Neolamprologus brichardi, a singular Tanganyika cichlid

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Neolamprologus brichardi, macho adulto

This species of attractive appearance and unique parental behavior, is one of the many endemic species that make the Lake Tanganyika (East Africa, originated 3-7 million years ago), a unique ecosystem with exceptional biodiversity, such as is credited by 250 cichlid species and other 150 fish species from different families that inhabit its waters.

As is well known, Neolamprologus brichardi1 (Poll,1974), was initially described as a subspecies of Lamprologus savoryi (L.savoryi elongatus) (Trewavas & Poll, 1952). The species has a laterally compressed body, which together with its long caudal in the form of "lyre", conveys an impression of great slenderness. It's really a beautiful cichlid, with a uniform beige color on which stands out a peculiar drawing behind and below the eye, consisting of two black spots and a third spot in yellow-orange. It also highlights a metallic blue iridescence under the eye and at the edge of the fins. In the literature it is cited with sizes up to 10 cm, but generally, more developed adult males do not exceed the 8-9 cm and females always measure something less.

Conditions of keeping

The aquarium water should reflect the physicochemical parameters of their lake of origin, which may be a little bit different depending on the source consulted, probably due to the different sampling points (Tanganyika is almost 700km from north to south and 50 km from east to west).

Averaging the various references consulted, we would consider a temperature in shallow waters of 25-26 ° C. The pH in the majority of sample points has a value of 8.4 but there are areas with measurements of 9.2. Total hardness is moved in a range of GH: 7-11°d, while carbonate hardness ranges KH: 15 to 18°d. It is an alkaline water, where we found among the salts dissolved and dissociated a dominance of carbonate anion $\mathbf{CO_3^{2-}}$ and among the most important cations: magnesium $\mathbf{Mg^{++}}$ ($Mg\ CO_3$: 144 mg/l), followed by the sodium $\mathbf{Na^{+}}$ (Na_2CO_3: 125 mg/l y Na_2SiO_3: 13,5 mg/l), potassium $\mathbf{K^{+}}$ (KCl: 59 mg/l) and calcium $\mathbf{Ca^{++}}$ ($CaCO_3$: 30 mg/l). Paradoxically it is not easy to use these same salts to obtain the values of pH, GH and KH of its biotope, given the resistance to be dissolved of the calcium carbonate and magnesium carbonate.

N. brichardi, pareja con alevines

There are several alternative formulations to obtain a suitable parameterization of the water; in my breeding experience with *N. brichardi* I used one of the most common: sodium bicarbonate $NaHCO_3$ (505 mg/l), magnesium sulfate-heptahydrate $MgSO_4$-$7H_2O$ (425 mg/l), potassium chloride KCl (58 mg/l), calcium chloride $CaCl_2$ (34 mg/l) y sodium carbonate Na_2CO_3 (21 mg/l).

The aquarium should reflect the main features of which enjoys this species in its original biotope (It is located in many areas of the lake, usually in waters close to the coast and sometimes forming large groups). A simulation of their natural environment should recreate a rocky maze mixed with sandy areas not free of vegetation (in Tanganyika lake there is no a wide variety of aquatic flora due to the peculiarities of its water, but some genera are present: *Vallisneria, Nymphaea, Myriophyllum, Ceratopteris*, *Potamogeton*).

