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Preliminary Trials on Taming and Feeding of Young Adults of Wild African Snakehead [*Channa obscura* Myers and Shapovalov, 1932] from Anambra River, South East of Nigeria

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Abstract

The use of *Clarias sp* and *Heterobranchus sp* in aquaculture research has been over flogged in total neglect of many would be aquaculture candidates which abound in Nigerian fresh water bodies. In the present research, *Channa obscura*, an example of a Nigerian freshwater species that attains appreciable size in the wild, was investigated. Young wild adults of *C. obscura* were, after many inducements, able to adapt to a confined environment and to accept artificial pelleted feed.

Key words: *Channa obscura*, young adults, preliminary trials, inducements, confined environment

1.0 Introduction

The history of aquaculture in Nigeria is fairly recent dating back to 1953 (Wokoma, 1987). The Inland waters of West Africa in which Nigeria situates, provide diverse habitats for over 200 fish species found in them (Holden and Reed, 1978). As at the present time, West African Countries, particularly Nigeria, depend upon importation of fish in order to meet up with their domestic demands, whereas much of the demand could be met locally (Holden and Reed, 1978) if the fisheries were better managed and the aquaculture potentials are seriously harnessed.

In the Nigerian inland waters, many cultivable fish species abound. Many of these cultivable species attain appreciable growth in length and weight under natural conditions in the wild waters. Examples of such good cultivable species as recorded by Holden and Reed (1978) include among others:

- *Mormyrus rume* which grows to at least a meter in length and to a weight of 6 kilograms.
- *Gymnarchus niloticus* which attains a length of over 1.5 m and a weight of 15 kg or more.
- *Citharinus distichoides*: This is by far the largest species of the genus *Citharinida*e. In Lake Chad, specimens of up to 600 mm in length and 12kg in weight have been caught.
- *Distichodus brevipinis*: This has been recorded to attain a maximum size of 500mm in length and 5kg in weight.
- *Distichodus rostratus* – which has been recorded to be the largest *Distichodus*. It can reach a length of at least 600 mm and weight of 6 kg.
- *Labeo senegalensis* – this is extremely fecund and spawns in rivers and streams in the wet season. The maximum size is about 500 mm in length and 3 kg in weight.
- *Labeo coubie*: It is very common and grows to about 700 mm in length and more than 10kg in weight.
- *Clarias anguillaris and Clarias gariepinus*: These grow to a large size, one meter or more in length and over 7 kg in weight.
- *Heterobranchus bidorsalis and H. longifilis*: They are common in the Inland waters of Nigeria and grow to a large size. Catches weighing more than 20 kg and over one meter in length have been recorded.
- *Bagrus docmac and B. bayad*: Both of these species grow to a large size, *B. bayad* reaching 700 mm in length and more than 5 kg in weight. *B. docmac* grows to one meter and weighs more than 12kg. The flesh is firm and very good to eat.
- *Synodontis gobroni*: This is the largest of all the Synodontis. A total length and weight of individual

fish of 870 mm and 7 kg respectively have been recorded.

- *Lates niloticus:* This grows to an enormous size. Specimen of 2 m length and 80 kg weight has been recorded. This fish can grow to about 250mm in one year in the wild conditions. Females grow longer than the males.
- *Channa obscura:* This is only one species of Channidae found in West Africa and hence Nigeria. It is an excellent carnivore feeding on flesh and growing to a length of about 500 mm. Agreeably, of all the above, mentioned fish species, that could be developed and admitted as candidates for aquaculture in Nigeria, only the African catfish, *Clarias spp and Heterobranchus spp* have been extensively researched on and are used principally in the fish farms. Indeed, *Clarias* species, particularly *Clarias gariepinus*, have dominated aquaculture research in Nigerian tertiary and Research Institutions to the neglect of other would-be-more important aquaculture candidates. *Channa obscura* wild sub adults were chosen for this study.

