ABSTRACT

The experiments were carried out to evaluate the effect of dietary protein level, the degree of incorporation of a legume Vigna catiang (cowpea) in the diet and the ration size on the reproduction of Oreochromis niloticus (L.). Experiments on protein level were carried out at 20, 25, 30 and 35% dietary protein levels. Experiments on ration size were carried out at 20, 30 and 35% protein levels in which fish were given rations of 1%, 2% and 3% of body weight or were fed to satiation. Eight substituted diets at two protein levels (25% and 30%) in which the fishmeal component was progressively substituted by the legume V. catiang were tested. All diets were isocaloric and fish were fed twice a day. In all experiments a sex ratio of 2♀ :1♂ was used. Young O. niloticus of initial mean weight of 10.6g ±2.5 were studied for an eight-month period.

Daily food consumption was variable. The overall mean food consumption decreased with increasing amounts of the legume in the diets. But this was not significant. The best growth performance was obtained at the 30% dietary protein level for all rations and all protein levels. Growth decreased with increasing level of incorporation of the legume, irrespective of the protein level, particularly in males. The 30% fish meal (control) diet gave the best FCR and PER for legume substituted diet experiments; these became poorer with increasing levels of the legume in the diet.

Total number of spawnings decreased linearly with increasing dietary protein level. In the substituted diet

experiments, the number spawned and total number of spawnings increased up to 18% and 42% legume incorporation at 25% protein level and both increased with increasing substitution level at 30% protein level. At all rations, the number of spawnings tended to decrease with increasing protein level but the number of spawnings were always higher when fish were fed 1% or to satiation at any protein level.

The mean size at first spawning tended to increase with dietary protein level and ration size, but the minimum size was independent from both. Fecundity ranged from 11-322 and 52-237 for 25% and 30% protein levels respectively and 14(2%, P_{20}) to 563 (3%, P_{20}) for all rations. Fecundity was linearly correlated to the body weight while relative fecundity was curvilinearly related to it.

Generally, larval size (dry weight) and condition factor tended to increase with increasing legume substitution in the broodstock diet at both (25% & 30%) protein levels. There was no clear cut relationship between larval size and broodstock ration size. There were no significant differences in proximate composition of the larvae obtained from groups fed substituted diets or fed different rations.

With all diets, the growth was higher at 30% protein (control) diet ($P_{30}V_0$), but spawning was least in fish fed on this diet. With all substituted diets 42-47% incorporation of V. catiang into the diet seemed to be favourable for the reproduction of O. niloticus irrespective of the protein level .