



# Northern Platyfish Husbandry Manual

**This husbandry manual was written to offer guidance and help to new breeders of northern platyfish as well as those who encounter some problems despite many years of experience. There is no „one easy way“ to do things, so it is meant as a platform to share our knowledge of what works and what not. Everyone is encouraged to contribute with his/her own interesting findings.**

This work is **authored by the members of the „Xiphophorus – Northern Platyfish“** (XNP) conservation project under the ÖVVÖ guidance with special thanks to: Libor Balnar, Arjan de Graaf, Torsten Friedrich, Michael Kempkes, Thomas Rehbeck, Jacques Sabatier, Reinhard Seidl and Dávid Urbányi.

XNP project homepage: <https://www.conservation.oevvoe.org/en/xiphophorus-northern-platyfish>

Markéta Rejlková, project manager  
Ostrava Zoo, Czech Republic



## About northern platyfish

This group of fish consists of three valid species of *Xiphophorus*. It also includes different genetic strains, whether they are the same species, local variant, subspecies or whatever else. All following platyfish are covered by the manual:

*Xiphophorus couchianus*

*Xiphophorus gordonii*

*Xiphophorus meyeri*

*Xiphophorus* sp. "Apodaca"

(Note on *X. sp. "Regio"*: This fish is also included in our conservation project. As its identity is not known yet and it has some traits which set it well apart from all other northern platyfish, it is not a subject of this manual. Anyway, its husbandry requirements are very similar, but this fish needs more space due to its bigger size.)

With the exception of *X. gordonii*, all northern platyfish are **extinct in the wild**. *X. gordonii* is endangered according to IUCN and considered to be critically endangered by local organizations; captive breeding program is considered to secure the species survival in case of loss of the remaining natural population, which is unfortunately foreseen. So the whole group of northern platyfish is extremely endangered.

**Please, keep this in mind – by having these fishes in your aquarium, you are contributing to the real species conservation. Thank you for acting responsibly.**



*Xiphophorus couchianus*, male.

# Natural habitats of northern platyfish

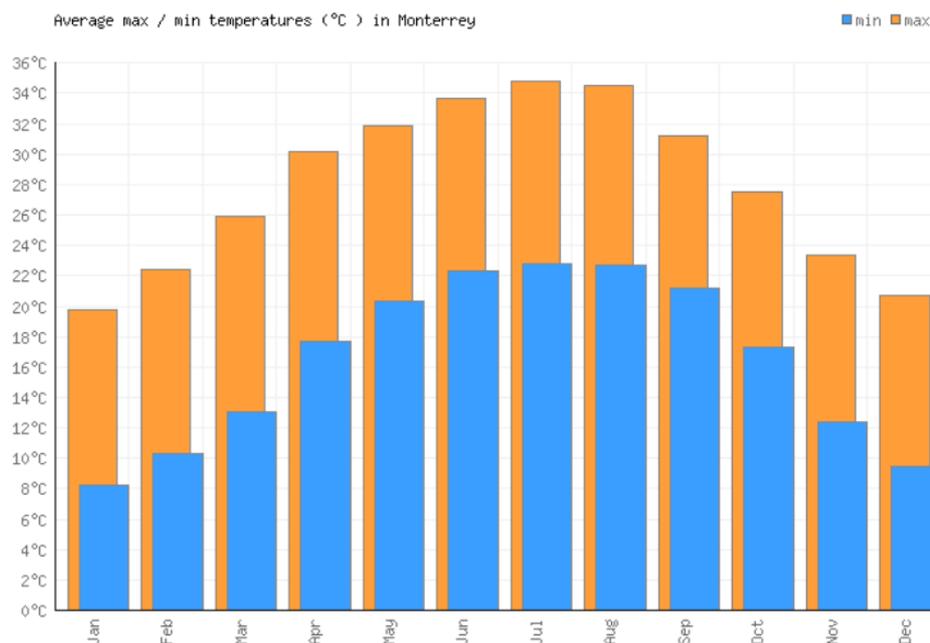
Let's have a look at semi-arid northern Mexican states Coahuila and Nuevo León. Water is not abundant here and rivers are often seasonally dry.

**Typical habitat of northern platyfish is a spring pool.** *X. couchianus* lived in several places in the upper Río Santa Catarina drainage, but we can also consider it to be well adapted to headwaters only. *X. meyeri* lived in a single spring and in a nearby semi-artificial pool used for recreation and fed by water pipes from the original spring. *X. gordonii* is endemic to Santa Tecla system – relatively small pools where it lives in inlet and outlet.