Tougels et al. (1984) classified this species thus:

Kingdom:	Animalia
Phylum:	Chordata
Class:	Actinopterigii
Order:	Perciformes
Family:	Channidae
Genus:	Channa
Species:	*Channa obscura*

This fish was chosen for study for its hardiness as it possesses air-breathing organ as seen in *Clarias sp*, its high taste and nutritive value as well as its medicinal properties (O'Bryen and Lee, 2007). Bolaji *et al* (2011) reported that *P obscura* is considered a piscivore – insectivore – invertivore in feeding habits and could be a viable candidate for aquaculture considering hardiness, palatability and fast growth if breeders would give it a chance. They advocated for more research in order to highlight its viability for domestication and culturability. Ajah *et al (*2006) reported that *C. obscura* was purely benthotrophic feeding 100 % on nematodes but fed mainly on fish at adult stage. Kpogue *et al (2013)* reported that *Parachanna obscura* lives in fresh water in quiet and muddy areas. It has accessory respiratory organs allowing it to live in hypoxic environment. It has a varied diet and feeds on fish, remains of fish, insects, other invertebrates and plant detritus. Hardiness, rapid growth, high tasty flesh and commercial value of this species represent significant aquaculture potentiality. Natural stocks of *P. obscura* are overexploited and are not sufficient to meet local demands. Successful farming of this species in intensive systems and semi—intensive can help not only to preserve and enhance natural stocks of *P. obscura* but also to continuously produce fingerlings remediation technologies for direct human consumption *(Kpogue et al (2013).* According to Gunther (1861), the upper body of *C. Obscura* displays 8 irregular blackish sports. The middle region contains up to 10 irregular greyish brown and black blotches which run posterior of the pectoral fins to the caudal peduncle. The belly has irregular brown and blackish spots. The head has a black patch and a broad dusty band that runs from the eye to the edge of the operculum. The crown of the head is almost black and underneath the chin, a white marbled effect is found. All the greyish olive fins are freckled black and white (Gunther, 1861).

In the study, preliminary culture trials on the taming, feeding and survival of young adults of wild, African snakehead, *Channa obscura* (Gunther, 1861) recruited from the Anambra River Flood Plain, South East of Nigeria were conducted.

The major objectives of this study were:

To groom wild *C. obscura* young adults to accept pond conditions;

To experiment on the feeds for *C.obscura* under confined environment; and

To monitor their survival in ponds.

2. Materials and Methods

2.1 The Fish

Sixty (60) sub adults of wild *C. obscura* with mean body weight (MBW) of 100 ± 44.33 g and mean total length (MTL) of 23.15 ± 0.798 cm, were randomly shared into three equal parts and stocked into 3 plastic containers containing about 40l of water. Each container measured approximately 60 litres. The containers were labeled A, B, and C.

2.2 The Water Supply

Water pumped from a bore-hole within the study site was stored in overhead open tanks from where it was applied to each container (pond). Water was renewed in each pond every alternate day until the end of the experiment. Water quality parameters comprising DO, pH and temperature were regularly monitored from the ponds.

2.3 Acclimation

The study fish in the ponds were first acclimated before feeding trials commenced. Hence no feeding was administered until the fish accepted the confined environment. The acclimation lasted for 2 weeks.

2.4 Feeding Trials

Progressively live-insects, worms, mollusks, young frogs and toads, meat and artificial commercial pelleted feeds were administered one at a time for 5 days each. Reactions of the fish to these feeds were monitored.

2.5 Inter-stocking of *C. obscura with Oreochromis niloticus* adults**.**

The study fish in each pond was inter - stocked with equal numbers of adult tilapia and feeding trials continued.

2.6 Inter-stocking of *C. obscura* sub adults, *Oreochromis niloticus* adults and *Clarias garieprinus* juveniles**.**

In continuation with attempt at getting *C. obscura* to accept artificial feed, all the surviving *C. obscura*, the tilapias were stocked together in a tarpaulin pond (1.5m X 1.5m X 1.0m) containing 120 juvenile *C. gariepinus* and constantly fed with 4 mm coppens (commercially pelleted fish feed) and observed.

2.7 Isolation of *C. obscura* from Polyculture and restocking in plastic ponds.

Finally, the *C. obscura* were isolated from the tarpaulin pond and again shared in the original plastic ponds and fed with 4 mm coppens feed. Feeding took a long time as pellets were administered a few at a time until fish satisfaction. The overall experiment from acclimation to the end lasted for 12 weeks. No growth parameters were monitored.

