



ISSN 0953-0029

LABYRINTH

Anabantoid Association
of
Great Britain



Newsletter No. 167 February 2012

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BADIS SINGENENSIS, THE MOST UNIQUE BADID GETS A NAME – OR DOES IT?

Stefan van der Voort



Note: 20 December 2011—recently an article by me was published in a German hobbyist magazine and was without notification altered to such extent that it no longer represented my view from the written and submitted version. What follows here is the original, unaltered version.

Introduction. New species belonging to both *Badis* and *Dario* (family Badidae) are discovered frequently with more collections being made by (native) hobbyists and ichthyologists alike. A new species of the Indo-Burmese genus *Badis* is described late 2011 from the Singen River, Brahmaputra basin in Arunachal Pradesh, India, raising the number of formally described species to sixteen. Within its genus *B. singenensis* represents the most unique species to date – that is, unless *B. sp.* ‘Buxar’ with which it is most likely conspecific, proves to be a separate

species. In that case both the aforementioned species are equally unique. Why they are so exceptional will be explained in this summary of the new species description, along with notes on care in captivity. With all evidence pointing towards the two badids being the same entity, the species from Buxar will herein be treated as *B. singenensis*. The only thing that casts a little doubt upon this is the distribution of both – which does not mean the newly described species

cannot have a wider distribution than initially presumed.

Differential. *Badis singenensis* can be differentiated from all other known species of *Badis* by having: (1) a black blotch posterodorsally on its opercle; (2) three distinct dark blotches at the dorsal fin base, the first blotch behind the third spine, the second behind the sixth dorsal fin spine, the third behind

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the fifth and sixth soft dorsal fin ray; another distinct dark blotch at the anal fin base behind the fifth soft anal fin ray. Other differences fall in morphometrics and meristics and are best taken by reading the original PDF description.

Etymology. *Badis singenensis* is named the type locality: the Singen River in Arunachal Pradesh.

Distribution. The type series was collected from the Singen River, Saku-Kadu Village, East Siang District, Arunachal Brahmaputra drainage, north-eastern India. Material labelled 'Buxar' was collected from Buxar, (Bihar, India) Shipra, a buffer zone of the Buxa Tiger Reserve at the Jalpaiguri District, West Bengal by Andrew Rao (Malabar Tropicals) in 2006. All data surrounding care, breeding and photographs are based on the latter material.

Sexual dimorphism. Males are brighter in colour. The description furthermore mentions that during the breeding season (running from April to June) males develop a red mark on their dorsal and anal fin lappets and that in a few female specimens red coloured marks were observed in lateral scales. Females also have a larger body depth and are smaller in size (about 45 mm TL in males and about 40 mm TL in females).



Badis sp Buxar fe male (S.v.d.Voort)

Husbandry. The bottom should exist of gravel, sand or a mix of both – *Badis singenensis* is a bottom dweller. Stones, pebbles and wood can be used to provide natural cover along with e.g. coconut shells scattered around for the males so they can form territories and breeding sites. Keeping a neutral a pH (around 7.5), a hardness of 7 °dH and a water temperature around 22-23 degrees Celsius one can choose from a wide variety of aquatic plants. In nature the water temperature can drop well below 20 degrees Celsius to around 15 °C so in captivity a colder period might actually be welcomed by the fish.

Live and frozen foods are consumed with great enthusiasm. Glass worms [Weiße Mückenlarven], adult *Artemia* and *Mysis* are among their favourites. Also live *Daphnia* will be taken readily, however avoid the frozen variety. During spring and summer one could collect live mosquito larvae [Schwarze Mückenlarven].

Reproduction. *Badis singenensis* is a cave breeder where the male protects the lot. After circa three days the eggs

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hatch but fry remain in the cave while they feed on their yolk sacs. Another three days later they have depleted their sacs but still remain in the cave. Soon they have become free swimming and will move out. The male and all other inhabitants now consider them food.

The young accept live baby brine shrimp immediately. It is best to feed them twice a day. Regular water changes with water possessing the same characteristics as that of their parents will provide a healthy situation. A rearing tank requires much more maintenance so keep it clean on a daily basis. Switch to larger foods as they grow.

Note: Whether or not *Badis* sp. 'Buxar' proves to be truly conspecific with *B. singenensis* needs to be studied, by examining and comparing the former to the latter.

