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Description of a New Gobiid Fish, *Glossogobius aureus*, with Notes on Related Species of the Genus

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Abstract One form of *Glossogobius* which has been regarded as *G. giuris* by various authors is revealed to be a new species. The most important characteristic for distinguishing this species from others of the genus is the arrangement of the pit organs. Other related species of the genus are compared and their diagnoses are presented.

The species of *Glossogobius* resemble one another so well that observation of the arrangement of the sensory canal pores and pit organs is essential for identification of the species. The various classifications of *Glossogobius* species were presented by authors who did not pay any attention to such characteristics (Koumans, 1935: 144). Koumans (1953: 163) concluded that only two species of *Glossogobius, G. biocellatus* (Valenciennes) and *G. giuris* (Hamilton) were recognizable in the Indo-Australian area. Aurich (1938: table 13) was the first to use the sensory canal pores and pit organs as an important characteristic to distinguish *G. giuris* and *G. celebius* (Valenciennes) from *G. matanensis* (Weber) and *G. intermedius* Aurich. However, he could not distinguish his *G. giuris* (=*G. aureus*, sp. nov.) from *G. celebius* with these characters. Inger (1957: 396) used the difference in the arrangement of the pit organs in the key to the Indo-Australian species of *Glossogobius*, and thus distinguished seven species, five of which Koumans (1953: 163) considered to be conspecific with *G. giuris*. In addition to these five species and *G. biocellatus*, which Koumans had already distinguished from *G. giuris*, Inger proposed a new species *G. sandakanensis*. *G. sandakanensis* is, however, synonymized in the present paper with *G. circumspectus* (Macleay). The species described here was noticed to be different from other species in the arrangement of the pit organs, but its scientific name was unclear (Prince Akihito, 1969: 94). We have checked all the synonyms of *G. giuris* which Koumans (1953: 165) listed, and also compared the species with *G. brunnoides* Nichols. We were, however, unable to identify this form with any of them because of the difference of characters or because of the loss or poor condition of the type specimens. In the present paper the new form is described. Diagnoses for 11 species of *Glossogobius* sympatric to the new form, namely, *G. biocellatus, G. brunnoides, G. giuris*, and eight species which were treated as synonyms of *G. giuris* by Koumans (1953: 165), are presented. However, this paper is not intended to be a revision of *Glossogobius* but to clarify the characteristics of the new form compared with the related species of *Glossogobius*.

Abbreviations: AMS, denotes the Australian Museum, Sydney; LICPP, Laboratory of Ichthyology, the Crown Prince's Palace, Tokyo; MNHN, Muséum National d'Histoire Naturelle, Paris; NSMT, the Department of Zoology, National Science Museum, Tokyo; QM, Queensland Museum, Brisbane; RMNH, Rijksmuseum van Natuurlijke Historie, Leiden; USNM, United States National Museum, Washington, D.C.; ZIUT, Zoological Institute, Faculty of Science, University of Tokyo; ZMB, Zoologisches Museum der Humboldt-Universität zu Berlin; S. L., standard length; Pref., prefecture; Prov., province; L., lake; R., river; Dist., district. Numbers in parentheses are the number of specimens examined.

Glossogobius aureus, sp. nov.
(New Japanese name: konjikihaze)

(Figs. 1 and 2)

Glossogobius giuris (not of Hamilton) sensu Aurich, 1938: 144, Philippines; Smith, 1945: 542, Samut Prakan, Thailand; Aoyagi, 1957: 238, Iriomotejima, Okinawa Pref., Japan; Inger, 1957: 396, locality not mentioned.

Holotype. NSMT—P. 18200, ♂, 136 mm in standard length, Sumiyoshi, Iriomotejima, Okinawa Pref., Japan, April, 1974.

Paratypes. NSMT—P. 18201, ♂ (1) and 18202, ♀ (1), 153 and 160 mm S. L., Samut Prakan Prov., Thailand, July 23, 1964; NSMT—P. 18203, ♂ (1), 123 mm S. L., Tungkang, Pingtung Pref., Taiwan, November 28, 1964; NSMT—P. 18204, ♀ (1) and 18205, ♂ (1), 115 and 120 mm S. L., L. Laguna, Philippines, October, 1966; NSMT—P. 18206, ♀ (1), 122 mm S. L., lower stream of middle reaches of Ilan R., Ilan Pref., Taiwan, April 12, 1967; NSMT—P. 18207, ♀ (1) and 18208, ♂ (1), 165 and 200 mm S. L., Seletar R., Singapore, April 15, 1969; NSMT—P. 18209, ♀ (1), 66 mm S. L., Gregory R., North Queensland, Australia; NSMT—P. 18210, ♂ (1), 157 mm S. L., Dunbar Cattle Station, Mitchell R., Queensland, Australia, October 25, 1947.

Other specimens. AMS I. 13055 (1), 99 mm S. L., Hughenden and Richmond, Queensland, Australia; LICPP 1927001 (1), 100 mm S. L., Pattani, Thailand; LICPP 1950005 (2), 33～47 mm S. L., Sungei Gaja, Kinabatangan Dist., Sabah, Malaysia; LICPP 1955003 (1), 75 mm S. L., Jala-jala, Luzon, Philippines; AMS IB. 4639 (1), 107 mm S. L., Mitchell R., Queensland, Australia; LICPP 1961005 (2), 89～98 mm S. L., Bangbang Creek, Los Banos, Laguna, Philippines; LICPP 1962031 (3), 38～47 mm S. L., Amaya, Tanza, Cavite, Luzon, Philippines; LICPP 1963095 (1), 183 mm S. L., mouth of Tuaran R., Tuaran Dist., Sabah, Malaysia; LICPP 1963096 (1), 90 mm S. L., Tuaran Fish Market, Sabah, Malaysia; LICPP 1963097 (1), 97 mm S. L., Davao City, Mindanao, Philippines; LICPP 1963098 (1), 126 mm S. L., Temon Dist., Progo Jogjakarta, Central Java, Indonesia; LICPP 1963099 (1), 86 mm S. L., Dagupan City, Luzon, Philippines; LICPP 1963100 (3), 68～94 mm S. L., Tanay, Rizal, Luzon, Philippines; LICPP 1963101 (1), 69 mm S. L., Manila, Luzon, Philippines; LICPP 1963104 (1), 75 mm S. L., Laoag, Ilocos Norte, Luzon, Philippines; LICPP 1964126 (31), 99～163 mm S. L., Samut Prakan Prov., Thailand; LICPP 1964133 (2), 108～117 mm S. L., Quinta Market, Quiapo, Manila, Luzon, Philippines; LICPP 1964134 (2), 104～113 mm S. L., Tungkang, Pingtung Pref., Taiwan; LICPP 1965033 (1), 144 mm S. L., Mekong, Cambodia; LICPP 1966076 (20), 113～269 mm S. L., L. Lanao, Mindanao, Philippines; LICPP 1966077 (76), 50～189 mm S. L., L. Laguna, Luzon, Philippines; AMS I. 17957-002 (9), 17～89 mm S. L., Gregory R., Queensland, Australia; AMS I. 17942-010 (4), 58～122 mm

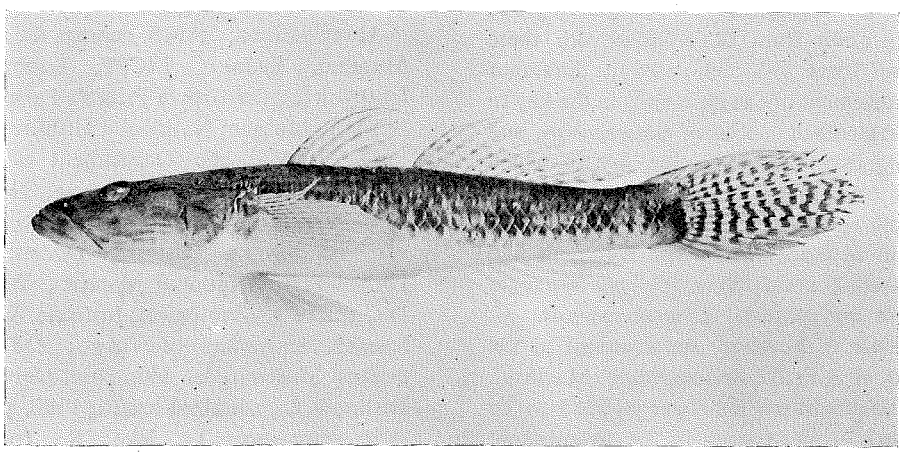

Fig. 1. *Glossogobius aureus*, sp. nov., holotype (NSMT-P. 18200, ♂, 136 mm in standard length) from Iriomotejima, Okinawa Pref., Japan.

