The Golden Severum is one of a slew of varieties derived from the common and popular Severum Cichlid. All Severum Cichlids *Heros severus* are easily recognized and popular with both beginner and advanced aquarists. Severum Cichlids tend to resemble their larger cousins, the Discus cichlids, in body shape and feature a laterally compressed oval shaped frame. Their strongest deviation from the Discus fish is in their coloring and size. The Severum Ciclids tend to only reach about 7 inches (18 cm) whereas Discus can reach up to about 12 inches (31 cm).

In its natural form, the Severum Cichlid is a greenish color with a yellow/gold tint to the belly. Juveniles have eight pronounced black vertical bands, though these tend to fade as they become adults. This striping has led to some other interesting common names like Banded Cichlid, Convict Fish, Deacon, Sedate Cichlid, Hero, and Striped Cichlid. The Golden Severum, or Gold Severum, is a captive bred color morph that lacks the black bands of the original form and has a yellow color over its entire body except for the dorsal and tail fins, which tend to be whiter with yellow specks.

Severum Cichlid varieties are available in a wide range of colors and tend to be very inexpensive, prompting the reference to them as the "poor man's discus." Don't let this remark bias you, however. Since they are so inexpensive, require less stringent care than discus, and are still a beautiful and interesting addition to an aquarium, they might be a much better choice for many fish keepers.

They also have a great disposition and display some unique behaviors which has helped them accumulate a wide and devout following. They tend to be less aggressive than many cichlids but do need plenty of space. They are mostly peaceful when kept with other similarly sized and tempered fish (except when spawning) and can be kept singly or as a mated pair. That being said, do not keep them with fish significantly smaller than themselves or with aggressive fish.
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Achilles Black Dark Buce Plant

Our Advertisers
Happy February!

I hope everyone has enjoyed our mild winter so far, we can only hope it continues this way.

February’s meeting will bring Frank Aguirre back to speak to us. Franks vast knowledge and his enthusiasm for the hobby always brings us an informative and interesting speech.

The jar show this month will be bowl beautiful, anabantids, as well as open plant and open fish categories.

As usual we will also have our monthly mini auction.

The spring auction season is starting in March and we all should try to get out to support our fellow clubs. All dates and times are listed on the C.O.A.O.C. website.

I hope everyone has a happy valentine!!!

Rick Hodgins
President
London Aquaria Society

Golden Severum
cont’d from front page

Golden Severums are moderately difficult to care for, but not as difficult as Discus and many other cichlids. As long as the owner is diligent in performing frequent water changes, they will generally respond well and live long and comfortable lives. They prefer softer water and it is important that you keep a lid on their aquarium as they tend to jump in the air when startled.

To keep them happiest, Include a decor of rocks along with pieces of sunken driftwood. Try to setup the aqairum decoration so that it provides natural "barriers" and divisions in the tank; this way the fish will feel like it has a defined and secure "territory" to defend. They enjoy living in well planted aquariums and will appreciate floating plants as they like to spend time hiding in the leaves and appreciate the security offered by the plants.
Parasitological and histological analysis of a new species of the genus *Thalohanellus* and description of a myxozoan parasite (Myxosporea: Bivalvulida) from cultured ornamental goldfish, *Carassius auratus* L.


An ornamental fish parasitological survey of West Bengal, India during the year 2014–16 revealed that goldfish, *Carassius auratus*, was the most susceptible species for myxozoan infestation.

This communication revealed the presence of two myxosporean species belonging to the genera *Myxobolus* and *Thalohanellus*. Although myxozoan infestation has been determined by isolating small to large, spherical to ellipsoidal plasmodia up to 0.5–2.5 mm were filled with disporic pansporoblasts and mature spores. *M. ichkeulensis* and one new species *T. dipaki* n. sp. have been isolated infecting the ornamental goldfish (*Carassius auratus*) for the first time in India. In the present study, new host, and new locality for *M. ichkeulensis* have been reported.

