

Livebearer News

Official Members Magazine of the
BRITISH LIVEBEARER ASSOCIATION



Issue 87
September
2026

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Data Protection Act

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Committee

Chairman: **Position vacant**
Vice Chairman: Clive Walker: clivewalker076@gmail.com
Treasurer: Peter Ellis: peter_c_ellis@hotmail.com
Editor: Greg Roebuck; gjrerr12@gmail.com
Events organisers: Paddy Davies: paddyd@googlemail.com
Clive Walker: clivewalker076@gmail.com
Steven Milne: thefinroom@gmail.com
Membership Secretary: Peter Ellis: fishybilly@outlook.com
Goodeids conservation: Paddy Davies: paddyd@googlemail.com
Xiphophorus conservation: Bill Galbally: fishybilly@outlook.com
Fundraising and Sponsorship: Sheridan Pamplin: sheridan9999@outlook.com
Scottish Rep: Steven Milne: thefinroom@gmail.com
FGUK Liaison: Bill Galbally: fishybilly@outlook.com

Editorial

The Carlisle meeting went well; there was a really nice atmosphere and everyone that I spoke to really enjoyed the day. We learned from the mistakes of last year and the auction was (mostly) restricted to livebearers. Plants and non-livebearers were sold from a sales table and kept out of the auction, which therefore took much less time and felt much more comfortable. The number of attendees was slightly down on last year with about half coming down from Scotland. The auctioneers, Kenny and Alan did a great job and I would like to say “thank you” to them both on behalf of the committee. Interesting livebearers sold in the auction included:

Amea splendens; *Chapalichthys encaustus*; *Characodon lateralis* (Los Berros); *Girardinus metallicus*; *Heterandria formosa*; *Limia isalai*; *L. nigrofasciata*; *L. perugiae*; *L. tridens*; *L. vittata*; *Neoheterandria elegans*; *Phallichthys fairweatheri*; *Poecilia chica*; *P. gilli*; *P. salvatoris*; *P. wingei*; *Quintana atrizona*; *Skiffia multipunctate*; *S. sp* “V188 Sayula”, *Xiphophorus helleri* [several different forms]; *X. kallmani*; *X. milleri*; *X. montezumae*; *X. xiphidium*; *Zoogoneticus tequila*;

Overall, prices were down on what we usually expect and if you wanted to get yourself a bargain or two, then this was the place to be. However, the fancy guppies and the “Endlers” in the auction did not do at all well and the majority went unsold.

Bill Galbally gave a talk about his collecting trip to Mexico this spring.

The next event is, of course, the big one – the Autumn Convention in Shenstone. Shenstone is a great venue, pretty central for anyone living in England (not so good for the Scots, I am afraid) and with a pub next door, a hotel half a mile away and a chip shop 200 metres away what’s not to like? I always really enjoy this event. Lots of us gather on the Friday evening for a meal in the pub – so why not join us then? All the details are in the “Diary Dates” section right at the end of this newsletter.

Thank you once again to Dan Fromm for sending me material for this newsletter and also to Kees de Jong. If it wasn’t for Dan and Kees I would have had to copy old articles from magazines to fill this newsletter – much better to have new stuff don’t you think? So please, get writing! Any topic to do with livebearers – keeping, breeding, collecting, all fine. And don’t worry about spelling or anything like that – those things are the job of the editor, i.e. me. My email address is above.

Finally – How did your fish fare in the hot weather? It was a mixed story for me. I lost three-quarters of my adult *Allodontichthys polylepis* but the young fry all survived. I also lost all of my *Chapalichthys pardalis* as the temperature in my fish room soared to over 32°C.

Among my non-livebearers, most of my *Elassoma evergaldei* died but my *E. okeefeenokee* produced young for the first time. It was much worse than that for Nigel Hunter – he lost some important species including *Xiphophorus malinche* and *X. evelynae*, *Allodontichthys zonistus*, *Allotoca goslinae* and *Girardinichthys viviparous* – all of which prefer cooler

conditions. We think that Nigel was the only person in the UK keeping the majority of these species but if you know differently and can help him out then please get in touch with me.

So how did your own fish get on? Did you lose any? How did you keep your tanks cool? It looks as though hotter summers will be a feature in future so any hints that you have about keeping tanks cool enough are important. I tried putting the freezer blocks from my cool-box into the tank with my *A. polylepis* and it brought the temperature down by perhaps 1 °C and this wasn't enough. So please get in touch with your own thoughts – it could be the hint that saves us from losing species in the future.

And finally – linking with the last paragraph – some species of goodeid would not exist today if it were not for the efforts of private fish-keepers. But do we have a role to play in the long-term conservation of species? We are just hobbyists, after all, so should we just leave the conservation of fish species to zoos and public aquaria? An article from Dan gives his hints on how to keep poeciliids long-term. I look forward to hearing your thoughts on this.

Happy fish-keeping. See you at Shenstone?

Greg

Report on the Basingstoke BLA meeting and show

By *Simon Bayley*

The Second Livebearers Convention of the year took place at the Kempshott Village Hall, Basingstoke, on Sunday 7th June 2026.

The doors opened at 10:30 with some early arrivals, many of those booking in entries for the auction and also entries to the livebearer show.



The room was packed. There were various sales tables around the outside of the hall and lots of people in the main body of the hall. One notable sales table was full of the best home-grown plants.

Refreshments were also available on the day. Many thanks to James and Rosie for doing the refreshments. Many thanks to the A of A for providing the room.



Two of the displays on the sales tables. Photos: *Simon Bayley*.

The day started with a presentation by Bill Galbally: “Xiphomania”, his report on his trip to Mexico with the GWG in April 2026.

Bill was meant to go to Mexico to attend the 10th Anniversary Convention of the Goodeid Working Group but that was cancelled after the unrest in Mexico and advice from the relevant authorities.

After the conference had been cancelled, Michael Köck, the team leader, arranged a collecting trip for an international group, which included a professor from the University of Morelia. Bill joined in with this group along with BLA member Nigel Hunter.

The team visited various locations in the Mexico to collect Xiphophorus to bring home.



Bill giving his talk. Photo: *Simon Bayley*.

There was a large selection of prizes on the raffle table. Many thanks to Sheridan for arranging the raffle and selling tickets.

Thanks also must go to:

Heron's Pet World
Kettering Koi Ponds Ltd
Corby Aquatics
Fish Science Aqua One
Aqua Zoo

for their kind donations for the raffle.