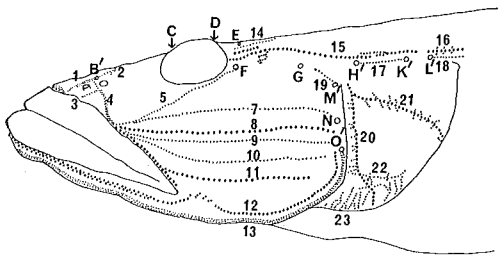

Fig. 2. The sensory canal pores and pit organs of the holotype (NSMT-P. 18200) of *Glossogobius aureus*, sp. nov. B′～O′, sensory canal pores; 1～23, rows of pit organs.

S. L., Saxby R., Queensland, Australia; AMS I. 18004–004 (1), 105 mm S. L., Gregory R., Queensland, Australia; AMS I. 17961–001 (1), 80 mm S. L., Saxby R., Queensland, Australia; LICPP 1967119 (2), 44～45 mm S. L., Gregory R., Gulf of Carpentaria, Queensland, Australia; LICPP 1967130 (3), 156～182 mm S. L., Chiukangkou, Yungansiang, Kaohsiung Pref., Taiwan; LICPP 1967139 (3), 69～83 mm S. L., Erhchieh, Wuchiehsiang, Ilan Pref., Taiwan; LICPP 1967140 (4), 62～103 mm S. L., Kangshanchi, Kangshanchen, Kaohsiung Pref., Taiwan; LICPP 1967169 (2), 73～99 mm S. L., mouth of Tanshui R., Shihtzutou, Wukuhsiang, Taipei Pref., Taiwan; AMS I. 17958–001 (1), 82 mm S. L., O'Shanassy R., Queensland, Australia; LICPP 1968342 (2), 130～146 mm S. L., Songkhla, Thailand; LICPP 1969182 (4), 111～134 mm S. L., Mekong, Cambodia; LICPP 1969194 (1), 185 mm S. L., upper Serangoon Fish Market, Singapore; LICPP 1969195 (3), 167～201 mm S. L., Seletar R., Singapore; LICPP 1970127 (22), 42～93 mm S. L., Laguna Bay, Luzon, Philippines; LICPP 1970133 (1), 122 mm S. L., Jurong R., Singapore; LICPP 1970140 (1), 248 mm S. L., Fisheries Research Institute, Penang, Malaysia; AMS I. 17950–008 (10), 61～117 mm S. L., Laura and Normanby R., Queensland, Australia; AMS I. 18245–001 (11), 41～62 mm S. L., Gregory R., Riversleigh Station, Queensland, Australia; AMS I. 16859–005 (2), 78 mm S. L., Northern Territory, Australia; LICPP 1 (1), 63 mm S. L., Gregory R., Queensland, Australia; LICPP 3 (1), 273 mm S. L., Manila, Luzon, Philippines.

Material used for comparison with *G. aureus*, sp. nov. *G. biocellatus*: RMNH 4539, probably holotype of *Gobius eleotrioides*, 59 mm S. L., Djakarta, Java, Indonesia; RMNH 4539, probably holotype of *Gobius sumatranus*, 52 mm S. L., Padang, Sumatera; USNM 51948, holotype of *Glossogobius aglestes*, 57 mm S. L., Negros, Philippines; USNM 51774 (2), syntypes of *Glossogobius vaisiganis*, 36～62 mm S. L., Apia, Western Samoa; AMS B. 8071 (1), 82 mm S. L., Madras, India; AMS I. 10733 (2), 63～68 mm S. L., and AMS IA. 14511 (5), 23～43 mm S. L., Cooktown, Queensland, Australia; AMS IA. 1803 (1), 56 mm S. L., Port Dension, Queensland, Australia; AMS I. 7381 (1), 37 mm S. L., South Port, Queensland, Australia; LICPP 1962032 (2), 56～58 mm S. L., Amaya, Tanza, Cavite, Luzon, Philippines; LICPP 1962035 (7), 23～64 mm S. L., Tamatave, Madagascar; LICPP 1963115 (1), 74 mm S. L., Sandakan Harbour, Sabah, Malaysia; LICPP 1968339 (1), 45 mm S. L., mouth of Miyara R., Ishigakijima, Okinawa Pref., Japan; AMS I. 16668–018 (1), 46 mm S. L., north of Maiwara, Papua New Guinea; AMS I. 17084–012 (2), 43～52 mm S. L., Madang, Papua New Guinea; AMS I. 17104–010 (1), 77 mm S. L., and AMS I. 17104–013 (1), 46 mm S. L., Port Moresby, Papua New Guinea; LICPP 1970141 (1), 60 mm S. L., Changi Beach, Singapore.

G. brunnoides: AMS IB. 3336 (1), 3339 (1) and 3341 (1), 85～90 mm S. L., Jimmi R., Camp 33 miles 6°E of N. E. of Mount Hagen airstrip, alt. 1200 ft., Papua New Guinea.

G. celebius: ZIUT 25545 (1), 25546 (1), 25547 (1), 25548 (1), 25549 (1), 25550 (1) and 25556 (1), 43～82 mm S. L., Philippines; AMS IA. 6340 (1), 101 mm S. L., South Bougainville Is., Papua New Guinea; the personal collection of the late Dr. Aoyagi (1), 64 mm S. L., Araba R., Iriomotejima, Okinawa Pref., Japan; AMS IB. 3583 (1), 98 mm S. L., Townsville, Queensland, Australia; LICPP 1960003 (2), 45～95 mm S. L., Kuira R., Iriomotejima, Okinawa Pref., Japan; LICPP 1970128 (1), 46 mm S. L., L. Laguna, Luzon, Philippines; LICPP 5 (2), 106～111 mm S. L., Buin, Bougainville Is., Papua New Guinea.

G. circumspectus: AMS I. 9186, holotype, 93 mm S. L., Milne Bay, Papua New Guinea; LICPP 1927003 (1), 71 mm S. L., Pattani, Thailand; LICPP 1953004 (3), 73～89 mm S. L., Malabon, Rizal, Luzon, Philippines; LICPP

1963112 (3), 71～83 mm S. L., Pangasinan, Luzon, Philippines; LICPP 1963113 (2), 61～94 mm S. L., Tuaran Fish Market, Sabah, Malaysia; AMS I. 16669-009 (1), 61 mm S. L., and AMS I. 16670-016 (6), 41～84 mm S. L., Madang Harbour, Papua New Guinea.

G. concavifrons: AMS B. 9950, holotype, 80 mm S. L., Strickland R., Papua New Guinea; AMS IA. 7259 (1), 7260 (1) and 7261 (6), 37～69 mm S. L., Fly R., Papua New Guinea.

