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Husbandry of *Anthias anthias* under Natural Conditions

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Abstract

The fairy basslet (*Anthias anthias*) is a fish, with a gregary behaviour, that is found commonly at depths from 30m to 200m along the continental shelf and in caves with coralline seabed.

Fifty *Anthias* specimens were collected by scuba divers and transferred to the Argentario Aquarium (Italy), where a special tank was prepared to host them. The *Anthias* spent 3 days in an acclimation container at different depths before returning to the surface. The present paper discusses the data concerning the first 24 months of their husbandry under natural conditions.

INTRODUCTION

Anthias anthias is a proterogynous hermaphrodite group of fishes (Serranidae family), where breeding takes place between June and September. When young, the sex of the basslets are females, but as they mature some of the females change sex and become males. The typical male morphology is

yellow-rose, with pectoral fins longer and a dominating behaviour along the breeding season. Basslets are geographically distributed in Mediterranean Sea and Austral Atlantic Ocean including Portugal and Morocco coasts. Their diet consists of crustaceans and little fishes. Maximum basslet length reaches 27 cm (FAO 1987). They can be easily found at the Morocco Sea Market.

The interest in this species is mainly for aquariology because of its colours and breeding behaviour. It is usually maintained under artificial conditions, it is worth the attention to observe it under natural conditions as it has already and is still being performed at the *Anton Dohrn Zoological Station* of Naples, Italy (Bentivegna *et al.*, 2001).

The Argentario Aquarium, situated along the southern coast of Tuscany, prepared a special tank supplied with natural seawater and during a 24 month period, a group of 50 Anthias were observed in an environment where natural conditions were reproduced such as: temperature, light and chemical and physical seawater parameters.

Methods

A group of basslets, caught on May 2001, at a depth of around 30 m by professional divers in Monte Argentario, were slowly transferred to the surface. Placed in special containers, they were brought up slowly, 10m per day, over a period of about 3 days. This procedure was necessary in order to prevent any stress and fast rising risks, of an overly fast ascension, to the swim bladder. Once on the surface, 50 specimens were soon transferred to the aquarium by a plastic container equipped with an air pump. The special tank, prepared a few weeks before, 5 000 l capacity and was connected by pipeline to a seawater pump located at 10m depth, weekly water changes of 200% in winter and of 100% in summer. The tank is also equipped with an external UV lamp and a 1 000 l filter placed under the tank for the mechanical and biological filtering, it also contains little shells from Normandy (French) beaches. A cooling device able to maintain 16°C, even in summer, controls the seawater temperature.

In order to reproduce natural caves, the tank was furnished with stones from the Orbetello Lagoon, which were cleaned with freshwater. Covering these stones, some "living rock", found at a 40m depth, thanks to the Environmental Office's permission, were placed inside the tank to allow for the fast colonization of microorganisms.

The 50 fairy basslets were introduced and placed into the aquarium directly. The tank had been prepared for a few weeks, before the fish had arrived, at a temperature of approximately 18°C.

Daylight hours were between 9:00 and 20:00, from May to June, while from July to August between 9:00 and 24:00, in September 9:00 to 20:00, and from October until May 9:00 to 19:00. They were fed every 48 hours, this diet was comprised of mussels parts (*Mytilus edulis*) or witness (*Parapaeneus longirostris*), pieces of anchovies (*Engraulis encrasicolus*); and once a week, a small artificial supplement, the same kind used at the fish farms (granulated), was distributed.

The other aquarium occupants include: curly saetta (*Stylocidaris affinis*), crinoids (*Antedon mediterranea*), crustaceans (*Calappa granulata, Lambrus angulifrons*), molluscs (*Tonna galea*), red coral (*Corallium rubrum*), and red gorgons (*Paramuricea clavata*).

Results and discussion

The fairy basslet were observed daily for 24 months in order to estimate their acclimation to the new environment (Tab.1). Special tanks were devised to reproduce the natural environment even if the maintained temperatures were a few degrees higher than those observed along bottoms of Argentario and vary from 14 to 22°C. The artificial light has partially reproduced the natural conditions of lighting system in terms of luminous intensity with a mounting extension, in the hours, every day during the July August period. Of the 50 Anthias collected, 48 exemplary have survived. Some of the females have developed the characteristics that identify them as males with longer fins, more intense colours, yellow liveries and rose, with the snout surface colored with blue spots. Moreover, since May it has been possible to observe, in the males, a different behaviour compared to the females, unexpected releases and movements around some females probably due to reproductive activity. During daylight hours, a major part of the fish swim visibly along the entire water column; as the lights were slowly turned off they soon moved to the caves placed between cliffs to form the wall. In the morning, when the lights are turned on, they slowly come out from their nocturnal hiding places. We therefore may assume that a natural atmosphere has been recreated in the aquarium with subdivision of the space in protected zones and feeding zones, and consequently a recreated natural microhabitat.

Month	pH	Sal.‰	T°C	Month	pH	Sal.‰	T°C
May 01	8.0	37	18	May	8.0	37	17
June	8.0	37	18	June	8.0	37	17
July	8.0	37	18	July	8.0	37	18
Agoust	8.0	37	19	Agoust	8.0	37	19
September	8.1	37	19	September	8.4	37	19
October	8.0	37	19	October	8.4	37	19
November	8.0	37	19.5	November	8.4	36-7	18
December	7.9	37	17.5	December	8.4	36	17
January 02	8.1	37	17	January 03	8.4	36	17
February	7.9	37	17	February	8.3	36	16
March	7.8	37	16	March	8.3	36	16
April	8.2	37	17	April	8.4	36	17

Table 1.– pH, Sal. and T° (monthly averages) in *Anthias* tank since may 2001 to April 2003.

The Argentario Aquarium has made every attempt to replicate the conditions found in the true Mediterranean aquatic environment. This has been done by paying special attention to the following conditions: light, temperature, pH and chemical-physical characteristics of waters of the several, recreated habitats. The aquarium also reproduced the natural zonation of the benthos, with the advanced circumlittoral zone at a depth of 60 m, and 7 panoramic tanks and 5 topic tanks that represent the typical fauna and flora represented at the isobata tropic level. Every panoramic tank is directly connected, with a pump, to the sea. The pump takes natural seawater from a depth of approximately 10m and a coastal distance of approximately 50m. The seawater can flow directly to the aquarium without being filtrated, depurified or passed through a filter and the actual UV system. Each exhibit tank is independent, with evident advantages in the possible situation of having polluted water. Such architecture and the excellent status of seawater health in front of the aquarium allows for the weekly water changes of 200% in winter and of 100% in summer; it also allows for the presence of

substances, oligoelements, plankton, necessary to the maintenance of the numerous invertebrates, sponges, cnidars, tunicats, crinoids, molluscs and crustaceans. The above-described system has granted that the environment and the maintenance that follows the biological and natural way, favours the management of holding Mediterranean aquatic organisms in captivity.

The maintenance of the *Anthias*, for more than 24 months, is possible with the correct reproduction of their typical natural habitat. The data supplied by the Naples Aquarium (Bentivegna, 2001) states that the proper maintenance of this species is possible in well equipped Aquariums.

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