**This gives us the idea of what is the most important feature of northern platyfish's habitat: clean and clear water, oxygenated and moderately flowing. Aquatic plants and/or algae are common.**

*X. gordonii* lives in the desert valley of Cuatro Ciénegas, where the temperatures are considerably higher than in the surrounding region. Water temperature in laguna Santa Tecla is around 29–30 °C all year round. Other species of northern platyfish lived in places where winter can bring even some snow cover for a few days and air temperature drops below 10 °C, while during summer it can reach 40 °C in hot peaks. So these fishes are tolerant to wider temperature range, but it is useful to keep in mind that their presence was restricted to headwaters and springs, where temperature is not so fluctuating.

Average temperatures in Monterrey, Nuevo León (former home of *X. couchianus*):



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Min °C	8.2	10.4	13.1	17.7	20.4	22.3	22.8	22.7	21.2	17.3	12.4	9.5
Max °C	19.8	22.5	26	30.2	31.9	33.7	34.8	34.5	31.3	27.5	23.4	20.7

Source: <https://www.weather2visit.com/central-america/mexico/monterrey.htm>

In February 2018, we (Markéta Rejlková and Libor Balnar) have visited some habitats of northern platyfish and have taken the following measurements:

Poza Grande / Santa Tecla, Cuatro Ciénegas (habitat of *X. gordonii*):

pH 7,65, conductivity 920  $\mu\text{S}/\text{cm}$ , water temperature 29,9 °C (air 26,5 °C)

La Cascada, Múzquiz (former habitat of *X. meyeri*):

pH 7,35, conductivity 565  $\mu\text{S}/\text{cm}$ , water temperature 16–22 °C (air 20 °C)

Ojo de Agua de Apodaca (former habitat of *X. sp.* "Apodaca"):

pH 7,20, conductivity 1542  $\mu\text{S}/\text{cm}$ , water temperature 24,9 °C (air 19,5 °C)



La Cascada, Múzquiz.



Outlet of the Poza Grande, Cuatro Ciénegas.

# Aquarium husbandry

It should be simple – just give your fish clean oxygenated water, plants for cover and grazing, variety of food... and enjoy a thriving colony! In reality, things can be complicated, your fish will not breed or you will lose them one by one. It happens, northern platyfish are quite challenging. If you want to start with the least demanding, go for *X. meyeri* – the least problematic species. But it can give you a headache, too!

Below, you can find general requirements of northern platyfish. It is not complete nor perfect manual. To complement this, we provide some real examples of our own set-ups.

## Aquarium

Depending on the size of your colony, start with a volume around 50 l. Of course, it will be ideal to have bigger tank and dozens of fish. Use bare bottom or sand/gravel, always with some plants; moss and algae are also useful. Especially *X. gordonii* can be quite shy, so plant cover is a must, and other species also appreciate it.

## Compatibility

Absolutely avoid any other species of genus *Xiphophorus* to prevent hybridisation. Active swimmers, predators and fish that would nip at fins can bother northern platyfish. A species tank is therefore recommended, but peaceful fish, such as small catfish, can make good companions.

## Filtration

It doesn't have to be powerful, but provide some water current and aeration by moving the surface or using an air-stone.

## Water changes

Frequent, northern platyfish do not like old water. Adjust quantity and frequency according to your own tank and fish condition, but 1/3 weekly should be OK – more frequent during summer when you can use very cold water (not for *X. gordonii*). Change water more frequently also during acclimatization of new fish or when you see some signs of possible illness.

## Temperature

28–30 °C for *X. gordonii*. They can tolerate lower temperature, but we should keep them in conditions as close to their natural habitat as possible. Our ultimate goal is to keep back-up populations for possible reintroduction, not to make them well adapted to life in aquarium. But if you struggle to keep your *X. gordonii* healthy and breeding, try to lower the temperature to 26 °C for a few weeks.

For other species, 22–26 °C during the warm period of the year is acceptable. It is highly beneficial to let the temperature drop below 20 °C (down to 16 °C) for several months. Fish would stop breeding at the lower end of this range, while warm water makes them uncomfortable and prone to diseases. 22 °C seems to be optimal. Day/night fluctuation is appreciated, but not necessary.