G. giuris: QM I. 220, holotype of *Eleotris laticeps*, 132 mm S. L., Queensland Coast, Australia; LICPP 1958004 (1), 84 mm S. L., Millstream Pool, Fortesque R., Western Australia; LICPP 1962028 (1), 112 mm S. L., Sanghar Dist., Pakistan; LICPP 1964125 (8), 139～192 mm S. L., Dakatia R., Chandpur, Bangladesh; LICPP 1965028 (30), 81～204 mm S. L., Madras, India; LICPP 1965031 (20), 34～57 mm S. L., Fitzroy R., Western Australia; LICPP 1967109 (7), 93～99 mm S. L., Laokeng, Chienwu, Litse Lotung, Ilan Pref., Taiwan; LICPP 1967112 (3), 58～79 mm S. L., Chingshuikang, Lotungchen, Ilan Pref., Taiwan; LICPP 1967139 (7), 76～123 mm S. L., Erhchieh, Wuchiehsiang, Ilan Pref., Taiwan; LICPP 1967215 (27), 152～229 mm S. L., L. Bato, Luzon, Philippines; AMS I. 17925-001 (2), 78～80 mm S. L., Burdekin R., near George Weir, Queensland, Australia; LICPP 1968342 (1), 145 mm S. L., Songkhla, Thailand; LICPP 1968356 (2), 93～99 mm S. L., Pichouchi, Tainan Pref., Taiwan; AMS I. 16668-004 (2), 187～204 mm S. L., north of Maiwara, Papua New Guinea; LICPP 1969183 (3), 94～117 mm S. L., Chandpur Market, Bangladesh; AMS I. 16835-002 (5), 40～73 mm S. L., and AMS I. 16856-001 (3), 59～62 mm S. L., Ord R., Northern Territory, Australia; AMS I. 18217-001 (17), 28～66 mm S. L., Maitland (20°51′S, 116°39′E), Western Australia; AMS I. 18358-011 (1), 62 mm S. L., Daintree, Queensland, Australia; LICPP 1975010 (3), 84～106 mm S. L., Saltwater Creek, Queensland, Australia; MNHN A. 1381 (1), syntype of *Gobius kokius*, 131 mm S. L., Pondicherry, India; MNHN A. 1387 (1), syntype of *Gobius kokius*, 133 mm S. L., Malabar, India; ZIUT 14857 (1), 104 mm S. L., Tainan Pref., Taiwan; LICPP 4 (1), 117 mm S. L., L. Bato, Luzon, Philippines; LICPP 37 (1), 143 mm S. L., Bangladesh; LICPP 1971218 (1), 121 mm S. L., branch of Cantho R., vicinity of Cantho City, Vietnam; LICPP 46 (2), 193～207 mm S. L., Hooghly Estuary, India.

G. kokius: MNHN 991 (6) and A. 1383 (1), syntypes, 39～76 mm S. L., Mauritius.

G. koragensis: LICPP 1964137 (6), 93～126 mm S. L., Senttani L., about 40 km from Djajapura, Indonesia.

G. matanensis: RMNH 13793, ~~holotype~~ syntype, 99 mm S. L., Soroaka at L. Matano, Celebes, Indonesia.

G. obscuripinnis: ZMB 6498 (4), syntype, 81～86 mm S. L., Rio Bicol, Sammlari Jager, Luzon, Philippines; LICPP 1962033 (2), 53～70 mm S. L., Ambuklao Reservoir, Mountain Prov., Luzon, Philippines.

G. olivaceus: LICPP 1964109 (1), 117 mm S. L., Ogōri Bay, Yamaguchi Pref., Japan; LICPP 1964121 (2), 86～106 mm S. L., Kōchi Pref., Japan; LICPP 1964122 (2), 107～109 mm S. L., Hinuma, Ibaragi Pref., Japan; LICPP 1964123 (1), 143 mm S. L., Higashinagasaki, Nishisonogi, Nagasaki Pref., Japan; LICPP 1965027 (2), 114～121 mm S. L., mouth of Amikake R., Kajiki, Aira, Kagoshima Pref., Japan; LICPP 1967111 (1), 86 mm S. L., Laokeng, Chienwn, Litse, Lotung, Ilan Pref., Taiwan; LICPP 1967112 (1), 84 mm S. L., Chingshuikang Wuchiesiang, Ilan Pref., Taiwan; LICPP 1967199 (4), 78～106 mm S. L., mouth of Tanshui R., Mitsang, Palihsiang, Taipei Pref., Taiwan; LICPP 1967140 (2), 71～73 mm S. L., Kangshanchi, Kangshanchen, Kaohsiung Pref., Taiwan; LICPP 1969178 (2), 134～141 mm S. L., Misaki, Akō, Hyōgo Pref., Japan; LICPP 1971055 (2), 92～119 mm S. L., Hamanako, Shizuoka Pref., Japan.

Diagnosis Second dorsal mostly I, 9; anal mostly I, 8; pectoral 16～21; scales in a longitudinal series 29～34; scales in a transverse series 8～12; predorsal scales 19～29. Head length 28～35%, eye diameter 4～11% of standard length. No projection from iris. Gill-membrane attached to isthmus. Lower tip of gill-opening behind lower tip of cleithrum. Anterior oculoscapular canal with pores B′, C (single), D (single), E, F, G and H′. Postreior oculoscapular canal with pores K′ and L′. Preopercular canal with pores M′, N and O′. Lines of pit organs mostly in single rows. Five longi-

tudinal lines (7, 8, 9, 10 and 11) below line 5. Line 6 absent. Lines 9 and 10 in single or irregular double rows. Line 13 in two or more rows. Lines 20 and 21 branched but not line 22. A group (23) of irregular short rows present. Outer gill-rakers 8～11; inner gill-rakers in advance of outer foremost gill-rakers 1～2; 4～9 gill-raker spines on the fifth from uppermost outer gill-raker of lower limb. No blackish dots on dorsal part of body. Middle blotch of the five lateral blotches narrower than half the depth of body at this position. Anal fin and pelvic fins not mottled, caudal fin mottled with dark spots.

Description of the holotype and ten paratypes Descriptions are made on the left side of the specimens. Proportions are expressed as per cent of standard length. Counts and proportions of the holotype are given first, followed by those of paratypes in parentheses. First dorsal rays VI (VI); second dorsal rays I, 9 (I, 9); anal rays I, 8 (I, 8～9); pectoral rays 19 (18～21); pelvic rays I, 5 (I, 5); scales in a longitudinal series 34 (31～33); scales in a transverse series 10 (9～10); predorsal scales 24 (22～27). Head length 35 (32～35); head depth and width at posterior margin of preopercle 15 (14～17) and 18 (16～19), body depth at origin of pelvic fins 18 (14～19), body width at origin of pectoral fins 18 (16～19). Anterior nostril tubular, tube reaching a point about halfway between base of tube and upper lip. Posterior nostril a pore. Eye diameter 6 (4～6). Upper jaw length 14 (12～14), no difference between sexes, posterior end of maxillary extending below the anterior part of eye. Lower tip of gill-opening behind lower tip of cleithrum. Second, third and fourth spines of the first dorsal fin slightly filamentous. Pelvic fins united into an oval disc and margin of interspinal frenum smooth. Genital papilla tapering to a point in the male and round in the female, distal end without processes. Tongue bilobate. Anterior oculoscapular canal with pores B′, C (single), D (single), E, F, G and H′; posterior oculoscapular canal with pores K′ and L′. Between the pores C and D a single canal. Preopercular canal with pores M′, N and O′. Canal pore C of the holotype irregularly paired, the right one more central to the longitudinal axis and slightly behind the left one. Pit organs mostly in single rows. Five longitudinal single-row lines (7, 8, 9, 10 and 11) below line 5. Line 1 in double rows. Line 6 absent. Line 12 showing a discontinuity behind the corner of mouth, and under lower jaw in irregular double rows but in single row posteriorly. Line 13 in double (the holotype included) or triple rows. Lines 20 and 21 branched but not line 22. Below line 22 a group (23) of irregular short rows. Some variation was found among the types. Line 3 of one paratype and line 4 of the holotype and two paratypes in irregular double rows. A longitudinal line between lines 14 and 15 on the left side of the holotype but not on the right side. Line 14 folded in three in one paratype and some irregular short lines between lines 14 and 15 in another paratype. Vertebrae 27 including urostyle.

