

Betta Tussyae -Score One More Off The Wish List Stephen Cumming

With most of us, there are always a number of species which we have seen or read about and one day wish to keep, unfortunately many of these we will never see in the flesh, let alone get hold of. This is where the benefit of being in an organisation such as the AAGB helps. Not only are there many members who are only too happy to talk about and share their experiences with many of these species, but you may also be lucky enough to acquire some, at both the members day and weekend which are held during the year. It was at the Member's Weekend in April of 2001 that my chance came and I was able to return with 2 pairs of *Betta tussyae*, a fish that I had added to my wish list after seeing pictures of it a number of books.

Betta tussyae originates from Malaysia where it can be found under the overhanging vegetation at the edges of small streams. The water values in these streams are around PH 4-5 and GH 1-2, the temperature is about 25C. This is a beautiful member of the *Betta coccina* group. They have a deep red colouration the intensity of which changes with the fish's mood, the female being slightly less colourful than the male and a light horizontal stripe pattern was noticed on some occasions. Differences in the appearance of the sexes are in my experience straightforward, the males having somewhat longer fins than those of the females. But I have been told that this is an unreliable method as both sexes can have extended fins. The method best used is to observe the fish and select pairs by colour as described above.

The two pairs of fish were both placed in a small tank to settle in before I attempted to spawn them. Over the next fortnight they were fed on a mixture of frozen and live bloodworm and the occasional small pellet granules (all of which they accepted without hesitation). During this time I set up a tank to spawn them. This was a small 12x8x8 tank filled to a depth of 5 inches with aged tap water that had been filtered through peat. This got my water values down to PH4 and the hardness down to GH3. The tank was bare, apart from a clump of Java Moss and some Floating Salvinia; there was also a 2" length of plastic pipe. I have read that *B. tussyae* can be aggressive but other than some flaring of fins and the odd chase and nip resulting in a torn fin I have not had any problems even when the two pairs were housed in the same tank. The same was true of when I placed the pair together in a small tank. The male would frequently display to the female and chase her but she gave as good as she got and no damage was ever done.

After only a couple of days the male had built a small nest inside the plastic tube, this was very compact and about the size of a 10p coin. He sat below this most of the time and made occasional forays to court the female who was by now visibly

rounder and taking more of an interest in the both the male and his nest. Both fish had also changed colour somewhat .the males red colour became more intense and 2 vertical bars were visible on his gill covers, the female on the other hand had lost the horizontal barring and was instead showing vertical stripes similar to *Betta splendens*.

Spawning commenced in the evening but unfortunately the tube had turned sideways and I could not get a clear view of the embrace or collection of the eggs and there placing in the nest. The female would leave the tube now and then to return by herself or when the male came looking for her between embraces. The spawning lasted somewhere in the region of 2-3 hours after which time both fish were left in the tank. The next day the tube had turned round and I could see into it, witnessing the male carefully guarding his nest. He was observed many times mouthing the eggs and adding bubbles to his nest. But did not seem at all bothered by the females presence even when she came fairly close.

The tails of the fry were visible hanging from the nest after a couple of days and I would make a guess that there where around 30-40. After about 5 days they where seen swimming around and I began feeding with an infusoria culture and later with newly hatched brine shrimp.

The young were left with there parents and although I saw no evidence of them eating there fry, there was a gradual decrease in numbers over the next month until I was left with about half the original number. It was at this point that I transferred them all to a bigger tank. They grew fairly well reaching a size of about 2 centimetres in around 3 months. Although they began to take on more adult colouration and finnage much earlier than this. I have fed them on a mixture of frozen foods and small pellets with the occasional live feeding.

I have found this beautiful fish to be very easy to keep and spawn. I have had no problems with disease to date and apart from the losses in the first month, all are thriving. It is my intention to try spawn them again and this time I will separate the young from their parent and see whether this reduces the losses I sustained initially.

BETTA PATOTI PRODUCES TWO TYPES OF EGGS

Norbert Neugebauer, IGL

Everyone was astonished when, in 1988, Arend van den Nuiwenhuizen reported that female *Betta unimaculata* produced some much smaller eggs before the actual reproductive eggs. Juergen Schmidt described them as eggs for

nourishment in his thesis, because they are eaten by both parents and may help the male store energy before mouthbrooding. This was later also noticed with *Betta fusca*. Strangely enough, this cannot be found elsewhere in the scientific or hobby literature. As far as I know, there has not been any further exploration of the 'nourishment eggs' nor of the behaviour of the various types of *Betta unimaculata* group when spawning. It really is quite surprising that apparently no one has taken a greater interest in this unusual behaviour during the process of reproduction. Even in the dissertation of Ralf Britz, who is concerned with the development and the types of eggs, there are no pointers.

