray 6.9 (6.7–8.1). Proportions as % HL: snout length 32.1 (31.7–34.1); orbital diameter 18.6 (16.5–22.2); upper jaw length 36.7 (36.1–37.0); lower jaw length 57.0 (54.9–59.3); interorbital width 8.3 (6.0–10.8).

Body depressed, mostly covered with ctenoid scales, some cycloid scales on undersurface. Head flattened, length 2.8 (2.6–2.8) in SL; postorbital region, opercle and nape scaled. Snout slender, much longer than orbital diameter, snout length 3.1 (2.9–3.2) in HL. Upper surface of eye without papillae. Iris lappet long and well branched, and not attaining center of eye dorsally, broad and simple ventrally (Fig. 3A) (each branch short and simple in a non type in 47.2 mm SL, Fig. 3B). Interorbit moderately broad and shallowly concave, width 12.0 (9.2–14.8) in HL. Posterior margin of orbit lacking distinct pit. Top and side of head possessing spines. Nasal with single small spine. Anteroventral margin of lachrymal without spines. Single sharp preocular spine present, lacking small spines on its anterior base (Fig. 2). Preorbital spines absent. Suborbital ridge with 2 spines below eye. Supraorbital ridge roughly serrated posteriorly (Fig. 2). Postorbital region, pterotic, parietal, supratemporal, supracleithrum and left side of posttemporal with single spine, respectively; right side of posttemporal with 2 spines. Preopercle with 2 spines [or 3 (single smallest lowermost spine added) in right side of BSKU 4176 and both sides of BSKU 60856]; upper longest, not reaching posterior margin of opercle, bearing single supplementary spine. Ridge of upper and lower opercular spines without serrations. Single large interopercular flap present. Maxilla reaching anterior margin of eye, length 2.7 (2.7–2.8) in HL. Villiform teeth in bands on palatine and jaws, except for anteromedial portion of upper jaw with small and slender conical teeth; tooth band on upper jaw with distinct notch medially. Small conical teeth in 2 separate patches on vomer. Lip margins without papillae. Sensory tubes from suborbitals and preopercle undeveloped, not covering cheek region. Scales anteriorly on lateral line with either single

Fig. 2. Dorsal view of head of *Inegocia ochiaii* sp. nov., BSKU 37647, paratype, 258.8 mm SL, Mogi Bay, Nagasaki Prefecture, Japan.

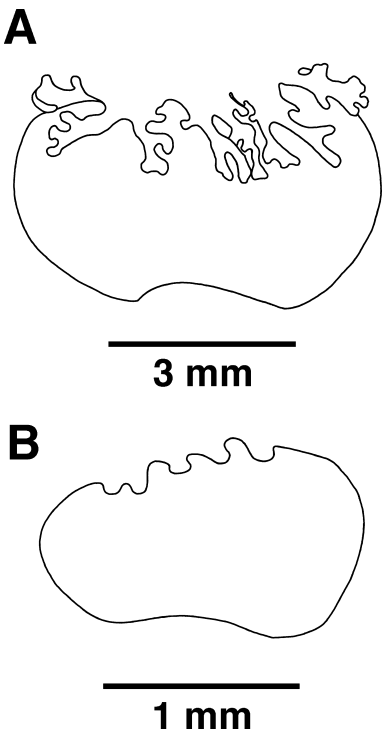

Fig. 3. Lateral view of iris lappet of *Inegocia ochiaii* sp. nov. A, BSKU 37647, paratype, 258.8 mm SL, Mogi Bay, Nagasaki Prefecture, Japan; B, NSMT-P 35729, non type, 47.2 mm SL, Sokodo, northeast coast of Hachijyo-jima Island, Izu Islands, Japan.

posterior opening or with 2 openings, scales posteriorly on lateral line with 2 openings. First dorsal fin originating slightly posterior to opercular margin. First and second dorsal fin narrowly separated. Pectoral fin rounded posteriorly, length 2.5 (2.3–2.8) in HL. Posterior tip of pelvic fin attaining anal-fin origin (position of posterior tip of pelvic fin ranging from anterior to anal fin to base of third ray), pelvic-fin length 1.4 (1.3–1.6) in HL. Caudal fin slightly rounded posteriorly, length 1.9 (1.7–2.2) in HL.