Acknowledgements

Thanks go out to K. Geetakumari for permitting the use of photographic material for the printed version and helpful insights, to I. Schindler for translating this brief into German. I am grateful to A. Rao for the gift of live specimens in 2006.

References

K. Geetakumari & Kento Kadu. 2011. *Badis singenensis*, a new fish species (Teleostei: Badidae) from Singen River, Arunachal Pradesh, northeastern India. *Journal of Threatened Taxa*, SEPTEMBER 2011, Vol. 3, No. 9.



Badis sp Buxar male (S.v.d. Voort)

MAINTENANCE AND BREEDING OF BETTA MACROSTOMA

Sylvain Mathieu



Maintenance

Given their size and their need for quiet, I take care to fill the tank with hiding places; half coconut shells, slate, caves ... and a rich planting. At the water surface, plants (*Pistia* ...) are particularly appreciated, they help filter the light and enable the fish to escape from view. The tank should be large, at least 150 L for a pair. I use very soft and acidic water for breeding: pH 5 to 5.5 and a conductivity of 150 S / cm, at a temperature of 24 °C.

The species is relatively fragile, water changes should be frequent and significant (20% each week). low power filtration is used. The flow of water out of the discharge of the pump is broken (eg by a trickle bar). The bottom of the tank is left bare for easy cleaning. Good hygiene appears to be beneficial.

The adult pair I kept regularly showed a reluctance to eat (especially male) which is not the case for the young

which accept all kinds of food, living (*Drosophila*, Grindal, daphnia, mosquito larvae) Frozen (brine shrimp, bloodworms ...) and granules. Contrary to what is concluded from the observations of Pat Yap in the wild, I have not seen bad interspecific relationships. On the contrary! To compensate for the timidity of my adult I had placed a few *Betta smaragdina* in my tanks. One of the couples spawned in the tank and neither the adults or even the fry were bothered.

Betta macrostoma is a fragile species, sensitive to bacterial infections. It seems to resent such changes in the tank, and demands a very good water quality and a relatively low temperature.



Reproduction

Betta macrostoma is a male mouthbroode. But it is actually the female that initiates egg laying. When her belly is stretched by the ovarian mass, she is ready to spawn.

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The coupling is typical of "Labyrinths." The male bends his body in "U" around the female, which is, in turn, almost upright. During the embrace, the eggs are released and immediately fertilized by the male.

The eggs are then taken into the mouth by the male, helped by the female. Here comes the most interesting behavior to observe. The female faces into the male in the mouth against mouth, and blow the eggs towards the male who opens his mouth in one synchronized motion.



Spawning goes on for more than 4 hours, 2 to 10-12 eggs being issued at each embrace.

Finally, the male withdraws out of sight, hidden in the leaves. The female guards the territory, protecting the male from intrusion for the duration of incubation, although vigilance decreases over time. This is understandable, as the male incubates for more than 30 days at 23-24° C!

The fry are released at an imposing size, 7-8 mm, and are immediately

able to feed on *Artemia* nauplii and Microworms, the yolk sac being already absorbed.

Use of *Terminalia catappa* leaves would be beneficial to most species of "Labyrinths." I observed in this species that spawning often occurred after placing one of these sheets in the tray. (However, they also spawned without placing the leaves in the tank.) It is difficult to comment with certainty on this point. Perhaps other factors were important before I knew it (water changes more substantial, atmospheric pressure, food). I think the temporary variations in temperature-induced changes of fresh water are rather the explanation.

Growth of the young :



The male took several hours to spit out the fry forty (maybe it is true, disturbed by a biped watching the show.). Some fry were even spat out even the next day. The fry were recovered directly from the although I left with a few young with the parents to avoid any risk of loss due to a change of conditions, by placing them in a floating tank (30 liter plastic container with sides cut out and

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covered with fine mesh, all floating with pieces of polystyrene glued on each side of the tank).

I did not notice in the parents any sign of cannibalism toward their young. Properly fed, their growth is rapid. Water changes are important for good health. Unlike the maintenance of adults, the young are in a tank with gravel as substratel and are none the worse for this.

Since 2006, I was able to raise three generations but in subsequent generations, unfortunately I noticed that they became more and more

difficult to reproduce and their size decreased. I do not believe in an effect of inbreeding as fast. (Why would it be much faster than in other species of Betta?)