Coloration of the holotype in formalin after two months of preservation. Head and body dark above, pale below. Six blackish bands across the back: two before first dorsal fin, one beneath first dorsal fin, one beneath second dorsal fin, and two on caudal peduncle. Five blackish blotches midlaterally along side of body, width of middle blotch narrower than half depth of body at this position. A blackish blotch on body behind base of upper part of pectoral fins. Several inconspicuous blackish lines running along side. Three blackish lines from eye: one to middle part of upper and lower jaw, a horizontal one to upper margin of anterior part of preopercle, an oblique one to posterior margin of preopercle. Cheek and opercle mottled with blackish blotches. Five longitudinal pale lines on lower part of cheek. Two blackish blotches at base of pectoral fins, upper dark. First dorsal fin mottled, membrane behind sixth spine mottled darker. Second dorsal fin and upper part of pectoral fins dusky and regularly mottled with dark spots. Caudal fin dusky and regularly mottled with dark spots except for uppermost and lowermost part, lower unmottled part broader. Upper edge of caudal fin dark and lower edge pale. Anal fin pale with some dusky hue, paler towards edge. Lower part of pectoral fins and pelvic fins pale with a dusky hue.

Description of some characters observed in stained specimens (LICPP 1963098*, 1964126,

1964133*, 1964134*, 1965033*, 1966076*, 1966077*, 1967133*, 1969182* and 1970133*). Segmented caudal rays 9+8=17. Teeth in outer and inner rows of both jaws large, outer larger, fine teeth between outer and inner rows. Snout and cheek naked. Upper part of preopercle and opercle and areas behind eyes to first dorsal fin and part anterior to pelvic fins covered with cycloid scales. Rest of body covered with ctenoid scales. Calcified outer gill-rakers of the first gill-arch rod-like with pointed tip, 1~2 on upper limb, 7~9 on lower limb, the inner side with spines. 4~9 gill-raker spines on the fifth from uppermost outer gill-raker of lower limb. Inner gill-rakers of the first gill-arch stubby with spines on them. Inner gill-rakers in advance of the outer foremost gill-rakers 1~2. Tip of glossohyal round.

Variation. Some variation was found on the left side of 47 specimens out of 249 specimens examined, including line 6, which was examined on both sides. The holotype has an irregularly paired canal pore C as mentioned above and two specimens have no canal pore C. Line 6 is present on both sides in two specimens (119~219 mm S. L.), on left side in three specimens (53~142 mm S. L.) and on right side in two specimens (185~201 mm S. L.). In 22 specimens (113~276 mm S.L.) lines 9 and 10 in irregular double rows, but no triple rows. Such a condition was found in other single-row lines of some specimens. Line 21 is unbranched in 15 specimens (33~93 mm S.L.) the right side of which has also line 21 unbranched.

In some specimens a blackish spot is found on the membrane behind the sixth spine. These differences are not geographical variations because the specimens with these characters were collected together with the typical specimens, and the occurrence of these specimens is rare compared with the typical specimens.

Distribution The northern limit: Iriomote-jima (ca. 24°20′N, 123°50′E), Okinawa Prefecture, Japan; the southern and eastern limit: Launa and Normanby River (ca. 15°50′S, 144° 30′E), Queensland, Australia; the western limit: Penang (ca. 5°20′N, 100°25′E), Malaysia.

* Only gill-rakers stained.

Previous records of *Glossogobius aureus*. *G. aureus* is a common and widely distributed species, but it has been confuesd with *G. giuris*. We regard the four records of *G. giuris* mentioned above, as *G. aureus*. *G. giuris* was described by Aurich (1938: 144) and Inger (1957: 396) as having 24 or more predorsal scales and the characteristic arrangement of single row pit organs as found in *G. aureus*. We also regard the *G. giuris* of Smith as *G. aureus* because his collection has *G. aureus* under the name of *G. giuris* (Smith, 1945: 542). Further, the *G. giuris* of Aoyagi is regarded as *G. aureus* on the basis of the description of its having 24 predorsal scales (Aoyagi, 1957: 238), but the specimen is not extant.

Etymology This species is named from pla bu tong (golden goby) as it is called in the Maenam Chao Phya (Smith, 1945: 542). Smith's collection contains specimens of this species from Pattani and Samut Prakan in Thailand under the name of *Glossogobius giuris*.

Comparison with related species Before making detailed comparison of *G. aureus* with 11 related *Glossogobius* species, a few remarks are made on the species which were presented by Koumans (1953: 165) as synonyms of *G. giuris*. Koumans (1953: 165) presented many synonyms of *G. giuris*, some of which belong to or seem to belong to different genera. *Gobius brunneus* Temminck and Schlegel belongs to *Rhinogobius*, as Koumans (1935: 149) has shown. *Gobius fusiformis* Bleeker does not belong to *Glossogobius* because of the prominent upper jaw. *Gobius suppositus* Sauvage has such characteristics as a round tongue tip, no predorsal scale and no scale on anterior part of pelvic fins, which are not found in the *Glossogobius* species which we examined at this time. *Gobius boscii* Sauvage was not compared in detail because it is from Martinique and not sympatric with *G. aureus*. *Stupidogobius flavipinnis* Aurich has no canal, so it is not closely related to *G. aureus*.

The arrangement of pit organs of *Glossogobius intermedius* Aurich is the same as those of *Glossogobius matanensis* according to Aurich (1938: 145) so it is clearly different from *G. aureus*. However, as the type specimens were