Color in alcohol. In holotype (Fig. 1), dorsal and lateral portions of head and body brown, densely scattered with small blackish dots; lower side of head and body pale brown. Head with 2 dark brown bands dorsally, crossing eyes and opercular region, respectively; posterior band indistinct. Body with 7 dark brown bands dorsally; 2 indistinct and 1 distinct bands below first dorsal fin, 1 indistinct and 2 distinct bands below second dorsal fin; and 1 distinct band on caudal peduncle. First dorsal fin with broad marginal dark brown band; anteroventral region of first dorsal fin with several dark brown spots. Second dorsal fin with many dark brown spots; several spots somewhat continuous and tending to form oblique bands. Pectoral fin with small brown to dark brown spots. Pelvic fin with large brown to dark brown spots; several spots with blackish center. Anal fin pale basally and dusky distally. Caudal fin with brown to dark brown spots of various sizes; several spots with blackish center; narrow and broad dark brown bands on basal and

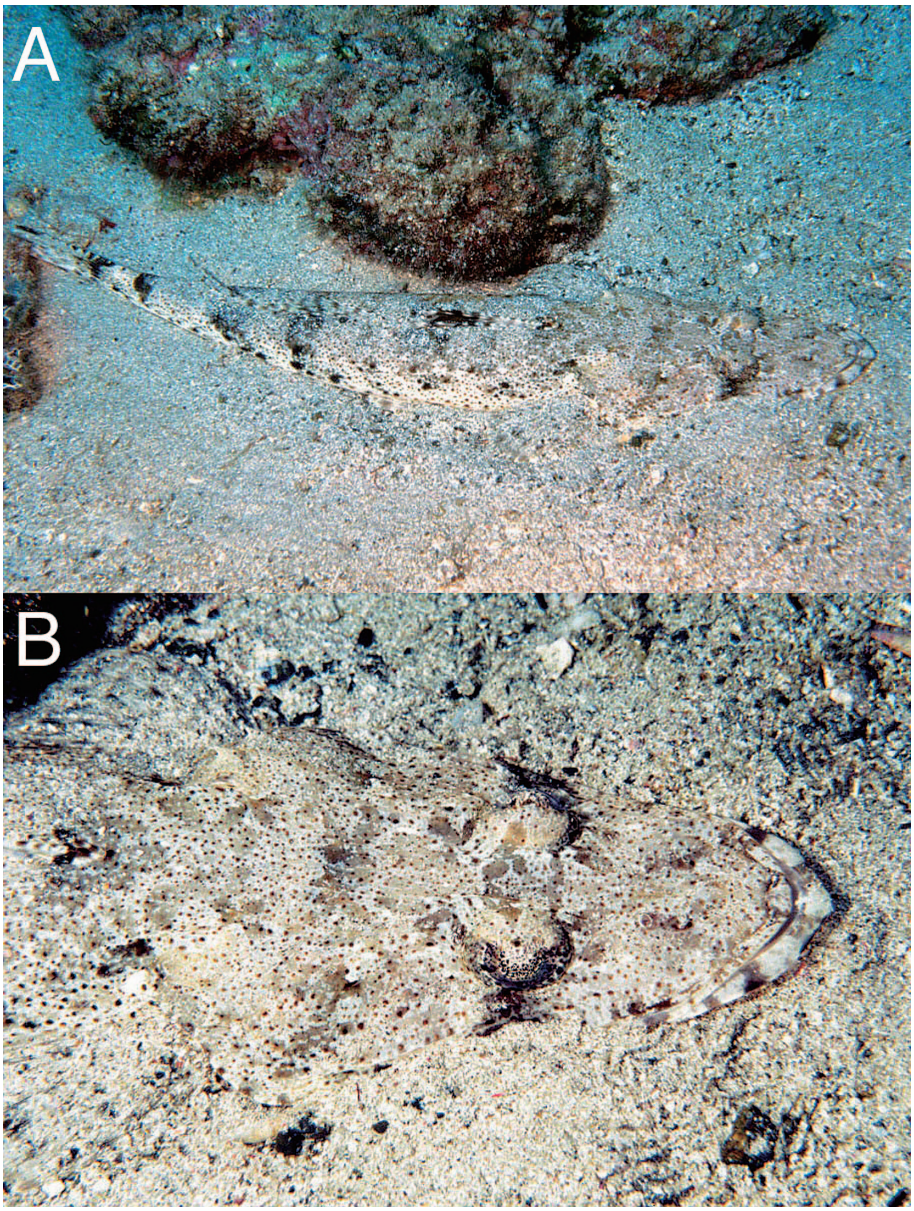

Fig. 4. Underwater photograph of *Inegocia ochiaii* sp. nov., showing whole body (A) and close up of head (B) (specimen not preserved, photos by H. Endo).

distal portions, respectively; posterior margin narrowly pale.