The day also consisted of a Livebearer show showing various classes of livebearer and winners:



Class Wildform Goodeid
 Fish *Ilyodon furcoides*
 Winner Ollie Prinn



Class Wildform Poecilia/Limia
 Fish *Limia nigrofasciata*
 Winner Allan Finnigan



Class Wildform Xiphophorus Swordtail
 Fish *Xiphophorus montezumae*
 Winner Ollie Prinn



Class Wildform Xiphophorus Platies
 Fish *Xiphophorus xiphidium*
 Winner Keith Sollett



Class Wildform Pairs
 Fish *Girardinus metallicus*
 Winner Mathew Bryan



Class Cultivated Mollies
Fish Molly Peach Albino
Winner Ollie Prinn



Class Cultivated Pairs
Fish *Xiphophorus helleri* “Black Tiger”
Winner Simon Baylay



Class AOV Livebearer
Fish *Girardinus metallicus*
Winner Mathew Byan

Class Fancy Guppy
Fish Snow White Coppertail Guppy
Winner Allan Finnigan

Class Endler
Fish Male Endler
Winner Roy Bryan

CLASS BEST IN SHOW
FISH *LIMIA NIGROFASCIATA*
WINNER ALLAN FINNIGAN

Class Cultivated Swordtails / Platies
Fish *Xiphophorus variatus* “Red Tuxedo”
Winner Allan Finnigan



Allan Finnigan receiving Best in Show and the Eddie Wade Award from BLA Vice Chair Clive Walker. Photo: Simon Bayley.

[Images of show fish not actual fish on bench.]

Many thanks go to Show Judges Dave Mac and Alan Rothwell.

Also thanks to: Andy Pearce, Keith Sollitt

For their administration of the show and **Heron Pet World** for the prizes for the winners.

The auction started 13:00 with some nice fish being sold.

15 Sellers had booked lots with the best lot of the day selling for an impressive £105 for a pair of *Brachyrhaphis holdridgei*.

Interesting species of fish in the auction included:

Goodeids: *Ameca splendens*, *Ataeniobius toweri*, , *Skiffia multipunctate*, *S. sp* V188 “Sayula”, *Xenophorus captivus*, *Xenotoca doadrioi*, *Xenotoca lyonsi* Rio Tamazula, and the egg-laying goodeid *Crenichthys baileyi*

Poeciliids: *Brachyrhaphis holdridgei*, *B. roseni*, *Girardinus metallicus*, *Heterandria formosa*, *Limia vittata*, *L. nigrofasciata* Lake Miragoane, *Neoheterandria elegans*, *Phallichthys fairweatheri*, *Poecilia mexicana*, *Priapella compressa*, *Xiphophorus alvarezi* Rio Candelaria,

X. clemenciae, *X. helleri*, *X. kallmani*; *X. meyeri*, *X. montezumae*, *Xiphophorus nigrensis*, *X. variatus* Lake Laguna, *X. variatus* Punte Escalanar, *X. xiphidum*. Overall the day was very enjoyable for all who attended.

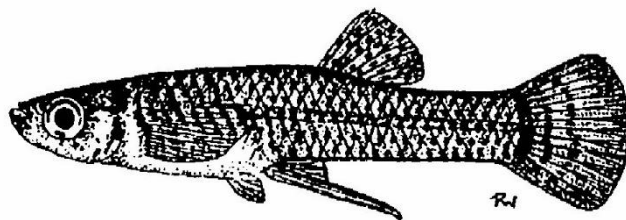
***Gambusia nobilis* split and the importance of describing species**

By Kees de Jong

In recent years, many new species have been described. Due to new techniques, such as DNA analysis and the study of larger numbers, new species are sometimes found in areas that have already been studied. Portnoy et al. (2025) also described two species from locations that have been known for a long time. In addition to the two new species they describe, they also discuss the utility of describing species. I know that many hobbyists dislike changing the painstakingly learned scientific names and adopting new names, but it is important to acknowledge the value of these changes.

I will first introduce the new species and then discuss the usefulness of describing species. If you want more details, I recommend reading the free downloadable article.

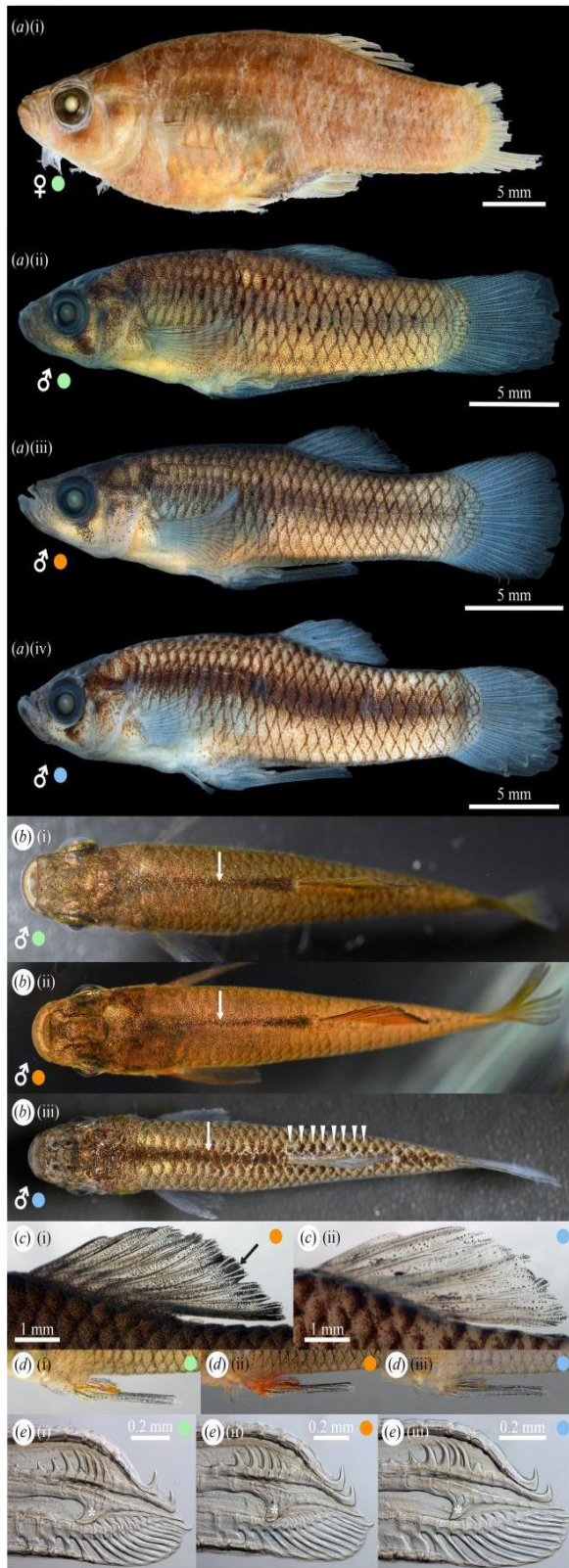
Portnoy et al. Investigated three populations of the North American live-bearing killifish *Gambusia nobilis*. The species inhabits a number of springs in the Pecos River basin in Texas and New Mexico in the United States. It is hypothesized that the species spread during periods of higher precipitation, such as the Pliocene (3.5 – 2.5 million years ago). As the region became drier, many species remained only as isolated populations in small, groundwater-fed freshwater springs. *G. nobilis* is threatened with extinction by predation from introduced species, increasingly frequent droughts, human water use and hybridization with the introduced *G. affinis* and *G. geiseri*.