On the plus side, F3 generation fish are much less fragile and easier to keep than wild caught fish. I guess we have yet to master a difficult maintenance parameter, probably the food that appears in its original environment which consists almost exclusively of crustaceans

.



TRADITIONAL FIGHTING FISH FARMING IN THAILAND - SECRET HERBS FOR COLOUR

Jens Kühne www.mahachai-tours.com

Surisa Somadee www.hoyaworld.com



Concrete vats for breeding splendens under shade (background) and for water fleas (foreground)

It is rooted in the culture of Thailand just as deep as the use of the elephant is as a working animal, and every Thai child knows his name - Pla Kat as they call the Siamese fighting fish. This is the way a few Thais distinguish the known naturally occurring species, each of which may be a "Biting Fish" (the literal translation). Of course, depending on current fashion at various times the preferred population were probably mainly *Betta splendens*, fighting fish

from the central part of Thailand, relied upon originally and primarily for the creation of today's breeds.

Today, most are modern farms around Bangkok, such as the one I know with 10 000 bottles . But the basis of many businesses are small holder, family-owned farms, distributed throughout the whole of Thailand, and sometimes established for a smuch as 100 years .

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History

Thailand has a long tradition of fighting fish farming, which goes back at least 300 years, topped perhaps only by the much more successful goldfish breeds of China. In earlier times, these fish were in large clay pots and vessels were (in Thai, "Ong") that are still some places used as tanks to hold the catch. For breeding these "Ong" quickly become impractical due to their height, so shallower vessels (the "Krataang") became used in Thailand. It is often claimed that this often beautifully decorated pottery was invented just for the fighting fish.

It is proven that the development "boom" of the Pla Kat - breeding began about 1890. The vessels are still around today, but these are rarely used for "Bettas" now but more for container planting. Since all of these containers in Thailand, have received the collective term "Moo", the Siamese fighting fish, which were grown in pots, are known by the name of "Pla Kat luk Moo" - "Biting Fish, children of the pot." To view and to evaluate the fish, glass containers came in. Of course, this was not possible in earlier times except by the most wealthy and aristocratic elite, so until not so long ago, only those in the civil service and fairly well-paid officials could afford the breeding of Siamese fighting fish.



A "Kratang" - handsome container with swamp plants, formerly often used for the Pla Kats

The fish

The traditional breeding aimed to use the territorial behavior of Siamese fighting fish, to harness their aggression in order to use them in competitions, which for our present understanding is not the interesting thing. However, their strong and robust form and bold color, meant these fish were much admired in the aquarium.



Wild-caught *B. splendens* from Ranong / Thailand

The most interesting behavior of *B. splendens*, and probably also of his close relatives *B. smaragdina* and *B. imbellis*, is their survival of the dry period of the year in the dwellings of the rice field crabs, the Puu-Na. They

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use the labyrinth organ that allows them to convert atmospheric air to breathe. As the marsh slowly dries, the crabs dig their dwellings deeper to reach the water table level. The adult fish then follows the crab. The wet season sets in and the swamps become suitable again for the large Bettas to breed there and that's when the big males are collected by the successful breeders looking for new blood.

Although no one really knows what the original *B. splendens*, really looked like,

this is probably the ancestor of modern cultivated varieties. Reagan also described the Siamese fighting fish in 1910 based on "pla kat luk Moo", it certainly has influenced breeding forms. Today's cultivated varieties derive from a gene pool of mainly *B. splendens* but also the two species *B. imbellis* and *B. smaragdina*. Strong males are at least twice as large as their wild relatives and a very stocky shape.



Siamese fighting fish still reminiscent splendens, but these animals are already nearly three times as large.

Around 1950, more of the colour that already may be found in wild fighting fish populations, came into play. The first "Pla sang ka sii" (fish such as metal/zinc) were selected and widespread. This fish with a bluish silvery sheen to their scales can be seen

even today in most farms. The Thais say that these fish can be grown using a certain strong herb cocktail which is of course kept as a secret family recipe.

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Visiting a farm

We will be warmly welcomed, as is the Thai custom, not only because of the business. A glass of water is always served. When the landlord and owner learns that we want to photograph for a magazine and its associated large audience, he leads us around, not without some pride. Even his wife and daughter are involved. Sure you have to handle the sale with the accompanying packaging. The subdued pride of our host is not surprising, but nevertheless "Pla Kat" breeders are important to Thai people and their advice is asked.

