The altum angelfish, Pterophyllum altum

by Antoine Saucier[1], February 10th, 2024, Montreal, Canada.

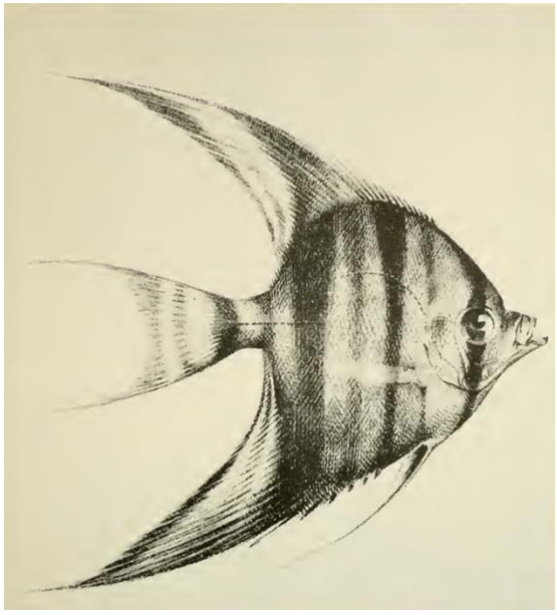
This article on the altum angelfish comprises two sections. The first section, spanning pages 1 to 14, presents a literature review encompassing materials from various sources, including biological and aquarium literature, articles from aquarium magazines, scientific publications, selected internet references (primarily databases and YouTube), and anecdotal insights from friends of La Maison du Poisson. In the second section, on page 15, we draw on this review and our experience to formulate our recommendations for the care of the altum angel in the aquarium.

1 - Literature review

Introduction

The genus *Pterophyllum* comprises three species: the common angelfish (*Pterophyllum scalare*), the altum angelfish (*Pterophyllum altum*) and the Leopold's angelfish (*Pterophyllum leopoldi)* (from Fishipedia[2], [8]). There are many subspecies of these fishes, which is why wild individuals are often named after their river of origin [8].

The genus *Pterophyllum* has been representative of the South American ichthyofauna, widely distributed in the basin of the Orinoco River and the Brazilian, Colombian and Peruvian Amazon [4]. Several species belonging to the genus *Pterophyllum* are grouped together under the name scalaria [4], from the Latin scalaris, "ladder", for the stripes on their bodies reminiscent of a ladder [11]. Body shape and color patterns serve as camouflage in dense vegetation ([5] p. 381).



Pterophyllum altum, drawing made in 1903 by the French biologist Jacques Pellegrin [3].

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[2] Fishipedia [10] is an encyclopedic social network dedicated to fish and aquatic ecosystems. It features a "fish" thematic section with over 1,300 detailed records. Since 2013, the Fishipedia database has been developed with the help of a team of recognized specialists.

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In 1903, French biologist Jacques Pellegrin [7] described a species caught in the Atapabo River, in the Orinoco basin. He writes (translated from French): "This pretty species is clearly distinguished from *Pterophyllum scalare* by its higher form and notably smaller scales". His description is as follows: "Profile rising very abruptly above the anterior edge of the eye", "Dorsal and anal with strongly growing spines, with extremely prolonged, filamentous anterior soft rays. Filamentous ventrals. Caudal scalloped with filamentous angles. Same coloration as in *Pterophyllum scalare* but fins darker." He completes his description with the drawing on page 1, that shows the characteristic snub nose of the altum angel.

Scientific name	*Pterophyllum altum* (Pellegrin, 1903), *Pterophyllum* from the Greek pteron = fin, sail and phyllon = leaf [1], apparently in reference to the tall wide and triangular dorsal fin.
Family	Cichlid [8]
Common name (French)	Scalaire altum [8], ange altum, altum [8].
Common name (English)	Deep angelfish [2], altum angel [13], altum angelfish ([5] p. 381), altum.
Common name (German)	Altumskalar [1]
Common name (French Guyana)	Kweyu
Common name in Peru	Pez angel, scalare ([5] p. 381)
Common name in Brazil	Acara Bandera ([5] p. 381)

According to Fishipedia [8], *Pterophyllum altum* is the largest species in the genus, with specimens measuring over 50 cm (20 inches) from the tip of the dorsal fin to the tip of the anal fin. Specimens up to 40 cm (16 inches) have been observed in captivity. According to Tabares *et al* [4], this species can reach up to 18 cm (7 inches) in length, between the nose and the tail, and its morphologic characteristics make it a very desirable species for the ornamental fish aquarium hobby.

