Cryptocentrus cinctus. Practical experience in maintenance and reproduction

Cryptocentrus cinctus, male inside shelter caring spawn

Text & photos

Introduction

Cryptocentrus cinctus (Herre, 1936 / *Gobiidae*), inhabits large areas of the Western Pacific. The specimens of this species, may have two patterns of coloration: a bright yellow and another gray. Five dark vertical bands on the flank is observed only in the grey pattern. In both patterns, we can see tiny eyespots of intense blue. All my breeding pairs (three in total), initially presented the yellow color pattern, but from the year and a half old were evolving (with differences of months between specimens) grey pattern. At the same time, each new generation born and developed in my aquariums, has provided mixture of young yellow gobies and grey gobies, with trend dominate the latter.

Cryptocentrus cinctus, female at the entrance of the shelter

Formation of couples-methodology

In general, the reproduction of marine species in captivity, finds its main challenge in search of planktonic diets suitable to the characteristics of the larvae of each species. But, when intra-specific aggressiveness is high, an added challenge is the own formation of breeding pairs. Cryptocentrus cinctus is a good example.

In many species that is not appreciated sexual dimorphism, when it comes to form pairs, often gives good results the formula to locate a group of young specimens of sizes and disparate aspects in an aquarium the roomier and specific that we can. But, didn't work with this species. I put a group of 6 young specimens with different sizes and profiles in an aquarium of 150 L, with the hope that a couple was formed spontaneously. In less than three days appeared a dominant specimen, who did not tolerated none of the others. These specimens were wounded of different consideration and I had to evacuate them.

I repeated the experience in an aquarium of 450 L with an unbeatable offer of shelters. Same disastrous result.
So I decided to change strategy. This which I describe below is a brief summary of the Protocol I follow to form pairs in this species:

Phase 1. I use three 30 L. aquariums with a separation in the middle by a network of plastic material that has a 'light' of 0.5 cm. This allows the water to pass freely between both sides and also any chemical message (pheromones). Then places a specimen to each side of the separation, repeating the operation in three aquariums up to three "couple projects". In each separation, each goby has a unique ceramic shelter. In either of the three tanks, the two shelters are in contact both sides of the net and their entrance holes are oriented to face.
This situation allows, in three aquariums at the same time, a mutual familiarization and recognition without aggression.
With the passing of the days you can go confirming one of the two following situations:

Cryptocentrus cinctus, couple two years old; male above

a) Rejection: one of the specimens is showing signs of panic, stress. While the other displays aggressive behaviors through positions with his head up and very open mouth (showing the lower jaw dentition).

If the situation continues, proceed to change the goby "dominated" by another of different profile and the process begins again.

b) Mutual interest: if you notice mutual interest, absence of sharply aggressive attitudes and certain conformity to stay next , then this situation is maintained for 2 or 3 weeks, after which moves to a second phase.