***Gambusia geiseri* (Drawing: Ruud Wildekamp)**

New species:

Material from *G. Nobilis* was collected at twelve separate locations in the river basin. The DNA was analyzed, and morphological differences were also examined. The conclusion of this study was that there are three geographically and genetically distinct species. Thus, in addition to *G. Nobilis*, there are two others. The first described species is *Gambusia pyrros*. The body colour of the males of this species is orange-red or yellow-orange. The scientific name *pyrros* is derived from Greek and means “flame-coloured”, referring to the body colour of the males. The species lives in springs and spring-fed tributaries.



Morphological differences between members of the *Gambusia nobilis*-complex, including *G. nobilis* (shown in green), *G. pyrrhos* n. sp. (orange) and *G. echelleorum* n. sp. (blue).

(a) Examples of the three *Gambusia* species, left side (side view): (i) *G. nobilis*, standard length (SL) 35,2 mm; (ii) *G. nobilis*, male, 25,9 mm SL; (iii) *G. pyrrhos*, male holotype, 22,8 mm SL; (iv) *G. echelleorum*, 24,5 mm SL.

(b) Dorsal surface of a live male, white arrow pointing to a median stripe on the dorsal side, white arrowheads pointing to spots forming a row next to the base of the dorsal fin van *G. echelleorum*: (i) *G. nobilis*; (ii) *G. pyrrhos*; (iii) *G. echelleorum*.

(c) Dorsal fin showing the presence (black arrow) or absence of a thick, black pigment band at the edge of the fin : (i) *G. pyrrhos*; (ii) *G. echelleorum*.

(d) Gonopodium: (i) *G. nobilis*; (ii) *G. pyrrhos*; (iii) *G. echelleorum*.

(e) Distal end of gonopod: (i) *G. nobilis* (ii) *G. pyrrhos* (iii) *G. echelleorum*

The second species is *Gambusia echelleorum* and is named after Alice and Anthony Echelle in honour of their work on *G. Nobilis*. The body colour of both sexes of this species is

yellow-grey to light cream. The species lives in the spring-fed creeks and sinkholes in the Bitter Lake National Wildlife Refuge, Chaves Co., New Mexico.

Map. Distribution and relationships of the *Gambusia nobilis*-species complex.

(a) Map showing the distribution of *G. nobilis*, *G. pyrros* n. sp. and *G. echelleorum* n.sp. in the Chihuahuan-desert ecoregion in western Texas and southeastern New Mexico.

(b) Close-up of the area surrounded by a dotted line (b) in (a), showing the location of *G. echelleorum* samples from the Bitter Lake basin in New Mexico, type locality indicated by a black asterisk (*).

(c) Close-up of the area surrounded by a dotted line (c) in (a), showing the location of *G. nobilis* samples from the Leon Creek watershed and *G. pyrros* samples from the Toyah Creek watershed in Texas, type sites indicated by a black asterisk (*).



Genetic drift and natural selection:

Genetic drift gives rise to random genetic variants . Due to these changes, certain genes can disappear completely or become dominant, without this necessarily being advantageous or disadvantageous for the survival of the organism. This occurs primarily in small, isolated populations.

In natural selection, genetic variants that provide an advantage for an organism's survival and reproduction are passed on to the next generation more frequently. Traits that increase an organism's success become increasingly common within the population. It is therefore not random but is determined by the environment and the organism's chances of survival.

The importance of describing species:

The study shows that the endangered *Gambusia nobilis* actually consists of three genetically and geographically separate species: *G. nobilis*, *G. echelleorum*, and *G. pyrrhos*. Genetic drift, and not natural selection, was likely the main cause of this divergence. The differences between the groups are significant enough to consider them separate species, which is supported by both genetic and morphological evidence.

The Earth is currently in a mass extinction, characterized by the rate at which species are disappearing and by the major impact of human activities. This era is sometimes called the “Anthropocene”. The biodiversity crisis is evident not only in the accelerated extinction of species, but in homogenization.

Thanks to technological advances, particularly in the field of genetic research, scientists can now better detect hidden (cryptic) diversity between and within species. This makes the work of conservationists more challenging, as they must protect diversity while knowing they cannot oversee everything. As a result, conservation measures often lag behind reality.

The problem of human-caused biodiversity loss is particularly severe in freshwater systems. The systems are especially vulnerable due to their importance to humans and their location close to human activities. Human interventions such as dams, deforestation, urbanization and the introduction of new species have led to a sharp increase in extinctions in freshwater, even more so than on land. It is estimated that nearly a quarter of freshwater species are now threatened with extinction.

Because freshwater systems are often isolated, species can develop rapidly on a small scale. Therefore, new species are found not only in remote areas but also through rigorous genetic and morphological research on widespread species with separated populations.

Portnoy et al. emphasize that recognizing and describing new species is essential, especially at a time when biodiversity worldwide is under pressure due to climate change, water use and other human influences. In desert ecosystems, such as those of the *Gambusia nobilis* group, there may still be many undiscovered species. Correctly identifying species is important because only recognized species can receive specific protection. Errors in species delineation can lead to inefficiencies or even the extinction of small populations. Therefore, the careful application of genetic and morphological analyses is necessary to distinguish and protect species. Describing new species contributes directly to biodiversity conservation and helps prevent species from disappearing before they are even recognized.