The description of *M. ichkeulensis* is being considered as a first report from India. Spore of *T. dipaki* n. sp. measures uniquely 13.99 ± 0.60 × 9.82 ± 0.60 μm in size, having a one globular pyriform polar capsule measuring 7.45 ± 0.62 × 5.91 ± 0.39 μm. The severity of newly isolated myxozoan infestation has also been assessed by the histopathological changes of fins of the hostfish. A combination of light and scanning electron microscopic observation along with its severity of infestation, comparison of same and closely related species has been incorporated to identify the new species. The paper deals with the diversity, distribution and taxonomic descriptions of new and known myxozoan species along with new host, locality records and incidence of infestation.

Goldfish *Carassius auratus* auratus, showing multiple nodules on the margins of the fins filled with *Thalohanellus hoffmanni* sp. nov. spores. Nodules appeared white, gray, or black and were arranged in grape-like clusters.

In all of the years I have been in the pond hobby, breeding and raising Koi & Goldfish, I have never seen anything that even comes close to what I am seeing right now. 

*Lorraine*
Alaska’s Earthquake Caused Endangered Desert Pupfish to Spawn

By: Mika McKinnon smithsonianmag.com January 26, 2018

Nevada’s endangered desert pupfish are spawning after Alaska’s earthquake sent waves reverberating around their watery home.

Earlier this week, Alaska’s magnitude 7.9 earthquake triggered a small tsunami. Waves only three to eight inches tall washed in along shores from British Columbia through California. But the shaking also rippled across the continent, setting off waves in Devil’s Hole, an 18 foot-long pool that branches deep into the Nevada aquifer. The sloshing water was reflected in the pool, building into waves—also known as a sieche—over a foot tall, Abby Wines writes in a statement for Death Valley National Park. The seiche didn’t cause any damage, but it did disrupt the pool’s most famous inhabitant, the desert pupfish, causing the creatures to unseasonably spawn.

Desert pupfish usually spawn during the spring and the fall but any disruption of their environment can spark another spawning event, biologist Ambre Chaudoin tells Wines. The males turn a brilliant blue when they spawn, while the females are a subdued grey to silvery blue.

Devil’s Hole pupfish (Cyprinodon diabolis) are critically endangered and live only in Devil’s Hole. Though this limestone cavern dives over 400 feet deep below the Mojave Desert, the inch-long fish live in just the upper 80 feet of the pool. The fish eat algae that grows in a shallow sunlit shelf at the top of the hole, and spawn on a tiny shallow shelf.

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The creatures have survived in this environment for thousands of years, depending on its steady oxygen concentrations and a constant temperature of 93 degrees Fahrenheit. But the situation is precarious; small interferences could cause the conditions of this delicate ecosystem to rapidly change, devastating the pupfish. Their population had hovered around 400 to 600 fish until water levels in the pool dropped due to nearby irrigation. Park biologists only found 115 fish during the last survey, Wines writes, up from 38 fish during a 2006 survey.

Park staff aren’t concerned that the seiche and unexpected spawn will cause any lasting damage. “The pupfish’s food source will probably be a little reduced for a bit, but it is expected to rebound,” Chaudoin tells Wines.

“It’s crazy that distant earthquakes affect Devils Hole,” ecologist Kevin Wilson tells Wines. “We’ve seen this a few times before, but it still amazes me.” Similar seiche were observed in 2010 and 2012.

In 2010, Chaudoin was at the pond performing pupfish behavioral surveys as part of her graduate research, and managed to film an approximately 4-foot-tall seiche triggered by a magnitude 7.2 earthquake in Baja California. “The shelf substrate sediment was largely redistributed as a result of the water oscillations,” she said at the time in a statement from the US Geological Survey. “Such disturbance can be important because the spawning shelf is less than 13 feet long and 7 feet wide, smaller than many walk-in closets.”