Betta patoti from Pusrehut

Knut Bieler brought back some fish from the eastern coast of Kalimantan which we know as *B.patoti* from Pusrehut. I got several F1 from him which I have bred several times. In February 2001 for the first time I was able to watch my F1 pair take part in spawning and was able to take pictures. It definitely seemed that they produced two types of eggs which seems to be a clear sign that there is a similarity, not only in appearance but also in behaviour which points to a close relationship between *B.patoti* and *B.unimaculata* and also indicates that the different egg types appear in several species.

Spawning

Now a short look at my observations of the spawning which took most of the afternoon. I think I registered most of the decisive phases, even if I could not remain by the aquarium all the time. The pair spawned behind the front glass of the aquarium - it was not so good for my photography that they found a place directly in front of my not very decorative filter ! In the 100 l tank were two males and one female *Betta* as well as a slightly larger *Channa bleheri*. I did not measure any water values. As the aquarium gets a regular change of tap water one can say that the pH was about 7, DKH, about 2° and DGH 6° at a temperature of 24°C.

The change of water the day before seemed to stimulate the pair. I noticed the courtship about an hour after I had switched on the fish room light although there is a small window there which admits some light. The pair stood very close to each other and had changed colour. Both partners are normally a light brown all over but now they were medium brown with a lighter stripe from eye to the root of the tail, this being more marked in the female. The belly was lighter. This is comparable with *Betta unimaculata* but of course the remarkable shining scales over the eye of the male are missing. Soon the female started to encourage the male by the presentation of her belly and by swimming over his back. The followed the first circling and trial embrace but it took some time before they became co-ordinated. When the *Channa* came too near, the pair went into hiding

and when the second *Betta* male became too close, it was chased away by the female. Straight away after that, both partners returned to their courtship site and the spawning process continued. This happened just above the floor of the aquarium.

At the real pairing, the female swam into the side of the male, which caused him to embrace her. The male laid himself around her but did not turn her over and the circle of his body around her was slightly open at the top. After a few seconds, the pressure of the embrace eased and the female was able to slip out of it. The male remained on his side in the spawning stupour and the eggs which lay on his flank slowly slipped down to the base of the aquarium. A little later, the male awoke from his stiffness and started to pick the eggs off the floor with his mouth.



Spawning Of Betta Patoti

The eggs from the first three pairings were small and glassy. The male successfully avoided sucking up the small pebbles which were lying around (as it also did later). The female did not take part in this but stood a little higher in the water and guarded the area (just like *Betta unimaculata*). On the fourth spawning, which I witnessed, some much larger eggs appeared with the glassy ones. The male first selected the bigger white eggs and only later collected the smaller ones. With the next spawning there were still some smaller eggs but later on, only the larger, whiter ones appeared. Juegen Schmidt also observed the same with *B.unimaculata*. he also noted a colour change with his fish which I didn't with mine (but of course the serious researcher notices more than the layman).

I must have seen approximately 10 spawnings and after that, the pair withdrew under a root and the female stayed next to her partner for the day. I did not note an active defence of the place.

Discussion

It was particularly interesting that the male first took up the white 'reproductive' eggs and then only afterwards the glassy 'nourishment' eggs. Apparently the male can, not only differentiate readily between the egg types but also sort them out in his mouth and swallow them afterwards, if they really are a food reserve. This would tally with observations of some other IGL members who note that mouthbrooding Bettas take food, even during this time. But it may be that more proof is required that they really are eggs for nourishment. Nieuwenhuizen and Schmidt have already written that they saw swallowing movements after the male had collected the eggs with *B.unimaculata* and they without question thought of feeding but Michael Kokoscha pointed out the analogy with tree-frogs.

As far as I know, mine are the first photos of *B.patoti* spawning and I also think no other description has been published. This should encourage other owners of the *B.unimaculata* group to look at their fish and describe the spawning behaviour.

REPRODUCED WITH PERMISSION AND THANKS FROM IGL 'DER MAKROPODE'
AND TRANSLATED BY MRS R. ARMITAGE (WYNEKEN).

BETTA SP BUNG BIHN
Herve Gonin and Jacques Laird, CIL

Originating from Vietnam, *Betta* sp. Bung Bihn was discovered in summer 2000 by a world enthusiast charmed by Fighters, paradise fish and other gouramis. Its original compartment is complemented by an interesting mode of reproduction; mouthbrooding.

The locality for fishing for *Betta* sp Bung Bihn is situated in the region of Cuchi on the road from Cambodia, about 80 km from Saigon in Vietnam. The wild specimens were captured in a small stream flowing out of the forest and which passed into private property. The water was slightly brown and feebly flowing, muddy in the rainy season. It was soft, without much organic material. The conductivity was +/- 300 micro Siemens and the pH 7.5. The temperature was about 25°C. A *Betta* affin. *imbellis* was also found here.