Literature:

Portnoy DS, Bretzing-Tungate RJ, Fields AT, Bean MG, Smith RK, Dolan EP, Blanchard R, Conway KW. 2025. A total evidence approach justifies taxonomic splitting of the endangered Pecos gambusia into three species. *R. Soc. Open Sci.* **12**: 251025.

<https://doi.org/10.1098/rsos.251025>

Livebearing Halfbeaks

Part IV: The lacustrine halfbeaks of Sulawesi

By Ulrike Korte

The subject in parts I and II of this halfbeak series was the genus *Dermogenys*, encompassing all species in this genus valid at present whereas part III, the foregoing part, dealt with some halfbeak species from the Philippines which were transferred from the genus *Dermogenys* to the genus *Nomorhamphus* by Meisner (2001) on the grounds of comprehensive in-depth revision.

Livebearing halfbeaks in general are restricted to Southeast Asia where we find four scientifically most interesting hotspots of biodiversity: the Philippines (with some *Dermogenys* species as well as the already discussed *Nomorhamphus* species), Indo-Burma, Sundaland and Wallacea with Sulawesi as its largest island.

With the exception of the Philippine *Nomorhamphus*, all species in the genus *Nomorhamphus* are endemic to the island of Sulawesi. Aquarists who consider to arrange an authentic biotope display may choose specimens from the popular sailfin silversides or ricefishes as tankmates for their halfbeaks as the genus *Telmatherina* and some *Oryzias* species are endemic to Sulawesi, too.



Nomorhamphus megarrhamphus. Photo : Hans Evers

To obtain a comprehensive idea of the genesis of Sulawesi it is crucial to know that in the geological history of this island its landmass did not evolve as an entity, but with ancient oceans receding and new areas of land arising. In the distant past the several parts of the island merged and the island gradually increased in size. That is why when beholding the contours of the island in the map, Sulawesi looks a bit like a hand with outstretched fingers and each of these parts comes with an endemic biodiversity of its own.

Topographically, the island is lined with rather high mountain ranges and in the wake of primeval tectonic movements, difference in geological configuration in this area may attain up to 8000 meters.

Concerning distribution of livebearing halfbeaks, in the coastal lowlands you will predominantly find *Dermogenys* species while the mountainous heartlands are the realm of *Nomorhamphus*.

In their evolutionary history, populations have been isolated in comparatively small biotopes. They adapted to their restricted distribution areas and thus developed a host of different morphs.

On the occasion of our annual halfbeak conventions, travelling aquarists in search of a particular species familiar from their aquaristic scene at home, have reported their confusion.

Instead of being able to clarify status and whereabouts of their sought-after species, they encountered a variety of conspecifics all being somewhat similar but definitely not the same as the species they were looking for.

With respect to their high diversification, a majority of these species are at least vulnerable, if not severely endangered.

Due to its special topography, wide areas of Sulawesi are not easily accessible. In particular, the highlands are difficult terrain for infrastructure and vast areas of uncharted, remote backwoods are prevalent. This holds especially true for the northern and the northeastern part of the island.

Geographically, Sulawesi can be divided into five separate biodiverse parts. Besides the North Arm and the Northeast Arm, the island consists of Central Sulawesi, the trafficwise relatively well developed South Arm with Sulawesi's capital Ujung Padang, formerly Makassar, and the Southeast Arm with the Malili Lakes complex.

The Malili Lakes system is a chain of five hydrographically connected lakes, linear distance 16 km, which are supposedly two to four million years old and are among the oldest lakes in the world, each with a high biodiversity of its own. These lakes are remnants of an ancient pleistocene catchment arisen by immense tectonic activities. To understand the evolution of our halfbeaks, here is where we have to draw our attention to, for in these lakes there are still some biologically intriguing species of livebearing halfbeaks existent.

The geological history of this ancient basin brings about metalliferous (metal-containing) sedimentary deposits rich in raw materials and natural resources, and as a result with vast mining ventures and engineering projects comes a high vulnerability of on-site native endemic species.

The Malili Lakes basin is composed of three main lakes. Upstream, its oldest lake is Lake Mantano, 362 m above sea level, 30 km long, 5 km wide, maximum depth 590 m. Downstream its largest lake is Lake Towuti, 293 m above seal level, 43 km long, 24 km wide, maximum depth 203 m. In between the two is the smaller Lake Mahalona. Being located in an ancient tectonic fault catchment, all three lakes are at least periodically interconnected and feature very high water temperatures, around 30°C.

These lakes are home to two species of livebearing halfbeaks we call the lacustrine halfbeaks.

In appearance they convey definitely the traditional typical phenotype of *Dermogenys*: they are slender-bodied surface-dwellers with notably long elongated lower jaws. Females attain about 9 cm, males up to 7 cm. These are gregarious fish, forming huge shoals below the water surface and feeding preferably upon flying insects.

Corollary to Amy Meisner's revision in 2001, they have shared the fate of the Philippine *Nomorhamphus* I introduced in my previous section and henceforward have been assigned to the genus *Nomorhamphus*. However, prevailing controversy among taxonomists concerning the split into the two separate genera *Dermogenys* and *Nomorhamphus* should not be dismissed.

At the time when Brembach, being a supervisee, undertook among other expeditions collection trips to the Malili Lakes region, the lacustrine halfbeaks of those sites were without any doubt considered to belong to the genus *Dermogenys*.

On grounds of the morphological data collected, Brembach in his dissertation (1991) even suggested the lacustrine halfbeaks of the Malili Lakes to be the most primitive forms of all *Dermogenys* species.

Endemic to Lake Towuti is *Nomorhamphus megarrhamphus*, first described by Brembach in 1982 as *Dermogenys megarrhamphus* and as the chosen scientific name “*megarrhamphus*” suggests, this species sports the longest beak ever among livebearing halfbeaks.

These are beautiful fish of intense blue or green body colour, with yellow fins and an orange coloured beak.

The other lacustrine halfbeak species, likewise attractive and also being raised into the genus *Nomorhamphus* by Meisner, is *Nomorhamphus weberi*, endemic to Lake Mantano and also occurring in the in-between-lying Lake Mahalona in sympatry (i.e. alongside) with its sister species *Nomorhamphus megarrhamphus*.



Nomorhamphus weberi. Photo: Hans Evers

Its original description dates from 1897 (Boulenger), back then named *Hemirhamphus weberi*. *Nomorhamphus weberi* is distinguished from *Nomorhamphus megarrhamphus* by a higher number of anal-fin rays (17-19 versus 14-16) and a conspicuous dark body pigmentation. Contrary to *Nomorhamphus weberi*, specimens of *Nomorhamphus megarrhamphus* display black spots in the distal tips of their dorsal and ventral fins.

