

A preliminary assay on the mixed culture of red Florida tilapia and freshwater prawn *Macrobrachium americanum* stocked in outdoor tanks at different tilapia densities

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ABSTRACT

Red jumbo tilapia and *M. americanum* prawns were placed in 1000 L units in polyculture at three different densities of tilapia (4/5, 9/5 and 14/5 m²; tilapia/prawn) during 112 days with initial weight of 6.5 ± 2.8 g for tilapia and 25.9 ± 8.5 g for prawn. Prawn (0/5 m²) and tilapia (4/0, 9/0 and 14/0 m²) controls were included. Tanks were maintained outdoors and under shade. Total weight gain (WG), daily individual weight gain (DWG), specific growth rate (SGR), survival, production of gross mass and food conversion ratios (FCR), ammonia, nitrite and nitrate, and chlorophyll *a* were measured in all units. Only prawn weight gain was significantly higher in polyculture. For tilapia, the highest survival at the end of the trial was 94% and the lowest was 75%, while prawns had final survival rates from 43% to 86%. No statistical differences were observed in weight increase among treatments at $p \leq 0.05$.

Keywords: Native Prawn; Tilapia; Polyculture; Density

1. INTRODUCTION

The freshwater prawn *Macrobrachium americanum* from Western America has culture potential [1-3]. However, this issue it is understudied and there are not previous studies on its polyculture. Polyculture is an efficient

way to use culture units by adding two species with different requirements [4,5]. Since 1962 Ling [6] had promoted the polyculture of *Macrobrachium* prawns with fish such as tilapia. It is known that the polyculture of tilapia and prawns may increase total production and improve profits because of the high market value of prawns [7-9]. Tilapia may tolerate low water quality, can resist infections and has high market value [10]. This fish is often stocked at low densities fed with no balanced diets, so low final yields are obtained [11]. Male tilapia fingerlings may have a weight of 450 g after five months, but this size could be larger in polyculture [12]. Tilapia has been cultured successfully with prawns (*M. rosenbergii*, [13]), crayfish (*Cherax quadricarinatus*, [13]) and shrimp (*Litopenaus vannamei*, [14]). So, they could be also good if combined with *M. americanum* (Bate 1868). If possible, the culture of *M. americanum* with tilapia could be suitable in places in which this prawn is native. Tilapia is a very adaptable fish and has different feeding habits than prawns as they feed in the upper level while prawns take food from the bottom [9,13]. Mono cultured tilapia may produce significant deposition of surplus organic matter and lower water quality [12,15] while prawns do not utilize the upper level of the water column, thus favoring plankton instability [16]. In addition, inappropriate tilapia densities have been recognized as a factor that causes a low yield [13,17]. Therefore, polyculture in proper densities could be more profitable than mono culture.

This issue has been studied on Tilapia but not with *M. americanum* prawns. The aim of this study is to determine the mutual benefit of *M. americanum* and tilapia