

# Livebearer News

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BRITISH LIVEBEARER ASSOCIATION



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### Data Protection Act

In order to comply with the requirements of the Data Protection Act, we need to inform members that their name, address, email address and telephone number are being maintained on a database, the purpose of which is for the distribution of the Association's magazine and to inform members of forthcoming events. This information will not be provided to any other organisation for any purpose whatsoever without prior consultation. The association agrees to remove any details at a member's request.

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**Erratum** :- The photograph on page 34 of the March newsletter, "Livebearer News 65" was incorrectly labelled. The caption should have read "*Gambusia vittata fry*" and not "*Skiffia multipunctata fry*".

## **Editorial**

I have many people to thank this time. Thanks to David Hart and Vincent Nobel for their hints and thoughts below. Thanks to Dr Dieter Gentsch for giving permission for me to use his article which originally appeared in "Viviparos", the magazine of the VDA. Thanks to Paddy Davies, our Chairman, for his article about the Blue-tailed goodeid. Many thanks also to Dr John Lyons of the American chapter of the Goodeid Working Group for his article about the optimal water temperatures for goodeids. This is especially relevant during the summer months when fish houses can get very warm and some people keep their goodeids outdoors. Finally, thanks to newish BLA member Stephen Galloway for his photos.

And now to you! Thanks for reading this but now it is your turn to contribute to this newsletter. Any photos, articles, thoughts or snippets will be gratefully received and incorporated into future newsletters.

Have a look at the "Diary Dates" section at the end of this newsletter. As I write we are still waiting to hear whether the final restrictions will be lifted on June 21<sup>st</sup>.

Assuming that the restrictions are lifted at last and that this damned virus does not rear its head again we should be in for two cracking events. We haven't been able to sell our surplus fish or buy those hard-to-find wild-type livebearers for over a year and so we are expecting sell-outs at both events. Please note that they are both **ticket only** and that tickets can be bought via the BLA website. The committee members, especially Steve Oliver, have put in a lot of work already, so thanks Steve and let us all keep our fingers crossed.

## **Snippets**

BLA member David Hart got in touch after the "Tales of woe" in the last newsletter to say that hand sanitizer could be responsible for mass die-offs of fish. A friend of his had told him about multi-deaths in one of his tanks that he blamed on the sanitizer. We have all been using sanitizer during these Covid-affected times [haven't we?] but how much do we know about their effects on fish? Sanitizers contain bacteriacides which might have been tested on mammals but possibly not on aquatic life. One chemical used is Triclosan which has been shown to have a high toxicity to aquatic algae and bacteria and can have a huge effect on fish. The moral is; wash your hands before putting them into fish tanks if you have hand-sanitized.

## **Musings from the fish room**

Water changes. We all do them don't we? When I first started keeping fish one of the older guys at the now defunct Ellesmere Port Aquarium Keepers Society [EPAKS] told me :- "Two rules. Never over-feed and do lots of water changes". And I do. But talking to other BLA members, different regimes emerge. Sara told me that she runs four tanks inside her house and does smallish water changes on each tank on Mondays, Wednesdays and Fridays. She uses water straight from the tap and adds hot water from the kettle to bring the temperature up to that of the tanks. The last time I visited Nigel he had over 100 tanks on the go. He told me that he spends all day Sunday doing water changes and adds fresh water straight from the tap. The temporary cooling does not seem to cause his fish any problems. Bill seems to have

similar ideas to me. I run 20 tanks. Water from the tap goes into a barrel (outside) where it is left to stand. I fill buckets of water from the barrel and then leave them to stand in my fish room for at least 12 hours. The temperature rises to a little below that of the tanks. I do water changes on four or five days a week, adding the fresh water a little at a time so that any temperature changes are gradual.

So is there any "correct" strategy? Maybe it depends on how much chlorine / chloramines is added to your tap water. The last time I was in London a glass of water from the tap tasted like the swimming baths and that concentration of chlorine is not going to do your fish any good. [Oh dear, now I am going to sound like a chemistry teacher.] gases become less soluble as the temperature rises so allowing tap-water to warm up will drive off some of the chlorine. If your tap-water is heavily chlorinated you could also bubble air through it for an hour or more and the effect is to increase the surface area and speed up the removal of the chlorine.

What is your opinion on this?

*Greg Roebuck*

### **Response to "Are we green?"**

New BLA member Vincent Nobel was quick to reply when he received his copy of the March newsletter. In particular, he replied to my summary of Dr John Lyons' article about the environmental effects of our hobby. Below is Vincent's reply :-



Thank you for the newsletter.

I, like you, consider myself an environmentalist, but honest review would probably show that it is a claim hard to maintain on evidence.

In response to your article I would make a few observations.

I suspect that habitat destruction is by far the greater threat to most fish species seen in the hobby. Certainly a bigger threat these days than overfishing. Part of the appeal of fish keeping is the bewildering array of different species, many unique to very small areas. As a result, habitat destruction in that area can easily wipe out entire species.

Of course many of the fish we keep come from countries where corruption is rife and it can be incredibly hard to be certain that fish were obtained legally and responsibly. If there are ways in which we can improve responsible practices I would hope that all hobbyists would welcome that, even if it puts the price of the fish up a little.

There is another angle of our hobby that may struggle to boast green credentials. As environmentally conscious hobbyists we should consider the carbon impact of our hobby.

Locally bred fish have fewer miles on them than wild imports, for example (or Asian bred imports) and that matters a lot these days. When I buy a fish in my local fish store I cannot tell where that fish was bred. I would love to know that. Was it bred commercially or by a hobbyist? Even whether fish are wild or captive bred is often not available information. I have become a member because I am looking for some wild / pure strain swordtails to breed (though the tequilas also sound like a good project) and I can only find commercially bred

hybrids. At least the hybrids are easily identified as such, but for many fish that identification is hard to do. I think that should be mandatory information. Some people may prefer captive, others wild, but to not know seems odd in this day and age.

What about water changes? Making clean drinking water is an energy and resource intensive process and as fish keepers we use more than our fair share. What about heating our fish rooms (maybe less of an issue for many live bearers). Except for those of us that can claim to use only renewable energy the carbon footprint of our hobby is probably substantial.

What about all the single use plastic bags and styrofoam boxes in which fish are shipped?

Like you, I want to continue keeping fish, but an honest survey of the green credentials of the hobby should probably include these aspects. I fear that when we look at our hobby objectively we may be somewhat appalled, but that could be the first step towards making meaningful improvements.