Its natural base color is silver with four dark vertical stripes, one of which runs across the eye and another across the start of the tail. Between each pair of dark stripes, there is a vertical stripe of lighter brownish coloring. There are therefore four dark stripes and three lighter stripes. Note that the intensity of color of these vertical bands, i.e. darker or lighter, can vary significantly according to the mood of the fish. The altum angelfish breeder Simon Forkel emphasizes the golden-brown color of altum angels and the presence of three distinctive broad bands on the tail [15]. He also notes that the snub nose becomes more pronounced with age [15]. The author Petrovivky ([18] p. 356) notes that this snub nose is sometimes observed on tank raised *Pterophyllum scalare* specimens.

Petrovivky points out the presence of a first vertical black stripe that passes through the eye, followed by a second brownish or grayish stripe just after the gill cover, followed by a third black stripe like the first. Petrovivky claims that this three-stripe pattern is absent in the other two Pterophyllum species.

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According to Schultz ([3] page 6, 1967), this species is best recognized from the common angelfish by the greater average number of median fin rays, oblique scale rows, and vertebrae. Schultz reported only on specimens found in the upper Orinoco basin. Recently (2016), it was found that the overall genetic base composition of ***Pterophyllum altum*** shows a 92% identity to ***Pterophyllum scalare*** [9].

According to Fishipedia [8], there is no sexual dimorphism. Only during the breeding season does the female show a fairly thick conical protuberance in front of the anal fin, the oviduct. The male has only a thin, forward-facing organ, the spermiduct. Adult males often have a hump on the head.

The information in the rest of this section is taken from Tuccinardi [6], according to whom almost all genuine altum angels on the market are exported from Colombia. The true *Pterophyllum altum* is found along the border of Colombia and Venezuela in the Orinoco River drainage, including the rivers Atabapo and Inirida. It inhabits blackwater lakes and slow-moving streams throughout the region. There are also populations of *P. altum* in the middle and upper Rio Negro in Brazil and Colombia. Several other populations have been given the moniker *P. cf 'altum'*, but none appear to decisively match the original description and holotype of the fish as described by Jacques Pellegrin in 1903. During the altum fishing season — from July through December, when water levels are sufficiently low to allow for fishing — the fish are collected throughout their range. Collection occurs in typical fashion for wild angels, with fishers going out by canoe during the night and searching for the angels by flashlight.

Once collected, the altums must make their way to a local distributor, who either purchases the fish directly from the fishers or by way of roving Patrones. But the altum's journey does not end there, due to their delicate nature, many of the better exporters will transfer freshly arrived angels to their larger holding facilities in Villavicencio, about 3 hours' drive from Bogota. There, the fish are held in outdoor ponds and allowed to recuperate from the stresses of capture and transit while they are conditioned for export. The water in these ponds typically hovers between 78-80F, cooler than the altum's native waters and with a slightly higher pH, roughly 5.0-5.5. Once the fish are conditioned, they are transferred to aquariums in the Bogota exporter's facilities in the city, where they will remain anywhere from 2 days to 2 weeks before being shipped to importers across the globe. Altums are notoriously difficult shippers, and are extremely sensitive to handling, poor water quality, and crowding. The long supply chain for this fish, and the fact that they may change hands 2 or 3 times before even being exported, is almost certainly a major factor responsible for wild altum's (very deserved) reputation for being difficult to keep in an aquarium.

Once imported, altums face variable, and unfortunately sometimes less-than-ideal, care in the hands of trans-shippers, wholesalers, and retailers. That is where a significant proportion of the health issues with wild altums can take a turn from manageable to terminal. The better distributors and retailers, with appropriate handling practices, health management, and water quality, can really make a significant difference at this point in the

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supply chain and can determine whether a hobbyist receives relatively healthy or stressed, moribund fish.

During their trip after capture, altums are going through a gradual increase in pH, from as low as 4.0 in the black water they inhabit to upwards of 6.0-7.5 at most exporters' facilities, over the course of several weeks. According to Tuccinardi, many hobbyists and retailers set up a tank for newly imported wild altums with low pH, high temperatures, and tannins. Tuccinardi suggests that this may be a mistake, as it exposes the fish to a large, sudden change in water chemistry from what they have been acclimated to, and actually causes additional stress, rather than alleviating it. High temperatures (> 82°F) can also spur bacterial growth, potentially exacerbating minor bacterial fin and scale infections.

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Geographical distribution

Altum angels live on a few jungle rivers at the junction of Colombia and Venezuela [15]. More precisely, the altum is found in the Orinoco basin, including the Atapabo river, and in the Upper Rio Negro basin (see map below).