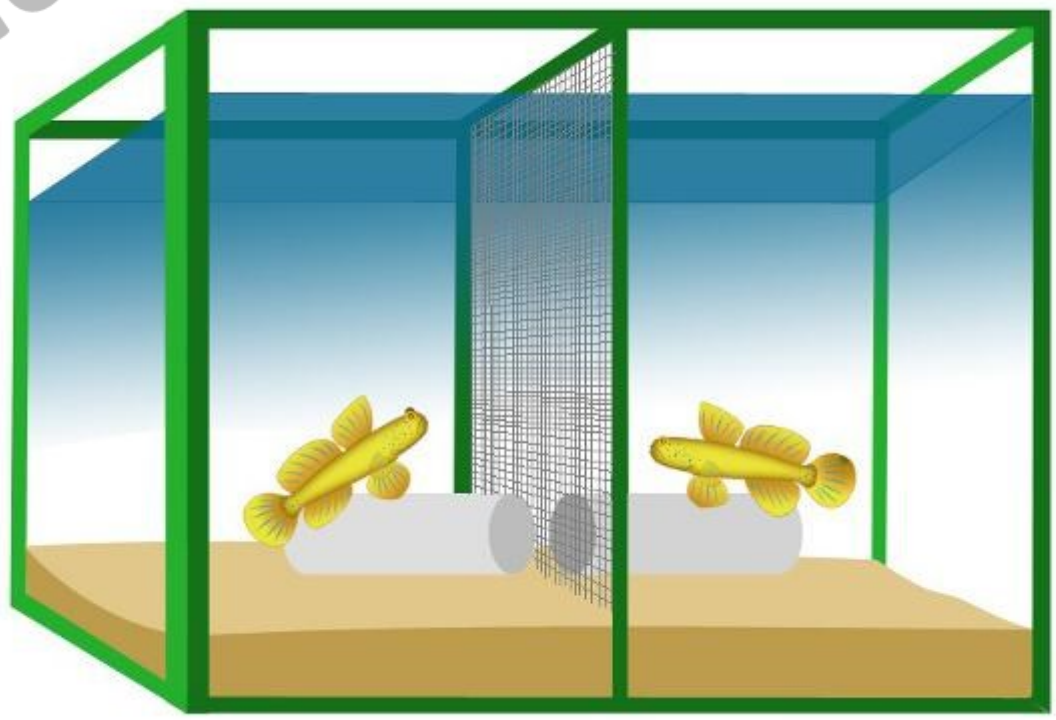
Phase 2. Remove the plastic divider allowing live together for the first time (in this period exceptionally may appear threats and attacks, which force to return to phase 1). The usual thing, is that if their conduct was positive in the phase 1, is now observed a continuous progress in their mutual acceptance: begin to spend nights together in the same shelter, interact jointly in the excavations, to share alerts on threats (my sudden presence), etc. If the situation described remains stable for 3-4 weeks, we may think that we have a "couple in progress" and move on to the final phase.

Phase 3 . With the lowest possible handling moves every "couple in progress" to a 150L. specific aquarium with abundant substrate of fine sand of coral, and abundance of shelters of suitable size. In my experience, the no presence in these aquariums decapod crustaceans of the genus Alpheus, which in the wild can live in symbiosis with Cryptocentrus, seems has not been relevant in that they breed in captivity regularly.

Maintenance and evolution of couples

With the procedure referred to above, I formed three stable couples, from specimens of between 4 and 5 cm which should not exceed six months of age. In specific aquariums and a rich and varied diet (including porridges of fresh meat, fish and vegetables enriched with vitamins A and E), the young couples grow significantly in just two months. During that time, their relationship as a couple becomes much more stable. To summarize and although each couple has its own peculiarities, all have chosen a main refuge, even though they have one or two more "secondary" shelters. Occasionally each member of the couple can stay overnight in a different, but not distant shelter each other. In two of the three pairs, has been very evident with the passage of time, the physical and behavioral differences: a specimen has always been more voluminous than the other and is also the member of the couple that more risking. It is always more advanced positions out of the shelter

Cryptocentrus cinctus, **couple formation aquarium**



by controlling the arrival of food. After the first spawnings, they have been identified as females. Their partners, the males, have been of similar size, but have retained a slender profile and always have been in positions of rearguard in the refuge.

With approximately 7 cm and about 8 months of age, couples started to breed regularly.

Reproduction

The 3-4 days prior to spawning, the female is very gravid even after many hours without eating. Both specimens do not modify their behavior and eat normally.

Spawning takes place always in semidarkness, with the aquarium lights off. The female deposits a voluminous mass of eggs on a wall or on the floor of the main refuge, which are then fertilized by the male. Each laying contains hundreds of eggs, with an average in mature couples of about 500-700 eggs. The spawn looks like a gelatinous mass (sometimes of circular outline) and it is very sticky. Egg observed under the microscope has an elliptical outline, where its main axis measuring 1.5 mm.