Kind regards

Vincent Nobel

### **The Bluetail Goodeid, *Atainiobius toweri*, by Paddy Davies**

Common Name:

Bluetail Goodeid or Striped Goodeid

Introduction:

A species of Mexican Goodeid Livebearer. *A.toweri* is an ideal first goodeid to keep as it has simple requirements and is less aggression than many other species, also it is fairly tolerant of wide range of temperatures, particularly higher ones.

While possibly not as striking as some Goodeid species, it is one of the prettiest with a graceful streamlined shape, the stripes of the females and the blue of the males tail are very attractive, especially if under modern good quality LED lighting.

Distribution:

Mexican

Occurs only in the North Central Mexican State of San Luis Potosí, in the Rio Verde Basin.

Populations and ESU's

ESU is short for Evolutionarily Significant Unit.

Each unit expresses an isolated population with different genetic characteristics within one species

There is only one ESU for *A.toweri* - Atato1

There are however several populations distributed in the UK currently, including Rio Verde and Media Luna. It is advised that you keep these populations separate and always distribute any fish with the full information. This helps to ensure the pedigree of your fish and enables them to be of use for conservation breeding. It also protects them in case this species is ever split into multiple ESU's.

The conservation status of this species is considered as Endangered/declining: so it is important that we keep maintaining his species in captivity.

### Keeping in Captivity

Temperature: 18- 26 degrees (Can go slightly cooler or slightly warmer for short periods, but not advised for longer periods) This species can be maintained at higher temp all year (24-26)if required, but will do best if they can have a cooler period to replicate their winter period.

This species is not as cold hardy as other species of goodeid. Mine are kept in room temperature in the UK (17 degrees in winter (01/01/2021) - 28 in summer 2020).

Personally I am not sure this species will be suitable for outdoors maintenance in the UK as the temp may swing too much within a day, which may be too much for this species which does not naturally experience very severe swings (unlike other species).

### Aquarium size:

Fairly accommodating species; it can be maintained in aquariums of 60 litre successfully, but they will appreciate and benefit from larger aquariums (100 litres or larger) something like 90cmx30x30 would be a nice size.

I used to keep and breed in smaller tanks, but have seen far better results in larger (longer) tanks, the fish appear less skittish and more confident, also far less prone to eating their babies.

### Aquarium Style

The natural habitat has a slow - moderate flow, with gravel as substrate and roots, branches, fallen leaves and submersed plants. Algae will be growing on the surfaces which will provide much of the diet of this species as well as small insects and crustaceans that they disturb in the algae.

### Filtration and Maintenance:

Filtration is of course a personal choice; previously I have maintained them using mid-sized internal power filters with a flow of approx 400lph. This was perfectly fine but ensure the flow is not too strong as I did find that they fish would avoid the main flow.

Currently I have change to a single Air Powered medium sized sponge filter (Approx 150lph air flow) in a 120cm Aquarium, a second could easily be added although i feel this is not required. Even with this set up the *toweri* prefer the really slow flow areas further from the filter.

This would be a perfect species for a Hamburg matten style filter or a simple shop bought sponge filter.

### Water changes:

Once again this species can be maintained in various ways, although it does come naturally from very clean clear waters so it would be wise to prevent a build up of excessive organics.

Personally my fish don't seem to enjoy large water changes larger than 50% and seem to take a while to recover, particularly in the cooler months.

My current practice is to do approx 40-50% water changes weekly or twice weekly in the summer when it is warmer, and 10-20% weekly in the winter.

#### Bare Breeding Aquarium:

While there are always advantages to this style of aquarium as they are easy to clean and observe. I feel this fish does settle down better in a planted/decorated aquarium.

#### Planted/Display Aquarium:

As a display species it makes for a great display in a planted aquarium, the adult cruise around in the top 2/3rds of the aquarium while the babies tend to hide at the top amongst the plants until they get a bit larger and bolder.

This species can usually be bred as a colony with the newly born young surviving along with the parents.

Initially, especially if you just have one large adult pair, you may have an issue with the parents predated on the babies, if this is the case you should remove the female to a separate aquarium, or a good size commercial livebearer 'trap'.

This will enable you to remove the female after the young are born so they are not eaten. Then they can be raised separately for a few weeks, then added to the adults aquariums, this then means they get used to the presence of smaller fish and are less likely to eat new-borns next time.

#### Sex Differences:

The best way to sex these is to look for the notched anal fin or splitfin in males. Also males have a slightly bigger dorsal fin than females.

Males also have a bluish tail (caudal fin) most noticeable in mature males at breeding time, when this blue can extend over the whole body. Females always keep those two horizontal lines and a clear caudal fin.

#### Breeding:

Gestation period is approximately 60 days; while they can reproduce year round, I tend to get 2-3 broods of approximately 10-20 young from a female. The babies are usually fairly large and able to cope with going straight in with the parents, although they usually stick together for protection and confidence.

#### Tank Mates:

This is always a difficult section to write as I am strongly of the opinion that it is easiest and best for most species of goodeids to be kept in single species tanks. It is just easier to provide the requirements for one species rather than multiple and generally you will get better productivity.

However! This is a species that can be mixed with other species with care. One reason for this is that it can be kept warmer than some other species of goodeids,

this opens up more options for tank mates. They are also less argumentative and nippy, so slow moving, more passive species like *Corydoras* sp. can be considered.

I keep mine with young from other goodeid species, ones which are more predatory of their young, raising them for a few months with the *toweri* until they are big enough to go in with their parents - currently *Xenoporphous captivus*.

*A. toweri* is unlikely to hybridise with any other goodeid species, so can be mixed fairly safely with other more peaceful species, particularly those that occupy different areas of the aquarium - *Skiffia* or *Zoogeneticus* species should work.

Of course poeciliid livebearers can be considered, but bear in mind that they can occupy the same space in the aquarium so should be mixed with care. Previously I have kept with *Xiphophous nezyhuacoytl* and Guppies.

Cichlids - This may sound strange, but *toweri* has been kept with several Central American species, mainly smaller more peaceful species from the *Ex-Cryptoheros* and *Thorichthys* species. But also with larger, more herbivorous, species like *Cinclithys boucorti* and *Obscura heterosplia*.

Obviously this should only be done with care; an appropriate sized tank and decorated tank to provide plenty of hiding places. You should also have the ability to remove fish to a safe space rapidly if required.

My own feeling is that the benefits don't outweigh the potential risks. I keep several species of smaller Central American cichlids which could fit the bill but just don't see the point.

