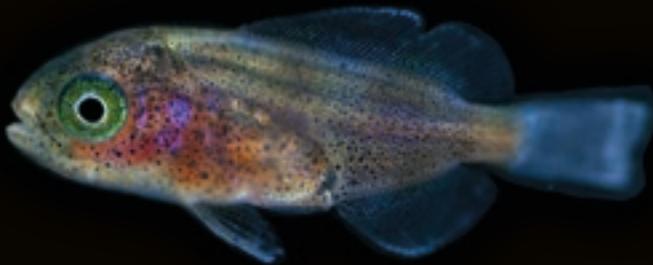


Publishers Lenfant P.
3rd EDITION 2022

ATLAS

of POSTLARVAL FISH

of the WESTERN MEDITERRANEAN



ATLAS

of **POSTLARVAL**
FISH

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This document should be cited as follows: Lenfant Philippe, Frézel Alizée, Fortin Antony, Ensargueix Damien, Fonbonne Sébastien, Gudefin Anaïs, Lecaillon Gilles, 2022. Atlas of fish postlarvae of the western Mediterranean (3rd edition).



Epinephelus marginatus - © AFo

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Balistes capriscus - © AFo

FOREWORD

It has already been ten years since the first identification guide for Mediterranean postlarvae was created. Published by Ecocean for the Fondation pour la Recherche sur la Biodiversité, this initial guide presented around fifty species of fish and crustaceans and was illustrated with 127 photos (Lecaillon *et al.*, 2012).

It was followed by a more extensive document that was one of the major deliverables of the Européen LIFE+ SUBLIMO programme conducted by the Universities of Perpignan and Corte between 2012 and 2015. Entitled 'Atlas of Post-Larval Fish of the Northwestern Mediterranean Sea' (Crec'hriou *et al.*, 2015), this document now included descriptions of 88 species and nearly 300 photos.

Sparus aurata postlarva - © AFo

Published in French and English, 3000 copies of the document were printed (1500 in French and 1500 in English). Due to their popularity, these free paper versions are no longer available but a downloadable pdf version is still available on numerous internet sites (<https://www.ecocean.fr/documents-a-telecharger/#dearflip-df-5322/1/>).

In this foreword we would like to thank the contributors to this major deliverable of the SUBLIMO project: Crec'hriou Romain, Garsi Laure-Hélène, Lèbre Laurie, Lozano Laura, Pastor Jérémy, Lecaillon Gilles, Durieux Eric, Simon Gaël, Ternengo Sonia, Bracconi Jérémy, Briot Lisa, Verdoit-Jarraya Marion, Saragoni Gilles, Pristcheva Séverine, Bastien Romain, Agostini Sylvia, and Lenfant Philippe, 2015. Atlas of Fish Postlarvae of the western Mediterranean Publishers: Crec'hriou R. & Lenfant P., Life + 'SUBLIMO' Programme, 192p

This corrected and enriched work is therefore a new stage in the sharing of knowledge by a team of specialised ecologists with a passion for the early stages of fish and crustacean life cycles. In this work, scientists, fish-farmers/breeders and lovers of nature or photography will all find an exhaustive list of the more or less rare coastal species that can be observed in the western Mediterranean Sea.



This new atlas has been based on the two previously mentioned documents and as part of a cooperative approach that associates researchers, technicians, managers, institutions and financial partners under the DRIVER programme (www.restauration-ecologique.com). This new edition now includes descriptions of nearly 100 species and over 300 photographs.

The contribution of the earlier works is certainly of great importance, but in the last seven years two new projects co-funded by Agence de l'Eau Rhône Méditerranée Corse have enabled the capture, rearing and repopulation of several thousand individuals per year on the French Mediterranean coast (CASIOMAR project in Marseille and the ORREA project in Toulon).

Hundreds of nights spent fishing have thus enriched this guide with 6 new species but above all have enabled the correction of several errors in the previous guides due to a lack of knowledge, and to complete all the species sheets with new, high-quality photos that illustrate more numerous stages of growth to facilitate identification by readers. Finally, the periods of recruitment of the species presented are also more precise; they have all been reassessed after a decade of fishing for larvae in the Mediterranean Sea!



LIFE CYCLE

To understand what a postlarva is, it is necessary to examine the various stages of the life cycle of coastal marine fish (**Fig. 1**). Indeed, most of these start their life cycle by a phase of oceanic dispersal (28)¹ where the fertilised eggs and later the larvae are subject to the movement of the water mass. This phase enables them to colonise new habitats and thus promotes connectivity among populations, genetic mixing and therefore the preservation of the species (5, 9, 42).

¹Number of the bibliographical reference p. 274

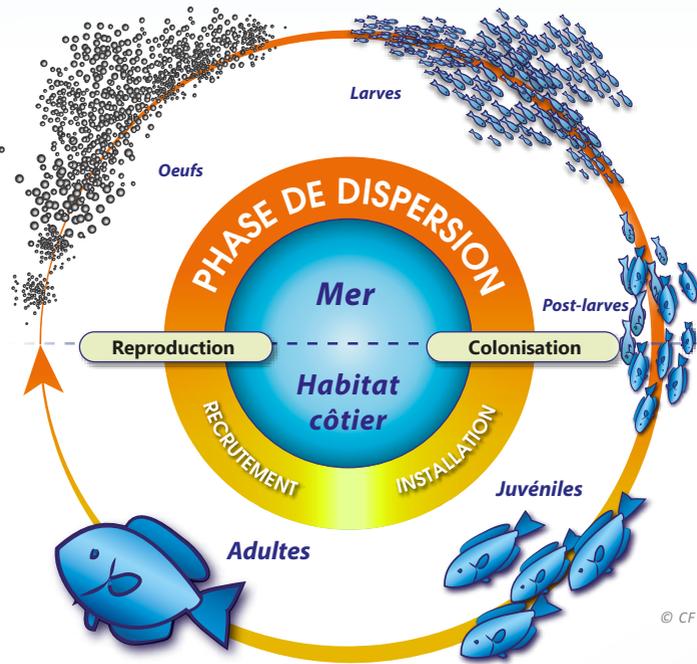


Fig. 1
Stages in the life cycle
of fish



Depending on the species, the larvae spend between twenty and one hundred days in the ocean (28). At the end of this oceanic phase, the larvae become active (29, 30), which corresponds to the postlarval stage.

Postlarvae are thus competent larvae that are capable of leaving the water mass and directing their movement towards the coast in the search for a suitable habitat for their development. This phase of colonisation of their future habitat is followed by a phase of settlement in which the individuals undergo the physiological modifications that are necessary for their final life style. They thus become the juveniles that will subsequently join the adult populations (recruitment).

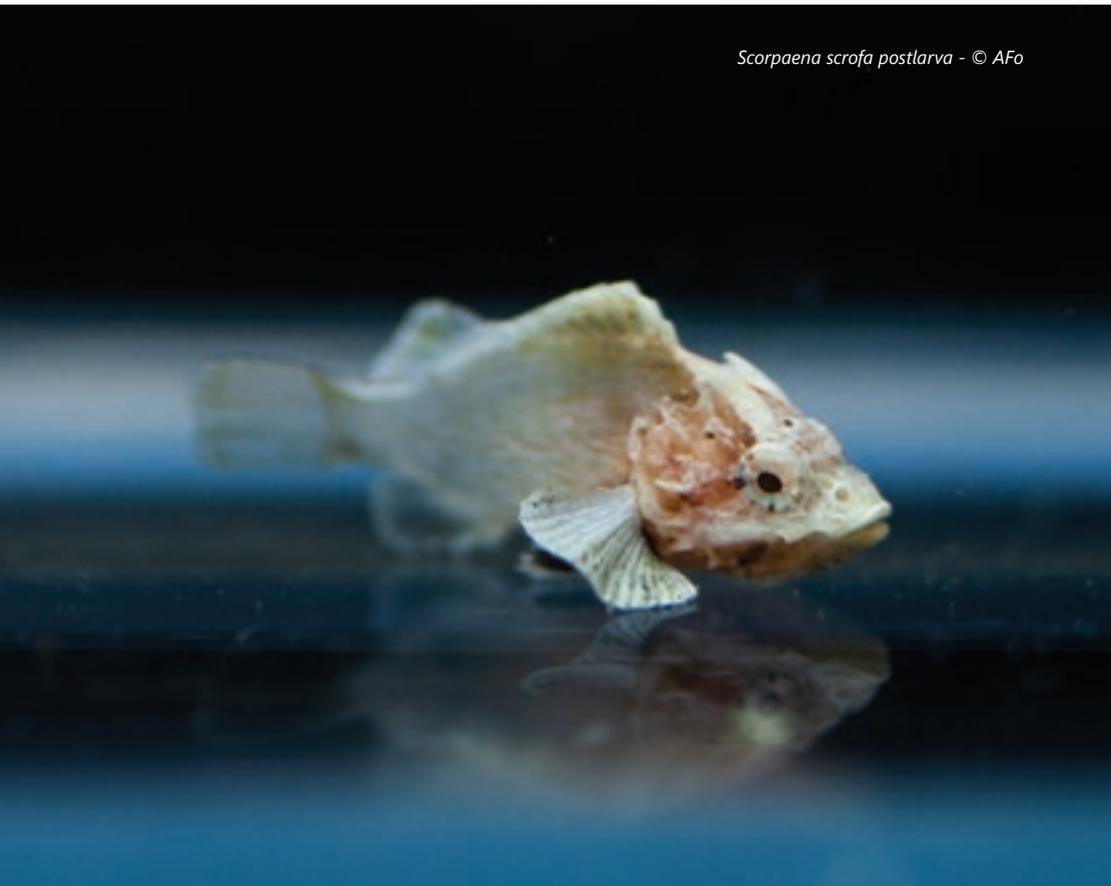
There is a very high mortality rate during the phases of colonisation and settlement: indeed, it has been estimated that over 95% of all postlarvae disappear when they arrive at the coastal habitat. This high level of mortality is due to natural predation

aggravated by the deterioration of coastal ecosystems due to human activity, thus reducing the potential for the preservation of biodiversity.

Indeed, each postlarva that is victim to predation or the destruction of its coastal habitat is one less individual that will not reach the mature reproductive stage and will not participate in population renewal. (Fig. 2)

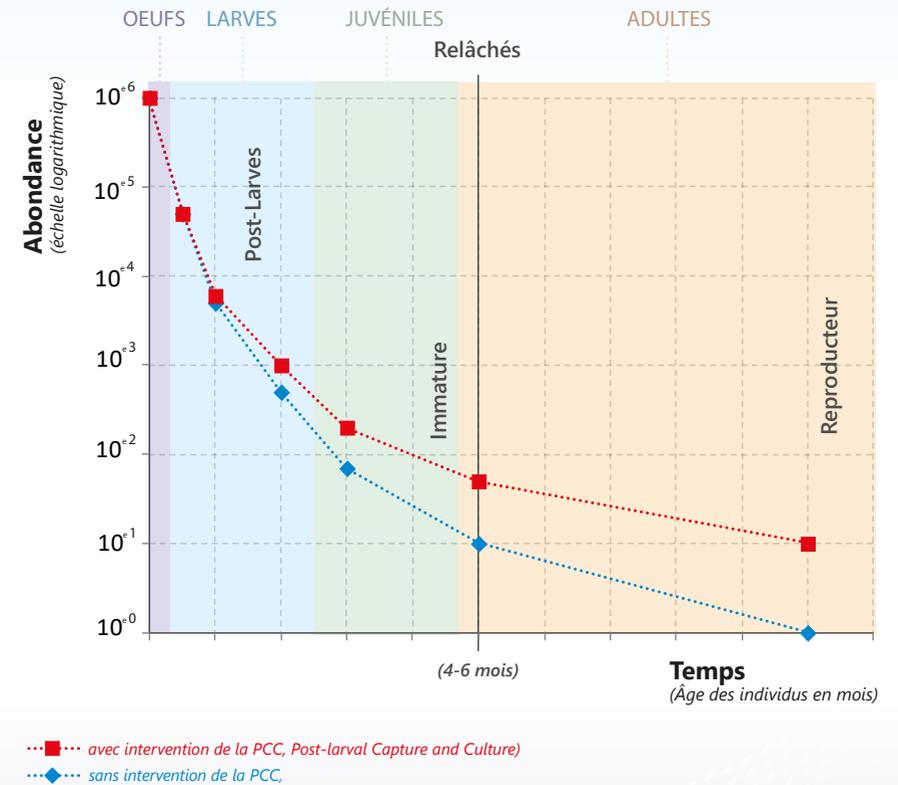
This loss of biodiversity affects both the number of species and the function of the ecosystem. One then observes the collapse of the trophic network and the subsequent destabilisation of the ecosystem services.

The objective of the research programmes that enabled the development and the transfer of postlarval fish capture and rearing (PCC) to the Mediterranean Sea was to directly act on the life cycle of species by capturing postlarvae before the



major episode of mortality and rearing them until they reach a size where they are less vulnerable to predation and releasing them in their natural habitat, thus increasing the juvenile survival rate and even increasing local fish populations. This mainly concerns the BIORESTORE, GIREL, CASCIOMAR and ORREA projects associated with the European Life+ SUBLIMO project.

Fig. 2
Schematic representation of the variation in the number of individuals during growth for a theoretical fish species



REPOPULATION PROGRAMMES ORIGIN AND GOALS

Developed in a coralligenous environment, the capture and rearing of fish postlarvae (PCC) eliminates the need for animal sampling with sometimes highly destructive methods. This idea gave birth to the possibility to use this technique to help fish populations recover their original abundance via two programmes launched in the Mediterranean Sea: POPMED and BIORESTORE Agde in 2010-2011. For this purpose, ECOCEAN associated with the scientists of the CEFREM, University of Perpignan, which benefits from a great deal of experience concerning the tracking of juvenile fish in temperate zones.



© SB



Thalassoma pavo postlarva - © AFR

BIORESTORE Agde validated the fact that we were able to fish postlarvae in the Mediterranean Sea, that technique was of interest to fishermen, and that the regulations, even though strict, enabled a more ambitious project to be envisaged.

POPMED enabled the creation of the first guide to the identification of Mediterranean Sea postlarvae (55), in collaboration with partners from Spain, Italy and the University of Corsica, thus revealing the interest of the scientific community for these early stages.

On the basis of the acquired knowledge, the European **Life+ SUBLIMO** programme (Tracking the Biodiversity of northwestern Mediterranean Sea fish postlarvae) (LIFE10NAT/FR/000200) was created at the initiative of a research team of the University of Perpignan working on juvenile fish and the French ECOCEAN company around its innovative process based on postlarval fish capture and rearing (PCC). The objective was to answer several questions:

- What biodiversity?
- What abundance?
- Are all sites equivalent in the number of species or abundance?
- Where do they arrive more frequently?



© AD

On the basis of postlarvae catches at 7 sites (2 priority and 5 secondary sites) distributed along the continental and Corsican coastlines in the western Mediterranean Sea, the SUBLIMO project has demonstrated the wide biodiversity of postlarvae with a differential distribution among sites and years.

As part of the repopulation phase of the project, the captured postlarvae were reared ashore and then released into their natural environment after reaching a so-called 'refuge' size. This increases the survival rate of juveniles by avoiding the high mortality that affects postlarvae when they arrive at the coast and thus to maintain or even increase local fish populations.

The initial results were disseminated to other French Mediterranean Sea regions where the process may be reproduced, thus enabling a more global vision and action at the scale of the Mediterranean basin. The applications and progress of this programme were also enhanced and transferred to the scientists, users and managers of the European Union. They may lead to proposals for measures of management and new indicators. The French Ministry for Sustainable Development and the Agence de l'Eau Rhône Méditerranée Corse (AERMC) have already incorporated the importance of the postlarval stage in the assessment

and management of good ecological status. New projects have emerged with the support of the AERMC and have provided interesting results:

- For over 7 years, RESPIRE (Réseau pour le Suivi du Recrutement - recruitment monitoring network) has tracked the intensity of juvenile fish recruitment on the Mediterranean seafront with regional variations;
- CASCIOMAR and ORREA, projects for repopulation at the scale of the Marseille and Toulon metropolitan areas, have enabled the release of over 25,000 fish juveniles in 7 years.

Public-private collaborations continue and have enabled, with the involvement of the AERMC, the development of a maritime ecological engineering sector that is actively supported by the Pôle Mer Méditerranée. In its new plan for the recovery of marine nurseries, which is integrated into the next intervention programme, the AERMC has decided to actively support BioRestore® type approaches.



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CAPTURE

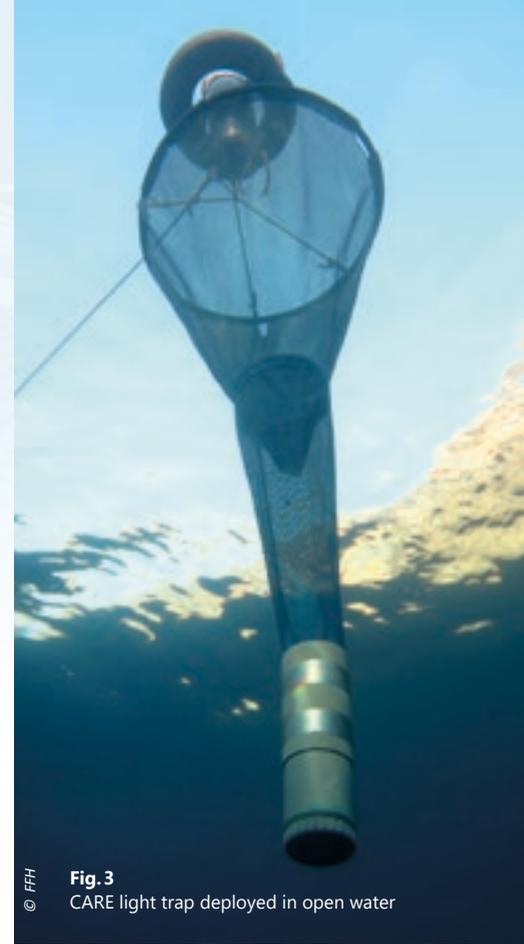
The first action consists in capturing live postlarvae. This is performed using CARE-type (Collect by Artificial Reef Eco-friendly) (76) light traps, which are specific fishing devices that have been developed and patented by the French ECOCEAN company to catch the postlarvae of reef-dwelling or demersal fish.

CARE devices consist of a floating light chamber and a cylindrical PVC net that closes around a collector (**Fig. 3**). It enables live postlarvae to be caught before they settle in the environment. This fishing technique is based on one of the particularities of postlarvae, phototropism. During the night, the postlarvae are attracted by the light source and voluntarily seek refuge in the collector by moving along the net, which acts like an artificial reef (thigmotropism (26)).

CAPTURE METHOD

The fishing process takes place around the new moon. The CAREs are installed at the surface at sunset and are moored on sea bottoms that generally exceed 15 to 20 metres in depth. They are recovered very early the following morning. The postlarvae thus captured in the collector by fishermen or environmental managers (**Fig. 4**) are placed in numbered cold boxes for safe transport to the laboratory for sorting and identification.

The interest of this innovative technique is that it employs a device that does not require a large boat for towing and which optimises the work performed within a suitable time frame (**Fig. 5**).



© FFH
Fig. 3
CARE light trap deployed in open water



© RD
Fig. 5
Recovering a CARE device in Marseille



© Afo
Fig. 4
Recovering the catch in the collector

REARING

The postlarvae collected by the CAREs are reared in a closed circuit system. The main objective of the rearing phase is to grow individuals until they reach a size where predation is reduced when they are reintroduced into the natural environment ('refuge' size). Rearing also enables the identification of species and their different phases of development.

SORTING

Sorting is performed by the naked eye in a shallow tank containing seawater and an aeration system. The most fragile postlarvae are never taken out of the water and are sampled using small transparent containers. They are identified, measured and then transferred to pre-growth tanks. Their distribution and density vary according to the species and size of individuals. (**Fig. 6 & 7**).

Fig. 6 — Sorting *D.vulgaris* postlarvae



© AFO



Fig. 7 — Postlarvae growth

GROWING

Postlarvae reared at low density in a controlled environment. Temperature, salinity, pH and the bacteriological quality of the water are carefully monitored in order to provide the fish with optimal conditions for survival and development.

The growth phase generally lasts 4 to 6 months, depending on the species. This period is considered to be sufficient to reach the 'refuge size', when the juveniles have the greatest chances of avoiding predation.

During the rearing phase, the postlarvae are mainly fed live brine shrimp nauplii. This feeding phase, which is of variable length depending on the species, enables the transition between feeding on live prey and inert food.

Once weaned, the fish are fed various foods, including aquafarming pellets to ensure they receive all the nutritional elements they require.

The postlarvae are fed two to three times per day. Certain specific species require more complex and diversified types of food. These rations may be completed with brine shrimp, krill, mysid shrimp, fish flesh, mussels, frozen food for ornamental aquariums and live plankton caught by the CARE devices. The diet is carefully monitored to respect the needs of the species and to ensure that the size of the food distributed is adapted to the size of their mouths.

To maintain optimal rearing conditions (suitable density, favourable abiotic parameters), the fish are regularly sorted and moved to new tanks (**Fig. 8**). They are grouped by size as well as the capacity of species to coexist.



Fig. 8 — Postlarvae sorting

Rearing facilitates the identification of certain species. Over time, postlarvae in pre-growth tanks develop an increasing number of adult characteristics.

Fig. 9 — Transitional habitats

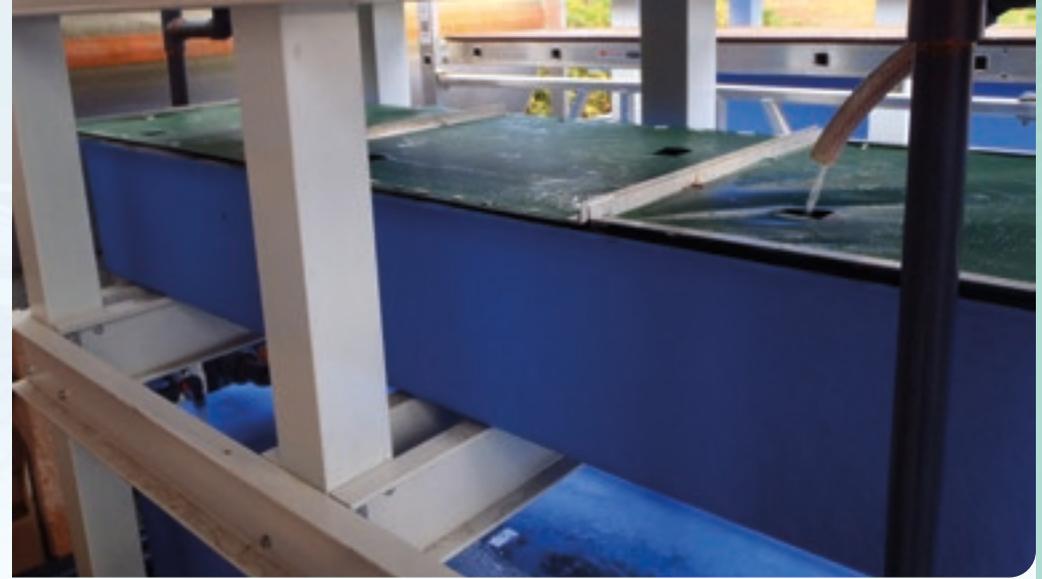


Fig. 10 — Raceways

NON-DOMESTICATION

Before they are reintroduced into the wild, specific procedures are implemented to readapt the fish to life in the marine environment. This phase, during which their feeding and habitats will change, takes place in large tanks or raceways. It is necessary for the fish to improve their feeding performance and exploratory behaviour to enable them to adapt more quickly to their natural habitat. Transitional habitats are incorporated into the rearing tanks for this purpose (Fig. 9). These metal structures will later be used when the fish are released into the natural environment.

Once released into the wild, the individuals will have to find a source of food on their own. They may have to temporarily modify their diet according to the availability of prey. Feeding must respect certain parameters to prevent the fish from becoming accustomed to human presence. Food is distributed through small openings in the covers of the raceways (Fig. 10).

The various types of food are randomly distributed 1 to 3 times per day to ensure a suitable availability of food while avoiding domestication and excessive competition among individuals. Live prey, such as shrimp 2 to 3 cm in length, are regularly distributed during the period before repopulation in order to solicit and encourage predation behaviour.



RELEASE

The release of fish in the juvenile stage is the last phase of this type of ecological recovery process. Indeed, the value of this approach is to be able to release pre-grown juveniles at a stage when their chances of survival in the wild are much greater than during the postlarval stage.

The individuals released are the result of natural reproduction (postlarvae captured in their natural environment) respecting the gene pools of local populations. Repopulation takes place near the postlarvae capture zones and consists of a series of stages that aim to maximise the chances for survival of the individuals after release. This is a critical stage because there are serious risks for the health of the animals during their transfer from the rearing environment into the wild.

On the day of repopulation, release habitats (ECOCEAN) are immersed into the natural environment near habitats that are favourable to colonisation by the repopulated species. These artificial habitats consist of metal structures that contain a shelly substrate that enables juveniles to shelter from certain predators

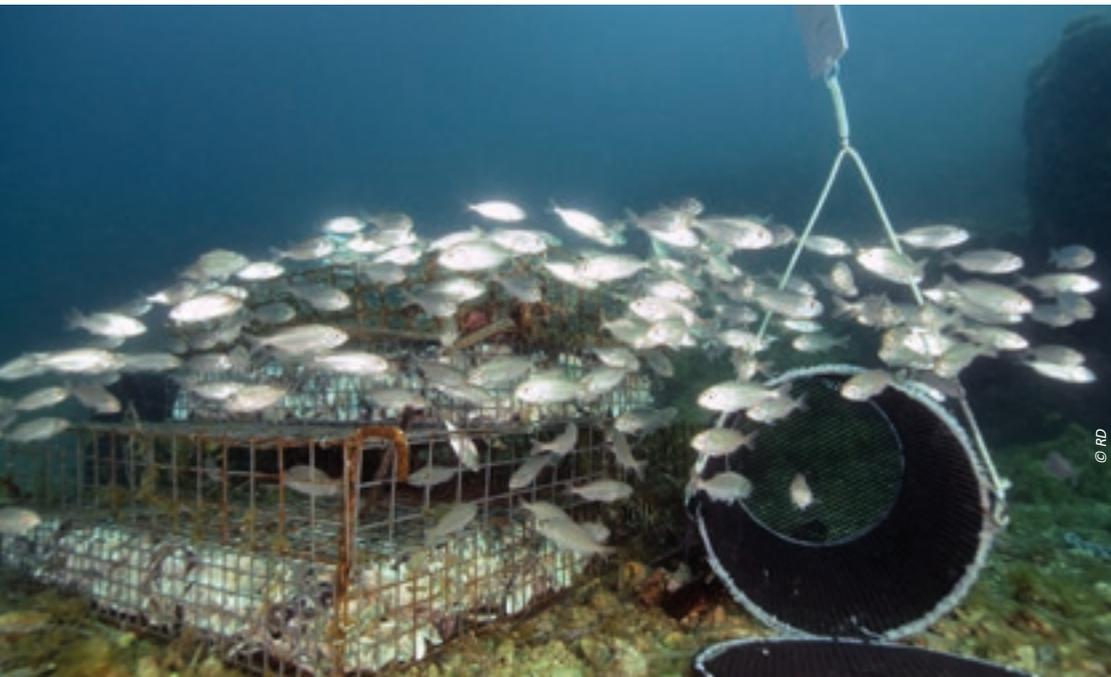


Fig. 11 — Fish under repopulation net

before they colonise the surrounding natural areas. They thus recall the artificial transitional habitats immersed in the raceways during the rearing stage.

The animals are fished out of the rearing tanks and placed in cage traps which in turn are placed in cold boxes to ensure transport to the repopulation site. Once in the sea, the cage traps are lowered during dives and installed around the release sites.

The entire installation is covered by a fine-mesh protection net to prevent the approach of potential predators (**Fig.11**). The traps are opened and the juveniles thus remain 'under cover' for 24 hours in order to gradually become accustomed to the odours, noise and the coastal environment in general.

The following day, the protection net is lifted in order to free the juveniles, who will rediscover their natural environment and colonise the surrounding habitats. Most of the individuals released are fully in juvenile stage III and some are already in juvenile stage IV (sub-adult stage) – see below.

Definitions

Postlarva (or competent larva): the final larval stage. The stage at which the fish returns towards the coast, thigmotropic.

Juvenile: individual that is not yet capable of reproducing.

Juvenile **stage I:** juvenile that has only recently settled. A rather transparent individual that resembles a postlarva. Metamorphosis is incomplete and the mortality rate is still high.

Juvenile **stage II:** pigmented individual. Can be observed feeding, but is still subject to high mortality and very dependent on its habitat.

Juvenile **stage III:** larger/wider movement (for nektobenthic species), ready to leave the nursery. Less dependent on its habitat. Has reached refuge size with greatly reduced mortality.

Juvenile **stage IV:** sub-adult. Body colour is established, no longer needs its habitat as a nursery. Resembles an adult and may have already joined the adult population.

Adult: an individual that is capable of reproducing (has reached or exceeded its size of initial sexual maturity).

Species	Common Name	Family	Postlarvae size		Stage II size	Stage III size	Stage IV size	Mature size
			Stage I size	Stage II size				
<i>Aidablennius sphyinx</i>	Sphinx blenny	Blenniidae	15	20				36
<i>Anguilla anguilla</i>	Eel	Anguillidae	50					450
<i>Apogon imberbis</i>	Cardinal fish	Apogonidae	10	25				55
<i>Arnoglossus thori</i>	Thor's scaldfish	Bothidae						
<i>Atherina boyeri</i>	Big-scale sand smelt	Atherinidae	10	15	20	25	30	35
<i>Atherina hepsetus</i>	Mediterranean sand smelt	Atherinidae		20				35
<i>Balistes capricus</i>	Grey triggerfish	Balistidae						163
<i>Belone belone</i>	Garfish	Belonidae						305
<i>Chelon labrosus</i>	Thicklip grey mullet	Mugilidae	10	15	25	40	65	340
<i>Chelidonichthys lucerna</i>	Tub gurnard	Triglidae	20	25				194
<i>Chelidonichthys obscurus</i>	Longfin gurnard	Triglidae						
<i>Chromis chromis</i>	Damselfish	Pomacentridae	5	10	15	30	55	100
<i>Conger conger</i>	European conger	Congridae						200
<i>Coris julis</i>	Mediterranean rainbow wrasse	Labridae	15	25	30	40	60	160
<i>Dentex dentex</i>	Common dentex	Sparidae	10	15				386
<i>Dicentrarchus labrax</i>	European seabass	Moronidae	15	20	25	40	65	265
<i>Diplodus annularis</i>	Annular seabream	Sparidae	10	15	20	40	70	106
<i>Diplodus puntazzo</i>	Sharpsnout seabream	Sparidae	10	15	20	40	80	219
<i>Diplodus sargus sargus</i>	White seabream	Sparidae	10	15	20	35	60	208
<i>Diplodus vulgaris</i>	Two-banded sea bream	Sparidae	10	15	20	35	70	174
<i>Epinephelus marginatus</i>	Dusky grouper	Serranidae	25	35	40	75	125	530
<i>Gaidropsarus mediterraneus</i>	Shore rockling	Lotidae	30	35				250
<i>Gobius geniporus</i>	Slender goby	Gobiidae	10	12				100
<i>Gymnammodytes cicereus</i>	Mediterranean sand eel	Ammodytidae	50	60				73

Species	Common Name	Family	Postlarvae size	Stage I size	Stage II size	Stage III size	Stage IV size	Mature size
<i>Hippocampus guttulatus</i>	Long-snouted seahorse	Syngnathidae	12	20				125
<i>Hippocampus hippocampus</i>	Short-snouted seahorse	Syngnathidae	15	20				77
<i>Lipophrys trigloides</i>	Combtooth blenny	Blenniidae	10	15				120
<i>Lithognathus mormyrus</i>	Sand steenbras	Sparidae	20					180
<i>Liza aurata</i>	Golden grey mullet	Mugilidae	10	20	25	40	65	265
<i>Liza ramada</i>	Thinlip grey mullet	Mugilidae	10	20	25	40	65	283
<i>Mugil cephalus</i>	Flathead grey mullet	Mugilidae	10	20	25	40	65	448
<i>Mullus barbatus barbatus</i>	Red mullet	Mullidae	45	50	55	60	85	130
<i>Mullus surmuletus</i>	Striped red mullet	Mullidae	45	50	55	60	85	155
<i>Nerophis maculatus</i>	Spotted pipefish	Syngnathidae						
<i>Nerophis ophidion</i>	Nerophis ophidion	Syngnathidae						
<i>Oblada melanura</i>	Saddled seabream	Sparidae	10	15	20	35	50	170
<i>Pagellus acarne</i>	Axillary seabream	Sparidae	20	30				187
<i>Pagellus bogaraveo</i>	Blackspot seabream, red seabream	Sparidae	25	35				314
<i>Pagellus erythrinus</i>	Common pandora	Sparidae	10	20				174
<i>Pagrus pagrus</i>	Red porgy	Sparidae	20	25	30	50	85	266
<i>Parablennius gattorugine</i>	Tompot blenny	Blenniidae	15	20				
<i>Parablennius incognitus</i>	Surprise blenny	Blenniidae						
<i>Parablennius pilicornis</i>	Ringneck blenny	Blenniidae	15	20				
<i>Parablennius rouxi</i>	Longstriped blenny	Blenniidae	15	20				
<i>Parablennius tentacularis</i>	Tentacled blenny	Blenniidae	20	30				90
<i>Parablennius zvonimiri</i>	Zvonimir's blenny	Blenniidae	15	20				70
<i>Salaria pavo</i>	Peacock blenny	Blenniidae	15	20				100
<i>Sardina pilchardus</i>	European pilchard	Clupeidae						121
<i>Sarpa salpa</i>	Salema porgy	Sparidae	15	20	25	40	75	217

Species	Common Name	Family	Postlarvae size	Stage I size	Stage II size	Stage III size	Stage IV size	Mature size
<i>Sciaena umbra</i>	Brown meagre	Sciaenidae	20	25	30	45	90	258
<i>Scorpaena maderensis</i>	Madeira rockfish	Scorpaenidae						
<i>Scorpaena notata</i>	Small red scorpionfish	Scorpaenidae	10	20				90
<i>Scorpaena porcus</i>	Black scorpionfish	Scorpaenidae	15	20				145
<i>Scorpaena scrofa</i>	Red scorpionfish	Scorpaenidae	12	20				200
<i>Seriola dumerili</i>	Greater amberjack	Carangidae	60					
<i>Serranus cabrilla</i>	Comber	Serranidae	15	20	25	40	55	117
<i>Serranus hepatus</i>	Brown comber	Serranidae	10	20	25	40	55	85
<i>Serranus scriba</i>	Painted comber	Serranidae	10	20	25	40	55	103
<i>Solea solea</i>	Dover sole	Soleidae						183
<i>Sparus aurata</i>	Gilt-head bream	Sparidae	15	20	25	50	85	200
<i>Sphyræna sphyraena</i>	European barracuda	Sphyrænidae	40	45	60	85	125	245
<i>Spicara maena</i>	Blotched picarel	Centracanthidae	10	20				117
<i>Spicara smaris</i>	Picarel	Centracanthidae	10	20				91
<i>Spondylisoma cantharus</i>	Black seabream	Sparidae	15	20	25	40	65	220
<i>Symphodus ocellatus</i>	Ocellated wrasse	Labridae						
<i>Syngnathus abaster</i>	Black-striped pipefish	Syngnathidae						
<i>Syngnathus taenionotus</i>	Darkflank pipefish	Syngnathidae						
<i>Thalassoma pavo</i>	Ornate wrasse	Labridae	15	20	25	40	70	100
<i>Trachinus draco</i>	Greater weever	Trachinidae	10	15				200
<i>Trachurus mediterraneus</i>	Mediterranean horse mackerel	Carangidae	10	15	20	25	35	200
<i>Trachinotus ovatus</i>	Pompano	Carangidae	30	45				150
<i>Trachurus trachurus</i>	Atlantic horse mackerel	Carangidae	10	15	20	25	35	187
<i>Uranoscopus scaber</i>	Atlantic stargazer	Uranoscopidae	10	15				140

In this guide, readers will find a large quantity of information concerning the species described, their biology, morphology, distribution (adults and postlarvae on the collection sites) and their habitat. They will also find descriptions and photographs of the different stages of postlarval development at certain key moments of their transition from the larval stage (often translucent) to the juvenile stage (with adult characteristics).

FAMILY TABLE

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In this part, you will find the family, genus, species, author citation, common names in various languages and IUCN status and interest icons.

Meristic data provides information concerning the number of fin rays:

- Roman numerals indicate the number of hard rays;
- The other figures indicate the number of soft rays.

Information concerning reproduction, pelagic larval duration (PLD), spawning periods and recruitment.

Information concerning postlarvae rearing and the references used. ND means that certain aspects of rearing have not been determined

Graph representing monthly abundance

In this section, postlarvae and juveniles are described according

Practical information concerning their maintenance in rearing, their observed period of recruitment and their size on arrival is also available.

A certain number of **terms and abbreviations** are used throughout this guide. Definitions are provided in the glossary at the end of the book.

Family Genus & species

The photos illustrating the species are completed by a caption that indicates their stage after capture, where they were collected and their size. A close-up focusing on certain characteristics of identification may be provided.

214 **Diplodus annularis** (Linnaeus, 1758)
Sparidae

Sparailon
Raspailón (Es), Sparaglione (It), Annular seabream (UK)

CARACTÈRES MÉRISTIQUES

NAGEOIRE DORSALE	XI + 11-13
NAGEOIRE ANALE	III + 11-12
Type de ponte	Pélagique*
PLD	16-21
Reproduction	Avril-Juin
Saison d'installation	Été

DISTRIBUTION
Mer Méditerranée et mer Noire, présent sur la côte est Atlantique du Portugal au golfe de Gascogne.

ÉCOLOGIE
De l'œuf au juvénile
Pas de données.

Adulte
Habite majoritairement les herbiers de zostères mais se retrouve aussi dans les herbiers de posidonies et sur les fonds sableux. Rarement observé sur les fonds rocheux.

