

Original Papers

Gen Ito*, Ryota Noguchi, Rintaro Taniguchi, Jyun-ichi Kitamura and Yasunori Koya. 2025. Phylogeography of *Tanakia lanceolata* in the Tokai region, central Honshu, Japan. Japan. J. Ichthyol., 72(1): 1–9. DOI: 10.11369/jji.24-016.

Abstract Using mitochondrial DNA cytochrome b region nucleotide sequences, we investigated the phylogeographical structure of *Tanakia lanceolata*, which inhabits the Tokai region of central Honshu, Japan. As a result, we found one non-native haplotype (native distribution in the Kinki region) and 32 native haplotypes in the Tokai region. The non-native haplotype was only found in the Shin River system in Aichi Prefecture. Therefore, it is suggested that artificial introduction from other regions is limited. Among the haplotypes included in the native lineage, one haplotype was widely distributed in the Tokai region, while 31 haplotypes were endemic to one river system or neighboring river systems. The analysis of molecular variance (AMOVA) showed genetic differentiation between river systems. We propose to consider each river system as conservation units.

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Takahiro Morosawa*, Kosuke Takaku, Takashi Matsuki, Tomonori Kawamoto, Yuka Iguchi, Jun Nakajima, Tadao Kitagawa and Koshiro Watanuki. 2025. Selecting founders for ex situ conservation based on population estimations: a case study for two *Cobitis* species designated as ‘National Endangered Species of Wild Fauna and Flora’ in the Japan. Japan. J. Ichthyol., 72(1): 11–18. DOI: 10.11369/jji.24-034.

Abstract When selecting founders of endangered species for *ex situ* conservation, it is necessary to acquire sufficient individuals so as to ensure the genetic diversity of the *ex situ* population, while taking into consideration the impact of removing founders from the *in situ* population. Surveys for population estimation by removal method were conducted for two *Cobitis* species in November 2019. For each estimation, a population was surveyed 5–8 times using dip nets to remove captured individuals, the hierarchical Bayesian model being used to estimate the number of individuals in the population. The *Cobitis takenoi* population was estimated 500–5,305 (95% CI) individuals, and the *Cobitis striata hakataensis* population, 249–1,601 (95% CI) individuals. The number of individuals selected to be founders was based on the lower limit of the 95% credible interval of the estimate, thereby minimizing the impact on the *in situ* population. This established protocol was considered to be a model case for securing future *ex situ* conservation populations.

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Yuki Yashima*, Tomonari Asaka, Ryoichi Torii, Eikichi Uchihara, Ryuya Okada, Takahiko Mukai and Tadao Kitagawa. 2025. Examination of Type I mtDNA haplotypes in dojo loach populations in Nagoya City, Aichi Prefecture: nativeness and genetic structure of the population. Japan. J. Ichthyol., 72(1): 19–30. DOI: 10.11369/jji.24-033.

Abstract The native range of “Type I” mitochondrial DNA (mtDNA) of the dojo loach (*Misgurnus anguillicaudatus* complex), originating from *M. sp. Type I* sensu Okada et al. (2017), is found only in Japanese native dojo loach populations on the eastern Pacific and central-north Japan Sea regions of Honshu Island. However, a stand-alone distribution of Type I mtDNA was recently reported from a few individuals in a single dojo loach population in Nagoya City, Aichi Prefecture, located in central Honshu Island. Genetic analyses on 54 individuals (out of 81 collected from the population) were conducted to clarify the strict phylogenetic position of Type I mtDNA and the genetic population structure. Genetic screening and sequencing analyses targeting the *Cytb* gene region revealed a single common Type I haplotype in only four individuals. Although the independent phylogenetic status of the haplotype among Type I haplotypes from the entire native range was confirmed, it was clustered with known Type I subclades detected from the west side of the Fossa Magna region. Such genetic independence and its relationship to geographical proximity indicated that the haplotype was native to that region. Nuclear DNA analysis targeting the *IRBP2* and *RAG1* gene regions revealed that most individuals were hybrids among three groups comprising the detected mtDNA (Type I and Types IIa and IIb, originating from Japanese native and Chinese clades of *M. anguillicaudatus*). Four individuals carrying Type I deviated significantly from random mating with individuals carrying other mtDNA types, and two individuals with notable morphological characteristics of *M. sp. Type I* (including genetic factors associated with *M. sp. Type I* in both mitochondrial and nuclear DNA) indicated that *M. sp. Type I* had maintained its genetic integrity in the presence of the other two groups.

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Takuto Mizutani and Mikio Inoue*. 2025. Stream gobies of the genus *Rhinogobius* may use paddy systems as a nursery habitat during their amphidromous migration. Japan. J. Ichthyol., 72(1): 31–44. DOI: 10.11369/jji.24-044.

