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Full Papers

Japanese Journal of Ichthyology

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Morphology and habitats of two gobiid species, *Pandaka trimaculata* and *P. lidwilli*, on Okinawa Island

Ken Maeda, Nozomi Yamasaki, Takahiko Mukai and Katsunori Tachihara

Abstract The morphology of the miniature gobies *Pandaka trimaculata* and *P. lidwilli* on Okinawa Island was described and their habitats were investigated. Postflexion larvae, juveniles and adults of the two species could usually be identified by body depth, in addition to the pigment pattern on the first dorsal fin of adults and juveniles, formerly the only known distinguishing characteristics. Postflexion larvae could also be identified by the arrangement of ventral melanophores on the tail. Postflexion larvae of the two species (6–7 mm in standard length = SL), collected by small seine net from the Teima Stream estuary at high tide and the surf zone of a beach near the estuary, from April to November, 1999, had almost full fin ray complements, there being no earlier stage larvae present. The occurrence of the two *Pandaka* species was investigated at 21 sampling stations along the Teima Stream from February to March and in July, 2006. Fishes at various developmental stages (6–14 mm SL), from

postflexion larvae to adults, were collected from stations set in shallow shores, and in small creeks and tide pools within the estuary. Therefore, it is suggested that the larvae arrived at the beach and estuary after spending most of their larval stages at sea, subsequently settling into adult habitats in the estuary where they became pigmented and completed their adult transformation. *Pandaka trimaculata* occurred in various habitats, being broadly distributed from the middle to upper reaches of the estuary. By contrast, *P. lidwilli* was restricted to stations in the middle reaches of the estuary, the preferred habitat always consisting of soft muddy substrate close to mangroves.

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Effects of suspended solid concentrations and particle size on survival of Ayu (*Plecoglossus altivelis altivelis*)

Keiko Muraoka, Kunihiko Amano, Takahide Doi, Hitoshi Kubota and Junji Miwa

Abstract The influence of highly concentrated suspended solids on Ayu (*Plecoglossus altivelis altivelis*) survival was examined experimentally. Ayu were initially exposed to particles of eight different sizes, ranging in concentration from 1,500 to 15,940 mg/l, and the survival rate over 24 hours recorded. Subsequently, Ayu were exposed to particles of two different sizes, ranging in concentration from 560 to 20,750 mg/l, the mass and particle size distribution of particles adhered to the gills being noted. The particle size distribution of suspended solids differed from that of adherent material on the gills. A comparison of the mass of particles adhered to the gills of surviving and dead fish indicated that fatal adherence of particles occurred in a short

time. The diameter of particles adhering to the gills was related to the space between two adjoining filaments. The use of particle sizes ranging from 19 to 54 μm to correct suspended solid concentrations enabled the determination of 90% survival levels of Ayu under different materials and suspended solid concentrations. The results indicated that survival states of adult Ayu in highly turbid rivers can be predicted by corrected suspended solid concentrations, which can be determined for any range of particle size.

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Record of peculiar *Cobitis* (Cypriniformes: Cobitidae) from Oyodo River system in Miyazaki Prefecture, southern Kyushu Island, Japan

Jun Nakajima, Tomofumi Nakamura and Yuzuru Suzawa

Abstract Examination of the morphological and genetic features of spined loach (*Cobitis* sp.) collected from the Oyodo River system, southern Kyushu Island, Japan, indicated that they represented a new taxon. The specimens were clearly distinguished from other known Japanese *Cobitis* species by their mitochondrial DNA sequences. In addition, the shape of the adult male lamina circularis differed to those of the *C. sp.* 'yamato' complex and *C. biwae*.

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Biogeographical study of the freshwater fish fauna of islands in the Seto Inland Sea, Hiroshima Prefecture, Japan

Takuro Hirayama and Yoshifumi Touyama

Abstract A cluster analysis of freshwater fish fauna of 30 rivers on 13 islands in the Seto Inland Sea and 17 short rivers on the mainland of Hiroshima Prefecture revealed two island groups, based on fish species composition: eastern islands group (8 islands) and western islands group (5 islands). The fish fauna of the western islands group showed a greater resemblance to that of the mainland rivers than shown by the eastern islands group, indicating differing geographical relationships between the island groups and between the latter and the mainland.

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Short Reports

Japanese Journal of Ichthyology

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Body size at maturity of Biwa salmon *Oncorhynchus masou* subsp. in some inlet rivers of Lake Biwa, central Japan

Masanori Oda, Tei Kishino and Yasushi Harada

Abstract Examination of Biwa salmon (*Oncorhynchus masou* subsp.) in four rivers discharging into Lake Biwa, Japan, demonstrated the absence of sexual size dimorphism (SSD). Previous studies having reported the direction or extent of SSD as being likely attributable to the relative strength of sexual selection (favouring larger adult males) versus natural selection favouring larger adult females, (e.g., fecundity selection) in

masu salmon populations, the lack of SSD in this case suggests a balance between those two factors.