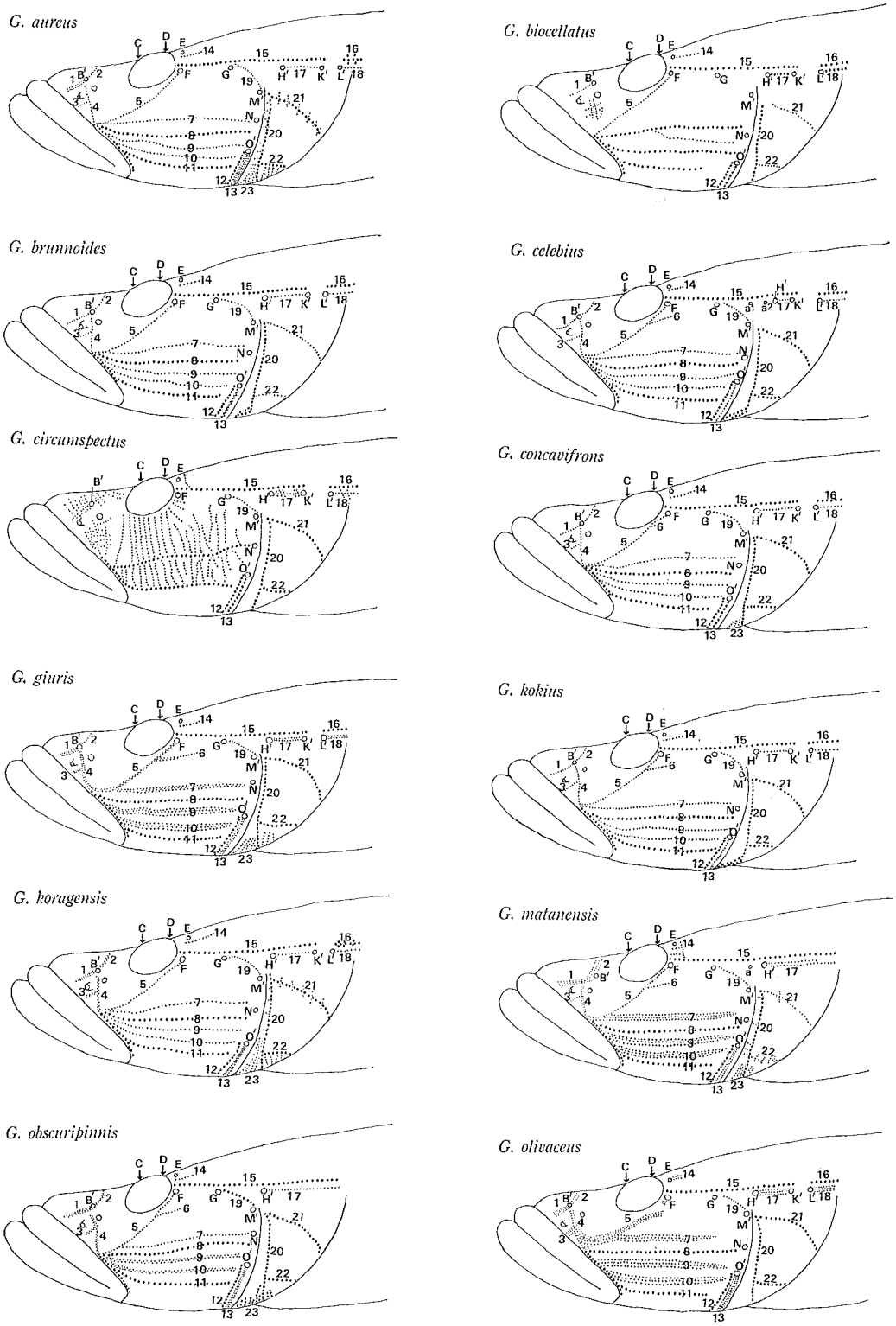

Fig. 3. Schematic figures of the sensory canal pores and pit organs of the 12 species of *Glossogobius*.

not examined, it is not clear whether it is a distinct species or not. Other species which were not mentioned in this paper were indistiguishable because of the lack or poor conditions of the type specimens.

The most important characteristics by which *G. aureus* can be distinguished from other species of *Glossogobius* are the arrangement of canal pores and pit organs (Fig. 3).

With respect to the arrangement of the canal pores, out of 12 species of *Glossogobius* the following nine species have the same pattern: *G. aureus, G. biocellatus, G. brunnoides, G. circumspectus, G. concavifrons, G. giuris, G. kokius, G. koragensis* and *G. olivaceus*. The following three species are different from the above nine species: *G. celebius* has two additional pores, a1 and a2 (Prince Akihito and Meguro, 1975: fig. 3); *G. matanensis* has paired canal pores C*, one additional pore, a, and no posterior oculoscapular canal; *G. obscuripinnis* has no posterior oculoscapular canal.

The arrangement of the pit organs in the species of *Glossogobius*, except in *G. biocellatus* and *G. circumspectus*, is similar in basic pattern. Differences are found in the number of rows in a line, the presence or absence of line 6, the presence or absence of branches on lines 20 and 21, and the presence or absence of a group (23) of irregular short rows. From *G. giuris, G. aureus* differs in that *G. aureus* has single or rarely irregular double rows in lines 9 and 10, whereas *G. giuris* as well as *G. matanensis* has triple rows in lines 9 and 10, but no double rows, *G. olivaceus* has three or more rows; *G. aureus* has no line 6 except some specimens mentioned above, whereas *G. giuris* has line 6; *G. aureus* has branches on lines 20 and 21, except the few specimens mentioned above, whereas *G. giuris* has no branches on lines 20 and 21, except in two out of 154 specimens which have one or two pit organs before line 20. Among the species with lines mostly in a single row *G. aureus* differs from *G. brunnoides* in two or more rows of line 13, the presence of branches on lines 20 and 21, and the presence of a group (23) of irregular short rows, but the lowest part of line 20 of *G. brunnoides* in irregular rows; from *G. celebius* in the absence of line 6, two or more rows of line 13, the presence of branches on lines 20 and 21, and the presence of a group (23) of irregular short rows, but the lowest part of line 20 in irregular rows; from *G. concavifrons* in the absence of line 6, two or more rows of line 13, the presence of branches on lines 20 and 21, and the absence of a group (23) of irregular short rows; from *G. kokius* in the absence of line 6, two or more rows of line 13, the presence of branches on lines 20 and 21, and the presence of a group (23) of irregular short rows; from *G. obscuripinnis* in the absence of line 6, the presence of branches on lines 20 and 21. No differences are found between *G. aureus* and *G. koragensis* in the arrangement of pit organs.

Differences in counts of fin rays and scales among species of *Glossogobius* are not clear except for the fewer number of second dorsal and anal rays in *G. obscuripinnis* and the number of predorsal scales in some species (Tables 1～3). *G. aureus* is characterized by having the most numerous predorsal scales among the species of *Glossogobius*. It differs in having fewer scales in a transverse series than *G. koragensis* whose arrangement of pit organs is similar to that of *G. aureus*. The difference in predorsal scales between *G. aureus* and *G. giuris* is not as clear as previously published (Prince Akihito, 1966: table 4).

Proportional measurements of head length and eye diameter are different in some species. *G. aureus* can be discriminated from *G. koragensis* in the head length and *G. aureus* can be discriminated from *G. celebius* and *G. matanensis* in the eye diameter (Table 4).

A difference in the position of the lower tip of the gill-opening with respect to the cleithrum is found between *G. brunnoides, G. concavifrons, G. kokius* and *G. obscuripinnis* (the lower tip of the gill-opening is before the position at lower tip of cleithrum) and the other eight species, where the lower tip of the gill-opening is behind the position at the lower tip of cleithrum.

The number of gill-rakers, the position of outer gill-rakers in relation to inner gill-rakers and spines on the gill-rakers are also characteristic in distinguishing some *Glossogobius* species;

* It is unknown whether this is really a diagnostic character of this species or not, because only one specimen was examined and irregular paired canal pores C were found in the holotype of *G. aureus* as mentioned above.

Table 1. Counts of second dorsal, anal and left pectoral rays.

	Second dorsal rays					Anal rays			Pectoral rays								
	I, 7	I, 8	I, 9	I, 10	I, 11	I, 7	I, 8	I, 9	14	15	16	17	18	19	20	21	22
G. aureus	1	11	236*	1		1	230*	18			1	13	36	127*	67	5	
G. biocellatus			34				33	1				16	17	1			
G. brunnoides				3			3						1	2			
G. celebius			15				15					1	2	8	4		
G. circumspectus		1	15*	1			17*						2*	15			
G. concavifrons				1*	8		5*	4			1	4	4*				
G. giuris		19	135			2	150	2				4	17	38	47	27	20
G. kokius			5	2			6	1				1	3	3			
G. koragensis			6				6						1	4	1		
G. matanensis			1*				1*					1*					
G. obscuripinnis		6				6			1	1	3	1					
G. olivaceus			20				20						2	11	7		

* Holotype included.

Table 2. Counts of scales in a longitudinal series and in a transverse series.

	Scales in a longitudinal series											Scales in a transverse series						
	25	26	27	28	29	30	31	32	33	34	35	7	8	9	10	11	12	13
G. aureus					4	16	48	94	80	7*			1	23	195*	26	4	
G. biocellatus	1		3	6	6	5	9	3				1	15	15	2			
G. brunnoides							2	1						1	2			
G. celebius						1	2	4	7	1				9	6			
G. circumspectus					2	5	3*	2	3				3	12*				
G. concavifrons					1	4	4*								9*			
G. giuris					5	15	27	53	42	11	1			27	126	1		
G. kokius								2	4					1	5			
G. koragensis										2	4						4	2
G. matanensis											1*							1*
G. obscuripinnis							2	1	2						4	1		1
G. olivaceus							3	3	7	6	1			3	15	2		

* Holotype included.