ÉLEVAGE DES POST-LARVES

Élevage	Délicat	Particularité	Les PL sont agressives dans des petits volumes. Elles doivent être passées en grand bassin très rapidement ainsi que triées par taille.
Intra-spécifique	Dominance	Taille de prise	14,1 mm ± 2,3 mm (n=2454)
Inter-spécifique	Vif	Référence	53, 33, 19, 31, 58
Alimentation	Très facile		
Stress	Manipulation		
Croissance	Moyenne		

POST-LARVES
De 10 à 15 mm
La PL est translucide, avec une coloration sur les flancs noire-orangée. La vessie gazeuse est bien visible. Après 4 jours, de nombreux mélanophores* apparaissent le long du corps des individus et la coloration orangée s'estompe sur les flancs.

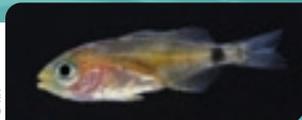
JUVÉNILES
De 15 à 20 mm
Le juvénile prend une teinte jaune noire comme pour le *D. dentex*, mais avec un TD bien rosé et surtout des nageoires dorsales et anales colorées en noir (et non en jaune).

Plus de 20 mm
Le juvénile commence à prendre les caractères adultes avec une coloration grisée et les nageoires dorsales et pectorales commencent à jaunir. Au stade suivant, elles sont couleur or et un point noir apparaît sur le pédoncule caudal, qui s'estompe sur une livrée d'adulte.

SPARIDAE 215
Diplodus annularis



J+0 - Bastia - 12 mm



J+0 - Marseille - 15 mm



J+8 - Bastia - 18 mm



J+30 - Embiez - 26 mm



J+33 - Bastia - 26 mm



J+210 - Bastia - 76 mm



J+0 - Marseille - 20 mm

Nombre d'individus pris par mois (hors alevage et canétes conteneurielles)

Month	Number of individuals
Janvier	0
Février	~300
Mars	0
Avril	0
Mai	0
Juin	~1100
Juillet	~1300
Août	~50
Septembre	0
Octobre	0
Novembre	0
Décembre	0

The following terms are used in the 'postlarvae rearing' section

Rearing

to describe the degree of rearing difficulty:

- Difficult
- Delicate
- Easy

Intra- and inter-specific

to describe intra-specific and inter-specific relations:

- **Cannibalism / Predation**(eats members of its own species / eats others)
- **Aggressive**(attacks other fish)
- **Territorial** (appropriates a corner of the tank and is aggressive towards those that approach it)
- **Dominance**(a hierarchy is established among individuals)
- **Lively**(coexists but may be aggressive)
- **Coexistence**(does not attack others)

Feeding

to describe the quality of feeding:

- **Difficult**(live prey only)
- **Delicate**(live prey and a variety of frozen food)
- **Easy**(may reject dry food)
- **Very easy**(quickly accepts dry food)

Stress

to describe the level of sensitivity of the fish:

- **Stressed**(very stressed fish, difficult to maintain)
- **Handling**(docile fish but very stressed when handled)
- **Shy**(shows curiosity but is fearful)
- **Docile**(not very fearful).

Growth

to describe the rate of growth of individuals:

- Quick
- Average
- Slow

Particularity

Any complementary information necessary for rearing.

The 'IUCN status' and 'Interest' icons used in this book:

CR Critically Endangered

EN Endangered

VU Vulnerable

DD Data Deficient

NT Near Threatened

LC Least Concern

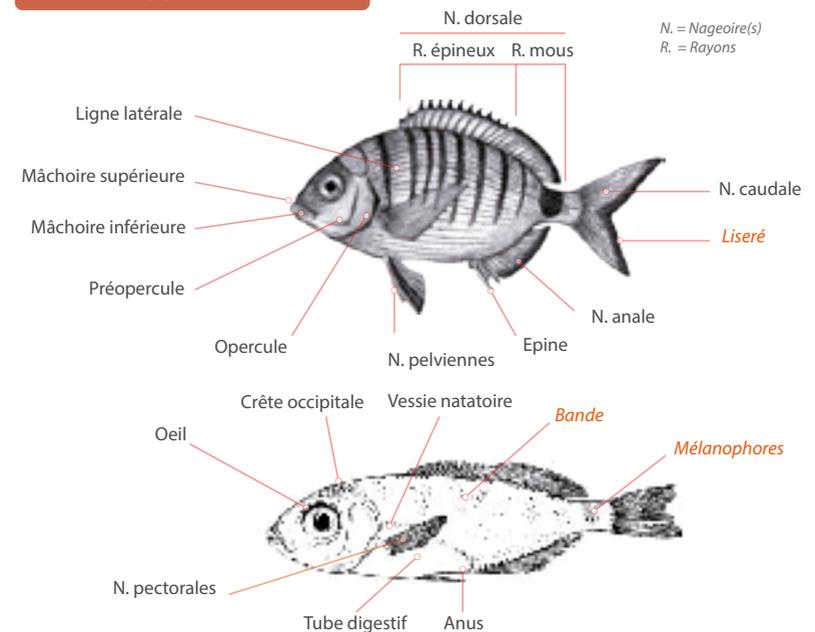
NE Not Evaluated

F_{ish} Ecological value

E_{co} Economic value

P_{at} Heritage value

Terminology and



These are bony, elongated fish with neither a pelvic fin nor a swim bladder. They are silvery blue and burrow in coastal sand. The head is thin, pointed and elongated. The body is very slender and eel-like. They possess a very long dorsal fin. The anal fin is approximately half the length of the dorsal fin.

1 species

1 genus

- *Gymnammodytes cicereus*

Gymnamodytes cicereus

(Rafinesque, 1810)

Ammodytidae

Mediterranean sand eel

Sonso (SP), Cicerello (IT), Cicerelle de Méditerranée (FR)



MERISTIC CHARACTERS

DORSAL FIN	53-59
ANAL FIN	27-32

Spawning strategy	Pelagic*
PLD	ND
Reproduction	November-January
Settlement season	Winter

DISTRIBUTION

Mediterranean Sea and the eastern Atlantic coast.

ECOLOGY

From the egg to the juvenile

No data

Adult

Often burrows in shelly, coarse sand bottoms.

POSTLARVAE REARING

Rearing	Difficult
Intra-specific	ND
Inter-specific	ND
Feeding	ND
Stress	Stressed
Growth	ND

POSTLARVAE

From 50 to 60 mm

The PL is translucent with several rows of melanophores* on the body (in the dorsal position on the myomeres*, diffuse above and below the notochord* and inter-myomere* on the ventral part). The gut* ends in the middle of the body, with melanophores* on its dorsal side. Prognathous mouth*.

JUVENILES

Over 60 mm

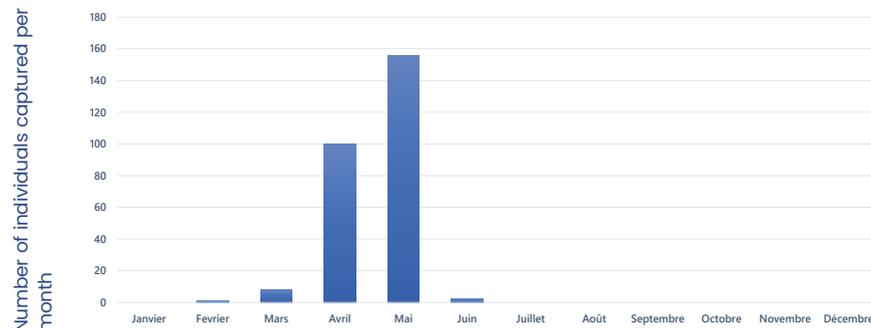
Pigmented line above the notochord*, below which there is a silvery pigmentation over the entire body. Pigmented dorsal line stopping at each myomere*. The ventral side of the gut is pigmented.

Particularity

It is necessary to provide sand and a lid. 'Plays dead' on the seabed.

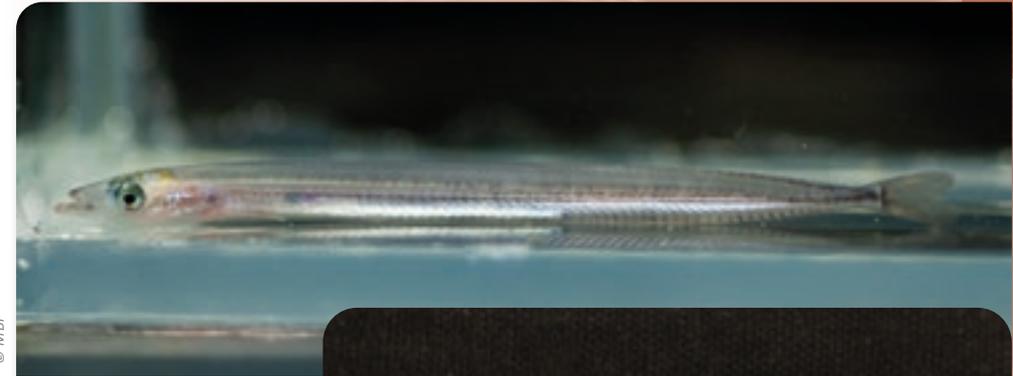
Catch size 54.1 mm ± 11.6 mm (n=267)

Bibliography 53, 33, 19, 58



AMMODYTIDAE

Gymnamodytes cicereus



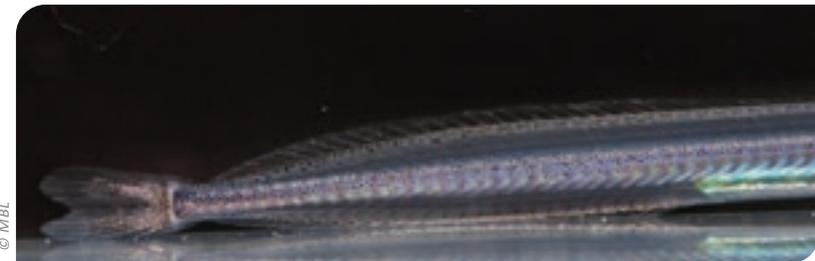
© MBI

D+0 – Marseille – 55 mm



© LHG

D+0 – Bastia – 55 mm



© MBL

D+0 – La Ciotat - 52 mm



© MBL

D+0 – La Ciotat – 52 mm

These fish are easily recognised by their slender, elongated body with viscous (mucus) skin. The dorsal, anal and caudal fins are continuous around the posterior two thirds of the body, the extremity of which is pointed. The fins are not supported by bony spines and there are no pelvic fins.

1 species

1 genus

- ***Anguilla*** *anguilla*

Anguilla anguilla

(Linnaeus, 1758)

Anguillidae

European eel

Anguilla europea (SP), Anguilla europea (IT), Anguille d'Europe (FR)



MERISTIC CHARACTERS

DORSAL FIN 245–275
ANAL FIN 205–255

Spawning strategy	Pelagic*
PLD	163–235
Reproduction	January–May
Settlement season	Year round

DISTRIBUTION

Mediterranean Sea and Baltic Sea, present on the eastern Atlantic coast from Scandinavia to Morocco.

ECOLOGY

From the egg to the juvenile

After hatching in the Sargasso Sea, the larva is pelagic and feeds on plankton. It rises towards the surface and arrives at the coast assisted by the Gulf Stream.

Adult

Present in all types of benthic* habitats from streams to the banks of large rivers and lakes. Naturally found in all inlets connected to the sea.

POSTLARVAE

From 70 to 90 mm

The PL is translucent with a slightly pigmented notochord (in the dorsal position). The top of the head is pigmented, the mouth is prognathous*. The size of the leptocephalus larva does not always increase with age: a size reduction is observed during metamorphosis.

JUVENILES

Over 90 mm

The eel takes on a yellow colouring after 45 days. It will keep this colour until it reaches the young adult male stage.

POSTLARVAE REARING

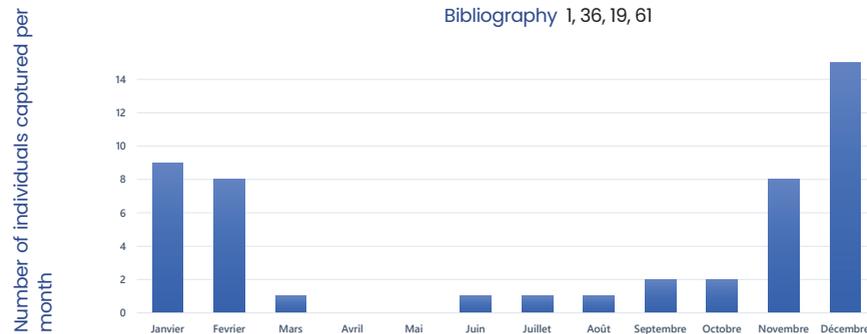
Rearing	Delicate
Intra-specific	Cannibalism
Inter-specific	Aggressive
Feeding	Easy
Stress	Docile
Growth	Slow

Particularity

A lid is necessary, must be regularly sorted by size to prevent cannibalism. Add PVC pipes to provide hiding places as well as a sandy bottom.

Catch size 74.1 mm ± 13.4 mm (n=48)

Bibliography 1, 36, 19, 61



ANGUILLIDAE

Anguilla anguilla



© MBI

D+0 – Marseille – 60 mm



© MBI

D+8 – Marseille – 62 mm



© MBI

D+25 – Marseille – 75 mm



© R.C.

D+45 – Leucate – 90 mm

Small spindle-shaped fish measuring 10 cm in length on average. Their head is rounded, with big eyes and a large, deep jaw. The scales are usually ctenoid (covered with small and fine dots that give it a rough appearance). These fish have two dorsal fins, the anterior fin is supported by 6 to 8 spines, and the posterior fin is supported by 8 to 14 soft rays. The particularity of these fish is that they are paternal mouthbrooders. Most species are rather nocturnal and feed on zooplankton and small benthic invertebrates.

1 species

1 genus

• *Apogon imberbis*

Apogon imberbis

Cardinal fish

Salmonete Real (SP), Castagneua russa (IT), Apogon commun (FR)

(Linnaeus, 1758)

Apogonidae



MERISTIC CHARACTERS

DORSAL FIN VII + 9-10
ANAL FIN II + 8-9

Spawning strategy Mouthbrooder

PLD 18-24

Reproduction July-October

Settlement season Summer-Autumn

DISTRIBUTION

Mediterranean Sea, present on the Atlantic coast.

ECOLOGY

From the egg to the juvenile

The males keep the eggs in their mouth until hatching (approx. one week).

Adult

Found in small gregarious groups of 5 to 10 individuals in rocky areas and dark caves.

POSTLARVAE REARING

Rearing	Delicate
Intra-specific	Coexistence
Inter-specific	Predation
Feeding	Delicate
Stress	Shy
Growth	Slow

POSTLARVAE

From 10 to 20 mm

The orange-red colour is characteristic of the species at this stage. The PL possesses rather coarse melanophores* towards the front and especially behind the eye. Slight pigmentation is observed at the end of the caudal peduncle as well as at the edge of the scales. Particularity: the eye is traversed by two horizontal white stripes.

JUVENILES

Over 25 mm

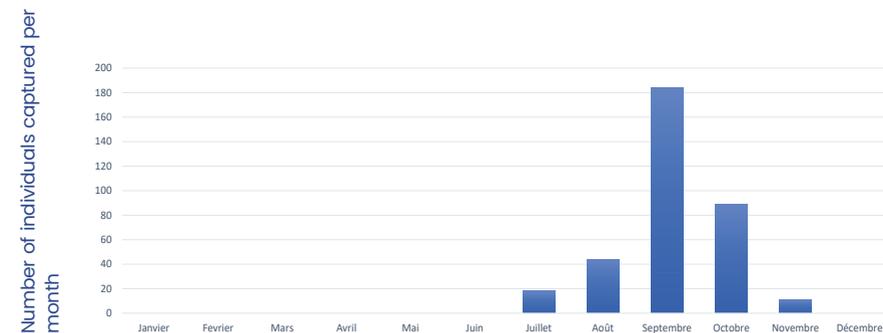
With growth, the melanophores* enlarge over the entire body and the two white stripes over the eye remain.

Particularity

A dark tank or PVC pipes are necessary to calm the individuals. Appreciates high densities that limit stress.

Catch size 7.2 mm ± 4.8 mm (n=346)

Bibliography 20, 33, 19, 43, 53



APOGONIDAE

Apogon imberbis



D+0 - Leucate - 16mm



D+0 - Leucate - 16 mm



D+116 - Bastia - 25 mm



D+19 - La Ciotat - 30 mm

Most of the species of this family inhabit coastal marine waters. These fish are small with a slender body and a terminal mouth. They possess two dorsal fins separated by a wide space. The pectoral fins are inserted into the upper part. They are gregarious and often form huge schools. They are a highly important element in the trophic chain. They feed on plankton.

2 species

1 genus

- ***Atherina*** *Boyeri*
- ***Atherina*** *hepsetus*

Atherina boyeri

(Risso, 1810)

Atherinidae

Big-scale sand smelt

Pejerrey mediterráneo (SP), Latterino capoccione (IT), Joël (FR)



MERISTIC CHARACTERS

DORSAL FIN D1: VII+8 D2: VIII+16
ANAL FIN II + 8-10

Spawning strategy Benthic*

PLD 9-12

Reproduction April-June

Settlement season Spring

DISTRIBUTION

Mediterranean Sea and Black Sea, present on the eastern Atlantic coast from Portugal to Mauritania.

ECOLOGY

From the egg to the juvenile

The eggs are demersal with long filaments that enable them to cling to the substrate. The larvae are pelagic* and form schools near the shore.

Adult

Considered as semi-pelagic*, it can spend part of its life in shallow coastal waters and near estuaries.

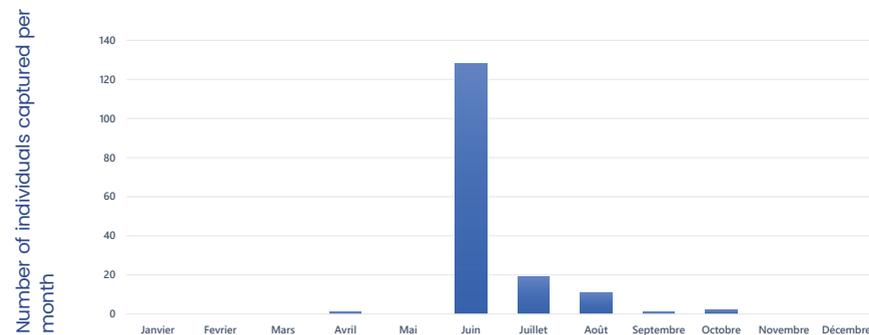
Bibliography 33, 20, 58



D+0 - Bastia - 25mm



D+0 - Bastia - 25mm



ATHERINIDAE

Atherina boyeri



D+0 - Leucate - 15mm

Atherina hepsetus

(Linnaeus, 1758)

Atherinidae

Mediterranean sand smelt

Sercllet (SP), Attarina (IT), Sauclet (FR)



MERISTIC CHARACTERS

DORSAL FIN D1: VII -X D2: I+10-12
ANAL FIN III + 5

Spawning strategy	Benthic*
PLD	9-14
Reproduction	December-May
Settlement season	Spring

DISTRIBUTION

Mediterranean Sea and Black Sea. Present on the eastern Atlantic coast from southern Spain to Morocco.

ECOLOGY

From the egg to the juvenile

No data

Adult

Considered as semi-pelagic*, it can spend part of its life in shallow coastal waters and near estuaries.

POSTLARVAE REARING

Rearing	Difficult
Intra-specific	Coexistence
Inter-specific	Coexistence
Feeding	Delicate
Stress	Stressed
Growth	Slow

POSTLARVAE

From 10 to 20 mm

The PL is elongated and translucent, with melanophores* on the dorsal, lateral and ventral parts. The gut ends at 1/3 of the body. The notochord is marked laterally with a slight orange-yellow border.

JUVENILES

From 20 to 30 mm

After 15 days, the juvenile loses its translucent appearance to take on a silvery aspect and two dorsal fins can be clearly distinguished. Melanophores* are scattered along the back. These have almost disappeared on the belly. The belly is marked by a green border above the lateral line.

Over 30 mm

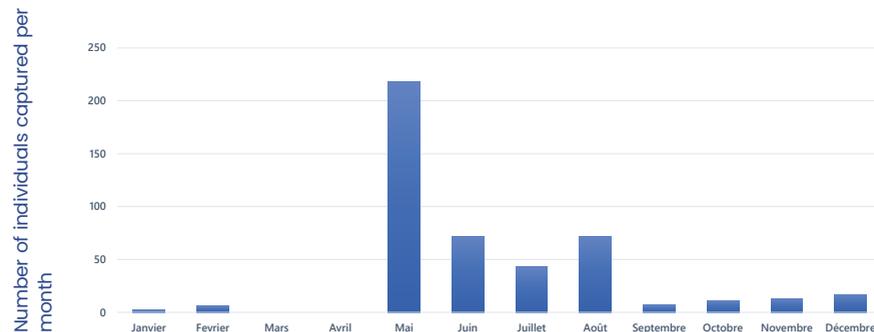
The dorsal melanophores* are thicker. The lateral line is marked by a silver-green border that is specific to the species.

Particularity

Very sensitive to handling, swims very actively in the tank.

Catch size 40.6 ± 20 mm (n=461)

Bibliography 53, 54, 33, 58



ATHERINIDAE

Atherina hepsetus



D+0 - Leucate - 20mm



D+15 - Leucate - 30mm



D+30 - Leucate - 35mm



D+30 - Leucate

Measuring 16 cm to 1 m in length, these fish have a strong body that is laterally constructed and flattened. They often possess lively colours with striking patterns. The body is covered with thick skin and small scales that do not overlap. The scales often bear small spines. The caudal fin possesses 12 rays. The eyes can move independently. The mouth is small but equipped with sharp, solid teeth. They mainly feed on hard-shelled invertebrates, including crustaceans, molluscs and echinoderms. Most species lay their eggs in large, funnel-shaped trenches on the seafloor. The larvae hatch after 12 to 24 hours and then live for a very long time in the open sea.

1 species

1 genus

- ***Balistes capriscus***

Balistes capriscus

(Gmelin, 1789)

Balistidae

Grey triggerfish

Pejeperuco blanco (SP), Pasce balestra (IT), Baliste commun (FR)



MERISTIC CHARACTERS

DORSAL FIN III + 26-29
ANAL FIN 23-26

Spawning strategy Benthic*

PLD ND

Reproduction June-August

Settlement season Summer

DISTRIBUTION

Essentially in temperate to warm waters. Originally from North America, it is present in the Mediterranean and the eastern and western Atlantic.

ECOLOGY

From the egg to the juvenile

The juveniles are found in shallow coastal rocky areas and like to remain near floating objects.

Adult

Found in rocky areas among algae along coasts between 5 and 30 metres depth. During the winter, they are found at deeper depths, around 100 m.

POSTLARVAE REARING

Rearing Easy

Intra-specific Aggressive

Inter-specific ND

Feeding Very easy

Stress Docile

Growth Quick

POSTLARVAE

From 15 to 25 mm

The PL is pigmented and has the same shape as the adult. Only the dorsal, anal and caudal fins are transparent. Rather dark in colour with scattered light spots.

JUVENILES

From 25 to 55 mm

Its fins become coloured after one month. Blue spots and patterns start to form. The light spots increase in number and cover the entire body.

Over 55 mm

The juvenile resembles a miniature adult. The colouration has changed very little, the spots that covered the body now give a mottled appearance.

Particularity

When reared, they appreciate the presence of floating objects. Do not capture them with a dip net to avoid damage.

Catch size 22 mm (n=1)

Bibliography 16, 56



BALISTIDAE

Balistes capriscus



© AFo

D+0 – La Ciotat – 22 mm



© AFo

D+30 – La Ciotat – 55 mm



© AFo

D+60 – La Ciotat – 75 mm

Commonly called needlefish, Belonidae are all predators of small fish and pelagic invertebrates. Marine species are generally pelagic and are found both in the open sea and near the coast. They all have a similar and incomparable appearance, very thin and elongated with very elongated and thin jaws that are strongly armed with teeth. The dorsal and anal fins are symmetrical and well to the rear. The caudal fin is generally forked. The ventral fins are set back. The bones of nearly all species are bright green.

1 species

1 genus

• ***Belone*** *belone*

Belone belone

(Linnaeus, 1761)

Belonidae

Garfish

Aguja (SP), Aguglia (IT), Orphie (FR)



MERISTIC CHARACTERS

DORSAL FIN 16-20

ANAL FIN 19-23

Spawning strategy Pelagic*

PLD ND

Reproduction May-June

Settlement season Spring

DISTRIBUTION

Mediterranean Sea and Black Sea, present on the eastern Atlantic coast.

ECOLOGY

From the egg to the juvenile

The rather large eggs (3-3.5 mm), may be found attached by extensions to floating objects.

Adult

Lives near the surface.

Bibliography 20, 53



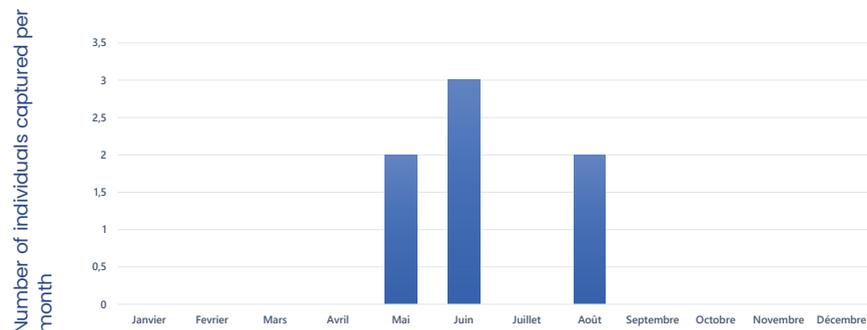
© RC

D+0 – Leucate - 60mm



© RC

D+0 – Leucate - 60mm



BELONIDAE

Belone belone



© RC

D+0 – Leucate - 60mm



© Afo

Lavandou - 60mm

Blennies have a rather elongated body with a large, blunt head, rather large eyes and fleshy lips. The skin is soft, viscous and without scales. There are usually barbels on the head that can facilitate identification. The dorsal fin covers almost the entire back; it is often quite low and is frequently divided in two by a slight hollow in the middle. Each pelvic fin consists of only two long rays that are inserted far forward. They mainly live in very shallow water near rocky coasts and feed on small animals and sometimes algae. The male parades to attract females towards a selected site where he carefully watches over the eggs she lays until hatching.

10 species

4 genera

- ***Aidablennius*** *sphynx*
- ***Lipophrys*** *pholis*
- ***Lipophrys*** *trigloides*
- ***Parablennius*** *gattorugine*
- ***Parablennius*** *incognitus*
- ***Parablennius*** *pilicornis*
- ***Parablennius*** *rouxi*
- ***Prablennius*** *tentacularis*
- ***Parablennius*** *zvonimiri*
- ***Salaria*** *pavo*

Aidablennius sphyinx

(Valenciennes, 1836)

Blenniidae

Sphinx blenny

Dormilaga de roca (SP), Bavosa sfinje (IT), Blennie sphinx (FR)



MERISTIC CHARACTERS

DORSAL FIN XII + 16
ANAL FIN II + 8

Spawning strategy	Benthic*
PLD	35-45
Reproduction	May-August
Settlement season	Summer

DISTRIBUTION

Mediterranean Sea and Black Sea, present on the eastern Atlantic coast.

ECOLOGY

From the egg to the juvenile

No data

Adult

Present in very shallow rocky areas in the coastal zone exposed to the sun and waves.

POSTLARVAE

From 15 to 20 mm

The PL is translucent. It possesses two rounded yellow fins speckled with light melanophores*. The dorsal and ventral fins are translucent. The eye tentacle is barely visible.

JUVENILES

From 20 to 30 mm

The very fine eye tentacle is characteristic of this species. At 28 mm, the dark side bands become increasingly marked.

Over 30 mm

The side bands may have white or blue highlights. The 'inverted-V' shaped stripe below the eye is characteristic of the species.

POSTLARVAE REARING

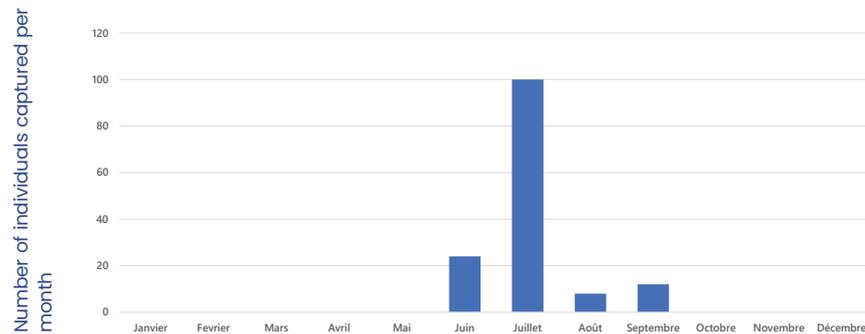
Rearing	Easy
Intra-specific	Territorial
Inter-specific	Lively
Feeding	Easy
Stress	Handling
Growth	Average

Particularity

Blennies are rather aggressive. They can be kept with other fish at the very beginning but must be quickly separated.

Catch size 8.7 mm ± 4.7 mm (n=144)

Bibliography 54, 33, 19, 25



BLENNIIDAE

Aidablennius sphyinx



© MM

D+0 – Murcia – 18mm



© LHG

D+54 – Bastia – 22mm



Leucate – 29mm



© IL

Leucate – 38mm



Leucate – 45mm

Lipophrys pholis

(Linnaeus, 1758)

Blenniidae

Shanny

Bavosa de cinc (SP), Galeto d'Istria (IT), Mordocet (FR)



MERISTIC CHARACTERS

DORSAL FIN XII + 18-19

ANAL FIN II + 19

Spawning strategy Benthic*

PLD 30-38

Reproduction April-August

Settlement season Summer

DISTRIBUTION

Mediterranean Sea, present on the eastern Atlantic coast from Norway to Morocco.

ECOLOGY

From the egg to the juvenile

The eggs are demersal, adhesive and are brooded by the males.

Adult

Lives in the intertidal zone, obeys a certain level of territoriality. Found in the shallow zones of rocky coasts.

Bibliography 20, 14, 54

© RC

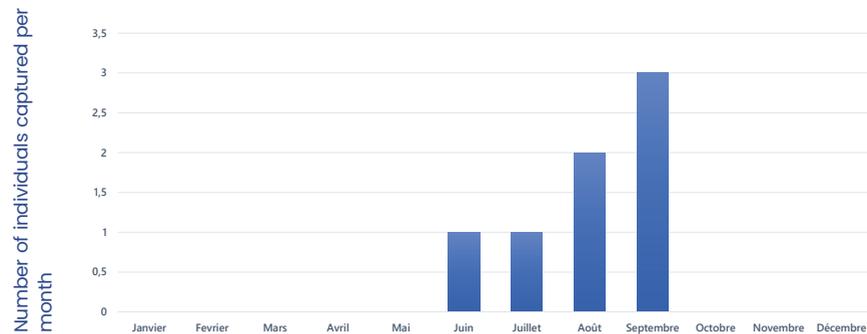


D+0 - Leucate

© RC



D+2 - Leucate



BLENNIIDAE

Lipophrys pholis

© MM



D+0 - Murcia

Lipophrys trigloides

(Valenciennes, 1836)

Blenniidae

Combtooth blenny

Futarra (SP), Bavosa capone (IT), Blennie trigloïde (FR)

NE



MERISTIC CHARACTERS

DORSAL FIN XII + 16-17
ANAL FIN III + 18

Spawning strategy Benthic*

PLD 52

Reproduction February-May

Settlement season Spring

DISTRIBUTION

Mediterranean Sea and Marmara Sea, present on the eastern Atlantic coast from Brittany to Senegal.

ECOLOGY

From the egg to the juvenile

No data

Adult

Found in surf zones up to 1 m depth. Prefers rocky bottoms with steep slopes and numerous faults, cracks and holes. Hides during the day.

POSTLARVAE

From 10 to 15 mm

The PL is translucent on arrival. A slightly yellow colouration appears rapidly with an initial outline of black stripes. The pectoral fins are not round but V-shaped, yellow, rounded and covered with small melanophores*.

JUVENILES

Over 15 mm

Eye tentacles are absent. Small tubercles appear in front of the eye. The black bands gradually cover the entire body. White spots appear at the notochord*. The pectoral fins are still very yellow with a black border. After 11 days, the small tubercles in front of the eye are barely visible. The white lateral spots extend to the caudal peduncle.

POSTLARVAE REARING

Rearing Easy

Intra-specific Lively

Inter-specific Aggressive

Feeding Very easy

Stress Docile

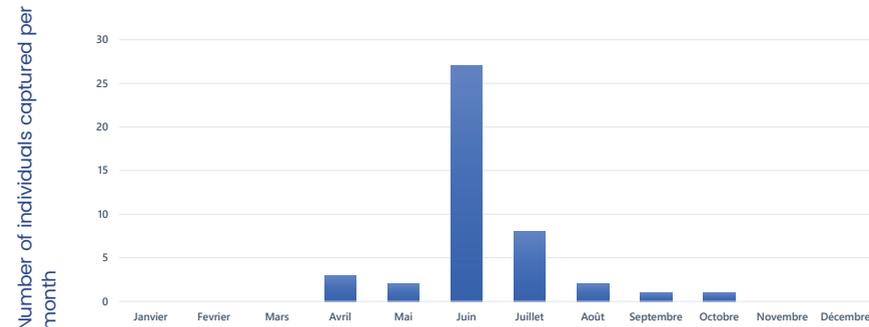
Growth Quick

Particularity

Blennies are rather aggressive. They can be kept with other fish at the very beginning but must be quickly separated.

Catch size 16.8 mm ± 3.1 mm (n=44)

Bibliography 54, 19, 58



Lipophrys trigloides



© LHG

D+0 – Bastia – 15mm



© LHG

D+5 – Bastia – 15mm



© LHG

D+5 – Bastia – 15mm



© LHG

D+28 – Bastia – 23mm

Parablennius gattorugine

(Linnaeus, 1758)

Blenniidae

Tompot blenny

Cabruza (SP), Bavosa gattorugine (IT), Blennie gattorugine (FR)



MERISTIC CHARACTERS

DORSAL FIN XIII + 18-19
ANAL FIN II + 20

Spawning strategy Benthic*
PLD 30
Reproduction March-May
Settlement season Spring

DISTRIBUTION

Mediterranean Sea and Marmara Sea, present on the eastern Atlantic coast from Ireland to Morocco.

ECOLOGY

From the egg to the juvenile

The larvae are planktonic and are found in shallow coastal waters.

Adult

Lives on rocks in shallow zones.

POSTLARVAE

From 15 to 20 mm

Common blenny in the Mediterranean. The PL is translucent and black stripes begin to take shape on the proximal part of the trunk. The pectoral fins are rather rounded and black. Eye tentacles are already present.

JUVENILES

From 20 to 25 mm

The eye tentacles have become thicker and recall the shape of 'fir trees'. The juvenile maintains a brown and beige colouring that extends to the dorsal fin. The lower part of the eye has a small white area that persists during several stages of development.

Over 25 mm

At this stage, the eye tentacles are well developed and thick. A small tubercle is visible in front of the eye. A bluish mark is visible in front of the dorsal fin.

POSTLARVAE REARING

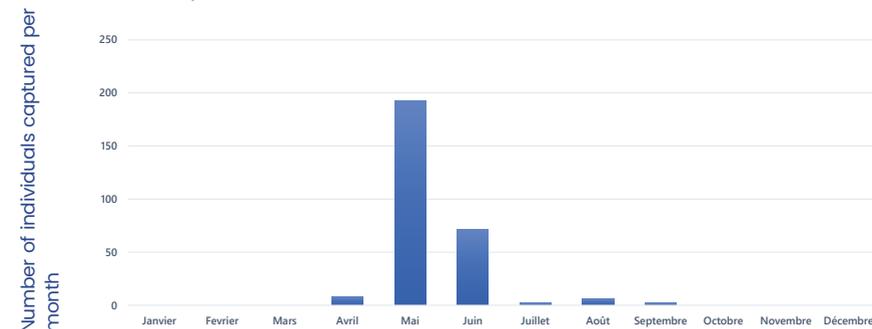
Rearing Easy
Intra-specific Lively
Inter-specific Aggressive
Feeding Very easy
Stress Docile
Growth Quick

Particularity

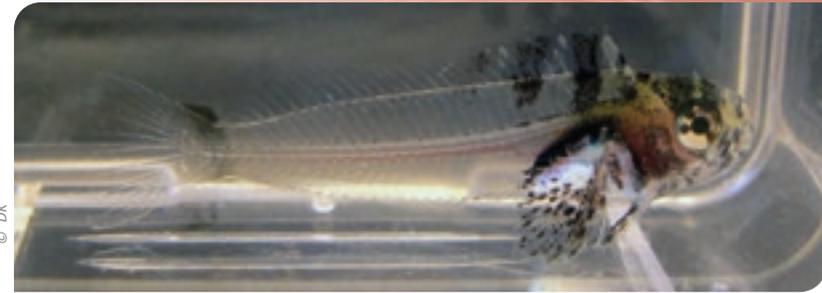
Blennies are rather aggressive. They can be kept with other fish at the very beginning but must be quickly separated.

Catch size 22.9 mm ± 4.6 mm (n=282)

Bibliography 54, 19, 62



Parablennius gattorugine



D+10 – Embiez

© DK



D+8 – Bastia – 26mm

© LHG



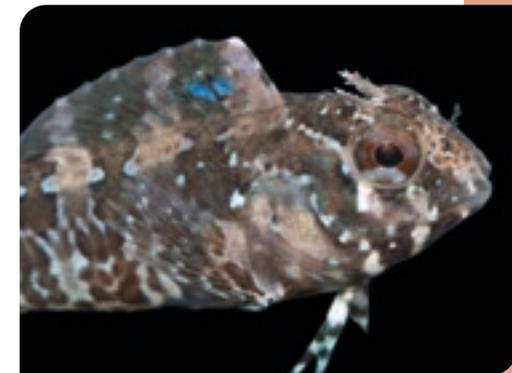
D+45 – Leucate

© LL



D+50 – Leucate

© IT



D+50 – Leucate

Parablennius incognitus

(Bath, 1968)

Blenniidae

Surprise blenny

Bavosa verda (SP), Bavosa Mediterranea (IT), Blennie diabolò (FR)



MERISTIC CHARACTERS

DORSAL FIN XII + 17
ANAL FIN II + 19

Spawning strategy	Benthic*
PLD	21-30
Reproduction	May-August
Settlement season	Summer

DISTRIBUTION

Mediterranean Sea, present on the eastern Atlantic coast.