They naturally do occur with *Nosferatu labridens*, but I think the cichlids would quickly munch the livebearers in the home aquarium.

In conclusion us hobbyists can and should breed this pretty livebearer at home, it is a delight to keep and we can do a small bit to help the conservation of this species.





Photo : *Paddy Davies*



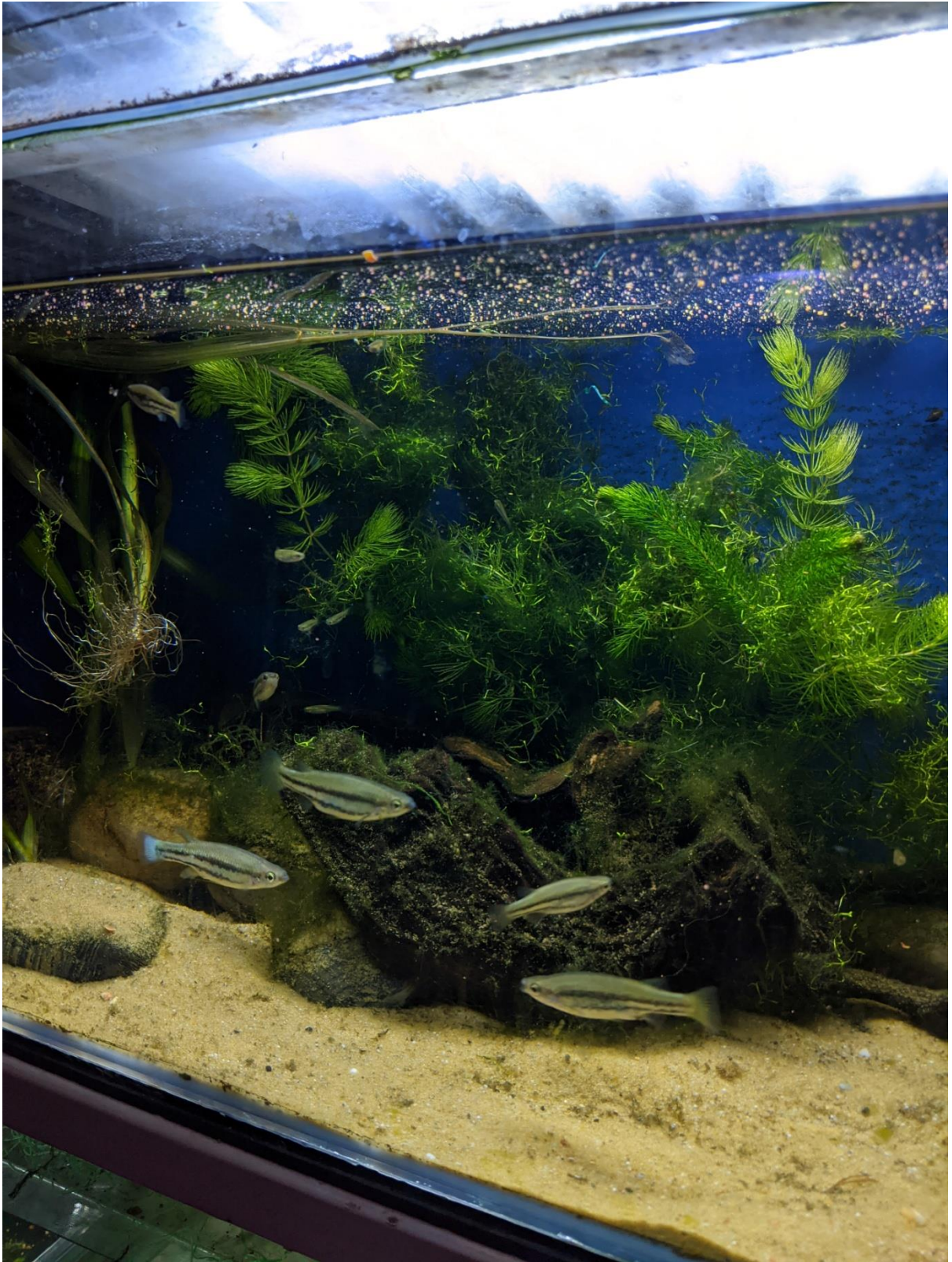


Photo : *Paddy Davies*





Photo : *Paddy Davies*



Photo : *Paddy Davies*

# Viviparos : 1.2021

P22 - 27

## The story of the “dwarf jewellery” livebearing toothcarp [=“Tiger teddy”] *Neoheterandria elegans*

*Dr Dieter Gentsch*

Since the first live import of the dwarf jewellery toothcarp, the “Tiger teddy”, to Europe in 1988, the population in aquaria has developed well. Since there are already many articles published on the maintenance of these fish a brief overview is given here. The original biotope of this species is especially difficult for a fishing excursion. In addition, a particularly aggressive civil war raged in this area for decades. Today it would certainly be possible and very interesting to investigate the distribution area in the region of the Rio Truandó in more detail in order to complete the memorable story of the Tiger teddy.

### **Some brief information about keeping in an aquarium**

In the numerous previous publications, it has always been more or less pointed out that keeping and propagating this species are relatively easy. This applies to the first aquarium generation and to numerous later generations. The latter, in particular, should be emphasized because numerous species, e.g. *Poeciliopsis turubarensis*, are difficult to multiply until after a few generations. Tiger teddies can be kept in a small aquarium according to its small size (females 17 – 25mm, males 12 – 20 mm). Of course, optimal keeping is also possible in larger aquaria. The only disadvantage is that maintaining them with other, larger, viviparous toothcarps is not recommended. Another possibility would be to keep the Tiger teddies along with the dwarf livebearer, *Heterandria formosa*. Nevertheless, this is not recommended because the optimal temperatures for keeping the latter are below 24°C and for *N. elegans* above 24°C.

In addition to certain similarities in the pattern, *N. elegans* and *H. formosa* have one thing in common, namely superfetation. The females have two or more broods at different stages of development at the same time. First BÖHM (1990) pointed out. Several authors argue that the females usually give birth to one to three young at intervals of a few days. I determined the following more precise litter numbers and dates for three females (Gentsch 1991) :



Female 1		Female 2		Female 3	
Date	Number of young	Date	Number of young	Date	Number of young
16.12.1989	3	19.04.1990	1	25.04.1990	1
18.12.1989	2	22.04.1990	1	17.05.1990	1
24.12.1989	1	03.05.1990	1	19.05.1990	1
02.01.1990	4	07.05.1990	4	21.05.1990	1
08.01.1990	3	09.05.1990	1	24.05.1990	1
13.01.1990	1	13.05.1990	2	02.06.1990	3
14.01.1990	2	17.05.1990	3	03.06.1990	3
17.01.1990	3	19.05.1990	4		
23.01.1990	6	21.05.1990	3		
28.01.1990	8	24.05.1990	2		
04.02.1990	1	29.05.1990	4		
06.02.1990	5	05.06.1990	2		
		12.06.1990	1		
		17.06.1990	1		
		18.06.1990	2		
		27.06.1990	2		
		20.07.1990	1		
Total	39		35		11

Table 1 : Overview of litter numbers and dates of three females.

