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Threatened fishes of the world: *Aphanius baeticus* (Doadrio, Carmona & Fernández Delgado, 2002) (Cyprinodontidae)

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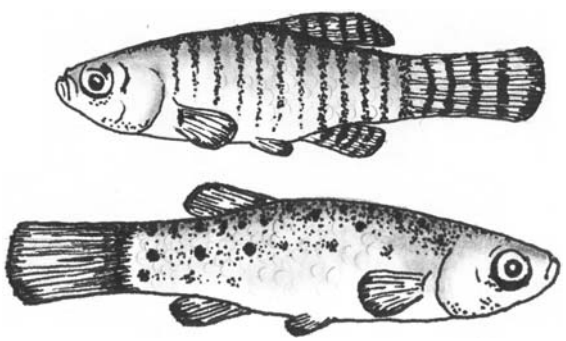

Common names: Andalusian toothcarp; Salinete (Spanish). **Conservation status:** NE (IUCN 2004); EN A1ce; B1 + 2bcd in the Red List of freshwater fish from Spain (Doadrio 2002). **Identification:** Iberian endemism. Morphological analyses (Doadrio et al. 2002) have revealed that *A. baeticus* differs from all other known species of *Aphanius* in the combination of ten branched rays in the anal fin, eight branched rays in the dorsal fin, long and low caudal peduncle, and shorter preorbital length than *Aphanius iberus* (the most similar species). *A. baeticus* is sexually dimorphic. Adult males show a coloration pattern characterized by light vertical bars (typically 14 – 17) along the body side (more patent in juveniles), which are continued on the caudal fin (4 – 5 bars). Rows of dark spots extend onto the dorsal and anal fins. Females show numerous small dark spots on the body flanks which tend to form two rows (one along the lateral line and another on the ventral side). Males (Total length$_{max} \leq 43$ mm) are smaller overall than females (Total length$_{max} \leq 55$ mm) (Fernández-Delgado et al. 1988). Illustration by Ana I. Torres. **Distribution:** *A. baeticus* shows a distribution range characterized by a high degree of isolation among its populations. It is restricted to the lower reaches of the River Guadalquivir and small streams located on the southern Atlantic coastline of Spain. The species occurs only in nine localities (Moreno-Amich et al. 1999) into the Andalucian biogeographical area (Doadrio et al. 1996). Due to fixed genetic differences, independent conservation units have been established (Doadrio et al. 1996, Fernández-Delgado et al. 1998, Perdices et al. 2001). **Abundance:** The species is locally abundant, mainly in small saline creeks, but their populations are sparse and some populations in other habitats are subjected to a continuous decrease in numbers. Moreover, only nine wild populations exist. **Habitat and ecology:** *A. baeticus* inhabits four different types of habitat: freshwater lagoons (in Doñana National Park, SW Spain), tidal channels, small saline creeks (first order streams) and salt exploitation mines. Small saline creeks, where *A. baeticus* occurs in high densities and does not coexist with any fish species, are the most common habitat (Fernández-Delgado et al. 1999). It shows a very short life span with a growth period from April to September, so it is characterized by fast growth and reduced longevity (Age$_{max} < 2+$) (Fernández-Delgado et al. 1988, García-Berthou et al. 1999). **Reproduction:** *A. baeticus* shows a reproductive strategy adaptated to unstable environments with an early maturity (in the first months of life) and high reproductive effort. During the reproductive period, from April to September, the species spawns intermittently and very few of the 1+ group specimens survive to spawn the following year (Fernández-Delgado et al. 1988). **Threats:** According to the authors' description, the species should be catalogued as critically endangered (CR) according to the IUCN Red List Categories (Doadrio et al. 2002). Four of the nine populations reported are in a critical situation because they occur in habitats with *Gambusia holbrooki* (Agassiz 1859) and/or *Fundulus heteroclitus* (L.) (Fernández-Delgado et al. 1998, Gutiérrez-Estrada et al. 1998). Due to their limited and isolated distribution, without any connection, the genetic flow is non-existent. A progessive loss and alteration of its habitat has taken place, especially in coastal areas exposed to tourism (e.g. nitrate input from the non-sustainable development of golf resorts). The loss of traditional salt exploitation mines, as an important coastal habitat for the species, is another threat. **Conservation action:** *A. baeticus* (noted as *A. iberus*) is included in Annexes II and III of The Bern Convention (1979); and in the Annexe II of the European Council Directive (1992/43/EEC). At national level, it is included in the Spanish National Catalogue of Threatened Species. In Spain, when a species is legally considered an endangered species each regional autonomous government is obligated to develop a Recovery Plan for this species. In this way, between 1994 and 1997 conservation plans have been developed in their first phases by the

Andalucian autonomous environmental agency (Fernández-Delgado et al. 2000). Moreover, the species it has recently been included on the Andalucian Red List (2001). **Conservation recommendations:** Four criteria must be satisfied to ensure the species no longer needs protection: (1) Present wild populations must be made secure by reducing existing and potential threats to the greatest extent possible, and population size must be stable or increasing. (2) Viable wild populations have been re-established in the most natural habitats within the *native range* (*sensu* Hendrickson & Brooks 1991). No new population will be considered established until the population has persisted for a minimun of 10 years. (3) Protection and establishment of Refugium populations (Minckley & Deacon 1991). (4) Correct conservation plans should recognize the established conservation units and should be managed separately, using natural stocks as sources of genetic diversity (Perdices et al. 2001) and wild stocks to initiate captive breeding programmes (Schönhuth et al. 2002). **Remarks:** In Spain, traditional information on *Aphanius* species has included data from populations in littoral areas of the South. Atlantic and Eastern Mediterranean, despite the fact that Atlantic and Mediterranean populations are genetically and morphometrically different. So, *A. baeticus*, as a new species for the Atlantic area, is being described (Doadrio et al. 2002). The species name '*baeticus*' derives from the roman name of the Guadalquivir river valley. Its recovery will depend on the coordination of social, economical and political actions. The participation of conservationist organizations could be essential. Educational and information programmes are of great importance, in this way it could be remarkable the edition of the Iberian Cyprinodontids Monography (Planelles 1999).

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