Color when alive (based on underwater photographs, Fig. 4). Dorsal and lateral portions of head and body grayish, mottled by small brownish and blackish spots, and densely scattered with small blackish dots. Head with 2 indistinct bands formed by pale brownish to brownish spots dorsally, crossing eyes and opercular region, respectively; distinct dark brownish marking present below eye. Body with 6 bands dorsally; 2 indistinct pale brownish bands below first dorsal fin; 1 indistinct pale brownish and 2 distinct dark brownish bands below second dorsal fin; and

1distinct blackish band on caudal peduncle. First dorsal fin with 1 blackish marginal marking and several dark brown and lighter brown spots. Second dorsal fin with many brownish spots. Pectoral fin with small brownish to blackish brownish spots. Caudal fin with pale brownish to dark brownish spots of various sizes.

Distribution. Known only from East Asia, ranging from southern Japan to the East and South China seas, including Sagami and Wakasa Bays, Hachijo-jima Island, southern Korean Peninsula, Taiwan and China (e.g., Matsubara and Ochiai, 1955; Anonymous, 1962; Nakabo, 2002; Kim *et al*., 2005; this study).

Etymology. Named in honor of Dr. Akira Ochiai, for his many contributions to fish taxonomy, including those for the Platycephalidae.

Remarks. *Inegocia ochiaii* has been mistakenly identified as *Platycephalus guttatus*, a junior synonym of *Cociella crocodila* (see Imamura and Yoshino, 2009) known from southern Japan to the South China Sea. However, *I. ochiaii* is easily separable from *C. crocodila* in having such characters as a single large interopercular flap (vs. interopercular flap absent in *C. crocodila*), and scales anteriorly on the lateral line with either single posterior opening or with 2 openings and scales posteriorly on the lateral line with 2 openings (all lateral-line scales with single opening), and preorbital spine absent (present). In addition, *I. ochiaii* has a longer snout than *C. crocodila* (31.7–34.9% HL in *I. ochiaii* vs. 26.6–29.3% HL in *C. crocodila*, Fig. 5) (data for *C. crocodila* from Knapp, 1996, Imamura and Yoshino, 2009 and this study).

Inegocia ochiaii resembles 2 congeners, *I. harrisii* (McCulloch, 1914) and *I. japonica* (Cuvier, 1829) (see Imamura and Yoshino, 2009 for authorship of *I. japonica*) in having a long and branched iris lappet dorsally, lacking a distinct pit on the posterior margin of the orbit, and lacking sensory tubes from the suborbitals and preopercle on the cheek region. However, *I. ochiaii* is easily distinguishable from these 2 species in having a greater number of oblique body scale rows slanting downward and backward above the lateral line (63–76 in *I. ochiaii* vs. 52–55 in *I. harrisii* and 53–55 in *I. japonica*). *Inegocia ochiaii* has a large interopercular flap, whereas *I. harrisii* lacks the flap and *I. japonica* possesses a finger-like flap. *Inegocia ochiaii* has scales anteriorly on the lateral line with either a single posterior opening or with 2 openings, and scales posteriorly on the lateral line with 2 openings. In contrast, all lateral-line scales have 2 openings in *I. harrisii* and *I. japonica*. In addition, *Inegocia ochiaii* differs from *I. japonica* in having a fewer number of second dorsal and anal-fin rays (usually both 11 in *I. ochiaii* vs. usually both 12 in *I. japonica*) (data for *I. harrisii* and *I. japonica* from Knapp, 1999 and this study).

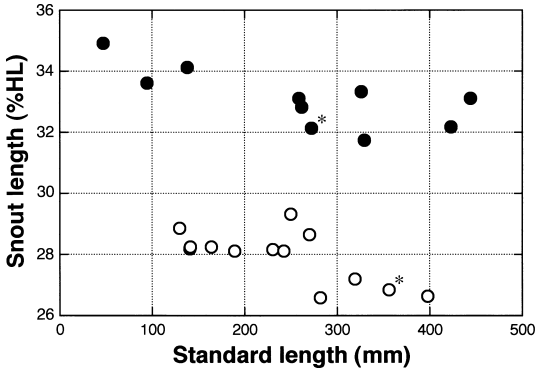

Fig. 5. Relationship of snout length (%HL) and standard length (mm) in *Inegocia ochiaii* sp. nov. (solid circle) and *Cociella crocodila* (open circle). Asterisks on right shoulder of symbol indicate holotype.