After the last brood mentioned above, all three females still looked healthy for a few weeks without producing any more offspring. KEMPKE (2020) also determined more precise original data.

There is an important difference in the gender distribution between *N. elegans* and *H. formosa*. With the former, the sexes have always been evenly balanced, whereas *H. formosa* often has an excess of either males or females.

*N. elegans* is a typical omnivore; of course the young need correspondingly small food, e.g. the newly hatched naupli of brine shrimp. This species is probably only sensitive to very soft water.

The only disadvantage of this colourful livebearer is the small size, but this can also be an advantage.

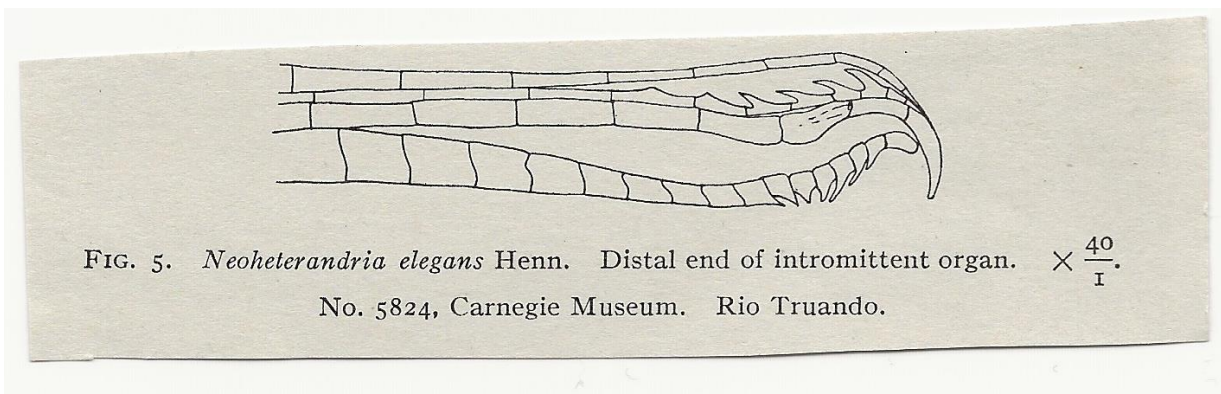
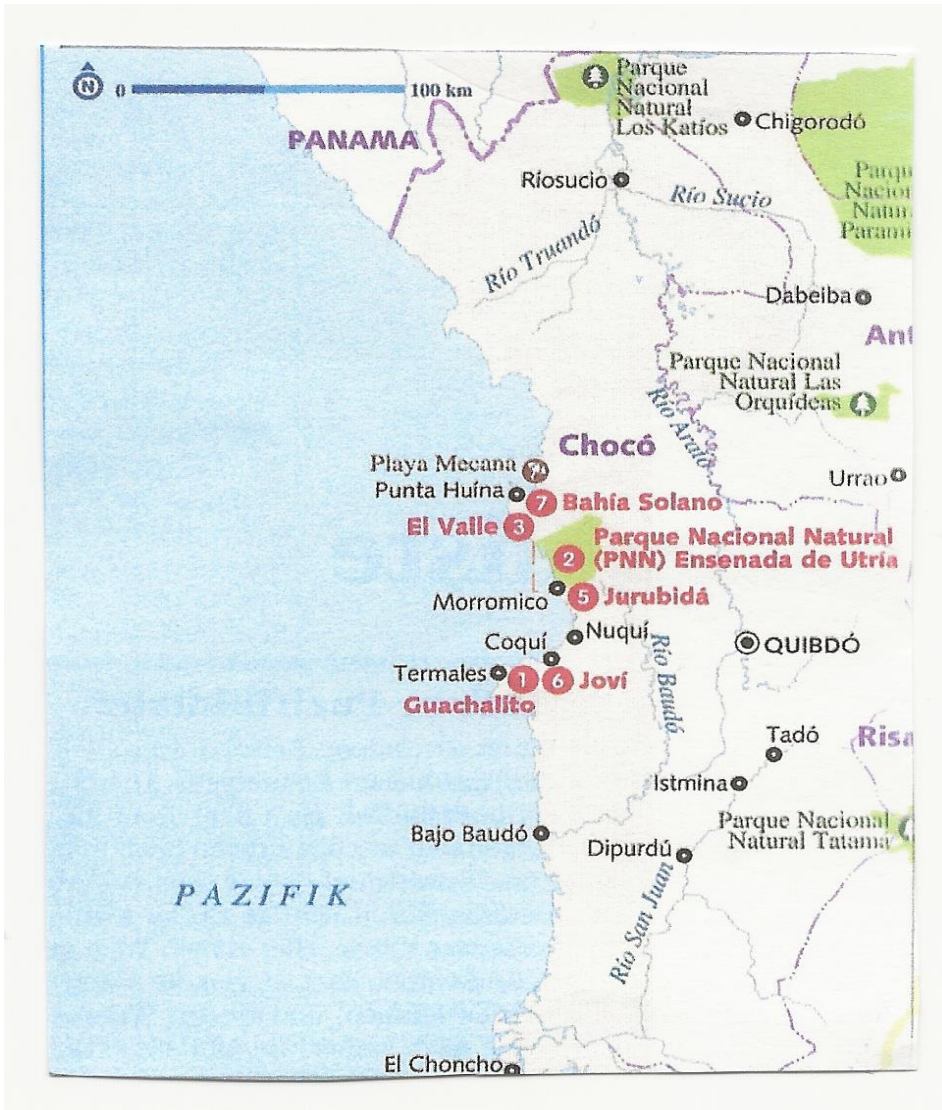
### Two reasons for the difficulty in finding the natural biotope

The extremes in precipitation, temperature and relative humidity in Quibdó, the capital of the province of Choco, Colombia, for the period from 1961 to 1990, are as follows in Table 2 below. ([www.Wetter-Kontor.de/Klima](http://www.Wetter-Kontor.de/Klima) Quibdo, Prov Choco).