ECOLOGY

From the egg to the juvenile

No data

Adult

Present in coastal zones on algae-covered rocks. Often takes refuge in rocky cavities and faults.

JUVENILES

From 30 to 35 mm

Difficult to identify in the translucent stage. The appearance of eye tentacles enables the identification of the species. These have 4 or 5 branches, the first of which is longer than the others. A small tentacle appears in front of the eye. Rather brown in colour, the body does not have a colour scheme, except for a few white spots on the side of the trunk. After six weeks, the white spots on the side of the body have become iridescent. At the base of the dorsal fin, spots gradually alternate upward on the rays.

Over 35 mm

After two months, a white spot appears between the first two rays of the dorsal fin. The eye tentacles have 5 branches. A small tentacle with two branches is visible in front of the eye.

POSTLARVAE REARING

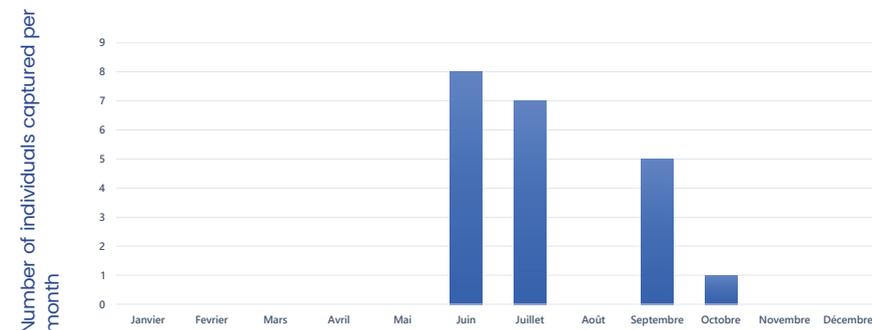
Rearing	Easy
Intra-specific	Lively
Inter-specific	Territorial
Feeding	Very easy
Stress	Handling
Growth	Average

Particularity

Blennies are rather aggressive. They can be kept with other fish at the very beginning but must be quickly separated.

Catch sizeND

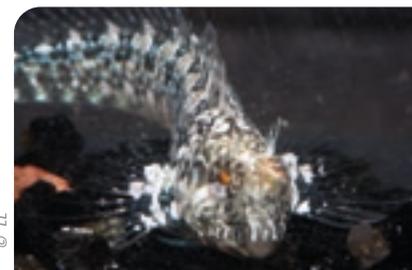
Bibliography 53, 54, 33, 19, 58



Parablennius incognitus



D+30 – Leucate – 30 mm



D+45 – Leucate – 33 mm



D+60 – Leucate – 37mm

Parablennius pilicornis

(Cuvier, 1829)

Blenniidae

Ringneck blenny

Bavosa de plomall (SP), Bavosa capone Minore (IT), Blennie pilicorne (FR)



MERISTIC CHARACTERS

DORSAL FIN	XII + 21
ANAL FIN	II + 23

Spawning strategy	Benthic*
PLD	31-37
Reproduction	May-August
Settlement season	Summer

DISTRIBUTION

Western Mediterranean Sea, present on the eastern Atlantic coast from the Bay of Biscay to Namibia. Herculean* species.

ECOLOGY

From the egg to the juvenile

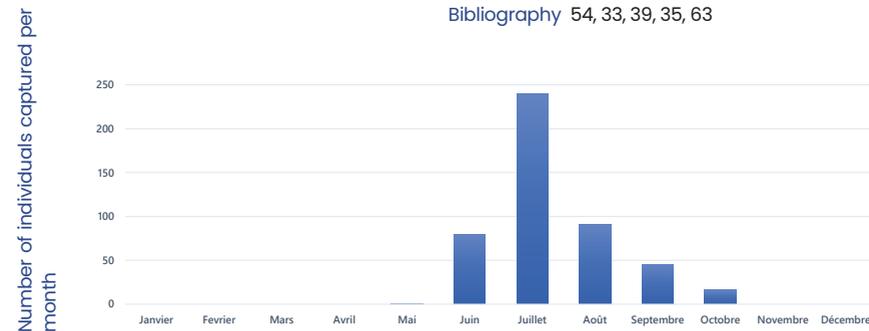
The eggs are brooded by adults.

Adult

Found on rocky bottoms, often on steep surfaces exposed to currents and surf.

POSTLARVAE REARING

Rearing	Easy
Intra-specific	Aggressive
Inter-specific	Aggressive
Feeding	Very easy
Stress	Docile
Growth	Quick



POSTLARVAE

From 15 to 20 mm

The PL is translucent. Alternate pigmentation starts to appear at the base of the dorsal fin. Two small eye tentacles with no branches are present. Branching begins after 7 days. A black colouration extends from the head to the rear part of the body.

JUVENILES

From 20 to 30 mm

The tentacles are now well branched. Body pigmentation may be variable from brown with a slight dark lateral stripe to pink with a well-marked black lateral stripe (may be confused with *P. rouxi*). A honeycomb pattern forms on the cheeks.

Over 30 mm

The honeycomb pattern is typical of the species and enables the species to be distinguished from *P. rouxi*, even when they present the same body colouration.

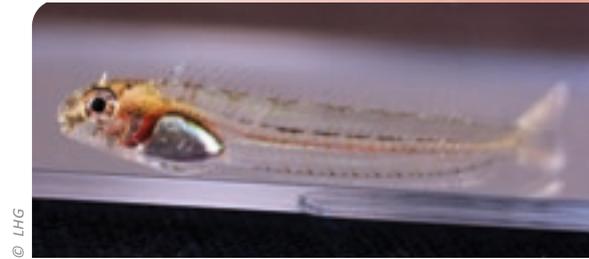
Particularity

Blennies are rather aggressive. They can be kept with other fish at the very beginning but must be quickly separated.

Catch size 19.3 mm \pm 2 mm (n=473)

Bibliography 54, 33, 39, 35, 63

Parablennius pilicornis



D+0 – Bastia – 15mm



D+1 – Bastia – 15mm



D+7 – Bastia – 18mm



D+100 – Leucate



D+80 – Leucate



D+191 – Bastia – 43mm



D+255 – Bastia – 58mm

Parablennius rouxi

(Cocco, 1833)

Blenniidae

Longstriped blenny

Bavosa de banda bruna (SP), Bavosa bianca (IT), Blennie de Roux (FR)



MERISTIC CHARACTERS

DORSAL FIN XII + 21-22
ANAL FIN II + 23

Spawning strategy Benthic*

PLD ND

Reproduction May-July

Settlement season Spring-summer

DISTRIBUTION

Northwestern Mediterranean Sea. Present on the northeastern Atlantic coast.

ECOLOGY

From the egg to the juvenile

No data

Adult

Found in shallow coastal surf zones on small rocks and stones with low algae cover.

POSTLARVAE

From 15 to 20 mm

Like *Parablennius pilicornis*, the PL is translucent and starts to pigment at the base of the dorsal fin. The digestive part is silver-grey. Possesses a small ocular tentacle. The dorsal colouration remains the same after 3 days. A black colouration appears on the side of the body and behind the head.

JUVENILES

Over 20 mm

Appearance of the typical colouration scheme of the species with a pinkish body and a black stripe from the front of the eye to the caudal peduncle. No honeycomb pattern on the cheeks. The ocular tentacle is very slender and branched. There is also a small tubercle under the eye.

POSTLARVAE REARING

Rearing Lively

Intra-specific Aggressive

Inter-specific Coexistence

Feeding Very easy

Stress Handling

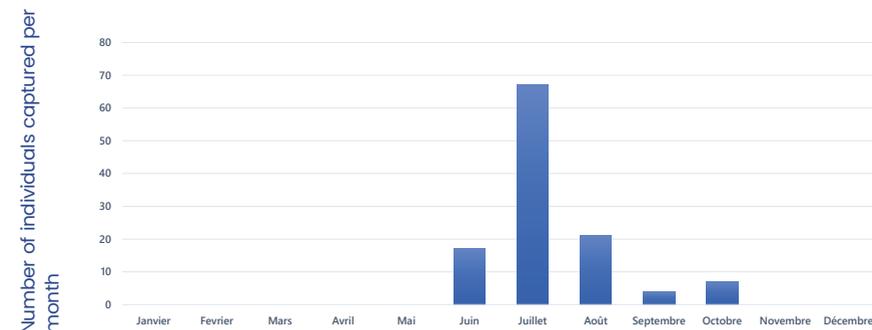
Growth Average

Particularity

Blennies are rather aggressive. They can be kept with other fish at the very beginning but must be quickly separated.

Catch size 21 ± 3.1 mm (n=116)

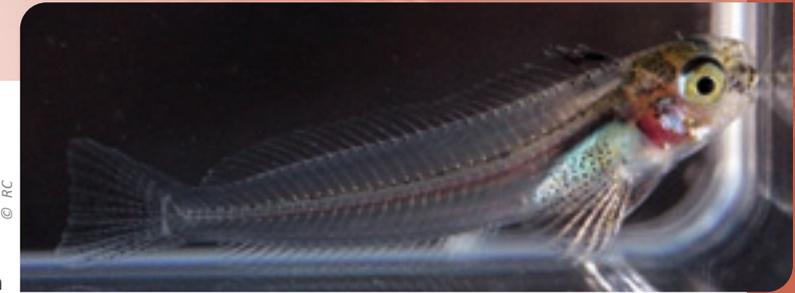
Bibliography 54, 19



79

BLENNIIDAE

Parablennius rouxi



D+1 – Leucate –18 mm



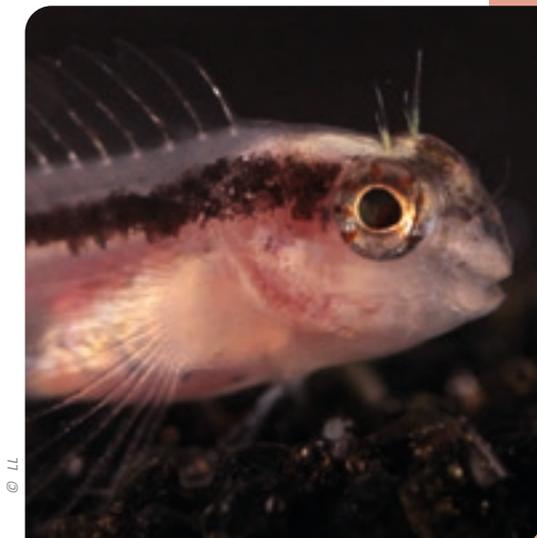
D+0 – Marseille – 20mm



D+45 – Leucate – 25mm



D+45 – Leucate –25mm



D+45 – Leucate – 25mm

Parablennius tentacularis

(Brünnich, 1768)

Blenniidae

Tentacled blenny

Bavosa banyuda (SP), Bavosa cornuta (IT), Blennie cornue (FR)



MERISTIC CHARACTERS

DORSAL FIN XII + 20-21
ANAL FIN II + 22-23

Spawning strategy	Benthic*
PLD	ND
Reproduction	March-May
Settlement season	Spring

DISTRIBUTION

Western Mediterranean Sea, Marmara Sea and Black Sea, present on the eastern Atlantic coast from Portugal to Guinea.

ECOLOGY

From the egg to the juvenile

Oviparous. The eggs are demersal and adhesive, attached to the substrate by filaments. The larvae are planktonic and are often found in shallow coastal waters.

Adult

Lives in the coastal zone along rocky coasts and in coralligenous substrates. Can live in brackish water and may settle on the sandy bottoms of lagoons.

POSTLARVAE REARING

Rearing	Easy
Intra-specific	Aggressive
Inter-specific	Lively
Feeding	Very easy
Stress	Handling
Growth	Average

POSTLARVAE

From 20 to 30 mm

Difficult to identify at first, the PL resembles other blennies with long eye tentacles. On closer observation, these long tentacles are also branched, which is a characteristic of the species. The rays of the dorsal fin show easily visible colouration, with a white spot between the first two rays.

JUVENILES

From 30 to 40 mm

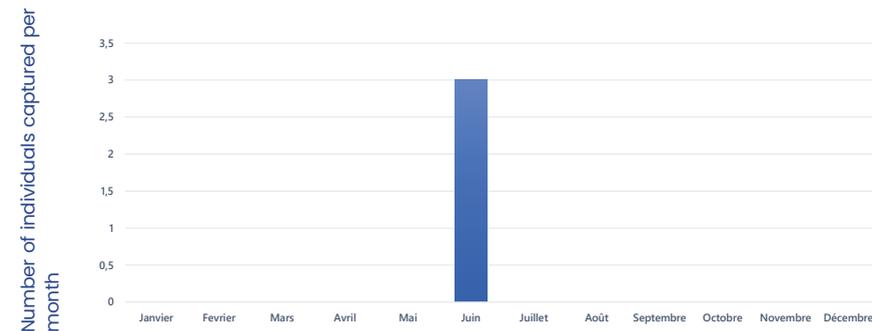
Individuals become quite stocky with growth. The tentacles are visible and prominent. 8 well-marked dark patches on the body. The tentacle is well branched and thick, with a series of small extensions over its entire length. There is also a small tubercle under the eye.

Particularity

Blennies are rather aggressive. They can be kept with other fish at the very beginning but must be quickly separated.

Catch size

ND
Bibliography 54, 33, 19, 45, 58



BLENNIIDAE

Parablennius tentacularis



D+0 - Leucate - 20mm



Leucate - 40mm



Leucate - 40mm



D+0 - Leucate - 20mm



Leucate - 40mm



Leucate - 50mm

Parablennius zvonimiri

(Kolombatović, 1892)

Blenniidae

Zvonimir's blenny

Bavosa menuda (SP), Bavosa cervina (IT), Blennie de Zvonimir (FR)



MERISTIC CHARACTERS

DORSAL FIN XII + 18
ANAL FIN II + 19-20

Spawning strategy Benthic*
PLD 24
Reproduction May-July
Settlement season Summer

DISTRIBUTION

Mediterranean Sea and Black Sea.

ECOLOGY

From the egg to the juvenile

Oviparous. The eggs are demersal and adhesive, attached to the substrate by filaments. The larvae are planktonic and are often found in shallow coastal waters.

Adult

Lives in rocky surface zones battered by waves. Hides in cavities with only the head exposed.

POSTLARVAE

From 10 to 20 mm

No data

JUVENILES

From 20 to 30 mm

Difficult to identify, juveniles rapidly take on a brown-beige colouration. The species' characteristic white spots appear. There is a branched eye tentacle on the head. The white spots (4) at the base of the dorsal fin become more dense and marked on both sides of the dorsal fin.

Over 30 mm

As individuals grow, the number of spots increases to reach 6 to 8 on the back. Many small appendages develop near the eye tentacles.

POSTLARVAE REARING

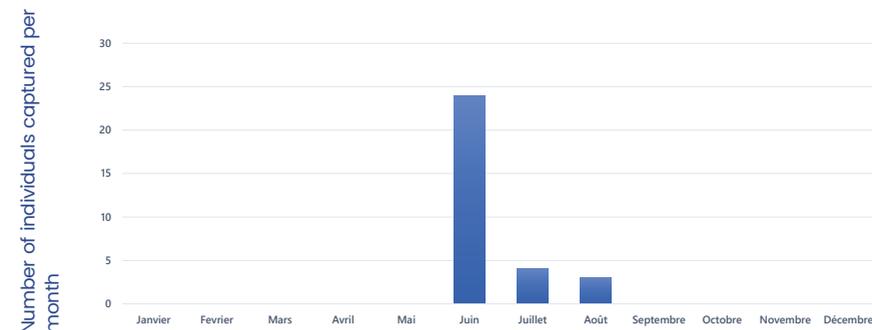
Rearing Delicate
Intra-specific ND
Inter-specific Lively
Feeding Very easy
Stress Handling
Growth Average

Particularity

Blennies are rather aggressive. They can be kept with other fish at the very beginning but must be quickly separated.

Catch size 19.8 mm ± 2 mm (n=31)

Bibliography 54, 33, 19, 45, 3



Parablennius zvonimiri



© AFR

D+25 - Agde - 30 mm



© ES

D+35 - Agde - 40 mm



© LL

D+40 - Leucate - 40 mm

Salaria pavo

(Risso, 1810)

Blenniidae

Peacock blenny

Gallerbo (SP), Bavosa pavone (IT), Blennie-paon (FR)



MERISTIC CHARACTERS

DORSAL FIN X–XII + 20–24
ANAL FIN II + 22–26

Spawning strategy Benthic*

PLD ND

Reproduction May–July

Settlement season Summer

DISTRIBUTION

Mediterranean Sea and Black Sea, present on the eastern Atlantic coast from France to Morocco.

ECOLOGY

From the egg to the juvenile

The eggs are demersal and adhesive.

Adult

Lives in intertidal or shallow zones. Found in gravel beds or rocks with filamentous algae cover and exposed to the sun.

POSTLARVAE

From 15 to 20 mm

The PL is translucent. The head is greenish-brown. The eye tentacles are not visible. A lateral black colouration appears.

JUVENILES

From 20 to 30 mm

Juveniles take on a yellow-brown colour on the fore part of the body. The eye tentacles are barely visible.

Over 30 mm

Older individuals have a yellow-brown body colouration, with 3 or 4 series of white spots. The head is short and massive compared with other blennies. Also identifiable by the eyespot (round mark) behind the head.

POSTLARVAE REARING

Rearing Delicate

Intra-specific ND

Inter-specific ND

Feeding Very easy

Stress Shy

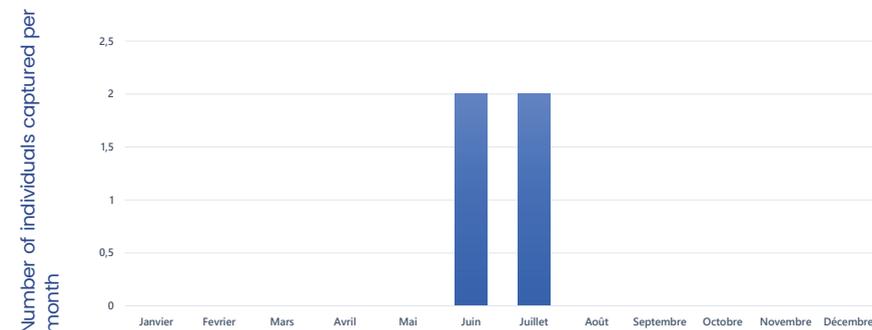
Growth Average

Particularity

None

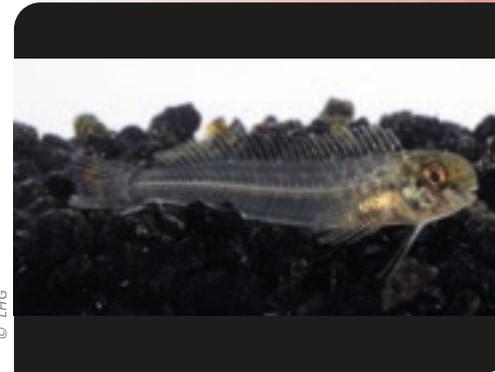
Catch size 20 mm ± 2 mm (n=4)

Bibliography 54, 33, 19, 45



BLENNIIDAE

Salaria pavo



© LHG

D+0 – Bastia – 20mm



© LHG

D+0 – Bastia – 20mm



© LHG

D+4 – Bastia – 23mm



© LHG

D+4 – Bastia – 23mm



© LHG

D+74 – Bastia – 46mm

These fish are flattened on the right side. They are bottom-dwellers and generally possess a camouflaged body. Both eyes are on the left side in most species (asymmetry). There are no spines in the fins. The dorsal fin is located above and in front of the upper eye. The dorsal and anal fins are separate from the caudal fin. They feed on benthic invertebrates and fish. Reproduction is pelagic. After hatching, the eyes of the larvae are in the classic position (symmetry), the 'migration' of one eye occurs during metamorphosis from the larva to the juvenile.

3 species

2 genera

- ***Arnoglossus*** *laterna*
- ***Arnoglossus*** *thori*
- ***Bothus*** *podas*

Arnoglossus laterna

(Walbaum, 1792)

Bothidae

Mediterranean scaldfish

Serrandell (SP), Suacia (IT), Arnoglosse de Méditerranée (FR)



MERISTIC CHARACTERS

DORSAL FIN 81-93

ANAL FIN 74-82

Spawning strategy Pelagic*

PLD ND

Reproduction April-August

Settlement season Summer

DISTRIBUTION

Mediterranean Sea and Black Sea, present on the eastern Atlantic coast from Norway to Angola.

ECOLOGY

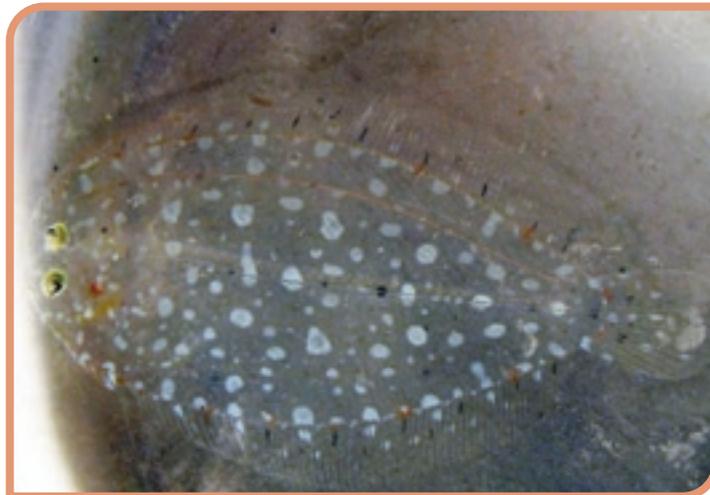
From the egg to the juvenile

No data

Adult

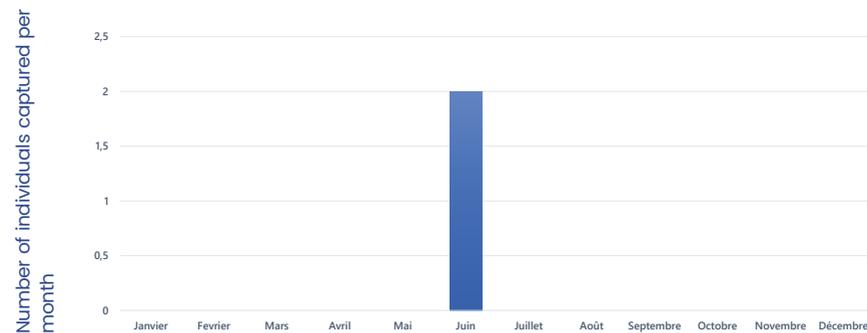
Lives mainly in mixed habitats and sandy-silty bottoms.

Bibliography 20, 58

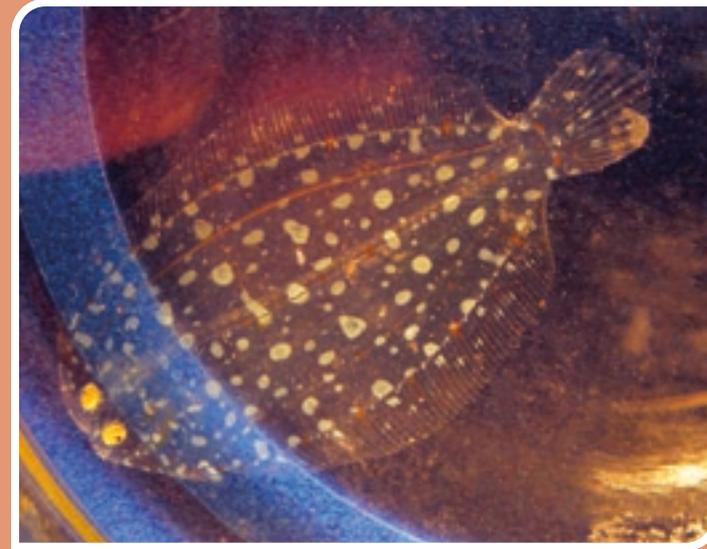


© DK

D+0 – Embiez – 35mm



© DK



D+0 – Embiez – 35 mm

© RC



D+0 – Port-Vendres - 38mm (dead individual)

Arnoglossus laterna

Arnoglossus thori

(Kyle, 1913)

Bothidae

Thor's scaldfish

Tapaculos (SP), Suacia mora (IT), Arnoglosse de Thor (FR)



MERISTIC CHARACTERS

DORSAL FIN 81-91
ANAL FIN 61-69

Spawning strategy Pelagic*

PLD 25-39

Reproduction April-July

Settlement season Summer-Autumn

DISTRIBUTION

Western Mediterranean Sea and Black Sea, present on the eastern Atlantic coast from Ireland to Cape Verde.

ECOLOGY

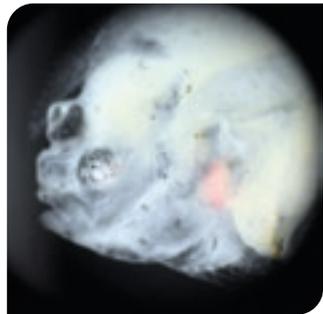
From the egg to the juvenile

No data

Adult

Coastal species that lives on sandy bottoms, more rarely on silty bottoms and especially near rocky zones.

Bibliography 20, 58



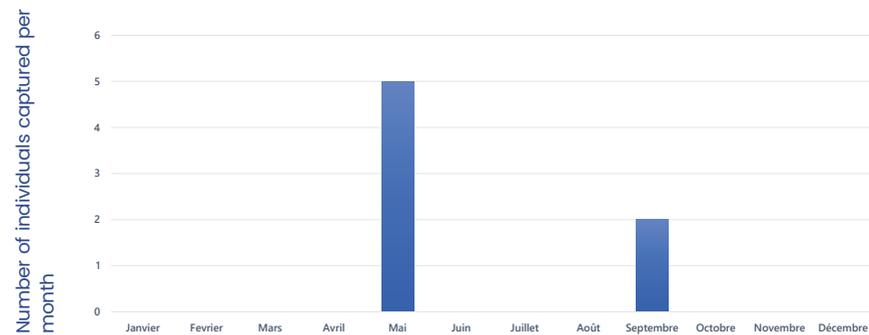
D+0 – Port-Cros (dead individual)



D+0 – Port-Cros (dead individual)



D+0 – Port-Cros (dead individual)



BOTHIDAE

Arnoglossus thori

Bothus podas

Wide-eyed flounder

Podas (SP), Rombo di rena (IT), Rombou (FR)

(Delaroche, 1809)

Bothidae



MERISTIC CHARACTERS

DORSAL FIN 85-95

ANAL FIN 63-73

Spawning strategy Benthic*

PLD ND

Reproduction May-August

Settlement season Summer

DISTRIBUTION

Mediterranean Sea and south-eastern Atlantic.

ECOLOGY

From the egg to the juvenile

The eggs are abandoned on the sand. Larvae are pelagic, symmetrical, small and transparent.

Adult

Benthic species found on sandy bottoms from shallow bottoms near the surface to great depths.

Bibliography 77

© AFr



Toulon

Number of individuals captured: 5
(all sites and years combined)

BOTHIDAE

Bothus podas

These are very fast predators that do not hide but live in open water in a pelagic environment. The body is moderately elongated and slightly compressed, with two dorsal fins and a thin caudal peduncle. They have two spines on the anal fin. They can release gas from the swim bladder into the gill chambers for rapid pressure equalisation. They are predatory fish that catch fish larvae and small fish.

5 species

4 genera

- ***Caranx*** *crysos*
- ***Seriola*** *dumeili*
- ***Trachinotus*** *ovatus*
- ***Trachurus*** *mediterraneus*
- ***Trachurus*** *trachurus*

Caranx crysos

Blue runner

Cojinúa negra (SP), Carango mediterraneo (IT), Grande sériole (FR)

(Mitchill, 1815)

Carangidae



MERISTIC CHARACTERS

DORSAL FIN IX + 23

ANAL FIN III + 19

Spawning strategy Pelagic*

PLD ND

Reproduction January–August

Settlement season Spring–summer

DISTRIBUTION

Western Mediterranean Sea, present on the eastern Atlantic coast from Senegal to Angola.

ECOLOGY

From the egg to the juvenile

The juveniles are often found in open water associated with drifting sargassum.

Adult

Form coastal schools.

Bibliography 16, 58



D+0 – Castellammare



D+0 –

Number of individuals captured: ND
(all sites and years combined)

CARANGIDAE

Caranx crysos



D+0 – Castellammare

Seriola dumerili

Greater amberjack

Cojinúa negra (SP), Carango mediterraneo (IT), Grande sériole (FR)

(Risso, 1810)

Carangidae



MERISTIC CHARACTERS

DORSAL FIN D1: VII D2: I+29-35
ANAL FIN II + I + 18-22

Spawning strategy	Pelagic*
PLD	31-36
Reproduction	May-September
Settlement season	Summer

DISTRIBUTION

Mediterranean Sea, present on the eastern Atlantic coast from the British Isles to Morocco.

ECOLOGY

From the egg to the juvenile

Young stages often live under the shelter of floating objects or among the tentacles of jellyfish.

Adult

Pelagic* fish that moves in schools. Can also be found in coastal waters and above shallows. Reproduction takes place near the coast.

Bibliography 16, 68

© RC

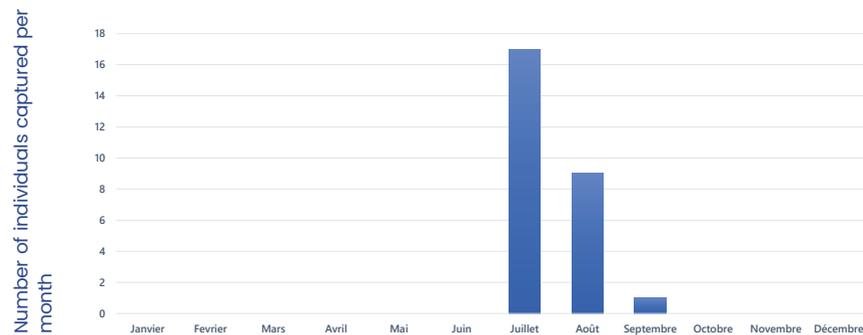


D+0 – Port-Cros

© RC



D+0 – Port-Cros



CARANGIDAE

Seriola dumerili

© TM



D+0 – Embiez - 75 mm

Trachinotus ovatus

(Linnaeus, 1758)

Carangidae

Pompano

Pámpano blanco (SP), Leccia stella (IT), Palomine (FR)



MERISTIC CHARACTERS

DORSAL FIN D1: VI D2: I + 23-27
ANAL FIN II + II + 22-25

Spawning strategy	Pelagic*
PLD	24
Reproduction	June-September
Settlement season	Summer

DISTRIBUTION

Mediterranean Sea, present on the eastern Atlantic coast from the British Isles to Angola.

ECOLOGY

From the egg to the juvenile

Juveniles are often found at night near steep rocks.

Adult

Moderate presence in coastal waters, especially in breaker zones. Also found on sandy and silty substrates. Forms schools.

POSTLARVAE REARING

Rearing	Delicate
Intra-specific	Coexistence
Inter-specific	Lively
Feeding	Very easy
Stress	Handling
Growth	Average

POSTLARVAE

From 30 to 45 mm

The PL is pelagic*. They are caught at various stages of development but are always pigmented. Individuals are entirely silver and possess two dorsal fins with a slight black edge.

JUVENILES

From 45 to 50 mm

The prominent myotomes (muscular fibre) are clearly visible on the body. Juveniles of this size are already good swimmers.

Over 50 mm

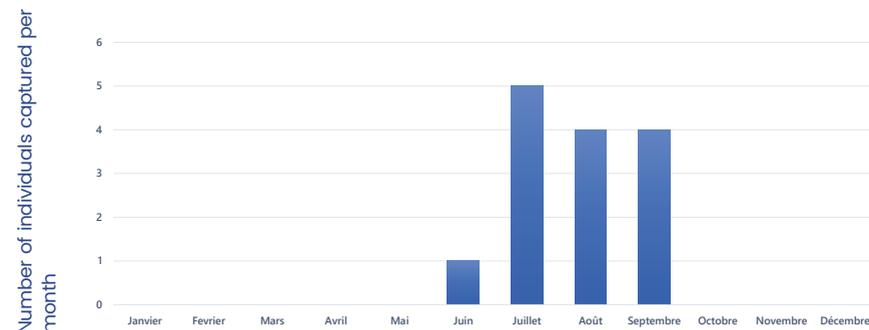
The head is rounded with a small mouth. The tip of the caudal fin starts to take on a black colour.

Particularity

An active swimmer, a cylindrical tank will enable it to remain in continuous movement. A lid is necessary. Keep it with other mugilidae-type species of the same size.

Catch size 24.3 mm \pm 2 mm (n=14)

Bibliography 53, 19



CARANGIDAE

Trachinotus ovatus



© AFR

D+3 – Murcia - 40 mm



© LL

D+3 – Leucate – 45 mm



© RC

D+20 – Leucate – 55 mm



© RC

D+20 – Leucate – 55 mm

Trachurus mediterraneus

(Steindachner, 1868)

Carangidae

Mediterranean horse mackerel

Jurel mediterráneo (SP), Sugarello maggiore (IT), Chinchard méditerranéen (FR)



MERISTIC CHARACTERS

DORSAL FIN D1: VIII D2: 1+29-35
ANAL FIN II + 1 + 26-39

Spawning strategy	Pelagic*
PLD	ND
Reproduction	May-August
Settlement season	Summer-Autumn

DISTRIBUTION

Western Mediterranean Sea, present on the eastern Atlantic coast from the Bay of Biscay to Mauritania.

ECOLOGY

From the egg to the juvenile

The PL often accompany floating objects and jellyfish.

Adult

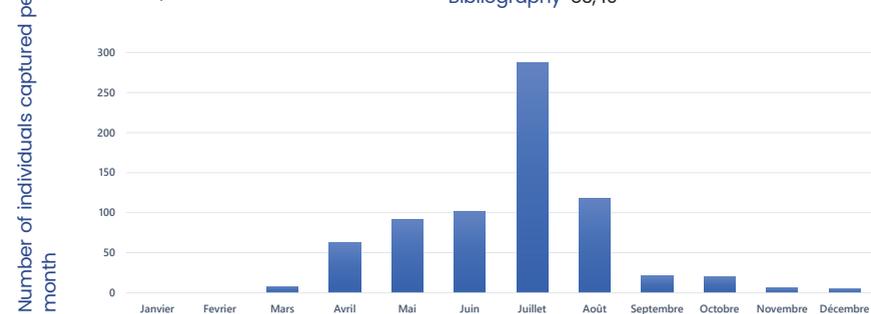
Found mainly on sandy bottoms in the coastal strip. These pelagic* fish form large schools during the migration period.

POSTLARVAE REARING

Rearing	Easy
Intra-specific	Coexistence
Inter-specific	Easy
Feeding	Delicate
Stress	Handling
Growth	Quick

Particularity

Pelagic* and highly active swimmers, these fish may occasionally be attacked by other species. A lid is necessary for the tank. It is difficult to



POSTLARVAE

From 13 to 20 mm

The PL is translucent. It has the diamond-shaped body that is characteristic of Carangidae. It pigments very quickly with more or less large melanophores*. Its gut turns silver and its body takes on a light green and silver colouring. There are melanophores* on the edges of the dorsal and anal fins.

JUVENILES

From 20 to 40 mm

Individuals possess an S-shaped lateral line edged with small scales that are different from those of the body (scutes*). These are characteristic of the Trachurus genus. Here they are small for the species, or at least smaller than those of *T. trachurus*.

Over 40 mm

Older juveniles bear a silver-grey colouration. The accessory lateral line (above the lateral line near the base of the dorsal fin) is more visible. It stops between the two dorsal fins for this species.

differentiate between the two species. Rearing is the only way to reveal the size of the scutes* and the appearance of the second lateral line. Requires regular feeding.

Catch size 30 mm ± 15 mm (n=720)

Bibliography 53,19

Trachurus mediterraneus



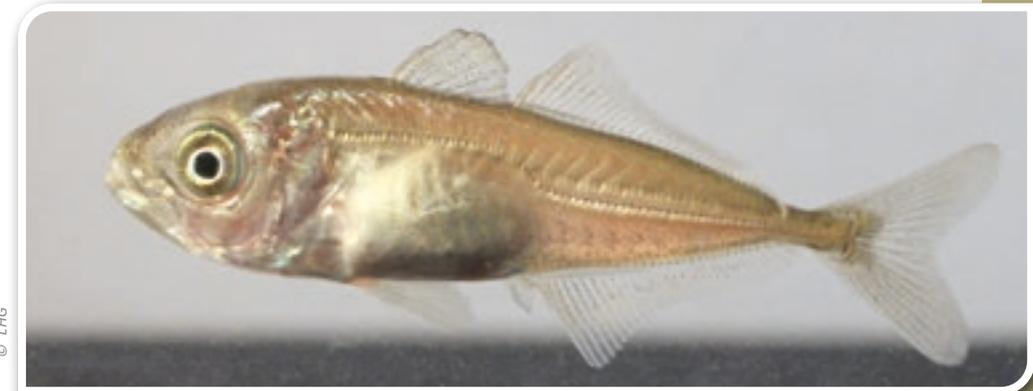
D+0 – Embiez – 15 mm



D+1 – Bastia – 15mm



D+29 – Bastia – 38mm



D+29 – Bastia – 38mm



D+60 – Leucate – 64mm



D+60 – Leucate – 64mm

Trachurus trachurus

Atlantic horse mackerel

Jurel (SP), Sugarello (IT), Chinchard d'Europe (FR)

(Linnaeus, 1758)

Carangidae



MERISTIC CHARACTERS

DORSAL FIN D1: VIII D2: I+29-33
ANAL FIN II + I + 24-29

Spawning strategy	Pelagic*
PLD	21-30
Reproduction	May-September
Settlement season	Summer

DISTRIBUTION

Mediterranean Sea, present on the eastern Atlantic coast.

