Bangladesh J. Zool. **49** (2): 347-351, 2021 **- Scientific Note**
ISSN: 0304-9027
eISSN: 2408-8455

FEEDING AND BREEDING HABITS OF MANGROVE KINGFISHER (*TODIRAMPHUS CHLORIS*) IN THE SUNDARBANS RESERVE FOREST, BANGLADESH

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From March 2017 to May 2018, a study was conducted on the feeding and breeding ecology of mangrove kingfisher in Satkhira Range of the Sundarbans. The Sundarbans is the largest single patch of mangrove woodland contributing to the different biotic and abiotic factors-soil formation, hydrological cycle, climate, and protection from natural disasters (Kathiresan and Bingham 2001). Among 12 kingfishers in Bangladesh, nine species of kingfishers including *Todiramphus chloris* are found in The Sundarbans (Rahman and Asaduzzaman 2010). Mangrove kingfisher has a bluish head, tail, and hindquarter; white ring on the neck that extends to the lower parts (Hoyo *et al.* 2001). In Bangladesh, Mangrove Kingfisher inhabits the tidal creeks, mangrove swamps, and forest edges along the coastline in Chattogram and Khulna division (Ahmed *et al.* 2008). The scientific name means green bird with a prominent bill (Ahmed *et al.* 2008). The bird can be identified by its loud, ringing, "kee" call (four times on average) (Hoyo *et al.* 2001).

Studies on the feeding and breeding ecology of this species are necessary, not only from a biological or ecological standpoint but also from the conservation and population management perspectives. The literature reveals a little information about mangrove kingfisher's life history. Researchers have studied a few anatomical, physiological and ecological attributes- the DNA barcoding, hunting method, population status and decline due to alien intruders, cooperative nesting molecular phylogeny niche partitioning- of mangrove kingfisher outside Bangladesh (Luczon et al. 2010, Fitzsimons et al. 2011, Pereira 2013, Beckon 1987, Campbell 2013, Anderson et al. 2015, Borah et al. 2012). No study has been done on the feeding and breeding ecology of mangrove kingfishers in Bangladesh. This short note would work as an ecological baseline database for mangrove kingfisher study and mangrove ecosystem of the southwestern part of the Sundarbans.

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©2021 Zoological Society of Bangladesh **DOI: https://doi.org/10.3329/bjz.v49i2.56269**

The study was undertaken from March 2017 to May 2018. The study was carried out in three nests, located in- Munshiganj forest office (22°16'15.2"N 89°11'50.2"E); Bank of Chuna river (22°15'10.3"N 89°11'25.5"E) and Kadamtola forest office (22°13'44.7"N 89°10'52.1"E) under Munshiganj union Shyamnagar Upazila of Satkhira. Chuna river has separated Munshiganj union from the Sundarbans. Field trips were conducted fortnightly. Lines of Hijal (freshwater mangrove- *Barringtonia acutangula*), Keora (sonneratia mangrove- *Sonneratia apetala*) trees are found along the bank of the Chunar river which is an unpaved road. In Munshiganj forest station, I found Nipa palm (*Nypa fruticans),* Jackfruit *(Artocarpus heterophyllus),* Sundri *(Heritiera fomes)*, Coconut (*Cocos nucifera).* The monsoon ranges from June to September and winter ranges from October to February in the Sundarbans (Rahman and Asaduzzaman 2010).