Mr. Suksoombum gives expert information, he understands the breeding of these magnificent fish. In modern times, under the open sky he has built usually round cast concrete pools - the capacity is about 300 l to 500 l. An umbrella shade of nets as protection against excessive overheating is stretched over the tanks.



View of an adult holding tank with colorful Plakats, including some "Pla Sang Ka Si"

A look at the pool is rewarded. Most are full of "Pla kat" of all ages. They

shimmer like a real adult "Pla sang ka sii" should shimmer - in blue – silver, and wait for the daily selection. Food, is traditional, mainly with "Luk Naam" - black mosquito larvae of various species. In some farms even frozen foods are fed, but mostly red mosquito larvae.



A champion and model animal - this fish has not much in common with *B. splendens*. head-chest area almost black, shows much blue sheen and no reds

I ask, of course, after his breeding recipe for "Luk Naam" and learn that he "pulls" them into the high, about 10 liter pots, that I mentioned earlier. He uses boiled rice, pineapple or Durian skins for the enrichment of water. Any gaps in the pots must be covered up. A look into one reveals that this procedure is successful. Worthy of imitation for me, because I see black mosquito larvae as one of the finest fresh food. Even the feeding of breeding animals separated in the bottles and glass containers goes traditionally. The black fly larvae are picked up with a feather and distributed.

Another living food well-known in Europe, water fleas, *Moina* (Luke khrai), are also raised by themselves. Concrete pools are redesigned for this use, its

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water recognizable by the green color of the algae bloom due to a specific recipe for eutrophication. In this "broth", the approach works magnificently, and may take several days to cultivate. Mr. Suksoombum uses at least 10 of these ponds in his installation . Aeration is not used.

These concrete tanks, which stood vacant for a long time are also selected for breeding fish. This probably has the advantage that microorganisms there are already microorganisms available in the substrate mulm. In addition, the old method with the mashed egg yolks is used, but it requires care .



The water tank for the individual consumer is also filtered by Pandanus

The important water quality is achieved with known and unknown agents. Almond leaves (*Thermalia catappa*) are added to the small aquariums with plenty of farmed fish, so that the water appears dark amber. *Pandanus amaryllifolius* are grown in buckets in the pool. They purify the water, probably because their roots take up the degradation products of the fish from the water very well. Perhaps they also give off some different substances in the water, which act to strengthen the fish, as *Pandanus* also gives out rich aromas during cooking. A *Justicia* species - the whole plant - was also added to the small aquariums, explained as a protective for outer skin layer of fish. Work is also needed on the added *Dracaena* leaves. It is known that genus *Justicia* produces some medically useful plants.



Training vessel - here the separated fighting fish are brought in the mood for a few hours a day

Even with the most important medium of successful fish farming; the water, nothing is left to chance. Rain water, or even tap water can be inferior. The successful Pla Kat breeder takes the water from a well-dug pit behind the plot. This water is probably of kept free of contaminants by plants and the soil

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itself. To my joy, the strong grass, *Hygroriza aristata*, grew in many water reservoirs, some of which which was kindly given to me.

At the time when we visited the farm, there were quite a few customers, so that it can be assumed that the sale of the fish goes well. After all, it costs on average about 300 baht a fish, which is about 7€.



Packing the fish

I learned that fish from other places are in great demand: at this time from southern Thailand and Malaysia. When they learned that I travel now and then to Malaysia, I was asked by people from Bangkok, if I could bring them "Pla kat" from Malaysia. Why it should be just as imbellis from Malaysia, I could not quite explain. Probably the word Malaysia recalls something exotic in Thailand and raised expectations. On the other hand, I caused people from

southern Thailand great joy when I brought them fighting fish from Laos.

We left after packing up a couple of Pla kats. We even got a special price, but we were not given the House of Kräutersuud's recipe for strong fish, to take away with us.

THE AAGB AUTUMN MEETING 01-10-11

The meeting started at 10.00 with about 40 members attending from all parts of the country.



Colin Dunlop was the first of our speakers and gave us his presentation on how he successfully keeps and breeds Betta macrostoma sharing with us what works for him. He later put a trio of juvenile B. macrostoma that he had bred in the auction.