Cryptocentrus cinctus, couple with spawn, male in the background

Spawn is guarded by the male, which sometimes doesn't leave the shelter to eat on a regular basis. The female, on the contrary continues to control the periphery of the refuge and continues feeding normally.

Embryonic development is completed in 8-9 days at 26-28°C. Exceptionally have hatched in seven days at temperatures of 29°C. As well as spawning, hatching takes place always in darkness and preferably at dawn.

During the fertile periods, which can last for many months, spawning occurs with a very variable frecuency, with minimum of 16 days and maximum of 35 days.

Cryptocentrus cinctus, spawn guarded by the male

Incubation of the laying and methods for inducing the hatching

I use to isolate the spawn in a small cylindrical container to the 7 th day of embryonic development. The container contains breed aquarium water of with a very slight concentration of bactericide. The laying stays suspended near the surface on a grid platform while a smooth column of aeration is on it. They are in darkness.

Although the larvae are born spontaneously at the dawn of the eighth or ninth day with levels of hatching between 70% and 80% in artificial incubations. There is a small action, overcome the eight days of embryonic development, which causes the birth of the larvae to our will. The procedure consists in displacing delicately the spawn - always submerged - to a small cylindrical receptacle of 1 L. The laying is illuminated and with the help of a thin stick I gently shake it . After few seconds they begin births and every 10 minutes I evacuated the hatched larvae to a development larval aquarium and renew the water of the small container to continue causing birth. In this way, after approximately 2 hours of stirring the mass of eggs, gets about 90% of births and the mass is reduced to a minimum. By then, hundreds of larvae swim already in the middle of the aquarium's development waters.

In fact, this maneuver should simulate somehow the parental behaviour, given that on occasion I have seen in the early hours of the day, the couple, in particular the male, waving mass of eggs with the mouth and the tail fin.

Cryptocentrus cinctus, spawn general appearance ; detail embryos 5 days old

Development of larvae and young

The larva of Cryptocentrus cinctus measured at birth between 2.7 and 3 mm TL. They are born fully developed with proportionally large eyes. They are translucent with minimum pigmentation. Just yolk sac are appreciated, but they have good mobility and quickly the shoal of larvae is situated in mid-water.

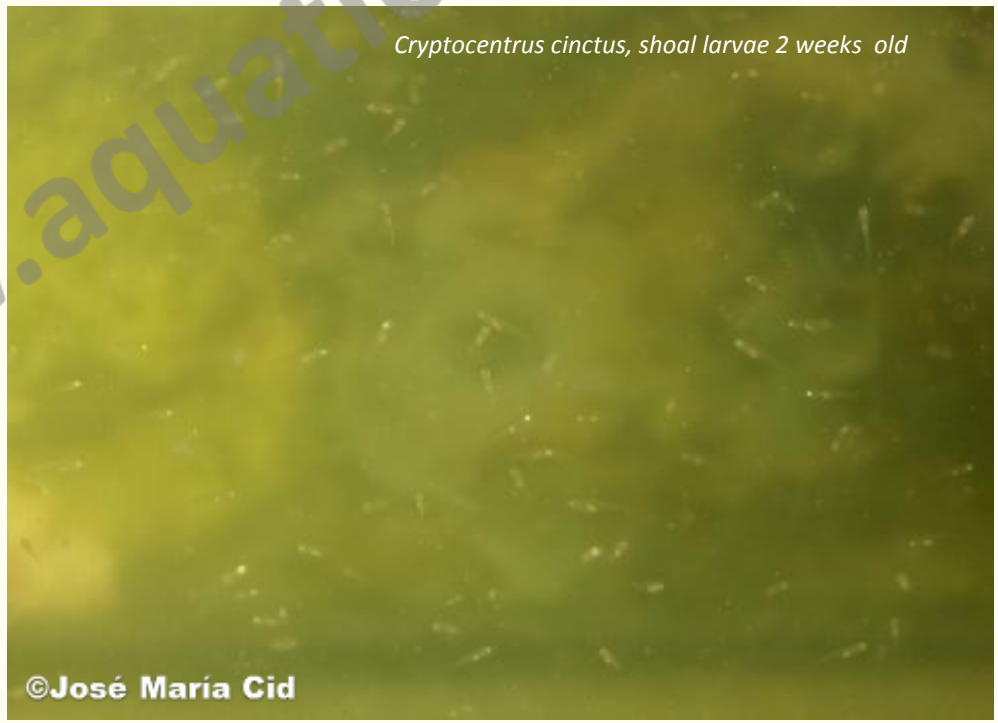
The development conditions in a circular aquarium of 15L. were as follows: photo-period: 24 h, temperature: 25 - 26 ° C, salinity: 33 - 34 gr/L.