Peter Byrne was at Devil’s Hole during the 2012 seiche, and wrote about the event for *Scientific American*. Then, too, it triggered a pupfish spawn, leading Byrnes to tease, “environmental disaster, it seems, acted as an aphrodisiac.” A video of the seiche went viral, and currently has over a million views.
During the 2010 seiche, biologist Paul Barrett hypothesized that the infrequent events played an important role in refreshing the Devil’s Hole ecosystem. “Earthquakes, such as a 1978 temblor in Mexico, can set up waves that clear the spawning shelf of the algae upon which the pupfish rely, however depending upon the time of year, the algae may regenerate quite rapidly,” Barrett said in the USGS statement. “Furthermore, quakes can serve a useful purpose in shaking silt and other fine particles that have washed into Devils Hole off of the spawning shelf and into the deeper waters. This frees important space between the substrate particles where the Devils Hole pupfish larvae seek refuge.”

Not every earthquake sets off a mating frenzy. The earthquake needs to be just the right frequency for waves to resonate. But with pupfish populations low, perhaps this latest seiche will help create a population boom.

Editor’s note
January 31, 2018: This article has been corrected to show that Devil’s Hole pupfish is a species of desert pupfish exclusively found in Devil’s Hole.
Green Tiger Barb
Puntius Tetrazona

www.tropicalfishsite.com/green-tiger-barb-puntius-tetrazona/

**Common name:** Green Tiger Barb, Sumatra Barb

**Scientific name:** Puntius Tetrazona

**Average Adult Fish Size:** 2.8 inches / 7 cm

**Place of Origin:** Indonesia and Malaysia

**Typical Tank setup:** A well planted aquarium with rock work and driftwood/bogwood. Plants will give the weaker individuals a place to hide, until the pecking order of the school is established.

**Recommended Minimum Aquarium Capacity:** 30 gallon / 120 litre

**Compatibility:** This fish needs to be kept in schools. The larger the school the better with 9 fish a good minimum amount. If kept in smaller schools the weaker individuals will be harassed continuously by the more aggressive individuals until they die. Green Tiger Barbs have a tendency to nip the fins of slow fish and ones that have long flowing fins. The way to combat this is to keep them in a large enough school. If this is done, they will generally keep themselves busy within the school and usually not bother their tank mates too much. If kept with smaller fish, they too should be kept in a school.

**Temperature:** 68 – 79 Deg F / 20 – 26 Deg C

**Water chemistry:** pH 6.0 – 8.0

**Feeding:** Omnivorous. They should be fed a varied diet of flakes, small pellets, frozen and live foods such as daphnia and brine shrimp. Blood worms and brown worms can also be fed as a treat, but do not feed worms very often as they can cause bloat.

**Sexing:** Sexing Green Tiger Barbs is not very hard, since the female Green Tiger Barb is larger than the male and sports a rounder belly. The male have a distinctive red nose, and above the black part of his dorsal fin you can see a characteristic red line. The dorsal fin of the female is mainly black.

**Breeding:** If you want to breed freshwater Green Tiger Barbs in captivity, the best method is to keep a shoal of Green Tiger Barbs together and let them form their own pairs. It a good idea to use a well planted aquarium since Green Tiger Barbs eat their own eggs, as well as eggs laid by other fishes. Removing the adult fish after spawning is therefore recommended.

**Additional Information:** Varieties include the normal tiger coloration, but green, black, gold, and albino Tiger Barbs with regular and long fins are also available. The average life-span in a well kept aquarium is 6 years.
Chopstick Snails (Stenomelania torulosa)

https://aquaticarts.com/products/chopstick-snail

Details

The Chopstick Snail (Stenomelania torulosa) is an excellent scavenger and substrate sifter with a unique, spike-shaped appearance. Though it is native to the warm Sulawesi lake system and other waterways of Indonesia, this snail can thrive in lower water temperatures than many other Sulawesi animals. The Chopstick snail spends most of its time climbing aquarium terrain and burrowing in the substrate.