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Size

According to Petrovivky ([18] p. 356), the altum is 15 to 18 cm long (6 to 7 inches). According to Axelrod and Scott ([12] p. 532), the total height of the altum is 20 cm (8 inches). The altum breeder Simon Forkel[3] claims that his young altum angels can attain a height of 20 cm (8 inches) within six months and a good 30 cm (12 inches) after 12 months [13]. He also claims that a full-grown specimen can achieve a height of 40 cm (16 inches) after three years.

Natural habitat and behavior in the wild

The information in this section is from Fishipedia [8]. In the river, the altum hides in dense vegetation to avoid predators living in open water. For many species, these reassuring environments are also their preferred hunting grounds. The altum is adapted to a wide range of biotopes, from clear water to the edge of banks in submerged jungle.

The altum lives in river areas with slow currents. The water is acidic (pH between 4.8 and 6.2) and soft (GH hardness between 1 and 5) and the temperature varies between 25 °C and 31 °C, although water parameters vary with the season. It is often seen in close proximity to the flag cichlid (*Mesaunota sp.*). It lives in shoals near large roots or various submerged vegetation. Its atypical shape and patterns enable it to use mimicry to hunt and escape predators. This type of habitat is found close to banks, at a depth rarely exceeding two meters.

The altum is a diurnal and territorial gregarious fish found in schools of dozens of individuals. It is a hunter that can become aggressive in certain contexts. The altum angel is insectivorous, piscivorous, and vermivorous. It is generally peaceful with non-territorial fish, especially when the group is not hunting.

Breeding in the wild

During the breeding season, altums form monogamous pairs ([5] p. 381) and choose territories close to roots [8]. Unlike the common angelfish, which prefers to spawn on submerged leaves of plants and trees in flooded forest, altums lay their eggs on submerged roots and tree branches in moderate current [8]. Both parents look after the eggs and fry ([5] p. 381). They protect their eggs and fry from any intruder approaching their territory [8].

[3] From [14]: Simon Forkel is a 58-year-old German (in 2024) who has been an aquarist since the age of 10. He has bred viviparous fish, labyrinthids, Apistogramma, catfish, and finally wild angelfish (scalare) and wild altums. He has been breeding altum angels professionally for 18 years [15]. He won the 2006 scalare breeding championship in Prague. He is one of the only professional altum angel breeder in the world.

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Needs and behavior in the aquarium

Generalities and aquarium size

Altum angels grow rapidly and become large fish, easily reaching 20 cm (8 inches) in total height. A large aquarium of sufficient height and length is therefore required, i.e. at least two feet high and four feet long. For example, Fishipedia [8] recommends an aquarium of at least 600 liters (160 gallons), while Simon Forkel [14] [15] recommends a minimum aquarium size of 120 x 60 x 60 cm. The author's altums are currently housed in a 90-gallon aquarium, which is about right but rather minimal for adult altums.

According to Petrovivky ([18] page 356), the altum is a peaceful, quiet fish, but is easily startled. Petrovivky recommends placing the fish in a sufficiently spacious aquarium in a place where people regularly pass by, so that the fish gets used to a human presence.

According to Axelrod and Scott ([12] page 532), the care and husbandry of altums is generally the same as with *Pterophyllum scalare*, but a little more attention need to be paid to the quality of their water. These authors recommend keeping them in water that is warm, soft, acid and has a low bacterial count.

Fishipedia [8] considers the angel altum to be a rather robust species.

Water quality and maintenance

Aquarium water temperature: it should be between 25ºC and 31ºC, as in the altum's natural habitat. It is therefore reasonable to aim for a temperature of around 27ºC or 28ºC. Simon Forkel's farmed altums [14] live in tap water with a pH of 7.5, a KH of 4, a conductivity of 280 ms, and a temperature of 28°C. For newly acquired wild altums, Tuccinardi [6] recommends a temperature of around 26ºC or 27ºC, but no higher, to avoid worsening any small infections.

Aquarium water acidity: Fishipedia [8] recommends a pH between 4.8 and 6.2, which corresponds to the water in their native habitat. These authors suggest obtaining this pH by filtering on peat and adding decomposing leaves to the aquarium. However, Tuccinardi [6] points out that newly acquired altums have been acclimatized to less acidic water during transport, so he recommends a pH between 6 and 6.5, and preferably 6.5. He suggests achieving this pH by mixing tap water with reversed osmosis water [6]. If you really want to make the water as acidic as in the altum's natural habitat, we recommend doing so gradually, after the fish has recovered from the stress of transport and acclimatization. Indeed, altum angels are sensitive to abrupt changes in pH and temperature, as well as to chemicals [8].

