TILAPIA CULTURE IN ISRAEL

Shumuel Rothbard

YAFIT (R&D) Lab., Fish Breeding Centre. Gan Shmuel 38810, Israel.

Tilapia were introduced into Israeli polyculture at the early sixties. In last decade tilapia yields rapidly increased from 2 300 to 5 700 tons. The tilapia yield in 1995 are expected to reach about 6 000 tons. comprising more than 40 % of the total aquaculture production (1). The main tilapia spacies grown in Israel are hybrids of the indigenous and relatively cold-resistant *Oreochromis aureus* males and *O. niloticus* females. The crossbreds are characterised with extremely high proportions (close to 100 %) of males and distinguished by high growth rates. Red Taiwanese tilapia and a red mutant of *O. mossambicus* are cultured on a small scale in several fish farms. Tilapias are valued for their meat quality and economical importance. Tilapia are suitable for intensive culture. They have been extensively investigated in Israel for their genetic performances (sex-differentiation, genetic markers and chromosomal engineering), endocrinology and reproduction (2, 3, 4) nutrition, management (5) and pathology (6).

Tilapia males grow faster by 20-30 % than females. To obtain monosex population, androgen sex-inversion is applied on a commercial scale. Yolk-sac fry at the age of 9-11 days are perpetually (every 2-3 weeks) harvasted from spawning ponds. Sex-inversed fry are fed 3-4 weeks with protein-rich (45 %) starter, containing the androgen 17 α-ethynyl-testosterone. (60 mg/kg food). Male tilapia are nursed to the size of 50-150 g and than stocked either in ponds where they are grown to the *small* marketable size (350 g), or stored at high densities (100 t/ha) in overwintering ponds At springtime, the latter are restocked into on-growing ponds where they reach the *large* marketable size (600-700 g). Big tilapia are priced 200-250 % more than the smaller fish.

Tilapia are cultured in various managements: (a) in extensive polyculture with carps and mullets they comprise 20-40 % of the total yield, (b) in raceways and in strongly aerated recirculating systems,or in cages located in water reservoirs that serve also for in gation of crops, tilapia are grown as male monosex. Yields from such an intensive units may exceed 15-20 mt/ha.

Gynogenesis induced in *O. aureus* indicated presence of homogametic (ZZ) males and heterogametic (WZ) females (7). Experimental hybridization of *O. niloticus* (XX) females and gynogenetic *O. aureus* (ZZ) males, consistently yielded all-male (ZX) progenies.

In preliminary comparative tests carried out in cages, growth of gynogenetic *O. aureus* and their F_1-hybrids with *O. niloticus*, was compared to the normal parental lines and their crossbreds.

Offspring of crossed involving gynogenetic males of *O. aureus* displayed advantageous growth due to heterosis over crosses involving normal *O. aureus* (8).

1. Sarig S. Israeli J, Aquacult-Bamidgeh 1994;46:111-118.
2. Avtalion RR. In: The Biology and Culture of Tilapia. ICLARM, Manila, Philippines 1982;267-277.
3. Rothard S. *et al.* Aquaculture 1987; 61:59-74.
4. Rothard S, *et al.* In: Scott AP. *et al.* (Eds.), Reproductive Physiology of Fish Proc 4th Int Symp Fish Symp 1991;91:206 UK.
5. Viola S. *et al.* Israeli J, Aquacult-Bamidgeh 1988;40:64-68.
6. Paperna I. CIFA Tech Pap 1980;7:216.
7. Avtalion RR. & Don J J Fish Biol 1990; 37:167-173.
8. Kulikovsky Z. MSc Thesis, Bar Ilan Univ, Israel 1993;64.