

13. Biology and culture technics of commercially important aquatic species

2.1- SEABREAM GILTHEAD

The gilthead seabream *Sparus aurata* (Linnaeus, 1758) is a perciform fish, belonging to the family Sparidae and to the genus Sparus.

LOCAL NAMES		
	Albanian	koceja, spalç
	Arabic	denis (Egypt), ourata, warka (Tunisia), zerika (Morocco)
	English	sea bream, gilthead seabream
	French	dorade, daurade
	German	goldbrasse
	Greek	tsipoura
	Italian	orata
	Portuguese	dourada, doirada
	Spanish	dorada
	Turkish	çipura

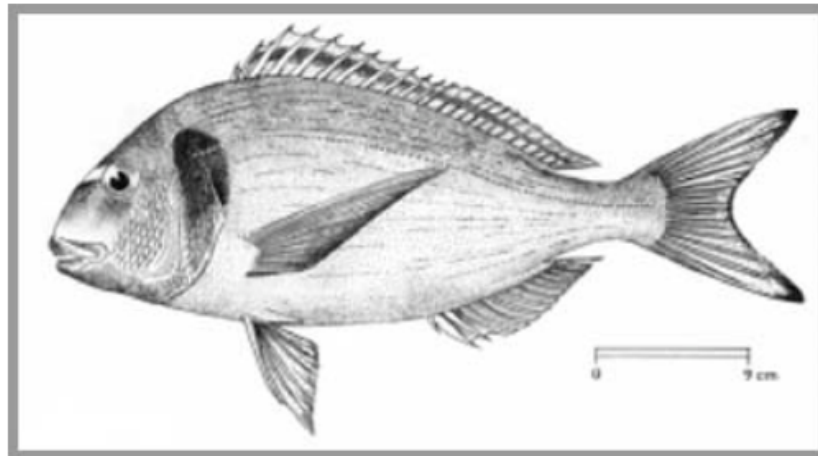


Fig. 6 Adult specimen of gilthead seabream

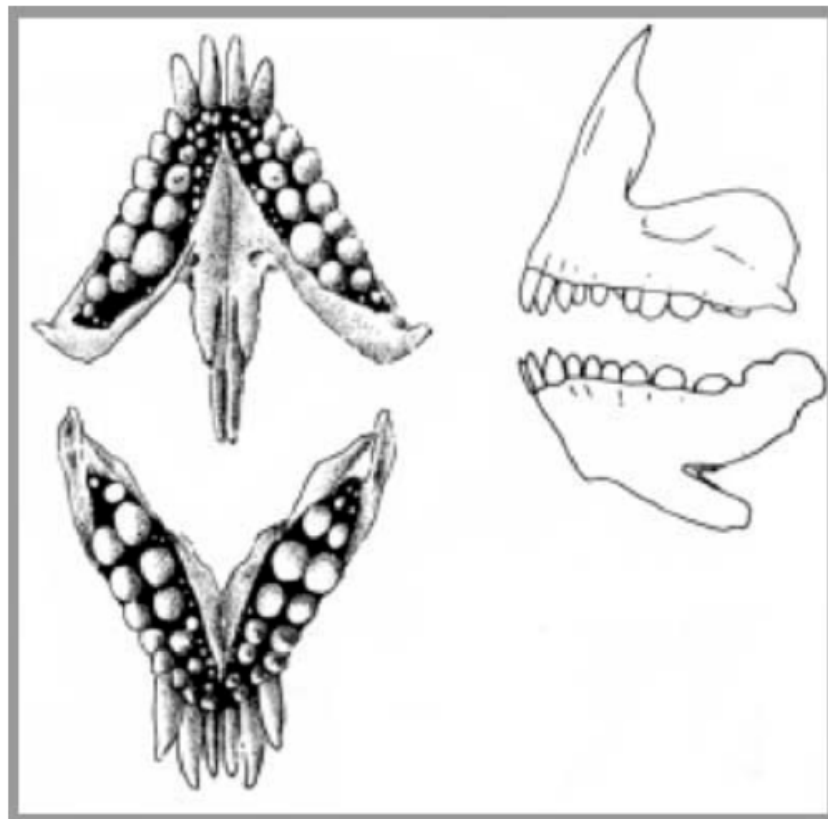


Fig. 7 - Gilthead seabream, teeth and jaws

Geographic distribution

S. aurata is common in the Mediterranean Sea, it is present along the Eastern Atlantic coasts from Great Britain to Senegal, and is rare in the Black Sea. Due to its euryhaline and eurythermal habits, the species is found in both marine and brackishwater environments such as coastal lagoons and estuarine areas, in particular during the initial stages of its life cycle. Born in the sea during wintertime, the fingerlings typically migrate in early spring towards protected coastal waters in search for abundant food and milder temperatures (trophic migration). Very sensitive to low temperatures (lower lethal limit is 4°C), in late autumn they return to the open sea, where the adult fish breed.