First, let us emphasize that it is not necessary to keep altums in acidic water, except perhaps for captive breeding. Several species of fish that live in the dark, acidic waters of the Amazon, such as cardinal tetras and discus, can live healthy aquarium lives in water with

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a neutral or even slightly basic pH. For example, Oliveira et al ([19], 2008) have shown that the cardinal tetra is quite tolerant of high temperatures (33.3ºC) and a wide pH range (acid pH = 2.9 and alkaline pH = 8.8). The author's cardinals live for years in his aquariums in Montreal water, which has a roughly neutral pH. According to the Stendker brothers, who bred discus in Germany for 50 years, their discus lived well in the water of Germany's municipal aqueduct. The author has kept Stendker discus healthy for years in Montreal aqueduct water. Finally, Simon Forkel grows his young altums in water with a pH of 7.5 [13].

Let us also stress that acidification of aquarium water raises several difficulties. Firstly, making acidic water is not always easy, as David Bogert points out in one of his experiments on acidifying alkaline water ([20] section 4.4.4). Secondly, the manufacture of acid water requires the use of expensive reverse osmosis equipment to demineralize the water. Finally, using water with a pH of 4.8 significantly reduces the efficiency of biological filtration, as most beneficial bacteria do not survive such acidity [21]. Indeed, most bacteria are neutrophilic and thrive best at pH values between 7.0 and 7.8 [21]. They can adapt to environments with pH values between 5.5 and 9.0, but do not survive at pH values below 5.5 (except for certain specialized acidophilic bacteria) [21].

There's no doubt that altum can acclimatize to water that is much less acidic than that of its natural habitat, but only if this water doesn't contain too many bacteria in suspension. Indeed, the water in an altum's natural habitat is poor in bacteria, as its acidity hinders their growth, and its very low mineral content creates an osmotic pressure that is lethal to most microorganisms. As a result, altum angels are probably poorly adapted to water containing too many suspended bacteria. According to Forkel [14], altums are very sensitive to a high density of suspended bacteria in aquarium water.

Water quality control and water changes: the question of frequency and percentage of water changes is not independent of the filtration method used. Water quality control has two main objectives: to limit the accumulation of toxins in the water, and to limit the concentration of microorganisms suspended in the water.

The best-known toxic substance to accumulate in aquarium water is nitrate, which results from the decomposition of organic matter by nitrifying bacteria. Nitrates are not very toxic to most fish. For example, a concentration of at least 800 ppm nitrate is needed to kill guppy fry [22]. Many credible aquarists (Bogert [20], Aquarium Co-Op [23]) agree that keeping their concentration below 80-100 ppm is sufficient. The Stendker brothers boasted that their discus could tolerate up to 200 ppm of nitrates. To significantly reduce the concentration of nitrates in water, we recommend water changes of around 50%. To prevent your altums from panicking, we recommend avoiding a water change so large that the altum can no longer maintain an upright position.

Microorganisms suspended in water can proliferate if the water contains nutrients in solution. These microorganisms can attack fish directly but can also secrete pathogenic enzymes [26]. The concentration of these nutrients can be reduced by significantly increasing the surface area of the biofilter sponges, as this increase in territorial surface

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area will house a greater number of beneficial microorganisms in the filter, which will compete with the suspended bacteria by consuming the organic matter in solution in the water. To maximize filtration surface, Bogert ([20] section 6.3) recommends using a very large surface area of sponges in the biofilter (at least 100 square feet per pound of fish) with a porosity of 20 ppi or 30 ppi (ppi = pores per inch).

The population of suspended microorganisms can also be reduced by adding ultraviolet light filtration, for example at the biological filter outlet. Finally, sufficiently large (say, at least 30%) and frequent water changes decrease the concentration of organic matter in solution and could therefore help reduce the population of suspended bacteria. Some experienced aquarists, such as Tropical Fish Hub [24], insist on the importance of weekly water changes for fish health. Others, like Bogert ([20] section 18.1), maintain that water changes should be sufficient to keep nitrates below 80 ppm, which generally implies water changes of 50% every month or three, depending on the aquarium population.

For the maintenance of his tank bred altums, Simon Forkel [14] recommends weekly water changes of 30% for optimal growth and to keep bacteria levels low. He makes no specific recommendations about filtration. Fishipedia [8] recommends changing 20% of the water every two weeks, without mentioning filtration either.