ECOLOGY

From the egg to the juvenile

The PL often accompany floating objects and jellyfish.

Adult

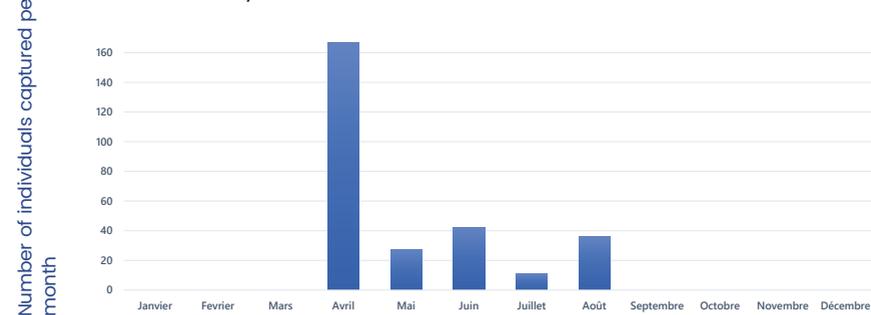
Found mainly on sandy bottoms in the coastal strip. These pelagic* fish form large schools during the migration period.

POSTLARVAE REARING

Rearing	Delicate
Intra-specific	Coexistence
Inter-specific	Coexistence
Feeding	Easy
Stress	Handling
Growth	Quick

Particularity

Pelagic* and highly active swimmers, these fish may occasionally be attacked by other species. A lid is necessary for the tank. It is



POSTLARVAE

From 10 to 20 mm

The PL is translucent and has the diamond-shaped body that is characteristic of Carangidae. It pigments very quickly with more or less large melanophores*. The swim bladder is visible. At 14 mm, its gut turns silver with a light green and silver colour on the body. There are melanophores* on the edges of the dorsal and anal fins.

JUVENILES

Over 40 mm

Individuals possess a marked lateral line, edged with small scales that are different from those of the body (scutes*). These are characteristic of the Trachurus genus. Here they are average for the species, or at least larger than those of *T. mediterraneus*. The accessory lateral line (above the lateral line near the base of the dorsal fin) is more visible. This ends almost at the end of the second dorsal fin in this species.

difficult to differentiate between the two species. Rearing is the only way to reveal the size of the scutes* and the appearance of the second lateral line. Requires regular feeding.

Catch size 33.7 mm ± 20 mm (n=283)

Bibliography 53,19

Trachurus trachurus



D+0 - Leucate - 14mm



D+1 - Bastia - 13mm



D+50 - Leucate - 45mm



D+50 - Leucate - 45mm

Average to large size fish (50 to 120 cm). They have a compressed body with a thick snout. The head is covered with pores and its large eyes are surrounded by fatty, poorly developed rings. They have a large mouth but do not possess teeth on the upper side. The dorsal fin is continuous. The base of the anal fin is shorter than that of the dorsal fin. They have small smooth scales, except on the head, where there are none. These pelagic coastal fish are generally found in deep water.

1 species

1 genus

- ***Centrolophus niger***

Centrolophus niger

Blackfish

Romerillo (SP), Fanfano (IT), Centrolophe noir (FR)

(Gmelin, 1789)
Centrolophidae



MERISTIC CHARACTERS

DORSAL FIN IV-V + 32-37
ANAL FIN II + 20-24

Spawning strategy	Pelagic*
PLD	ND
Reproduction	Autumn to winter
Settlement season	Spring

DISTRIBUTION

Found in temperate and subtropical zones. Present in the North Atlantic and the Mediterranean Sea.

ECOLOGY

From the egg to the juvenile

Juveniles are observed at the surface near the coast in spring and often with pelagic jellyfish and salpa.

Adult

Lives in the deep open sea and is only rarely observed during dives.

POSTLARVAE

From 15 to 20 mm

The PL is lightly pigmented, its body is scattered with melanophores. It has a black and white striped body colouration. Its eye is very large in proportion to the size of the body. The dorsal fin is located to the rear of the pelvic fins. The head is rounded.

JUVENILES

From 20 to 30 mm

Juveniles grow very fast. Its colouration changes to become a uniform pale orange. The melanophores disappear.

Over 30 mm

Juveniles become light grey. Its appearance is now identical to that of the adult. It can triple in size within 1 month.

POSTLARVAE REARING

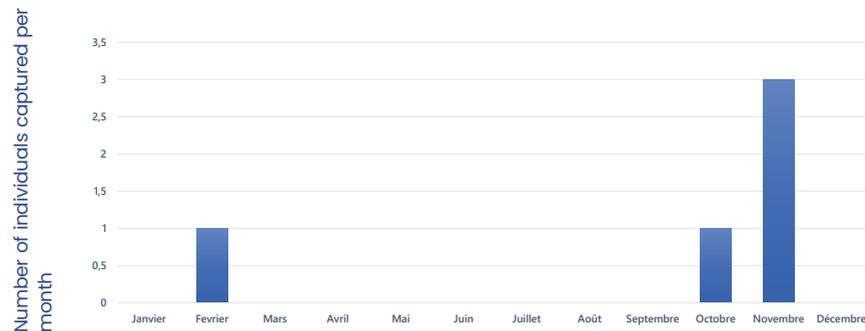
Rearing	Easy
Intra-specific	ND
Inter-specific	Coexistence
Feeding	Very easy
Stress	Handling
Growth	Very fast

Particularity

Reared with other individuals of other species when it is still young. Close the tank well with a lid because they will jump. Very fragile skin. Handle with care, beware of the mucus.

Catch size 15 mm \pm 3 mm (n=4)

Bibliography 16, 58



CENTROLOPHIDAE

Centrolophus niger



D+3 – Toulon – 12 mm



D+1 – La Ciotat – 20 mm



D+14 – Toulon – 31 mm



D+36 – Toulon – 36 mm

These are primitive fish that possess neither spines nor fins. The pelvic fins are abdominal, i.e. inserted into the belly and clearly behind the head. They have a single, rather short dorsal fin.

1 species

1 genus

- *Sardina pilchardus*

Sardina pilchardus

European pilchard

Sardina europaea (SP), *Sardina* (IT), *Sardine* (FR)

(Walbaum, 1792)

Centrolophidae



MERISTIC CHARACTERS

DORSAL FIN 13-21

ANAL FIN 12-13

Spawning strategy Pelagic*

PLD 40

Reproduction September-May

Settlement season Winter-Spring

DISTRIBUTION

Mediterranean Sea and Black Sea, present on the eastern Atlantic coast from Iceland to Senegal.

ECOLOGY

From the egg to the juvenile

No data

Adult

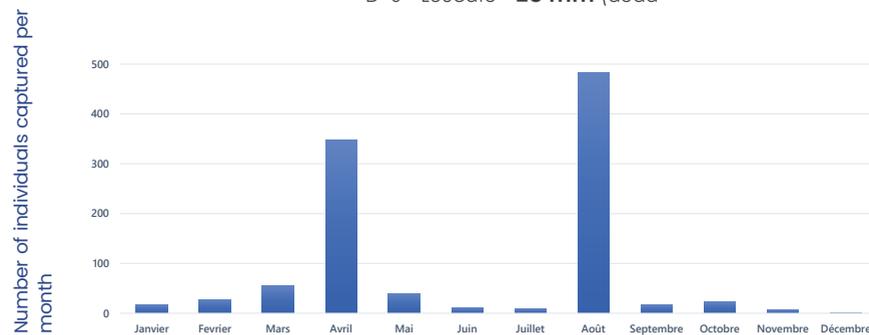
A coastal species, it forms schools that vary in depth between day (25/55 m) and night (10/35 m). The species reproduces in groups, in the open sea or near the coast.



D+0 – Leucate – 28 mm (dead individual)



D+0 – Leucate – 28 mm (dead)



CLUPEIDAE

Sardina pilchardus



D+0 – Leucate – 28 mm (dead individual)

They do not possess pelvic fins. Snake-like body. Their thick skin is covered in mucus. Scales are absent. There are no spines in the fins. Pelagic larval life. The flat, transparent and leaf-shaped larva, which is different from the adult, is called a leptocephalus.

2 species

2 genera

- ***Ariosoma*** *balearicum*
- ***Conger*** *conger*

Ariosoma balearicum

(Delaroche, 1809)

Congridae

Bandtooth conger

Congrio algino (SP), Cirusmiru (IT), Congre des Baléares (FR)



MERISTIC CHARACTERS

DORSAL FIN ND
ANAL FIN ND

Spawning strategy	Pelagic*
PLD	600-660
Reproduction	August-November
Settlement season	Year round

DISTRIBUTION

Mediterranean Sea, present on the eastern Atlantic coast from Portugal to Angola.

ECOLOGY

From the egg to the juvenile

No data

Adult

This fish can be observed on sandy or silty coastal bottoms, where it burrows tail first during the day or at the approach of a predator or threat.

POSTLARVAE

From 80 to 110 mm

The postlarva (Leptocephalus) is translucent and eel-like with a retrognathic * mouth. It is frequent to observe an organ in the form of a reddish point at the anus. The size of the leptocephalus larva does not always increase with age: a size reduction is observed during metamorphosis.

JUVENILES

From 100 to 70 mm (size reduction)

The juvenile thickens and takes on a brown colour while remaining partially transparent. It systematically seeks to burrow into the substrate (sand) and spends most of its time immobile with only the head visible.

Over 90 mm (after metamorphosis)

The pale brown to ochre colour becomes more intense, the dorsal and anal fins are edged with black. The eyes are marked with an orange patch with growth.

POSTLARVAE REARING

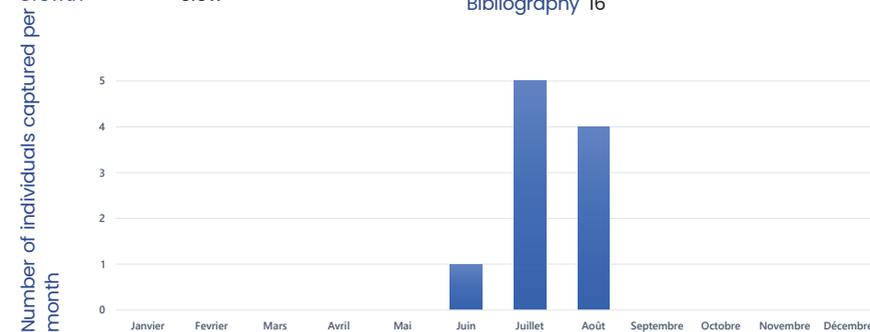
Rearing	Easy
Intra-specific	Coexistence
Inter-specific	ND
Feeding	Easy
Stress	Docile
Growth	Slow

Particularity

It is essential to provide an unconsolidated substrate (ideally fine sand) to enable the animal to burrow.

Catch size 107 mm ± 18 mm (n=10)

Bibliography 16



Ariosoma balearicum



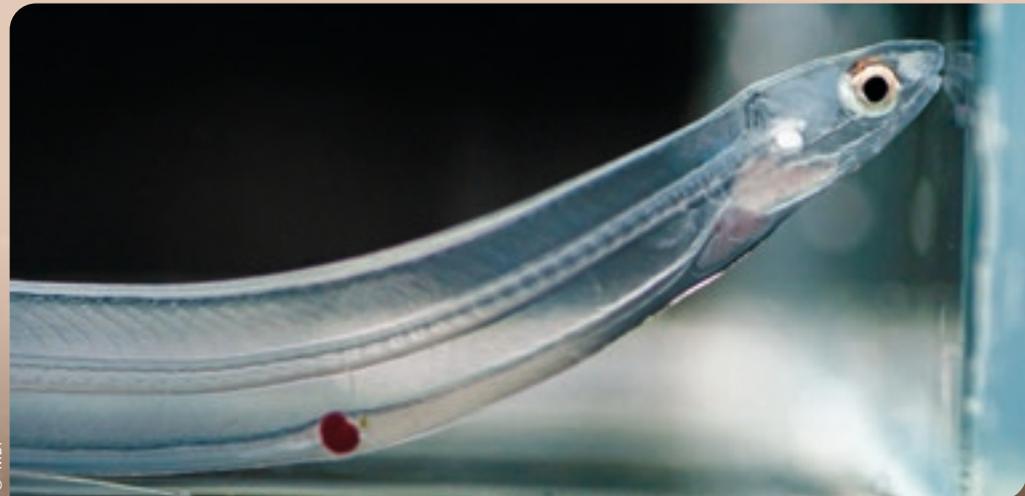
© MM

D+18 – Cagliari - 110 mm



© MBI

D+9 – Marseille - 85 mm



© MBI

D+9 – Marseille - 85 mm

Conger conger

(Rafinesque, 1810)

Congridae

European conger

Congrio común (SP), Grongo (IT), Congre d'Europe (FR)



MERISTIC CHARACTERS

DORSAL FIN	270-300
ANAL FIN	210-230

Spawning strategy	Pelagic*
PLD	ND
Reproduction	June-August
Settlement season	Summer

DISTRIBUTION

Mediterranean Sea and Marmara Sea, present on the eastern Atlantic coast from Norway to Angola.

ECOLOGY

From the egg to the juvenile

No data

Adult

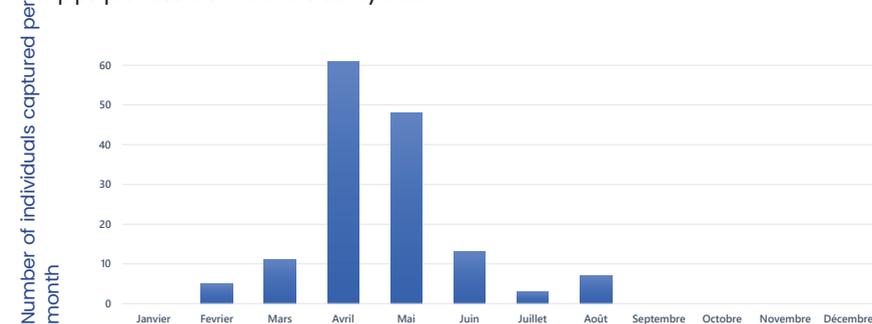
Neritic fish. Found on rocky and sandy-gravel bottoms, often hides in rocky cracks and cavities.

POSTLARVAE REARING

Rearing	Easy
Intra-specific	Coexistence
Inter-specific	Lively
Feeding	Easy
Stress	Docile
Growth	Average

Particularity

The presence of one or several pieces of PVC pipe provides them with the cavity that



POSTLARVAE

From 100 to 110 mm

The PL (leptocephalus) is translucent and eel-like. It has a retrognathous* mouth. The nasal tubes are quite prominent and translucent. The ventral part of the gut is scattered with several melanophores* and stops at about half the length of the body. The size of the leptocephalus larva does not always increase with age: a size reduction is observed during metamorphosis.

JUVENILES

From 100 to 80 mm (size reduction)

After 60 days, the juvenile takes on the same colouration as the adult. It always swims actively if there are no cavities to hide in.

Over 90 mm (after metamorphosis)

With a brownish purple colouration on the body, the dorsal and anal fins remain translucent with a light black border.

is necessary for their growth without creating territoriality. Several individuals may coexist in the same pipe or tank. They must be well fed or will become aggressive. Do not put more than 10 individuals in 25 litres.

Catch size 106.2 mm \pm 10 mm (n=148)

Bibliography 53, 19, 57

CONGRIDAE

Conger conger



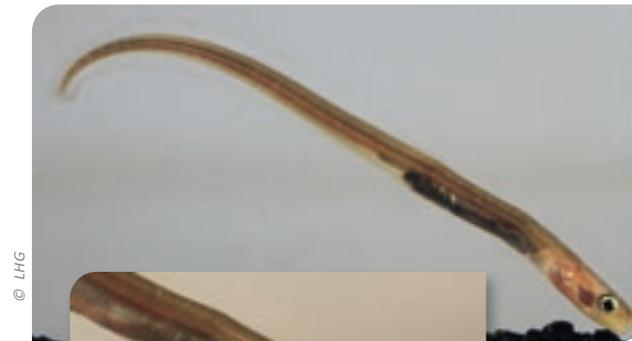
D+0 - Marseille - 120 mm



D+0 - Marseille - 120 mm



D+65 - Leucate - 80 mm



D+94 - Bastia - 100 mm



D+94 - Bastia - 100 mm



D+95 - Leucate - 120 mm

Also called the flying fish, its highly developed pectoral fins enable it to jump out of the water and glide for a short moment to escape predators. To prepare for gliding, the fish swims rapidly near the surface of the water with its fins close to its body. It unfolds its fins when it leaves the water. The body is conical and torpedo-like, with a small mouth, face upwards, small teeth and a large eye.

1 species

1 genus

- *Hirundichtys rondeletii*

Hirundichthys rondeletii

(Valenciennes, 1847)

Exocoetidae

Black wing flyingfish

Volador aleta negra (SP), Rondinella di mare (IT), Poisson-volant à ailes noires (FR)



MERISTIC CHARACTERS

DORSAL FIN 12 - 15
ANAL FIN 12 - 14

Spawning strategy Pelagic*

PLD ND

Reproduction Year round

Settlement season Year round

DISTRIBUTION

Mediterranean Sea, present in the tropical and subtropical zones of the world's oceans.

ECOLOGY

From the egg to the juvenile

No data

Adult

Forms schools at the surface, either at a distance or near the coast. They are capable of jumping out of the water and gliding long distances above the surface.

Bibliography 16, 70



© LHG

D+0 – Bastia - 60 mm

Number of individuals captured: ND
(all sites and years combined)

Hirundichthys rondeletii



© LHG

D+0 – Bastia- 60
mm



© LHG

D+0 – Bastia

The economically important species (cod) live in the open sea, but several others populate coastal and intertidal waters. Their body is typically spindle-shaped but the arrangement of the fins varies; all have a lateral line. Most have chin barbels and some possess them above the mouth. Gadoids feed on small fish, crustaceans and occasionally molluscs or polychaetes. Their eggs are spawned midwater and the larvae swim among plankton.

3 species

3 genera

- *Gaidropsarus mediterraneus*
- *Physis physis*
- *Trisopterus capelanus*

Gaidropsarus mediterraneus

(Linnaeus, 1758)

Gadidae

Shore rockling

Bertorella (SP), Motella mediterranea (IT), Motelle de Méditerranée (FR)



MERISTIC CHARACTERS

DORSAL FIN D1: 50-60 D2: 51-63
ANAL FIN 43-53

Spawning strategy	Pelagic*
PLD	43
Reproduction	November-April
Settlement season	Winter-Spring

DISTRIBUTION

Mediterranean Sea and Black Sea, present on the eastern Atlantic coast from Norway to the coasts of North Africa.

ECOLOGY

From the egg to the juvenile

The eggs yield pelagic* larvae. The juveniles that reach the coast measure between 30 and 40 mm on arrival.

Adult

Generally lives at shallow depths near rocky bottoms with aquatic vegetation.

POSTLARVAE REARING

Rearing	Delicate
Intra-specific	Lively
Inter-specific	Aggressive
Feeding	Easy
Stress	Stressed
Growth	Average

POSTLARVAE

From 30 to 35 mm

The PL is very silvery on the sides, with an iridescent turquoise-green colouration on the back. It is easily recognisable thanks to its 3 barbels (two in front of the eyes and one below the lower jaw), which are still translucent at this stage.

JUVENILES

From 35 to 55 mm

After one month, its colouration becomes rather brown. The first ray of the first dorsal fin is much longer than the others. The barbels begin to pigment, the pelvic fins are translucent.

Over 55 mm

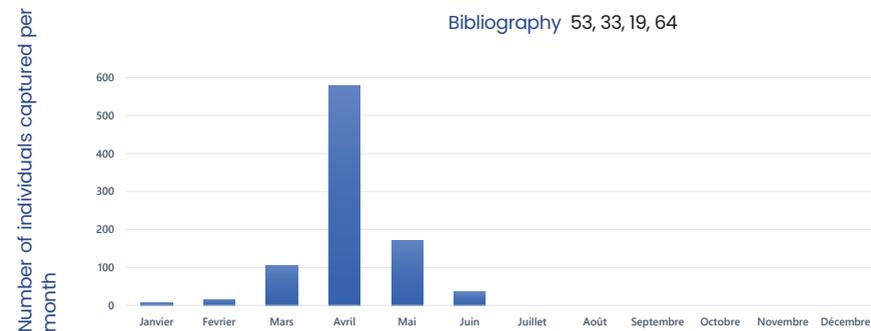
The body colouration resembles that of adults (brown). The barbels and pelvic fins are pigmented.

Particularity

The presence of one or several pieces of PVC pipe provides them with the cavity that is necessary for their growth without creating territoriality. Several individuals may coexist in the same pipe or tank. Individuals come out especially at night or to feed. Acclimatisation is delicate, should ideally be performed in the dark with cooler water (<18 °C).

Catch size 35.7 mm ± 5 mm (n=917)

Bibliography 53, 33, 19, 64



Gaidropsarus mediterraneus



© LHG

D+0 – Bastia – 31 mm



© LHG

D+0 – Bastia – 31 mm



© LHG

D+30 – Bastia – 56 mm



© LHG

D+30 – Bastia – 56 mm



TT ©

D+50 – Leucate – 58 mm



TT ©

D+50 – Leucate – 58 mm

Phycis phycis

(Linnaeus, 1766)

Gadidae

Forkbeard

Barbada de altura (SP), Musdea (IT), Mostelle de roche (FR)



MERISTIC CHARACTERS

DORSAL FIN 0
ANAL FIN 0

Spawning strategy Pelagic*

PLD ND

Reproduction January-May

Settlement season Spring

Possesses only one barbel under the lower jaw.
Possesses long Y-shaped pelvic fin filaments (forked filaments).

DISTRIBUTION

Mediterranean Sea and Atlantic as far as Cape Verde.

ECOLOGY

From the egg to the juvenile

ND

Adult

Rock-dwelling fish with an oblong brown body. Mainly lives in the dark, hidden under slabs or at the entrance to cavities. Nocturnal predator.

POSTLARVAE REARING

Rearing Easy

Intra-specific ND

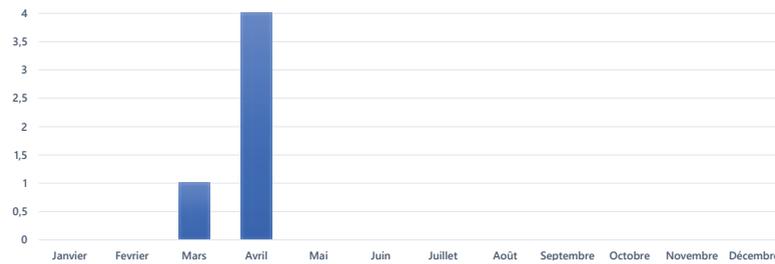
Inter-specific Predator

Feeding Easy

Stress Handling

@rowth Average

Number of individuals captured per month



POSTLARVAE

From 45 to 60 mm

The PL is very silvery on the sides, with an iridescent turquoise-green colouration on the back with scattered melanophores. The broad S-shaped lateral line is clearly visible. It is distinguished by a single barbel under the chin and its pelvic fins in the form of forked filaments that are characteristic of the species.

JUVENILES

From 60 to 100 mm

The back quickly darkens and turns a copper brown. Its fins gradually become opaque to take on a brown colour.

Over 100 mm

The flanks darken and the animal takes on its final adult colouration. The forked pelvic filaments elongate.

Particularity

The PL is particularly subject to stress, acclimatisation is preferable in a dark tank. It is essential to provide the animal with hiding places, such as small PVC pipes.

Catch size 62 mm ± 11.5 mm (n=5)

Bibliography 53, 19, 39

GADIDAE

Phycis phycis



D+0 – Marseille – 65 mm



D+0 – Marseille – 53 mm

Trisopterus capelanus

(Lacepède, 1800)

Gadidae

Mediterranean poor cod

Mollera (SP), Pesce mudo (IT), Caplan de Méditerranée (FR)



MERISTIC CHARACTERS

DORSAL FIN ND
ANAL FIN ND

Spawning strategy Pelagic*

PLD ND

Reproduction December-may

Settlement season Spring

DISTRIBUTION

Mediterranean Sea and Black Sea, present on the eastern Atlantic coast from the Bay of Biscay to Senegal.

ECOLOGY

From the egg to the juvenile

Eggs are spawned in a gelatinous mass. The larvae develop in open water before migrating to the bottom at a size between 15 and 20 mm.

Adult

A common species in rocky coastal substrates as well as coralligenous

substrates*.

POSTLARVAE

From 20 to 30 mm

The PL is already of large size when caught. The body is partially translucent with scattered melanophores. The chin barbel is now visible as well as the 3 dorsal fins. Several fins possess blue iridescence.

JUVENILES

From 30 to 40 mm

The juvenile undergoes rapid growth. Its body takes on a copper colour while the belly is rather white.

Over 40 mm

The juvenile now resembles a mini adult. The upper jaw is prominent. It possesses 3 dorsal fins and 2 anal fins, the latter being slightly separated.

POSTLARVAE REARING

Rearing Easy

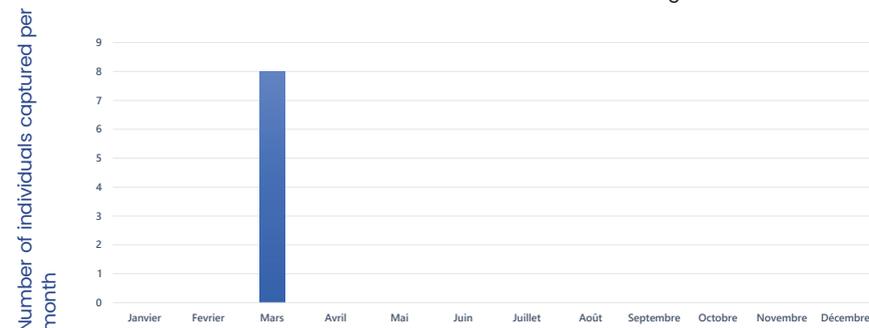
Intra-specific Dominance

Inter-specific ND

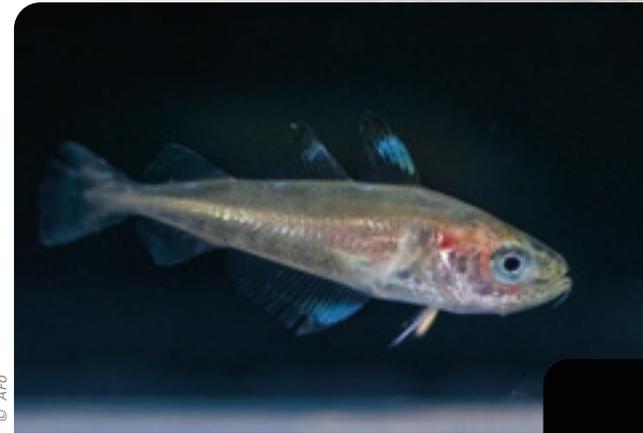
Feeding Very easy

Stress Handling

Growth Average



Trisopterus capelanus



© AFD

D+0 – Marseille – 32 mm



© MB

D+13 – Marseille – 40 mm



© MBI

D+20 – Marseille – 48 mm



D+46 – Marseille – 65 mm

Gobies are small coastal fish, almost all of which live gregariously on the bottom. They have a large head and a rather wide body that thins towards the tail. They have thick lips and large, protruding eyes that are usually situated near the top of the head. The dorsal fin is clearly divided into two parts, the first is short and the second quite large, roughly the same length as the anal fin. The pectoral and caudal fins are large and palette-like. The pelvic fins are fused into a disc which, with an anterior membrane, form a light ventral sucker. They consume a variety of small animals.

1 species

1 genus

• *Gobius geniporus*

Gobius geniporus

(Valenciennes, 1837)

Gobiidae

Slender goby

Gobio galano (SP), Ghiozzo geniporo (IT), Gobie svelte (FR)



MERISTIC CHARACTERS

DORSAL FIN D1: VI -VII D2: I+12-14
ANAL FIN I + 12-14

Spawning strategy Benthic*

PLD ND

Reproduction April-May

Settlement season Spring

DISTRIBUTION

Mediterranean Sea (endemic*).

ECOLOGY

From the egg to the juvenile

No data

Adult

Present in shallow coastal zones, found on sand and silt near seagrass beds.

POSTLARVAE REARING

Rearing Delicate

Intra-specific Coexistence

Inter-specific Aggressive

Feeding Very easy

Stress Handling

Growth Average

POSTLARVAE

From 10 to 12 mm

At this stage, the PL is translucent, with a slight yellow colouration at the head and trunk. The PL possesses a prominent swim bladder, a typical characteristic of Gobiidae.

JUVENILES

From 12 to 20 mm

After 10 days, juveniles pigment with several melanophores* over the entire body.

Over 20 mm

After 3 months, juveniles have a lateral brown line that starts at the snout, traverses the eyes and stops behind the head (not very distinct in the photo).

Particularity

They appreciate a small hiding place because they remain stressed by human presence.

Catch size 0 mm

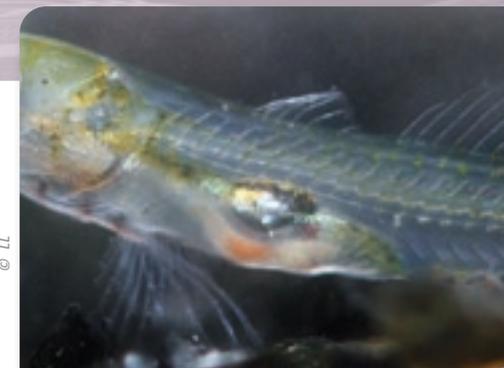
Bibliography 53, 33, 19

Number of individuals captured: ND
(all sites and years combined)

Gobius geniporus



D+0 - Leucate - 10 mm



D+0 - Leucate - 10 mm



D+10 - Leucate - 12 mm



D+90 - Leucate - 65 mm



D+90 - Leucate - 68 mm

These fish have a rather elongated body with large scales. There is only one dorsal fin, which bears rays on the anterior half. The rest of the body possesses soft rays that extend a little further. The shorter anal fin usually possesses three rigid rays. The mouth possesses thick lips and powerful teeth. These fish are often brightly coloured, but the colours and patterns may vary considerably according to the environment, the stage of development and the 'emotional' state. The individuals of several species undergo **protogynous** sexual inversion. All perform nuptial parades and nesting. Some, including the juvenile rainbow wrasse, 'clean' other fish. Their food mainly consists of benthic invertebrates.

4 species

4 genera

- *Coris julis*
- *Labrus viridis*
- *Symphodus ocellatus*
- *Thalassoma pavo*

Coris julis

(Linnaeus, 1758)

Labridae

Mediterranean rainbow wrasse

Julia (SP), Donzella (IT), Girelle (FR)



MERISTIC CHARACTERS

DORSAL FIN VIII-X + 11-12
ANAL FIN III + 11-12

Spawning strategy Pelagic*

PLD 21-34

Reproduction May-August

Settlement season Summer

DISTRIBUTION

Mediterranean Sea and Marmara Sea, present on the eastern Atlantic coast from Sweden to Gabon.

ECOLOGY

From the egg to the juvenile

No data

Adult

Found on the coastal strip, near rocks and seagrass beds.

POSTLARVAE

From 15 to 25 mm

The PL is rather yellow orange in colour, with a black lateral line that starts to form from the head. The species can be recognised by the two melanophores* at the end of the gut and on the caudal peduncle.

JUVENILES

From 25 to 30 mm

The black lateral line quickly extends over the entire length of the body. This is surrounded by two white lines on either side. A black dorsal line also appears.

Over 30 mm

After 2 months, individuals possess distinct stripes (alternating black and white) on the body from the head to the caudal peduncle. The ventral part takes on an orange colour.

POSTLARVAE REARING

Rearing Easy

Intra-specific Coexistence

Inter-specific Coexistence

Feeding Difficult

Stress Handling

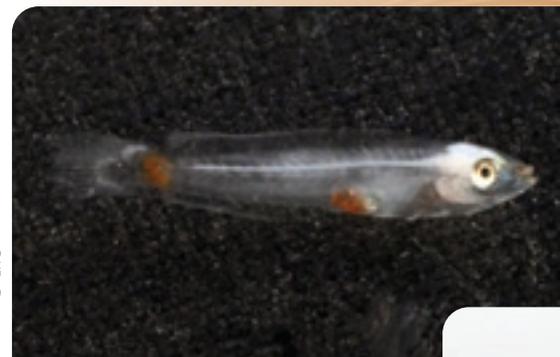
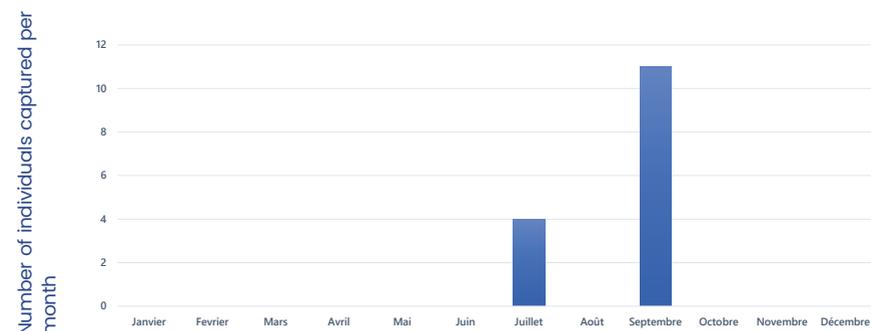
Growth Slow

Particularity

It is important to catch live enriched brine shrimp for its development. Live food should be preferred throughout rearing.

Catch size 24 mm \pm 2 mm (n=15)

Bibliography 53, 33, 19



D+0 – Bastia – 24 mm

© LHG

© LHG



D+1 – Bastia – 25 mm



D+5 – Bastia – 28 mm

© LHG



D+40 – Leucate – 33 mm

TT ©

Labrus viridis

(Linnaeus, 1758)

Labridae

Green wrasse

Tordo, pappagallo (IT), Tordo verde (SP), Labre vert / Lasagne (FR)



MERISTIC CHARACTERS

DORSAL FIN ND
ANAL FIN ND

Spawning strategy ND

PLD ND

Reproduction February-June

Settlement season Spring-Summer

DISTRIBUTION

The species is mainly present in the Mediterranean Sea but also in the Black Sea and the eastern Atlantic on the coasts of Portugal and Morocco.

ECOLOGY

From the egg to the juvenile

Juveniles live almost exclusively in seagrass beds.

Adult

Found in seagrass beds but also in rocky zones among algae and along coasts up to 50 m depth.

POSTLARVAE REARING

Rearing Easy

Intra-specific ND

Inter-specific Sociable

Feeding Easy

Stress Docile

Growth Slow

POSTLARVAE

From 10 to 20 mm

The PL is slightly translucent with yellow pigmentation. Note the presence of numerous melanophores over the entire body.

JUVENILES

From 20 to 60 mm

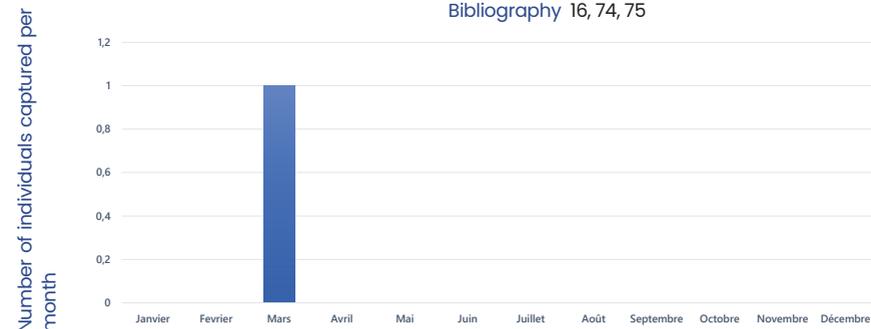
A white stripe from the eye to the anal fin develops quickly and the body takes on a green colour. This pigmentation will remain with the juvenile until the appearance of the mottling and light patches that are typical of the adult. It is only when they reach 30 to 40 mm that one can clearly distinguish the elongated snout that is characteristic of the species.

Particularity

A particularly sociable fish that appreciates company, which facilitates rearing. Requires a habitat. Difficult to wean, it feeds exclusively on live or frozen food.

Catch size 10 mm (n=1)

Bibliography 16, 74, 75

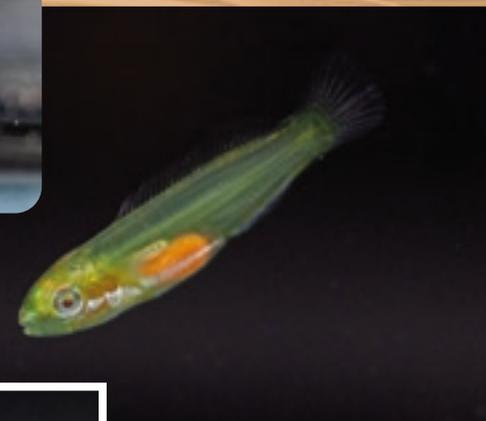


LABRIDAE

Labrus viridis



D+0 – Marseille – 10 mm



D+14 – Marseille – 20 mm



D+46 – Marseille – 30 mm



D+214 – Marseille – 63 mm

Symphodus ocellatus

(Forsskål, 1775)

Labridae

Ocellated wrasse

Tordo de roca (SP), Tordo ocellato (IT), Crénilabre ocellé (FR)



MERISTIC CHARACTERS

DORSAL FIN XIV + 10
ANAL FIN III + 10

Spawning strategy Benthic* (guardian)

PLD 9-11

Reproduction April-August

Settlement season Summer

DISTRIBUTION

Mediterranean Sea (endemic*).

ECOLOGY

From the egg to the juvenile

No data

Adult

Found mainly on rocky beds covered with algae and shallow seagrass beds.

Bibliography 16, 53



Leucate - 32 mm



Leucate - 32 mm

Number of individuals captured: ND
(all sites and years combined)

Symphodus ocellatus



Leucate - 42 mm

Thalassoma pavo

(Linnaeus, 1758)

Labridae

Ornate wrasse

Pez verde (SP), Donzella pavonina (IT), Girelle-paon (FR)



MERISTIC CHARACTERS

DORSAL FIN VIII + 12-14
ANAL FIN III + 9-11

Spawning strategy	Pelagic*
PLD	30-48
Reproduction	July-September
Settlement season	Summer

DISTRIBUTION

Mediterranean Sea, present on the eastern Atlantic coast from Portugal to Gabon.