Family Sparidae

Percoid fish with body oblong, usually deep and compressed. Scales cycloid or weakly ctenoid. Head large, often with a steep upper profile. Snout and supraorbital area scaleless. Mouth small, with the upper jaw reaching no further than the middle part of the eye. Preoperculum scaled, without spines on margin. Jaw teeth usually differentiated into conical, incisor or canine teeth in front and molar-like teeth behind. Palatines bones usually toothless.

One single unnotched dorsal fin with 10 to 15 stout spines and 9 to 17 rays. The spiny anterior part has the same length of the posterior part with rays. Anal fins with 3 stout spines and 7 to 16 rays; pectoral fins usually long and pointed; ventral fins with axillary scales; caudal fin emarginate or forked. A single continuous lateral line. Colours vary greatly, from silver to reddish to almost black.

Almost all Sparidae are demersal, and are found in relatively shallow waters, often in rocky areas; the young fish generally live in shallower waters than the adults; fry and fingerling school together, while adults usually show a solitary behaviour.

The eggs are pelagic, spherical (with a diameter of around 1 mm) and have an oil drop.

Many sparids are hermaphroditic: when reaching sexual maturity there could be a majority of males (protandric hermaphroditism) or of females (protogynic hermaphroditism). Sparids are carnivorous fish and feed mainly on molluscs and other benthic organisms, which they break with their strong teeth.

Due to their excellent meat, many representatives of this family have a high commercial value. Sparids are divided amongst many genera and a large number of species living in all tropical and temperate seas, including exceptionally cold and brackish waters. In the Mediterranean eleven genera represent the family: *Dentex*, *Sparus*, *Diplodus*, *Pagellus*, *Pagrus*, *Lithognathus*, *Spondyllosoma*, *Oblada*, *Crenidens*, *Boops* and *Sarpa*.

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The gilthead seabream is usually found on rocky and seaweed bottoms, but it is also frequently caught on sandy grounds. Young fish remain at low depth (up to 30 m), whereas adults can reach deeper waters (maximum depth of 150 m).

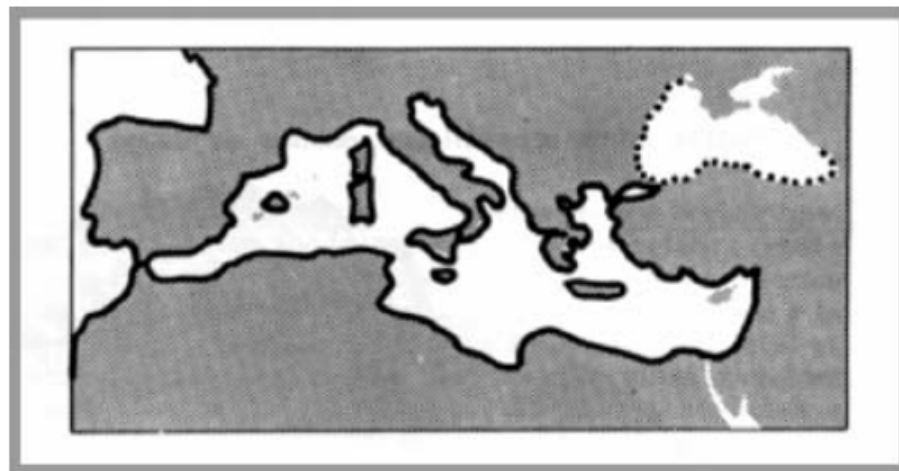


Fig. 8 - Gilthead seabream geographic distribution

Reproduction

The gilthead seabream is a protandric hermaphrodite with a breeding season ranging from October to December. The gilthead seabream is a functional male in the first two years and at sizes over 30 cm become females. After spawning, the eggs, which are spherical and transparent, have a diameter of slightly less than one mm. and present a single large oil droplet.

Fishery

The gilthead seabream is fished with traditional and sporting equipment, and sometimes with semi-professional systems (Spain, Sicily, Egypt and Cyprus), trawl nets, bottom set longlines, hand lines are also commonly used. The gilthead seabream is regularly present on the markets in Adriatic, Greece, Turkey and Maghreb. It is commercialised fresh, refrigerated and frozen.

2.2- THE EUROPEAN SEABASS

The seabass, *Dicentrarchus labrax*, Linnaeus 1758, is a Perciform fish, belonging to the Moronidae family and to the genus *Dicentrarchus*.