In the light of this information, the following approach seems reasonable:

- Use large specific surface sponges in your biological filters.
- Use ultra-violet filtration at the outlet of your biological filter.
- Make water changes of 50% and adjust their frequency to keep nitrate levels below about 60 ppm. If your altums develop health problems, try increasing the frequency of water changes.
- Avoid overfeeding your altums.

Using this approach, the author has kept several altums healthy for years.

Feeding the altum angelfish in the aquarium

The altum angelfish is insectivorous, piscivorous, and vermivorous [8]. This species can be fed on dry food (flakes, pellets), fresh food and frozen food [8]. Forkel [14] recommends feeding young altums three to four times a day with frozen food, mussels, artemia and daphnia, in addition to flakes and pellets. Forkel [15] emphasizes that young altums that are not fed optimally will never reach their maximal potential size.

In the aquarium during the day, the author's altums ask for food as soon as you approach them; they seem to be hungry all the time. A healthy altum has a big appetite and eats a lot. A lack of appetite in an altum bodes ill for its survival.

The author has noticed that his altums love cooked pureed shrimps, given in very small quantities (bites) at a time. Frozen artemia are also popular (Hikari brand). Large altums

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also like to eat *Bug Bites* pellets (1.4-2 mm) and even sticks designed for plecos, e.g. *Bug Bites, food for plecos*. Hikari's *Vibra Bites* are also popular.

Behavior in the aquarium and aquarium companions

The information in this section is taken from Fishipedia [8], unless otherwise stated. The altum angel is a fish that rarely leaves its territory in its natural environment and in the aquarium. In the aquarium, we observe that it tends to stay in one place for a long time. If it is accustomed to living in a community at a young age, it is generally not aggressive towards its neighbors. Its need for a sufficient and well-designed space to mark its territory should not be overlooked. One does not recommend cohabitation with large or overly aggressive territorial fish, to prevent altums from being intimidated or injured [8].

The altum angel can eat very small fish. Nevertheless, the author kept cardinal and rummy-nosed tetras together for years in the company of altums, without noticing any significant predation. The author also found that altum angels generally cohabit well with most tetras, provided they are large enough and not inclined to nibble fins.

Very small shrimps will probably be eaten by altums.

Altum angels and discus have similar water parameter requirements. They can be kept together [13]. The author has found that they generally coexist peacefully. The altum angel can also be kept in the company of the flag cichlid (*Mesonauta festivus*), with which it shares its natural habitat.

Breeding altum angelfish in the aquarium

Introduction: According to Tabares et al ([4], 2014), few scientific studies have been made on the breeding of the altum in captivity, despite its commercial importance. These authors also observe that most studies take the common angelfish as a study model due to its greater commercialization.

The Norwegian Svenn Fornbäck has succeeded in breeding wild altum in an aquarium using a natural method, i.e. leaving the parents to care for the eggs and fry. He gives a detailed account of his experience in his article entitled *Pterophyllum altum, towards a natural breeding out of an aquarium* ([25], 1994), an abridged version of which follows. The altums were installed in a 700-liter aquarium measuring 100cm x 100cm x 70cm (L x W x H). A continuous water change system and peat filtration were used for the aquarium. The water had a pH of 5, a conductivity of 10 µS - 30 µS and a temperature of 29ºC-30ºC. The altums were fed with live black mosquito larvae. The parents laid eggs on a leaf. One third of the eggs were destroyed by mold. Hatching took place 60 hours after

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laying, after which the parents transported all the fry to another leaf. The fry were initially fed with baby brine shrimps. Growing up the young altums was relatively straightforward.

To our knowledge, Simon Forkel seems to be one of the only commercial altum angelfish breeder having an international success. We chose him as our main source of information for this section because his work is documented: he wrote a detailed article about his altum breeding method in the Amazonas magazine in 2014 [13]; he gave an interview about his breeding techniques in the YouTube channel aqua-media.TV [15]; he has a web site [14] where he advertises his farmed altum angelfish and explains how to maintain them. The information in this section is therefore taken from [13]-[14]-[15], unless otherwise stated.

In his interview with aqua-media.TV, Forkel explains that it took him many years and an enormous effort to successfully breed altum angels, and that getting altums to lay eggs was only the beginning of a long learning process. During the first years of experimentation, Forkel explains that the altum eggs were dying in the first two days. Forkel states that breeding altums requires a lot of time and patience.