1 to 4 days of life: critical period during which, the mortality rises gradually to between 60 and 70%. The larvae remain concentrated in the better lit middle areas. Towards the end of this period a slight growth is appreciably at first glance. Also a swimming more firm.

Feeding: First food, based on enriched rotifers, has been formed through a mixture of Brachionus plicatilis and Brachionus rotundiformis fed with algae Tetraselmis suecica, Phaeodactyllum SP., Nanochloropsis sp.and enriched with omega-3 fatty acids ".

The number of doses of daily food can be variable depending on the number of larvae, quality crops, etc. The key is to maintain a high concentration of rotifers stable in the in the development environment . Never less than 25 rotif/ml.

Cryptocentrus cinctus, larva two weeks old



Cryptocentrus cinctus, shoal larvae 2 weeks old

5 to 14 days of life : the mortality curve is usually smooth, but occur between 8 and 10% of additional deaths. At the end of this period the surviving larvae (20-22%), measured 5-6 mm in length and 2 mm in height.

15 to 21 days of life:

Feeding: Added to the initial diet of rotifers, of two to three times a day (650 µ) newborn nauplii of Artemia salina enriched with omega-3 fatty acids. Larger larvae begin to catch them immediately. When I have had cysts of A. salina of small strains (450 µ), I have been able to advance its supply a few days. It continues to maintain a high concentration of rotifers daily fed algae Tetraselmis, Phaeodactyllum, Nanochloropsis dried and with a vitamin complex.

Development environment: the bottom is cleaned 2-3 times a week. It is a delicate operation due to that is very easy to suck in larvae and damage them. Stays of 24-h photoperiod. T:26 - 27 ° C. Partial renewals of water daily.

Larvae behavior changes, continue feeding in mid-water, near the light, but they are able to descend quickly and stick to the bottom if they detect danger. At the end of this period, the population is now stable around 21%, than for laying of 600 eggs, means the not inconsiderable figure of 126 larvae. Accomplished his third week of life, they measure of average 8 mm in length and 3 mm in height (in the head). They present more pigmentation. They acquire benthic habits, visiting the bottom frequently and attaching to the walls, although they still spend many hours feeding against the current of the diffuser in mid-water.

