

NOTICE OF PUBLICATION



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Sustainable Aquaculture for a Secure Future

Title: The effect of the introduction of Nile tilapia (*Oreochromis niloticus*, L.) on small indigenous fish species (mola, *Amblypharyngodon mola*, Hamilton; chela, *Chela cachius*, Hamilton; punti, *Puntius sophore*, Hamilton)

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Abstract: This is the first controlled experiment to quantify the effect of introduced tilapia on indigenous species. This experiment was conducted in small earthen ponds (100m²) to assess the impact of mixed-sex or all-male Nile tilapia (*Oreochromis niloticus*) on small indigenous species (SIS) commonly found in south Asia, mola (*Amblypharyngodon mola*), chela (*Chela cachius*) and punti (*Puntius sophore*). Ponds were fertilized, then stocked with 0.56 fish m⁻² of water surface area in the mixed-sex and all-male tilapia treatments and 0.42 fish m⁻² in the treatment without tilapia. No additional nutritional inputs were applied after stocking. Treatments were: mixed-sex tilapia with SIS, mono-sex male tilapia with SIS and SIS without tilapia (control). All treatments were stocked with 14 fish per species. All species reproduced during the 21-month culture duration. The number of recruits varied by species, Tilapia reproduced in greater numbers than SIS. Tilapia numbers at harvest were the highest (451 ± 25/100m²) in the mixed-sex treatment compared with mola (221 ± 22/100m²), chela (94 ± 8/100m²) and punti (100 ± 7/100m²). The number of mola was higher (399 ± 33/100m²) in the all-male tilapia treatment. There was reduction in the number of mola and chela in the treatment containing mixed-sex tilapia. Gut content analysis combined with water sampling revealed that all fish species fed selectively. Significant interspecies dietary overlap was found between Nile tilapia and SIS and among SIS. Thus, there is potential for tilapia to compete with indigenous fish species when space and other resources are limiting, but a longer duration study with varying level of management is needed to determine how suc-

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cessfully tilapia competes with locally adapted SIS.

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