The data shows the highest rainfall in Colombia and also in almost all of the world. The Rio Truandó lies in a swamp, although the boundaries of the river cannot be clearly defined. The precipitation is therefore more than ten times that in most places in Germany. The only source of literature on the biotope (BÖHM 1990) does not reveal the extent to which the tiger teddy occurs. The Rio Truandó is about 100

km long. The year-round high temperatures in connection with the extremely high relative humidity shows the burdens on the members of fish-catching excursions. It is not surprising that tropical diseases such as yellow fever, malaria, dengue fever, chikungunya and others are a great hazard. With most viviparous toothcarps there is a relatively favourable period of time for fishing but this is not the case here because of the year-round consistently high rainfall.

	Temperature in °C		Precipitation		Relative humidity	Sun
	Max	Min	mm	Days		Hours/day
Jan	30.0	23.0	558	22	86	2.9
Feb	30.4	23.0	486	18	85	3.0
Mar	30.5	23.2	513	18	85	2.8
Apr	30.9	23.2	605	21	86	3.1
May	31.3	23.1	705	25	86	3.6
Jun	31.4	22.8	754	23	86	3.8
Jul	31.4	22.8	770	25	86	4.5
Aug	31.2	22.8	868	27	86	4.3
Sep	31.0	22.9	688	24	86	3.6
Oct	30.6	22.6	621	25	87	3.8
Nov	30.5	22.7	695	24	86	3.7
Dec	29.9	22.9	648	24	88	3.0
Year	30.8	22.9	7910	276	86	3.5



*Gonopodium of N. elegans from the original description by Henn (1916)*

From the 16<sup>th</sup> century onwards, after the conquests by Europeans of all the South and Central American countries, there were there were many (civil) wars. But from around the middle of the 20<sup>th</sup> century the armed conflicts in Colombia were the most cruel of all South and Central American states. In 1948, the liberal, popular politician



GAITÁN was murdered, which led to bloody unrest across the country (Anonymous 2018). In 1964 the Colombian military dropped napalm bombs on Guerilla areas. This led to the formation of the Fuerzas Armadas Revolucionarias de Colombia (FARC), later the left-wing Ejército de Liberación Nacional (ELN) and the M-19. From the beginning, all organisations obtained their resources mainly through drug trafficking and violence, always trying to destroy one another. In 1974, President MICHELSEN tried in vain to fight the guerrilla groups. The Attorney General BONILLA was assassinated for advocating an extradition treaty with the United States. In 1990 the drug cartels declared war over the extradition agreement. The drug lord Pablo ESCOBAR was murdered in Medellin by the Colombian police with the help of the USA in 1993. In 2000, Columbia and the USA agreed on the “Plan Colombia” to halve coca cultivation by 2005. Despite the payment of a total of \$6 billion, coca cultivation did not decline during the first decade after that. With an uncompromising attitude towards the FARC, URIBE was elected President in 2002 and set in motion an effective action program and was re-elected in 2006. In that year, 20,000 AUC paramilitaries lay down their arms because they were promised mild sentences for their massacres and human rights violations.

The somewhat improved security situation can be seen most clearly in the fact that in 2010 around 1.4 million foreign visitors came to Colombia. In 2012, peace negotiations between representatives of the Colombian government and the FARC began in Havana with the aim of ending the acts of violence. In 2014, after two years of negotiations, the FARC declared an indefinite ceasefire against the Colombian army. In a referendum in 2016, the controversial peace agreement was narrowly rejected, mainly because the FARC was guaranteed extensive impunity despite its crimes. In the same year, however, after a few changes, the peace agreement with the FARC was ratified by the Colombian Congress.

The definite improvement in the security situation and living conditions in Colombia can be seen in the fact that refugees from Venezuela have been coming to Colombia more and more since 2018. Nevertheless, the province of Chocó, in particular, is a border area with neighbouring Panama and is still dangerous as it is a drug transit area. As in almost all tropical regions of the world, large parts of the forest have been cut down. The river basin of the Rio Truandó seems largely to have been spared.

### **More details on the history of *N. elegans***

The animals used to scientifically describe the species were caught in 1913 by Charles W. WILSON during the Landon - Fisher Expedition of Indiana University to Colombia. The animals came from the Rio Truandó, which flows into the Rio Atrato. The Rio Truando is located in Chocó, one of the 33 departments in Colombia. When published by HENN (1916), the genus *Neoheterandria* HENN, 1916, and the species *Neoheterandria elegans*, 1916, were described. It is noteworthy that both are still valid today. HENN described the genus as a transitional form between *Heterandria* and *Pseudopoecilia*. He emphasised the great similarity in coloration with *Heterandria formosa* and also the difficulties in description because of the small size. He did not find any gravid females, which led him to suspect that the animals were not yet fully grown. We now know that this is mainly due to superfetation, in which very small numbers of several generations are present inside the female at the same time.



*Heterandria formosa*, female

Photo: Elke Weiland

The species was probably not caught again until 1988. The extensive work by ROSEN & BAILEY 1963, describing all of the Poeciliidae also suggests this. The drawings of the gonopodia by the two authors are mostly their own. In *Neoheterandria elegans*, however, they used the illustration originally used by HENN in 1916. The extensive description of all viviparous toothcarps by Jacobs (1969) also mentions that they have not yet been imported. He described the species as the smallest of all the livebearers after *Poecilia minor* and gave them the common name tiger teddy.



*Neoheterandria elegans* , female

Photo : Elke Weiland

In 1988, *N. elegans* was brought back from a trip by H. MÖRTH. He caught the fish in small pools with shallow water in the area of the Rio Truandó, a tributary of the Rio Atrato, together with *Poecilia butleri*. The publication by BÖHM (1990) is the first

mention of this species as a live import in the aquarium hobby literature and was referred to as being in the aquarium hobby at that time.

From today's perspective, this is still true. The work also contains the only photograph of the biotope. Unfortunately, Dr Gentsch could not find any details about H. MÖRTH. Otto BÖHM, who fortunately received the first animals, immediately bred them without any problems. He was a very successful breeder of numerous wild forms of viviparous toothcarps in Vienna.