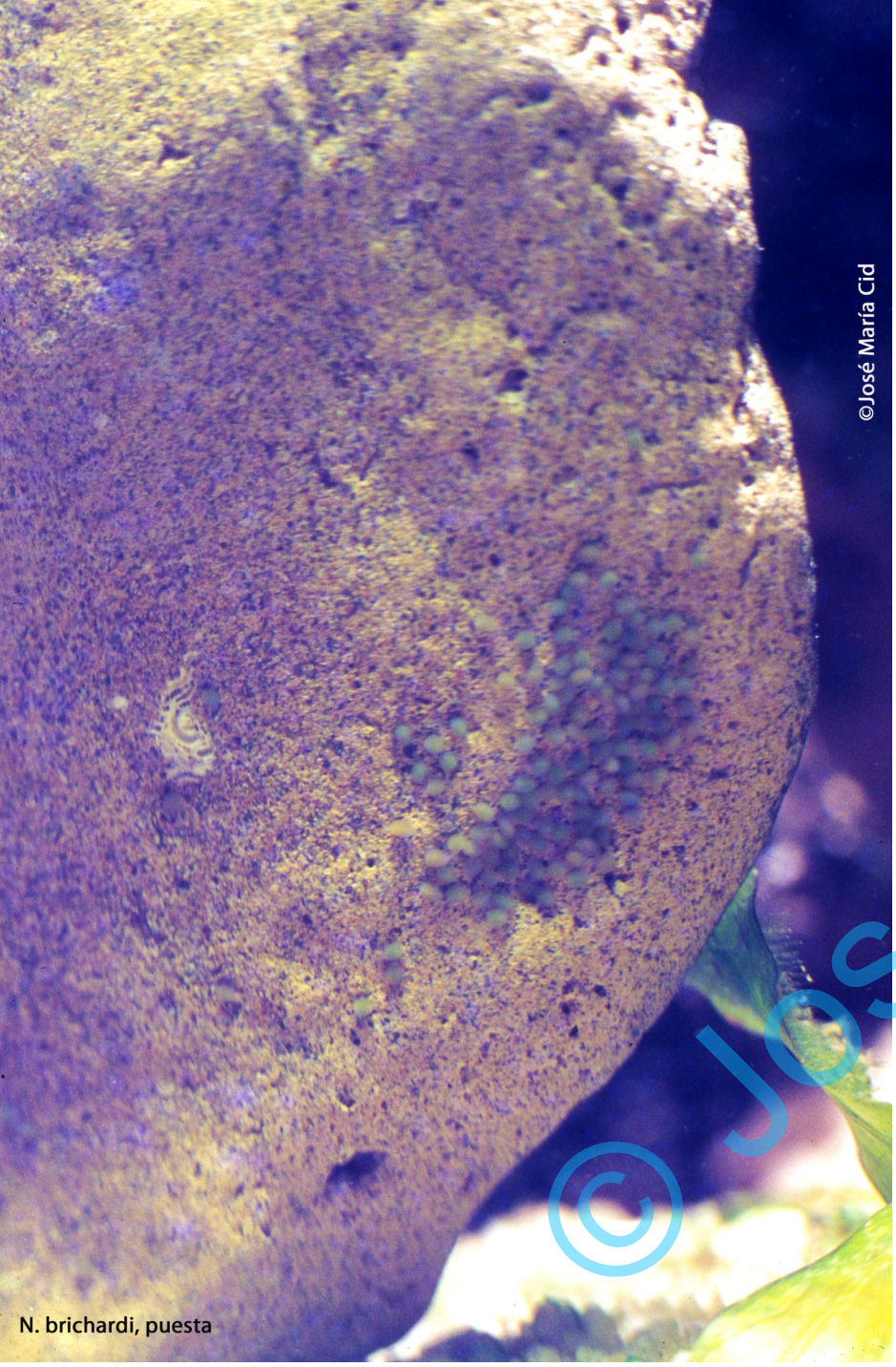
This species can be kept and bred in spacious aquariums coexisting with other species of medium size. Occasionally, I have maintained and reproduced this species living together with *Julidochromis ornatus* in an aquarium of 300l. However, in my opinion, it is preferable to keep a group of *N. brichardi* in a specific aquarium (at least 150 l), where they can fully develop their unique parental behavior. The truth is, that depending on the relative number of fish vs. space available, the species can show very different behaviors, sometimes contradictory, such as the dominant couple tolerates a group or proceed to systematically eliminate it.

