Family Sparidae

Porgies

Porgies are a family of approximately 164 species, most of which are marine. Only a few species occasionally enter brackish and freshwater habitats, with the only regular freshwater inhabitant in West Asia being *Acanthopagrus arabicus*. Porgies can be distinguished from other fish of similar appearance belonging to the families Percidae, Cichlidae, Centrarchidae, and Moronidae by the presence of a very long and strong second anal spine and a pointed, strongly compressed snout. Many porgies are hermaphrodites, with male and female gonads developing simultaneously, which allows them to change sex from male to female (protandry) or from female to male (protogyny). *Acanthopagus arabicus* was previously identified as *A. latus* but has since been sorted into five species, two of which occur in the area: *A. arabicus* and *A. sheim*. **Further reading.** Iwatsuki 2013 (identification); Nelson et al. 2016 (diversity).

Marine fishes in the Shatt al Arab/Arvand. The spatial and temporal position of the brackish water zone between the freshwater outflow of a river and the marine water of the sea depends upon the quantity of outflowing waters and the size of the river. In seasons characterised by high flow, the brackish zone may be situated a considerable distance from the coast, and it is possible to catch freshwater fishes offshore in the sea. In seasons with low flow, tidal waters may strongly influence the lower part of large rivers, allowing marine fish to swim far upriver in the salty waters. The Shatt al Arab is formed by the confluence of the Euphrates and the Tigris, approximately 200 km before the estuary. The altitude at the confluence is only 4 m, and the Shatt al Arab has a tidal range of approximately 1.8 m at Basra in Iraq. At Basra, the river is already 8–15 m deep and up to 800 m wide. While the Karun, which originates from the Zagros Mountains in Iran, could potentially contribute a significant volume of freshwater to the Shatt al Arab, the presence of dams has resulted in a reduction in the freshwater inflow, not only from the Karun but also from the Euphrates and Tigris, which are themselves obstructed by numerous dams.

The fishes of the Shatt al Arab are subjected to considerable fluctuations in salinity, ranging from almost pure freshwaters to nearly pure marine conditions. Several marine species periodically enter the Shatt al Arab, with most of these also entering the Hammar Marsh. These include the halfbeaks *Hemirhamphus marginatus* and *Rhynchorhamphus georgii*, the belonid *Strongylura strongylurus* and the platycephalid *Platycephalus indicus*. The following fish species have been observed entering the Shatt al Arab and Hammar Marsh: *Sillago sihama* (silver sillago), *Acanthopagrus arabicus* and *Sparidentex hasta*, *Johnius belangerii* and *Otolithes ruber* (drums), *Bathygobius fuscus* (gobies), *Pampus argenteus* (stromateid) and *Brachiurus orientalis* (flatfish). In total, more than 100 species are excluded from the coverage of this book. They are found in the Shatt al Arab but do not enter freshwaters regularly. It is impossible to define a strict border between fish that enter freshwater periodically and those that do so occasionally, as they are facultative freshwater inhabitants. For instance, the scathophagid *Scatophagus argus* was observed once in the Euphrates near Al Kaba'ish, and juvenile individuals of this species are well documented as entering freshwaters in other regions of its distribution. Different species regularly enter freshwaters, such as *Terapon jarbua*, but this may be a regional phenomenon.

Acanthopagrus arabicus

Common name. Arabian yellow seabream.

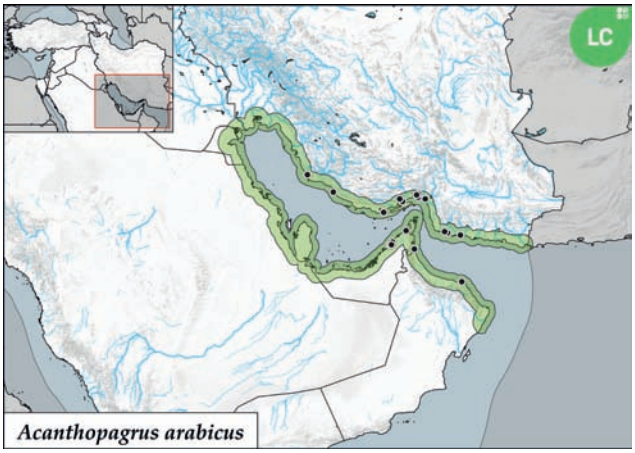
Diagnosis. Distinguished from *A. sheim*, a marine species in Persian Gulf, by: • black blotches on inter-radial membranes between dorsal rays absent (vs. present) / • no black streaks near base of anal inter-radial membranes between yellow anal rays (vs. present). Size up to 220 mm SL.