ECOLOGY

From the egg to the juvenile

No data

Adult

Lives in coastal waters. Prefers rocky bottoms, shallow cavities and abrupt slopes or seagrass beds.

POSTLARVAE REARING

Rearing	Delicate
Intra-specific	Coexistence
Inter-specific	Coexistence
Feeding	Difficult
Stress	Handling
Growth	Slow

Particularity

It is important to catch live enriched brine shrimp for its development. Sand is essential to enable them to burrow at night.

Catch size 18 mm ± 2 mm

Bibliography 53, 33, 19, 58

Number of individuals captured: ND
(all sites and years combined)

POSTLARVAE

From 15 to 20 mm

As for *Coris julis*, the PL is translucent with an orange gut pigmentation and a melanophore at the base of the dorsal fin.

JUVENILES

From 20 to 25 mm

Juveniles rather quickly take on a green colouration with scattered white patches over the entire length of the body. The dorsal fin bears green and orange pigments. The white side stripes overlap these and the central melanophore continuously increases in size.

Over 30 mm

After one month, the colour varies from brown to orange and white, with several green spots. The central melanophore is now surrounded with white at the fin. The 5 white stripes correspond to the blue stripes that are present in the adult.

Thalassoma pavo



© LGA

D+0 – Cagliari – 20 mm



© AFR

D+3 – Murcia – 17 mm



© AFR

D+11 – Murcia – 18 mm



77 ©

Leucate – 28 mm

These fish have the characteristic of two spines on the gill cover. They possess two dorsal fins and a forked caudal fin. Most species live in freshwater in America. In the Mediterranean, this family is represented by the *Dicentrarchus* (seabass) genus. These are average to large size fish with a spindle-shaped body that is slightly compressed on the sides. They are often found in schools in the rocky zones of shallow coastal waters. They are predators that like to hide in currents.

1 species

1 genus

• *Dicentrarchus labrax*

Dicentrarchus labrax

(Linnaeus, 1758)

Moronidae

European seabass

Lubina (SP), Spigola (IT), Bar commun, Loup (FR)



MERISTIC CHARACTERS

DORSAL FIN D1: VIII-IX D2: I+12-13
ANAL FIN III + 10-12

Spawning strategy	Pelagic*
PLD	46
Reproduction	January-March
Settlement season	Spring

DISTRIBUTION

Mediterranean Sea and Black Sea, present on the eastern Atlantic coast from Norway to Morocco.

ECOLOGY

From the egg to the juvenile

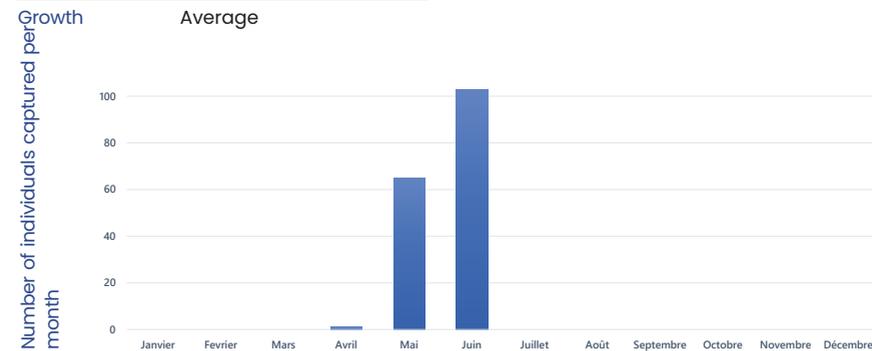
The postlarvae are found in shallow water sheltered from waves, on fine sand or silt. Harbour and channel constructions are also good nursery areas.

Adult

A euryhaline species that lives in the coastal zone on various bottoms as well as in estuaries, coastal lagoons and occasionally rivers.

POSTLARVAE REARING

Rearing	Easy
Intra-specific	Cannibalism
Inter-specific	Predator
Feeding	Very easy
Stress	Delicate
Growth	Average



POSTLARVAE

From 15 to 20 mm

With a spindle-shaped body, the PL possess a typical brown-black pigmentation. A black stripe traverses the eye. The gut ends at the dorsal fin. After 5 days, it takes on an orange tint in addition to the brown-black.

JUVENILES

From 20 to 45 mm

The juveniles have small melanophores* on the body, arranged in relation to the myotomes. Its colouration takes on a silvery or coppery aspect depending on the light.

Over 45 mm

After 2 months, individuals are a replica of the adult with a typical silver colour and elongated snout. The lateral line is clearly visible.

Particularity

Cannibalism is regularly observed among individuals of identical size. It is necessary to frequently distribute food rations to limit this. They appreciate a bed of sand at the bottom of the tank to hide in when stressed.

Catch size 17 mm ± 2 mm (n=169)

Bibliography 53, 19, 23, 24, 58

MORONIDAE

Dicentrarchus labrax

D+0 – Saintes-Maries-de-la-Mer – 15 mm



© MBI



TI ©

D+5 – Leucate – 20 mm

© AFR



Marseille – 30 mm



TI ©

D+50 – Leucate – 46 mm

© RC



D+60 – Leucate

Most species are marine and coastal but some can be found in brackish or even fresh water. These are elongated, silvery fish with two well-spaced dorsal fins. The mouth is small with very small or no teeth and often possess big lips. These fish generally move in groups or schools and feed in a rather omnivorous and opportunistic manner.

4 species

3 genera

- **Chelon labrosus**
- **Liza aurata**
- **Liza ramada**
- **Mugile cephalus**

Chelon labrosus, *Chelon aurata*, *Liza ramada*, *Mugil cephalus*

Mullet

Mujoles o Lisas (SP), Cefalo o Mùggine (IT), Muge (FR)

Mugilidae



MERISTIC CHARACTERS

DORSAL FIN ND
ANAL FIN ND

Spawning strategy	Pelagic*
PLD	ND
Reproduction	Sept-Dec (LA, LR, MC) & April-May (CL)
Settlement season	Autumn (LA, LR, MC) & Spring (CL)

DISTRIBUTION

Mediterranean Sea, widely distributed in the eastern Atlantic coast from Norway (CL) to Mauritania (MC).

ECOLOGY

From the egg to the juvenile

No data

Adult

Generally lives in large schools near the surface. The may enter brackish lagoons or estuaries.

POSTLARVAE REARING

Rearing	Easy
Intra-specific	Coexistence
Inter-specific	Coexistence
Feeding	Very easy
Stress	Docile
Growth	quick

POSTLARVAE

From 15 to 20 mm

The PL have a silver colouration with a variable dorsal colouring that ranges from black-brown to green. Pigmentation sometimes extends to the flanks of the individual. They form schools that are always highly active (and difficult to photograph).

JUVENILES

Over 20 mm

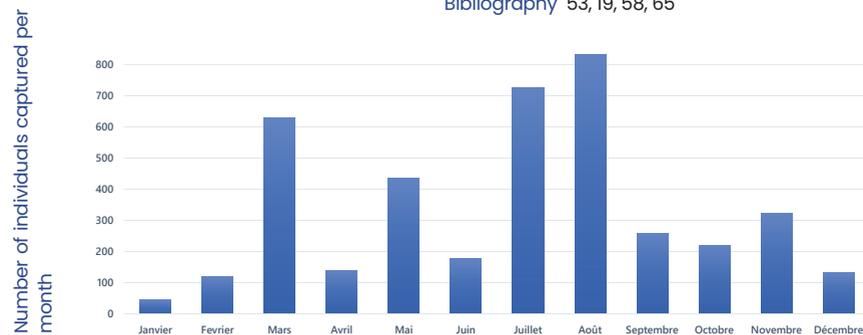
Not long after their arrival, they lose their silvery aspect to take on a colouration that approaches that of adults (e.g. yellow-gold for *Liza aurata*).

Particularity

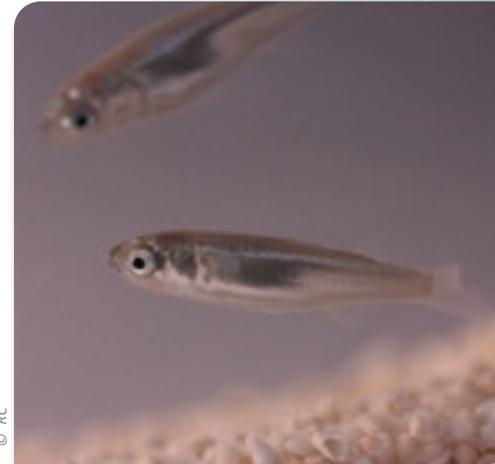
Robust PL Non-aggressive, they easily feed on everything offered to them. Indeed, they participate in the cleaning of tanks. Differentiation among species is very difficult, even when allowed to grow. That is why they are grouped under the same taxa.

Catch size 20.5 mm ± 5 mm (n=4034)

Bibliography 53, 19, 58, 65



Chelon labrosus, *Liza aurata*, *Liza ramada*, *Mugil cephalus*



D+0 – Leucate



D+0 – Leucate



D+0 – Leucate



D+2 – Bastia – 20 mm



D+2 - Bastia – 20 mm



D+2 – Bastia – 12 mm

These are slender fish with a rather straight belly and a body covered in large scales. The dorsal fin is clearly divided into two and the caudal fin is forked. The eyes are situated rather high on the head and the lips are thick. The two relatively long and fleshy barbels below the chin fold away into grooves along the body when swimming. Covered with numerous chemical and tactile receivers, these barbels enable them to seek their food by probing the sand. Their nocturnal colouring is redder than during the day, which enables them to go more unnoticed.

2 species

1 genus

- ***Mullus barbatus***
- ***Mullus surmuletus***

Mullus barbatus

(Linnaeus, 1758)

Mullidae

Red mullet

Salmonete de fango (SP), Triglia di fango (IT), Rouget-barbet de vase (FR)



MERISTIC CHARACTERS

DORSAL FIN D1: VII–VIII D2: 1+7–8
ANAL FIN I + 7

Spawning strategy	Pelagic*
PLD	20–30
Reproduction	April–August
Settlement season	Summer

DISTRIBUTION

Mediterranean Sea and Black Sea, present on the eastern Atlantic coast from the British Isles to Senegal.

ECOLOGY

From the egg to the juvenile

No data

Adult

Found on the gravel, sand and silt beds of the continental plateau.

POSTLARVAE REARING

Rearing	Difficult
Intra-specific	Coexistence
Inter-specific	Coexistence
Feeding	Difficult
Stress	Stressed
Growth	Slow

Particularity

Food must be abundant and distributed in several doses during the day. The fish must be regularly sorted to avoid that the largest

POSTLARVAE

From 45 to 55 mm

The PL are very large and elongated (over 45 mm). They have a rather greenish colouration that rapidly dissipates. They possess two barbels and the dorsal fin is very slightly coloured.

JUVENILES

From 55 to 60 mm

Its colouration becomes that of adults with pink tones and a red lateral stripe. The dorsal is not very colourful but nevertheless possesses melanophores*.

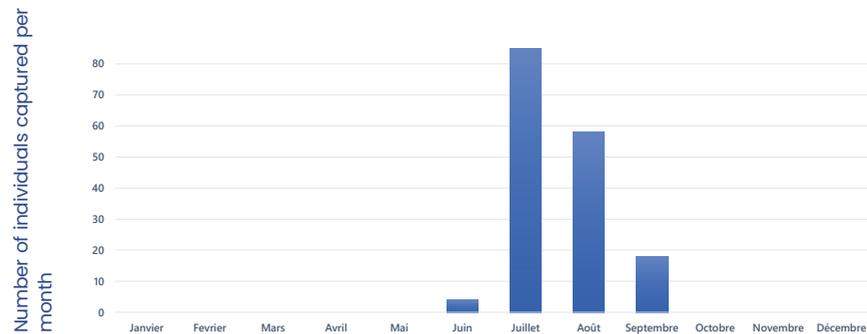
Over 60 mm

As they grow, colouration remains drab, the forehead indents and the dorsal fin remains colourless or only slightly pigmented.

individuals prevent the others from feeding. The presence of a sandy bottom, as in their natural environment, calms them. Differentiation between the two species (*M. surmuletus* and *M. barbatus*) is difficult as the PL rapidly change colour. Species identification can only be verified when reared. Provide food at the bottom of the tank via a tube.

Catch size 46.9 mm ± 2 mm (n=165)

Bibliography 53, 19, 39, 58



MULLIDAE 157

Mullus barbatus



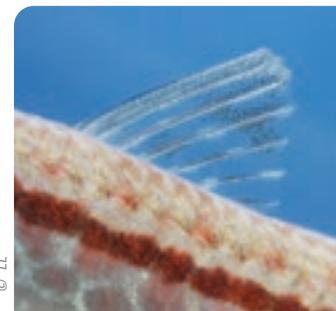
D+0 – Leucate



D+0 – Leucate – 53 mm



D+20 – Leucate – 57 mm



D+20 – Leucate – 55 mm



D+0 – Marseille – 65 mm

© MBI

Mullus surmuletus

(Linnaeus, 1758)

Mullidae

Striped red mullet

Salmonete de roca (SP), Triglia di scoglio (IT), Rouget-barbet de roche (FR)



MERISTIC CHARACTERS

DORSAL FIN D1: VII-VIII D2: 1+7-9
ANAL FIN I + 7

Spawning strategy	Pelagic*
PLD	25-35
Reproduction	May-July
Settlement season	Summer

DISTRIBUTION

Mediterranean Sea and Black Sea, present on the eastern Atlantic coast from the British Isles to Senegal.

ECOLOGY

From the egg to the juvenile

No data

Adult

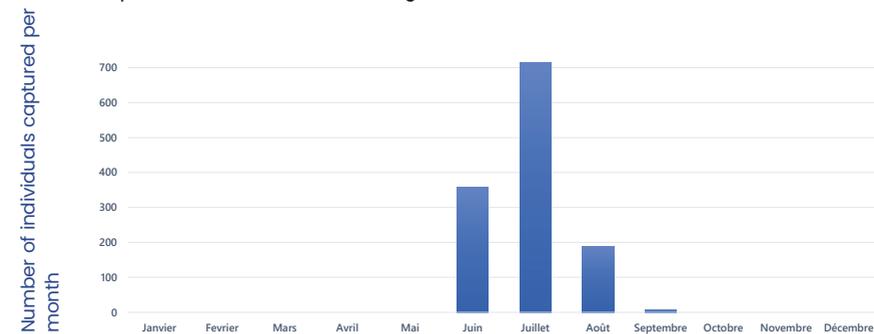
Found on chaotic rocky bottoms but is also observed on sand and unconsolidated bottoms at depths up to 100 m.

POSTLARVAE REARING

Rearing	Difficult
Intra-specific	Coexistence
Inter-specific	Coexistence
Feeding	Difficult
Stress	Stressed
Growth	Slow

Particularity

Food must be abundant and distributed in several doses during the day. The fish must be regularly sorted to avoid that the largest individuals prevent the others from feeding.



POSTLARVAE

From 45 to 55 mm

The PL are very large and elongated (over 45 mm on arrival). They have a colouration that is very close to that of adults, with a yellow tint on the belly and beige on the back with a red lateral stripe. They possess two barbels and the dorsal fin is highly marked with a black stripe surrounded with white. This characteristic remains very marked throughout their development.

JUVENILES

Over 55 mm

Very soon, the caudal peduncle takes on a yellow colouration that lasts over time. It is important to provide sand and to feed them regularly to avoid excessive stress (morphological change).

The presence of a sandy bottom, as in their natural environment, calms them. Differentiation between the two species (*M. surmuletus* and *M. barbatus*) is difficult as the PL rapidly change colour. Species identification can only be verified when reared. Provide food at the bottom of the tank via a tube.

Catch size 43.1 mm ± 2 mm (n=1268)

Bibliography 53, 19, 39, 58

MULLIDAE

Mullus surmuletus



D+0 – Embiez



D+0 – Bastia – 45 mm



D+0 – Embiez – 50 mm



D+2 – Bastia – 50 mm



D+45 – Leucate – 65 mm

In the Mediterranean, this family is represented by a single species, *Chromis chromis* (damselfish). These fish live in schools near the surface and near the coast. Dark grey colour. The upper part of the body is laterally compressed, the short and rounded snout ends with a highly protractile mouth that contains fine protruding teeth. The dorsal and anal fins are black and bluish, the caudal fin is black at the extremities and transparent in the centre, its 'swallow-tail' shape is highly characteristic.

1 species

1 genus

• ***Chromis chromis***

Chromis chromis

(Linnaeus, 1758)

Pomacentridae

Damselfish

Castañuela (SP), Castagnola (IT), Castagnole (FR)



MERISTIC CHARACTERS

DORSAL FIN XIV + 9-11
ANAL FIN III + 9-11

Spawning strategy Benthic*

PLD 15-25

Reproduction June-August

Settlement season Summer

DISTRIBUTION

Mediterranean Sea and Black Sea, present on the eastern Atlantic coast from Portugal to the Gulf of Guinea.

ECOLOGY

From the egg to the juvenile

The juveniles live in dense schools near seagrass beds.

Adult

They form large schools in open water above rocky reliefs and seagrass beds.

POSTLARVAE REARING

Rearing Difficult

Intra-specific Coexistence

Inter-specific Dominated

Feeding Delicate

Stress Stressed

Growth Slow

POSTLARVAE

From 10 to 15 mm

Rather uniform brown colouring on the body. They have a characteristic blue iridescence on their flank. The caudal peduncle is translucent.

JUVENILES

From 15 to 30 mm

As they grow, the blue shimmer becomes less visible and the various fins gradually pigment.

Over 30 mm

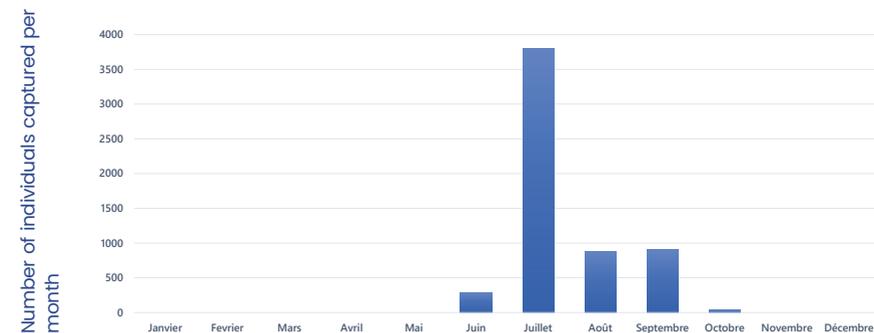
After 2 months, the fins of juveniles are entirely pigmented. Individuals have a uniform colouring and a few bluish highlights are still visible on the head.

Particularity

A particularly fragile species in both acclimatisation and rearing phases. Chromis are highly subject to stress and even a slamming door near the tank can cause their death. Be careful to separate them from other species to prevent them from becoming prey. Ideally kept in large numbers for rearing.

Catch size 10 mm \pm 2 mm (n=5907)

Bibliography 53, 33, 19, 58



POMACENTRIDAE

Chromis chromis



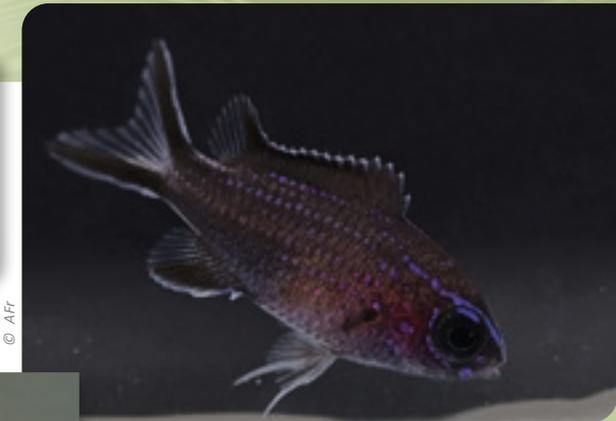
D+0 – Embiez



D+3 – Murcia – 14 mm



D+6 – Bastia – 18 mm



D+0 – Marseille – 15 mm



D+11 – Leucate – 20 mm



D+60 – Leucate – 50 mm

These attractive coastal fish prefer the sandy-rocky bottoms of benthic zones. Their body is generally laterally compressed and very elegant. The mouth is rather large and equipped with predatory teeth. There is a single dorsal fin but it is sharply notched, which divides the spiny part from the part with soft rays. The anal fin has a pair of spiny rays. The swim bladder is a vast and complex structure that several species also use to produce sounds. All species are carnivorous. The eggs are pelagic. The juveniles are often very different from the adult fish.

1 species

1 genus

• *Sciaena umbra*

Sciaena umbra

Brown meagre

Corvallo (SP), Corvina (IT), Corb (FR)

Linnaeus, 1758

Scianidae



MERISTIC CHARACTERS

DORSAL FIN XI + 23-25
ANAL FIN II + 7-8

Spawning strategy Pelagic*
PLD 22-23
Reproduction April-June
Settlement season Spring

DISTRIBUTION

Mediterranean Sea and Black Sea, present on the eastern Atlantic coast from England to Mauritania.

ECOLOGY

From the egg to the juvenile

No data

Adult

Inhabits shallow coastal waters where it usually lives in small sedentary groups. Found on rocky and sandy bottoms, in posidonia beds and occasionally in estuaries. Cracks and caves provide preferred shelter during the day.

POSTLARVAE REARING

Rearing Delicate
Intra-specific ND
Inter-specific ND
Feeding Easy
Stress Handling
Growth Average

POSTLARVAE

From 15 to 20 mm

The PL is yellow-brown with melanophores* arranged in a honeycomb pattern over the body. The pelvic and dorsal fins are pigmented, the others are not.

JUVENILES

From 20 to 30 mm

The fins gradually pigment. What is remarkable at this stage is the important development of the first dorsal fin and pectoral fins that seem to be disproportionate with respect to the individual.

Over 30 mm

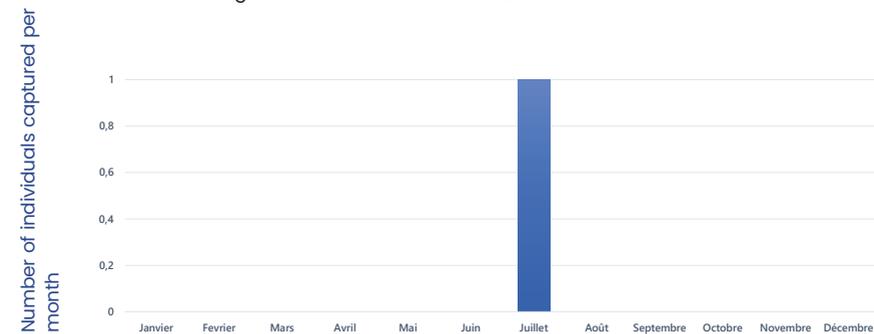
This hyper-development is accentuated among juveniles, which possess fins that are as large as the width of their body. They have a copper-brown colour with slightly darker spots on the body.

Particularity

When individuals grow, they need a great deal of space and few members of its species in the same tank. Two by-laws have regulated its capture in the French Mediterranean since 1993.

Catch size 7 mm \pm 2 mm (n=7)

Bibliography 53, 33, 19, 40, 58



SCIANIDAE

Sciaena umbra



© GA

D+0 – Castellammare



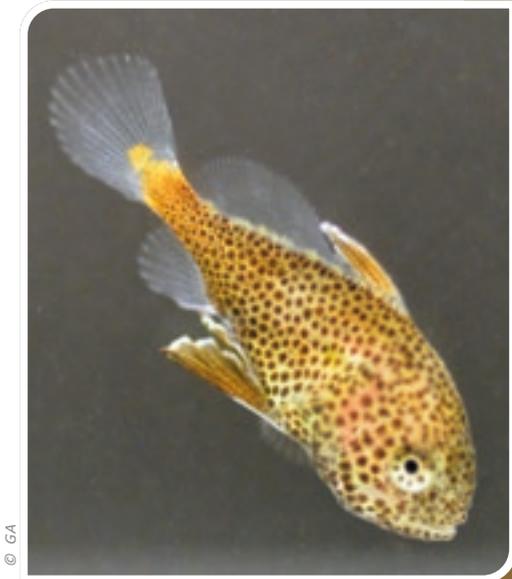
© GA

D+15 – Castellammare – 22 mm



© GA

D+45 – Castellammare – 28 mm



© GA

D+19 – Castellammare – 22 mm



TT ©

D+0 – Leucate – 80 mm

Flat fish with two eyes on the left side, a large terminal mouth with a prominent lower jaw. The fins do not possess spiny rays, the dorsal fin begins well in front of the upper eye. The lateral line is well developed on both sides. The colouration of the hidden side is highly variable and depends on the colour of the surrounding substrate. The blind side is generally whitish. These fish live on varied bottoms. Like Bothidae, the larvae have symmetrical eyes; the 'migration' of one eye takes place during the metamorphosis from the larval to juvenile stage.

1 species

1 genus

• ***scophtalmus*** *maximus*

Scophthalmus maximus

(Linnaeus, 1758)

Scophthalmidae

Turbot

Rodaballo (SP), Rombo chiodato (IT), Turbot (FR)



MERISTIC CHARACTERS

DORSAL FIN 60-67
ANAL FIN 43-47

Spawning strategy Pelagic*

PLD 60

Reproduction April-August

Settlement season Spring-summer

DISTRIBUTION

Mediterranean Sea, present on the eastern Atlantic coast from Norway to Morocco.

ECOLOGY

From the egg to the juvenile

Both PL and juveniles live on beaches, between the shore and the low tide level.

Adult

Benthic*, diurnal and territorial fish. Lives on sandy or mixed (silt, gravel and rock) bottoms. Found in shallow coastal waters from 10 to 140 m.

POSTLARVAE REARING

Rearing Delicate

Intra-specific ND

Inter-specific Lively

Feeding Delicate

Stress Docile

Growth Average

POSTLARVAE

From 20 to 25 mm

'Left-sided' flat fish (both eyes on the left side of the fish). The PL is already well pigmented with alternating white and darker spots. The caudal fin is still translucent.

JUVENILES

From 25 to 30 mm

These numerous spots are still accentuated after 10 days. The caudal fin is pigmented. The interior side is also slightly pigmented.

Over 30 mm

Juveniles adapt their colouration to the local environment, accentuating its light spots on light bottoms and vice versa. The ventral part (right) becomes opaque and the digestive part takes on a silvery tint. The first rays of the fins above the eye are well joined (*S. rhombus* possesses rays that are separate from each other).

Particularity

The presence of sand is not necessary even though it enables individuals to hide as in their natural environment.

Catch size 25 mm (n=2)

Bibliography 54, 19, 6, 16

Number of individuals captured: ND
(all sites and years combined)

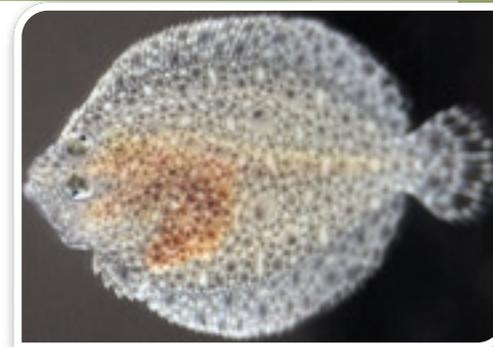
SCOPHTHALMIDAE 171

Scophthalmus maximus



D+0 - Leucate - 25 mm

© RC



D+10 - Leucate - 29 mm

© LL



D+10 - Leucate - 29 mm



D+40 - Leucate - 39 mm

© LL



D+40 - Leucate - 39 mm

© LL



D+40 - Leucate - 39 mm

Also called scorpionfish, these fish have a compressed body and a head with ridges and spines. They have a single dorsal fin that is often discontinuous. The dorsal, anal and pelvic fins often contain venom glands. Most live on the seabed above the benthos, where they feed on crustaceans and fish. The eggs are spawned in gelatinous pouches. The larvae are planktonic.

4 species

1 genus

- ***Scorpaena maderensis***
- ***Scorpaena notata***
- ***Scorpaena porcus***
- ***Scorpaena scrofa***

Scorpaena maderensis

(Valenciennes, 1833)

Scorpaenidae

Madeira rockfish

Rascacio de Madeira (SP), Scorfantina squamoso (IT), Rascasse de Madère (FR)



MERISTIC CHARACTERS

DORSAL FIN XII + 9
ANAL FIN III + 5

Spawning strategy Benthic*

PLD ND

Reproduction April–May

Settlement season Spring

DISTRIBUTION

Mediterranean Sea (sporadic), present on the eastern Atlantic coast from the Azores to Senegal. Herculean* species.

ECOLOGY

From the egg to the juvenile

The eggs are spawned in a gelatinous string on a hidden substrate. The larvae are planktonic.

Adult

Found in shallow coastal waters on rocky substrates covered with brown algae, as well as in hollows, rocky ledges and small rocks.

POSTLARVAE REARING

Rearing Delicate

Intra-specific Dominance

Inter-specific ND

Feeding Easy

Stress Docile

Growth Slow

POSTLARVAE

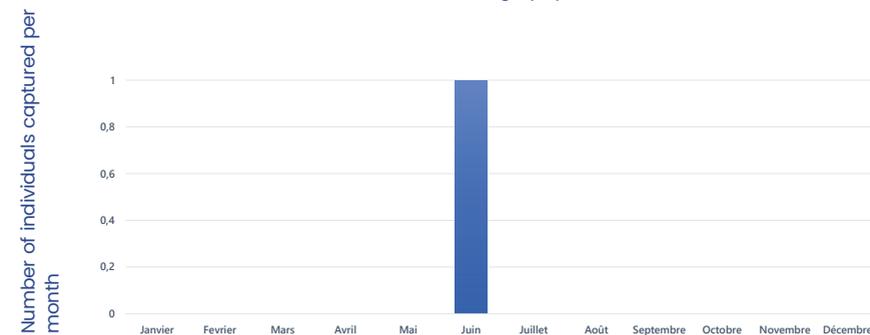
From 10 to 20 mm

The PL is already pigmented and has almost entirely lost its translucence. Its orange-red colouring presents wide vertical stripes.

JUVENILES

From 20 to 30 mm

The colouration is more clearly marked. Short skin flaps can be observed on the eye but are sometimes absent. 2 small flaps of white skin under the lower jaw.



Particularity

Can be initially reared in groups, but must then be separated. Do not mix individuals of different sizes. Provide PVC pipes to act as hiding places. Do not handle with a dip net.

Catch size 20 mm ± 2 mm (n=1)

Bibliography 16, 58

SCORPAENIDAE

Scorpaena maderensis



D+0 – La Ciotat – 20 mm



D+6 – La Ciotat – 23 mm

Scorpaena notata

(Rafinesque, 1810)

Scorpaenidae

Small red scorpionfish

Escórpora (SP), Scorfanotto (IT), Petite rascasse rouge (FR)



MERISTIC CHARACTERS

DORSAL FIN XII + 9-11
ANAL FIN III + 5-6

Spawning strategy Benthic*

PLD ND

Reproduction July-October

Settlement season Autumn

DISTRIBUTION

Mediterranean Sea and Black Sea, present on the eastern Atlantic coast from the Bay of Biscay to Senegal.

ECOLOGY

From the egg to the juvenile

Eggs are spawned in a gelatinous mass. The larvae develop in open water before migrating to the bottom at a size between 15 and 20 mm.

Adult

A common species in rocky coastal substrates as well as coralligenous

substrates*.

POSTLARVAE

From 10 to 20 mm

The PL arrives with a mottled brown colouring (characteristic of the species). The caudal peduncle remains translucent. It bears various spines on its head (supra-occipital, frontal, preopercular and opercular), which is typical of Scorpaenidae.

JUVENILES

From 20 to 30 mm

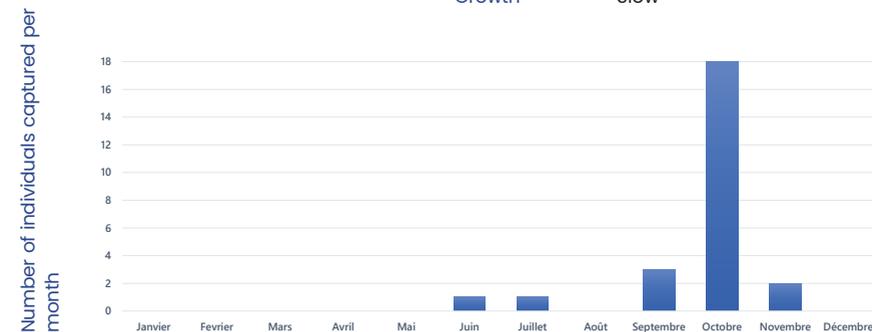
The colouration of the juvenile turns to light brown interspersed with white and slightly pink on the head. The caudal peduncle is coloured and the caudal fin bears a brown stripe. The head is light brown and the spines are less apparent. Small skin flaps appear above the eye.

Over 30 mm

With growth, the juveniles take on a mottled brown aspect. The skin outgrowth above the eye remains small or disappears.

POSTLARVAE REARING

Rearing	Delicate
Intra-specific	Cannibalism / Territorial
Inter-specific	Predator
Feeding	Delicate
Stress	Handling
Growth	Slow



SCORPAENIDAE

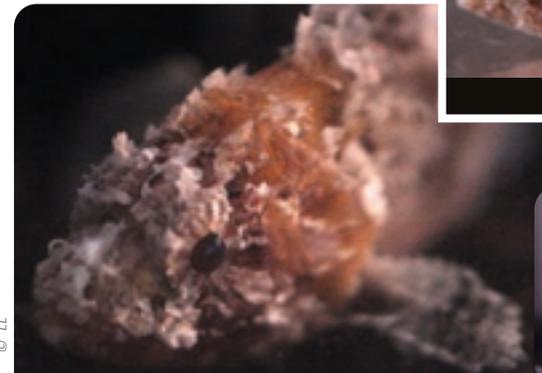
Scorpaena notata



D+0 – Embiez – 18 mm



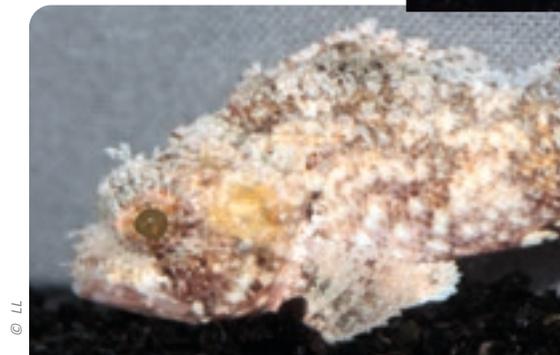
D+15 – Leucate – 22 mm



D+20 – Leucate – 23 mm



D+30 – Leucate – 40 mm



D+30 – Leucate – 40mm

Scorpaena porcus

Black scorpionfish

Rascacio (SP), Scorfano nero (IT), Rascasse brune (FR)

(Linnaeus, 1758)

Scorpaenidae



MERISTIC CHARACTERS

DORSAL FIN XII + 9-11
ANAL FIN III + 5-6

Spawning strategy Benthic*

PLD ND

Reproduction July-October

Settlement season Summer-Autumn

DISTRIBUTION

Mediterranean Sea and Black Sea, present on the eastern Atlantic coast from the Bay of Biscay to Senegal.

ECOLOGY

From the egg to the juvenile

Eggs are spawned in a gelatinous mass. The larvae develop in open water before migrating to the bottom at a size between 15 and 20 mm.

Adult

A common species in rocky coastal substrates as well as coralligenous

substrates*.

POSTLARVAE

From 15 to 20 mm

The PL has several possible colourings. It may have a dark/black body with a transparent caudal fin or may sometimes be lighter with a pale brown tendency. It bears the various spines on its head (supra-occipital, frontal, pre-opercular and opercular) that are typical of Scorpaenidae, but are less pronounced than for *S. notata* or *S. scrofa*. A brown colouration gradually appears in a stripe on the caudal peduncle.

JUVENILES

From 20 to 30 mm

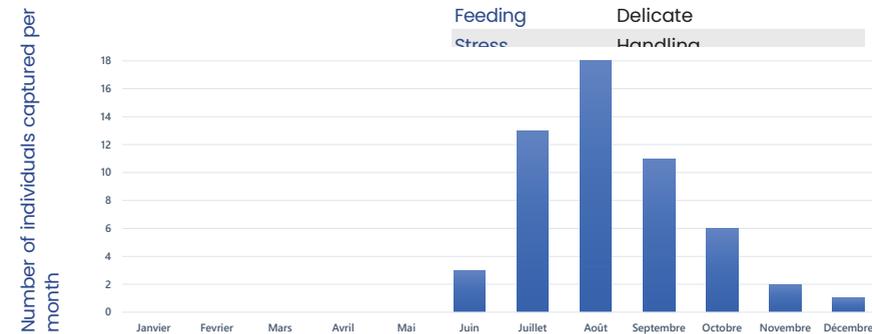
The colouration of the juvenile turns to a dark brown interspersed with white. The caudal peduncle is coloured and the caudal fin bears a brown stripe. The head is dark brown and the spines are less apparent. No skin flaps above the eye.

Over 30 mm

The juvenile does not yet have skin flaps on each eye but is characterised by the numerous small scales over its body.