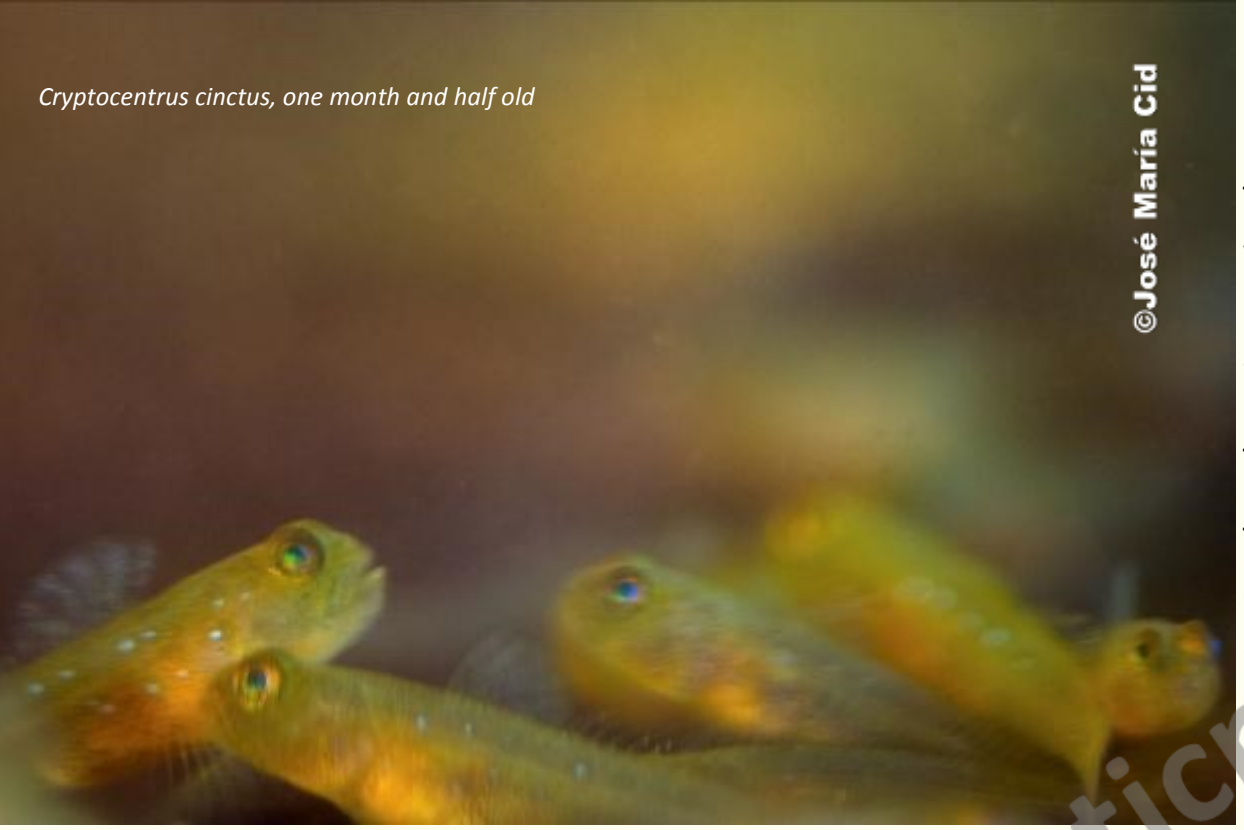
22 to 45 days of life:

Feeding: three feedings daily of nauplii and meta-nauplii of Artemia salina enriched with omega-3 fatty acids.

Development environment: Is passed to a photoperiod of 18 h with 6 hours short nights. The background is siphoning once a day.

During this period, begins to appreciate the great variability of sizes and level of pigmentation among the population. The size of the one month old larvae is 1 cm (the larger one) and 0, 7 cm (the most small) with 3 mm in height (in the head). The body has acquired a brownish green basic colour with presence in the back and flanks of a multitude of melanophores. Nearly all the larvae stay on the bottom or on the walls next to the bottom and manifest a typically benthic behavior. Tensions between larvae appear to be all too together in the background!. This probably explains some deaths that occur in this period, if they are not distributed in more spacious media. When you capture them to photograph, they pretend to “be dead".

Cryptocentrus cinctus, larva 1 month old



Cryptocentrus cinctus, one month and half old

Towards the end of this period, the chromatic difference between fry can be seen at a glance. One of every three young goby has acquired an intense yellow coloration, the rest remains a basic coloration greenish gray. All the specimens show the typical mottle formed by small electric blue ocelli and measure 1.3 cm TL.

Tensions increase among young Cryptocentrus (threats with the erect first dorsal in the same way that I is observed among adults). This does not tend to produce a significant number of deaths. Final survival stabilizes on average by 20%, representing about 90 specimens by laying developed .