You won't spot these species far out in the open waters of their native lakes. Instead, they gather in huge aggregations in the shallow waters near shores near inflowing streams and rivers where they can find shelter and feeder insects in the coastal vegetation. The behaviour pattern of the lacustrine halfbeaks bears evident resemblance to the lifestyle of the estuarine halfbeak species in the genus *Zenarchopterus* which live in the brackish waters of deltas and estuaries and are known to undertake extensive feeding migrations upstream into the lower reaches of inflowing rivers.

Likewise, migrating ancestors of our lacustrine halfbeaks may well have been at the origin of today's modern montane species in the genus *Nomorhamphus* and as thus even at the origin of viviparity (i.e. livebearing) itself.

As is the case in many lacustrine species that are adapted to the stable aquatic environment of their native lakes, *Nomorhamphus megarrhamphus* and *Nomorhamphus weberi* respond most sensitively to environmental changes and very easily fade away when captured.

Riverine species from flowing waters, however, are accustomed to fluctuating water conditions and that is why in the aquaristic hobby, the *Nomorhamphus* species from the temperate mountain streams are prevalent.

Nomorhamphus megarrhamphus and *Nomorhamphus weberi* are very similar to each other and the question may arise why have scientists split them into two separate species. The nature of taxonomy is to process and translate scientific findings on the evolutionary history of species. In the evolutionary history of livebearing species, the developmental progress of reproduction organs is vital. Morphology of the modified anal fin of males, in halfbeaks called an andropodium, is an essential discriminating character for species identification.

In comparison to *Nomorhamphus megarrhamphus*, in *Nomorhamphus weberi* there is some slight modification in the structure of the second anal fin ray which is the main part of the andropodium.

Interestingly enough, the andropodium of all other *Dermogenys* and *Nomorhamphus* species possesses two additional characters, the cryptoplica, a kind of sheath which covers the first seven rays of the anal fin, and the physa, a membranous pouch, presumably for storing sperm bundles. So the andropodium of all the other *Dermogenys* and *Nomorhamphus* species have the two additional characters, the cryptoplica and the physa while the lacustrine halfbeaks in their evolution are far behind and in their morphology have not yet developed those traits. That is, the lacustrine halfbeaks have no physa and their cryptoplica is only rudimentary.

In the lacustrine halfbeaks, *Nomorhamphus megarrhamphus* and *Nomorhamphus weberi*, development of a cryptoplica is only in its beginning and a physa, absent, has not yet evolved.

Inherent to all *Dermogenys* and *Nomorhamphus* species is the ability to reproduce continuously at any time of the year – with the exception of the lacustrine halfbeaks.

The genera *Dermogenys* and *Nomorhamphus* examined in extensive research studies and all livebearing halfbeaks we know from our own aquaristic scene are permanent spawners,

females having gestation periods of approximately three to six weeks, depending mainly on temperature.

The lacustrine species *Nomorhamphus megarrhamphus* and *Nomorhamphus weberi*, on the contrary, are season-bound spawners, a reproduction pattern they have in common with their ovoparous (i.e. egg-laying) marine *Beloniformes* relatives.

According to travelling aquarists, at spawning season the shores of their native lakes can be observed teeming with newborn fry while at other times of the year there are none. For instance, I had numerous conversations with the late ichthyologist Dieter Vogt and I was always under his spell when he described his experience and his adventures on his expeditions. Another aquarist, Hans Evers, who has traveled several times in Sulawesi, also reported on that phenomenon in an aquaristic magazine (Amazonas), indicating that it was the only time he made such an observation was when there was a dark night with a new moon.

We know there are species whose spawning activities depend on lunar cycles but concerning the lacustrine halfbeaks of the Malili Lakes we do not know much.

Suggestions that in respect to all the other *Dermogenys* and *Nomorhamphus* species they represent a transition form are supported not only by the more primitive structure of their andropodium and their cycle-bound spawning pattern, but also by their reproduction biology concerning embryonic development.



***Dermogenys* sp „Tuwuti“. Photo : Hans Evers**

Following Meisner's revision (2001), in parts I and II in this halfbeak series we have seen that in all species within the genus *Dermogenys* the development of the embryos takes place within the follicles of the ovaries (types I and II form of halfbeak viviparity) whereas in the species within the genus *Nomorhamphus* embryonic development is intraluminal (i.e. the embryos develop in an organ called the lumen).

The Philippine halfbeaks I introduced in the foregoing part were transferred from the genus *Dermogenys* into the genus *Nomorhamphus* because they feature intraluminal gestation, albeit in a very late developmental stage (type III form of halfbeak viviparity).

At first sight, the development of the embryos in lake-dwelling halfbeaks corresponds to the most primitive type I form of halfbeak viviparity characteristic of the *Dermogenys pusilla*

group: they have eggs with a notably large yolk supply and embryos in the ovary are all of the same developmental stage which means the ability to exhibit superfetation (i.e. the ability of a livebearing animal to have embryos of different ages, as shown by the poeciliid *Neoheterandria elegans* – the „tiger teddy“) as we have seen in the *Dermogenys orientalis* group (type II form of halfbeak viviparity) and in the Philippine *Nomorhamphus* (type III form of halfbeak viviparity) has not evolved. They have neither developed hypertrophied (i.e. excessively enlarged) organs nor the distinct epithelium (i.e. outer cell layer) observed in *orientalis* embryos and especially the Philippine embryos, nor other obvious modifications to ensure motherly nutrient uptake.

But, contrary to intrafollicular gestation which is characteristic of the genus *Dermogenys*, embryos of the lacustrine species *Nomorhamphus megarrhamphus* and *Nomorhamphus weberi* leave their egg envelope prior to fin-bud stage and continue their further maturation free-swimming in the lumen, thus turning to intraluminal gestation even at an earlier stage than their Philippine cousins.

Generally, in intraluminal gestation embryos lack noteworthy yolk mass as is the case in the Philippine *Nomorhamphus*. Instead, endowed with substantial amounts of yolk from their very beginning, *Nomorhamphus megarrhamphus* and *N. weberi* embryos retain their yolk supply throughout maturation. Even latest-stage embryos, swimming fully developed in the ovarian lumen, bear a conspicuous yolk sac so that newborn hatchlings come with a considerable yolk reserve.