POSTLARVAE REARING

Rearing	Delicate
Intra-specific	Cannibalism / Territorial
Inter-specific	Predator
Feeding	Delicate
Stress	Handling



SCORPAENIDAE

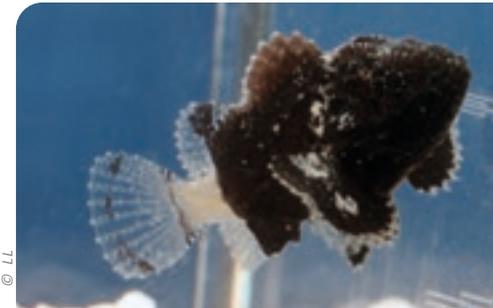
Scorpaena porcus



D+0 – Embiez – 16 mm



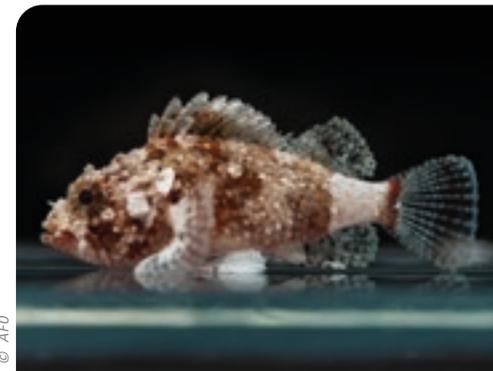
D+0 – Marseille – 15 mm



D+15 – Leucate – 18 mm



D+7 – Marseille – 20 mm



D+43 – Marseille – 32 mm



D+150 – Leucate – 80 mm

Scorpaena scrofa

Red scorpionfish

Cabracho (SP), Scorfano rosso (IT), Chapon (FR)

(Linnaeus, 1758)

Scorpaenidae



MERISTIC CHARACTERS

DORSAL FIN XII + 9-11
ANAL FIN III + 5-6

Spawning strategy	Benthic*
PLD	ND
Reproduction	July-October
Settlement season	Autumn

DISTRIBUTION

Mediterranean Sea and Black Sea, present on the eastern Atlantic coast from the Bay of Biscay to Senegal.

ECOLOGY

From the egg to the juvenile

Eggs are spawned in a gelatinous mass. The larvae develop in open water before migrating to the bottom at a size between 15 and 20 mm.

Adult

A common species in rocky coastal substrates as well as coralligenous

substrates*.

POSTLARVAE

From 12 to 20 mm

The PL has a yellow-brown colouring that is characteristic of the species. The caudal peduncle remains translucent. It bears various spines on its head (supra-occipital, frontal, preopercular and opercular), which is typical of Scorpaenidae. The PL then turns light beige.

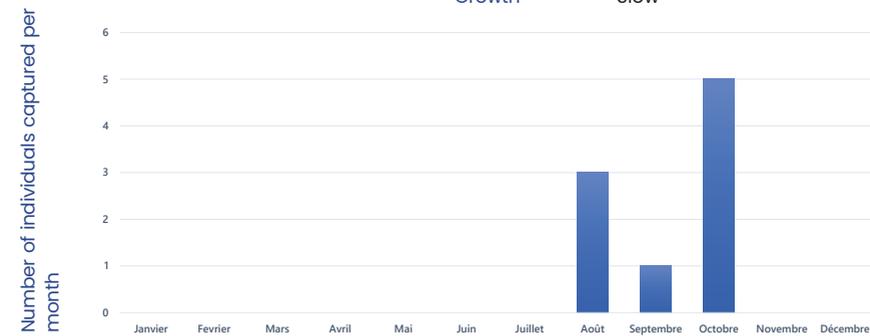
JUVENILES

Over 20 mm

After 15 days, the juvenile colouration turns to light brown interspersed with beige. The caudal peduncle is coloured and the caudal fin bears a rather light brown stripe. The head is light brown and the spines are less apparent. Small skin flaps appear above and in front of the eye.

POSTLARVAE REARING

Rearing	Delicate
Intra-specific	Cannibalism / Territorial
Inter-specific	Predator
Feeding	Delicate
Stress	Handling
Growth	Slow



SCORPAENIDAE

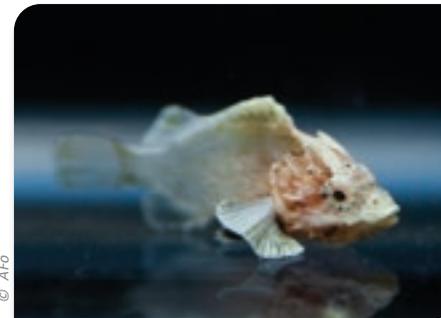
Scorpaena scrofa



D+0 – Bastia – 12 mm



D+0 – Bastia – 12 mm



D+0 – Marseille – 12 mm



D+21 – Marseille – 16 mm



D+50 – Marseille – 30 mm

Almost all species live in shallow water near the coast. They occupy rocky bottoms and seagrass beds. They prey on shrimp and small fish. Numerous species possess bright colours. They have a single dorsal fin and a rounded caudal fin. These fish have a large mouth and small spines on the gill arcs. All sea bass are carnivorous.

5 species

2 genera

- ***Epinephelus*** *aeneus*
- ***Epinephelus*** *marginatus*
- ***Serranus*** *cabrilla*
- ***Serranus*** *hepatus*
- ***Serranus*** *scriba*

Epinephelus aeneus

(Geoffroy Saint-Hilaire, 1817)

Serranidae

White grouper

Cherna de ley (SP), Cernia bianca (IT), Mérou blanc (FR)



MERISTIC CHARACTERS

DORSAL FIN XI + 14-16
ANAL FIN III + 8-9

Spawning strategy Pelagic*

PLD ND

Reproduction July-August

Settlement season Summer

DISTRIBUTION

Mediterranean Sea (mainly south, several appearances in the north in Monaco and Corsica), present on the eastern Atlantic coast from Morocco to Angola.

ECOLOGY

From the egg to the juvenile

Juveniles have been observed in coastal lagoons and estuaries.

Adult

Found on rocky and sandy-silty substrates.

Bibliography 16, 22



D+0 – Cagliari – 28 mm

Number of individuals captured: 1
(all sites and years combined)

Epinephelus aeneus



D+3 – Cagliari – 40 mm



D+10 – Cagliari – 45 mm

Epinephelus marginatus

(Lowe, 1834)

Serranidae

Dusky grouper

Mero moreno (SP), Cernia bruna (IT), Mérou brun (FR)



MERISTIC CHARACTERS

DORSAL FIN XI + 14-16
ANAL FIN III + 8

Spawning strategy	Pelagic*
PLD	22-30
Reproduction	July-August
Settlement season	Summer

DISTRIBUTION

Mediterranean Sea, present on the eastern Atlantic coast from the Bay of Biscay to Africa.

ECOLOGY

From the egg to the juvenile

The juveniles are often found near the rocky shore and remain cryptic (very few *in situ* observations).

Adult

Solitary and territorial, found in rocky coastal habitats that are rich in cavities and shelters.

POSTLARVAE REARING

Rearing	Delicate
Intra-specific	Dominance
Inter-specific	Predator
Feeding	Easy
Stress	Handling
Growth	Quick

Particularity

Rearing requires one or more small cavities to provide hiding places. Two by-laws have regulated its capture in the

POSTLARVAE

From 15 to 20 mm

The PL is distinguished on arrival by the first rays of its dorsal and pectoral fins, which are prominent and toothed. They are slightly pigmented. The PL has a light brown colouration that appears along its body. Red-orange chromatophores* are grouped at the base of the caudal fin. The PL has a large pre-opercular spine at the angle of indentation, which is also spiny.

JUVENILES

From 25 to 35 mm

After 2 days, 5 brown stripes mark the body of juveniles. The spiny dorsal and pectoral rays are reduced but remain brown, their spiny characteristics have disappeared. The patch on the caudal peduncle has migrated to the dorsal position and darkened.

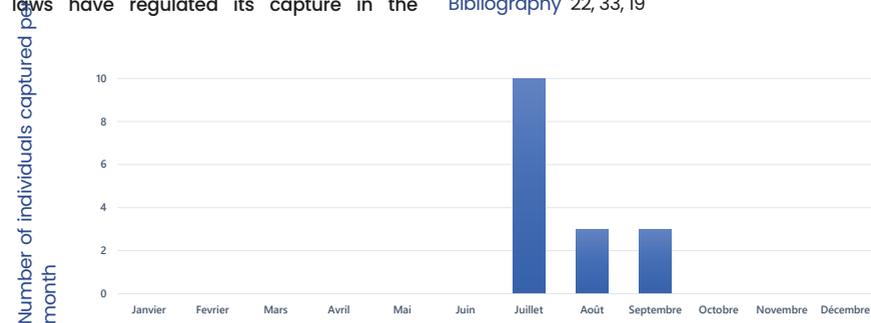
Over 35 mm

After two months, the juvenile has all the aspects of the adult with characteristic mottling, white spots interspersed over the body, and a dorsal fin with thick, hard and separated rays.

French Mediterranean since 1993. To be kept individually.

Catch size 8 mm \pm 2 mm (n=16)

Bibliography 22, 33, 19



SERRANIDAE 187

Epinephelus marginatus



D+0 – Cagliari



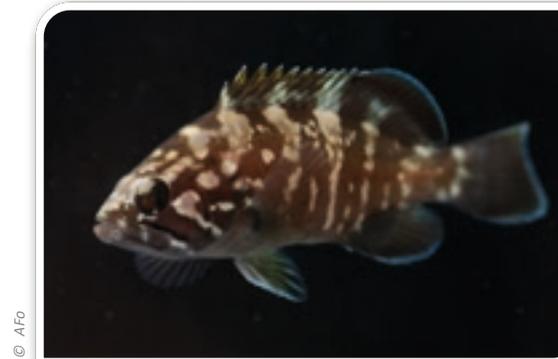
D+2 – Cap Sicié – 25mm



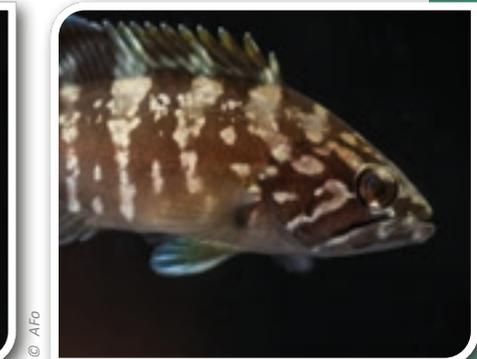
D+2 – Embiez – 26mm



D+2 – Embiez – 26mm



D+73 – Fabrégas – 60mm



D+73 – Fabrégas – 60mm

Serranus cabrilla

Comber

Cabrilla (SP), Perchia (IT), Serran-chevrette (FR)



(Linnaeus, 1758)

Serranidae

MERISTIC CHARACTERS

DORSAL FIN X + 13-15
ANAL FIN III + 7-8

Spawning strategy	Pelagic*
PLD	21-28
Reproduction	April-July
Settlement season	Spring

DISTRIBUTION

Mediterranean Sea and Black Sea (occasional), present on the eastern Atlantic coast and the English Channel.

ECOLOGY

From the egg to the juvenile

No data

Adult

Present on the continental plateau, where it frequents rocky and sandy bottoms as well as posidonia beds. Very common on rocky bottoms and coralligenous* substrates.

POSTLARVAE

From 15 to 20 mm

The PL arrives with a slightly translucent body but especially with parallel brown stripes that are beginning to form. A horizontal dark stripe traverses the eye.

JUVENILES

From 20 to 30 mm

The dark stripes thicken and are interspersed with rather bright white stripes. A dark stripe traverses the eye from the snout to behind the head. It practically forms a cross with another stripe at the eye.

Over 30 mm

Older individuals present the characteristics of juveniles with two fine dark lines surrounding a white line. The dark ventral stripe is punctuated with white and becomes coloured as the individual grows.

POSTLARVAE REARING

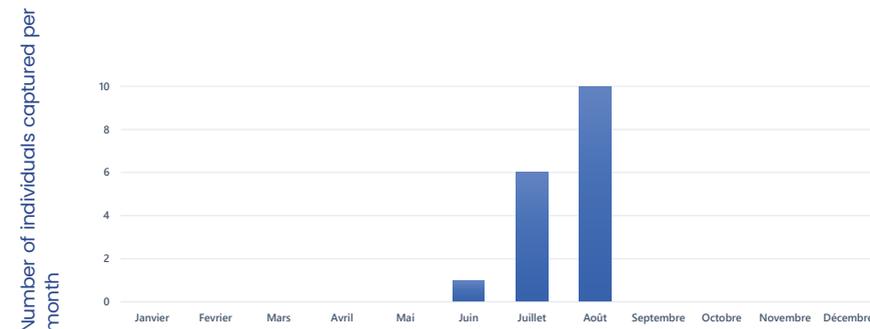
Rearing	Delicate
Intra-specific	Dominance
Inter-specific	Aggressive
Feeding	Very easy
Stress	Handling
Growth	Quick

Particularity

This species is shy but aggressive. TO be kept individually and provided with a hiding place.

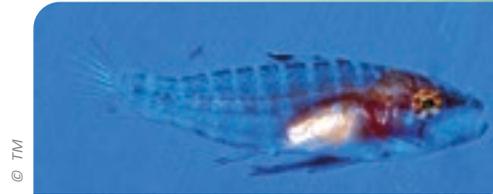
Catch size 19.3 mm \pm 5 mm (n=17)

Bibliography 53, 33, 19



SERRANIDAE

Serranus cabrilla



© TM

D+0 – Embiez – 15mm



© RC

D+10 – Leucate – 15mm



© TL

D+45 – Leucate – 40 mm



© TL

D+136 – Leucate – 80mm

Serranus hepatus

Brown comber

Merillo (SP), Sacchetto (IT), Serran tambour (FR)

(Linnaeus, 1758)

Serranidae

NE

E_{co}

MERISTIC CHARACTERS

DORSAL FIN X + 14-16
ANAL FIN III + 7-8

Spawning strategy	Pelagic*
PLD	26-32
Reproduction	April-August
Settlement season	Spring-Summer

DISTRIBUTION

No data

ECOLOGY

From the egg to the juvenile

Lives on unconsolidated bottoms, can be found on shallow sandy bottoms sheltered with small rocks and seagrass beds.

Adult

Solitary and territorial, found in rocky coastal habitats that are rich in cavities and shelters.

POSTLARVAE REARING

Rearing	Delicate
Intra-specific	Dominance
Inter-specific	Aggressive
Feeding	Very easy
Stress	Handling
Growth	Quick

POSTLARVAE

From 10 to 20 mm

The PL is translucent. 6 parallel brown stripes start to form. The dorsal, anal and pectoral fins are pigmented (black). The snout is slightly longer than that of *S. cabrilla*. The eye is not traversed by a dark stripe.

JUVENILES

From 20 to 30 mm

The juvenile has 5 black body stripes. In the prolongation of the 3rd stripe, a dark spot surrounded by white stands out on the dorsal fin.

Over 30 mm

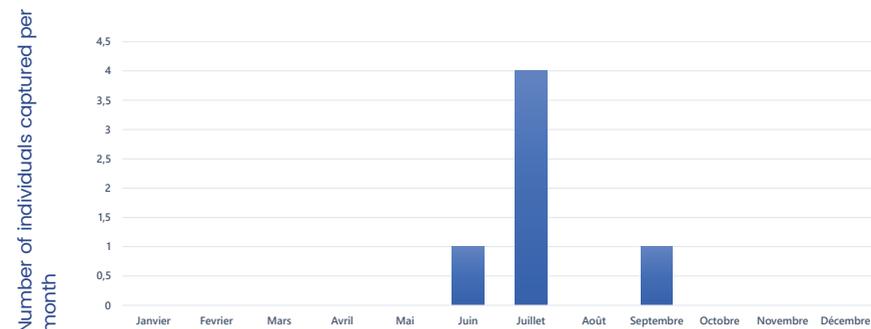
After one month, the juvenile has small brown and yellow lines on its head. The 3rd and 4th black stripes gradually meet to form the V-shaped stripe that is characteristic of the species at the next stage.

Particularity

This species is shy but aggressive. TO be kept individually and provided with a hiding place.

Catch size 2.5 mm ± 2 mm (n=6)

Bibliography 53, 33, 19, 58



SERRANIDAE 191

Serranus hepatus



D+4 – Leucate – 12 mm



D+19 – Leucate – 22mm



D+39 – Leucate – 33mm



D+39 – Leucate – 33mm



D+80 – Leucate – 60mm

Serranus scriba

(Linnaeus, 1758)

Serranidae

Painted comber

Serrano escribano (SP), Sciarrano (IT), Serran-écriture (FR)



MERISTIC CHARACTERS

DORSAL FIN X + 14-16
ANAL FIN III + 7-8

Spawning strategy	Pelagic*
PLD	26-32
Reproduction	April-August
Settlement season	Spring-Summer

DISTRIBUTION

Mediterranean Sea and Black Sea, present on the eastern Atlantic coast from the British Isles to the Canaries.

ECOLOGY

From the egg to the juvenile

No data

Adult

Mainly found on rocky bottoms or seagrass beds. Solitary and territorial species.

POSTLARVAE REARING

Rearing	Delicate
Intra-specific	Dominance
Inter-specific	Aggressive
Feeding	Very easy
Stress	Handling
Growth	Quick

Particularity

This species is shy but aggressive. TO be kept individually and provided with a hiding place.

POSTLARVAE

From 10 to 20 mm

The PL is translucent. Two black spots mark the base of the dorsal fin. A slight brown colouration begins to appear at the head.

JUVENILES

From 20 to 30 mm

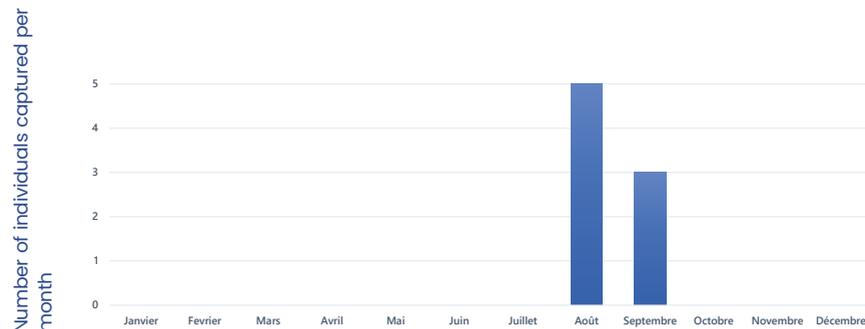
The crossed stripes are well present on the individuals, making them difficult to separate from *S. cabrilla*.

Over 30 mm

As for *S. cabrilla*, 2 lateral black lines surround a white one. One of these traverses the eye, running from the snout to the caudal peduncle. The body becomes a little more massive than for *S. cabrilla* and the snout elongates. A typical colouration of the species (black dots and white stripes) appears on the dorsal fin and remains with older individuals. At this stage, the vertical stripes appear along with the honeycomb pattern on the head.

Catch size 3 mm ± 3 mm (n=8)

Bibliography 53, 33, 19



SERRANIDAE

Serranus scriba



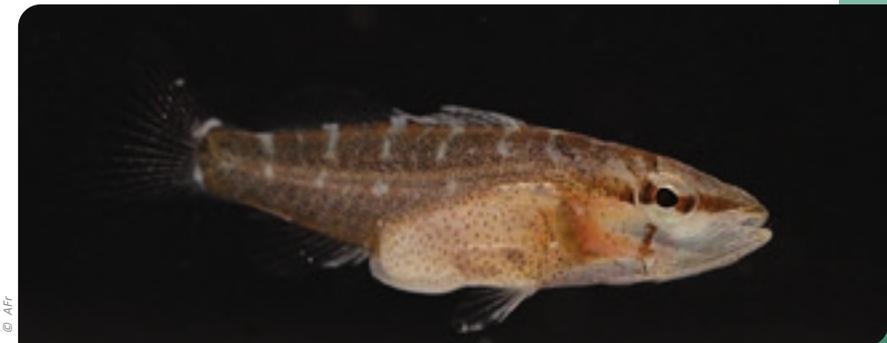
© MBI

D+0 – La Ciotat – 14mm



© AFo

D+0 – La Ciotat – 16mm



© AFr

Marseille – 25mm



© TT

D+180 – Leucate – 70mm

These benthic fish live on the bottom and feed on crustaceans and other invertebrates. They have bilateral symmetry from hatching to metamorphosis, when the eyes migrate to the right side of the head.

2 species

2 genera

- *Pegusa impar*
- *Solea solea*

Pegusa impar

(Bennett, 1831)

Soleidae

Adriatic sole

Sortija adriática (SP), Sogliola adriatica (IT), Sole adriatique (FR)



MERISTIC CHARACTERS

DORSAL FIN 65-83

ANAL FIN 53-63

Spawning strategy Pelagic*

PLD 15

Reproduction March-July

Settlement season Spring-Summer

DISTRIBUTION

Mediterranean Sea, present on the eastern Atlantic coast from Gibraltar to Senegal.

ECOLOGY

From the egg to the juvenile

No data

Adult

Found on coastal sandy-silty bottoms.

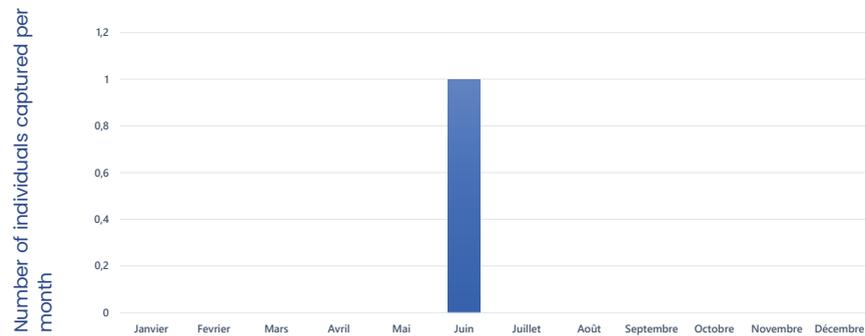
Bibliography 16



D+0 – Embiez – 17mm



D+30 – Embiez – 29 mm



SOLEIDAE 197

Pegusa impar



D+0 – Castellammare



Solea solea

(Linnaeus, 1758)

Soleidae

Dover sole

Lenguado (SP), Sogliola (IT), Sole commune (FR)



MERISTIC CHARACTERS

DORSAL FIN 0 + 69-97
ANAL FIN 0 + 53-80

Spawning strategy Pelagic*

PLD ND

Reproduction March-May

Settlement season Winter

DISTRIBUTION

Eastern Atlantic from southern Norway to Senegal, Mediterranean Sea, Marmara Sea, Black Sea.

ECOLOGY

From the egg to the juvenile

After metamorphosis, the fry adapt to benthic life near the shore on seabeds of less than 10 m depth.

Adult

Lives from the coast to a depth of 130 m. Can be found in estuaries and harbours up to the limit of fresh water. Lives on unconsolidated sand or silt bottoms.

POSTLARVAE REARING

Rearing Easy

Intra-specific Coexistence

Inter-specific Coexistence

Feeding Easy

Stress Docile

Growth Average

POSTLARVAE

From 10 to 20 mm

The PL is translucent with a few melanophores. Its stomach is clearly visible through transparency. Migration of the left eye is incomplete. The eyes are large compared with the rest of the body.

JUVENILES

From 20 to 30 mm

The migration of the eye is rapidly completed to take its definitive position. The juvenile is only very slightly pigmented at this stage but it has almost lost its transparency.

Over 30 mm

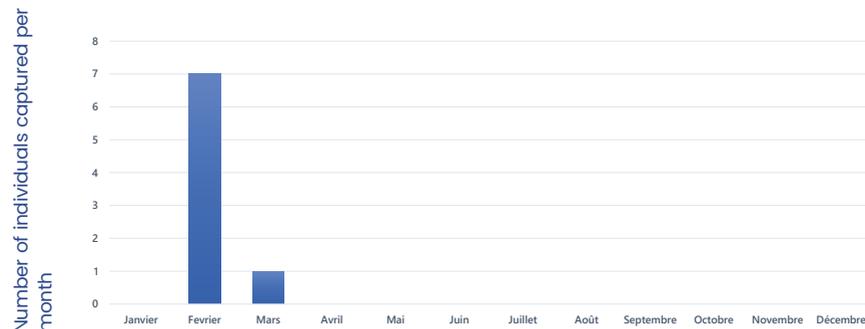
Pigmentation is now well marked. The individual is covered in melanophores, which enable it to hide in the sand. This colouration forms dark spots. Its eyes are smaller and the snout is rounded.

Particularity

To be reared on a bed of fine sand

Catch size 10 mm ± 2 mm (n=8)

Bibliography 16, 59



© AFo

D+1 – Marseille – 11mm



© AFo

D+17 – Marseille – 28mm



© MBI

D+30 – Marseille – 34mm



© MBI

D+37 – Marseille – 37mm



They have a laterally compressed body, a spiny dorsal fin, and a caudal fin that is truncated towards the bottom. These fish are essentially omnivorous with a carnivorous tendency. Some species are herbivorous (the salema porgy, *Sarpa salpa*). They live on the coast.

16 species

10 genera

- **Dentex** *v*
- **Diplodus** *annularis*
- **Diplodus** *puntazzo*
- **Diplodus** *sargus*
- **Diplodus** *vulgaris*
- **Lithognathus** *mormyrus*
- **Oblada** *melanura*
- **Pagellus** *acarne*
- **Pagellus** *bogaraveo*
- **Pagellus** *erythrinus*
- **Pagrus** *pagrus*
- **Sarpa** *salpa*
- **Sparus** *aurata*
- **Spicara** *maena*
- **Spicara** *smaris*
- **Spondylisoma** *cantharus*

Dentex dentex

Common dentex

Dentón común (SP), Dentice (IT), Denti (FR)

(Linnaeus, 1758)

Sparidae



MERISTIC CHARACTERS

DORSAL FIN X + 11-12
ANAL FIN III + 7-9

Spawning strategy	Pelagic*
PLD	35
Reproduction	March-May
Settlement season	Spring-Summer

DISTRIBUTION

Mediterranean Sea, present on the eastern Atlantic coast from the British Isles to Senegal.

ECOLOGY

From the egg to the juvenile

No data

Adult

Lives in a large number of varied biotopes: rocky bottoms or coralligenous* substrates, but also on wrecks or seagrass beds.

POSTLARVAE

From 10 to 15 mm

The PL is yellow. This colouration is accompanied by more or less large melanophores* along the entire body. The mouth already bears rather sharp teeth. The dorsal and anal fins are slightly yellow. The tip of the caudal peduncle remains colourless.

JUVENILES

From 15 to 20 mm

The caudal peduncle has now become yellow, the melanophores* enlarge and give the juvenile a darker appearance. The dorsal and anal fins gradually pigment. After 10 days, the juvenile remains dark yellow, the typical colouration of the species.

Over 20 mm

No data

POSTLARVAE REARING

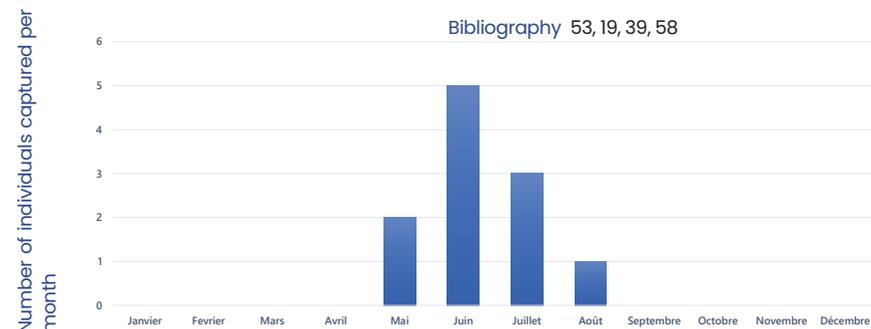
Rearing	Difficult
Intra-specific	ND
Inter-specific	Aggressive
Feeding	Easy
Stress	Docile
Growth	Average

Particularity

Demonstrates aggressiveness towards smaller individuals regardless of the presence or absence of food. Separate individuals by size in large volumes of water. The PL is highly subject to stress. Rear in suitable density with other species.

Catch size $2 \text{ mm} \pm 2 \text{ mm}$ (n=11)

Bibliography 53, 19, 39, 58



SPARIDAE

Dentex dentex



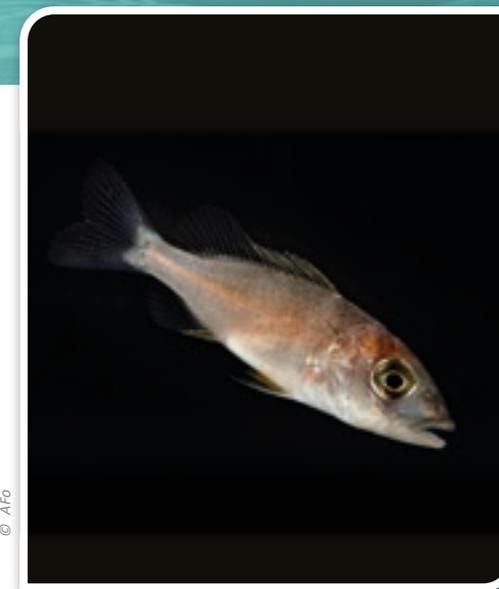
© LHG

D+4 – Bastia – 17mm



© MBL

D+22 – La Ciotat – 23mm



© AFo

D+41 – Marseille – 32mm



© AFo

D+119 – Marseille – 45mm

Diplodus annularis

(Linnaeus, 1758)

Sparidae

Annular seabream

Raspallón (SP), Sparaglione (IT), Sparailon (FR)



MERISTIC CHARACTERS

DORSAL FIN XI + 11-13
ANAL FIN III + 11-12

Spawning strategy Pelagic*
PLD 16-21
Reproduction April-June
Settlement season Summer

DISTRIBUTION

Mediterranean Sea and Black Sea, present on the eastern Atlantic coast from Portugal to the Bay of Biscay.

ECOLOGY

From the egg to the juvenile

No data

Adult

Usually lives in eelgrass meadows but is also found in posidonia beds and on sandy bottoms. Rarely observed on rocky bottoms.

POSTLARVAE REARING

Rearing Easy
Intra-specific Dominance
Inter-specific Lively
Feeding Very easy
Stress Docile
Growth Average

POSTLARVAE

From 10 to 15 mm

The PL is translucent, with an orange-black colouration on the flanks. The swim bladder is clearly visible. After 4 days, numerous melanophores* appear along the body and the orange colouration on the flanks fades.

JUVENILES

From 15 to 20 mm

The juvenile takes on a yellow-black tint like *D. dentex*, but with a very pink gut and, above all, black dorsal and anal fins (not yellow).

Over 20 mm

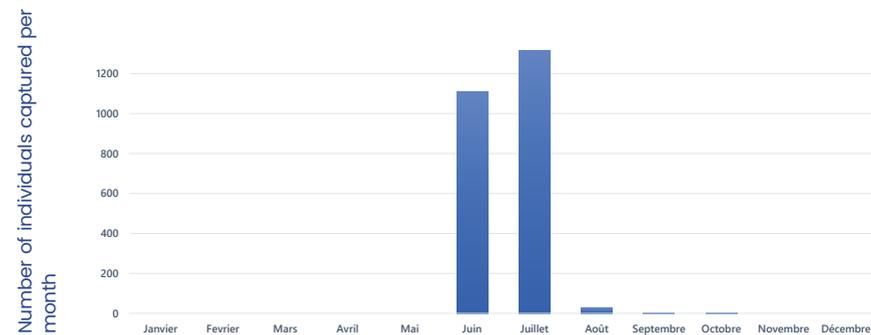
The juvenile starts to take on adult characteristics with a greyish colouration and dorsal and pectoral fins that begin to turn yellow. At the next stage, they have a golden colour and a black dot appears on the caudal peduncle, which fades with the adult stage.

Particularity

The PL are aggressive in small volumes of water. They must be rapidly sorted by size and transferred to a large tank. Inter-species coexistence in tanks is possible in low densities.

Catch size 4.1 mm \pm 2 mm (n=2454)

Bibliography 53, 33, 19, 31, 58



Diplodus annularis



D+0 – Bastia – 12mm



D+0 – Marseille – 15mm



D+0 – Marseille – 20mm



D+8 – Bastia – 18mm



D+30 – Embiez – 26mm



D+210 – Bastia – 76mm

Diplodus puntazzo

(Linnaeus, 1758)

Sparidae

Sharpsnout seabream

Picudo (SP), Sarago pizzuto (IT), Sar à museau pointu (FR)



MERISTIC CHARACTERS

DORSAL FIN XI + 12-15
ANAL FIN III + 11-13

Spawning strategy Pelagic*

PLD 19-48

Reproduction September

Settlement season Autumn

DISTRIBUTION

Mediterranean Sea and Black Sea (occasional), present on the eastern Atlantic coast.

ECOLOGY

From the egg to the juvenile

Juveniles gather in shallow coastal rocky zones. May be found in lagoons.

Adult

A gregarious species that lives in coastal waters on rocky and sandy beds.

POSTLARVAE REARING

Rearing Easy

Intra-specific Aggressive

Inter-specific Lively

Feeding Very easy

Stress Docile

Growth Average

Particularity

The PL are aggressive in small volumes of water. They must be rapidly sorted by size



POSTLARVAE

From 15 to 20 mm

The PL bears a vertical yellow-black stripe from the dorsal to the pelvic fins. A black stripe is present on the flanks up to the caudal peduncle.

JUVENILES

From 20 to 30 mm

After 15 days, the black stripe and the line on the flanks thicken. Melanophores* appear in the dorsal and ventral part of the caudal peduncle. These melanophores* are accompanied by clearly visible white spots on a black background. The groups of spots thicken or even group together at the caudal peduncle. They begin to form 3 wide lateral stripes.

Over 30 mm

These 3 stripes are interspersed with smaller ones (migration of the melanophores* of the large stripes), to form a pattern of stripes after 2 months that is close to those of the adult.

and transferred to a large tank. *D. puntazzo* is calmer than other *Diplodus* in the tank. Its growth is rather rapid (faster than *D. sargus*).

Catch size 2.6 mm ± 2 mm (n=496)

Bibliography 53, 33, 19, 31, 58

Diplodus puntazzo



© AFO

D+0 – Marseille – 11mm



© LHG

D+6 – Bastia – 16mm



© LHG

D+38 – Bastia – 35mm



© RC

D+60 – Leucate – 45mm



© RC

D+15 – Leucate – 18mm



© LHG

D+16 – Bastia – 21mm



© RC

D+81 – Leucate – 48mm

Diplodus sargus

White seabream

Sargo común (SP),
Sarago maggiore (IT), Sar commun (FR)

MERISTIC CHARACTERS

DORSAL FIN XI–XII + 12–15
ANAL FIN III + 11–14

Spawning strategy Pelagic*

PLD 19–37

Reproduction April–May

Settlement season Spring

DISTRIBUTION

Mediterranean Sea and Black Sea, present on the eastern Atlantic coast from Brittany to Mauritania.

ECOLOGY

From the egg to the juvenile

The juveniles gather in shallow rocky coastal bottoms and remain in the littoral fringe at a maximum depth of 1.5 m.

Adult

Often found in small groups very close to the substrate, on posidonia beds or shallow rocky bottoms.

POSTLARVAE REARING

Rearing Easy

Intra-specific Aggressive

Inter-specific Lively

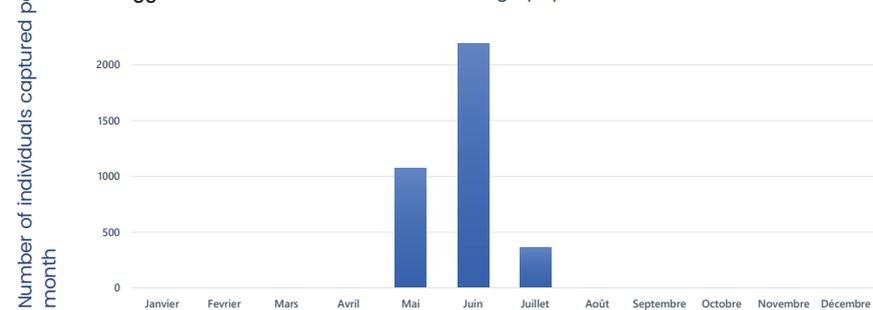
Feeding Very easy

Stress Docile

Growth Average

Particularity

The PL are aggressive in small volumes of



(Linnaeus, 1758)

Sparidae



POSTLARVAE

From 10 to 20 mm

The PL is translucent with scattered pigmentation on the flanks and anal fin. Head pigmentation is rather dark. After 10 days, black pigmentation arrives at the gut, reaching from the dorsal fin to the pelvic fin. There is a black spot on the caudal peduncle, edged with dorsal and ventral melanophores*.

JUVENILES

From 20 to 30 mm

After one month, this black spot is still present and begins to extend on the caudal peduncle. 5/6 lateral stripes have appeared. The juvenile takes on a silvery aspect.

Over 30 mm

The juvenile is silver, with 5 vertical black stripes on the body as well as a dark spot at the caudal peduncle. Among older individuals, one of the black stripes is more marked in front of the dorsal fin and at the pectoral fins. There are 9 lateral stripes.

water. They must be rapidly sorted by size and transferred to a large tank.

Catch size 2 mm ± 2 mm (n=3630)

Bibliography 53, 33, 19, 16

Diplodus sargus



D+0 – Marseille – 10mm



D+10 – Marseille



D+25 – Marseille – 25mm



D+45 – Leucate – 41mm



D+100 – Leucate – 65mm



D+120 – Leucate – 68mm

Diplodus vulgaris

(Geoffroy St. Hilaire, 1817)

Sparidae

Common two-banded seabream

Mojarra (SP), Sarago fasciato (IT), Sar à tête noire (FR)

NE

Eco Fish

MERISTIC CHARACTERS

DORSAL FIN XI–XII + 13–16
ANAL FIN III + 12–15

Spawning strategy	Pelagic*
PLD	25–61
Reproduction	October–November January–February
Settlement season	Winter–Spring

DISTRIBUTION

Mediterranean Sea and Black Sea, present on the eastern Atlantic coast from the Bay of Biscay to Cape Verde.

ECOLOGY

From the egg to the juvenile

The juveniles gather in zones with shallow rocky coastal bottoms and soon migrate towards deeper habitats.

Adult

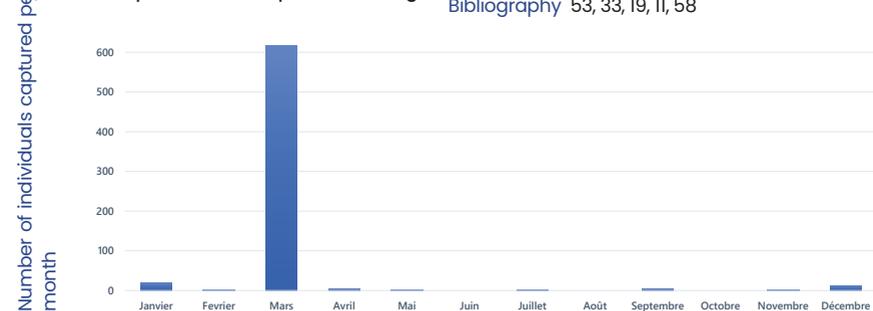
A euryhaline* species that is found on rocky or even sandy substrates. Found at depths to 50 m.