Feeding and care is very easy for the hardy Chopstick Snail. It requires the same maintenance and conditions as most tropical aquarium snails and should never be exposed to copper. It will eat nearly any high-quality dry and frozen foods, but it will also feed heavily on algae, biofilm, and decaying plant matter in the aquarium.

What We Like About These Snails

- Completely peaceful
- Unique, spike-shaped shell
- Safe with all plants and excellent for sifting substrate
- Excellent scavenger and algae eater

RECOMMENDED TANK PARAMETERS

- **Temperature:** 72° - 86° F (22° - 30° C)
- **pH:** 7.0 – 8.2
- **KH:** 2 - 12 dKH
- **Minimum tank size:** 5 gallons per snail

CARE GUIDELINES

- **Diet:** Scavenger that feeds continually. Requires very little feeding in a well-established aquarium containing algae, biofilm, or decaying plant matter. In less mature aquariums, high quality dry foods with high plant content can be sparingly fed daily.
- **Social behavior:** Peaceful
- **Origin:** Sulawesi Lakes and other waterways of Indonesia
- **Average adult size:** 1 - 2.5 inches (2.5 - 3.8 cm)
- **Average purchase size:** .5 - 1 inches (1.3 - 6.4 cm)
Aquarium Slime: What is it & what to do about it?

"Slime algae" is a common problem with aquarists of all levels but getting rid of it can be tricky. The name "slime algae" is a misnomer. Because Cyanobacteria are photosynthetic and aquatic, they are often called "blue-green algae". In reality they are NOT algae, but something more in between algae and bacteria. Cyanobacteria are bacteria that manufacture their own food and live in colonies -- large enough for you to see them! It’s these colonies that cause trouble for aquarists. They are not necessarily blue-green but can be black, green, blue green, and the familiar dark red sheets covering many surfaces in an aquarium.

The first thing aquarists who find an unwanted colony of cyanobacteria in their aquarium want to know is how to get rid of it. Well, this is where it gets tricky. To eradicate the problem -- the particular trigger for the cyano bloom must be identified and treated. Not every bloom is in response to the same trigger and while throwing a chemical at the problem will perhaps clear it up temporarily, it will come back, and it will be worse. (More on this later.)

As with all types of algae, any uncontrolled growth indicates an imbalanced system. An imbalance in one or both of two main triggers can set off a cyano bloom.

- **DOC** - Dissolved Organic Carbon is a food source of the bacterial side of the bacteria-algae. Sources of dissolved carbon include: fish slime, algae, bacteria, digested/uneaten food, metabolic waste, live food, some aquarium additives etc.

- **Lighting** - The food source for the algal side of the bacteria-algae is light. Light bulb spectra shift to red as they age, resulting more favorable conditions for photosynthesis to take place more vigorously.

**Note:** It is said that slime is caused from phosphates and silicates in the water. It’s true that these 2 elements will certainly grow algae of all sorts, but if removed will not reduce or remove a slime problem.

- Okay - so what DOES remove the problem?
- Control your DOC. This is best done by frequent water changes, good water movement (power heads and closed system circulation) and (this is important!) a good protein skimmer. An undersized or ineffective protein skimmer, high waste loads, or a combination thereof will increase the dissolved carbon level. As a rule of thumb for skimmers; buy one that is rated for at least twice the size of your tank. It may take some adjusting but a properly functioning skimmer can remove ½ cup of thick organic scum from a tank a day.
## Monthly Jar Show

