Papers Published in *Japanese Journal of Ichthyology*

Vol. 60, No. 1 April 25, 2013

CONTENTS

Full Papers

Short Reports

Full Papers

Japanese Journal of Ichthyology

Vol. 60, No. 1, pp. 1-13

Comparative morphology of spermatozoa in the Gasterosteoidei

Masako Hara, Izumi Akagawa and Ryouka Kawahara

Abstract The ultrastructure of mature spermatozoan was examined by TEM and SEM for 11 species of Gasterosteoidei: Hypoptychidae (*Hypoptychus dybowski*), Aulorhynchidae (*Aulichthys japonicus, Aulorhynchus flavidus*), and Gasterosteidae (*Gasterosteus aculeatus*, *G. wheatlandi*, *Pungitius pungitius*, *P. tymensis*, *P. sinensis*, *P. kaibarae* ssp., *Culaea inconstans*, and *Spinachia spinachia*). All spermatozoa were characteristic of a uniflagellate anachrosomal aquasperm type, but with significant variations. Nuclei, characterized in all species by a very shallow nuclear fossa, were grouped into four morphological types, ranging from an elongate temple bell shape to fully spherical. Coaxial arrangements of the proximal and distal centriole were confirmed in most species. A centriolar plug and accessory appendage were observed in some gasterosteid species, and a centriolar adjunct shared by *Aulorhynchus flavidus* and the gasterosteids. Mitochondria were divided into ring and tube-shaped types, separable at the generic level. Sperm morphology indicated paraphyly of Aulorhynchidae as presently recognized. Similarly, sperm structure did not support our molecular phylogeny placing *Gasterosteus* as the sister taxon of other gasterosteid genera.

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Japanese Journal of Ichthyology
Vol. 60, No. 1, pp. 15-26

Longitudinal distribution of newly emerged fry of amago salmon (*Oncorhynchus masou ishikawae*) in a mountain stream, Kyushu, southern Japan

Keisuke Kimoto, Masaaki Kagehira, Kazuhisa Azechi, Yuichi Fukuda and Kazuya Nagasawa

Abstract The longitudinal distribution of newly emerged fry and post-fry of amago salmon was investigated by snorkeling in 14 consecutive sections (totaling 16.4 km in length) of the Ogata River and its tributary, the Kohbaru Stream, Oita Prefecture, one of the waterways in northeastern Kyushu Island, southern Japan, in which are found the southernmost landlocked populations of amago salmon (*Oncorhynchus masou ishikawa*e). In two surveys, conducted at intervals of 11–32 days from January to April 2005, the densities of newly emerged fry were greatest in the four most upstream sections but remained very low in the six most downstream sections, the skewed distribution being stable. The densities of post-fry individuals were also greatest in the four most upstream sections, showing significant seasonal correlations (October 2003, February and August 2004). Furthermore, the density of newly emerged fry from January to April 2005 was significantly correlated with that of post-fry individuals in August 2004. On the bases of these and earlier reports, it was concluded that amago salmon fry in mountain streams of Kyushu Island stay near the spawning redd, at least until they attain the parr stage.

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Short Reports

Japanese Journal of Ichthyology

Vol. 60, No. 1, pp. 27–33

Present status of the Japanese eight-barbel loach in the Naka-ikemi Wetland, Fukui Prefecture, Japan

Tetsuro Kitagawa, Shigeru Masuda, Takumi Morishita, Yuka Oda and Kazumi Hosoya

Abstract The status of the endangered Japanese eight-barbel loach *Lefua echigonia* in the Naka-ikemi Wetland, Fukui Prefecture, officially registered as a sanctuary at the Ramsar Convention 2012, was surveyed from October 2010 to August 2012. The loach population, comprising approximately 300 individuals, was restricted to a small spring covering an area of only 84 m^2, a fraction of the total wetland area (250,000 m^2). The size frequency distribution of the collected individuals showed bimodal peaks in May to August, and showed a unimodal peak in April, September and October. The loach population is considered highly vulnerable and in need of significant protective measures.

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Japanese Journal of Ichthyology

Vol. 60, No. 1, pp. 35–41

First records of a worm eel (Anguilliformes: Ophichthidae: Myrophinae) *Scolecenchelys laticaudata* from Kikai Island, Kagoshima, Japan

Yusuke Hibino, Seishi Kimura and Kiyotaka Hatooka

Abstract Two specimens of the worm eel, *Scolecenchelys laticaudata* (Ogilby, 1897), collected from Kikai Island, Kagoshima Prefecture, Japan represent the first record of the species from Japan and the northernmost record of the Pacific Ocean. Although *S. laticaudata* is similar to *S. aoki* in the location of the dorsal-fin origin and vertebral counts,

the former is distinguishable from the latter by its rounded snout (vs. acute), large head (head length 9.9–12% of total length vs. 7.6–10%), robust body (body depth at gill opening 2.9–4.0% of total length vs. 1.7–2.6%), mouth rictus edge not behind the posterior margin of the eye (vs. well behind), two postorbital pores (vs. three) and biserial upper-jaw teeth, even in small specimens (vs. uniserial). *Scolecenchelys laticaudata* most closely resembles *S. gymnota* in the head, trunk, tail proportions, post orbital pore count and number of teeth rows, but differs in having a rounded snout and robust body (vs. 1.7–2.9%), as well as in the position of the mouth rictus edge and numerous vertebral and lateral-line pore counts (total 136–142 vs. 118–135; preanal 55–58 vs. 47–52; lateral-line pores before anus 54–59 vs. 49–53). The new Japanese standard name, "Futo-mimizu-anago", is proposed for the species.

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Japanese Journal of Ichthyology

Vol. 60, No. 1, pp. 43–48

Daily migration and spawning of Far Eastern catfish, *Silurus asotus* in channels associated with paddy fields

Toshinori Funao and Hiroichi Sawada

Abstract Owing to growing concern regarding the declining numbers of Far Eastern catfish, *Silurus asotus*, associated with and formerly abundant around paddy fields, a census of the species was conducted in the shallow lotic environment of a paddy field channel in 2008 and 2009. Although such a channel has been conventionally regarded as unsuitable as *S. asotus* habitat, a total of 707 adults were observed overall, eggs being collected during 30 of 58 egg census visits. A significant positive correlation existed between the number of *S. asotus* adults and eggs. Adult catfish were observed almost

exclusively at night when the water was deep, suggesting that most entered the channel at night for spawning. Such paddy-associated channels appear to function at least partly as alternative spawning sites when paddy fields are not accessible.

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Japanese Journal of Ichthyology

Vol. 60, No. 1, pp. 49–55

An extant native population of the Japanese rosy bitterling,

***Rhodeus ocellatus kurumeus*, in the Sanyo Region, western Japan**

Tsukasa Abe, Ichiro Kobayashi and Katsutoshi Watanabe

Abstract Morphological and mitochondrial DNA characteristics were investigated for a captive population of the rosy bitterling *Rhodeus ocellatus*, founded from a now extinct wild population in an irrigation pond in Seto, Okayama Prefecture, Sanyo Region, Japan. The data strongly suggested that the captive population represents a pure strain of the native Nipponbaratanago, *Rhodeus ocellatus kurumeus*. This is the sole confirmed recent record of this endangered subspecies in the Sanyo Region. The current critical status of the population necessitates immediate stock preservation, pending future reintroduction and/or conservation introduction to the wild.

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