Normally, embryos invested with yolk support show obvious decrease in dry weight after being born. *Nomorhamphus megarrhamphus* and *Nomorhamphus weberi* embryos, however, were found to continuously gain weight throughout gestation and it is suggested that they might live upon ovarian fluids.

In the lacustrine halfbeaks, it is fascinating to find two different approaches to successful reproduction in one species combined:

on the one hand embryos are supplied with large amounts of yolk (called lecithotrophy);

on the other hand embryonic nutrition is provided directly by the motherly organism (called matrotrophy).

It seems as if nature, by clinging to the prospect of lecithotrophy, is throwing a sheet anchor while experimenting with matrotrophic approaches on its voyage to viviparity.

This reproduction pattern has been described by Meisner&Burns (1997) as type IV form of viviparity.

There are two more species hailing from collection sites adjacent to the Malili Lakes, *Nomorhamphus kolonodalensis* and *Nomorhamphus towoetii* also exhibiting type IV form of halfbeak viviparity, but we do not know for sure if these populations have ever been rediscovered.



Nomorhampus cf kolonodalensis. Photo : Hans Evers

My experience with long term maintenance of poeciliids **Dan Fromm**

I've kept a few populations of poeciliids going for at least a decade:

Alfaro cultratus – since 1997
Brachyrhaphis roswithae – since 1997
Phallichthys amates -- since 2002
P. tico – since 1999
Poecilia boesemani – since 2014
P. reticulata – since 2014
P. picta – since 2014

These fish have a few things in common. I like having them around. Flock breeding works with them. My wife and I, or I, brought all back from the wild. They have a certain emotional resonance.

I've had other poeciliids that haven't lasted for one reason or another.

In 1977 said goodbye all of my fish because of my last house move. I left my apartment in August 1977, stayed in temporary quarters for a year before buying a house. I went dry for more than a year. Keeping the fish I had to let go in temporary holding was impossible.

I gave some poeciliids up before that move because an Australian friend sent me some *Glossamia aprion*, a freshwater cardinalfish that supposedly must have live food. Feeder guppies were too expensive but I was willing to give up my *Gambusia puncticulata* and *G. wrayi*. After the *Gambusia* were gone I persuaded the *Glossamia* to eat small prawns, sold as "cocktail shrimp."

Once in our new house my bride and I spent our honeymoon in Costa Rica collecting fish. Entirely her idea. After that excursion we've made many field trips to the tropics. We've brought home as many as 300 specimens of as many as 20 species from a trip. Since we have

finite tank space new arrivals often displaced “old” fish. This is the price of getting novelties, also the price of finishing one project and starting another.

In the bad old days we brought our new treasures home as excess baggage. Live fish can no longer fly in checked baggage. They now have to fly in carry on. This is very limiting.

Our collecting trips stopped in 2002 after Pat decreed that foreign travel was impossible because our finances “needed to be put in order.” Since then I’ve kept our tanks ready for new occupants by maintaining the old occupants.

When I resumed going to the field in 2014 – to Trinidad, an island that has only a few species of freshwater fishes I wanted to keep – I was able to accommodate the new arrivals without sacrificing any of the, um, tank warmers.

More recently I’ve gone to the field in places from which I wasn’t able to export live fish (Uruguay, Paraguay) or that have few species (Dominican Republic). So, having nothing better to do, I’ve maintained sixteen species, not all poeciliids, for more than a decade.

Lessons learned:

Give a species at least two tanks.

Make sure to maintain reasonably large populations to ensure that if sex ratios go awry – for decades my *Alfaro cultratus* ran 90% males – both sexes are present. We’ve lost some characins – *Hyphessobrycon bussingi* and *Gephyrocharax intermedius*, both treasures, and *H. savage*, a worthless fish with no redeeming qualities – because our populations ended up all male. At the moment I have two tanks of elderly “*Rivulus*” with only one sex. Yes, I know I have to start a third tank of each species with both sexes.

Start a new brood of a poeciliid species every six months or so.

Flock breeding doesn’t work for all poeciliids. For example, many, not all, “*Gambusia*,” *Poecilia elegans* and *Poecilia hispaniolana* eat their young. Trapping a gravid female from time to time can ensure that there’s a next generation.

Eliminate the risk of mechanical failures:

We heat our fish room, don’t heat individual tanks with aquarium heaters. I’ve heard too many tales of woe involving fish cooked because a heater’s thermostat failed.

After a 32-hour power outage I bought an expensive generator set as insurance. As expected, since the machine was installed we’ve had no long power outages. It is better to have insurance and no accidents than accidents without insurance.

Pay close attention to filters. Our fish room is large enough that only air-driven foam filters make economic sense. Lift tubes’ air injectors can clog. Foam pads can clog. Clean filters before it’s too late.

More photos from Arjan de Graaf

Photos first posted on “Facebook”. *Goodea atripinnis* “Presa Huapango”. They are very different. And probably the only ones of this location in captivity.



I (says Arjan) got them 2 years ago. They are collected in the wild as very young fry and have been mistaken for fry from *Girardinichthys multiradiatus*.

That was also when we began to worry about *G. multiradiatus* in the wild. It could not be found in places where it was abundant a few decades ago

Neoheterandria elegans and *Phallichthys tico* sharing a tank. Both species are back in the collection after an absence of a few years.

Already a group of fry from the *elegans* in the babyroom.

This tank is newly decorated and the plants need to grow.



2026 Fieldwork in the Dominican Republic

Dan Fromm

In March 2026 I went to the Dominican Republic to collect fish in the far southwest of the country, primarily in Barahona and Pedernales provinces. This is a dry area with little surface water, at first glance not a good place to look for freshwater fishes. However, there are museum collection records of “*Limia* sp.,” *L. melanonotata* and “*Gambusia*” with geocodes from these provinces and, thanks to satellite photos available on Google Earth with volunteers’ photos of swimmers in swimming holes, other places to look for fish.

I wondered what the *Limia* and *Gambusia* might be and whether they occur in places not yet sampled by ichthyologists. I hoped that “*Limia* sp.” might include *L. sulphurophila*.

I’ve wanted to visit that area for some time because the fish in the hobby and, sometimes, in the pet trade as “*Limia tridens*” and “Tiburón *Limia*” seems to be *L. sulphurophila* but no one knows where the founding stock was collected. I have a colony of the hobby fish and have seen *L. sulphurophila* from three of its known localities, have colonies from two of those places. My pet trade fish doesn’t exactly match any of them. Their founding stock has to have come from somewhere but where is unknown. A casual look at a highway map suggests that *sulphurophila* could occur along highway 44 in Barahona and perhaps even Pedernales.