After a month and a half of life:

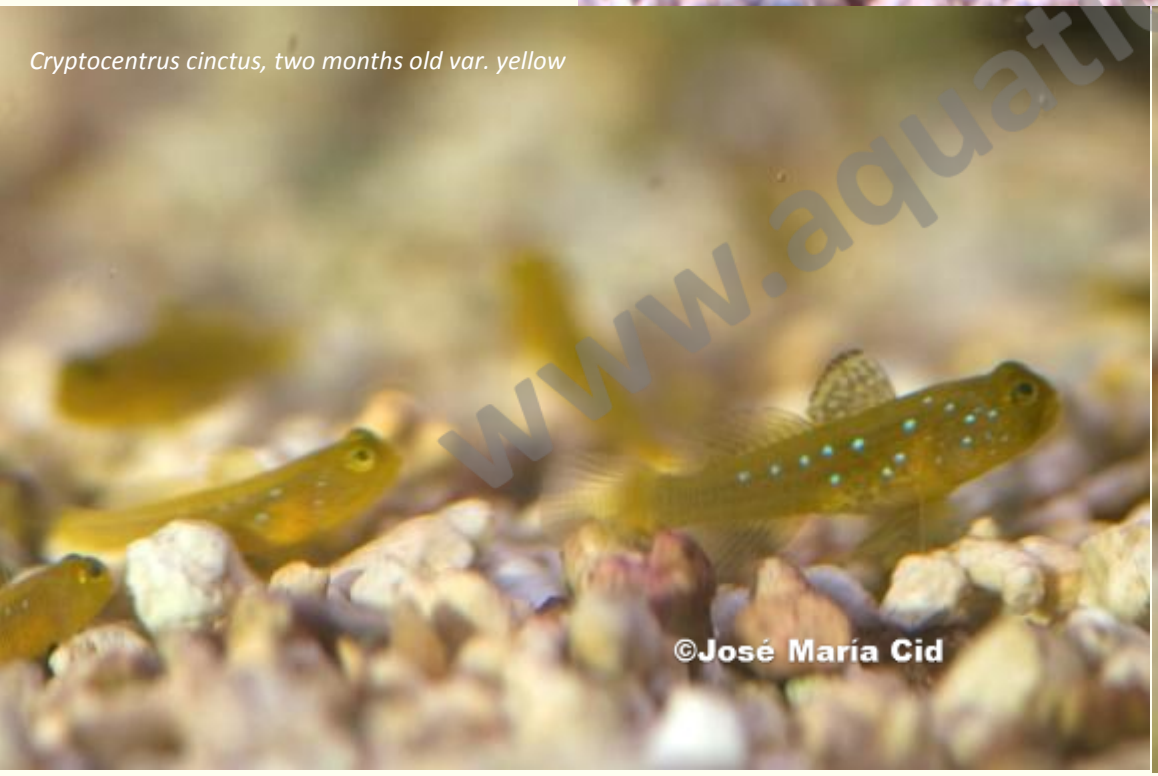
Development environment: The larvae are transferred in groups of 40-50 to aquariums of 60L. with filtration. Handling is difficult since they are very difficult to catch and if it does not act carefully some casualties occur when handling awkwardly.

Feeding: Cyclops are progressively incorporated into diet and frozen copepods. Also A. salina and Mysis frozen (adult sliced), and finely crushed fresh porridge

The average growth was: 1.7 cm at 2 months old; 2.5 cm at 2.5 months old; 3.0 cm at 3.5 months old; 3.5 cm at 4.5 months old.

Cryptocentrus cinctus, young gobies group of two months old

When they reach this age and size, I normally provided to a wholesale importer for distribution to retail stores. The few specimens that I have been able to keep (due to no space enough because of his aggressiveness), often exceed 4 cm to reach six months of age.



