Misgurnus anguillicaudatus **System:** Freshwater

Kingdom	Phylum	Class	Order	Family
Animalia	Chordata	Actinopterygii	Cypriniformes	Cobitidae

Common name

panispis (English, Philippines), Japanese loach (English), nai chau (Cantonese, Hong Kong), pond loach (English), weather loach (English), dojo loach (English), Aasianmutakala (Finnish, Finland), kinesisk smerling (Danish, Denmark), Amur mud loach (English), oriental weatherloach (English), loche asiatique (French, France), kinesisk Vejrfisk (Danish, Denmark), mud loach (English), oriental weatherfish (English), Amur weatherfish (English), Asian pond loach (English), loche d'étang (French, France), vostochnyi (Russian), amurskii v'yun (Russian), Ostasiatischer Schlammpeitzger (German, Germany), Chinese weatherfish (English), dojou (Japanese, Japan), Japanese weatherfish (English), misgurno (Spanish, Spain), u-u (English, Philippines), dojo (Tagalog, Philippines), misgurno de Asia (Spanish, Spain), cá Chạ ch bùn (Vietnamese, Viet Nam), cá diét (Vietnamese, Cambodia), dojô (Japanese, Japan)

Synonym

Cobitis anguillicaudata , (Cantor, 1842)
Misgurnus crossochilus , (Sauvage, 1878)
Misgurnus anguillicaudatus anguillicaudatus , (Cantor, 1842)
Misgurnus fossilis anguillicaudatus , (Cantor, 1842)
Misgurnus lividus , (Sauvage & Dabry de Thirersant)
Misgurnus mizolepis elongatus , (Kimura, 1934)
Misgurnus mizolepis grangeri , (Nichols, 1925)
Misgurnus mizolepis multimaculatus , (Rendahl, 1944)
Misgurnus mizolepis punctatus , (Oshima, 1926)
Misgurnus mizolepis unicolor , (Lin, 1932)
Misgurnus mohoity leopardus , (Nichols, 1925)
Misgurnus mohoity yunnan , (Nichols, 1925)
Misgurnus multimaculatus , (Rendahl, 1944)
Ussuria leptocephala , (Nikolskii, 1903)

Similar species

Summary

Misgurnus anguillicaudatus is a weatherfish native to southeast Asia that has established populations in Europe, Australia, and the United States. It is an important food fish common to aquaculture and the majority of its introductions are believed to be the result of escapes from fish farms. Although little is known about its impacts it has the potential to compete with native fish for resources, reduce macroinvertebrate populations, and decrease water quality.

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Species Description
Misgurnus anguillicaudatus is brown to yellow with greenish, gray-brown to black marbling, with a paler ventral. Its eel-like body is long, laterally compressed, commonly measuring around 15 cm, but reaching a maximum size near 30 cm. It has a small, narrow mouth and subinferior with 10 barbels, 4 of them, clearly smaller than the other, placed below the lower lip. Its lips are thick and fleshy. Its lateral line is short and does not exceed the length of the pectoral fin. It pectoral fins are triangular with a stout spine. The dorsal fin originates above the pelvic fin origin and is single and short-based. It bears conspicuous adipose crests along the ventral and dorsal mid-lines of the caudal peduncle. It also has a characteristic dark spot in the upper half of the base of the caudal fin. It has 9 dorsal rays, 6-7 pelvic rays, and 7-8 anal rays. Generally males have larger pectoral fins and females fuller abdomens (Nico & Fuller, 2010; Froese & Pauly, 2010; Australian Museum, 2009).

Notes
In rice paddies of their native range in Asia *Misgurnus agnuillicaudatus* up roots weeds with its feeding activity and is considered beneficial by rice farmers (Keller & Lake, 1994). The weatherfish derives this common name from its increase in activity as a result of changes in barometric pressure (Nico & Fuller, 2010).

Uses
Misgurnus anguillicaudatus is an important commercial food fish, a common live bait fish, and common aquarium fish. These trades are believed to be the main causes of their introduced populations.