POSTLARVAE REARING

Rearing	Easy
Intra-specific	Dominance
Inter-specific	Lively
Feeding	Very easy
Stress	Docile
Growth	Average

Particularity

PL to be kept at a suitable density. From 20/25 mm, prefer mono-species rearing



POSTLARVAE

From 10 to 20 mm

The PL is translucent with scattered pigments at the notochord* and anal fin (less clear than for *D. sargus*). Head pigments are rather dark and extend slightly to the rear. The gut possesses star-shaped melanophores*. After 13 days, black pigmentation arrives at the gut, reaching from the dorsal fin to the pelvic fin. Certain individuals are observed with a small white spot at the base of the dorsal fin.

JUVENILES

From 20 to 30 mm

This pigmentation is less dense than for *D. puntazzo* or *D. sargus*. A black border is apparent on the dorsal and anal fins. The black spot extends to the caudal peduncle.

Over 30 mm

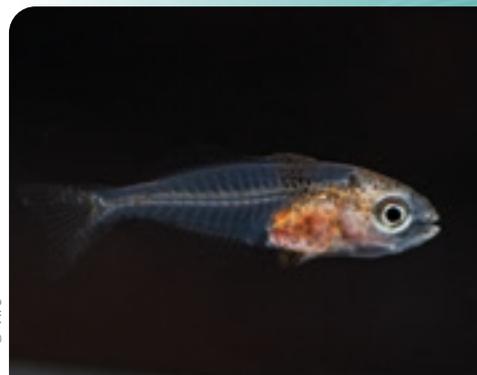
The black spot on the caudal peduncle has thickened into the shape of a triangle, and the juvenile has a silver–yellow colouring. Older individuals are more yellow and have two black stripes in front of the dorsal fin and on the caudal peduncle.

with reduced density and regular sorting by size. Inter-specific juvenile coexistence is possible in tanks with moderate density.

Catch size 2.4 mm ± 8 mm (n=667)

Bibliography 53, 33, 19, 11, 58

Diplodus vulgaris



© AFo

D+0 – Marseille – 16mm



© LHG

D+0 – Bastia – 16mm



© AFo

D+0 – Marseille – 19mm



© LHG

D+28 – Bastia – 24mm



© LHG

D+57 – Bastia – 42mm



© LHG

D+70 – Bastia – 55mm

Lithognathus mormyrus

(Linnaeus, 1758)

Sparidae

Sand steenbras

Pez harrera (SP), Mormora (IT), Marbré (FR)



MERISTIC CHARACTERS

DORSAL FIN XI–XII + 12–13
ANAL FIN III + 10–11

Spawning strategy Pelagic*

PLD ND

Reproduction May–August

Settlement season Summer

DISTRIBUTION

Mediterranean Sea and Black Sea, present on the eastern Atlantic coast from the Bay of Biscay to Morocco.

ECOLOGY

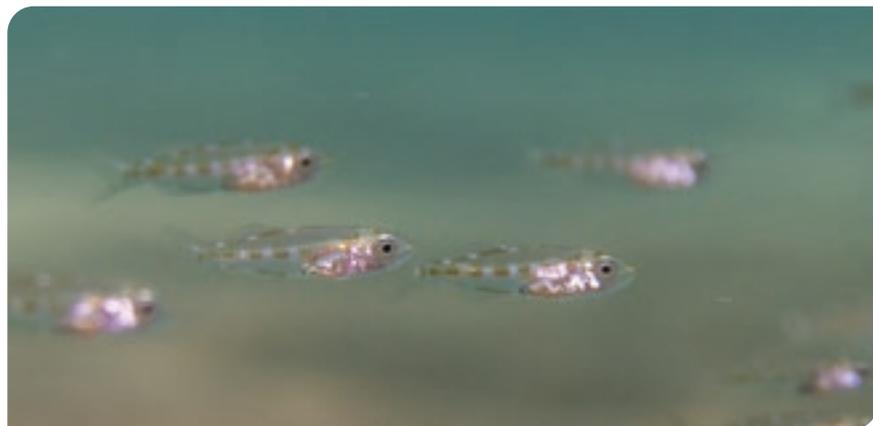
From the egg to the juvenile

No data

Adult

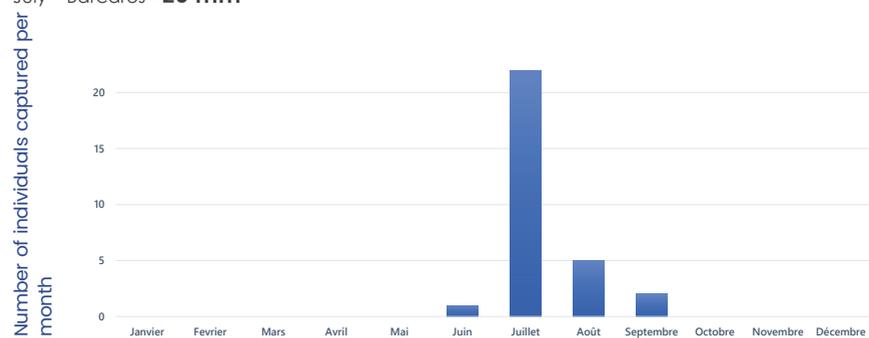
Found on the continental plateau, sandy-silty bottoms, seagrass beds and estuaries. These gregarious fish form large schools.

Bibliography 16, 58



© AFo

July – Barcarès - 20 mm



Lithognathus mormyrus



© TM

D+35 – Embiez



© TM

D+70 – Embiez

Oblada melanurus or *melanura*

(Linnaeus, 1758)

Sparidae

Saddled seabream

Oblada (SP), Occhiata (IT), Oblade (FR)



MERISTIC CHARACTERS

DORSAL FIN XI + 13-14
ANAL FIN III + 12-14

Spawning strategy	Pelagic*
PLD	14-18
Reproduction	April-June
Settlement season	Summer

DISTRIBUTION

Mediterranean Sea, present on the eastern Atlantic coast from the Bay of Biscay to Angola.

ECOLOGY

From the egg to the juvenile

Juveniles gather in shallow coastal rocky zones and form large schools.

Adult

A gregarious species that gathers in schools above rocky substrates and seagrass beds.

POSTLARVAE

From 10 to 20 mm

Translucent on arrival, the PL takes on an orange tint with melanophores* on the ventral and dorsal parts of the flanks. A large black spot is present in the middle of the caudal peduncle. After 6 days, the body is almost entirely covered in melanophores* and the black spot on the caudal peduncle extends. There is a white patch in front of this.

JUVENILES

From 20 to 30 mm

The white patch extends around the black patch, forming an 'eye' at the caudal peduncle.

Over 30 mm

The juvenile possesses all the characteristics of the adult with a grey body and a black spot encircled by white on the caudal peduncle. This patch is characteristic of the species.

POSTLARVAE REARING

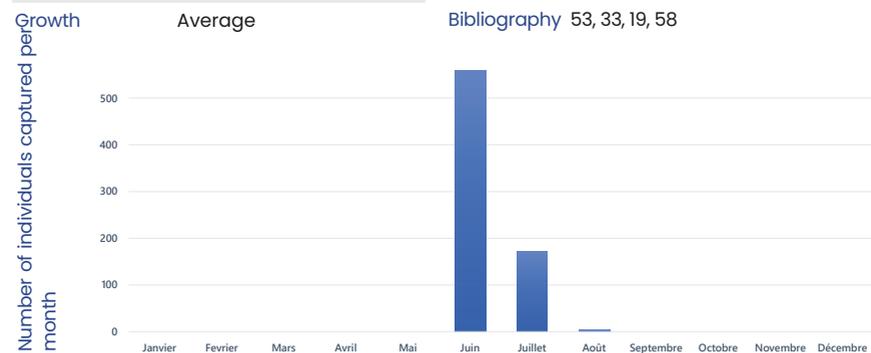
Rearing	Delicate
Intra-specific	Coexistence
Inter-specific	Lively
Feeding	Very easy
Stress	Docile
Growth	Average

Particularity

Coexistence is possible but the species may become aggressive when space is limited and have highly competitive feeding behaviour.

Catch size 10 mm ± 2 mm (n=734)

Bibliography 53, 33, 19, 58



SPARIDAE 215

Oblada melanurus



© LHG

D+0 – Bastia – 12mm



© AFR

Marseille – 20mm



© TM

D+10 – Embiez – 20mm



© LL

D+30 – Leucate – 32mm



© RC

D+48 – Leucate – 36 mm



© RC

D+48 – Leucate – 36mm

Pagellus acarne

Axillary seabream

Besugo de fondo (SP), Pagello bastardo (IT), Galet (FR)



(Risso, 1827)

Sparidae

MERISTIC CHARACTERS

DORSAL FIN XII–XIII + 10–12
ANAL FIN III + 9–10

Spawning strategy	Pelagic*
PLD	ND
Reproduction	June–September
Settlement season	Autumn–Winter

DISTRIBUTION

Mediterranean Sea, present on the eastern Atlantic coast from the Bay of Biscay to Senegal.

ECOLOGY

From the egg to the juvenile

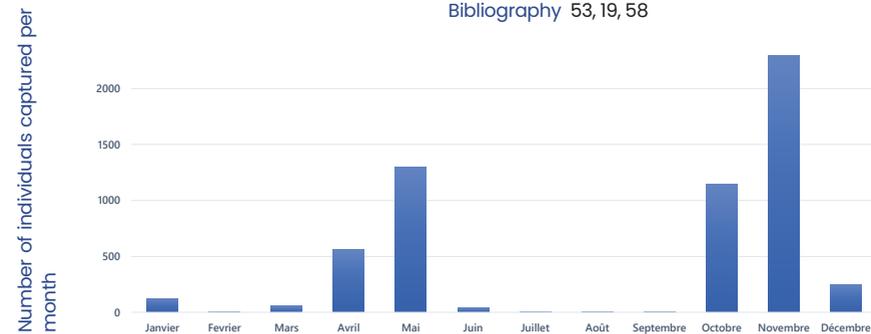
The juveniles gather in shallow coastal rocky zones.

Adult

Found on various types of bottoms but especially on seagrass beds. They are commonly found between 40 and 100 metres depth.

POSTLARVAE REARING

Rearing	Easy
Intra-specific	Coexistence
Inter-specific	Aggressive
Feeding	Very easy
Stress	Docile
Growth	Quick



POSTLARVAE

From 20 to 30 mm

Individuals of the *Pagellus* genus have a more elongated body than *Diplodus*. The pigmentation at the base of the dorsal and anal fin is characteristic. *P. acarne* possesses a slight iridescence on the flanks. Pigmentation densifies on the flanks. The melanophores* on the body are well aligned.

JUVENILES

From 30 to 40 mm

The pigmentation turns silver on the ventral part and they occasionally have a chequered aspect. The dorsal melanophores* are always very thin and well aligned.

Over 40 mm

The juveniles possess a silver colouration that turns pink on the back. A darker stripe is present on the side. It is important to be able to count the number of fin rays at young stages to differentiate it from *P. bogaraveo* (on arrival).

Particularity

Acclimatisation can be delicate, but rearing remains relatively easy. At high density, *Pagellus* is sensitive to pathologies. Prefer mono-species rearing because they are highly competitive.

Catch size 28.6 mm ± 3 mm (n=5767)

Bibliography 53, 19, 58

Pagellus acarne



D+0 – Bastia



D+17 – Bastia – 36mm



D+2 – Bastia – 25mm



D+16 – Bastia – 38mm



D+58 – Bastia – 48mm

Pagellus bogaraveo

(Brünnich, 1768)

Sparidae

Red sea bream

Besugo rojo (SP), Occhino (IT), Dorade rose (FR)



MERISTIC CHARACTERS

DORSAL FIN XII–XIII + 11–13
ANAL FIN III + 11–12

Spawning strategy Pelagic*

PLD 32–42

Reproduction January–May

Settlement season Spring

DISTRIBUTION

Western Mediterranean Sea, present on the eastern Atlantic coast from Norway to Mauritania.

ECOLOGY

From the egg to the juvenile

The juveniles gather in shallow coastal rocky zones.

Adult

Lives in coastal waters above varied types of sea bottoms (rock, gravel, sand and silt) to 400 m depth.

POSTLARVAE REARING

Rearing Easy

Intra-specific Coexistence

Inter-specific Aggressive

Feeding Very easy

Stress Docile

Growth Quick

POSTLARVAE

From 25 to 35 mm

Individuals of the *Pagellus* genus have a more elongated body than *Diplodus*. The pigmentation at the base of the dorsal and anal fin is characteristic. *P. bogaraveo* also possesses a slight iridescence on the flanks. The pigmentation becomes denser at the notochord*. The melanophores* on the body are well aligned.

JUVENILES

From 35 to 50 mm

The juveniles possess a silver colouration that turns pink on the back. It is possible to count the number of dorsal fin rays to differentiate it from *P. acarne*.

Over 50 mm

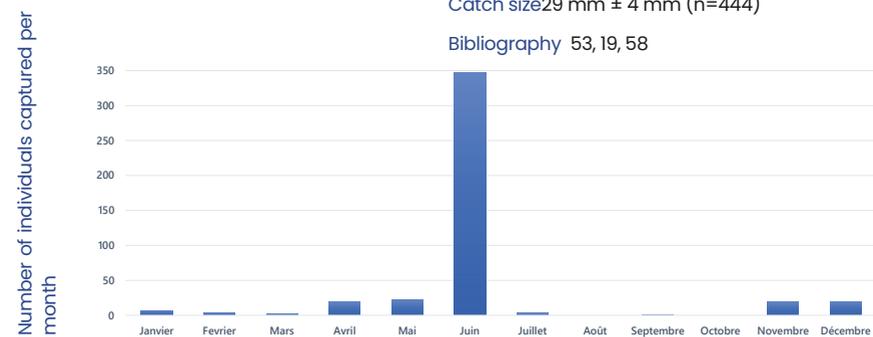
The juveniles may have a darker tint. They are slightly thicker than *P. acarne*. Their eyes are slightly larger than for *P. acarne*.

Particularity

Acclimatisation can be delicate, but rearing remains relatively easy. Red sea bream are sensitive to pathologies at high density. Possible confusion with *Pagellus acarne* and *Sarpa salpa*. Beware of competitive feeding behaviour if inter-specific rearing is performed.

Catch size 29 mm ± 4 mm (n=444)

Bibliography 53, 19, 58



SPARIDAE

Pagellus bogaraveo

D+0 – Marseille – 30mm



© AFR



© IT

D+30 – Leucate – 52mm



© IT

D+30 – Leucate – 52mm



© IT

D+50 – Leucate – 50mm



© IT

D+50 – Leucate – 58mm

Pagellus erythrinus

(Linnaeus, 1758)

Sparidae

Common pandora

Breca (SP), Pagello fragolino (IT), Pageot commun (FR)



MERISTIC CHARACTERS

DORSAL FIN XII-XIII + 10-11
ANAL FIN III + 8-9

Spawning strategy Pelagic*

PLD 40-49

Reproduction April-July

Settlement season Summer

DISTRIBUTION

Mediterranean Sea, present on the eastern Atlantic coast from Norway to Guinea.

ECOLOGY

From the egg to the juvenile

Juveniles gather in shallow coastal rocky zones.

Adult

Lives in coastal waters above varied types of sea bottoms (rock, gravel, sand and silt) to 200 m depth.

POSTLARVAE REARING

Rearing Difficult

Intra-specific Coexistence

Inter-specific Coexistence

Feeding Easy

Stress Stressed

Growth Average

POSTLARVAE

From 10 to 20 mm

Individuals of the *Pagellus* genus have a more elongated body than *Diplodus*. Body pigmentation with crossed stripes is typical of the species, even at young stages as here. Like other *Pagellus*, it also has a slight iridescence on the flanks between the stripes. When body pigmentation becomes denser, it is more difficult to distinguish the stripes.

JUVENILES

From 20 to 30 mm

The body later takes on a silver colouring that highlights its stripes. An iridescence is still visible at the dorsal fin.

Over 30 mm

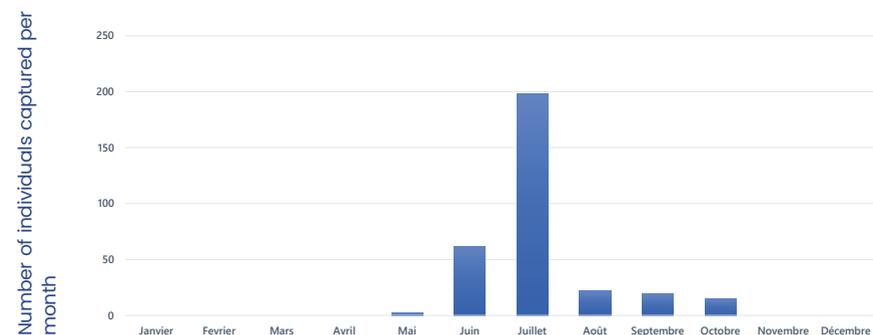
No data

Particularity

Possible confusion with *Lithognathus mormyrus* (which has perfectly parallel black body stripes). Jumps systematically, ensure the tanks are closed with a lid. PL to mix with other species to limit stress.

Catch size 4.4 mm \pm 4 mm (n=318)

Bibliography 53, 33, 19, 58



SPARIDAE

Pagellus erythrinus



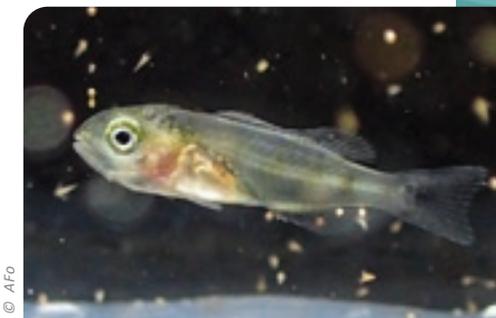
© LHG

D+0 – Bastia – 14 mm



© RD

D+0 – Marseillan – 15 mm



© AFo

D+0 – Marseille – 12 mm



© LHG

D+3 – Bastia – 18 mm



© RC

D+15 – Leucate – 22 mm



© MBI

D+0 – Marseille – 30 mm

Pagrus pagrus

Red porgy

Besugo (SP), Pagro (IT), Pagre commun (FR)

(Linnaeus, 1758)

Sparidae



MERISTIC CHARACTERS

DORSAL FIN XII–XIII + 9–10
ANAL FIN III + 7–8

Spawning strategy Pelagic*

PLD 38

Reproduction April–June

Settlement season Spring

DISTRIBUTION

Mediterranean Sea, present on the eastern Atlantic coast from the British Isles to Gibraltar.

ECOLOGY

From the egg to the juvenile

The juveniles are found on posidonia beds and mixed zones between posidonias and sand.

Adult

Lives on rocky, gravel and unconsolidated bottoms.

POSTLARVAE REARING

Rearing Delicate

Intra-specific Coexistence at equivalent size.

Inter-specific Aggressive

Feeding Easy

Stress Stressed

Growth Average

Particularity

PL to mix with other species to limit stress. Aggressive juvenile behaviour, to be rapidly

separated into low densities.

POSTLARVAE

From 10 to 20 mm

The PL is partially transparent with several body stripes. Individuals are generally orange-yellow. A clearly visible occipital crest develops on the head (characteristic of the species). At 20 mm, the body of the PL is bright yellow, as well as the pelvic fins and the first hard rays of the dorsal and anal fins. Small melanophores* are randomly distributed over the body. The stripes are less distinctive.

JUVENILES

From 20 to 30 mm

The juvenile is slightly darker with a dominant yellow appearance, the melanophores* on the body are thicker. The melanophores* dominate between the fin rays.

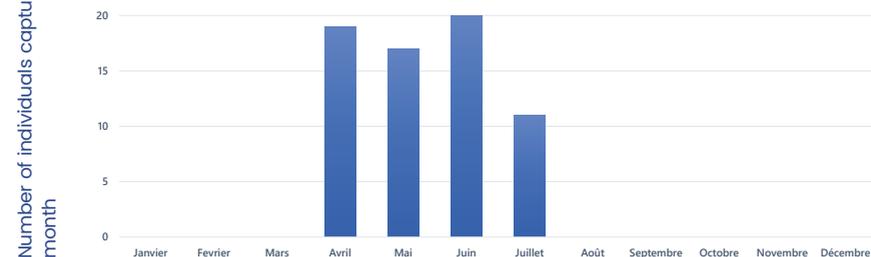
Over 30 mm

Over 30 mm, it quickly loses its yellow colouring for a grey/pink appearance. It has bluish veins on the snout.

separated into low densities. Inter-specific coexistence is possible with peaceful species of equivalent size. Tends to jump.

Catch size 20.4 mm ± 5 mm (n=67)

Bibliography 53, 33, 19, 58



© LHG

D+0 – Bastia – 20 mm



© LL

D+0 – Leucate – 26 mm



© AFO

D+0 – Marseille – 32 mm



© MBI

D+19 – Marseille – 33 mm

Sarpa salpa

Salema porgy

Salema (SP), Salpa (IT), Saupe (FR)

(Linnaeus, 1758)

Sparidae

NE

Eco Fish

MERISTIC CHARACTERS

DORSAL FIN XII–XIII + 14–17
ANAL FIN III + 13–15

Spawning strategy Pelagic*

PLD 27–38

Reproduction April–May
Sept.–Nov.

Settlement season Winter–Spring

DISTRIBUTION

Mediterranean Sea, present on the eastern Atlantic coast from the Bay of Biscay to Africa.

ECOLOGY

From the egg to the juvenile

The juveniles are found on shallow rocky bottoms covered with macro-algae.

Adult

Found above sandy and rocky bottoms with algae cover, as well as in posidonia beds. Gregarious fish, they sometimes form large schools.

POSTLARVAE

From 10 to 20 mm

The PL is translucent, rather elongated and presents blue pigments at the gut. At 20 mm, these pigments have created a bluish colouring above the gut. The PL possesses a body pigmentation of the same type as *Pagellus*.

JUVENILES

From 20 to 30 mm

This correspondence is also seen by the alignment of the melanophores* on the body. However, there is no iridescence on the flanks.

Over 30 mm

The white spots appear on the back and remain for a certain time. These spots enable rapid identification at the surface with no immersion necessary. For older individuals, the mouth becomes more rounded and a few white spots remain on the flanks.

POSTLARVAE REARING

Rearing Easy

Intra-specific Coexistence

Inter-specific Coexistence

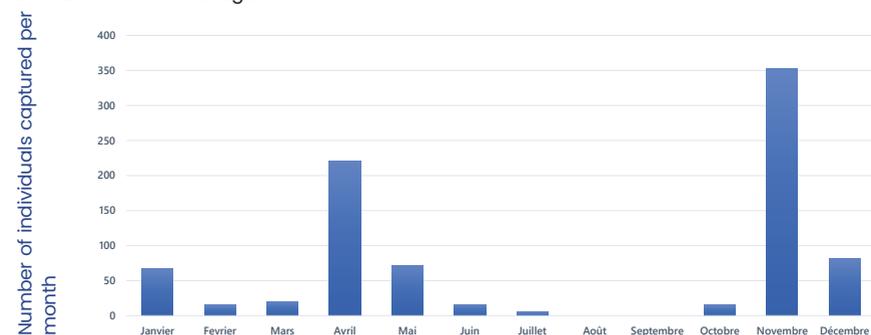
Feeding Very easy

Stress Docile

Growth Average

Catch size 18 mm ± 4 mm (n=866)

Bibliography 53, 33, 19, 58



D+1 – Bastia – 20mm



D+3 – Bastia – 20mm



D+8 – Bastia – 22mm



D+29 – Bastia – 28mm



D+34 – Bastia – 30mm



D+56 – Bastia – 33mm

Sparus aurata

Gilthead seabream

Dorada (SP),
Orata (IT), Daurade royale (FR)



(Linnaeus, 1758)

Sparidae

MERISTIC CHARACTERS

DORSAL FIN XI +13-14
ANAL FIN III + 11-12

Spawning strategy	Pelagic*
PLD	50
Reproduction	October-December
Settlement season	Winter

DISTRIBUTION

Mediterranean Sea, present on the eastern Atlantic coast from the British Isles to Cape Verde.

ECOLOGY

From the egg to the juvenile

The juveniles settle in lagoons.

Adult

Found grazing on seagrass beds, as well as on sand and in breaker zones.

POSTLARVAE

From 15 to 22 mm

The PL is translucent with yellow and black dorsal and ventral pigments that come together in the middle of the caudal peduncle. Melanophores* gradually develop on the body. The dorsal and ventral fins thicken and turn black.

JUVENILES

From 22 to 30 mm

The melanophores* are more equally distributed over the body, light and dark areas appear on the flanks.

Over 30 mm

This densification extends on the flanks in more or less thick stripes. The forehead is slightly arched.

POSTLARVAE REARING

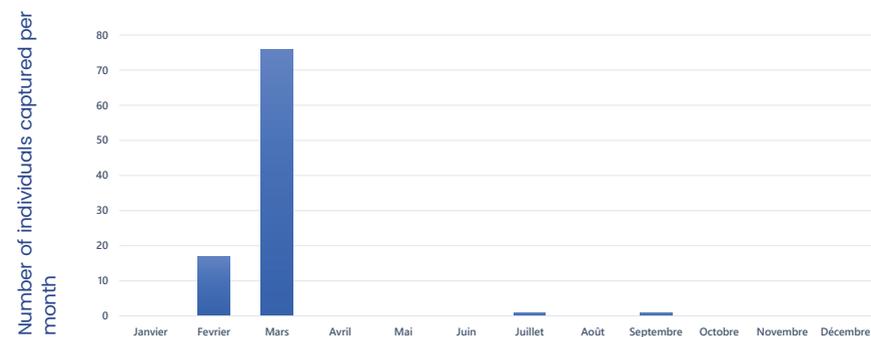
Rearing	Delicate
Intra-specific	Dominance
Inter-specific	Aggressive
Feeding	Very easy
Stress	Handling
Growth	Average

Particularity

Possible confusion with *Pagellus acarne* and *Sarpa salpa*.

Catch size 19 mm ± 5 mm (n=95)

Bibliography 53, 33, 19, 58



© AFo

D+8 - Marseille - 18mm

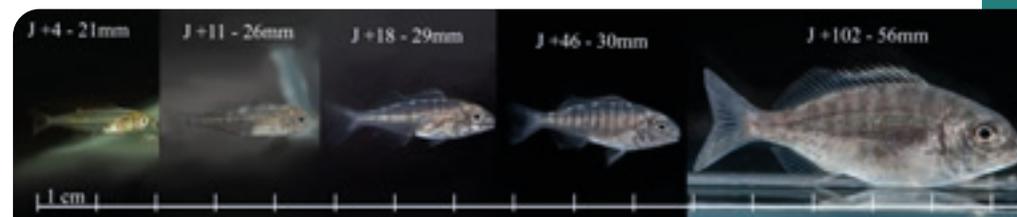
© AFo



© AFo

D+32 - Marseille - 45mm

D+15 - Marseille - 25mm



J +4 - 21mm

J +11 - 26mm

J +18 - 29mm

J +46 - 30mm

J +102 - 56mm

1 cm

Spicara maena

Blotched picarel

Chucra (SP), Menola (IT), Mendole (FR)

(Linnaeus, 1758)

Sparidae (ex Centranchidae)

NE

E_{co}

MERISTIC CHARACTERS

DORSAL FIN XI + 12
ANAL FIN III + 8-10

Spawning strategy Benthic*

PLD ND

Reproduction August-October

Settlement season Autumn

DISTRIBUTION

Mediterranean Sea and Black Sea (occasional), present on the eastern Atlantic coast.

ECOLOGY

From the egg to the juvenile

The juveniles are found on posidonia beds.

Adult

Found on posidonia beds and neighbouring sandy-silty bottoms.

POSTLARVAE

From 10 to 20 mm

The PL has a typical Sparidae shape. It has an orange colouration at the notochord* accompanied by melanophores* on the dorsal, ventral and lateral parts. Two white spots are visible in the dorsal position on the caudal peduncle (clearly visible on a black background).

JUVENILES

From 20 to 30 mm

The white spots dissipate with growth. Melanophores* cover the greater part of the body. Individuals still possess this orange tint.

Over 30 mm

At 28 mm, the spots have disappeared and the melanophores* are prominent.

POSTLARVAE REARING

Rearing Delicate

Intra-specific Coexistence

Inter-specific Coexistence

Feeding Delicate

Stress Handling

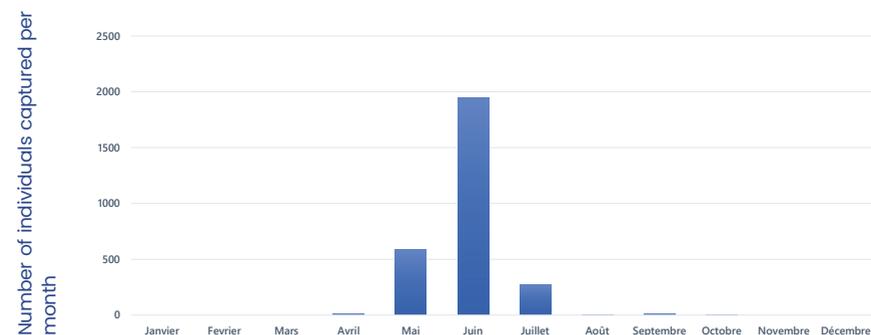
Growth Average

Particularity

None

Catch size 2 mm ± 2 mm (n=2828)

Bibliography 53, 58



D+0 – Marseille – 10mm



D+13 – Marseille – 20mm



D+22 – Marseille – 20mm



D+48 – Marseille – 40mm

Spicara smaris

Picarel

Caramel (SP), Zerro (IT), Picarel (FR)

MERISTIC CHARACTERS

DORSAL FIN XI–XII + 10–12
ANAL FIN III + 8–10

Spawning strategy Benthic*

PLD ND

Reproduction February–May

Settlement season Spring

DISTRIBUTION

Mediterranean Sea and Black Sea, present on the eastern Atlantic coast from Portugal to Morocco, including the Canaries.

ECOLOGY

From the egg to the juvenile

The juveniles are found on posidonia beds.

Adult

Found on posidonia beds and neighbouring sandy-silty bottoms.

POSTLARVAE REARING

Rearing Delicate

Intra-specific Coexistence

Inter-specific Coexistence

Feeding Delicate

Stress Handling

Growth Average

POSTLARVAE

From 10 to 20 mm

The PL has a typical Sparidae shape. It has an orange colouration at the notochord* accompanied by melanophores* on the dorsal, ventral and lateral part.

JUVENILES

From 20 to 30 mm

Three white spots that are characteristic of the species are present on the caudal peduncle (clearly distinct on a black background). As the fish grow, these will disappear to give way to a black colouration with orange tints.

Over 30 mm

From 40 mm, the silver colouration is that of adults, with several chromatophores* with varying colour on the back. A rectangular black patch is present on the flank behind the pelvic fins.

(Linnaeus, 1758)

Sparidae (ex Centracanthidae)

NE

E_{co}

Number of individuals captured: 51
(all sites and years combined)

SPARIDAE

Spicara smaris



D+8 – Marseille – 20mm



D+8 – Bastia – 18mm



D+10 – Bastia – 18mm



D+19 – Bastia – 20mm



D+50 – Embiez – 40mm

Spondyliosoma cantharus

(Linnaeus, 1758)

Sparidae

Black seabream

Chopa (SP), Cantaro (IT), Dorade grise / Canthare (FR)

NE

Eco Fish

MERISTIC CHARACTERS

DORSAL FIN XI + 11-13
ANAL FIN III + 9-11

Spawning strategy Benthic*

PLD 26-32

Reproduction March-May

Settlement season Spring

DISTRIBUTION

Mediterranean Sea and Black Sea, present on the eastern Atlantic coast from Scandinavia to Namibia.

ECOLOGY

From the egg to the juvenile

The juveniles are found on seagrass beds.

Adult

Lives above sandy and rocky bottoms to 300 m depth. Gregarious fish, they sometimes form large schools.

POSTLARVAE REARING

Rearing Delicate

Intra-specific Coexistence

Inter-specific Coexistence

Feeding Easy

Stress Stressed

Growth Average

POSTLARVAE

From 10 to 15 mm

The PL is yellow. Interspersed with melanophores* at the dorsal and anal fins. All these melanophores* rapidly thicken at the ventral part.

JUVENILES

From 15 to 20 mm

The entire body bears large melanophores* that considerably darken the juveniles. The fins remain colourless.

Over 20 mm

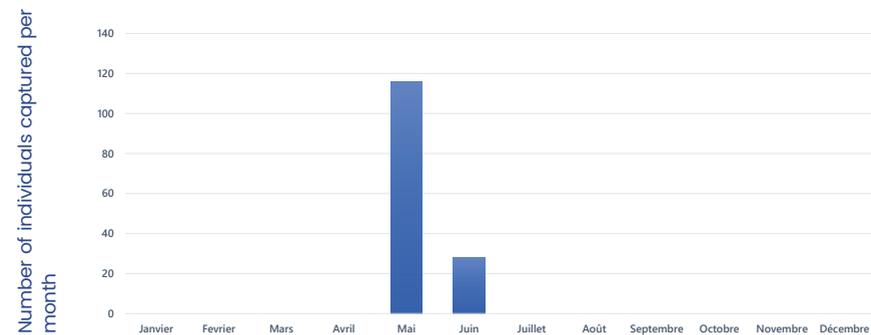
With growth, the number of melanophores* increases and their size decreases. The snout elongates. The fins begin to colour at the base. The fins remain translucent (except for the hard rays) even among juveniles.

Particularity

Stress in the postlarval stage makes rearing delicate and it is preferable to mix it with other animals of similar size.

Catch size 2 mm \pm 2 mm (n=144)

Bibliography 53, 33, 19, 58



SPARIDAE

Spondyliosoma cantharus



© MBL

D+0 – La Ciotat – 16mm



© LHG

D+0 – Bastia – 14mm



© AFF

D+8 – Marseille – 20mm



© MBL

D+4 – La Ciotat – 18mm



© MBL

D+46 – La Ciotat – 37mm

Large fish of the barracuda family, they have a spindle-shaped body that enables them to reach significant peaks of speed. The mouth is large with a lower jaw that is longer than the upper and very sharp teeth. The pectoral fins are set rather low and the dorsal is divided in two. They are voracious predators of other fish and cephalopods. Reproduction takes place in the open sea.

1 species

1 genus

- *Sphyraena sphyraena*

Sphyraena sphyraena

European barracuda

Espetón (SP), Luccio di mare (IT), Bécune européenne (FR)

(Linnaeus, 1758)

Sphyraenidae



MERISTIC CHARACTERS

DORSAL FIN D1: V D2: I + 9
ANAL FIN II + 8

Spawning strategy Pelagic*

PLD ND

Reproduction April–July

Settlement season Summer

DISTRIBUTION

Mediterranean Sea and western Black Sea, present on the eastern Atlantic coast from the Bay of Biscay to Angola.

ECOLOGY

From the egg to the juvenile

The juveniles gather in small schools and frequent shallow rocky coastal bottoms (between 0 and 1.5 m depth).

Adult

Found in both coastal waters and the open sea.

Bibliography 53, 20, 58



D+0 – Bastia – 70mm

Number of individuals captured: ND
(all sites and years combined)

SPHYRAENIDAE 237

Sphyraena sphyraena



D+0 – Cagliari (damaged snout)

Pipefish and seahorses have a dermal skeleton consisting of bony rings that reduce the flexibility of the body, which can give them a rough aspect. They are poor swimmers, essentially beating their dorsal fins. Their colour and shape help them hide from predators and prey in algae or eelgrass. Their small mouth opens at the tip of a narrow snout. They feed on tiny planktonic animals. The males carry the eggs in their brood pouch.

7 species

3 genera

- **Hippocampus** *guttulatus*
- **Hippocampus** *hippocampus*
- **Nerophis** *maculatus*
- **Nerophis** *ophidion*
- **Syngnathus** *abaster*
- **Syngnathus** *cf tenuirostris*
- **Syngnathus** *sp*

Hippocampus guttulatus

Cuvier, 1829
Syngnathidae

Long-snouted seahorse

Caballito de mar mediterráneo (SP), Cavalluccio camuso (IT), Hippocampe moucheté (FR)



MERISTIC CHARACTERS

DORSAL FIN 18-21
ANAL FIN ND

Spawning strategy Brood pouch

PLD 21

Reproduction April-October

Settlement season Spring-Summer

DISTRIBUTION

Mediterranean Sea and Black Sea, present on the eastern Atlantic coast from the British Isles to Morocco and the English Channel.

ECOLOGY

From the egg to the juvenile

The eggs and larvae are carried by the males, who expel them from their brood pouch after 3 to 4 weeks.

Adult

Lives in varied substrates: seagrass beds, unconsolidated sediment, rocky bottoms and coralligenous substrates. It lives on the bottom, either by setting down on the sea floor or using its prehensile caudal peduncle to cling to a support (algae, debris, gorgonian, etc.).

POSTLARVAE

From 12 to 20 mm

The PL is green-brown. Small expansions develop on the body. The top of the head is rather rounded compared with *H. hippocampus*. The snout is rather elongated.

JUVENILES

From 20 to 40 mm

Among juveniles, the top of the head is regularly rounded (triangular-shaped ridge for *H. hippocampus*), with a prominent axial spine. Possesses a long snout (~ $\frac{1}{2}$ the length of the head). The thin body has a relatively narrow abdominal profile (marked curve of the abdomen for *H. hippocampus*).

Over 40 mm

The juveniles may develop skin filaments with growth. A small 'coronet' gradually forms on the top of the head, preceded by a relatively flat ridge.