Distribution. Persian Gulf to Duqum (Oman) to Trivandrum in southwest India. In lower Euphrates and Tigris drainages, recorded from Shatt al Arab/Arvand, Shatt al Basra Canal, Hammar and Horalazim marshes, and lower parts of Karun. Also enters lower parts of coastal rivers in Persian Gulf basin, not reported from wadis along Arabian Peninsula.

https://doi.org/10.1515/9783111677811-051

Acanthopagrus arabicus; Shur drainage, Iran; ~150 mm SL.

Habitat. Coastal lagoons and lower parts of rivers. On sand and rocky bottoms in sea to about 50 m depth. Often feeds on mudflats. Spawns at sea.
Biology. Lives up to 14 years. Juveniles enter brackish or freshwaters, and fish in fresh and brackish waters are usually less than 145 mm SL. Large parts of the population remain at sea. Adults migrate from Shatt al Arab from January–March to spawn. Spawns January–April with a peak in February–March. Protandrous hermaphrodite with males dominating smaller and females dominating larger size groups. Feeds mainly on bivalves and crabs, less commonly on other benthic invertebrates, plants, and fish.
Conservation status. LC; important commercial species.
Further reading. Coad 2010a (biology in Iraq).



Hermaphrodite fishes. In contrast to mammals, where chromosomes determine sex at fertilisation, many fishes are born with their gender undetermined. Their gender is often later determined by age, ecological, and/or social factors. Protandrous hermaphroditism is a reproductive system where individuals mature as males but may reproduce as females later in life. The opposite is protogynous hermaphroditism, where individuals mature as females but reproduce as males later. A species reproducing as both sexes over its entire reproductive lifespan is a lifelong simultaneous hermaphrodite. However, some species start as simultaneous hermaphrodites but later reproduce as pure females. There is no clear boundary between these systems, and a great deal of diversity is observed, with considerable individual variation.

Protandrous hermaphroditism encompasses a continuum of life histories, distinguished by the degree of temporal overlap between male and female reproduction. Protandrous sequential hermaphroditism: Reproduce early

as a pure male and later as a pure female. Protandrous hermaphroditism with overlap: (i) Reproduce early as a pure male and later as a pure female, with an intervening period of reproduction as both sexes. (ii) Protandrous simultaneous hermaphroditism: Reproduce early as a pure male and later as both sexes.

Acanthopagrus, like other Sparidae, possesses ovotestes, which comprise paired bisexual gonads consisting of a mediodorsal ovarian zone and a latero-ventral testicular zone, separated by a wall of connective tissue. The ovotestes of male *A. latus*, a species absent from West Asia, develop from gonads containing substantial amounts of testicular and ovarian tissue. The testicular component of the ovotestes of all males undergoes a marked regression after spawning. During the next spawning season, the ovotestes either become gonads in which the testicular zone again predominates and contains spermatids and spermatozoa (functional males) or gonads in which the ovarian zone now predominates and contains mature oocytes (functional females). Once a fish has become a functional female, it remains a female throughout the rest of its life.

The evolution of hermaphroditism is linked to the potential for reproductive success to change with the size and age of fishes (budget effects) and their position in social hierarchies. Reproductive success in fishes is often determined by investment into gametes. If a fish is small, it might optimise its reproductive success by producing sperm, egg production shows more linear returns and larger individuals should invest more heavily in egg production. However, the situation may be reversed in species that hold territories and guard eggs. **Further reading.** Hesp et al. 2004 (*Acanthopagrus latus*); Collin 2013 (sexual systems in molluscs); Leonard 2013 (budget effects); Henshaw 2018 (protandrous hermaphroditism).