Finally and most importantly, I wanted to see what was there.

Thanks to help from the Dominican ichthyologist Patricia Torres-Pineda I was able to obtain a collecting permit. My wife, also named Patricia, tells me that I’m old – true – and fragile – not tested yet but likely. She won’t let me go to the field without a companion who can rescue me if necessary. I don’t like this restriction but I take her point. Mark Sabaj, head of the Academy of Natural Sciences of Drexel University’s Ichthyology Department helped me obtain the all-important spousal visa. Alfredo Dalmau-Disla, one of Pat’s students, accompanied us in the field. I would not have been able to make the trip without a collecting permit and either companion. I am very grateful to both Pats, Mark and Alfredo for making my trip possible.

The trip’s plan was simple:

- Day 1: Mark and I fly to Santo Domingo, collect rental car, check in with the national museum, go to hotel
- Day 2: Alfredo meets us at the hotel. We pick up the collecting permit, drive to a hotel in the town of Barahona, stopping on the way to collect at two sites in the gap between the two islands that came together ~ 15 MYA to form Hispaniola.
- Day 3: drive at least to the Río Mulito above Pedernales, collect back toward Barahona as possible.
- Days 4-6: drive to the last site visited, continue collecting toward Barahona
- Day 7: drive to Santo Domingo, deposit specimens in museum, hang out in airport
- Day 8: check in at 02:00, flight home departs at 05:00



Reality didn't quite match the plan: we found native poeciliids at only 4 sites. Most of the plan's sites were inaccessible.

March 10: car rental formalities took so much time that we couldn't go to the museum. We stayed in Hotel Aladino, where I'd stayed on earlier visits to the DR.

March 11: Alfredo met us at the Aladino. We went to the environment ministry to pick up the collecting permit. The office is next to a La Sirena supermarket where we bought water. And then we headed west to Barahona. On the way we tried to find and work two sites on the south side of the "gap." We found an accessible site with parking on the Río Lempa some distance downhill from Balneario La Sequia (also called La Acequia), the day's first planned site, collected *Limia*, *Gambusia* and *Nandopsis* in it. La Sequia (drought) is probably a contraction of La Acequia (irrigation canal).

Given site 1's location we expected to find *Limia melanonotata* and *L. sulphurophila*. We collected *melanonotata* and another *Limia* that could be *sulphurophila* but to the naked eye isn't right for it.



Site 1, upstream view. The stones in the foreground are a dam that makes a pool where people bathe - Mark Sabaj photo.



A male mystery *Limia* from Site 1. Not *melanonotata*; could be *sulphurophila* because of its orange dorsal fin but it lacks the rest of *sulphurophila*'s color pattern - Mark Sabaj photo.



Site 1 mystery (?) *Limia* female. Slender for *melanonotata*, lacks *sulphurophila*'s dark markings, *melanonotata* females' rows of spots. On second thought, possibly *melanonotata*. Mark Sabaj photo.

We went on to Mata de Maíz, the day's second planned site, because we risked running out of daylight. The actual site is a stream that has been dammed to make a swimming hole, which is roughly five hundred feet (elevations measured by my handheld GPS) below the parking lot. The road from the parking lot to the pool is paved but so badly broken up in places that we doubted that our vehicle could climb some of the breaks. For me, fifteen minutes to walk down, forty minutes up. We saw and collected no fish in the pool and stream.



Mata de Maíz lower pool



Up the hill. Not fun.

Mark Sabaj photos

We stayed in Neo's Hotel in Barahona. Neo's has no restaurant but is convenient to a 24 hour supermarket where we bought water to drink in the field, coffee and food for breakfast. There's a nice Puerto Rican restaurant next to the supermarket; we dined there while in Barahona. And there's a bar nearby where we watched the World Baseball Cup



Unprepossessing, better than good enough, but no restaurant

March 12: on the way to Pedernales we drove through a job site on highway 44 that was closed to traffic from 17:30 to 05:30. The two alternate routes back to Barahona are difficult mountain roads over the Sierra de Bahoruco. This meant that we couldn't collect as late in the day as planned.

We got lost in Pedernales; the map that worked perfectly on my PC had loaded into my GPS without error messages but somehow the version in the GPS didn't have the map tile with Pedernales. Alfredo used his phone and Google Maps to navigate us through town. A stream crossed highway 544 below the Río Mulito; we saw and caught no fish in it. We found only guppies in the Mulito. Paved road, in places; unpaved in places, some difficult.

We found Pozo Ecologico de Romeo Francés, a complex of three sinkholes. It has parking. The sinkholes are surrounded by cacti. We collected *Limia*, *Gambusia* and *Eleotris* in the sinkhole nearest the parking area. The next sinkhole over is harder to work, also has the poeciliids. The third sinkhole should have the same fish but getting down to its water is impossible.

The sinkholes are part of a cavern system that lies under the karst plain that stretches from, more-or-less, Cabo Rojo to Oviedo. Since we found *Eleotris*, probably *E. perniger*, in one of the sinkholes the cavern must connect to the sea at least 2.7 km away. This because *Eleotris* is amphidromous; the adults live and spawn in freshwater, larvae go to sea to develop and eventually return to freshwater to live out their lives. The poeciliids probably navigate from sinkhole to sinkhole underground. I wonder whether there are *Lucifuga*, a live-bearing cusk eel, in the caverns, am not up to going into them to look.



Sinkhole 1. 2060 ppm TDS

There are at least five species of cactus in this picture. One is aggressive, rather like the Sonoran Desert's Jumping Cholla (*Cylindropuntia fulgida*); it nailed Mark. Small plants of another were in holes in the rocks. We had to be careful where we sat.



Alfredo at sinkhole 2 - Mark Sabaj photo



Sinkhole 3 - Mark Sabaj photo.



The male above is deeper than the others and his dorsal fin inserts farther forward.
As far as I can tell they're all the same species.



Three male *Limia* from sinkhole 1. Close examination of preserved specimens found that they're most like *L. melanonotata* but aren't quite right for it – Mark Sabaj photos



Female Pozo Ecologico *Limia*, nicely spangled



**Two *Gambusia* from sinkhole 1. Mark thinks they are *G. hispaniolae*, I'm not sure.
Some males have more red in their dorsal fins - Mark Sabaj photos.**

In most places highway 44 has no shoulders and deep concrete drainage ditches very close to the

pavement on both sides; parking along it was impossible and leaving our car on the road while we worked seemed a bad idea. We got through the job site with perhaps half an hour to spare.