Differences between *Inegocia ochiaii* and *Cymbacephalus bosschei* (Bleeker, 1860), known from the Philippines to northern Australia, and *Leviprora inops* (Jenyns, 1840), known from southern Australia, are also discussed here because the latter 2 species possess 3 characters in common with the 3 species of *Inegocia*. *Cymbacephalus bosschei* had been placed into the genus *Inegocia* by several authors (e.g., Gloerfelt-Tarp and Kailola, 1984; Imamura, 1996) until Knapp (1999) put it into the genus *Cymbacephalus* Fowler, 1938. *Inegocia ochiaii* is easily separable from *C. bosschei* and *L. inops* in having 11 second dorsal and anal-fin rays, and the suborbital

ridge with 2 spines (vs. 12 second dorsal and anal-fin rays in *C. bosschei* and *L. inops*, and suborbital ridge with single spine in *C. bosschei* and with no spines in *L. inops*). In addition, the interopercular flap and lateral-line scales are also helpful in separating *I. ochiaii* from *C. bosschei* (broad interopercular flap with shallow incisions, and all lateral-line scales with single opening posteriorly in *C. bosschei*). *Inegocia ochiaii* is also distinguishable from *L. inops* by having I+VIII first dorsal-fin rays (I+VII in *L. inops*) (data for *C. bosschei* from Knapp, 1999 and this study, and those for *L. inops* from Kuiter, 1994 and this study).

Comparative materials. *Cociella crocodila* (13 specimens, all from Japan, including holotype of *P. guttatus*, ZMB 726, 355.9 mm SL, see Imamura and Yoshino, 2009 for data of examined specimens, except for newly added NMW 74721, 397.8 mm SL). *Cymbacephalus bosschei* (7 specimens, all from northern Australia): AMS I.33461-021, 191.2 mm SL; AMS IB.4093, 133.7 mm SL; NTM S.12444-022, 232.3 mm SL; NTM S.12892-005, 104.6 mm SL; NTM S.12962-005, 205.6 mm SL; NTM S.14472-017, 139.6 mm SL; NTM S.14665-005, 152.4 mm SL; NTM S.15532-005, 132.7 mm SL. *Inegocia japonica* (20 specimens, whereabouts of types unknown, see Imamura and Yoshino, 2009 for data of examined specimens); *Inegocia harrisii* (8 specimens, all from northern Australia): AMS E.2844 (lectotype of *Insidiator harrisii*), 169.7 mm SL; AMS I.20473-009, 107.4 mm SL; AMS I.21830-006, 168.9 mm SL; AMS I.34398-038, 102.5 mm SL; NTM S.14354-008, 124.7 mm SL; NTM S.14356-004, 175.7mm SL; NTM S.14362-011, 145.8 mm SL. *Leviprora inops* (5 specimens, all from southern Australia): BMNH 1917.7.14.76 (holotype of *Platycephalus inops*), 340.1 mm SL; CSIRO C2365, 292.0 mm SL; WAM P.27590-027, 260.8 mm SL; WAM P.27881-002, 148.6 mm SL; WAM P.28016-001, 240.8 mm SL.

Acknowledgments

I express my sincere thanks to T. Iwamoto (CAS) for critically reading a draft manuscript and providing important comments. I am grateful to P. Bartsch (ZMB), H. Endo (BSKU), A. Graham (CSIRO), H. Larson, G. Dally and R. Williams (NTM), J. Maclaine (BMNH), K. Matsuura and G. Shinohara (NSMT), M. McGrouther (AMS), S. Morrison (WAM) and H. Wellendorf (NMW) for providing the opportunity to examine specimens. H. Endo kindly provided color photographs of *I. ochiaii*. Finally, I sincerely thank K. Matsuura for the opportunity to publish this description of the new species. This study was partly supported by an Ito Grant for Ichthyology, Fujiwara Natural History Foundation to the author.

Literature Cited

Anonymous. 1962. Platycephalidae. Pages 909–937 *in* Institute of Zoology, Academia Sinica, Institute of Oceanology, Academia Sinica, and Shanghai Fisheries College, eds. Fishes of the South China Sea. Science Press, Beijing. (In Chinese.)