POSTLARVAE REARING

Rearing Difficult

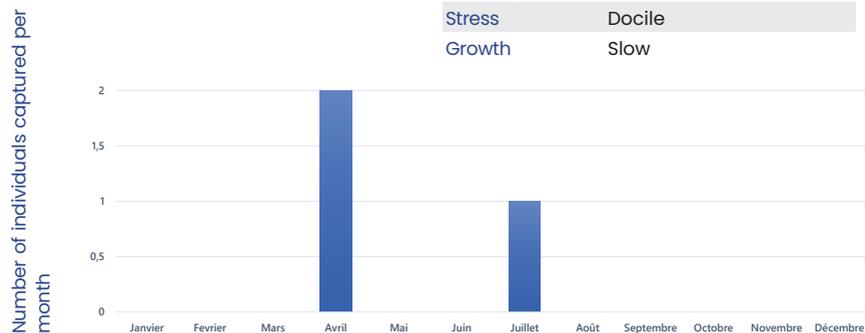
Intra-specific Coexistence

Inter-specific Coexistence

Feeding Difficult

Stress Docile

Growth Slow



SYNGNATHIDAE Hippocampus guttulatus



© PL

Étang de Thau - 12 mm



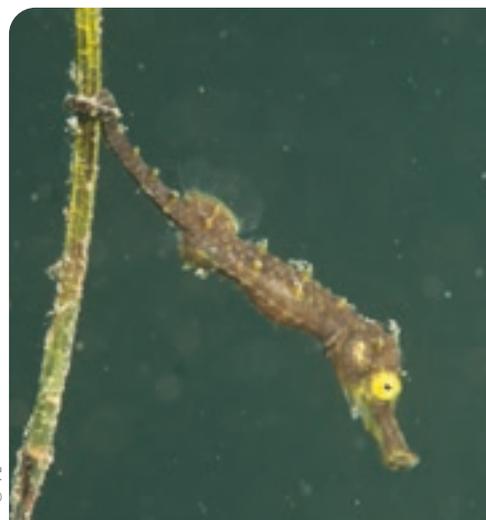
© PL

Étang de Thau - 12 mm



© PL

Étang de Thau - 12 mm



© PL

Étang de Thau - 30 mm



© PL

Étang de Thau - 50 mm

Hippocampus hippocampus

(Linnaeus, 1758)

Syngnathidae

Short-snouted seahorse

Caballito de mar común (SP), Cavalluccio marino (IT), Hippocampe à museau court (FR)

DD

E_{co}P_{at}

MERISTIC CHARACTERS

DORSAL FIN 16-19
ANAL FIN ND

Spawning strategy Brood pouch

PLD 21

Reproduction April-October

Settlement season Summer-Autumn

DISTRIBUTION

Mediterranean Sea and Black Sea, present on the eastern Atlantic coast from the North Sea to Mauritania.

ECOLOGY

From the egg to the juvenile

The eggs and larvae are carried by the males, who expel them from their brood pouch after 3 to 4 weeks.

Adult

In the Mediterranean, this species is mostly observed at sea on unconsolidated bottoms, often in sheltered sectors where debris accumulates. It lives on the bottom and uses its prehensile caudal peduncle to cling to algae or debris.

POSTLARVAE REARING

Rearing Difficult

Intra-specific Coexistence

POSTLARVAE

From 12 to 20 mm

Among the 2 Mediterranean species, *H. hippocampus* is characterised by a rather short snout. The shape of the head is very angular with a characteristic triangular 'coronet'. There is a small 'horn' above each eye.

JUVENILES

From 20 to 40 mm

The horns are well present in older individuals and the body may develop white and brown spots. Skin expansions (discreet) may appear, but they are usually absent.

Inter-specific Coexistence

Feeding Difficult

Stress Docile

Growth Slow

Particularity

It is essential to provide the tank with a support for it to cling to. Rearing difficulty is essentially due to feeding; seahorses have a clear preference for live food.

Catch size 35.5 mm ± 20 mm (n=17)

Bibliography 53, 19, 47, 67



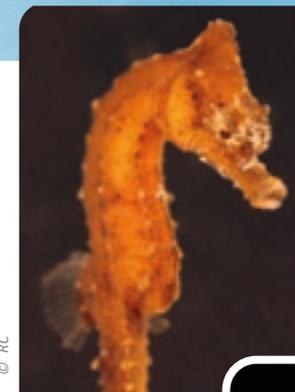
SYNGNATHIDAE

Hippocampus hippocampus



© RC

D+0 - Leucate



© RC

D+0 - Leucate



© RC

D+0 - Leucate



© RC

D+0 - Leucate



TT

D+15 - Leucate



TT

D+15 - Leucate



TT

D+30 - Leucate

Nerophis maculatus

Spotted pipefish

Serpetò (SP), Nerofidio maculato (IT), Nérophis tacheté (FR)

Rafinesque, 1810

Syngnathidae



MERISTIC CHARACTERS

DORSAL FIN	24-29
ANAL FIN	ND

Spawning strategy	Incubator
PLD	30
Reproduction	February-May
Settlement season	Spring

DISTRIBUTION

Western Mediterranean Sea, present on the eastern Atlantic coast from Portugal to the Azores.

ECOLOGY

From the egg to the juvenile

No data

Adult

Mainly found in posidonia beds, between 1 and 20 m depth.

JUVENILES

From 80 to 90 mm

Like *Hippocampus*, individuals of the *Nerophis* genus do not have a caudal fin. The caudal peduncle is prehensile and enables it to cling to a support. Individuals have a brown body with white patches on arrival (80 mm). These patches form a white line at the snout. After 30 days, the white patches on the body have reduced to become small widely-spaced spots.

Over 90 mm

At 95 mm, the body turns orange-yellow and the white patches on the body have almost disappeared. A white and red line traverses the eye.

POSTLARVAE REARING

Rearing	Difficult
Intra-specific	Coexistence
Inter-specific	Coexistence
Feeding	Difficult
Stress	Handling
Growth	Slow

Particularity

Ideally provide a mono-species tank with a weak current and a few (floating) hiding places as well as a support that it can cling to. Feeds on live prey and/or frozen brine shrimp.

Catch size 37 mm \pm 2 mm (n=4)

Bibliography 53, 19, 47



SYNGNATHIDAE

Nerophis maculatus



D+0 – Leucate - 80mm



D+0 – Leucate - 80mm



D+0 – Leucate - 80mm



D+0 – Leucate - 95mm



D+30 – Leucate - 90 mm



D+30 – Leucate - 90mm

Nerophis ophidion

Straightnose pipefish

Alfiler (SP), Pesce ago sottile (IT), Nerophis ophidion (FR)

(Linnaeus, 1758)

Syngnathidae

DD

E_{co}

P_{at}

MERISTIC CHARACTERS

DORSAL FIN 32-44
ANAL FIN ND

Spawning strategy	Incubator
PLD	21-22
Reproduction	May-August
Settlement season	Spring-Summer

DISTRIBUTION

Mediterranean Sea (occasional), present on the eastern Atlantic coast.

ECOLOGY

From the egg to the juvenile

No data

Adult

Found in estuaries and occasionally in rivers. It favours the shallow depths of rocky shores. Frequently found under stones, near rock cavities, essentially among gravel beds and at the foot of algae and eelgrass.

JUVENILES

From 120 to 130 mm

Like Hippocampus, individuals of the Nerophis genus do not have a caudal fin, their caudal peduncle is prehensile and is used to cling to a support. Their size on arrival is variable. Individuals have a golden yellow colouring, sometimes tending towards green.

From 130 to 150 mm

The snout is rather short and prolongs the body. A series of lighter wavy colouration can be observed behind the eye.

Over 150 mm

There are parallel bluish lines behind the head (more frequent among females). A series of very specific patterns appears on the snout below the eye and on the gill cover.

POSTLARVAE REARING

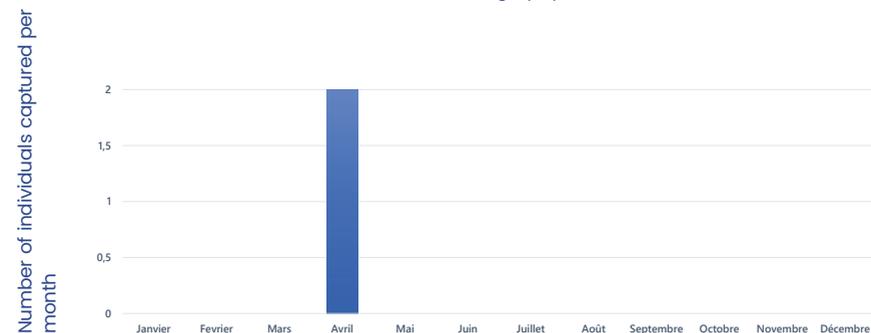
Rearing	Difficult
Intra-specific	Coexistence
Inter-specific	Coexistence
Feeding	Difficult
Stress	Handling
Growth	Slow

Particularity

Ideally provide a mono-species tank with a weak current and a few (floating) hiding places as well as a support that it can cling to. Feeds on live prey and/or frozen brine shrimp.

Catch size 81.7 mm ± 2 mm (n=2)

Bibliography 53, 33, 19

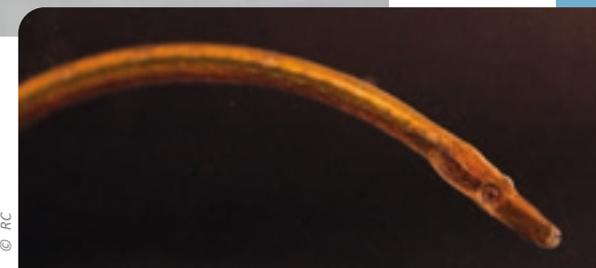


SYNGNATHIDAE

Nerophis ophidion



D+0 - Leucate - 130mm



D+0 - Leucate - 140mm



D+0 - Leucate - 162mm



D+0 - Leucate - 162mm



D+0 - Leucate - 180mm

Syngnathus abaster

(Risso, 1827)
Syngnathidae

Black-striped pipefish

Pez pipa de rayas negras (SP), Pesce ago di rio (IT), Syngnathe de lagune (FR)



MERISTIC CHARACTERS

DORSAL FIN	24-40
ANAL FIN	ND

Spawning strategy	Brood pouch
PLD	28
Reproduction	March-July
Settlement season	Autumn

DISTRIBUTION

Mediterranean Sea and Black Sea, present on the eastern Atlantic coast from the Bay of Biscay to Gibraltar.

ECOLOGY

From the egg to the juvenile

No data

Adult

A euryhaline species that is found in the vegetation of sandy bottoms. This species is probably amphidromous.

POSTLARVAE REARING

Rearing	Difficult
Intra-specific	Coexistence
Inter-specific	Coexistence
Feeding	Difficult
Stress	Handling
Growth	Slow

JUVENILES

From 80 to 90 mm

Unlike *Hippocampus* and *Nerophis*, pipefish possess a caudal fin. *S. abaster* has a rather short, straight snout. The dorsal part is brown with white spots and the belly is quite light. The spots are not arranged in any particular pattern.

Over 90 mm

The mouth is slightly oriented upwards.

Particularity

Ideally provide a mono-species tank with a weak current and a few (floating) hiding places. Feeds on live prey and/or frozen brine shrimp.

Catch size 90 mm \pm 2 mm (n=1)

Bibliography 53, 19, 47, 18

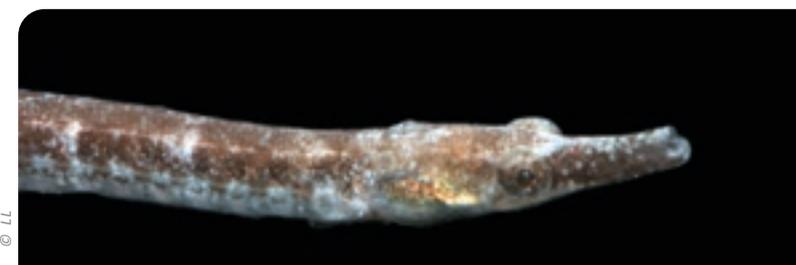
Number of individuals captured: 1
(all sites and years combined)

SYNGNATHIDAE

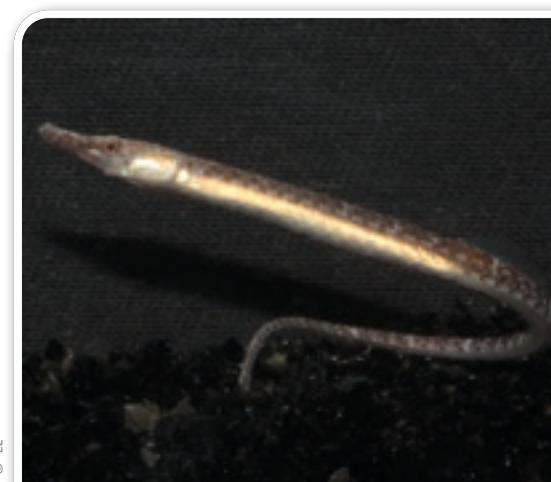
Syngnathus abaster



D+0 – Leucate – 85mm



D+0 – Leucate – 85mm



D+0 – Leucate – 85mm



D+30 – Leucate – 95mm

Syngnathus cf tenuirostris

Rathke, 1837
Syngnathidae

Narrow-snouted pipefish

Aguja de morro fino (E), pesce ago musolungo (I), Syngnathe à museau long



MERISTIC CHARACTERS

DORSAL FIN 33-41
ANAL FIN ND

Spawning strategy Brood pouch

PLD ND

Reproduction ND

Settlement season Summer-Autumn

DISTRIBUTION

Mediterranean Sea (endemic).

ECOLOGY

From the egg to the juvenile

No data

Adult

A benthic species that lives on unconsolidated bottoms, coralligenous substrates or more rarely on seagrass beds.

JUVENILES

From 75 to 85 mm

Unlike *Hippocampus* and *Nerophis*, pipefish possess a caudal fin. They have a long straight snouts and a small bump at the back of the head. The yellow body consists of a series of white coils. White spots are also present on the snout and above the eye. The juvenile has a small terminal mouth.

Over 85 mm

Often of a light colour, the juveniles may also have a darker appearance. A white and red line traverses the eye.

POSTLARVAE REARING

Rearing Difficult

Intra-specific Coexistence

Inter-specific Coexistence

Feeding Difficult

Stress Handling

Growth Slow

Particularity

Ideally provide a mono-species tank with a weak current and a few (floating) hiding places. Feeds on live prey and/or frozen brine shrimp.

Catch size 20 mm \pm 2 mm (n=3)

Bibliography 53, 33, 19

Number of individuals captured: 1
(all sites and years combined)

SYNGNATHIDAE 251

Syngnathus cf tenuirostris



71 ©



© LL

D+0 – Leucate - 75mm



71 ©



71 ©

D+45 – Leucate - 90mm



71 ©



© LL

Syngnathus sp.

Lagoon swimmer pipefish

Syngnathidae

DD Eco Pat

MERISTIC CHARACTERS

DORSAL FIN 33-41
ANAL FIN ND

Spawning strategy	Brood pouch
PLD	ND
Reproduction	ND
Settlement season	Spring-Summer

DISTRIBUTION

Mediterranean Sea (endemic).

ECOLOGY

From the egg to the juvenile

No data

Adult

This demersal species is found on the bottoms of shallow coastal lagoons, mainly among debris or vegetation on sandy-silty bottoms, as well as macro-algae and seagrass beds.

JUVENILES

From 120 to 130 mm

Unlike *Hippocampus* and *Nerophis*, pipefish possess a caudal fin. Of a golden yellow colour, they have a long and slightly curved snout and do not have a small bump behind the head. Older juveniles have white spots on the head and body.

Over 130 mm

Body colouring may be variable, ranging from brown to green.

POSTLARVAE REARING

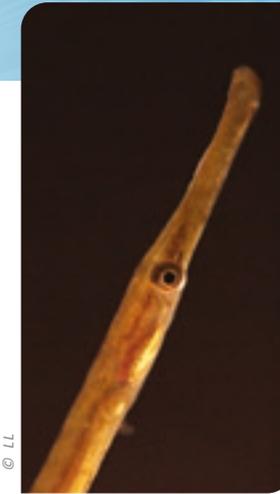
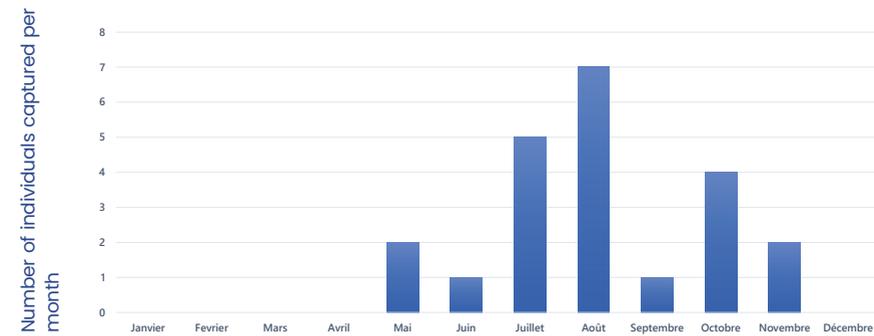
Rearing	Difficult
Intra-specific	Coexistence
Inter-specific	Coexistence
Feeding	Difficult
Stress	Handling
Growth	Slow

Particularity

Ideally provide a mono-species tank with a weak current and a few (floating) hiding places. Feeds on live prey and/or frozen brine shrimp.

Catch size 12 mm (n=8... or 6?)

Bibliography 53, 33, 19, 18, 17



D+0 – Leucate – 120mm



D+30 – Leucate – 140mm



D+60 – Leucate – 130mm

The particularity of this family is that it has a venomous dorsal spine. These fish live below the surface of the sand near the coast in summer and further offshore in winter. They hunt at night and swim freely, occasionally in the pelagic zone. Exclusively carnivorous, they feed on small fish and crustaceans.

1 species

1 genus

• *Trachinus draco*

Trachinus draco

Linnaeus, 1758

Trachinidae

Greater weever

Pez escorpión (SP), Tracina drago (IT), Grande vive (FR)



MERISTIC CHARACTERS

DORSAL FIN D1: V-VII D2: 29-32
ANAL FIN III + 28-34

Spawning strategy Pelagic*

PLD 12-14

Reproduction April-August

Settlement season Summer

DISTRIBUTION

Western Mediterranean Sea, present on the eastern Atlantic coast from Norway to Morocco.

ECOLOGY

From the egg to the juvenile

No data

Adult

Found on sandy, sandy-silty and gravel bottoms.

POSTLARVAE

From 10 to 15 mm

The PL is translucent. Its head is a very light colour and the first dorsal fin (D1) has a yellow and black colouring.

JUVENILES

From 15 to 20 mm

The body is very quickly covered with lateral white spots. A white border appears on the first dorsal fin.

Over 20 mm

After 41 days, the juvenile resembles the adult with numerous brown spots on a white body. A brown border appears on all fins. They lie in wait on the sediment and move very little. The white part of the body is slightly iridescent.

POSTLARVAE REARING

Rearing Easy

Intra-specific ND

Inter-specific Lively

Feeding Easy

Stress Handling

Growth Average

Particularity

The animal possesses a venomous dart on the dorsal; beware of stinging when handling.

Catch size 15 mm (n=2)

Bibliography 53, 33, 19, 58



TRACHINIDAE

Trachinus draco



D+2 - Leucate - 13mm



D+6 - Leucate - 17mm



D+2 - Leucate - 13mm



D+41 - Leucate - 36mm

These fish live on the bottom and emit noise in case of danger. This growling is produced by a vibration of the swim bladder. The ventral fins transformed into tactile organs with which they can move on the bottom is typical of Triglidae. The dorsal fin is divided, while the shape of the head is characteristic of the genus. They feed on fish, small lobsters and mussels.

2 species

1 genus

- ***Chelidonichthys lucerna***
- ***Chelidonichthys obscurus***

Chelidonichthys lucerna

(Linnaeus, 1758)

Triglidae

Tub gurnard

Bejel (SP), Capone (IT), Grondin perlon (FR)



MERISTIC CHARACTERS

DORSAL FIN D1: VIII-X D2: 16-17
ANAL FIN 14-16

Spawning strategy Pelagic*

PLD 18-21

Reproduction December-April

Settlement season Winter

DISTRIBUTION

Mediterranean Sea and Black Sea, present on the eastern Atlantic coast from Norway to the coasts of Africa.

ECOLOGY

From the egg to the juvenile

Juveniles are occasionally observed near the shore.

Adult

Found on sand, silt or gravel bottoms between 20 and 250 m depth. Approaches the coast in summer, occasionally entering estuaries.

POSTLARVAE REARING

Rearing Easy

Intra-specific ND

Inter-specific Coexistence

Feeding Delicate

Stress Docile

Growth Average

POSTLARVAE

From 20 to 25 mm

The PL is dark brown. The occipital and pre-opercular spines are typical of the family. The dorsal (D2), anal and caudal fins are not pigmented.

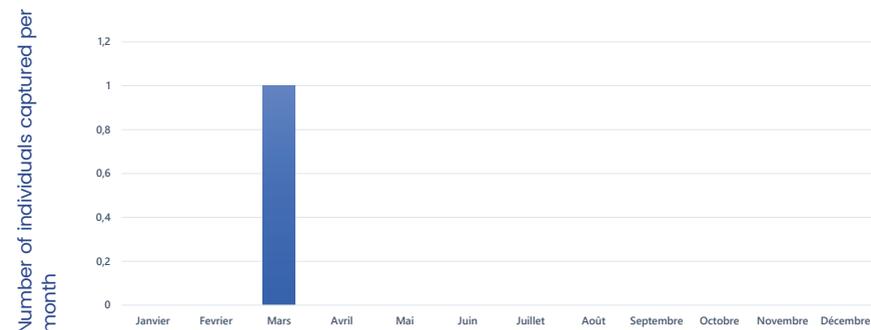
JUVENILES

From 25 to 35 mm

The rear of the fins starts to take on a blue colouring. The pelvic fins enable the fish to stabilise itself and face prey.

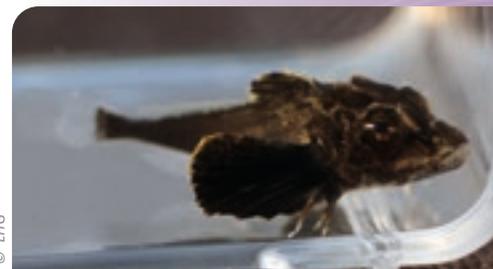
Over 35 mm

The colouration develops into more or less light brown stripes. The 'crown of thorns' is always very prominent. Seen from above, a patch stands out in the middle of the pectorals and remains at more advanced stages.



TRIGLIDAE 261

Chelidonichthys lucerna



D+0 – Bastia – 23mm



D+2 – Bastia – 23mm



D+34 – Bastia – 26mm



D+42 – Bastia – 33mm



D+90 – Bastia – 55mm



D+120 – Bastia – 75mm

Chelidonichthys obscurus

(Walbaum, 1792)

Triglidae

Longfin gurnard

Arete aleton (SP), Luserna (IT), Grondin morrude (FR)



MERISTIC CHARACTERS

DORSAL FIN X–XI
ANAL FIN 16–20

Spawning strategy Pelagic*

PLD 19–37

Reproduction February–August

Settlement season Spring

DISTRIBUTION

Eastern Atlantic, from the southern coasts of the British Isles to Mauritania. Mediterranean Sea, excluding the northern Aegean Sea.

ECOLOGY

From the egg to the juvenile

Adults are occasionally observed near the shore.

Adult

Juveniles are occasionally observed near the shore.

POSTLARVAE

From 15 to 25 mm

The PL is pigmented and already resembles the adult. Its head is massive in comparison to the rest of its body. As soon as it is captured, it settles on the substrate, which must be sandy.

JUVENILES

From 25 to 35 mm

The head is now smaller than the rest of the body. Colouration is well marked, from brown to beige and forms 4 wide stripes on the body.

Over 35 mm

2 months after capture, its size has tripled from 18 mm to over 60 mm. Colouration tends towards red and becomes more mottled.

POSTLARVAE REARING

Rearing Easy

Intra-specific ND

Inter-specific ND

Feeding Delicate

Stress Docile

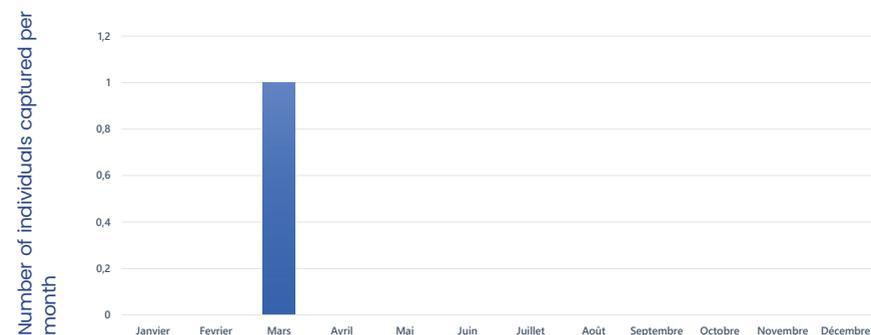
Growth Average

Particularity

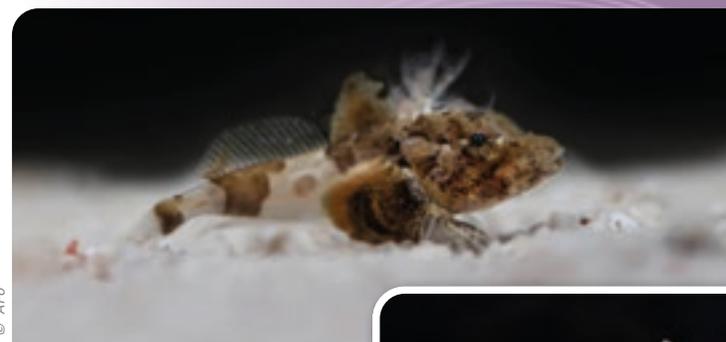
Requires sand on the bottom.

Catch size 18 mm (n=1)

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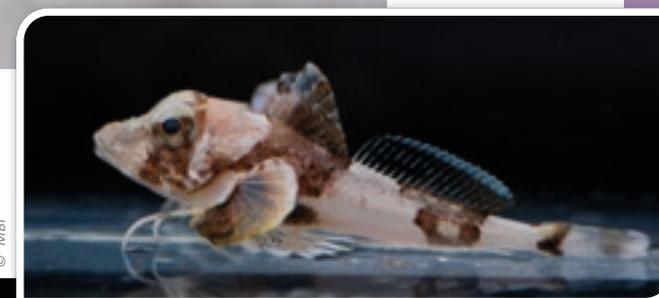


Chelidonichthys obscurus



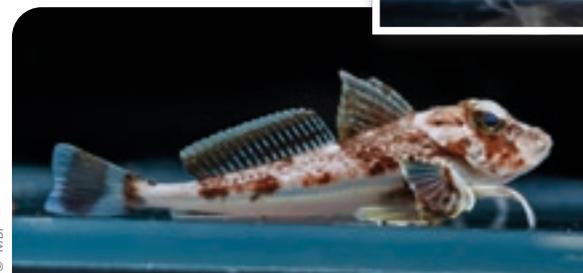
© AFO

D+2 – Marseille – 18mm



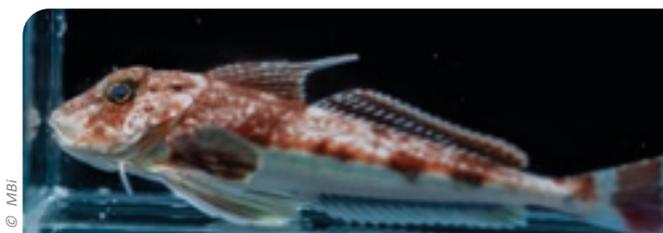
© MBI

D+22 – Marseille – 35mm



© MBI

D+36 – Marseille – 64mm



© MBI

D+90 – Marseille – 106mm



These fish have vertically oriented eyes above their head as well as a large mouth oriented upward and a large head. They usually burrow into the sand and ambush fish that pass above them. The two dorsal and anal fins are relatively long. These fish are venomous with two large venomous spines behind the gill covers and above the pectoral fins.

1 species

1 genus

- *Uranoscopus scaber*

Uranoscopus scaber

Linnaeus, 1758
Uranoscopidae

Atlantic stargazer

Miracielo (SP), Pesce prete (IT), Uranoscope (FR)



MERISTIC CHARACTERS

DORSAL FIN D1: III-IV D2: 13-15
ANAL FIN III + 8-9

Spawning strategy	Pelagic*
PLD	ND
Reproduction	April-August
Settlement season	Spring-Summer

DISTRIBUTION

Mediterranean Sea, present on the eastern Atlantic coast.

ECOLOGY

From the egg to the juvenile

The eggs, larvae and juveniles of this oviparous fish are pelagic*.

Adult

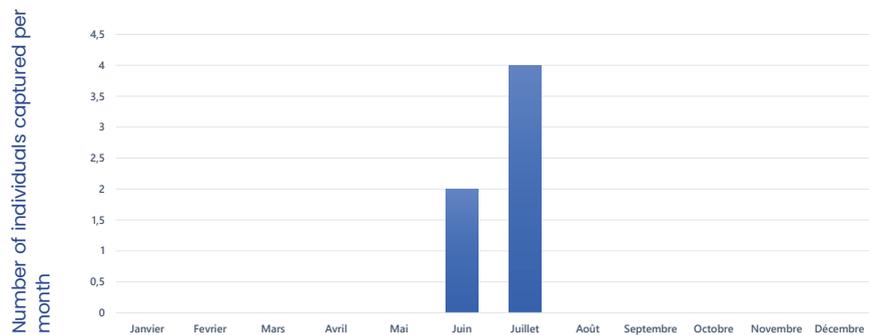
Mainly lives on sandy-silty bottoms. Burrows into the sand, only the eyes remain visible.

Bibliography 53, 20, 58



D+0 – Castellammare

D+0 – Port-Vendres – 14mm (dead individual)



Cassis - 30 mm



D+0 – Port-Vendres - 14 mm (dead individual)

Invertebrates, which do not possess a backbone and skeleton, form a group with a wide diversity of branches: arthropods, molluscs, echinoderms, cnidaria, spongiae, etc.

We group them here in the same chapter because they generally represent accessory catches in relatively limited quantities.

8 species

8 families

- **Argonauta** *argo*
- **Homarus** *gammarus*
- **Loligo** *vulgaris*
- **Octopus** *vulgaris*
- **Scyllaridae** *arctus*
- **Sepia** *officinalis*
- **Sepiola** *rondeleti*
- **Upogebia** *pusilla*

Argonauta argo

Argonaut

Argonauta (SP), Argonauta (IT), Argonaute (FR)



D+0 – Castellammare

© MM

Linnaeus, 1758

Argonautidae



DISTRIBUTION

Mediterranean Sea, Pacific, Indian and Atlantic oceans, Red Sea

ECOLOGY

Epipelagic species*, oceanic, lives in surface waters. Females and juveniles approach the surface at night.

Bibliography 72

Homarus gammarus

European lobster

Bogavante (SP), Astice europeo (IT), Homard européen (FR)



D+0 – Marseille – 13mm

© AF0

(Linnaeus, 1758)

Nephropidae



DISTRIBUTION

Mediterranean Sea and Black Sea, present on the eastern Atlantic coast from the Bay of Biscay to Senegal.

ECOLOGY

Eggs are spawned in a gelatinous mass. The larvae develop in open water before migrating to the bottom at a size between 15 and 20 mm.

Bibliography 71

Loligo vulgaris

European squid

Calamar europeo (SP), Calamaro europeo (IT), Calmar commun (FR)



71 ©

D+0 – Leucate – 45mm

Lamarck, 1798

Nephropidae



DISTRIBUTION

Mediterranean Sea and Black Sea, present as far as the northwestern Atlantic, but also in the English Channel and the North Sea.

ECOLOGY

Found in mesopelagic* and infrapelagic zones* (50 to 400 m). Difficult to observe except during spawning periods, when they migrate to coastal waters.

Bibliography 37, 72

Octopus vulgaris

Common octopus

Pulpo común (SP), Polpo comune (IT), Poulpe commun (FR)



71 ©

D+0 – Leucate – 20mm

Cuvier, 1797

Octopodidae



DISTRIBUTION

Mediterranean Sea and Black Sea, present in temperate and tropical waters around the globe.

ECOLOGY

Found on rocky substrates and shores as far as the upper limit of the continental plateau. Coralligenous* substrates, rocky outcrops, sandy or silty bottoms and seagrass beds are highly frequented according to the region.

Bibliography 2, 72

Scyllarides arctus

Small European locust lobster

Santiaguiño (SP), Cicala di mare (IT), Petite cigale de mer (FR)

(Linnaeus, 1758)

Scyllaridae



© MM

D+0 – Castellammare

DISTRIBUTION

Mediterranean Sea and Black Sea, present on the eastern Atlantic coast from Norway to Morocco.

ECOLOGY

Found in caves, faults and under isolated rocky slabs as well as in Posidonia beds. Often found clinging to overhangs and the roof of cavities, where they blend with the colour of the substrate. More readily active at night.

Reference 41

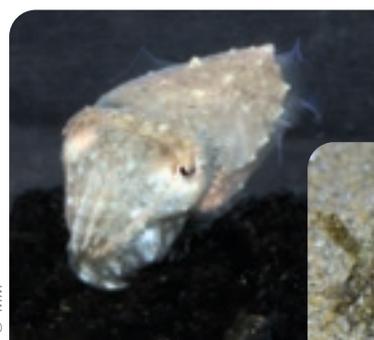
Sepia officinalis

Common cuttlefish

Sepia común (SP), Seppia comune (IT), Seiche commune (FR)

Linnaeus, 1758

Sepiidae



© MM

D+0 – Leucate – 14mm

DISTRIBUTION

Mediterranean Sea and Atlantic Ocean, from the Baltic Sea to South Africa.

ECOLOGY

Cuttlefish are occasionally observed on rock but are most often found on unconsolidated sand or gravel bottoms, in seagrass beds or among large size algae.

Frequently burrow into the sediment.

Bibliography 10, 72



© MBI

Carnon – 15mm

Sepiola rondeletii

Dwarf bobtail squid

Seppiola (SP), Globito (IT), Sépiole de Rondelet (FR)

Leach, 1817

Sepiolidae



© MBI

D+1 – Marseille – 19mm

DISTRIBUTION

Mediterranean Sea (endemic*).

ECOLOGY

Epibenthic species* that can be found from the surface water. Essentially observed at night. Common in posidonia beds, they can be observed on and in the sand or hidden in rock debris.

Reference 44

Upogebia pusilla

Mediterranean mud shrimp

Grillo real marino (SP), Corbola (IT), Crevette fousseuse (FR)

(Petagna, 1792)

Upogebiidae



© IT

D+0 – Leucate – 16mm

DISTRIBUTION

Mediterranean Sea and Black Sea, the eastern Atlantic coast from Brittany to Mauritania.

ECOLOGY

Present in intertidal and subtidal zones, it buries itself in sand and silt in Y-shaped galleries with 2 or more entrances.

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GLOSSARY

Words followed by an asterisk * in this text are defined below.

Benthic — Adjective describing a species that lives in relation to the seabed, either near the bottom (vagile organisms), directly on the substrate (epibenthic), or in the substrate (endobenthic).

Notochord — The developing spinal column.

Chromatophores — Pigmented cells that reflect the light present in the skin.

Coralligenous — Describes a hard substrate of biogenic origin that is essentially produced by the accumulation of encrusting calcareous algae.

Endemic — A species whose natural presence is exclusively restricted to a geographical zone.

Euryhaline — A species that supports significant variations in the salinity of its aquatic habitat.

Halophile — Defines an organism that supports or requires high concentrations of salt in its environment to live.

Herculean — A species that has arrived in the Mediterranean Sea via the Strait of Gibraltar.

Leptocephalus — Larval stage that is transparent, colourless and elongated, mainly among anguilliformes (eels, congers, etc.).

Melanophore — Pigment cell containing black or brown melanin.

Myomere — Fish trunk muscles are segmented, a myomere is one of these segments. The space between two segments is called an inter-myomere.

Neritic — Shallow ocean water from the littoral zone to the edge of the continental shelf.

Pelagic — Adjective to qualify a species that lives in the open sea, epipelagic when it lives in the upper part of the water column (0-50 m), mesopelagic from 50 to 200 m, and infrapelagic from 200 to 600 m depth.

PL — Abbreviation for postlarva.

PLD — Abbreviation for "Pelagic Larval Duration". Defines the time a larva spends in the open water between hatching and arrival at the juvenile stage.

Prognathous — Describes an animal whose jaws protrude forward to a greater or lesser degree.

Psammophilous — Describes species that spend all or part of their life cycle on a sandy substrate.

Raceway — Continuous flow system used in aquaculture.

Retrognathous — A term to describe an animal whose jaws recede to a greater or lesser degree.

Scutes — Small specialised scales situated on either side of the lateral line (especially among Carangidae).

DT — Abbreviation for digestive tube (gut).

Thigmotropism — A term to describe individual behaviour in response to a touch stimulus.

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This work was made possible through the financial support of the Agence de l'Eau Rhône Méditerranée Corse (2nd and 3rd editions), the support of the LIFE NATURE & BIODIVERSITY European fund (2nd edition), and the support of the Fondation pour la Recherche sur la Biodiversité- FRB (1st Edition).

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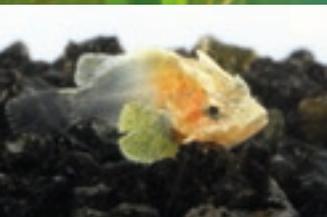
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In this guide the reader will find information concerning over 94 species of Mediterranean fish at the postlarval and juvenile stages, with descriptions and photographs of the different stages of fish development at key moments of their passage from the larval stage (often translucent) to the juvenile stage (with adult characteristics). This guide also synthesises more general information about their ecology, morphology, distribution and habitats, as well as rearing information. This third edition is based on work carried out 10 years ago as part of the European SUBLIMO (Life+) programme, enriched by new photos and numerous complementary data from the CasCioMar and ORREA projects conducted by ECOCEAN and co-funded by the Agence de l'Eau Rhône Méditerranée Corse. This guide is an essential tool for all those who wish to know a little more about this key stage of the fish life cycle.



ATLAS

of **POSTLARVAL FISH**

of the **WESTERN MEDITERRANEAN**

This guide is distributed thanks to the financial support of the Agence de l'Eau Rhône Méditerranée Corse