March 13: We started at Arroyo Salado, a complex of spring-fed pools with considerable current at the downstream end. As the name says, salty; 6380 ppm TDS, ~ 20% sea water. The pools were surrounded by mangroves. We collected *Gambusia* and a *Limia* much like *L. perugiae*, with, unlike *perugiae*, spangled females. Attractive fish.



Arroyo Salado - Mark Sabaj photo



ANSP 212522 *Gambusia* cf. *hispaniolae* Arroyo Salado - Mark Sabaj photo



Alfredo casting bread upon the waters, Arroyo Salado. The fish like bread.



ANSP 212521-A1357 *Limia* cf. *Perugiae* Arroyo Salado – Mark Sabaj photo

Next stop was Laguna de Oviedo, a hypersaline (~ 60-90 ppt salt) lagoon that is ~ 10 km long by > 2 km across, no more than 1.5 m deep. It has an endemic pupfish, *Cyprinodon nichollsi*, and resident flamingos. These last are a tourist attraction. We collected pupfish, *Gambusia* and a strange *Limia* that has been identified as *L. melanonotata*. I'm not sure about this identification; preserved specimens are more like *perugiae*. I think, could be mistaken, that the Laguna de Oviedo and Arroyo Salado *Limias* are the same even though the Laguna de Oviedo fish are considerably smaller. We also found a weird marine alga, *Acetabularia* sp., an enormous single cell whose common names include Mermaid's Wineglass and Mermaid's Parasol.



Male *Cyprinodon nichollsi* – Mark Sabaj photo



Male *Limia* cf. *perugiae* Laguna de Oviedo – Mark Sabaj photo



***Acetabularia* sp. Laguna de Oviedo**

On the way back to Barahona we visited high gradient streams that come down to the sea from the Sierra de Bahoruco and a sea-level spring. The streams had Mountain Mullet (*Dajaus* – formerly *Agnonostomus* – *monticola*) and *Eleotris*, probably *E. perniger*. The spring had guppies but no other fishes. There were no native poeciliids in any of them.

March 14: At this point we'd visited most, if not all, sites in the plan that turned out to be accessible. So we went back to the sinkholes and Laguna de Oviedo and collected more specimens for the museum. March 14, 2026, is a Saturday. There was no activity at the job site that is closed to traffic from 5:30 to 5:30 weekdays; it was open to traffic all night.

March 15: We went a good distance up the Río Palomino, which flows to the sea through the town of Barahona. It was easily accessible in two places; we saw and captured no fish at either.

After that we went to La Sequia. On the way up we forded a small creek. No fish. La Sequia was formerly a spring-fed swimming hole but the spring has been captured. All its water now flows into an irrigation canal. I believe it is used by a banana plantation some distance downhill. No fish visible in or collected from the canal. On the way down from La Sequia we found accessible water – the Río Lempa -- in El Salido, a small village. The trip's first site was less than one kilometer downhill in the Lempa. We were taken over by a small mob of kids who wanted to play with us and our nets, also to try out the English they were starting to learn in school. They had a good time, so did we, but our productivity suffered a little. Same fish as downhill. And then down the hill to our first site.



Alfredo, me and helpers – Mark Sabaj photo

March 16: Back to Santo Domingo, where we deposited specimens in the National Museum of Natural History. While Mark talked shop with Gabriel de los Santos, head of the museum's department of research and conservation, I looked at jars of *Limia* in the collection. I didn't find the large (~ 40 mm SL) male *perugiae* that Claudia Erbeleding (pers. comm.) told me she'd seen in a collection (Carlos Rodriguez'?) in Santo Domingo, did note that the color pattern of male *zonata* (many narrow bars, some anterior to the gonopodium's base) from the Río Yaguajal is unlike that of eastern male *zonata* (four broad bars, all posterior to the gonopodium's base).

And then to the airport to return the car and hang out until it was time to check in.

March 17: check luggage 02:00, fly out at 05:00. After customs and Fish & Wildlife formalities in Newark, drive home, put live fish away and go to bed.

Although we'd agreed to deposit all of the specimens we preserved in the national museum, most of the specimens Mark photographed somehow found their way to Philadelphia. Unfortunately we brought back no Río Lempa mystery *Limia*. I looked closely at the preserved specimens we had and was fascinated.

Not keeping some live Laguna de Oviedo and Arroyo Salado *Limia* and Río Lempa mystery *Limia* was a bad mistake. In May Alfredo and I went collecting again, preserved more specimens of both species for the Academy and got live ones for me. Unfortunately the live specimens were confiscated at the Santo Domingo airport because I had no export permit. The preserved material wasn't detected or confiscated. Having it in the Academy of Natural Sciences made the trip worthwhile.



Why the site 1 truck tire is there.

Across the road. Desert.

I've looked closely at the Río Lempa specimens. Until proven otherwise – I could very well be mistaken about this -- they are *Limia sulphurophila*.



Male Río Lempa mystery *Limia*



Female Río Lempa mystery *Limia*

Diary dates

Autumn Convention: Shenstone

Our final meeting of the year is to be held October 24 and 25 at Shenstone village hall.

Accommodation can be booked at the Holiday Inn express at Wall Lane. The hotel is half a mile from the venue.

BRITISH LIVEBEARER ASSOCIATION OPEN DAY AND LIVEBEARER SHOW 24th OCTOBER 2026

An absolute must for any one with an interest in Livebearing fish. This is to be a social day, where you can meet and chat to club members. Discover and learn new things about fish husbandry and Livebearer conservation.

Membership is £6.00 and available at the event.

What we have planned for the day: -

- Livebearer show
(Wild type and cultivated)
- Fancy Guppy show hosted by FGUK.
- Informative talks from renowned guest speakers.
- A Q&A forum ready for your questions from beginner to expert.
- A sales table for all those little bits and pieces you may need.
- Club raffle with some great prizes already in.



The Shenstone Village Hall
Barnes Rd,
Shenstone,
Lichfield
WS14 0LT

This to be a two day event with guest speakers on Saturday and a livebearer show and auction on Sunday.

Details of the guest speakers, AGM, Livebearer show and Livebearer auction will be available soon.