### Categories

<table>
<thead>
<tr>
<th>Month</th>
<th>Fish</th>
<th>Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>September</td>
<td>Loaches, Suckers &amp; Catfish (e.g. Corydoras, Brochis, Plecos)</td>
<td>My Favourite</td>
</tr>
<tr>
<td>October</td>
<td>Cyprinids (e.g. Goldfish, Koi, Barbs, Danios, Sharks, Rasboras, White Clouds....)</td>
<td>Family</td>
</tr>
<tr>
<td>November</td>
<td>Cichlids-substrate spawning (e.g. Angels, Kribs, Rams.... - mouth-brooding (e.g., Aulonocara....)</td>
<td>C.A.R.E.S. Fish</td>
</tr>
<tr>
<td>December</td>
<td>None - Due to Christmas Pot Luck</td>
<td>-</td>
</tr>
<tr>
<td>January</td>
<td>Guppies, (Fancy, Trinadadian...)</td>
<td>Non-Fish</td>
</tr>
<tr>
<td>February</td>
<td>Anabantids (e.g. Bettas, Gouramis, Paradise)</td>
<td>Bowl Beautiful</td>
</tr>
<tr>
<td>March</td>
<td>Mollies, Platies, Swordtails,</td>
<td>My Favourite Fish</td>
</tr>
<tr>
<td>April</td>
<td>Characoids (Tetras, Hatchetfish, Silver Dollars...)</td>
<td>Family</td>
</tr>
<tr>
<td>May</td>
<td>Killifish</td>
<td>Pairs</td>
</tr>
<tr>
<td>June</td>
<td>Due to Awards Night</td>
<td>-</td>
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</tbody>
</table>

## Monthly Jar Show Results

### Loaches, Suckers, Catfish

#### BEST IN SHOW

<table>
<thead>
<tr>
<th>Name</th>
<th>Month</th>
<th>Fish Name</th>
<th>Sponsor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guy Moreau</td>
<td>January</td>
<td>full red albino male Guppy</td>
<td>Finatics and Big Al's</td>
</tr>
<tr>
<td>Ben Hunter</td>
<td>January</td>
<td>non-fish Neocaridina davidi</td>
<td>Southwestern Pet Centre</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name</th>
<th>Month</th>
<th>Adult Fish Competition</th>
<th>Ribbon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guy Moreau</td>
<td>January</td>
<td>Guppys - full red albino male Guppy (Poecilia reticulata)</td>
<td>Red</td>
</tr>
<tr>
<td>Elizabeth Kelly</td>
<td>January</td>
<td>Guppys - half black pastel male Guppy (Poecilia reticulata)</td>
<td>Blue</td>
</tr>
<tr>
<td>B. Greenough</td>
<td>January</td>
<td>Guppys - full gold platinum male Guppy (Poecilia reticulata)</td>
<td>White</td>
</tr>
<tr>
<td>Ben Hunter</td>
<td>January</td>
<td>Pygmy Corydoras (Corydoras pygmaeus)</td>
<td>Red</td>
</tr>
<tr>
<td>Ben Hunter</td>
<td>January</td>
<td>Celestial Pearl Danio (Celestichthys margaritatus)</td>
<td>Blue</td>
</tr>
<tr>
<td>Ben Hunter</td>
<td>January</td>
<td>non-fish Neocaridina davidi</td>
<td>Red</td>
</tr>
<tr>
<td>Ben Hunter</td>
<td>January</td>
<td>Mexican Dwarf Crayfish (Cambarellus patzcuarensis)</td>
<td>Blue</td>
</tr>
<tr>
<td>Ben Hunter</td>
<td>January</td>
<td>non-fish Neocaridina davidi</td>
<td>White</td>
</tr>
<tr>
<td>Ben Hunter</td>
<td>January</td>
<td>Dwarf Crayfish (Cambarellus diminutus)</td>
<td></td>
</tr>
</tbody>
</table>

## Congratulations to All

### Special Thanks

SPECIAL THANKS TO ALL MEMBERS WHO BRING FISH & PLANTS TO OUR MONTHLY SHOW & AUCTION.
C.A.O.A.C. Calendar
Updated January 8, 2018

CAOAC typically holds its meetings on the dates shown below each year.

