

# Hungry, Hungry Heterotis.

**Joshua Pickett** talks about the bizarre feeding habits of this African river monster and the troubles that causes in captivity.

**A**frican arowana (*Heterotis niloticus*) is a species of large, air breathing fish from the prehistoric bonytongue family. They appeared in the late Triassic 220 million years ago and have been thriving throughout Africa ever since; but when it comes to raising them in captivity—we can't seem to do it right. For the most part, captive raised fish have an all round better quality of life. No threat of predators, regular nutritional diet—all leading to a longer lifespan, so you could assume African arowana would do even better under these circumstances. Well ever since they were introduced into captive environments, we've discovered this isn't true; with well-fed rearing farms failing breeding efforts and losing up to half their collected juvenile population. Recent studies into their diet have discovered why their mortality rate is so high—it's starvation. A once or twice daily feed isn't enough to sustain them. They are a very active species, constantly sifting through the substrate searching for food, (sometimes using the substrate to grind up larger foods).

This burns weight and energy very fast and they don't begin to hold fat reserves until they are over 8 inches. This can cause muscle tissue to be burned off, resulting in the fish becoming noticeably lethargic and later dying. In the wild the fish have access to a nearly unlimited supply of micro-organisms to feed on. In captivity, this is restricted and the fish is at the mercy of feeding schedules. To keep up with their active behaviour they have to be fed small amounts as often as possible, but what do they eat?

African arowana are known primarily as Zooplanktonivores, meaning they eat small plankton however they can be more flexible through trophic plasticity, meaning that they can adjust their behaviour to collect energy from a wide range of food sources. A trophic structure is the energy transfer between organisms in a food chain. For example, a carnivore has a low diet breadth, meaning they can only consume meat. They are unable to digest and collect energy from vegetation, so they get their energy from the vegetation which is already metabolised by their prey. Like omnivores, the fish are able to adjust their behaviour's trophic hierarchy to what food is available. When there is an abundance of a certain food, the fish's structure changes to best suit the energy transfer of that food over less available foods.

Due to the high water disturbance in the Sô River, one of the natural habitats of the African arowana, during the flooding season, there is little photosynthesis, because of silty water; which results in less phytoplankton and zooplankton for the fish to feed on. The reduced availability of plankton means they feed predominantly on molluscs.

**“The gizzard helps to digest the hard carapace of a mollusc, while the gill rakers allow for filter feeding plankton.”**

The Sô River is also rich in seeds and insects, but they prefer an animal (mollusc) protein diet to satisfy their energy and protein requirements for rapid growth. During seasons when food can be scarce, the dietary breadth of most species is limited, however the African arowana amazingly aren't affected. In some environments, their diet range is expanded by this. For example, if their abundant staple protein vanishes, they search for a more varied diet to meet those growth requirements. This plastic behaviour is facilitated by their bodies' unique morphological structure. They have a large number of gill rakers and an adapted suprabranichial organ which facilitates filter feeding. The presence of the gizzard also helps to digest seeds and molluscs with a hard carapace.

According to a 2013 study in Benin, the juvenile arowana fed on aquatic insects and Microcrustacea; the larger they grew, the less of those they would feed on and the more they would feed on detritus and seeds. This is because their unique feeding structures are still developing, so their diet is temporarily restricted. This is not to say that juveniles can't eat anything but aquatic insects and microcrustaceans, only that other foods aren't collected as efficiently.

**In the wild, fish under 4 inches fed on:**

- 10% - Sand
- 1% - Detritus
- 14% - Microcrustacea
- 10% - Invertebrate Eggs
- 64% - Aquatic Insects
- 0.1% - Hydracharids

Farms and aquarists benefit from feeding more common Microcrustacea such as Daphnia, mysis, krill, Cyclops and Artemia. Mosquito larvae are also a food they will utilize. Adults begin to feed more on detritus, seeds, bivalves, worms, larger insects and plant material, and still feeding on small amounts of Microcrustacea and other planktonic organisms. The African arowana still grow very quick when fed on low quality carnivore pellets which contain lots of fillers such as corns, fish meal and cereals, as farms which feed exclusively grain have discovered. As they grow, they need to be fed on somewhat larger, more protein filled foods only 1–3 times a day as they will be able to store fat.

This information is very recently being made aware to rearing farms and aquarists to help improve lifespan and welfare, so that they may one day be bred in captivity.

**If you'd like to learn more about the African arowana, check out this video:**

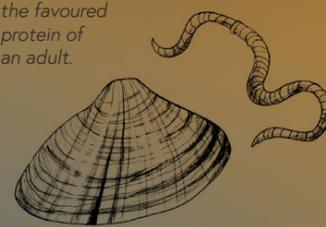
*YouTube @ Josh's Fish | "African Arowana (Heterotis niloticus) Care Guide"*

*Illustrations by Summer-Louise Baksa*

**Hydrocharids,**  
an aquatic plant  
juvenile's would  
graze on.



**Molluscs,**  
the favoured  
protein of  
an adult.



**Invert Eggs,**  
from aquatic snails  
and insects provide  
vital fats for growth.



**Aquatic Insects,**  
making over half of  
a juvenile's diet.

**Microcrustacea,**  
an abundant food  
which supports their  
frequent feeding.



*At 19 inch, this H. niloticus sifting through the sand, is only semi-adult. They can reach 3ft long and weigh over 20lbs.*

**Photographs by Joshua Pickett**

*African arowana have a thin esophagus, meaning they can't swallow large foods or they'll choke. This restriction forces their near constant grazing habits.*