## Seasonal variability

Northern platyfish are not tropical fishes, so their natural habitats are subject to seasonal variations. Even if the spring pools have less prominent fluctuations in temperature, it can still play an important role. You will notice that northern platyfish do not breed all year round (they stop during winter and often also during summer). It can be useful to simulate periods of rest and activity by changing the water temperature, light period and feeding.

### **Outdoor keeping during summer months**

Possible, and gives positive results for all species. Use heater for *X. gordonii*. You can consult the next section of the manual to see a real example.

### **Water chemistry**

Not critical, but if you have any doubts, always look at the natural conditions (see above). Water should be clean with low organic load. High pH and moderately hard water are preferable. We have not observed any health issues related to low pH, soft water etc.

### **Feeding**

All types of food are well accepted. Diet should be variable and based on low-protein food, at least part of it consisting of plant matter – vegetable flakes, algae etc. Cyclops, dafnia, moina are also suitable, as well as brine shrimp, grindal worms or microworms. You can use more protein/fat rich food occasionally, but it is not necessary and only do it with caution and reason. Watch for signs of under- or overfeeding - „nicely fat“ fish will stop breeding! Grazing on algae and aufwuchs is natural behaviour of northern platyfish, so it is best to mimic it. Note that *X. gordonii* needs more food due to higher temperature and increased metabolism.

### **Breeding**

It is not necessary to separate female for birth, fry is not eaten. It is actually better to leave female in her tank to prevent stressing her.

### **Population management**

Genetic variability of northern platyfish is low. Captive populations are being kept for decades (over 50 years in case of *X. couchianus*!) and in low numbers. Watch for signs of inbreeding (e.g. deformities, stunted growth) and consider „refreshing“ your stock every few years. Currently, there are no guidelines, but we are keeping records about origin of everyone's stock to map the relationships. If you think about getting some „fresh genes“, get in contact with our project.



*Xiphophorus meyeri*, spotted form. Algae and moss are appreciated by the fish.

# Disease treatment

When you see signs of discomfort, you can use salt (up to 1 table-spoon / 10 litres of tank volume). If it doesn't help, northern platyfish usually react well to the use of common fish medicines. You can raise the temperature above 30 °C if it is needed, but make sure to provide plenty of oxygen.

Most frequent problems are:

- 1) mycobacteria (see below);
- 2) bacterial infection – *Flavobacterium* type, clumped opaque fins, fish shimmying – this is caused by stress, so check your water temperature, chemistry and other potential stressors; water change can often help;
- 3) nematodes – internal parasites which are quite easily diagnosed (microscope is needed for some species) and easily treated by fenbendazole or levamisole.

**Mycobacteria** are unfortunately quite common in strains of wild type *Xiphophorus*. Several different species of *Mycobacterium* can cause infections in our aquariums. Note that this bacterial infection can affect in rare cases also humans, so if you have any open wounds on your hands, be very careful when putting your hands in the tank. But this is not restricted to *Xiphophorus* species.

Common symptoms include: ulcers on the body and other non-healing lesions, fin erosion, weight loss, strange coloration, spinal deformities, swimming irregularities. In our strains, we have frequently noticed heavy breathing, open mouth and non-functional swim bladder (belly sliders among fry, adult fish sunable to maintain buoyancy) and less frequently emaciation and stringy, almost invisible poop.

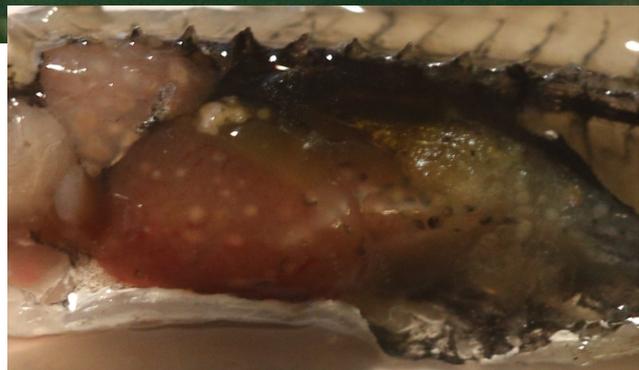
Mycobacteriosis is a chronic disease and there is no cure. If you suspect that your fish are infected, you can try to move the healthy looking specimens into a new tank. Sometimes, a radical change of conditions can help and you will get a healthy offspring. If you don't react, you will lose your fish slowly one by one.

