New species in Italy

Barbato F., Corbari L.

Aspects économiques de la production aquacole

Zaragoza : CIHEAM
Cahiers Options Méditerranéennes; n. 14

1995
pages 123-128

New species in Italy

F. BARBATO
ENEA INN BIOAG PAN
ROMA
ITALY

L. CORBARI
ITTICAUGENTO
LECCE
ITALY

SUMMARY - This work considers the species of marine teleosts not yet established with relevant productions, reared in Italy at various levels, from resarch, through pilot scale to commercial scale. For each species a short note is reported considering the main characteristics of interest for rearing and for market perspectives.

Key words: Marine teleosts, rearing, market, Italy.

RESUME *- Le présent travail considère les espèces de téléostéens marins qui ne présentent pas encore des productions significatives, et qui sont élevés en Italie à plusieurs niveaux, depuis la recherche, avec des expériences pilotes, jusqu'à l'échelle commerciale. Un bref passage en revue de chaque espèce présente les principales caractéristiques d'intérêt en vue de l'élevage et des perspectives de marché.*

Mots-clés *: téléostéens marins, élevage, marché, Italie.*

INTRODUCTION

The progressive development of fish culture worldwide put some problems related to the increased production of species once considered of high value and then, due to the ever increasing offer, after some years reconsidered of medium or even low value. This is probably one of the main reasons for the search of new species to be grown. In Italy, the above mentioned situation is in full development for Sea bass and Sea bream, whose price is descending rather quickly.

So, nowadays, there is a growing interest towards the so called "new species", even though there is still a rather low production of them.

A peculiar characteristic of the research about new species in Italy is that most of the work is done by and in commercial plants. This is due mainly to the lack of resarch facilities within research institutes, especially for marine species. In fact, many of the scientific publications on marine aquaculture themes, derives from the collaboration between research institutions and productive plants. This can be considered positive for the tight relationships between research and production but also negative for the state of public research in this particular sector and for the inevitable loss of accuracy due to the production needs.

Anyway, apart from these considerations, there are several interesting aspects concerning the new species in Italy. First of all, the number of species involved, that is rather high (17 in this study, and perhaps more); then the presence of hybrids, that is crosses between different species, all belonging to the sparid family; and the presence of two species imported from Japan, that is *Pagrus major* and *Paralichtys olivaceus*.

SPECIES INVOLVED
This is a list of the species which can be defined "new", even though some of them have been tested since many years. Still, at the light of new technological developments, some of them could be reconsidered and exploited in a better way.

SPARIDS
Diplodus sargus, D. vulgaris, D. puntazzo.
Dentex dentex.
Pagrus major, P. pagrus.
Pagellus erythrinus.
Litognathus mormyrus.
Pantice, pagata, orantice (Sparid hybrids).

NON SPARIDS
Paralichtys olivaceus.
Umbrina cirrosa.
Sciaena umbra.
Seriola dumerilii.
Epinephelus marginatus.
Solea vulgaris.

It can be seen that most of the species belong to the sparid family, so there is a division between **sparids** and **non sparids**.
In the sparid family there are many of the most appreciated fish for human consumption and of course the gilthead sea bream, *Sparus aurata*, the most intensively cultured species among the mediterranean ones. The sparid hybrids derive from interspecific crosses realized in one plant in Northern Italy, and are:

TAB.1 : SPARID HYBRIDS

Hybrid Italian name	**female parent**	**male parent**
PANTICE	*Pagrus major*	*Dentex dentex*
PAGATA	*Pagrus major*	*Sparus aurata*
ORANTICE	*Sparus aurata*	*Dentex dentex*

Another classification could be drawn on the basis of commercial production of intensively reared fish: some species have already reached this stage both for fingerlings and for grown up or for only one of these two groups. It is to note that production could have been interrupted and nowadays could be not available.
In the following table is represented a list of new species with their characteristics on fingerlings and grown up production level, distinguished in research, pilot scale and commercial scale.

In 1994 only 3 species were reared up to commercial size in relevant quantities and these were *D. puntazzo, D. sargus* and *Pagrus major,* with respectively 50, 20 and 15 tons.