LOCAL NAMES		
	Albanian	lavraku; levreku
	Arabic	karous
	English	European seabass; bass; sea perch;
	French	bar; loup; loubine; perche de mer; barreau
	Greek	lavraki
	German	wolfsbarsch; seebarsch; meerbarsch
	Italian	spigola; branzino
	Spanish	lubina; robaliza; róbalo; magallón
	Turkish	levrek

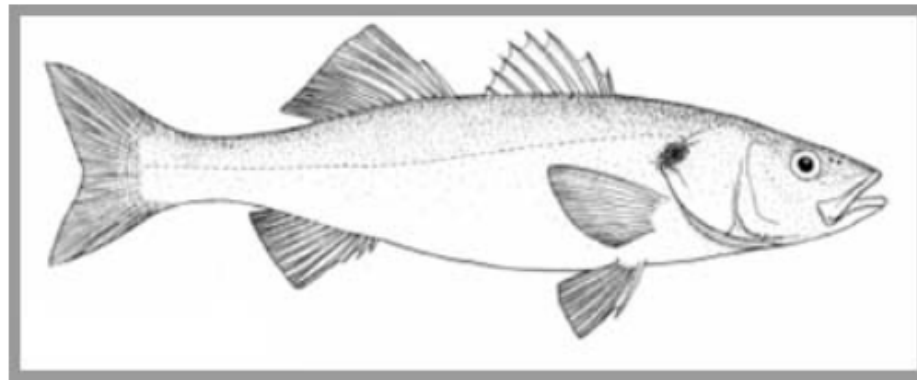


Fig. 9 - Adult specimen of seabass

Two species occur in the Mediterranean Sea: *D. labrax* (L.) and *D. punctatus* (Bloch), the latter with only a marginal interest in artisanal fishery along the southern Mediterranean coasts. They can be identified on the following characters:

presence on the back and sides of dark, permanent spots in adult	<i>D. punctatus</i>
vomerine teeth extend over the vomer like an arrow point	<i>D. punctatus</i>
vomerine teeth only on the anterior part, like a V	<i>D. labrax</i>
diameter of the eye is smaller than the interorbital space	<i>D. labrax</i>
while larger	<i>D. punctatus</i>

Morphology

The seabass, *Dicentrarchus labrax* has a silvery elongated body, with two clearly differentiated dorsal fins and a rather high tail. The opercular bone has two flat spines and a range of spines are visible in the lower part of the preopercular bone, pointing in the direction of the mouth. The vomer presents teeth with a crescent shape. This species has cycloid scales in the interorbital region. The lateral line is visible as a dark line with 62-80 cycloid scales.

The first dorsal fin has 8-10 spiny rays, and the second dorsal fin 12-13 rays of which the first is spiny. The anal fin has 3 spiny rays and 10-12 soft rays.

The colour is dark grey on the back, passing to grey-silver on the sides, while it is white-silver on the abdomen. Specimens from the sea show a much clearer colour than fish from lagoons and estuarine environments. On the opercular bone there is a dark spot. The juveniles show a livery with little dark spots, mainly on the front or only on the head, which disappear with age. The maximum size is over 1 m with a weight of over 12 kg.

The seabass is a eurythermal and euryhaline species and can survive at temperatures between 2 and 32°C, with a limited territoriality related to their search for food and to reproduction. Outside the spawning period, the seabass can be found anywhere food is available. Maturation and spawning need more specific environmental conditions (temperature, photoperiod, salinity) which determine variation in spawning period.

Feeding

Seabass is a predator consuming small fish and a large variety of invertebrates. In spite of variations associated with differences in latitude, bass hunts at any time of the day. The feeding behaviour is related to size. Juveniles feed mainly on small Crustaceans (Amphipoda, Mysidacea, Isopoda) and small fish (about 1/4 of the diet), like *Atherina* and *Gobius*. In fish larger than 20 cm, shrimps and crabs begin to be common preys.

Geographic distribution

D. labrax is common in the Mediterranean Sea, the Black Sea and along the Eastern Atlantic coasts from Great Britain to Senegal. With a tolerance to salinity and temperature fluctuations greater than the gilthead seabream, this species is found in marine to slightly brackish environments such as coastal lagoons and estuarine areas. In particular during the first stages of its life cycle displays the same behaviour of gilthead seabream. Much less sensitive to low temperatures, some fish may overwinter in coastal lagoons instead of returning to the open sea.

Reproduction

In seabass sexes are separate: the female shows a deeper body with a longer pointed head and greater pre-dorsal and pre-anal lengths. Sure sex confirmation is however possible only during the spawning season by checking the presence of sperm by squeezing gently the males and by observing the protrusion of the anus and genital papilla in the females.

Sexual maturity takes place earlier in males and earlier in Southern populations. There is only one breeding distribution season per year, which takes place in winter in the Mediterranean population (December to March), and up to June in the Atlantic populations. Unlike gilthead seabream, female gonads complete their maturation at the same time and eggs are released all together in a short time, usually at night. For hatchery purposes, spent females have to be replaced by new breeders as soon as new batches of eggs are required.

After being released, the eggs acquire their characteristic spherical shape, with a size that varies according to latitude:

Place	diameter (mm)
Great Britain	1,2 - 1,5
Mediterranean	1,15 - 1,2

Fisheries

Seabass is fished both by artisanal and sport fishermen. The quantities caught in the Mediterranean are relatively small which linked to high appreciation for the species in the Mediterranean markets makes it a high value species. The gear used to catch seabass include beach and purse seines, trawl nets, trammel nets and longlines, as well as rod and line. It is regularly present in the Mediterranean markets but it is scarce in the eastern Mediterranean basin and it is rare in the Black Sea.