To prevent mycobacterial infection in northern platyfish, keep the water temperature low. All year around 20 °C is better than all year around 24 °C.



Top: *Xiphophorus gordonii* infected with mycobacteria. Note the (permanently) half-opened mouth and wound on the caudal peduncle, a very typical location.

Right: Autopsy confirmed granulomas (white nodules) in the liver.



# Husbandry examples

Following are examples of husbandry with description of particular parameters, problems etc. We provide these data to share our own experience of what works – and what not so much. Sometimes our experience could be contradictory to the general guidelines or someone else's experience. As with all living systems – you have to carefully watch and understand your own aquarium and fish instead of following a recipe.

## CASE 1 (*X. meyeri*)

Over the winter, the fish swim in one of my basement pools. It is a small system with 4 shelves, each 120 x 40 x 40 cm. The tank in the bottom row is the **filter**. This is equipped with a granular filter media and the known blue filter sponges. From this filter, the water is pumped into the top shelf row and then runs through all tanks back into the filter. In addition, an **air operated sponge filter** is in each row for safety. Even with a breakdown of the circulation, this does not lead to losses in the fish. All aquariums are planted with **various robust plants**: Javamoos (*Taxiphyllum barbieri*), Java fern (*Microsorium pteropus*) and *Echinodorus*.

When it rains enough, most of the tanks run on **rainwater**. In the summer of 2018 it also worked for 4 months only with tap water. As a result, the **conductivity varies between 200 and 800  $\mu\text{S}/\text{cm}$**  and the **pH value varies between 7,6 and 9**.

**Water changes** are performed every 14 days (about 30%). In between, water is refilled because I use the tank water from this system for various cleaning works in the basement and fish room. That makes additional 10% in the two weeks.

**Lights** are on from 7 in the morning to 22 in the evening with a 2,5 hour lunch break. The long illumination time was chosen to have time to feed later in the evening.

**Feeding** is done twice a day. So far almost exclusively with dry food (flakes or pellets). One to two times a week, if available, live food from my breeding ponds or from the garden pond. When the breeding of *Cyclops* is running very bad seasonally, you can also see it at the fish condition. Then I use a substitute in the form of frozen food (*Cyclops* and glassworm). Just flake food does not work well also with other species of platyfish. **I think the best would be many live *Cyclops* and a rich algae growth where the fish can graze the whole day.**

As a cleaning crew I use shrimps *Neocaridina davidi* and trumpet snails, probably *Melanoides tuberculata* and *Tarebia granifera*. Involuntarily, I have in these tanks also flatworms (*Rhabdocoela*?). But since they do no harm I have not done anything about it.

A large part of the *X. meyeri* **spend the summer outdoors** in my 1000 liter aquarium. Since I had been doing this successfully with another platyfish (*X. variatus*) for years, I wanted to see if this works well with the *X. meyeri*. The tank was planted in mid-April and filled with pond water (mostly rainwater). In early May, the *X. meyeri* and *Gymnogeophagus terrapura* were then placed in. There are two 300 watt heaters ready for emergencies. Filter is Eheim 2252 with an additional piece of blue filter mat in front of it to extend the cleaning cycle of the filter and protect juvenile fish. Both fish species were in this basin until the beginning of October and have proliferated magnificently. On the particularly hot summer days, a parasol is stretched to avoid temperatures above 35 °C. Failures due to overheating did not occur although the 35 °C was often exceeded. Presumably, the powerful filter contributes to keeping the oxygen content high enough. The water from this pool is used to water the garden. Refilled, if available, with rain or pond water. Otherwise, our hard tap water needs to be taken. The rain and tap water is used cold and also deliberately used to cool the pool. The water change is therefore much more intensive than in the basement pool. When the fish are moved back inside, it is not attempted to do so on a too cold day and I take as much of the tank water as possible. I've been doing this with platyfish and goodeids for many years, and have not failed.



#### **CASE 2 (*X. couchianus*, *X. meyeri*)**

As **food**, they get often microworms and frozen *Cyclops* and in between some artificial food. Feeding more microworms and *Cyclops* gives me positive results in the form of stronger fish and more fry.