Following here, there is a series of notes concerning the main informations available

TAB. 2 : PRODUCTION OF NEW SPECIES

SPECIES	FINGERLING PRODUCTION	GROWN UP PRODUCTION
D. sargus	research	commercial in ponds, cages
D. puntazzo	commercial	commercial in ponds, cages
Pagrus major	commercial	commercial in ponds
Pagellus erythrinus	no	research, in ponds
Lithognathus mormyrus	no	pilot scale, in cages
Dentex dentex	research	research, in ponds
D. vulgaris	no	pilot scale in ponds, cages
Seriola dumerilii	no	pilot scale, in cages
Solea solea	pilot scale	no
Umbrina cirrosa	pilot scale	pilot scale, in ponds

through literature examination and personal communications with different operators, about the single species.

Diplodus sargus

It is an interesting species from the point of view of commercialization, being the selling price at the farm rather high, 25,000 Lit/kg. Unfortunately it has a slow growth, especially in the second year. The artificial reproduction is not particularly difficult, the reproduction time being in April - June. There is hermaphroditism, protandrous, but also sex determination. Probably needs more knowledge on nutritional requirements.

Diplodus puntazzo

It is the nearest to become a consolidated species for intensive aquaculture. In fact its satisfactory selling price (20,000 Lit/kg), its fast growth and the possibility to obtain fingerlings from artificial reproduction, can contribute to the future success of this species.

The techniques for reproduction and larval rearing have been set up and are quite similar to those employed for *S. aurata*. The reproduction period is September-October. There is hermaphroditism, protandrous, but also sex determination. Survival during the on growing is still lower than Gilthead Seabream, probably because the small fish have to face the winter at a reduced size, being somehow more weak. The growth is fast, since they reach more than 300 g in 24 months.

Diplodus vulgaris

Another of the seabreams, not very interesting cause of its slow growth. Artificial reproduction has been attempted at a research level, but there is no commercial production of fingerlings. Reproduction in September-November. Sometimes it is reared together with other seabreams in cages, from wild fingerlings catched at *lavorieri* (lagoon fish traps).

Pagrus major

The japanese Red Sea Bream, imported in Italy in 1986 by the authors. The introduction has been successfull regarding reproduction and rearing, being the techniques not dissimilar to those nowadays commonly employed with *S. aurata*, with *P. major* less demanding for larval rearing and a bit more delicate for on growing.

Growth is acceptably fast, a little slower than *S. aurata*. Unfortunately commercialization has ben difficult, despite of the high selling prices in Japan. The market considered the species as a second choice, perhaps for its resemblance with imported seabreams of the genus *Pagrus,* despite of an evident better quality of the fish flesh . The wholesale price is around 12,000 Lit/kg.

Pagrus pagrus

The mediterranean-atlantic Red Porgy, is a species reared at research scale, with no commercial production of fingerlings or grown up. Growth seems to be comparable with that of *S. aurata*, so it could be a promising species. No data on artificial reproduction and larval rearing. Commercialization could be difficult, as for *P. major.*

Dentex dentex

It is an interesting species, for its good market quotations, which has been tested both for artificial reproduction and for growth. It revealed a very shy behaviour, with much stress caused by sudden changes in rearing parameters. The reproduction has been achieved but with unsatisfactory survival rates. So, it seems difficult to forecast a good success for big scale rearing of this fish, unless after some generations it becomes more acquainted to the captive environment. At present broodstocks are mantained most of all for hybrids creation.

Pagellus erythrinus

The most important member of the genus *Pagellus*, in some Italian region, mainly in Sicily, has a good selling price. There is hermaphroditism protogynous. The rearing of this species is at a research level, with some plant keeping a broodstock. Growth seems not fast, with differences between sex, males being faster. Commercialization with some problems out of the regions where the species is appreciated.

Lithognatus mormyrus

This is a fish commonly reared in extensive environment, such as coastal lagoons. For intensive rearing, there is some plant that cultivates this species, mixed with other sparids, in cages, starting from wild fingerlings catched at lavorieri fish traps. It is appreciated for its firm flesh. Artificial reproduction (june-july) and larval rearing have been achieved, but there is no commercial production of fingerlings. Growth seems to be rather slow, perhaps due to the benthic habits of this species.