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First record of a deep-sea ophidiid fish, *Bassozetus robustus*, from Japan

Munehiro Takami, Shinichi Tomiyama and Atsushi Fukui

Abstract Two specimens of the robust assfish, *Bassozetus robustus* Smith and Radcliffe, 1913 (84.1 and 341.9 mm in standard length, SL), collected from Suruga Bay and the continental slope of the Ryukyu Trench, respectively, represent the first records of the species from Japanese waters. *Bassozetus robustus* is distinguished from all congeners by the following combination of characters: dorsal fin rays 112–130, anal fin rays 92–103, pectoral fin rays 24–28, precaudal vertebrae 13–16, long gill rakers on first gill arch 11–16, oblique scale rows between anus and dorsal fin 25–36, pelvic fin length 16.5–20.5% SL, body depth at anal fin origin 10.0–19.0% SL, a well-developed basibranchial tooth patch and inner surface of sagittal otolith with an ostial channel. The new Japanese name “Ishi-fukumen-itachiuo” is proposed for the species.

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Seasonal occurrence patterns of *Mola* sunfishes (*Mola* spp. A and B; Molidae) in waters off the Sanriku region, eastern Japan

Etsuro Sawai, Yusuke Yamanoue, Yukiko Yoshita, Yoichi Sakai and Hiroaki Hashimoto

Abstract Seasonal occurrence patterns of *Mola* sunfishes (*Mola* spp. A and B) in waters off the Sanriku region, eastern Japan were examined with particular focus on sea surface temperatures (SST) during 2002–2008. The two species differed from each other in both seasonal occurrence pattern and body size. SSTs during the occurrence of *Mola* sp. A (16.8–25.6°C) were higher than those during the occurrence of *Mola* sp. B (11.5–25.6°C). Although sex-ratio differences were not correlated with SSTs during the occurrence of *Mola* sp. B., body size and SST were negatively correlated for *Mola* sp. B. Thus, the occurrence patterns of *Mola* sunfishes around the Japanese coast may involve not only species-level characteristics but also intraspecific growth-stage differences, probably representing differences in water temperature preference.

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Genetic analysis of wild Medaka (*Oryzias latipes*) populations in the Yamato River, Nara Prefecture, Japan: detection of the *b* allele responsible for the “himedaka” phenotype

Koji Nakai, Ryohei Nakao, Shoji Fukamachi, Naoto Koyama and Tadao Kitagawa

Abstract Genetic disturbances in wild populations of Medaka (*Oryzias latipes*) have resulted from the introduction of populations originating from the commercial

orange-red strain (himedaka). The “himedaka” phenotype, caused by a defect in melanin deposition in skin cells, is conferred by a mutated recessive allele (*b* allele) on the *slc45a2* locus (linkage group 12). To examine genetic introgression from “himedaka” to wild Medaka populations, a new DNA marker (*b*-marker) was constructed that detects fish with the *b* allele according to a length polymorphism of the promoter region between the wildtype (*B*) and *b* alleles. Among 169 fish from 45 wild populations in the Yamato River, Nara Prefecture, all specimens with the orange-red phenotype (from 7 populations) had a homozygous *b/b* genotype. Although most of the wildtype fish had a homozygous *B/B* genotype, 12 wildtype fish from 9 populations (3 of which consisted of fish with the orange-red phenotype) had the heterozygous genotype (*B/b*). These results indicated a high level of cryptic genetic introgression from “himedaka” to wild Medaka populations.

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Host mussel utilization by *Sarcocheilichthys variegatus variegatus* (Cyprinidae, Sarcocheilichthyinae) in a drainage ditch and the Harai River of the Kushida River system, Japan

Jyun-ichi Kitamura

Abstract Freshwater mussel (family Unionidae) utilization for oviposition by *Sarcocheilichthys variegatus variegatus* was investigated in a drainage ditch and the Harai River. Twenty five freshwater mussels in *Pronodularia japonensis* (4% of 616 individuals examined) in a drainage ditch connected to the Kushida River hosted *S. v. variegatus* eggs, compared with none of two other freshwater mussel species,

Inversidens brandti and *Unio douglasiae douglasiae*. In the Harai River, eight freshwater mussels (3 *I. brandti*, 2 *Obovalis omiensis*, 1 *Lanceolaria grayana* and 1 *Anodonta* spp.) (2.7% of 290 individuals examined) hosted *S. v. variegatus* eggs, compared with none of *P. japonensis* and *U. d. douglasiae*. Among the available freshwater mussel species, *U. d. douglasiae* may be only one selected against for oviposition by *S. v. variegates*.

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