Habitat Description
Misgurnus anguillicaudatus is a freshwater fish that inhabits the demersal layer of rivers, lakes, ponds swamps, and rice fields. It prefers still or gently flowing waters with muddy bottoms and silty substrates. They commonly burrow into muck and leaf litter with their head sticking out. *M. anguillicaudatus* typically inhabits subtropical climates with a temperature range of 5°C - 25°C and a latitudinal range of 53°N - 27°S . However, it has been found to tolerate temperatures as low as 2°C and as high as 30°C. *M. anguillicaudatus* may utilize atmospheric air to survive low oxygenated waters, through an adaptation of the digestive tract (Froese & Pauly, 2010; Gestring & Stanford, undated; Chang *et al*., 2009; McMahon & Burggren, 1987).

Reproduction
Misgurnus anguillicaudatus is an external fertilizer. Males wrap their body around the female and stimulate the release of eggs which it then fertilizes. Its eggs are scattered in the open water and along substratum and are not guarded. *M. anguillicaudatus* has demonstrated a high reproductive potential. It has been shown to be able to migrate to paddy fields to spawn as a substitute for flood plains (Froese & Pauly, 2010; Fujimoto *et al*., 2007; Koster *et al*., 2002).

Nutrition
Misgurnus anguillicaudatus preys on insects, insect larvae, crustaceans, annelids, algae, detritus, and other small aquatic organisms (Tabor *et al*., 2001). It does not forage by sight but rather chemical stimuli sensed by their barbels. They feed by taking mouthfuls of sediment and filtering food items (Gestring & Stanford, undated; Froese & Pauly, 2010).

General Impacts
Misgurnus anguillicaudatus was found to cause significant reductions in macroinvertebrate numbers and biomass in experimental conditions. It is also associated with elevated ammonia, nitrate/nitrite (NOx), and turbidity levels, having a similar effect on water quality as carp (*Cyprinus carpio*). There is concern that *M. anguillicaudatus* may impact native fishes by reducing populations of macroinvertebrate prey, competing for shelter and spawning sites, and preying on eggs and juveniles. Such impacts combined with its environmental adaptability, high competitive ability, high reproductive capacity, high survivorship, and high dispersal ability make it a potentially problematic invasive. In Hawaii it is reported as having an intermediate ecological effect in Hawaii based on its habitat, diet, and populations (Keller & Lake, 2007; Koster *et al*, 2002; Freyhoff & Korte, 2005; Nico & Fuller 2010).

Management Info
Preventative measures: Although little has been proven about the ecological impacts of *Misgurnus anguillicaudatus* researchers urge fisheries managers to prevent its establishment and further dispersal based on its speculated impacts. Australia banned the importation of *M. anguillicaudatus* in 1986. Increasing awareness to the public and to commercial fisheries may help reduce introductions and aid in the detection of new populations. Additional research is required to determine the range of impacts caused by *M. anguillicaudatus* and to evaluate management methods (Koster *et al*, 2002).

Pathway
Misgurnus anguillicaudatus is an ornamental fish common to aquarium trade as well as a live bait fish. Many of its introductions to new locations are the result of its importation as such (Franch *et al*, 2008).

Principal source:
Froese, R. & Pauly, D. 2010. *Misgurnus anguillicaudatus* (Cantor, 1842). FishBase.\r\n
Nico, L. & Fuller, P. 2010. *Misgurnus anguillicaudatus*. USGS Nonindigenous Aquatic Species Database, Gainesville, FL.\r\n
Freyhof, J., Korte, E. 2005. The first record of *Misgurnus anguillicaudatus* in Germany. Journal of Fish Biology. 66(2): 568-571.

Compiler: National Biological Information Infrastructure (NBII) & IUCN/SSC Invasive Species Specialist Group (ISSG)

Review: Miguelito Clavero, Grup d'Ecologia del Paisatge, Àrea de Biodiversitat, Centre Tecnològic Forestal de Catalunya

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