In my experience with this species, the scheme has been to locate a group of four young specimens with a size of 4 to 5 cm (about five months) in a 150 l aquarium and decorated as it was described above. The approach was repeated similarly in a second aquarium with other four specimens. In just days, the first group began to interact with great harmony, although there were two of them in particular tune (I gather that the group consisted of one male and three females). In the second group, two specimens have been linked rapidly, proceeding to attack to a third fish, until it reached the surface with significant injuries in their fins (the attacked fish was evacuated). After a few days, the fourth specimen appeared together with the couple (I assume that this second group was initially formed by two males and two females). In general, stable groups interacting together and is widely described as the care of a new school of larvae in this species is a "multigenerational" matter, where adults and youth are involved[4,7]. However, this behavior of "communal parental care" is much more noticeable in very spacious aquariums where you can locate a large group. Yet, within the group, there is always a special interaction between a male and a female that forming a stable couple

N. brichardi, pareja

and generally spawning together.

With both groups, I developed a maintenance routine oriented to breeding, based primarily on a wide and frequent feeding (3 shots by day). Similarly, renovations of 20% water are made biweekly (water is prepared with a mix of salts with "profile Tanganyika", in advance and it's left 72 hours in aeration). They are not problematic fish with the feed: *Tubifex* and brine shrimp (live), *Mysis* and red mosquito larva (frozen) and meat porridge with fish, crustaceans and also some vegetable (spinach, *Spirulina* sp, *Tetraselmis sp*) or manufactured like *Freshtick*™.



N. brichardi, puesta

Breeding

Under these conditions, young Neolamprologus grew rapidly and in just six weeks, the first spawning was observed. It's really, a species very prone to breed in aquarium under minimum conditions of quality. The pre-spawning behavior can be very apparent, if parents decide to dig in its territory to release a hidden portion of rock surface near the substrate where the eggs will be deposited. But sometimes, they made spawning directly into a hidden side of a rock situated in the area that control. If you are attentive, you can observe how between 12 and 24 hours prior to spawning, is noticeable to the naked eye the prolapse of the genital duct through the genital opening.

The size of the spawning varies greatly with the size and age of the specimens. Averaging the spawns made by my two groups, I would summarize by saying that young couples will get put between 50 and 60 eggs, whereas in adult couples (a year or older), the number of eggs varied between 100 and 120 occupying a circular area between 3 and 4 cm in diameter. Spawning frequency is also variable: between 14 to 40 days. In the literature on this species are cited[3] bulkier spawnings.

In general, the female is especially active in caring for the eggs and later larvae, while the male focuses its behavior in the control of the territory. Sometimes, a couple enters a period of "reproductive rest" which can last between two and three months. I couldn't objectify the influence the permanence of juveniles with parents in the duration of these non-reproductive periods.

The egg of *N. brichardi* is brown-green, has an elliptical shape and is between 1.5 and 1.75 mm. The eggs are attached to the rock surface by one of its poles. 48 hours after fertilization, it is clearly visible through the egg, the generation of tissues and organs of the embryo (in embryology that phase is called "organogenesis"). The embryo already has numerous melanophores. At 25 ºC, the larvae hatch in about 72 hours. The larvae are born in a very poor state of development: the eyes are still in formation, there isn't development of fins (a transparent membrane covers the posterior half of the body). They have a large yolk sac very pigmented and remain attached to the surface of the rock, by special glands in the head which secrete a sticky substance. At the time of birth are between 3.5 and 4 mm LT and if they are disturbed made very short and very rapid movements.