According to my experience, **it is easier to keep *X. meyeri* than *X. couchianus* and wild form of *X. meyeri* is definitely more sensitive than the spotted form.** I keep *X. meyeri* in two groups, one is always in the aquarium, another spent the **summer outside** in a black mortar tub in the half-open greenhouse. That was positive, even without **frequent water changes** which you have to do in the indoor aquarium, otherwise the fish are not going to be in that good shape in the long-term. I had some problems with fish dying, but that was solved when I started to **change water every three days also cooling it down by using cold water**. The *X. meyeri* stopped dying and they look good since then, I keep them at 21–22 °C. According to my feeling the *X. meyeri* feel well even at **normal room temperatures** and breed successfully.

This is a bit different for the *X. couchianus*. I had severe problems with **females not giving birth**. But I discovered a **fry which was not properly developed, sometimes still with a big yolk sac, unable to swim**. I raised temperature in one of these tanks to 26 °C, the other still had 21–22 °C. The result was live juvenile fish at 26 °C and in the other again underdeveloped non-viable. However, there were still some "belly sliders" among the live juveniles. After this, I changed the husbandry accordingly. Definitely **they require higher temperatures for breeding**.

In principle I am sure of two things, both (*X. meyeri* and *X. couchianus*) do not see **temperatures down to 16 °C** as a restriction, on the contrary, it **increases their vitality**; only there are no litters there and medium-sized juveniles grow more slowly (logically). The births seem to be affected by daylight length and temperatures. With the *X. couchianus*, I still suspect somewhat higher temperatures for reproduction than with the *X. meyeri*. The juveniles need warmer temperatures above 22 °C for rearing.

I am of the opinion that the **stocking density** should not be too high, so that young fish can get born, but also a **minimum stock** should be kept. From the moment my stocks were over 10 animals, it was obviously better with the offspring. That's why I'm considering setting up larger aquariums.

My water has a **conductivity of 700–900 µS/cm, pH around 7 and hardness around 18 GH.**

### **CASE 3 (*X. couchianus*, *X. meyeri*)**

I keep both species in a **dedicated species tank** with the dimensions 60 cm x 60 cm x 60 cm, which makes about 216 liters. The aquariums are **densely planted** (mainly with *Cryptocoryne*) and have a **substrate of fine-grained gravel**.

During the **cold season** (end of October to mid-March) the daily **lighting** duration is 10,5 hours and the water **temperature** varies between 19 and 21 °C. During the **warm season**, I increase the lighting duration to a good 12 hours and the water temperature varies between 23 and 24 °C. The **reproduction increases significantly** with increasing temperatures and a longer illumination.

**The water has a hardness of 18 GH and a pH of 7,2.**

### **CASE 4 (*X. couchianus*, *X. gordonii*, *X. meyeri*)**

We feed **varied food** twice a day, mainly flakes with *Spirulina*, live microworms, *Moina*, *Artemia*, frozen *Cyclops* and sometimes other food types. *X. gordonii* are kept at higher temperature (29–31 °C) and lower temperature (25–26 °C) and they all get much more **rich food** – daily enriched *Artemia* and more often (compared to other species) microworms. They are very active and especially in the tank with higher temperature, they would look skinny without extra feeding. On the other hand, when feeding enriched *Artemia* to *X. couchianus*, the females got fat and stopped reproducing. Instead, they started to die and the autopsy showed a **fatty liver**. It is better to feed them more **vegetable diet** only with *Cyclops* and *Moina*. All species of northern platyfish **like to graze on green algae**, *X. meyeri* has a moss in its tank and it actively nips at it, too.

We perform 30% **water changes** once or twice a week, with **cold water** in summer. *X. couchianus* and *X. meyeri* are kept at 18–26°C according to the season. We use small power filters or air sponges, the fish are more active with an **aeration**, but they also need some sheltered area with plants and low current. **Soft water (5 GH, 200 µS/cm ) with pH above 8 is not a problem.**



**CASE 5 (*X. couchianus*, *X. meyeri*)**

The *X. meyeri* are kept in a 80 x 35 x 40 cm tank with a small pump for watermovement. Fully planted with *Anubias* and *Cryptocoryne*. Temperature about 25 °C. They have been unheated for most of the year, but started to get **very shy and inactive at 19 °C, so I raised the temperature**. With a few degrees more they seem to eat better and have a better condition.

The *X. couchianus* are kept in a 60 x 30 x 40 cm tank, small pump for watermovement and planted with *Pogostemon*, *Cryptocoryne* and *Echinodorus*.