Bleeker, P. 1860. Tiende bijdrage tot de kennis der vischfauna van Banka. *Natuurkundig Tijdschrift voor Nederlandsch Indië*, 21: 135–142.

Cuvier, G. and A. Valenciennes. 1829. Histoire naturelle des poissons. Tome troisième. Suite du Livre troisième. Des percoïdes à dorsale unique à sept rayons branchiaux et à dents en velours ou en cardes. F. G. Levrault. xxviii+2+500 pp.

de Beaufort, L. F. and J. C. Briggs. 1962. The Fishes of the Indo-Australian Archipelago. 9. Scleroparei, Hypostomides, Pediculati, Plectgnathi, Opisthomi, Discocephali, Xenopterygii. E. J. Brill, Leiden. xi+484 pp.

Eschmeyer, W. N. 1998. Collection abbreviations. Pages 16–22 in W. N. Eschmeyer, ed. Catalog of Fishes. Vols 1–3. California Academy of Sciences, San Francisco. 2905 pp.

Fowler, H. W. 1938. Descriptions of new fishes obtained by the United States Bureau of Fisheries steamer "Albatross", chiefly in Philippine seas and adjacent waters. *Proceedings of United States National Museum*, 85: 31–135.

Gloerfelt-Tarp, T. and P. J. Kailola. 1984. Trawled Fishes of Southern Indonesia and Northern Australia. The Australian Development Assistance Bureau, the Directorate General of Fisheries, Indonesia and the German Agency for Technical Cooperation, Jakarta. xvi+2pls.+406 pp.

Hubbs, C. L. and K. F. Lagler. 1958. Fishes of the Great

Lakes region. *Bulletin of Cranbrook Institute of Sciences*, 26: 1-213, pls. 1–44.

Imamura, H. 1996. Phylogeny of the family Platyephalidae and related taxa (Pisces: Scorpaeniformes). *Species Diversity*, 1: 123–233.

Imamura, H. 1997. *Inegocia guttata*. Page 219 *in* O. Okamura and K. Amaoka, eds. Sea Fishes of Japan. Yamakei Publishers Co. Ltd., Tokyo. 783 pp. (In Japanese.)

Imamura, H. and T. Yoshino. 2009. Authorship and validity of two flatheads, *Platycephalus japonicus* and *Platycephalus crocodilus* (Teleostei: Platycephalidae). *Ichthyological Research*, 56: 308–313.

Jenyns, L. 1840. Part 4. Fish. Pages i–xv+1–172, 29 pls. *in* C. Darwin, ed. The zoology of the voyage of H. M. S. Beagle, under the command of Captain Fitzroy, R. N., during the year 1832 to 1836. Smith, Elder, and Co., London.

Jordan, D. S. and R. E. Richardson. 1908. A review of the flat-heads, gurnards, and other mail-cheeked fishes of the waters of Japan. *Proceedings of the United State National Museum*, 33: 629–670.

Jordan, D. S. and W. F. Thompson. 1913. Notes on a collection of fishes from the Island of Shikoku in Japan, with a description of a new species *Gnathypops iyonis*. *Proceedings of the United States National Museum*, 46: 65–72.

Kim, I. S., Y. Choi, C. L. Lee, Y. J. Lee, B. L. Kim and J. H. Kim. 2005. Illustrated book of Korean fishes. Kyohaku Publishing, Seoul. 615 pp.

Knapp, L. W. 1996. Review of the genus *Cociella* Whitely (Teleostei: Platycephalidae) with the description of three new species. *Proceedings of the Biological Society of Washington*, 109: 17–33.

Knapp, L. W. 1999. Platycephalidae. Pages 2385–2421 *in* K. E. Carpenter and V. H. Niem, eds. FAO species identification guide for fishery purposes. The living marine resources of the western Central Pacific. Vol. 4. Bony fishes part 2 (Mugilidae to Carangidae). FAO, Rome.

Knapp, L. W., H. Imamura and M. Sakashita. 2000. *Onigicia bimaculata*, a new species of flathead fish (Scorpaeniformes: Platycephalidae) from the Indo-Pacific. *Special Publication of the J.L.B. Smith Institute of Ichthyology*, (64): 1–10.

Kuiter, R. H. 1994. Family Platycephalidae. Pages 514–524 *in* M. F. Gomon, J. C. M. Glover and R. H. Kuiter, eds. The Fishes of Australia's South Coast. Flora and Fauna of South Australia Handbooks Committee. State Printer, Adelaide.