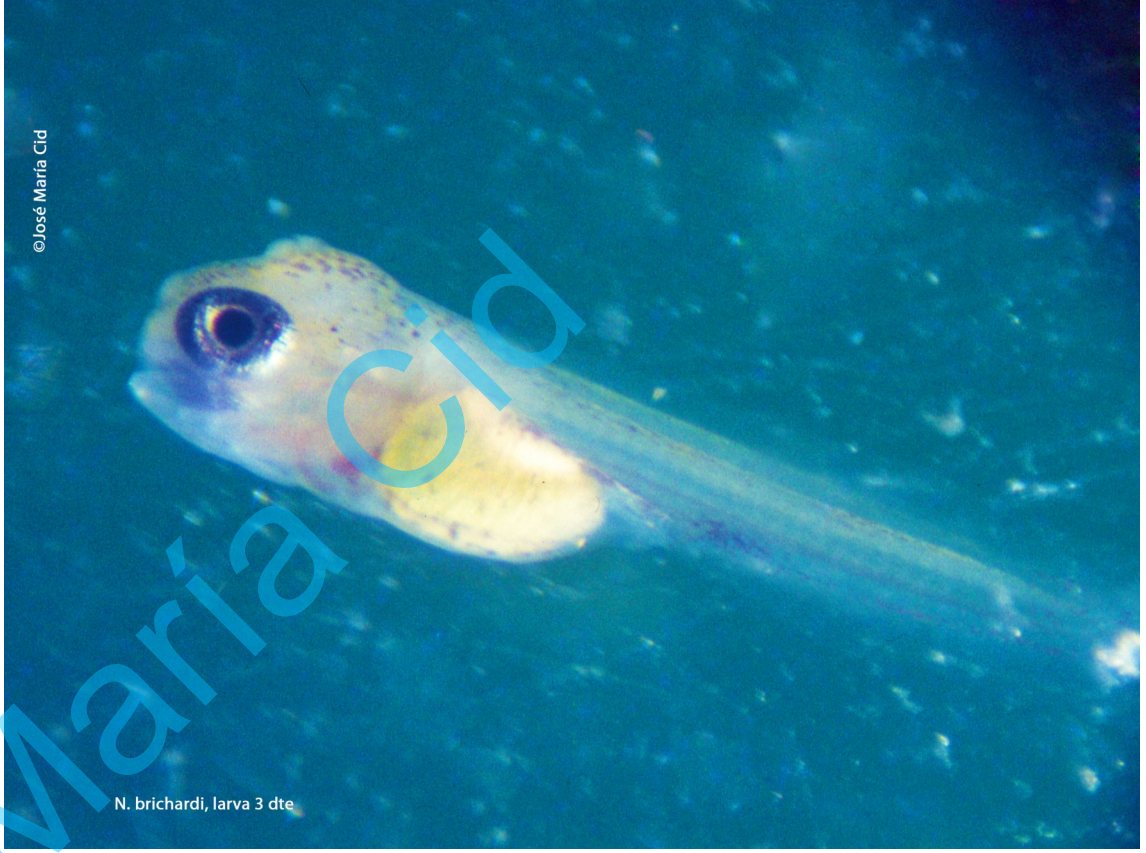
With **1 dph** (days post hatching), the eyes appear more formed, the jaws are closed without any movement on them. They are still nourishing endogenously by their yolk sac.

With **2 dph**, eyes are now completely developed and jaws are shown open and in continuous movement. With **3 dph**, the gill operculum appears open and are already developed tiny pectoral fins. The yolk sac was reduced by 85%. Complied **4 dph**, is when the larvae begin to swim freely very attached to the shelter, at this moment they have already developed the caudal fin and they are more darkly pigmented throughout the body. Between the 3rd and 5th dph (differs in each couple), parents move larvae to a new shelter. Normally, it is different from the first one used to spawn. At the slightest sign of danger, the larvae rush to take refuge into the recesses of the new shelter.