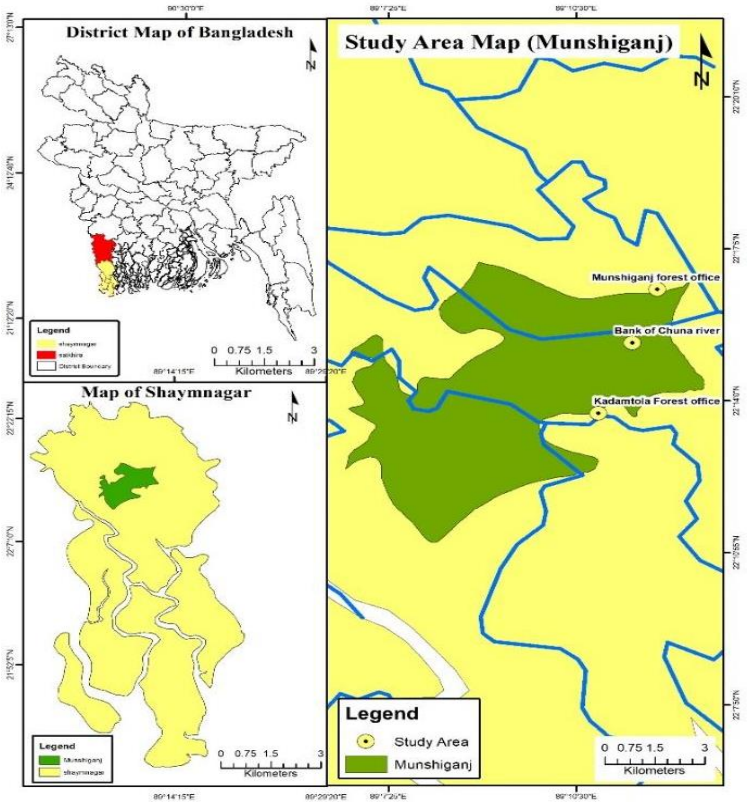

Fig. 1. Map of study areas.

Focal animal sampling method at 5 minutes intervals was followed to study and observe the feeding ecology of mangrove kingfisher (Altmann 1974). A total of 48

days were spent in fieldwork. No nest was visited directly, due to the heavy rain and the high altitude location of the nest. Volunteers (two college student citizen scientists) were appointed to visit the nest on the bank of Chuna river twice a week in July and collected data on the nest, breeding behaviour and hatchlings. Secondary data were collected from thirteen (13) inhabitants and local anglers through a questionnaire survey. The questions were: what reproduction behaviors and interactions (chasing, food offering, mounting) did you observe?; What type of parental care (incubation, brooding and feeding hatchling) did they observe? and which other animals disturb the parent birds? Each nesting tree was marked by GPS coordinates when water level was low.

Mangrove Kingfisher showed sit-and-wait foraging technique with keen eyesight. Every single feeding (n=91) includes conspicuous searching, diving, and prey handling. So the mangrove kingfisher can be termed as a specialist forager, not an opportunistic feeder. Its food items (n=106) are crabs (n=66, 62.26%), minnows (n=13, 12.26%) and shrimps (n=10,9.43%) chiefly. Among crabs, paddler crab (*Metopograpsus messor*) and ghost crab (*Ocypode macrocera*) were identified (Ahmed *et al.* 2008). Other twelve (12) individuals were unidentified. Paddler crab (72.72%) was the highest preference. The bird spent 32.74 seconds (SD±12.03) on average for a single feeding.

During the study period, the frequency of feeding was higher (2.43 times/day) in monsoon (June-September) and lower in winter (Oct-Feb) (2.31 times/day). The parents beat the crab against the branch of trees until the crab stopped moving. Then they provisioned it to the fledglings.

But the breeding behavior started to be observed from late February till July. As sexes were alike in mangrove kingfisher, it could not be possible to determine whether they were monogamous or polygamous. The bird pair nested solitarily. Parents became territorial after pair formation and nest selection in April-June. Pair formation occurred in mid-February. Two nests were built in the branchless portion of the trunk of two different blinding trees (*Excoecaria agallocha*) in Munshiganj Forest office and another one of Chuna river. The third nest was observed on a grey mangrove (*Avicennia* species) in Kodomtola. All the nests were previously made. Both partners defended the territory aggressively. In breeding season, they displayed agitated gestures and chased other birds (conspecies and other species), especially common myna (*Acridotheres tristis*) and crow (*Corvus splendus*). However, from the questionnaire survey it is known that mating behavior (mounting) was observed thrice in the second week of May at the nest tree in the bank of Chuna river. One clutch with four eggs was recorded in the 2nd week of June on the bank of Chuna river. One of which was spoiled and eaten by one parent including the shell and the shell was

regurgitated later. After 17-20 days of incubation period, three eggs hatched in the first week of July. The newly hatched hatchlings were naked and blackish. After hatching the chick took 25-30 days to fledge. But they did not leave the nest immediately. Parents feed them and nurture them (secondary data). Whenever they could not grab the prey by their beak at the first attempt, they tried again sitting on the mud. Local people informed that children climbed up and took the eggs whenever a nest was accessible to them. Coastal belt plantation program took place in the riverbank of Chuna under the supervision of the Munshiganj Union Parishad.

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(Manuscript received on 20 April 2020 revised on 18 June, 2021)