Lee C. L. and D. S. Joo. 1995. New record of the flathead fish, *Inegocia guttata* (Platycephalidae) from Korea. *Korean Journal of Ichthyology*, **7**: 114–119.

Lee C. L. and D. S. Joo. 1998. Taxonomic review of flathead fishes (Platycephalidae, Scorpaeniformes) from Korea. *Korean Journal of Ichthyology*, 10: 216–230.

Lindberg, G. U. and Z. V. Krasyukova. 1987. Fishes of the Sea of Japan and adjacent parts of Okhotsk and Yellow Sea. Part 5. Teleostomi, Osteichthyes, Actinopterygii. 30 Scorpaeniformes (176. Fam. Scorpaenidae–194. Fam. Liparididae). Nauka, Leningrad. 526 pp. (In Russian.)

Masuda, H., C. Araga and T. Yosihno. 1975. Coastal Fishes of Southern Japan. Tokai University Press, Tokyo. 379 pp.

Masuda, H. and Y. Kobayashi. 1994. Grand Atlas of Fish Life Modes. Color Variation in Japanese fish. Tokai Univ. Press, Tokyo. xliii+465 pp. (In Japanese.)

Matsubara, K. and A. Ochiai. 1955. A revision of the Japanese fishes of the family Platycephalidae (the flatheads). *Memoirs of the College of Agriculture, Kyoto University*, (68): 1–109.

Matsubara, K. 1955. Fish Morphology and Hierarchy. Ishizaki Shoten, Tokyo. xi+v+1605+viii pp., 135 pls. (In Japanese.)

McCulloch, A. R. 1914. Report on some fishes obtained by the F.I.S. "Endeavour" on the coasts of Queensland, New South Wales, Victoria, Tasmania, south and south western Australia. Part II. *Zoological Results of Fishing Experiments carried on by F.I.S. "Endeavour," 1909–1914*, 2: 75–165.

Nakabo, T. 1993. Platycephalidae. Pages 535–539, 1299–1300 *in* T. Nakabo, ed. Fishes of Japan with Pictorial Keys to the Species. Tokai University Press, Tokyo. (In Japanese.)

Nakabo, T. 2000. Platycephalidae. Pages 615–620, 1530–1531 *in* T. Nakabo, ed. Fishes of Japan with Pictorial Keys to the Species, second edition. Tokai University Press, Tokyo. (In Japanese.)

Nakabo, T. 2002. Platycephalidae. Pages 615–619, 1523–1534 *in* T. Nakabo, ed. Fishes of Japan with Pictorial Keys to the Species, English edition. Tokai University Press, Tokyo.

Ochiai, A. 1984. Platycephalidae. Pages 321–322, pls. 288, 361 *in* H. Masuda, K. Amaoka, C. Araga, T. Uyeno and T. Yoshino, eds. The fishes of the Japanese Archipelago. Tokai University Press, Tokyo.

Shao, K.-T. and J.-P. Chen. 1987. Fishes of the family Platycephalidae (Teleostei: Platycephalidae) of Taiwan with descriptions of two new species. *Bulletin of the Institute of Zoology, Academia Sinica*, 26: 77–94.

Shao, K.-T. and J.-P. Chen. 1993. Platycephalidae. Pages 255–260 *in* S. C. Shen, ed. Fishes of Taiwan. Department of Zoology, National Taiwan University, Taipei.

Temminck, C. J. and H. Schlegel. 1843. Pisces, parts 2–4. Pages 21–72 *in* P. F. von Siebold, ed. Fauna Japonica, sive descriptio animalium quae in itinere per Japoniam suscepto annis 1823-30 collegit, notis observationibus et adumbrationibus illustravit P. F. de Siebold. J. Muller & Co., Amsterdam.

Yamada, U. 1986. *Inegocia guttata*. Page 331 *in* O. Okamura, ed. Fishes of the East China Sea and the Yellow Sea. Seikai Regional Fisheries Research Laboratory, Nagasaki. (In Japanese.)

Yamada, U., S. Shirai, T. Irie, M. Tokimura, S. Deng, Y. Zheng, C. Li, Y. U. Kim and Y. S. Kim. 1995. Names and Illustrations of Fishes from the East China Sea and the Yellow Sea. Japanese, Chinese, Korean. Overseas Fishery Cooperation Foundation, Tokyo. xi+288 pp.

Manuscript received 16 June 2009; revised 29 July 2009; accepted 15 August 2009.

Associate editor: K. Matsuura.