Table 3. Counts of predorsal scales.

	Predorsal scales																
	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
G. aureus							2	1	4	21	40	47*	68	39	15	9	1
G. biocellatus	2	16	10	6													
G. brunnoides				2	1												
G. celebius	4	7	3	1													
G. circumspectus			1	3	11*	1	1										
G. concavifrons	2	4*	3														
G. giuris		3	5	9	14	17	42	31	17	12	3	1					
G. kokius		2	3		1												
G. koragensis											2		2	1	1		
G. matanensis										1*							
G. obscuripinnis			1	1			3										
G. olivaceus												2	8	6	4		

* Holotype included.

Table 4. Proportional measurements of head length and eye diameter in per cent of standard length.

	Head length											Eye diameter							
	28	29	30	31	32	33	34	35	36	37	38	4	5	6	7	8	9	10	11
G. aureus	1	2	1	2	11	14	23	7*				12	9	14*	20	4	1		1
G. biocellatus			3	4	9	14	6						1	13	14	6	2		
G. brunnoides				2	1									2	1				
G. celebius					1	6	4	4							5	7	3		
G. circumspectus					3*	5	7	2					1	5*	10	1			
G. concavifrons	1*	1	3	3	1										5*	4			
G. giuris				4	12	15	13	8				8	12	3	18	8	1	2	
G. kokius		2	3		2									1	2	4			
G. koragensis										3	3			5	1				
G. matanensis									1*							1*			
G. obscuripinnis							1	4		1				1	4		1		
G. olivaceus					7	7	4	1	1			1	10	9					

Syntype

* Holotype included.

Table 5. Number of outer gill-rakers and the position of one side of the foremost gill-raker in relation to the other side of the gill-rakers.

	Gill-rakers													Outer				Inner			
	5	6	7	8	9	10	11	12	13	14	15	16	17	3	2	1	0	1	2	3	4
G. aureus				2	12	5	1											7	13		
G. biocellatus	1			2	1	2										3	2	1			
G. celebius						1	1											2			
G. circumspectus										1	1	1	1		2	2					
G. giuris				2	1	6	7	4										5	5	9	1
G. koragensis					3														2	1	
G. obscuripinnis				1														1			
G. olivaceus								1	2	5	9	3		2	5	9	4				

Table 6. Number of gill-raker spines on the fifth from uppermost outer gill-raker of lower limb.

	Spines																					
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21···27
G. aureus					6	2	4	5	1	2												
G. biocellatus		1	1		3	1																
G. celebius					1								1									
G. circumspectus													1	1	1	1						
G. giuris	12	7		1																		
G. koragensis							1	2														
G. obscuripinnis	1																					
G. olivaceus											3	1	1	2	1	3	2	2		1	2	1···· 1

G. aureus can be separated from *G. giuris* in the number of spines on the gill-rakers, but no difference is found in the number of gill-rakers and the position of outer gill-rakers in relation to inner gill-rakers (Tables 5 and 6).

The difference of coloration of species of *Glossogobius* is not clear from the specimens examined except for *G. biocellatus, G. koragensis* and *G. olivaceus*. *G. biocellatus* differs clearly from the others by the presence of dots on the dorsal surface, mottling on the anal fin and pelvic fins, and the distinctly mottled lower part of the caudal fin. *G. koragensis* differs from the others by the larger lateral blotches, wider than half

the depth of body. *G. olivaceus* differs from the others by the dots on its dorsal surface.

No clear osteological differences were found between *G. aureus* and *G. giuris*.

Identification of *Glossogobius giuris* *G. giuris* was originally described by Hamilton (1822: 51, pl. 33, fig. 15) from the Gangetic provinces, but no type specimen exists (Greenwood, personal communication). Therefore *G. giuris* has to be identified from the original description and figure of Hamilton (1822: 51, pl. 33, fig. 15). From the original description and figure only one characteristic, the high number of pectoral rays, is capable of distinguishing *G. giuris* from other species of *Glossogobius* (Table 1). According to Hamilton (1822: 51), *G. giuris* has 22 rays in each pectoral fin. Among the numerous specimens examined, only one form has as many as 22 pectoral rays; this form was taken from the Gangetic waters, and therefore we regard it to be *G. giuris*. It is this form of *G. giuris* from Taiwan that the Japanese name "hutago-haze" was given by Tomiyama (1936: 88).

The diagnoses of 11 species of *Glossogobius* with their synonyms (Fig. 3 and Tables 1~6) The gill-rakers of some species were not examined because they were unable to be stained.

Glossogobius biocellatus (Valenciennes)
(Japanese name: hitomihaze)

Gobius biocellatus Valenciennes, 1837: 73. Pondicherry, India. Holotype examined by Dr. le Danois.

Gobius eleotrioides Bleeker, 1849: 25. Djakarta, Indoneisa. Types examined by us.

Gobius sumatranus Bleeker, 1854: 83. Sumatera, Indonesia. Types examined by us.

Glossogobius aglestes Jordan and Seale, 1905: 798, fig. 16. Negros, Philippines. Types examined by us.

Glossogobius vaisiganis Jordan and Seale, 1906: 403, figs. 93. Apia, Western Samoa. Types examined by us.

Glossogobius abacopus Jordan and Richardson, 1909: 200. Taiwan. Type not seen, but judged as a synonym on the basis of the original description.

Second dorsal I, 9; anal I, 8; pectoral 17~19; scales in a longitudinal series 26~32; scales in a transverse series 7~9; predorsal scales 13~16. Head length 30~34%, eye diameter 5~9% of standard length. A projection from upper part of iris into pupil. Gill-membranes united across isthmus. Anterior oculoscapular canal with pores B′, C (single), D (single), E, F, G and H′. Posterior oculoscapular canal with pores K′ and L′. Preopercular canal with pores M′, N and O′. Lines of pit organs in single rows. Four longitudinal lines of pit organs below line 5. Outer gill-rakers 5~10; outer and inner foremost gill-rakers about equal in position; 1~5 gill-raker spines on the fifth from uppermost outer gill-raker of lower limb. Blackish dots on the dorsal part of body. The shape of lateral blotches not distinct. Anal fin and pelvic fins mottled with dark spots; lower part of caudal fin distinctly mottled with dark spots.

Glossogobius brunnoides (Nichols)

Gobius (*Glossogobius*) *brunnoides* Nichols, 1951: 6, fig. 4. Papua New Guinea. Type not seen. The specimens described by Whitley (1956: 29) were examined.

Second dorsal I, 10; anal I, 8; pectoral 18~19; scales in a longitudinal series 31~32; scales in a transverse series 9~10; predorsal scales 16~17. Head length 31~32%, eye diameter 6~7% of standard length. No projection from iris. Gill-membrane attached to isthmus. Lower tip of gill-opening before lower tip of cleithrum. Anterior oculoscapular canal with pores B′, C (single), D (single), E, F, G and H′. Posterior oculoscapular canal with pores K′ and L′. Preopercular canal with pores M′, N and O′. Lines of pit organs mostly in single rows. Five longitudinal lines (7, 8, 9, 10 and 11) below line 5. Line 6 absent. Lines 9 and 10 in single rows. Line 13 in irregular double rows. Lines 20, 21 and 22 unbranched. The lowest part of line 20 in irregular rows, but a group (23) of irregular short rows absent. No blackish dots on the dorsal part of body. Anal fin and pelvic fins unmotled; caudal fin mottled with dark spots.