Fortunately, shortly after the first importation, Professor Alfred RADDA also received some *N. elegans*. In addition to his profession as a virologist, he was a well-known ichthyologist and imported, propagated and passed on a particularly large number of species. In particular, Dieter KADEN, of Dresden (one of the best-known breeders of viviparous toothcarps in the GDR [East Germany]) received a large number of wild-form *N. elegans*. Dr Gentsch bought a pair from him on October 15<sup>th</sup>, 1988. He assumes that this is the only species of live-bearing toothcarp, except for some species from Cuba, of which there were more in the GDR than in the FRG [West Germany]. As early as 1990, four keepers were listed in the inventory of ZAG live-bearing toothcarps, as opposed to none in the DGLZ (Anonymous 1975 – 2019; Anonymous 1988-1989). Since the 1990s, a large number of enthusiasts of wild-form livebearers have received the species. It has even been available several times in the aquarium trade. In contrast to many other viviparous species, it can be expected that tiger teddies will have a permanent distribution in captivity.

So far, Dr Gentsch has found no indication in the literature that there has been another importation of wild stock of *N. elegans* since the 1988 importation from Colombia. It can be assumed with a high degree of probability that all the present stock of the species can be traced back to the 1988 importation. This means that the numerous cited holdings for (Anonymous (1990 – 2019) without information



*Neoheterandria elegans*, pair, female above.

Photo : Elke Weiland

about the place of discovery or being traded commercially can be precisely supplemented by the following information about the place of discovery: “Rio Truandó, upper reaches of the Rio Atrato; Colombia 1988, Collector MÖRTH”.

It would be very nice if an expedition were to examine the natural biotope (s) more closely. The distribution of *N. elegans* is completely unknown. Finding other species of fish, especially livebearing toothcarps, is also promising. The by-catch of *Poecilia butleri* mentioned by BÖHM (1990) is likely to be wrong as a determination, since, according to MILLER (2005), this species occurs further north. Presumably it is a not yet determined *Poecilia* species. No other livebearer species are yet known from the area of the Rio Truandó. The following species have been found from areas a little further away (MEYER 2015) :

*Neoheterandria cana* (Rio Sambu and Rio Tuyra basins, Darién, Panama);

*N. tridentiger* (Pacific and Atlantic slopes, Central Panama and Tobago Island);

*Poecilia caucana* (Rio Aruza, near Aruza, Rio Tuyra drainage, Darién, Panama; a pond 2km north of Sabanagrande, Rio Magdalena drainage, Atlantico department, the port area of Cartagena, Bolivar department; and a lagoon near San Cayetano, Bolivar department Colombia);

*Pseudopoecilia chocoensis* (Rio Calima, Rio-San-Jun-System as well as small, coastal waters to the south, Chocó and Valle de Cauca, Colombia);

*Pseudopoecilia darienensis* (coastal waters of the Pacific slopes, Darién, Panama)  
[Dr Gentzsch also notes that it is possible that this species also occurs in Chocó and the Rio Truandó.]

*Pseudopoecilia austrocolumbiana* (Rio Telembi-Patia system and upper Rio-Mira catchment area, Narino, Colombia).

It is very pleasing that a JBL expedition has planned an interesting excursion to Colombia in 2021 (Anonymous 2019). Unfortunately, for reasons of age and health, Dr Gentzsch is unable to apply to participate. This would also be very interesting when looking for live-bearing toothcarps, even if the province of Chocó, the home of the tiger teddy, is not visited due to lack of time or the still relatively strong mafia in the border area with Panama.

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### **A message about the new Goodeid Group from Mark Burdette in the USA**

"The recently formed Facebook group, Goodeid Journeys, is a place for Goodeid enthusiasts, or anyone wanting to learn more about these endangered fish, to share their stories and experiences. More than that, we are hoping to build a community of hobbyists working together to help save them. Goodeid keepers of all experience levels are welcome so please think about joining. Goodeids need our help now more than ever."

*Thanks to Mark Burdette for the original message and to Bill Galbally for passing it on to me.*

## Determining Optimal Water Temperatures for Goodeids

*John Lyons*

Goodeid Working Group

University of Wisconsin Zoological Museum, Madison, WI, USA

Water temperature is considered a “master variable” by fish scientists. It is critically important, directly or indirectly controlling most aspects of a fish’s life including survival, health, metabolism, activity, feeding, growth, reproduction, and social interaction. Each fish species has a particular range of temperatures that is optimal, and waters too far outside that range are harmful and may be lethal. For some recreational and commercial fishes, preferred temperatures have been accurately and precisely determined via complex laboratory experiments and careful field measurements. But for most aquarium species, including nearly all Livebearers, optimal temperatures have not been scientifically determined. Instead, years of painstaking observation and trial and error by hobbyists have provided the necessary information about which temperatures are best for captive maintenance and breeding for each species. For widely kept tropical Livebearers such as guppies, ideal temperatures for growth and reproduction have long been established. These tend to be in the range of 25-28° C (77-82.4° F). But for less widely kept Livebearer species, such as the Goodeids, which live in the highlands of central Mexico, preferred and harmful temperatures for aquarium husbandry remain poorly documented. The general perception is that Goodeids like slightly cooler temperatures than domesticated guppies, mollies, platies, and swordtails. But is this true, and does it apply to all Goodeid species?

Detailed laboratory or field studies of the temperature preferences for most Goodeids aren’t likely to happen anytime soon. But that doesn’t mean we can’t make a good estimate of what temperatures are best for them. We can do this by determining the water temperatures where they live in the wild. Goodeids (and all fishes) have evolved to do best at the temperatures they typically experience, and they are adapted to thrive at the average temperature and to tolerate the thermal extremes they routinely encounter in nature. But how do we know what these water temperatures are? Measured water temperatures are unavailable for all but a handful of the sites where Goodeids occur in Mexico. Fortunately, the science of hydrology gives us a couple of techniques to generate accurate estimates from the comfort of our homes.

Many Goodeids dwell in springs. Springs are environments that have a relatively constant water temperature, and they lack the daily and seasonal thermal swings of streams or lakes. Most springs reflect the temperature of the shallow groundwater from which they are derived, which in turn tracks the average air temperature of the region. So, if you know the mean annual air temperature for the general area where a spring is located, and air temperatures are readily available online for cities and towns all over Mexico, you have a good estimate of the temperature of the spring.