After a short tea break Colin gave us his second presentation on British amphibians, this made a great break away from fish and every one found it really interesting.

Our famous ten minute presentations followed next.

Peter Riley gave an amusing and interesting talk on adapting house hold sponges in to filter sponges, definitely a Blue Peter moment.

After a lunch of mixed sandwiches, baguettes, chips, salads and hot apple crumble and custard we came back to a presentation from DMA.

Dave Armitage chose a presentation on his 30 years in the AAGB, the places he had been collecting fish and the meetings in Europe of our sister groups. He described the fish he had come across and had kept, but most of all the memories of the people he had met and the great friendships formed. For many of us who had been around for a while it was a trip down memory lane for us too but the newer members were given an opportunity to see just how much Dave and the AAGB have achieved over the last 30 years.

At the end of the day we was an auction of Labyrinth fish the auctioneer was our very own Mr. Peter Riley



Fish available as follows :-

Three types of **chocolate gourami** S. Acrostoma, selatensis, vaillanti.

Bettas pingus, ocellata, tussyae, pallifina, ideii, compuncta, edithae, strohi, imbellis, knehnei, mandor, simorum, patoti, stigmosa, falx, simplex, channoides, uberis, smaradina,

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pugnax & splendens (different fin variations)

Belontia signata

Ctenopoma acutirostre

Microctenopoma fasciolatum

Badis badis, B. tulvaiei & Dario Dario

Luciocephalus ara.

Trichogaster sota

Trichopsis pumila

Parosphromenus rubrimontis,
pahunensis, deissneri & ornaticauda

Channa bleheri, asiatica punctata & ornatipinnis

The auction had something for all our members and at a reasonable price.

The spring Members Weekend is booked for the 14th & 15th April 2012, early confirmed speakers include Colin Dunlop, Dr Peter Burgess and David Armitage.

CONGRATULATIONS TO MIKE, STUART & SARAH AND FOR FLYING THE AAGB FLAG



Sarah, Mike and Stuart receiving their award at Weston from Dick Mills.

Under the name of the AAGB from the start of 2011 Mike Kirkham, Stuart & Sarah Brown have travelled the length and breadth of the country showing their fish with some real success. Their winnings boast the championship classes in the North East, 14 points in Yorkshire Association of Aquarist Society (Y.A.A.S) end of year Show

Table (usually we start on zero and end on zero) and more success at the Federation of Northern Aquarist Society (FNAS) shows.

At the Federation of British Aquarist Society (F.B.A.S) weekend meeting at Weston – super- Mare their efforts made the AAGB the highest pointed Society/Association.



Mike being awarded Best in Show by Ian Stephenson who sponsored the AAGB 30th Anniversary Show.

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Front cover: A hybrid - crossed in the previous generation of wild *B. splendens* one, this animal is not as strong, but he shows very well the zinc-colored sheen of the scales " Pla Sang Ka Si" By Jens Kuhne

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LITERATURE

*Gouramis & anabantoids. H.Richter, TFH

*Bettas, Gouramis..... J.Vierke, TFH

*Labyrinthfish. H.Pinter, Barrons Labyrinthfish,

H. Linke. Tetra (see below)

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1992 *Pseudosphromenus dayi*, *Betta bellica*, *Macropodus opercularis*, *Ctenopoma damasi*; all by K.Webb.

1993 *Parosphromenus deissneri*, *Betta splendens*, *Anabas oligolepsis* by K.Webb, *Ctenopoma nanum* by D.Armitage

1994 *Malpulutta kretseri* (male) *M.kretseri* (female) by D.Armitage; *Colisa lalia*,

Ctenopoma weeksi (*oxyrhynchum*), *C.muriei* (female), *Channa gachua* (portrait) by K.Webb

1995 *Sandelia bainsii*, *S.capensis* and *habitats of each* (4 slides, tri-fold leaflet p&p £3)

1996 *Parosphromenus nagyi*, *Ctenopoma fasciolatum*, *Trichopsis vittatus*, *Betta persephone*, *B splendens*: Twin-tail and

Cambodian. 6 slides by Kevin Webb,

Ctenopoma intermedium and its Okavango habitat 2 slides by Dr J. Cambray

Fish name, photographer and year are printed on each slide, to protect copyright.

75p each or plus 24p P&P (£1.00 Overseas)

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