How to get a breeding pair of altums: one needs to keep several adult altums in a large aquarium (about 100 gallons = 380 liters) with good water quality and frequent feedings and hope for the formation of a pair. Simon Forkel does not breed altums before the age of 18 months. Note that a randomly chosen male-female pair of fish will typically not form a couple (the same is true for discus fish, genus *Symphysodon*) [8]. If an altum pair forms, it monopolizes nearly all the space in the aquarium and forces all the other fish to remain within a restricted territory. An illustration of this behavior can be observed in a video [16] from the Tropical Fish Hub channel. It's worth noting that it's not uncommon for two females to form a pair that can lay infertile eggs [8].

How to set-up the aquarium of a breeding pair of altums: Forkel puts an altum breeding pair in an empty aquarium (no media, no decorations [8]) with dimensions 120 x 60 x 60 cm (430 liters / 114 gallons), with a terra-cotta cone where they can lay the eggs. The pair may then begin to clean out rigorously a spawning area on the cone, then lay eggs. The egg-laying process last about two hours [8]. Forkel adjusts the breeding tank water to have a temperature of 28°C (82°F), a pH of 5.5-6 and a conductivity of 100-150 μS/cm.

How to induce spawning: according to Forkel, water quality is essential to induce a breeding pair to spawn. His aquariums are filtered with internal sponge filters that are installed on one side of the aquarium sides. A varied diet of frozen food is also important, using mostly glassworms[4], artemia, bloodworms, and krill. A low-pressure weather system can also stimulate spawning.

Spawning periods and frequency: the tank-bred altums of Forkel spawn up to eight times at intervals of a certain number of weeks in a single spawning phase from October to July, and then there is usually a pause that lasts till nest October, when the pair starts spawning again. For wild-caught altums, the main spawning time is usually from April to June, and then again from October to November.

[4] Glassworms are of midges in the family *Chaoboridae*. The larvae are known as glassworms because they are transparent. They can be found commonly in lakes all over the world and can be up to 2 cm (0.8 in). The adults are sometimes called phantom midges or lake flies [17].

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How to take care for the eggs: If the eggs are left with the parents, they take turns blowing water on the eggs for oxygenation, and they remove (eat) the unfertile eggs [8]. The altum fry are born approximately 48 hours after spawning [8]. The parents then transport them to another location, previously cleaned, and protect their babies for a few days [8]. Unfortunately, and as also observed with discus, the parents often end-up eating all the eggs and/or the fry.

Forkel practices artificial rearing, i.e. he does not let the altum couple take care of the eggs and fry, because it eliminates problems related to gill-worms and flagellates. After the eggs are laid, Forkel moves the cone with the spawn to a separate 16-gallon (60 liters) tank with the same water parameters as the spawning tank, but with a higher temperature of 30°C. To supply the larvae with the necessary oxygen and provide water movement, an airstone is installed at about 2 inches (5 cm) from the cone. This tank must be matured for a long time, which is achieved with an internal filter with two sponge cartridges. To avoid the altum fry to fall on a bottom glass possibly coated with a harmful bacterial slime, the tank bottom is covered with a 0.75-inch (2 cm) layer of quartz sand. Forkel observed that egg development proved problematical with wild altums but can be achieved via optimized water quality.

How to take care of the fry: if the brood develops well, then one may get around 500 free swimming larvae after eight days. Forkel feeds freshly hatched *Artemia* nauplii four times a day. Tabares *et al* [4] confirm that the best growth of altum larvae is obtained when brine shrimp nauplii are used for feeding. Forkel changes about 20 percent of the water every day to remove uneaten food, as it rapidly pollutes the water. To finally obtain high quality fishes, it is inevitable that some poorly developed youngsters have to be culled.

How to promote the growth of young altums: After a three-week period, Forkel transfers the young altum angels to larger tanks, accommodating around 100 juveniles in a 430-liter (114-gallon) tank or 200 fry in a 720-liter (190-gallon) tank. These spacious aquariums, boasting a depth of 60-79 cm (24-28 inches), are necessary to ensure optimal growth and the development of beautiful, elongated fins. The juveniles are maintained in tap water at a temperature of 82°F (28°C), a pH level of 7.5, a carbonate hardness of 4°KH, and an electrical conductivity of 280 µS/cm.