The actual spring temperature is usually  $\pm 1.5^{\circ}\text{C}$  ( $2.7^{\circ}\text{F}$ ) of the mean annual air temperature. For example, populations of *Characodon* are found in spring systems around the city of Durango. You can find online that Durango has a mean annual air temperature of  $16.7^{\circ}\text{C}$  ( $62^{\circ}\text{F}$ ), so springs in the area come out of the ground at roughly  $15$  to  $18^{\circ}\text{C}$  ( $59$ - $64.5^{\circ}\text{F}$ ). Thus, *Characodon* populations are likely to do well at those temperatures. As another example, many Goodeids, including *Alloophorus robustus*, *Allotoca dugesii*, *Goodea atripinnis*, *Neotoca bilineata*, *Skiffia lermiae*, *Xenotoca variata*, and *Zoogoneticus quitzeoensis*, occur in springs near the city of Morelia, which has a mean annual temperature of about  $16.2^{\circ}\text{C}$  ( $61^{\circ}\text{F}$ ). They too should do well at temperatures of about  $15$  to  $18^{\circ}\text{C}$ .

Of course, as soon as spring water issues forth, it is influenced by the air temperature of the moment, which varies daily and seasonally. And Goodeids in springs don't just sit at the spring head but regularly move into pools or channels that may be distant and substantially cooler or warmer than the spring discharge. Furthermore, some Goodeids are found in stream or lake habitats with minimal or no spring influence. How do we estimate the temperatures they experience?

Now we have to use an equation. Hydrologists have found that over the course of a day, water temperatures not influenced by springs track air temperatures in a predictable fashion. Sorry to force you to do maths (or "math" as we say in the U.S.), but the equation isn't too complicated:

$$\text{Water temperature (}^{\circ}\text{C)} = \text{Air temperature (}^{\circ}\text{C)} \times 0.81 + 4.4$$

Typical minimum and maximum daily temperatures for each month of the year are available online for most Mexican towns and cities. The minimum temperature not surprisingly occurs in January, but interestingly, the maximum temperature usually occurs in May at the end of the dry season rather than during July or August as is the case in the UK and the USA. During the wet season, which runs from June through September in most of Mexico, clouds and regular afternoon rains moderate the air temperatures a bit.

Anyway, returning to our Durango example, the January daily minimum air temperature is  $3.6^{\circ}\text{C}$  ( $38.5^{\circ}\text{F}$ ) and the May daily maximum is  $29.3^{\circ}\text{C}$  ( $74.7^{\circ}\text{F}$ ). Plugging these values into the equation, we get a minimum water temperature of  $7.3^{\circ}\text{C}$  ( $45.2^{\circ}\text{F}$ ) and a maximum water temperature of  $28.1^{\circ}\text{C}$  ( $82.6^{\circ}\text{F}$ ). These represent the range of temperatures a *Characodon* population might encounter over the course of a normal year. These are not the upper or lower lethal temperatures – the fish can no doubt tolerate temperatures a bit colder and warmer than this – but they'll do best if you stay within this range.

Now here's a tip. Temperatures in the mid to low teens might seem a little low for a routine tank setting and might be hard to maintain during a warm summer or in a fish room where you're also keeping Cichlids or warmer-water Livebearers. While it's true that *Characodon* will do just fine at  $15$ - $18^{\circ}\text{C}$ , they won't grow particularly quickly or produce large broods. If you want your fish to get larger and mature more quickly and produce more young, you need to turn up the heat. It turns out that maximum

growth and reproductive output in many fish species occurs at about 3-4° C (5.5-7° F) below the maximum temperature they typically experience, assuming they have sufficient food. So in the case of *Characodon*, which experiences a maximum of about 28° C, you would keep your fish at 24-25° C (75.2-77° F) if you really wanted to speed things up. The risk here is that you'll be providing a lot of food and fish metabolic rates and waste production will be high, and you'll need good aeration and frequent water changes to avoid health problems. If you don't relish a high-maintenance set-up but still want reasonably fast growth and good numbers of offspring, a compromise would be to keep the temperature midway between the annual average and the fast-growth setting, in this example about 20-22° C (68-71.6° F).

You can use this approach to determine the preferred temperatures for any Goodeid species, as long as you have an idea of where it is found in nature. Go online and look up the mean annual, May maximum, and January minimum temperatures for the city or town nearest to where your species occurs. If you're not sure of its exact origins, pick a location near the centre of its geographic range. Plug the May and January air temperatures into the equation to get the upper and lower water temperatures your species is likely to experience. Also determine the average annual air temperature to get an idea of what the water temperatures of local springs are. Then choose the water temperatures you want to use for your fish. If you want rapid growth and high numbers of offspring and are willing to put in the effort to maintain good fish health, use temperatures 3-4° C below the maximum water temperature you've estimated for May. If you want slower growth and reproduction with low levels of maintenance, choose a temperature close to the estimated temperature of the local springs. And for an intermediate level of growth, reproduction, and maintenance, use a temperature somewhere between these two values.

Returning to the questions posed at the beginning of this article, yes, it's true that many Goodeids do prefer cooler water than domesticated Livebearers. But are all Goodeid "sub-tropical" rather than "tropical" fish? Let's look at some of the extremes. The Goodeids that experience the highest air temperatures are *Allodontichthys zonistius*, *Ilyodon furcidens*, and *Xenotaenia resolanae*. They occur at elevations as low as 360-550 m (1,180-1,800 feet) at 19° N latitude, where the climate is warm year-round. The May daily maximum temperature there is about 33° C (91.4° F). This results in an estimated maximum water temperature of 31.1° (88° F), warm enough for a nice bath. If you really wanted to maximize growth and reproduction, you could raise these fish at 27-28° C (80.6-82.4°C). They are truly tropical fish. The Goodeids *Ameca splendens*, *Skiffia francesae*, and *Zoogoneticus tequila*, experience similarly elevated water temperatures and can also be raised in really warm water. They live (or once lived) in the Teuchitlán Springs, 65 km west of Guadalajara, at an elevation of 1,260 m (4,133 feet) at 20° N latitude, a region with a more subtropical climate. However, the Teuchitlán Springs have thermal heating from the nearby Tequila Volcano (from which the famous liquor draws its name), and water temperatures in the Springs in May are higher than would be predicted from air temperatures. Similarly, although found at about 1,000 m (3,280 feet) at 21° N latitude, *Ataeniobius toweri* also often lives in thermal springs and does well in warmer water than local air temperatures would suggest.



What about the other extreme, the Goodeid that can deal with the coldest temperatures? That honour goes to *Girardinichthys multiradiatus* in Lago Zempoala, about 35 km southwest of Mexico City. This lake is at 2,900 m (9,500 feet) and the area around it gets quite cold in the winter. During extreme cold snaps ice may form on the fringes of the lake, although under those conditions the fish move to deeper water where it is warmer. The typical January daily minimum is 1° C (33.8° F), and from that value the estimated minimum water temperature routinely experienced by this population is 5.2° C (41.4° F). This species is more temperate than tropical, and, fittingly, the only other fish species it shares its home with is introduced rainbow trout, a coldwater species.