- Third Sunday in January - Newsletter award nominations are due and club memberships accepted.
- Second Sunday in February - Recognition awards nominations are due.
- Third Sunday in March - Awards Committee meeting precedes the Executive Meeting.
- Third Sunday in April - Annual Reports due.
- Victoria Day Weekend in May - CAOAC Annual Convention and Annual General Meeting with Executive elections. *See Calendar below for any changes to this date*
- Fourth Sunday in June (avoids Fathers Day on the third Sunday) - Committee heads chosen.
- Third Sunday in September - Budget day.
- Third Sunday in October.
- Third Sunday in November.
- Second Sunday in December - Authors and Advanced Authors Awards nominations due - Membership applications due.

Occasionally dates may have to be moved. Please check this calendar often to be kept up-to-date. Dates in **GREEN** are official CAOAC meeting dates. Clubs are respectfully asked **NOT** to hold events on these dates.

Dawn Tetra (Aphyocharax paraguayensis)

Discussion in 'Freshwater General Discussion' started by JIM, Nov 26, 2009.
Dawn Tetra, White Spot Tetra, Rio Paraguay Tetra, Panda Tetra "JIM, Nov 26, 2009"
https://aquariumspace.com/threads/dawn-tetra-aphyocharax-paraguayensis.3816/

**Family:** Characidae

**Species Type:** Characins
**Maximum Size:** 2 inches
**Life Span:** 5 years

**Natural Habitat:** South American Rivers (Rio Paraguay Basin)

**Minimum Tank Size:** 30 gallons

**Tank Region:** Middle to surface of tank

**Possible Tank Mates:** Other small community fish. A rare species in the trade, the Rio Paraguay Tetra is usually only encountered accidentally when it appears as contaminant in a shipment of another species of tetra.

Though not imported very often, this species is hardy and does well in captivity. This is one of the several species of tetra that mimics Corydoras hastatus in coloration. This is a very active species. Because of this a tank of at least 3 feet should be provided.
Tanganyikan Black Calvus Cichlid

https://www.azgardens.com/product/tanganyikan-calvus-cichlid/

**Description**

**Temp:** 72-82° F  **KH:** 10-20  **pH:** 7.8-9.0  **Max:** Size: 6"

The Calvus Cichlid is native to the Southwestern rocky coastal waters of Lake Tanganyika in Africa. This species is very slow growing, taking over 6 months to reach only 1.5" long, and 2 years+ to reach sexual maturity. That’s a very slow growing fish! Their bodies are very thin and compact and are a dark black color w many small white spots. Their sloping forehead and large mouth gives them a sinister look.

The Calvus Cichlid can be housed in an aquarium of at least 30 gals if in a species aquarium, and a larger aquarium if maintained with other smaller Tanganyikan cichlids. Calvus cichlids will appreciate plenty of rocks, shells and driftwood.

The Calvus Cichlid is a shell spawner and breeding is more difficult than most of the cichlids. The males are typically larger than the females.

Offer plenty of empty shells for the female to lay their eggs on. Incubation occurs in 3 to 4 days. To increase their survival rates, move the young frye to a separate aquarium after hatched.

The Calvus’ diet should contain meaty foods such as blood worms, shrimp, carnivore flake & pellet foods.
L330 Fully Spotted Watermelon Royal Pleco (Panaque cf. nigrolineatus)


One of the most beautifully marked of all Royal Plecos, the L330 “Watermelon” Pleco is found throughout the soft, acidic waters of the middle and upper Orinoco and its tributaries in Colombia and Venezuela. Like all *Panaque* species, it is a specialized wood eater and requires driftwood in its diet. They should also be offered a variety of other foods, including fresh veggies and specialty diets like Repashy’s xylivore formula gel diet. The L330’s pattern varies significantly, from fully spotted to primarily striped, with the fully spotted variant being the most sought after.