Collecting Betta Sp. Bung Binh

The big difference between this *Betta* and most of the small species is its large tolerance in captivity. Water with a PH slightly acid or a little alkaline and a conductivity more than 300 micro Siemens is amply sufficient to keep them for many years. It abhors very soft or too acid water. It sneaks through the cover of bank vegetation and between plant scraps that litter the bottom of stagnant water and muddy ricefields.

This *Betta* possesses, like all the anabantoids, a respiratory organ situated at the back of the head, called the labyrinth. This supra-branchial organ permits it to absorb atmospheric oxygen and exploit biotopes that are deficient in oxygen. Its is composed of a number of membranous sinuous folds which are strongly vascularised. The dorsal and anal fins are supported by strong spiny rays. The pelvic fins posses a greatly elongated first ray, resembling those of the *B.pugnax* group. the jaws have conical teeth. In filtered light, a green line appears on the gill cover, the fins are reddish and the pastel maroon-red colours are a little lighter in the male than the female. The sexual dimorphism is very weak. At the very most, its possible to observe that the male is a bit bigger and the fins a bit more elongated. The gravid female is markedly stout. In periods of stress, the fish of both sexes have the same characteristic sombre chequer-board pattern.

In the aquarium, the fish isn't a very active swimmer. Rarely stirring, is prefers to rest on the substrate or on a plant, protecting a vital space. In a group of fish, a dominant male defends a large part of the available territory. His speed of attack is lightening. But the intraspecific relations are very good. Generally, for a gregarious fish, there is a tendency to live in a group without interactions. It needs a an aquarium of reasonable volume, not less than 80 l. Interspecific relations are good with other Asiatic fish such as *Oryzias* or *Aplocheilus panchax*. However, in view of its rarity, a tank devoted solely for this species is advisable. Numerous hiding places such as coconut shells, roots and bricks will give the fish a number of refuges while fleeing from dominant fish. A substrate of previously

boiled oak leaves will fill the spaces between plants and render the water slightly acid and tannic. Strongly-growing plants are introduced. at the surface, *Riccia fluitans* with its tender green bundles provides a screen for strong light which is much appreciated by the fish. More than this, it also consumes nitrates and plays a role as an oxygenator. Several bunches of *Hygrophilia* or other decorative and tolerant 'ferns' complete the flora. In addition to the fact that they accept high temperatures, of the order 27-28°C, indispensable for fighters, they can multiply easily without the need for ground feeders. Iron supplements will aid their development.



A pair of Betta Sp. Bung Binh

The aquarium, longer than high, should have a large surface area and be equipped with good filtration without any strong turbulence. An interior box filter powered by an airline is sufficient; for a volume of 80 l, one at each corner at the rear of the aquarium.

The water should be of the following characteristics; pH between 6.5 and 7.2, KH 6.6-10°, GH 10-15°. The temperature should be in the region of 27°C. In water that is too cold, the fish stay prostrate and show a stress pattern. The conductivity can be 400 micro Siemens/sq cm which is much higher than conditions generally accepted by fighters in general. Water changes of a third of the volume should be frequent, using water of similar physico-chemical properties. A mixture of tap water, left for 48 h to disperse the chlorine, with rain water or reverse osmosis water, is perfect.

Betta sp Bung Binh is a big eater so the quality of food is not very difficult. All the usual food is consumed; from classic flake, small worms, to all living and frozen foods. Preparations based on mussels or beefheart are equally well

received. Small prey is rapidly snapped up, larger prey seized, then they return for more. The species is not very fragile under the conditions described.

Breeding is very easy. Contrary to received information, these fighters are not bubble nesters but mouthbrooders. The water characteristics for maintenance prove quite adequate for breeding. Sometimes nothing is noted, except for the disappearance of one or two fish. Their reappearance after 10-13 days of brooding confirms the prediction of breeding when several fry appear. These are not usually eaten by the parents or the other occupants of the tank. They are not very prolific but the first matings very often have positive outcomes. The eggs are white, largely oval and measure 1.5-2 mm. The nuptial display, started by the embraces in which the male encloses the female by curving his body around her. He then retires into a cave to incubate the eggs discretely and in peace.



Mouthbrooding Male Betta Sp. Bung Binh

The fry are relatively big. Their length, at about 6-7 mm allows them to consume *Artemia* naupilii. It doesn't matter that food is shared out according to size, their survival is partly guaranteed by the infusoria in the Riccia and decomposing vegetation and the remainders from the gargantuan meals of the adults. Their growth is rapid. It is prudent not to disturb the volume of air at the surface, particularly at 15-20 days when the labyrinth is forming.

A cold current of air can be fatal to fry taking their first breath at the surface ! At 5 months, they are about 8 cm and able to reproduce on their own account.

In conclusion, *Betta* sp. Bung binh is an attractive and original fish. It is without doubt not the last *Betta* that remains to be discovered. Vietnam seems to abound in undescribed fish.

Heok Hui Tan of Singapore University comments these fish are likely to be B.prima although somewhat redder than those he has seen from Cambodia or Thailand.

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