Taxonomic arrangements proposed in this book. In preparing this book, we encountered numerous taxonomic inconsistencies and nomenclatural problems requiring careful evaluation and resolution. Based on comprehensive analyses combining published and unpublished molecular data, extensive morphological examinations of fresh material from diverse populations and a critical reassessment of existing literature, we propose several taxonomic changes (including synonymies and revalidations) that have not been formally published elsewhere. Multiple lines of evidence support these decisions. In some cases, we discovered misidentifications in previous literature where specimens had been incorrectly assigned to species. Others resulted from misinterpretations of historical taxonomic descriptions or the application of names to populations that were not appropriate. Our molecular analyses of both published datasets and newly generated sequences revealed genetic uniformity among some populations that had previously been considered distinct species. Most critically, our morphological examinations of fresh specimens from as many populations formed the basis for our understanding of morphological variation within and between species. We recognise that some of these taxonomic actions may require additional in-depth studies for full confirmation. However, based on the overall evidence and our detailed analyses, the arrangements presented in this book offer the most accurate taxonomic framework currently available. Until additional evidence emerges that contradicts these findings, the taxonomic changes proposed in this book should be viewed as working hypotheses that advance our understanding of the diversity of West Asian freshwater fish. We encourage future researchers to test these hypotheses with additional data and welcome constructive taxonomic dialogue.

The synonymies established in this book are as follows. The respective rationale behind each one can be found in the species texts.

Names in previous literature	Correct name
Acanthobrama microlepis	*Acanthobrama punctulata*
Alburnus attalus	*Alburnus derjugini*
Alburnus carinatus	*Alburnus derjugini*
Alburnus istanbulensis	*Alburnus derjugini*
Alburnus nicaeensis	*Alburnus derjugini*
Alosa fallax	*Alosa agone*
Anatolichthys chantrei	*Anatolichthys danfordii*
Atherina caspia	*Atherina pontica*

Names in previous literature	Correct name
Barbus bergi	*Barbus tauricus*
Barbus oligolepis	*Barbus tauricus*
Capoeta alborzensis	*Capoeta aculeata*
Capoeta gracilis	*Capoeta aculeata*
Capoeta macrolepis	*Capoeta aculeata*
Capoeta pyragyi	*Capoeta damascina*
Capoeta raghazensis	*Capoeta saadii*
Capoeta sevangi	*Capoeta capoeta*
Capoeta umbla	*Capoeta damascina*
Chondrostoma orientale	*Chondrostoma regium*
Chondrostoma smyrnae	*Chondrostoma turnai*
Clupeonella muhlisi	*Clupeonella cultiventris*
Cobitis osurgeticus	Name not available *(nomen nudum)*
Garra sauvagei	*Garra nanus*
Ladigesocypris irideus	*Ladigesocypris ghigii*
Ladigesocypris mermere	*Petroleuciscus smyrnaeus*
Leucos (genus)	*Rutilus* (Genus)
Oxynoemacheilus melenicus	*Oxynoemacheilus simavicus*
Oxynoemacheilus sakaryaensis	*Oxynoemacheilus simavicus*
Ponticola rhodioni	*Ponticola constructor*
Ponticola turani	*Ponticola rizensis*
Pseudophoxinus caralis	*Pseudophoxinus anatolicus*
Salmo danilewskii	*Salmo ischchan*
Salmo duhani	Name not available *(nomen nudum)*
Sarmarutilus rubilio	*Rutilus rubilio*
Squalius adanaensis	*Squalius cappadocicus*
Squalius recurvirostris	*Squalius pursakensis*
Squalius semae	*Squalius berak*
Squalius seyhanensis	*Squalius cappadocicus*
Sterletus colchicus	*Sterletus persicus*
Tariqilabeo iranicus	*Tariqilabeo macmahoni*
Tristramella magdalenae	*Tristramella simonis*
Vimba melanops	*Vimba vimba*
Vimba mirabilis	*Vimba vimba*
Vimba persa	*Vimba vimba*

Changes that are not supported by our data
Synonymy of *Garra smartae* with *Garra dunsirei*
Synonymy of *Garra sindhae* with *Garra dunsirei*
Synonymy of *Oxynoemacheilus pantheroides* with *Oxynoemacheilus insignis*
Synonymy of *Glyptothorax alidaeii* with *Glyptothorax silviae*
Synonymy of *Glyptothorax galaxias* with *Glyptothorax silviae*
Synonymy of *Glyptothorax hosseinpanahii* with *Glyptothorax silviae*
Synonymy of *Glyptothorax shapuri* with *Glyptothorax silviae*
Replacement of *Capoeta anamisensis, C. barroisi, C. erhani, C. mandica*, and *C. trutta* with *Paracapoeta*