



Indigenous Traditional Knowledge on Mud Eel Reproduction in Bangladesh

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Macksood Alam Khan was born on 1975 in a muslim family of Bogura district and presently serving as the Director (In-charge) of Project Planning and Monitoring Division of Rural Development Academy (RDA), Bogura. He has completed B.Sc. Fisheries (Hons.) and M.S in Fisheries Management from Bangladesh Agricultural University, Mymensingh. Later on, he did second Masters's Degree from the University of Kent, UK on Conservation and Rural Development. He is also a PhD Research Fellow in Department of Fisheries Management under Bangladesh Agricultural University (BAU), Mymensingh. Title of the PhD research is - Reproductive biology of endangered mud eel *Monopterus albus* (Final dissertation accepted by CSAR, awaiting for approval of BAU Syndicate). At RDA, he is involved in planning, designing, and organizing training courses and conducting research and piloting projects, especially on fisheries and the rural development sector. Besides, he looks after the Fisheries Unit of the RDA Demonstration farm and supervises aquaculture, breeding, and spawn production of commercial fish species of carps, catfishes All Male (Mono-sex) Tilapia. He has also initiated several activities towards conserving the natural environment and launched Ecotourism program at RDA with the slogan 'Green RDA, Clean RDA'. So far, he has ten research publications, of which four are Journal articles, and the rest are research reports.



Dr. Harunur Rashid is a Professor of Aquatic Ecology and Climate Change Impacts employed as permanent faculty member at Bangladesh Agricultural University (BAU) Faculty of Fisheries since 2000. Dr Rashid is trained from BAU (BSc, 1999 & MS, 2000), Japan (PhD, 2008), USA (Fulbright visiting research fellow at the University of North Carolina Greensboro, 2018) and Germany (Leibniz Centre for Tropical Marine Research, Bremen, 2019). Dr Rashid's research & work experiences are quite interdisciplinary, such as - aquatic stress ecology studies with fish & invertebrates, coastal-marine pollution, environmental toxicology, climate change impacts, food security & food safety. He has experiences supervising researches related to fish ecology, climate change impacts on fish, aquatic ecotoxicology, microplastics pollution, etc. So far, Dr Rashid has supervised 6 doctoral and more than 60 MS students. He has published more than 60 research articles, book & book chapters in international and local peer-reviewed journals and conferences. Prof. Rashid's profile page is <http://harunurrashid.net>.

ABSTRACT

In many parts of the world, indigenous people and their knowledge are rediscovered as valuable sources of information for knowing different components of the nature towards their sustainable management. As a result, Indigenous Traditional Knowledge (ITK) is getting popular as a supportive tool in understanding of the nature and management of nature resources. Freshwater mud eel, *Monopterus albus* (locally, 'cuchia'), is a native fish species of Bangladesh available in shallow freshwater habitats. According to IUCN Red List, this is one of the threatened fishes of Bangladesh. To document ITK on mud eel reproduction, this study was carried out in three sub-districts of Mymensingh district of Bangladesh where many indigenous people are traditionally involved in harvesting mud eel from natural freshwaters. This ITK study revealed that mud eel is commonly found in the low-lying shallow waters of the floodplains (locally, 'beel') under aquatic weeds; also found in ditches, ponds, dead canals and muddy-watery paddy fields. Building their own nest for hiding and reproduction is reported as a prominent behavioral feature of mud eel. Frog tadpole is the most preferred food of nocturnal mud eel, followed by small mollusk, worm, small fish, small shrimp, fish fry and fingerling, small amphibian, insect, insect larvae, etc. The body shape of mud eel is reported elongated, compressed eel-like and cylindrical anteriorly; tail is tapered and compressed. Newly hatched spawns are reddish-brown initially, become brown upper and whitish lower after three-four days, gradually turn into blackish afterwards; adults are reported greenish, brownish or blackish above and light yellow on abdomen and numerous round black spots above the lateral line. A fish attains 150-200 g weight within a year and lives for 10-15 years. Secondary sexual characters help separate male and female particularly during breeding season; male has rounded body with narrow tail and prominent, bright and brownish body colour, while female has soft abdomen, bulging-out belly and rounded vent with pinkish body colour and flattened tail; female body colour is dull

compared to male; the junction between head and body of male is slightly compressed compared with rounded shape in female; female is slightly larger and stronger than male. The breeding season of mud eel is reported during the Bengali month of *Chaitro* to *Joishto* (mid-March to mid-June), while the peak breeding season is in the month of *Boishakh* (mid-April to mid-May). A female lays 500-700 yellow, granular, congregated but non-sticky eggs in the widened part of the mud-hole where water easily entered from the waterbody. Larvae usually hatch-out from eggs during *Joishto* (mid-May to mid-June) where mother takes parental care inside mud-hole-nest and shelter them inside her oral cavity if there is any sign of external threat from predators. Indigenous people usually harvest mud eel from natural freshwater habitats by using baited traps, long lines, spears, hooks, handmade tools and hands. Overexploitation, degradation and conversion of wetland habitats areas reported as the key reasons behind decline in natural population of mud eel in Bangladesh. Conservation through co-management, restricting use of chemical fertilizers and pesticides, measures to control overexploitation, ban on harvesting mud eel during breeding season and developing artificial breeding, nursing and fry rearing techniques are suggested by indigenous people for prevention of mud eel population from decline.