2.8 Survival of *C. obscura* throughout the trial period

The survival of *C. obscura* was monitored throughout the period of trial. Dead fish were removed from the ponds and discounted from the original number. In the end the percentage survival was calculated by subtracting the number of dead fish from the total take off number of fish and multiplied by 100.

3. Results

3.1 Acclimation Period

The fish in each container vigorously resisted the confined environment. There were a lot of attempts of the fish to jump out from the containers. Serious fighting issued among them. Some succeeded in jumping out of the containers and were recovered and returned to the plastic containers (ponds). However, after about two weeks of trial, the fish started to get used to the confined environment. There was little jumping effect. The fish became timid and started to hide at the bottom of the pond only surfacing at intervals when everywhere was quiet.

3.2 Pond Water Regime

Table 1: Average weekly results of the dissolved oxygen (DO), pH and temperature

Parameter	**wk1**	**wk2**	**wk3**	**wk4**	**wk5**	**wk6**	**wk7**	**wk8**	**wk9**	**wk10**	**wk11**	**wk12**
DO mg/l	7.5	7.0	7.0	7.0	6.5	6.0	6.5	6.0	6.5	6.0	6.0	6.5
pH	7 – 8	7 -8	7 -8	7 – 8	7 – 8	7 – 8	7 – 8	7 – 8	7 – 8	7 – 8	7 – 8	7 – 8
Temperature ^{0}C	26.0 ± 0.454	26.5 ± 0.335	26.5 ± 0.453	27.0 ± 0.401	26.5 ± 0.095	26.5 ± 0.085	27.0 ± 0.336	27.0 ± 0.091	26.5 ± 0.091	26.0 ± 0.445	26.5 ± 0.097	27.0 ± 0.404

3.3 Preliminary Feeding Trials

The fish completely refused to accept any of the feed – whether live or artificial- throughout the 30 days of feed trials. The fish continued to emaciate as they were feeding on their own flesh (protein break - down to supply energy).

3.4 Inter stocking of *C.obscura* with *Oreochromis niloticus* adults

For a period of two weeks that this trial lasted, whereas the adult tilapia freely accepted 4 mm coppens pelleted feed twice daily, the P. obscura failed to respond to the feed.

3.5 Inter stocking of *C.obscura* sub adults, *Oreochromis niloticus* adults and *Clarias gariepinus* juveniles.

The *C. gariepinus* juveniles vigorously gulped the coppens pelleted feed. The tilapia also fed on the coppens. It was at the second week of this trial that *C. obscura* were spotted perking at the feed and days later they started to accept the coppens pelleted commercial feed.

3.6 Isolation of the *C .obscura* from the poly culture and their mono-stocking.

The study fish freely accepted the artificial pelleted feed until they were satisfied. Within two weeks, the fish which hitherto looked like skeleton started to add flesh. The fish fed with characteristic violent capture of the pellets as if they were live -moving animals in water.

Table 2: Percentage survival of *C. obscura* in the preliminary trials (Culture period = 56 days)

No. stocked	No. Survived	% Survival
60	57	95

4. Discussion

The advocacy of Bolaji *et al* (2011) for more research in order to highlight the viability of *P. obscura* for domestication and culturability led the present researchers to embark on this study. From the preliminary results, it can be seen that, although the results of Ajah *et al* (2006) showed that *C. obscura* is a serious predator of fish in the wild, this fish can be domesticated and trained to accept artificially compounded feeds. Until now, no known report has been made on successful feeding of sub adult wild *C. obscura* on artificial pelleted feed. The present achievement in getting *C. obscura* accept commercial pelleted feed, is a sure positive step to embark on further work to determine growth and survival of this fish under confined environment. The overall aim would be to admit *C. obscura* as an aquaculture candidate in Nigeria.

5. Conclusion

I conclude by recommending for a more intensive research on the reproductive biology of *C. obscura* aimed at improving the stock of this indigenous species. The reported rapid growth of *C. obscura* in the wild coupled with

its tasty flesh, high commercial value and medicinal properties makes this fish a good candidate for aquaculture in Nigeria.

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