

Iberian endemic freshwater fishes and their conservation status in Spain

B. ELVIRA

Department of Animal Biology, School of Biology, University of Madrid, 28040 Madrid, Spain

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Nineteen species of fishes (listed below) are endemic to fresh waters in Iberia. Of these, eleven species occur in both Spain and Portugal, four are endemic to Spain and two to Portugal; two also occur in North Africa and one in France. The 17 endemic species found in Spain represent 25% of the country's freshwater fishes. Present knowledge of their general distribution and conservation status in Spain is as follows.

Family Cyprinidae

Anaocypris hispanica (Steindachner, 1866). Spain and Portugal, with a very restricted distribution area in middle and lower Guadiana. Classified as rare by ICONA (1986). There are no data on population parameters.

Barbus bocagei Steindachner, 1865. Spain and Portugal. There are three subspecies: *B. bocagei bocagei* (Duero, Tajo, Júcar and Turia); *B. bocagei graellsii* Steindachner, 1866 (Ebro, Nervión, Llobregat) and *B. bocagei sclateri* Günther, 1868 (Guadiana, Guadalquivir and Segura).

Barbus comiza (Steindachner, 1865). Spain and Portugal; Tajo, Guadiana and Guadalquivir.

Barbus microcephalus Almaça, 1967. Spain and Portugal; Tajo and Guadiana. Classified as insufficiently known by ICONA (1986). There are no details for Spanish populations.

Barbus haasi Mertens, 1924. Spain; Ebro, Llobregat, Júcar and Turia.

Chondrostoma polylepis Steindachner, 1865. Spain and Portugal. There are two subspecies: *C. polylepis polylepis* (= *C. p. duriensis* Coelho, 1985) from Miño, Duero and Tajo; *C. polylepis willkommii* Steindachner, 1866 from Guadiana and Guadalquivir.

Chondrostoma toxostoma (Vallot, 1837). Spain and France. There are three Iberian endemic subspecies: *C. toxostoma arrigonis* (Steindachner, 1866) from Júcar; *C. toxostoma turiensis* Elvira, 1987 from Turia and Mijares; *C. toxostoma miegii* Steindachner, 1866 from Ebro, Nervión and Llobregat.

Iberocypris palaciosi Doadrio, 1980. Spain, from a very restricted area of the middle Guadalquivir River basin. Classified as insufficiently known by ICONA (1986) and known only from its original description.

Leuciscus carolitertii Doadrio, 1987. Spain and Portugal; Miño, Duero and upper Ebro.

Leuciscus pyrenaicus Günther, 1868. Spain and Portugal; Tajo, Guadiana, Guadalquivir, Segura and Júcar.

Rutilus arcasii (Steindachner, 1866). Spain and Portugal; Miño, Duero, Tajo, Ebro, Júcar and Turia.

Rutilus lemmingii (Steindachner, 1866). Spain and Portugal; Duero, Tajo, Guadiana and Guadalquivir.

Rutilus lusitanicus (Collares-Pereira, 1980) and *Rutilus macrolepidotus* (Steindachner, 1866) are restricted to Portugal.

Tropidophoxinellus alburnoides (Steindachner, 1866). Spain and Portugal; from lower Duero, Tajo, Guadiana and Guadalquivir.

Several of the above endemic cyprinid fishes are still common enough to be caught by anglers in Spain, particularly the larger species, *B. bocagei*, *B. comiza*, *B. haasi*, *C. polylepis*

and *C. toxostoma*. Some smaller species are also fished by anglers: *L. carolitertii*, *L. pyrenaicus*, *R. arcasii*, *R. lemmingii* and *T. alburnoides*. Some species, such as *B. comiza*, seem to be less common than before, and may become threatened in the near future. Losses of habitat and introduction of exotic fish-predators (*Esox lucius* Linnaeus, 1758, *Silurus glanis* Linnaeus, 1758, *Ictalurus melas* (Rafinesque, 1820) and *Micropterus salmoides* (Lacepède, 1802)) are the main threatening factors for their survival.

Family Cobitidae

Cobitis calderoni Bacescu, 1961. Spain; Duero and upper Ebro. Classified as insufficiently known by ICONA (1986) for its rather scattered populations.

Cobitis maroccana Pellegrin, 1929. Spain, Portugal and Morocco; Tajo, Guadiana, Guadalquivir, Júcar, Turia, lower Ebro, and the River Sebou in Morocco.

Loaches are still used as live fish bait for angling, although it is forbidden by law. Nevertheless, pollution of waters is thought to be the principal cause of decline.

Family Cyprinodontidae

Aphanius iberus (Valenciennes, 1846). Spain and Algeria; inland littoral brackish waters of southern Atlantic and Mediterranean Spanish coasts, and inland waters of Algeria. Classified as endangered by ICONA (1986).

Valencia hispanica (Valenciennes, 1846). Endemic species from inland littoral brackish waters of the Mediterranean coast in Spain. Classified as endangered by ICONA (1986).

Desiccation of salterns and other littoral wetlands, together with the introduction of exotic species like *Gambusia holbrooki* (Agassiz, 1859) and *Fundulus heteroclitus* (Linnaeus, 1766), may be major factors affecting the scarce populations of these toothcarps.

In conclusion, negative factors affecting the endemic fishes of Spain are: (1) loss of habitat due to strong desiccation and channeling of river courses, (2) pollution of waters, mainly for species with a restricted area of distribution, and (3) introduction of exotic fishes (18 species) including some predatory fishes, a type of fish previously absent from Iberian fresh waters.

Reference

ICONA (ed.) (1986). *Lista Roja de los Vertebrados de España*. Madrid: Ministerio de Agricultura, Pesca y Alimentación.