

## SELECTIVITY OF THREE AQUATIC WEEDS AS DIET FOR NILE TILAPIA (*Oreochromis niloticus*)

By

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### ABSTRACT

A total of sixty juvenile *Oreochromis niloticus* (Nile Tilapia) were fed three species of aquatic weed, namely *Azolla filiculoides* (water fern), *Elodea* sp. and *Pistia stratiotes* (water lettuce) to determine which of the weeds will be selectively consumed, and preferred of all.

A control group of twenty Nile Tilapia was fed compounded feed.

The selectivity of the weeds was observed based on their utilization as food source, and *Azolla filiculoides* was found to be highly utilized, *Elodea* sp. and the roots of *Pistia stratiotes*.

The growth response of the fish to the diets was found to be highest for fish fed compounded feed followed by *Azolla filiculoides* and *Elodea* sp. While *Pistia stratiotes* produced negative growth trend.

It is therefore, postulated that *Azolla filiculoides* and *Pistia* sp. are good feedstuff for *O. niloticus* especially when used together with other feedstuff.

### MATERIALS AND METHODS

Juveniles, *Oreochromis niloticus* was obtained from Agodi fish farm Ibadan. The three aquatic weeds namely *Azolla filiculoides*, *Elodea* sp and *Pistia Stratiotes* collected on the surface of a river within Ibadan area.

Three treatments and a control was set up each with a replicate, making eight units. Each unit contained 10 juveniles *Oreochromis niloticus* in a 36.5 litres bowl. The control units were fed with compounded feed purchased from a commercial miller in Ibadan.

Aquatic weed dierts were fed ad-libitum, while the control was at 5% body weight.

Part of plants consumed were observed and recorded, the remains of uneaten plants were removed and weighed everyday before fresh portions were given. Weight of plant consumed was divided by the number of fish per unit to determine daily consumption per fish.

Fish were weighed weekly using digital weighing balance and daily growth rates were calculated from these measurements.

### RESULTS

The selectivity of *O. niloticus* towards the three aquatic weeds used was observed according to their utilization as a feed source as suggested by Stronganove (1963). *A. filiculoides* was found to be highly utilized, *Elodea* sp was moderately utilized while *P. stratiotes* was poorly utilized. The part of plants was consumed entirely, the leaves of *Elodea* sp. were devoured leaving usually the stalks while only the roots of *P. stratiotes* were consumed (Table 1).

The growth response of the fish to the diets is shown in table 2 while figure 1 depicts the graph of weight changes of the fish per time in weeks. *Pistia stratiotes* produced a negative growth trend while the other diets show positive growth trend. The growth rate for the fish fed compounded feed was found to be the highest.

There was significant difference in the mean weight gain of the fish fed the different four diets at 5% level of significance.

However, the correlation and regression analysis between the weight consumed was not significant. gained and food Prediction equation was;

$$Y = -43.69 + 0.049x$$

r	r <sup>2</sup>	Remark.
0.62	0.39	Not sig.

### DISCUSSION

The greater consumption of *A. filiculoides* diet is probably due to the soft nature of this aquatic weed which makes it easily digested and assimilated by *O. niloticus*. For the same reason only the leaves of *Elodea sp* were accepted, the younger leaves and leaf tips being more preferred to older leaves and parts. This observation agrees with that of Prowse (1971). In general the fish seemed to prefer either small floating plants like *Azolla lemna*, filamentous algae like *Cladophara sp.* or the tender parts of some plants like *pistia* root hairs

(Duthu and Kilgen, 1974). The roots of *pistia sp.* were the only parts of the plant accepted, probably because the fresh leaves, being spongy and with several air cavities are difficult for fish to bite off and ingest. It has also been reported that the plant has an odour that put animals off when it was served as feed (Ayoade *et al*, 1982).

Even though *A. filiculoides* and *Elodea sp* were nutritionally adequate and accepted by the fish which show positive growth, large quantities must be consumed for proper growth due to high water content. The nutrient utilization parameters were highest for the fish fed compounded feed and generally lower for aquatic weeds since on a wet weight basis aquatic weeds contain too much water to make them good feedstuffs and thus should be dehydrated before feeding them to fish if they are to produce proper growth of fish.

The results of this study have, therefore, indicated that the aquatic weeds *A. filiculoides* and *Elodea sp.* are good feedstuff for *O. niloticus* but need to be used along with other feedstuffs for proper growth and development. Also the use of the three aquatic weeds can be enhanced as feedstuff if they are dried and incorporated as part of the ingredient for compounding feeds for the fish.

Further investigation on the use of adult fish species in ponds as biological control agent for aquatic weed is recommended in order to evaluate the potential of this fish as weed control agent for effective aquatic plant management.

Basic research is also needed to determine optimum stocking densities for weed control, rates of feed consumption, competition with other species and growth rates.

**Table 1. Feed selectivity of *O. niloticus* (Nile Tilapia) towards three aquatic plants, according to utilization and part of the plant consumed.**

Plant Species	Utilization	Plant part consumed in order of preference
Azolla filiculoides	High	Entire plant
Elodea spp.	Moderate	Leaves
Pistia stratiotes	Poor	Roots.
Control	High	Entire Feed

**TABLE 2: Stocking Rate, Survival Rate, Growth and Nutrient Utilization Indices of *O niloticus* fed 3 aquatic weeds for 8 weeks.**

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