In these aquariums, it is necessary to conduct a 50 percent water change twice a week to maintain low nutrient levels. Starting from the fourth week, Forkel introduces frozen *Cyclops* as part of the altums' diet. In the fifth week, Forkel begins offering *Artemia* multiple times a day, and by the sixth week, glassworms are also included in their diet. This feeding regimen is sustained until the tenth week when the young altums typically attain a saleable size of 8-10 cm (3-4 inches) (8-10 cm). Continuing this routine beyond 10 weeks can result in altum angels reaching a height of 20 cm (8 inches) within six months and 12 inches (30 cm) after 12 months. A fully grown specimen may achieve a height of 40 cm (16 inches) after 36 months. Forkel asserts that his tank-raised altums surpass wild altums in size and perfection, possibly due to the suboptimal feeding conditions for altums in their natural habitat.

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Testimonials from Friends of La Maison du Poisson

A mini survey was offered on January 30, 2024 on the Maison du Poisson Facebook site (https://www.facebook.com/lmaisondpoisson). The questions were as follows:

1- Have your altums attacked or eaten other species of fish in your aquarium? If so, which ones?
2- Have your altums been attacked by other species of fish in your aquarium? If so, which ones?
3- Have your altums developed any diseases? If so, can you describe the symptoms?
4- If you have kept altums in good health for a year or more, can you share your method by giving:
- the size, layout and other fish in your aquarium.
- food used
- filtration method.
- frequency and percentage of water changes.
5- Other comments

The survey responses are as follows:

Isabelle Leblanc has a 135-gallon aquarium filtered by two FX6 filters. She does a 50% water change once a week with tap water. The water used is at room temperature and has been resting long enough for the chlorine to evaporate. This aquarium is home to seven altums as well as *Pterophyllum scalare*, pleco and zebra danios. She feeds her altums with flakes, frozen artemia and homemade food, and doesn't recommend feeding chironomid larvae (bloodworms) to the altums. She has not observed any illnesses in 14 months. In the past, Mrs. Leblanc has observed head-hole disease on her altums, and she attributes the cause to too-frequent use of RO water. Ms. Leblanc, who has already succeeded in breeding *Pterophyllum scalare* in aquariums, hopes to succeed in breeding altums.

Orçun Açariz (personal communication): Mr. Açariz acquired 10 small altums (1-1.5 inches) that he houses in a 37-gallon *Seapora 37 high* aquarium. Filtration is by a hang-on-the-back filter (*AquaClear 20*) containing sponges and *Matrix* granules from *Seachem*. He does 15% water changes once a week (or every two weeks) with dechlorinated tap water, as he observes that his altums don't like big water changes.

The aquarium is mature and abundantly planted (green cabomba, vallisneria, echinodorus, Lotus, cryptocoryne, ludwigia, Anubias) to improve water quality. He also uses duckweed to attenuate the intensity of light. He observes that intense light stresses the altums and makes them more aggressive.

The altums are fed once a day. Mr. Açariz observes that his altums eat a little, then stop, only to start eating again an hour later, searching for food at the bottom of the aquarium.

Mr. Açariz believes it's best not to introduce other fish species with altums. For example, he argues that corydoras, which are often nocturnal, could disturb the altums' sleep. Very active fish could also disturb them. Mr. Açariz says that snails are useful for cleaning the bottom of the aquarium.

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Mr. Açariz encountered the following problems:

- On arrival, some altums had damaged fins. After treatment with *Melafix,* the fins regenerated completely within a month.

- He observed a lot of aggression between altums two hours after feeding. To alleviate this problem, he feeds them around 9h pm.

- Two months after acquiring them, he observed symptoms of ich and fin infection, which he treated with *Kordon Rid-Ich Plus* for a week, at a temperature of 31ºC. These problems gradually disappeared.

- He observed that altums are fearful and panic very easily. He recommends avoiding sudden movements around the aquarium. He observes that altums are less shy if the aquarium is brighter than the room.

- He observed that altums do not necessarily accept the food offered. He feeds them frozen artemia and bloodworms (*Hikari* brand), various flakes and *Hikari Vibra Bites*.

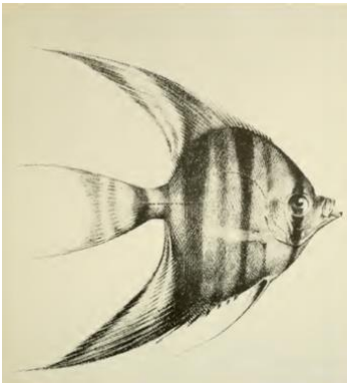
Aladdin's observations and advice on altum angelfish

1. The mortality rate is high if the altums have not been quarantined beforehand in Colombia, and if they are not freshly caught.
2. If quarantine has been carried out on the exporter's premises, there is no difference in the fragility of the fish according to its size on import.
3. Small altum grow quite rapidly, even very rapidly. Significant growth is observed within a few months.
4. Altums readily accept all kinds of food.
5. Altums are less aggressive than scalars. They squabble a little, but mostly at mealtimes.
6. The symptoms of disease that I have observed most often in altums are popeye (swelling of one eye), and the appearance of white pimples around their face, behind the eyes. In both cases, their breathing accelerates and they die.
7. Altums easily manage to eat cardinal tetras and rummy nose tetras.
8. Altums cohabit very well with discus.
9. Sexual dimorphism is undetectable except during breeding season.
10. Altums can stand still together for several minutes, looking in the same direction.

