



XVI AGRICULTURAL SCIENCE CONGRESS 2023



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Transformation of Agri-Food Systems for Achieving
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Induced breeding and mass seed production of pool barb (*Puntius sophore*) – A nutrient-dense small indigenous fish species in Assam

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Integrating small indigenous fish species (SIS) into conventional carp polyculture systems holds great promise for addressing micronutrient deficiencies in nutritionally disadvantaged human landscapes. Among the diverse SIS in Assam, the pool barb (*Puntius sophore*) stands out as an exceptional candidate, abundant in vital micronutrients such as calcium and vitamin B12. Previous studies have already demonstrated the successful incorporation of pool barb into composite culture with carps, making it an ideal species for promoting nutrition-sensitive aquaculture approaches in the region. This research presents successful captive breeding and seed production of pool barb conducted at a farmer's field in the Darrang, Assam. The study utilized pioneering techniques that combined hormone administration, using a Synthetic GnRH analogue, and environmental manipulation to stimulate seed production. For females, the diluted inducing agent was administered through the peritoneal cavity at two different doses of 0.3 and 0.5 mL kg⁻¹ body weight, while males received a single hormone dose of 0.2 mL kg⁻¹ body weight. The sex ratio was maintained at 1:1. The brooders' average length and weight were recorded at 6.25±0.35 cm and 7.34±0.42 g for males, and 10±0.54 cm and 12.15±1.32 g for females, respectively. Breeding was conducted in rectangular cement tanks, featuring a

double hapa arrangement (10 mm inner hapa and 250-µ outer hapa) and continuous oxygen-rich water showering. To facilitate egg-laying, an artificial grass substratum was provided at the bottom of the inner hapa. Latency periods for breeding ranged from 8-10 h, with a temperature of 26.5 °C. Fertilized eggs, displaying adhesive light brownish coloration, hatched after 13-15 h of fertilization at 26.5-27.8°C. Notably, breeding performances were significantly enhanced ($P<0.05$) with the inducing agent administered at 0.5 mL kg⁻¹ body weight for females, resulting in the highest number of egg output (3,690 eggs), fertilization rate (84.36%), and hatching rate (88.75%). The research protocol facilitated the production of approximately 1 million spawns from a total of 2.5-3.0 kg matured female pool barb, with the yield varying based on seasonal, temperature, and maturity factors of the brooders. Through the successful development of mass seed production and rearing technology of pool barb at the farmer's field, offers a significant contribution to accelerate ongoing efforts in scaling nutrition-sensitive carp-SIS polyculture in Assam. These findings underscore the potential of sustainable aquaculture practices to combat nutritional challenges and herald a promising food secured future.

Keywords: Mass seed production, Nutrition-sensitive aquaculture, Pool barb, *Puntius sophore*, Small indigenous fish species (SIS).