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Title: Evaluation of reproductive performance and early growth of four strains of Nile tilapia (Oreochromis niloticus, L) with different histories of domestication

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Abstract: Nile tilapia Oreochromis niloticus is the primary tilapia species being cultured in the world, but many of the stocks being cultured were founded from a limited number of fish collected from the wild in the 1960s and 1970s. Such limited founding stocks and the numerous generations since offers the possibility of inbreeding depression. An evaluation of reproductive and growth characteristics of one highly domesticated stock of O. niloticus (Ivory Coast), two stocks not as domesticated (Egypt and Sagana), and one recently collected from the wild (Lake Victoria) was conducted at Auburn University. Brood fish held in 2-m3 hapas were checked weekly; females holding eggs or sac fry in their mouths were transferred to the hatchery to continue eggs and sac fry incubation. Growth was evaluated during primary (1–30 days post-swimup) and secondary nursery (31–90 days post-swimup). The four strains differed in relative fecundity (seed / g female), percentage of females that spawned (11.6% to 57.2%) and in incubation success (5.3% to 91.3%). The combined effects of relative fecundity, percentage of females spawning, and incubation success, resulted in the Ivory Coast strain giving eight times more fry per kg of female brooder used than the Lake Victoria strain. Average weights of fingerlings for the four strains at the end of primary nursery ranged from 2.1 to 2.8 g; survival was similar for all strains. Secondary nursery results for the Egypt and Ivory Coast strains were similar when in a common production setting for 60 days. Average weights of Egypt and Ivory Coast fingerlings were 21.8 ± 7.3 and 21.0 ± 6.5 g, respectively, when produced in organically fertilized ponds, 87.9 ± 23.1 and 103.2 ± 3.9 g when produced in outdoor tanks and given a commercial feed, and 36.1 ± 2.6 and 36.5 ± 2.4 g when produced in a recirculating system and given a commercial feed. No genotype–environment interaction for growth or survival by Egypt and Ivory Coast strains was seen in three secondary nursery settings.

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