Abstract A previous study has shown that an amphidromous goby, *Rhinogobius mizunoi*, in the Daimyoujin River, Shikoku, is a landlocked population. However, this river has no standing water body (e.g., dam reservoir), which is necessary for landlocked migration as a nursery habitat for their larvae. Furthermore, the flow in the lowest reach of this river is ephemeral (i.e., surface flow is usually disconnected from the sea). Therefore, we inferred that amphidromous gobies of the genus *Rhinogobius* in this river use paddy-associated aquatic systems behind the river channel for their landlocked migration. To examine this idea, we

monitored drifting larvae and ascending juveniles of the gobies in agricultural ditches connecting the Daimyoujin River channel with the paddy systems. As a result, we confirmed that (1) drifting larvae emigrated to the paddy systems from the river channel through the ditches. We also found (2) small juvenile gobies that could be assumed to be ascending age-0 individuals in the ditches. Our one-year monitoring confirmed that (3) surface water of the study river rarely reached the sea, suggesting that ordinary amphidromous migration using the sea is almost impossible for the gobies in this river. However, our fish survey confirmed that (4) the perennial-flow reach of this river was inhabited by abundant amphidromous gobies. These lines of circumstantial evidence support our idea that the amphidromous gobies in the Daimyoujin River use paddy associated aquatic systems for their landlocked migration. Such a landlocked migration using paddy systems may be common for gobies of the genus *Rhinogobius*, as most streams and rivers in Japan are usually accompanied by paddy-associated aquatic networks.

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Notes

Tomohiko Fujita*, Kazumi Hosoya, Katsuki Nakai, Takahiko Mukai, Yoshinori Taniguchi and Seiichi Mori. 2025. Longear Sunfish (*Lepomis megalotis*) in Tokuyama Dam Reservoir, Gifu Prefecture: first Japanese record. Japan. J. Ichthyol., 72(1): 45–52. DOI: 10.11369/jji.24-010.

Abstract Tokuyama Dam Reservoir, located upstream on the Ibi River, Kiso River system, is the largest dammed lake in Japan, construction having been completed in 2008. Ongoing biological monitoring surveys, conducted since the pre-construction period, noted underwater observations of *Lepomis* sp. in 2021. Individuals subsequently collected from several locations on the eastern and western shores of the lake in 2022 and 2023 were morphologically and genetically identified as *Lepomis megalotis* (Rafinesque, 1820). The collected specimens included juveniles, confirming that the species was reproducing in the lake. *Lepomis megalotis* was designated as an Unevaluated Alien Species when the Act on the Prevention of Adverse Ecological Impacts Caused by Designated Invasive Alien Species came into force in 2005. However, the population identified in this study may not represent a recent importation so much as having originated from a breeding population established prior to the above legislation.

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Yoshihiro Tsuno* and Hiromitsu Endo. 2025. *Laemonema rhodochir* (Gadiformes: Moridae) recorded from the Emperor Seamount Chain and Sagami Bay, with comments

on the morphological characteristics. Japan. J. Ichthyol., 72(1): 53–63. DOI: 10.11369/jji.24–025.

Abstract Nine specimens (126.9–194.6 mm standard length) of the morid *Laemonema rhodochir* Gilbert, 1905, previously recorded in the North Pacific Ocean from the Hancock Seamount, Hawaiian-Emperor Seamount Chain, Hawaiian Islands, Kyushu-Palau Ridge, and Taiwan, were collected from the Koko, Yuryaku, and Colahan Seamounts (Emperor Seamount Chain) and Sagami Bay, representing the first record from each locality and northernmost range extension of the species (Sagami Bay, off Zushi City, Kanagawa Prefecture, Japan, ca. 35°15'N). Re-examination of the type specimens of *L. rhodochir* and *L. palauense* supported a previous view that the former species is the senior synonym of the latter.

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Shodai Kashiwaya, Masashi Kimura, Shinnosuke Oguma*, Seiya Kaneko, Takaharu Natsumeda and Kouki Kanou. 2025. Diet and habitat characteristics of endangered sculpin (*Cottus reinii*) juveniles in rivers feeding a brackish water lake. Japan. J. Ichthyol., 72(1): 65–80. DOI: 10.11369/jji.24-013.

Abstract Diet and habitat characteristics of juvenile stages of the endangered sculpin *Cottus reinii* were investigated in eight rivers flowing into Lake Hinuma, a brackish water lake in Ibaraki Prefecture, eastern Japan, from April to September 2020. Juvenile *C. reinii* fed mainly on aquatic insects, such as chironomid, baetid, simuliid and trichopterid larvae, and gammaridean amphipods. A generalized linear mixed model based on occurrence/non-occurrence data in the former with a number of environmental variables at sampling sites in eight rivers in May and June (upstream migration period) and August and September (post-migration) revealed that lower weir height, shallower water depth, lower water temperature, greater current velocity, and greater coverage by submerged vegetation were the most significant determinants of juvenile occurrence.

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Katsutoshi Watanabe*, Ko Sugiura, Akihisa Iwata, Tsukasa Abe, Satsuki Tsuji and Ryoichi Tabata. 2025. Fish fauna around the habitat of the endangered loach *Parabotia curtus* and prospects for restoring extirpated areas. Japan. J. Ichthyol., 72(1): 81–91. DOI: 10.11369/jji.24-046.

Abstract Ayumodoki (*Parabotia curtus*), a critically endangered loach, survives only in three locations in western Japan. Its population in Yagi, Kyoto Prefecture, went extinct in the wild in the 1990s but has been maintained in captivity for over 40 years. This study investigated fish fauna in the areas including the former and nearby current habitats primarily using environmental DNA metabarcoding. We detected 41 freshwater fish species from 26 sites, but *P. curtus* was found only in its known habitat in Kameoka. However, the species composition

suggests that re-establishing the population in the Yagi former habitat is feasible if spawning habitats and migration routes are improved. Adequately maintaining the captive population and enhancing the local environment are crucial for successful reintroduction.

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