Glossogobius celebius (Velenciennes)
(Japanese name: iwahaze)

Gobius Celebius Valenciennes, 1837: 69. Celebes, Indonesia. A syntype examined by Dr. le Danois.

Second dorsal I, 9; anal I, 8; pectoral 17~20;

scales in a longitudinal series 30～34; scales in a transverse series 9～10; predorsal scales 13～16. Head length 32～35%, eye diameter 7～9% of standard length. No projection from iris. Gill-membrane attached to isthmus. Lower tip of gill-opening a little behind lower tip of cleithrum. Anterior oculoscapular canal with pores B′, C (single), D (single), E, F, G and H′ with two additional pores, a1 and a2, between pores G and H′. Posterior oculoscapular canal with pores K′ and L′. Preopercular canal with pores M′, N and O′. Lines of pit organs mostly in single rows. Five longitudinal lines (7, 8, 9, 10 and 11) below line 5. Line 6 in long single row, pit organs more than five. Lines 9 and 10 in single rows. Line 13 in single row. Lines 20, 21, and 22 unbranched. The lowest part of line 20 in irregular rows, but a group (23) of irregular short rows absent. Outer gill-rakers 10～11; inner gill-rakers in advance of outer foremost gill-rakers 1; 4～12 gill-raker spines on the fifth from uppermost outer gill-raker of lower limb. No blackish dots on the dorsal part of body. The middle blotch of the five lateral blotches narrower than half the depth of body at this position. Anal and pelvic fins unmottled; caudal fin mottled with dark spots.

Glossogobius circumspectus (Macleay)

Gobius circumspectus Macleay, 1884: 267. Papua New Guinea. Holotype examined by us.

Glossogobius sandakanensis Inger, 1957: 393, fig. 6, Sabah, Malaysia. Type not seen, but judged as a synonym on the basis of the original description.

Second dorsal I, 9; anal I, 8; pectoral 18～19; scales in a longitudinal series 29～33; scales in a transverse series 8～9; predorsal scales 15～19. Head length 32～35%, eye diameter 5～8% of standard length. No projection from iris. Gill-membrane attached to isthmus. Lower tip of gill-opening behind lower tip of cleithrum. Anterior oculoscapular canal with pores B′, C (single), D (single), E, F, G and H′. Posterior oculoscapular canal with pores K′ and L′. Preopercular canal with pores M′, N and O′. Transverse lines of pit organs on cheek. Outer gill-rakers 14～17; outer gill-rakers in advance of inner foremost gill-rakers 1～2; 12～15 gill-raker spines on the fifth from uppermost outer gill-raker of lower limb. No blackish dots on dorsal part of body. Middle blotch of the five lateral blotches narrower than half the depth of body at this position. Anal fin and pelvic fins unmottled; caudal fin mottled with dark spots.

Glossogobius concavifrons (Ramsay and Ogilby)

Gobius concavifrons Ramsay and Ogilby, 1887: 12. Papua New Guinea. Holotype examined by us.

Second dorsal I, 10～11; anal I, 8～9; pectoral 16～18; scales in a longitudinal series 29～31; scales in a transverse series 10; predorsal scales 13～15. Head length 29～32%, eye diameter 7～8% of standard length. No projection from iris. Gill-membrane attached to isthmus. Lower tip of gill-opening before lower tip of cleithrum. Anterior oculoscapular canal with pores B′, C (single), D (single), E, F, G and H′. Posterior oculoscapular canal with pores K′ and L′. Preopercular canal with pores M′, N and O′. Lines of pit organs mostly in single rows. Five longitudinal lines (7, 8, 9, 10 and 11) below line 5. Line 6 in short single row, number of pit organs one or two. Lines 9 and 10 in single row. Line 13 in single row. Lines 20, 21 and 22 unbranched. The lowest part of line 20 in irregular rows, but a group (23) of irregular short rows absent. Blackish dots on the dorsal part and the side of body. The shape of lateral blotches not distinct. Anal fin and pelvic fins unmottled; caudal fin mottled with dark spots.

Glossogobius giuris (Hamilton)
(Japanese name: futagohaze)

Gobius giuris Hamilton, 1822: 51, pl. 33, fig. 15. Gangetic provinces, India. No type exists.

Gobius Russelii Valenciennes, 1837: 75. Pondicherry, India. Holotype examined by Dr. le Danois.

Gobius catebus Valenciennes, 1837: 76. Rangoon, Burma. A syntype examined by Dr. le Danois.

Gobius spectabilis Günther, 1861: 45. India. A possible type examined by Dr. Greenwood.

Eleotris laticeps De Vis, 1884: 692. Queensland Coast, Australia. Holotype examined by us.

Second dorsal mostly I, 9; anal mostly I, 8; pectoral 17～22; scales in a longitudinal series 29～35; scales in a transverse series 9～11;

predorsal scales 14～24. Head length 31～35%, eye diameter 4～10% of standard length. No projection from iris. Gill-membrane attached to isthmus. Lower tip of gill-opening behind lower tip of cleithrum. Anterior oculoscapular canal with pores B′, C (single), D (single), E, F, G and H′. Posterior oculoscapular canal with pores K′ and L′. Preopercular canal with pores M′, N and O′. Lines of pit organs in single and pluriserial rows. Five longitudinal lines (7, 8, 9, 10 and 11) below line 5. Line 6 in long single or double rows, number of pit organs more than five in a row. Lines 9 and 10 in triple rows. Line 13 in double rows. Lines 20, 21 and 22 unbranched. A group (23) of irregular short rows present. Outer gill-rakers 8～12; inner gill-rakers in advance of outer foremost gill-rakers 1～4; 0～3 gill-raker spines on the fifth from uppermost outer gill-raker of lower limb. No blackish dots on dorsal part of body. Middle blotch of the five lateral blotches narrower than half the depth of body at this position. Anal fin and pelvic fins unmottled; caudal fin mottled with dark spots.

Glossogobius kokius (Valenciennes)

Gobius kokius Valenciennes, 1837: 68. Mauritius. Types examined by us.

Second dorsal I, 9～10; anal mostly I, 8; pectoral 17～19; scales in a longitudinal series 32～33; scales in a transverse series 9～10; predorsal scales 14～17. Head length 29～32%, eye diameter 6～8% of standard length. No projection from iris. Gill-membrane attached to isthmus. Lower tip of gill-opening before lower tip of cleithrum. Anterior oculoscapular canal with pores B′, C (single), D (single) E, F, G and H′. Posterior oculoscapular canal with pores K′ and L′. Preopercular canal with pores M′, N and O′. Lines of pit organs mostly in single rows. Five longitudinal lines (7, 8, 9, 10 and 11) below line 5. Line 6 in long single row, pit organs more than five. Lines 9 and 10 in single rows. Line 13 in single row. Lines 20, 21 and 22 unbranched. The lowest part of line 20 in irregular rows, but a group (23) of irregular short rows absent. No blackish dots on dorsal part of body. Middle blotch of the five lateral blotches narrower than half the depth of body at this position. Anal fin and pelvic fins unmottled; caudal fin mottled with dark spots.

The specimens from Pondicherry and Malabar, India in the syntypes of *G. kokius* are *G. giuris*, so they must be omitted from the syntypes of *G. kokius*.

Glossogobius koragensis Herre

Glossogobius koragensis Herre, 1935: 419. Papua New Guinea. Type not seen.