### Description

**Origin:** Wild Colombia  
**Locale:** Rio Orinoco and tributaries  
**Diet:** Driftwood, algae, biofilm, vegetables, prepared sinking/gel diets  
**Adult Size:** 20”  
**Recommended Tank Size:** 120+ gallons  
**Compatibility:** Generally peaceful, but can be territorial toward similar species

### Preferred Water Parameters

- **pH:** 6.5 – 7.5  
- **Temp:** 76-82F  
- **Ammonia:** 0ppm  
- **Nitrite:** 0ppm  
- **Nitrate:** <30ppm

**Shipping Note:** Due to size, the need for extra packing, and space requirements, larger sizes may not be eligible for our flat rate shipping. We strongly recommend shipping via air cargo when possible. Please contact us for a quote or for additional shipping info.

---

**Do shrimps eat poop?**

They **do poop** though, so you will still have **poop**, it will just be further under the surface because they burrow. It **does** help the bacteria access the **poop** to break it down. ... **Shrimp eat** fish **poop** and crap rainbows. January 11, 2016

---

**Do shrimp have gills?**

They **do not** brood eggs like the caridean, but shed them directly into the water. Their **gills** are branching, whereas the **gills** of caridean **shrimp** are lamellar. The segments on their abdomens are even-sized, and there is no pronounced bend in the abdomen.
**Clam shrimp** (once Conchostraca) are a taxon of bivalved branchiopod crustaceans that resemble the unrelated bivalved molluscs.[1] They are extant, and known from the fossil record, from at least the Devonian period and perhaps before.[2] They were originally classified in a single order Conchostraca, which later proved to be paraphyletic, being separated into three different orders: Cyclestherida, Laevicaudata, and Spinicaudata.

**Characteristics:** Both valves of the shell are held together by a strong closing muscle. The animals react to danger by contracting the muscle, so that the valves close tightly and the crustacean, as if dead, lies motionlessly at the bottom of the pool.

In most species the head is dorsoventrally compressed. The sessile compound eyes are close together and located on the forehead; in the genus Cyclestheria they are truly fused. In front of them is a simple naupliar eye. The first pair of antennae is reduced and unsegmented. The second pair of antennae, however, is long and biramous. Both branches are covered with numerous bristles. The crustaceans swim primarily by swooping the antennae. In the common genus Lynceus, which can open its spherical valves wide, the thoracic legs move in an oar-like manner along with the antennae.

The number of segments constituting the thorax varies from 10 to 32, and the number of legs varies accordingly. They are similar in structure to the legs of tadpole shrimp, and similarly, their size decreases from front to back. In females, the outer lobes of several middle legs are modified into long, upward-bending threadlike outgrowths, used to hold the eggs on the dorsal side of the body under the shell.

However, the main functions of the thoracic legs are respiration and carrying food forward to the mouth. The gills are basically the outer lobes of all thoracic legs that are closest to the base of the leg. The legs are in constant movement, and the water between the valves of the carapace is quickly renewed. The body ends in a large chitinised telson, which is either laterally compressed and bears a pair of large hooks, or dorsoventrally compressed, with short hooks.

**Reproduction:** Clam shrimp have different reproductive strategies. For example, within the family Limnadiidae are found dioecious (male-female), hermaphroditic (only hermaphrodites), and androdioecious (male-hermaphrodite) species.
**Life cycle:** The eggs are surrounded by a tough shell and can withstand drying out, freezing and other hostile conditions. In some species these eggs can hatch after as long as 7 years.

When the egg arrives in a suitable pool, a larva hatches out at the *nauplius* stage. Clam shrimp nauplii are distinguished by very small front antennae. At the second stage (*metanauplius*), the larva develops the small shell. They develop very quickly. For instance, *Cyzicus* reaches sexual maturity in 19 days after hatching.