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2 - Recommendations of La Maison du Poisson

Scientific name: *Pterophyllum altum*.
Common names: altum angelfish, altum angel, altum, deep angelfish.
Length 18 cm, height 20-40 cm.
Water: temperature 25ºC to 31ºC, average 27ºC-28ºC, pH 6.5 to 7.5, well oxygenated.



General: The altum angel inhabits a few jungle rivers at the border of Colombia and Venezuela. It lives in slightly acidic water (with a pH between 4.8 and 6.2) but can adapt to neutral pH levels in the aquarium. The natural habitat of altum angels is regularly replenished by tropical rains, resulting in soft water with minimal amounts of bacteria in suspension. Consequently, altum angels require very clean, well-oxygenated water, akin to the conditions favored by discus fish. Achieving this cleanliness involves employing biological filtration on large sponge surfaces, utilizing ultraviolet radiation filtration, and conducting regular water changes (see pages 8-9).

The altum angel, described by Jacques Pellegrin in 1903 as a "pretty species", is a magnificent and majestic fish whose posture seems imbued with dignity. Distinguished from the common angelfish by its larger height, an altum angel can reach a height of 30 cm within a year. It follows that an aquarium with a minimum height of 60 cm is necessary. An insufficiently high aquarium may result in malformations of the altum's fins. The altum is more likely to panic than its cousin the *Pterophyllum scalare*. It's best to set up your aquarium where people regularly pass by, so that it can get used to the presence of humans. One should also avoid making sudden movements around your aquarium, and also avoid changing so much water that the altum can no longer maintain an upright position.

Intra-species sociability: In the wild, altums are found in groups of dozens of individuals. It therefore seems preferable to keep them in group. However, you should be aware that if a couple forms, it will tend to monopolize all the space in the aquarium, which can become stressful for the other fish. Small and large altums can also be kept together without any problems: the large ones chase the small ones from time to time, but never in a sustained manner. The little altums will run away from the big ones, but they soon revert to their proud stance and their ogre-like appetite. Small altums are rather aggressive with each other, especially at mealtimes. Altums are less aggressive towards each other than angelfish, but they bicker a bit at mealtimes.

Inter-species sociability: Altum can generally cohabit in the aquarium with small, non-fin-nibbling tetras, such as the cardinal or the rummy nose. Very small tetras can be the prey of altums, but they can also live quite long in their company. The altum can be kept in the company of the flag cichlid, with which it shares its natural habitat, as well as discus and species of corydoras that are adapted to high temperatures, such as *Corydoras sterbai*. We strongly advise against cohabiting altum with large, aggressive cichlids, as altums are naturally calm and serene fish, which seem to practice immobility conscientiously.

Food: Altum angelfish are insectivorous, piscivorous, and vermivorous. They can be fed on dry food (flakes, pellets), fresh food and frozen food. The author's altums clamor for food as soon as one approaches the aquarium; they seem to be hungry all the time. For optimal growth, the altum breeder Simon Forkel recommends feeding young altums three to four times a day with frozen food, mussels, artemia and daphnia, in addition to flake and pellet food. Forkel points out that young altums that are not fed optimally will not reach their maximum potential size.

Breeding: Captive breeding of altums has been achieved commercially by Simon Forkel. It is possible to get a pair of altums to lay eggs, but caring for the eggs and fry is a complex process that requires a great deal of time, patience, and perseverance (see pages 10-12). Natural breeding in captivity has also been successfully achieved by Svenn Fornbäck (see pages 10-11).

Remarks: The wild altum has a reputation for being very difficult to maintain in the aquarium. We believe this reputation is caused by its premature death, which occurs when it has been too traumatized by its journey from its native river to the aquarist's aquarium. Our experience shows that the wild altum, which has been carefully acclimatized in South America and then properly packed for its journey by plane (one altum per bag), is a rather robust and relatively easy-to-maintain fish, comparable in difficulty to the discus. The altum angelfish requires better water quality than its cousin, the common angelfish.

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