**Water changes up to 80 %** for both species with regular tapwater (pH 7,8; 7,2 °GH) about every 10 days.

Feeding : daily with freshly hatched *Artemia* (brineshrimp) and fry flake food. Weekly with several types of frozen food. The frozen food contains **a lot of greens (pea, spinach, zucchini, spirulina)**. In summer, additionally with mosquito larvae and *Daphnia*.



#### **CASE 6 (*X. couchianus*)**

My circumstances for *X. couchianus* are a bit different, but also working very well. I keep my breeding group in a 50 liter tank without any substrate. There are many branches and *Najas* plant for hiding. I pay more attention to feeding, I give them frozen *Artemia*, white mosquito larvae, some bloodworms and flakes daily. **If you feed them that rich, its very important to provide also a lot of green food.** I use **very strong, natural lights to grow algae** in the tanks, so they can graze on it as much as they want.

My water parameters are very simple, I use cold tap water, with pH around 7. I don't use any heater, the water **temperature is 26–27 °C in the summer, and 14–15 °C throughout the winter.**

I use only sponge filters but I make 50–60 % water changes once in a two weeks. My breeding group is very large, so not many fries survive in the main tank. I need to separate the heavily pregnant females to give birth in smaller tanks or boxes, where the juveniles can grow safely. Their first meals are micro and grindal worms, frozen cyclops and some dry food.



#### **CASE 7 (*X. meyeri*)**

My tanks are divided into two parts, one reserved for reproduction, the other for the rearing of fry. The first part consists of 3 aquariums of about 60 liters. **Hard water (GH >25°, pH 7,2)** from the tap, settled for at least 48 hours at room temperature. Filtration is provided by a blue filtration foam and air enhancer. The rearing part has 3 aquariums of about 130 liters filled with the same water. The filtration of two of the tanks is ensured by external pumps and filters (Eheim type).

**Weekly water changes of 80 %** of the volume, except for one of the rearing tanks which is in open circuit, equipped with a stream pump and a dripping system (12 liters/day) without water changes for more than a year.

**All aquariums have dense vegetation**, plants that need to be planted are planted in pots. This arrangement allows them to be removed when the tank needs to be cleaned or fry taken. **The temperature of the tanks varies from 18 °C in winter to 26 °C (few days) in summer.** The lighting of the tanks is provided 10 hours a day by 6000K LED tubes. The fish are fed once a day with artemia naupli, flakes and granules for herbivores, white mosquito larvae. In case of absence of artemia, they get crushed spirulina.

For breeding, I isolate 2 males and 3 or 4 females. One of the males becomes dominant, then **it is essential to have a well-planted tank** to provide shelter for the other male and then the fry. **Females are not isolated to give birth. Fry are very little attacked by the adults.** Occasionally, the fry is transferred to the grow-out tanks. And the result? January 2020: 5 individuals. January 2021: 290 individuals. January 2022: 415 individuals.

#### CASE 8 (*X. meyeri*)

The animals are still in a 54 liter aquarium, but there is already a 112 liter aquarium ready for them. I put the flattest Yugoslavia stones on the bottom for young fish, plants are also provided. I work with **two internal filters**, with one biological and one chemical being cleaned alternately every 2 weeks. I also consider the **addition of mineral salt** to be very important, I use the JBL Aquadur for Malawi and Tanganika at 5 g /100 l. It is in my opinion an absolute must. I maintain a **temperature fluctuation of 23–25 °C daily**, whereby I am very consistent. A varied diet is also important, and of course regular water changes of at least 1/3 a week.



#### CASE 9 (*X. couchianus*)

This was a temporary solution and it has turned into the most successful „factory“ producing *X. couchianus* – and very healthy and big fish. Tank volume around 35 litres, bare bottom, **dense plant cover**. Feeding daily with **freshly hatched artemia (this was the base of the diet)**, frozen cyclops and white mosquito larvae, live blackworms, flakes... **Temperature 18–21 °C according to the season of the year (unheated tank)**. **Water changes around 1/3 of volume every 5 days** with tap water (pH 7,8 and hardness 5 °dGH, nitrates close to 0). There were almost 200 fish at one moment (this was discovered only after netting them out, as there were more and more fishes coming out of the plants!) and the **pH used to drop down to 4,9** two days after water change. This didn't affect the fish and they were in the top condition. **Low temperature is the key.**