Second dorsal I, 9; anal I, 8; pectoral 18～20; scales in a longitudinal series 34～35; scales in a transverse series 12～13; predorsal scales 23～27. Head length 37～38%, eye diameter 6～7% of standard length. No projection from iris. Gill-membrane attached to isthmus. Lower tip of gill-opening behind lower tip of cleithrum. Anterior oculoscapular canal with pores B′, C (single), D (single), E, F, G and H′. Posterior oculoscapular canal with pores K′ and L′. Preopercular canal with pores M′, N and O′. Lines of pit organs mostly in single rows. Five longitudinal lines (7, 8, 9, 10 and 11) below line 5. Line 6 absent. Lines 9 and 10 in single rows. Line 13 in double rows. Lines 20 and 21 branched but not line 22. A group (23) of irregular short rows present. Outer gill-rakers 9; inner gill-rakers in advance of outer foremost gill-rakers 2～3; 6～7 gill-raker spines on the fifth from uppermost outer gill-raker of lower limb. No blackish dots on dorsal part of body. Middle blotch of the five lateral blotches wider than half the depth of body at this position. Anal fin and pelvic fins unmottled; caudal fin mottled with dark spots.

Glossogobius matanensis (Weber) Syntype

Gobius matanensis Weber, 1913: 209, fig. 7. Celebes, Indonesia. Holotype examined by us.

Second dorsal I, 9; anal I, 8; pectoral 17; scales in a longitudinal series 35; scales in a transverse series 13; predorsal scales 22. Head length 36%, eye diameter 8% of standard length. No projection from iris. Gill-membrane attached to isthmus. Lower tip of gill-opening behind lower tip of cleithrum. Anterior oculoscapular canal with pores B′, C (paired*), D (single), E, F, G and H′ with an additional pore, a, between pores G and H′. No posterior oculoscapular canal. Preopercular canal with pores M′, N and O′. Lines of pit organs in

* Only one specimen was examined.

single and pluriserial rows. Five longitudinal lines (7, 8, 9, 10 and 11) below line 5. Line 6 in long single row, pit organs more than five. Lines 9 and 10 in triple rows. Line 13 in double rows. A transverse line behind line 14. Lines 15 and 16, lines 17 and 18 not separated. Lines 20, 21 and 22 branched. A group (23) of irregular short rows present. Pattern indistinct, due to poor condition of specimen.

Glossogobius obscuripinnis (Peters)

Gobius obscuripinnis Peters, 1868: 263. Luzon, Philippines. Types examined by us.

Second dorsal I, 8; anal I, 7; pectoral 14～17; scales in a longitudinal series 31～33; scales in a transverse series 10～13; predorsal scales 15～19. Head length 34～37%, eye diameter 6～9% of standard length. No projection from iris. Gill-membrane attached to isthmus. Lower tip of gill-opening before lower tip of cleithrum. Anterior oculoscapular canal with pores B′, C (single), D (single), E, F, G and H′. No posterior oculoscapular canal. Preopercular canal with pores M′, N and O′. Lines of pit organs mostly in single rows. Five longitudinal lines (7, 8, 9, 10 and 11) below line 5. Line 6 in long single row, pit organs more than five. Lines 9 and 10 in irregular double rows. Line 13 in double rows. Lines 15 and 16, lines 17 and 18 not separated. Lines 20, 21 and 22 unbranched. A group (23) of irregular short rows present. Outer gill-rakers 8; inner gill-rakers in advance of outer foremost gill-rakers 1; no gill-raker spines on the fifth from uppermost outer gill-raker of lower limb. No blackish dots on the dorsal part of body. Middle blotch of the five lateral blotches wider than half the depth of body at this position. Anal fin and pelvic fins unmottled; caudal fin mottled with dark spots.

Glossogobius olivaceus
(Temminck and Schlegel)
(Japanese name: urohaze)

Gobius olivaceus Temminck and Schelgel, 1845: 143, pl. 74, fig. 3. Japan. The identification was made on the basis of a photograph of the original Japanese drawing in Burger's collection, which was used in the original description.

Gobius fasciato-punctatus Richardson, 1845: 145, pl. 62, figs. 13 and 14. Kuang-chon, China. Type not seen.

Second dorsal I, 9; anal I, 8; pectoral 18～20; scales in a longitudinal series 31～35; scales in a transverse series 9～11; predorsal scales 24～27. Head length 32～36%, eye diameter 4～6% of standard length. No projection from iris. Gill-membrane attached to isthmus. Lower tip of gill-opening behind lower tip of cleithrum. Anterior oculoscapular canal with pores B′, C (single), D (single), E, F, G and H′. Postrior oculoscapular canal with pores K′ and L′. Preopercular canal with pores M′, N and O′. Lines of pit organs in single and pluriserial rows. Five longitudinal lines (7, 8, 9, 10 and 11) below line 5. Line 5 discontinuoust. Line 6 absent. Lines 9 and 10 in three or more rows. Line 13 in two or more rows. Lines 20, 21 and 22 unbranched. A group (23) of irregular short rows absent. Outer gill-rakers 12～16; outer gill-rakers in advance of inner foremost gill-rakers 0～3; 10～27 gill-raker spines on the fifth from uppermost outer gill-raker of lower limb. Blackish dots on dorsal part of body. Middle blotch of the five lateral blotches wider than half the depth of body at this position. Anal fin and pelvic fins unmottled; caudal fin mottled with dark spots.

Key to the 12 species of *Glossogobius* mostly based on the arrangement of pit organs

1a. Transverse lines on cheek. ..... *G. circumspectus*
1b. Longitudinal lines on cheek 2
2a. Four longitudinal lines below line 5 on cheek. ..... *G. biocellatus*
2b. Five longitudinal lines (7, 8, 9, 10 and 11) below line 5 on cheek. 3
3a. Lines 9 and 10 in single or irregular double rows. 4
3b. Lines 9 and 10 in three or more rows. ... 5
4a. Line 6 present. 6
4b. Line 6 absent 7
5a. A transverse line behind line 14; lines 15 and 16, lines 17 and 18 not separated with the absence of posterior oculoscapular canal; lines 20, 21 and 22 branched. ..... *G. matanensis*
5b. No transverse line behind line 14; lines 15 and 16, lines 17 and 18 separated with the presence of posterior oculoscapular canal; lines 20, 21 and 22

unbranched. 8

6a. Lines 9 and 10 in irregular double rows; line 13 in double rows; lines 15 and 16, lines 17 and 18 not separated with the absence of posterior oculoscapular canal. ..... *G. obscuripinnis*

6b. Lines 9 and 10 in single rows; line 13 in single row; lines 15 and 16, lines 17 and 18 separated with the presence of posterior oculoscapular canal. 9

7a. Lines 20 and 21 unbranched. ..... *G. brunnoides*

7b. Lines 20 and 21 branched. 10

8a. Line 5 continuous; line 6 present; a group (23) of short irregular rows present. ..... *G. giuris*

8b. Line 5 discontinuous; line 6 present; a group (23) of short irregular rows absent. ..... *G. olivaceus*

9a. Line 6 short, pit organs one or two. ..... *G. concavifrons*

9b. Line 6 long, pit organs more than five. 11

10a. Head length 28~35% of standard length; middle blotch of the five lateral blotches narrower than the depth of body at this position. ..... *G. aureus*, sp. nov.

10b. Head length 37~38% of standard length; middle blotch of the five lateral blotches wider than the depth of body at this position. ..... *G. koragensis*

11a. Two additional pores, a1 and a2, between canal pores G and H′. ..... *G. celebius*

11b. No additional pores between canal pores G and H′. ..... *G. kokius*

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ハゼ科魚類の1新種 *Glossogobius aureus* とその近縁種に対する特徴　　明仁親王・目黒　勝介

フタゴハゼ *Glossogobius giuris* (Hamilton) と見なされていたウロハゼ属の1型は新種と認められたので *G. aureus* (新称: コンジキハゼ) として記載した．本種の最も重要な特徴は孔器の配列にある．ウロハゼ属の他の種と比較し，その特徴を明らかにした．

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