

Sustainable aquaculture of Asian arowana: a review

ABSTRACT

Asian arowana, *Scleropages formosus* is a highly valued aquarium fish in the world, particularly in Asian countries, and has been listed as one of the most highly endangered species. This is a freshwater, carnivorous, fairly large mouth breeding fish belonging to the family Osteoglossidae. Arowana can be found in different colour varieties such as green, red, silver and golden. Among these varieties, Malaysian golden is the most valuable fish and is endemic to the Krian riverine system, Malaysia. However, overexploitation, habitat change and pollution have caused a serious decline of this arowana variety. Recently, arowana aquaculture industry is expanding rapidly in Southeast Asian countries. However, difficulties in an accurate differentiation of sex and strains, causing imbalanced stocking ratios for optimum spawning, remain major obstacles in maximizing arowana production. In addition, problems in sustainable water sources of suitable quality and prevention of diseases need to be addressed. Recirculating aquaculture system (RAS) and bioremediation are two possible technologies that could be used to minimize pollution and ensure adequate high-quality water for arowana culture. In addition, the application of appropriate molecular markers for sex and strain identification is also an important strategy required for the improvement of captive breeding. This review discusses several issues such as the importance of arowana as an aquarium fish, its market demand, current problems in the arowana aquaculture industry and the possible technologies to enhance reproductive capacity and increase culture production.

Keyword: Arowana aquaculture; Bioremediation; DNA markers; *Scleropages formosus*; Water quality