**Geological history:** Modern clam shrimp have little significance to humans. However, extinct species of these crustaceans are often studied by geologists. In freshwater deposits, generally poor in fossils, the well-preserved clam shrimp shells are found quite often. They help identify the age of the corresponding strata.

During the past geological periods clam shrimp were apparently more numerous and diverse than they are now. 300 extinct species are known, and half as many living species. The oldest clam shrimp, such as *Asmussia murchisoniana*, were found in Devonian deposits. Many extinct species, especially Triassic ones, lived in the sea, where no clam shrimp remain today.
Achilles Black Dark Buce Plant (Bucephalandra sp. "Achilles Black Dark")


**This awesome long-leaf buce plant that will develop near black leaves with proper care!**

Achilles Black Dark Buce Plant (*Bucephalandra* sp. “Achilles Black Dark”) is a beautiful variant of the extremely popular *Bucephalandra* group. It is a very hardy plant that can be grown emersed or submerged in the aquarium, terrarium, and paludarium. It requires only low to moderate lighting and can thrive in a variety of water parameters. With proper care, Achilles Black Dark Buce Plant will grow at a slow to moderate rate. The care of Buce plants is similar to *Anubias* and *Cryptocoryne* species. Also, like *Anubias*, Buce plants are rhizome plants that attach to and grow on hard surfaces. This plant attaches particularly well to rocks, but can also grow very well on driftwood and other surfaces. If planted on the substrate, Buce plants should be only partially embedded in the substrate with the rhizome exposed. If the rhizome is buried, it is prone to rot.

In addition to its attractive appearance, Achilles Black Dark Buce Plant provides a valuable refuge for aquarium animals, especially dwarf shrimp, nano fish, and fry. With proper care, Achilles Black Dark Buce Plant can easily flourish and grow to become a major centerpiece of the planted aquarium!

Like most plants, Achilles Black Dark Buce Plant will benefit from supplementation such as Seachem Flourish, Flourish Excel, Nitrogen and other plant supplements. However, supplementation is not required for this plant to grow and stay healthy. Buce plants generally show their most intense coloration and optimal growth when submerged with high lighting and stable, consistent fertilization. Drastic changes in fertilization can result in gradual leaf loss, although the plant rhizome will typically recover in time.

**Our current specimens of this plant are portions that have at least 4-6 leaves.**

**This long-leaf variety appears much larger than most varieties.**

**What We Like About This Plant:**

- Exceptional coloration
- Thrives in low-tech and high-tech setups
- Can be attached to almost any aquarium décor
- Perfect for shrimp and nano tanks

**Care Guidelines:**

- **Temperature:** 71.6° - 82.4° F (22° - 28° C)
- **pH:** 5.0 - 8.0, although 6.0 - 7.5 is more ideal.
- **Lighting:** Low to High
- **Origin:** Indigenous to Borneo, Indonesia. Cultivated in Asian and US nurseries
- **Aquarium placement:** Middle and foreground. Rhizome should not be completely buried.
- **Care:** Easy to Moderate
This cool wild/mix neo, showed up today. Not sure what generation it is, as my tanks are heavily planted. I don't often see all the shrimplets until they’ve grown.  

**Curt Beleutz**

Great Picture David, congratulations.

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**Pepper’s Pearls**

Revealing pearls together!
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In case anyone needs a laugh tonight. I was working on tanks, and sat in this bowl of duckweed. Most of it is now on my butt.....

LOL

Steve Pereira: She’s doing a pretty good job on her own, but for the first time, she didn’t want daddy big blue in the tank anymore. :0)

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I must send out a special Thank You to those Members who contribute to the London Aquaria Society Newsletter, Below the Waterline.

There are no words to express how much I appreciate their help.

Annette & Ron Bishop, Jennifer McNaughton, Jack Parkinson, John Swick and Alan Noon

If I have forgotten anyone, please let me know.

Hugs, Lorraine

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Great Job Leanne

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