Photo captions (all photos by *John Lyons*):

Figure 1 – El Toboso Springs near Durango, on a cold dreary January day, and *Characodon audax*

Figure 2 – La Resolana stream, about 150 km SW of Guadalajara and one of the most tropical Goodeid sites in Mexico, and *Xenotaenia resolanae*

Figure 3 – Teuchitlán Springs, and *Ameca splendens*

Figure 4 – Lago Zempoala and *Girardinichthys multiradiatus*











Photos from Stephen Galloway



*Skiffia multipunctata*

Photo : Stephen Galloway



*Skiffia multipunctata*

Photo : Stephen Galloway

## **Diary Dates**

Our **summer meeting and auction** is to take place on the 25<sup>th</sup> July in Leicester.

Address :-

Braunstone and District Working Men's Club

Braunstone Close,

Braunstone Town,

Leicester LE3 2GE

Tickets are £3.50 and can be purchased via the BLA website. Entry to the event on the day, without a ticket will cost £5.00 and be dependent on room availability. This is a Charity event with all monies raised being divided between Tropiquaria and Chester Zoo. The room itself is being paid for with a donation of £100 to the air ambulance.

The BLA will be holding a show. We are looking for those of you who would like to show fish from all aspects from total novices to experienced people. This is an area we are looking to expand over the coming years. Details will be on Facebook and the website soon.

Covid: We have no reason to believe there will be any problems putting this show on. However, we may have to ask you to abide by appropriate covid-19 protection measures for the day or even cancel the show at short notice.

## **Autumn Convention : The Fishkeepers' Extravaganza**

The autumn convention is the most ambitious event that we have tried in my time in the BLA. It is a joint event with the British Killifish Association, the British Cichlid Association and the Fancy Guppy UK society. All four societies will be holding auctions so the attendees will have the chance to buy or sell lots of different fish that you will not normally see in aquarium shops. There will also be talks, discussions, trade stalls and a chance to meet up with other fishkeepers and talk about fish to our hearts' content. For more details see the BLA website.

Dates :- Saturday 18<sup>th</sup> September and Sunday 19<sup>th</sup> September

Address :- Holiday Inn,  
South Normanton,  
Alfreton,  
Derbyshire,  
DE55 2EH



# THE BRITISH LIVEBEARER ASSOCIATION & FANCY GUPPIES UK



SUMMER SHOW - 25<sup>TH</sup> JULY 2021



**Braunstone & District Working Mens Club  
Braunstone Close, Braunstone Town, Leicester LE3 2GE**

## Ticket / Admission Fee

**Please note Tickets are not yet on sale – Details to follow**

This will be a ticketed event, tickets will be available through the BLA website priced at £3.50. Tickets will be available on the door priced at £5.00, but please remember that on the day, tickets may be limited due to the room capacity.

## COVID

**Please be aware that some COVID 19 restrictions may still apply at this event  
And this event may need to be cancelled at short notice.**

## Proceeds

The COVID lockdowns have been extremely harsh on our zoos, all proceeds from this event will be divided between both Tropiquaria and Chester zoos to help them maintain their vital work conservation work.

## Some of the things we are now planning for this event

- Fancy Guppies UK will be holding the first leg of the Guppy league
- Q&A session with Shaun from Tropiquaria
- Poecilia wingei display area.
- Sales tables
- Livebearer auction

**This event is the first we have been able to plan for over a year, we are planning this event to be more of a social meeting with less structure than usual**

Full details of this event will be advertised on the BLA and FGUK Facebook and websites pages.  
[www.britishlivebearerassociation.co.uk](http://www.britishlivebearerassociation.co.uk)  
[www.fancyguppies.co.uk](http://www.fancyguppies.co.uk)





# Fishkeepers Extravaganza

The show for all fish keepers and enthusiasts of any level  
18<sup>th</sup> – 19<sup>th</sup> September 2021

The BLA and Fancy Guppies UK will be taking part in the newly formed Fishkeepers extravaganza.

The Fishkeepers Extravaganza is a partnership of associations to provide an extravaganza of information, fish shows, trade stalls, lectures, forums and auctions of Killifish, Fancy Guppies, Livebearers and Cichlids.

Priority for tickets and accommodation will be offered to members of the associations first as accommodation and room capacity may have to be restricted.

Tickets will be £5.00 per day

Accommodation will be £79.00 for a single occupancy room and £89.00 for a double occupancy room (breakfast included).

Details of how to book your tickets and accommodation if required will be made available soon.



Carter Lane East  
South Normanton  
Alfreton  
DE55 2EH  
J28 M1

Full details of this event will be advertised on the BLA and FGUK Facebook and websites pages.  
[www.britishlivebearerassociation.co.uk](http://www.britishlivebearerassociation.co.uk)  
[www.fancyguppies.co.uk](http://www.fancyguppies.co.uk)



The BLA are part of the Fishkeeping Extravaganza to be held in September at the Holiday Inn (South Normanton, Derbyshire.) You will need to purchase tickets to gain access to the show on both Saturday and Sunday. The tickets are priced at £5.00 per person, per day.

Accommodation is available to our members at a discounted rate for both Friday and Saturday night. Single occupancy rooms are £79.00 and double occupancy rooms are £89.00 (breakfast included).

To book tickets or accommodation, please follow the link to the BKA website page <https://killis.org.uk/wp/fishkeeping-extravaganza-2021/>. This is a hidden page on the BKA website as these deals and bookings are initially for members of the associations involved. You will need your BLA number to book, if you haven't got this, don't worry as they are being sent out.

Whilst we look forward to seeing you there to enjoy the weekend, we also need your help in making the show run smoothly. We are looking for volunteers to help us out on both days. There will be nothing complicated involved, just helping us as out as and when to can to make the day go smoothly. This won't interfere with your day too much, **but we will need help.**

If you are willing to help us out, please get in touch with Steve Oliver ([steven.oliver63@yahoo.co.uk](mailto:steven.oliver63@yahoo.co.uk)) letting me know when you are available to help.

### **Payment Acknowledgement**

If you have paid your membership subs using PayPal, the website is now set up to send you a welcome letter and acknowledge you have paid, for people who have paid by cheque this is a manual operation on our side and we have to add you to the website. If you haven't received this letter, please send us a message through the 'Contact us' page.