Cryptocentrus cinctus, two months old var. yellow

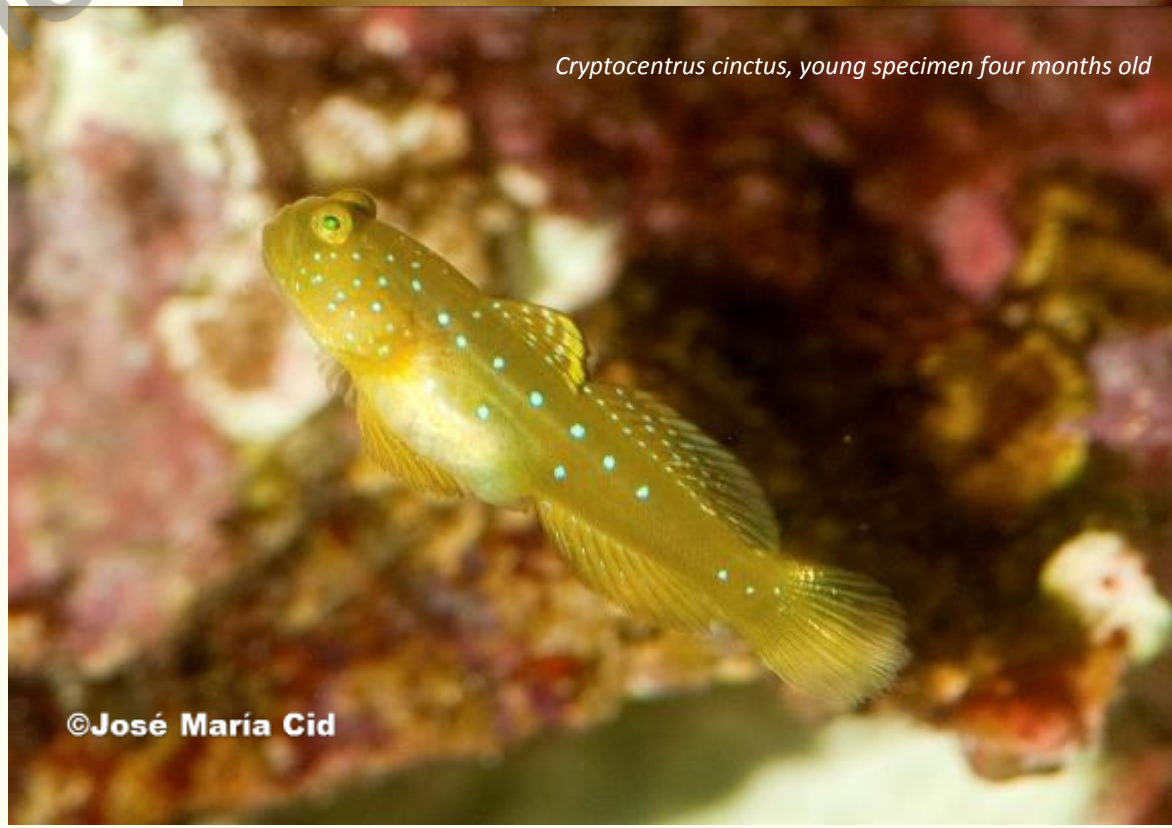
Cryptocentrus cinctus, two months old var. grayish

Endnotes

The fact that a majority of captive-bred specimens present inconspicuous greenish gray coloration, seems to be a fact also widespread in other centers of reproduction (personal communication from a professional hatchery in the USA). The absence of bright yellow pigmentation may be a lack in the diet, but that would not explain 30% of individuals which show yellow pattern with the same food.

Cryptocentrus cinctus, young specimen three months old

Finally indicate, as I said in the section on maintenance, all my breeding pairs, were specimens with bright shades of yellow in their youth. They have evolved over the years to greyish coloration. In general the females first change (from 1.5 years of age) and later (with 2 or 2.5 years old) males. Of course three couples, just six gobies, are not statistically significant.



Cryptocentrus cinctus, young specimen four months old

Cryptocentrus cinctus, female five years old

Two of the three couples, have been breeding regularly until more than three years of age. At the time of writing this article, keep alive two females with five years of age and sizes of 9.5 cm TL (size larger than described for the species in the wild). They enjoy good health.

For more information or contact the author: www.aquaticnotes.com.