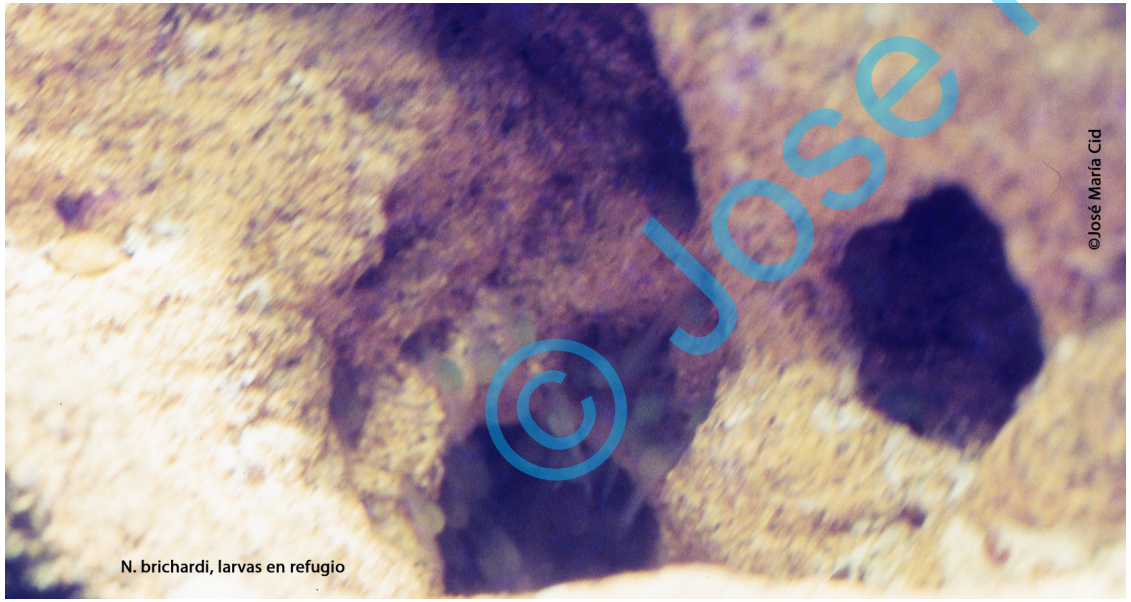
With **7 dph**, larvae swim in shoal in open water close to the epicenter of the territory and at closeness of their parents. The fry are not bothered by the other adults belonging to the group, which seem to exert some protective behavior toward the shoals. If the larvae are dispersed in excess, the parents (especially the female) catch them and then larvae are deposited again in the center of the territory.

Sometimes they have coexisted in my tanks, two generations of fry together with the adult group. Again, as was previously stated, the available space "is everything" when we observe a behavior or another: if there is plenty of room, adults and several generations of different ages can live harmoniously[4]. By contrast, with limited space and large crowding, cases of cannibalism in this species are common.

As soon as the larvae begin to swim freely, supplied them two to three times daily with nauplii of Artemia salina, which are quickly devoured. The nauplii of freshwater copepods of the genus Cyclops are also a good addition in their diet.



N. brichardi, larva 3 dte



N. brichardi, larvas en refugio

The number of fry has always been significantly lower than the number of eggs, but always this loss has been smaller, if we have in aquarium fine sand, instead of using a coarse gravel (in the latter case, the larvae must sneak between the sand grains with fatal results).

N. brichardi, pareja con alevines

Another aspect that helps to preserve larvae during the first weeks of free swimming, consists of providing an ambient light (the light from the room) for 10-15 minutes after turning off the aquarium lighting. Thus, the scattered shoal have enough time to regroup at the shelter where they spend the night. On average, I have obtained shoals whose number has ranged between 20 and 80 fry.

If provided with intensive feeding and good water quality, youth "brichardi" grow at a reasonable rate during the first month. In their diet, we can include worms "Grindal" and small specimens of Daphnia, together with a finely ground freeze dried food.

With this diet, the young reach a size of 1.3 cm in average, when they only have a month old. With three months old, already exceed 2.3 cm TL and they show a charming light beige with the end of all fins (except pectoral) in a bright blue. Although it isn't the best for their proper development, if the aquarium is large enough, they can stay with the adult group without group harmony is disturbed until reaching adulthood. New generations are sexually mature, approximately when they reach 7 months old and with a size about 6 cm TL.

For further information or to contact the author: www.aquaticnotes.com

Notes

(1): Taxonomically, we speak of *N. brichardi* complex[7]. This complex brings together *N. brichardi* and several species more (between 4 and 10 according to the author consulted), which have very obvious morphological similarities. Some of these species are: *Neolamprologus marunguensis, N. falcicula, N. crassus y N. gracilis*. Other authors[8] mention the species within the complex *N. savoryi*.

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