Sparid hybrids

Probably these are the best candidates for successfull substitutes of sea bass and sea bream in the mediterranean aquaculture.

As already mentioned, the hybrids derive from interspecific crosses between members of the sparid family; nowadays, there are 3 hybrids under rearing tests in one productive plant of Nothern Italy. Especially one of these hybrids, called pantice, seems very promising. In fact the growth seems to be twice that of *S. aurata*. There are not many indications on the difficulty of reproduction and larval rearing of these hybrids, but it seems that they preserve the better characteristics of the parents. The first impact with commercialization will arrive in a few months, when the first relevant lots of hybrids will be sold. The selling strategy will consist in commercializing fish of around 1 kg , that is a size still not covered by the cultured product.

Paralichtys olivaceus

This is a flatfish imported from Japan, very similar to the european turbot, *Scophtalmus maximus*, that is a species not reared in Italy mainly for temperature problems. *P. olivaceus* is instead fully compatible with the average temperatures available in Italian productive plants. So there are two plants in Southern Italy attempting to establish a production line of this fish. The first trials gave very promising results for the larval rearing and for the on growing in particular, but it is still to achieve the first sexual maturation and spawning of the imported lot.

Umbrina cirrosa

A member of the sciaenid family, is a well known fish for its white firm flesh. It is experimentally reared since some years. The artificial reproduction and subsequent larval rearing are mastered, but there are still some little problems to solve and there is not yet commercialization of fry. The growth is reasonably fast, but there are problems for the adaptation to cage rearing cause of the habit of bottom feeding. Commercialization of grown up should be interesting, being the wholesale price around 20,000 Lit/kg.

Sciaena umbra

Another sciaenid, only mentioned here because a single plant is attempting to obtain the artificial reproduction from a broodstock held captive. Still no data on larval rearing and growth. Interesting for the possible commercialization.

Seriola dumerilii

The mediterranean yellowtail, it has been object of interest for culture since many years, cause of its proximity with the japanese *S. quinqueradiata*, one of the most produced reared marine fish in the world. Unfortunately, despite of the research efforts on this fish, in Italy nobody achieved the artificial reproduction and the larval rearing on a consistent scale. So the on growing in cage is linked to the availability of wild fingerlings, that is not very reliable for big quantities. This, in addition to the rather low wholesale prices, explain why this fish did not become an established cultured species in Italy.

Epinephelus marginatus

The mediterranean most common grouper, is mentioned here, as for *S. umbra*, only because one plant is attempting to obtain artificial reproduction from a broodstock held in pond. This is also an hermaphroditic protogynous species, and it is dificult to find ripe males. Market could be interesting.

Solea vulgaris

This is one of the first species object of experiments for the culture, being one of the highest valued in the market. Unfortunately in the early history of marine aquaculture in Italy, nobody could find a solution to the weaning problems showed by the postlarvae of this fish, being completely mastered the artificial reproduction and the first larval rearing. Then also the on growing could never be attempted on a relevant number of individuals, so at present we still do not register a production of reared Solea. But, if the mentioned problems could be solved, the market would pay very well the eventual solution.

CONCLUSIONS

From the notes reported above it is evident an interest of Italian operators towards the so called "new species". Some of the mentioned species appears to be very promising, above all the pantice hybrid and the *Diplodus puntazzo* . There are also species not yet tested for aquaculture in Italy, but studied abroad and present in Italian marine waters, such as *Coryphaena hippurus*, which could be candidates for intensive rearing in offshore cages. Also the red tuna, *Thunnus thynnus*, could be reared in big offshore cages, with technologies not available a few years ago. So, also the continuous technological development in rearing systems can stimulate the research towards species previously considered as impossible.

Anyway, the species that seem to be adaptable to the most utilized rearing conditions in Italy , that is intensive ponds and floating cages, are mostly members of the sparid family, with the possible exception of *Umbrina cirrosa*.

In the future it is to hope that a diversification and increase in number of reared species will contribute to expand and solidly consolidate the marine fish culture activity in Italy.