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ECOLOGICAL STATUS OF THE HERPETO-MAMMALIAN FAUNA OF THE PADMA RIVER AND ITS ADJACENT AREAS, RAJSHAHI AND THEIR CONSERVATION ISSUES

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Abstract: Status and diversity of animals are the important indicators for a healthy habitat of animals. We conducted a survey on ecology and status of herpeto-mammalian fauna from November 1995 to October 1996 in the Padma river and its adjacent areas, Rajshahi. To achieve the objectives direct field observation and interviewing local people were made by employing standard methods. A total of 50 species of herpeto-mammalian fauna was recorded from the study area. Of these, 5(10%) were amphibians, 20 (40%) reptiles and 25 (50%) mammals. In the amphibians, 3 species were common, rest one species was fairly common and one few. In the reptiles, 5 species were very common, 4 common, 7 fairly common, 3 few and only one species was occasionally found. Of the mammals, 2 species were very common, 5 common, 10 fairly common, 6 few and 2 species were occasional. Among the total species, 3 species of amphibians were vulnerable nationally, 4 species of reptiles were critically endangered, 4 endangered and 4 vulnerable and one species of mammals were critically endangered (*Lutra lutra*), 6 endangered and 4 species were vulnerable nationally. Group discussion with the local people indicated that species diversity of herpeto-mammalian fauna has been decreased day by day in the study area. This might be due to the results of highly disturbance by human. Meanwhile, increase of human population, destruction of habitat, expansion of agricultural activities, illegal hunting and trade are the main causes for declining herpeto-mammalian fauna in the study area. The study suggests that creation of public awareness, improvement of ecological condition and implementing a management action plan are necessary to conserve the herpeto-mammalian fauna in the study area.

Key words: Herpeto-mammalian fauna, ecology, relative abundance, threatened species, Padma river.

INTRODUCTION

Herpeto-mammalian fauna is one of the most important natural renewable resources in Bangladesh. This group of wildlife in the Padma river has not been studied methodically. It is well known that the population size and species composition of the wild fauna has been rapidly decreasing due to ecological degradation e.g. soil erosion, flood, cyclone, over-exploitation, extension of agricultural lands, climate change, etc. The Padma river becomes very narrow during the dry season and became very wide during rainy season that causes flood. The study area includes a wide variety of unique habitats for

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herpeto-mammalian fauna. Human habitations are increasing in the plain land area along the river side. Many visitors come to the Padma River near T-badgth for recreation all the year, particularly in the winter seasons and causing serious disturbances for herpeto-mammalian fauna and destroy their habitat and breeding activities. The fisherman catches fishes in the Padma river without considering the breeding seasons of turtles and tortoises. Sometimes local people catch the turtles and tortoises and sell them in the local markets. The ecological condition of the study area has been changing very rapidly due to the human activities.

Little study on the status of herpeto-mammalian fauna has been done in the Padma river and its adjacent areas. Although, some works has been done on the same aspect elsewhere: Rodents of Bangladesh (Alam 1975), the amphibian fauna of Bangladesh (Hussain and Rahman 1978), list of snakes of Bangladesh (Khan *et al*. 1980), reptiles of Bangladesh (Akond *et al*. 1982, Daniel 1983, Sarker and Sarker 1985, IUCN 2000, Hossain and Sarker 1993, 1995 and 1996). Therefore, this study is important to prepare a baseline data on herpeto-mammalian fauna in order to conserve biodiversity in the study area.

The objectives of the paper were to prepare a baseline data on herpeto-mammalian fauna of the Padma river and its adjacent areas; to estimate relative abundance of all recorded species and to study the status of threatened species; and to investigate ecological condition of the herpeto-mammal fauna in the study area.

MATERIAL AND METHODS

The study was conducted from November 1995 to October 1996 in aquatic and terrestrial habitats. The investigation was mainly based on the direct observations, distribution of questionnaires and interviewing the local people. Observation was made once in a month during the study period. Each observation was conducted for five consecutive days and continued from early morning to evening. The study area covered the whole Padma river starting from Godagari to Rajshahi sadar and its associated land areas. Observation was made by walking in the plain land and using a mechanized boat in water areas in the morning and afternoon. Six plots were selected, such as Char Alatuli, Sultangonj Ghat, Godagari, Premtoli, Rajshahi (near 'T-badgth') and Kazla. Transect lines were used for counting the animals in the field. Transect lines were varied from 500 to 1000 m in length and 50 to 100 m in breadth. Sometimes, 100m × 100m sizes of blocks were also used when it was necessary for counting the population. During field observations, a pair of field binocular, still camera, spot light, plastic steel tape, preservatives, polythene bags, rubber

band, map, etc were used. The species were identified following Banglapedia (2009).

When any species was sighted more than 80% in field visits, it was recorded as very common (VC) species, common (C) when it was sighted 60-79%, fairly common (FC) when 20-59%, and few when species was sighted less than 20% (Hossain *et al.* 2004). Besides, two or three times were seen in the whole study period is known as occasionally (O) found. The habitat type of each transect was recorded separately as (1) bush dwelling, (2) open place, (3) human habitation, (4) paddy field and (5) tree.

The study area: Rajshahi is located in the north-west part of Bangladesh and very near to western border of India. Rajshahi district lies betwen 24.09° and 25.13° north latitude and between 88.02° and 89.21° east longitude. The study area included the Padma River and adjacent area from Rajshahi Sadar to Godagari Upazila. Geographically Rajshahi district is important, particularly because of the river Padma. The north, east and west sides of the study area are plain land mainly covered by crop, bushes, trees and village houses. But, the southern side of the Padma river is mainly sandy and open (Fig. 1). Rajshahi including Godagari Upazila is a vast alluvial plain unrelieved by natural elevation of any kind. In the north, there are high sandy plains of large extent and along the west there is strip of high land composed of stiff red clay. The Barind lands are prominent in this area. Specially, river side is dominated by alluvial sandy land. In the dry season, the river Padma becomes almost dry, sandy and open, locally called 'char'. During the rainy season the 'chars' go under water and become a single sheet of vast water area. The greater part of the study area is composed of recent alluvium locally known as 'Pali' which is soft sandy loam of great fertility. The other part is Barind clay residue which is not plain and it is reddish color soil.

The homestead forest is found in some parts having a variety of plants. The most of the land are covered by paddy field. The important plants are: khayer (*Acacia catechu*), babla (*Acacia nilotica*), bell (*Aegle marmelos*), shirish (*Albizia* spp.), chatim (*Alstonia schalaris*), kadam (*Anthocephalus chinensis*), bamboo (*Bambusa* spp.), tal (*Borassus flabellifer*), papaya (*Carica papaya*), neem (*Azardirachta indica*), jackfruit (*Artocarpus heterophyllus*), mango (*Mangifera indica*), coconut (*Cocos nucifera*), shisu (*Dalbargia sisso*), banana (*Musa* spp.), khejur (*Phoenix sylvestris*), kul (*Zizyphus maritiana*), Koroi (*Derris robusta*), Premkata (*Chrysopagon aciculatus*), durba (*Cynodon dactylon*), etc.

During the rainy season some plants are grown like, kalmilata (*Ipomoea aquatica*), shapla (*Nymphaea nouchalli*), helencha (*Enhydra fluctuans*), padma (*Nelumbo nucifera*), kachuripana (*Pistia* spp.), paniphal (*Tropa bispinosa*), etc.

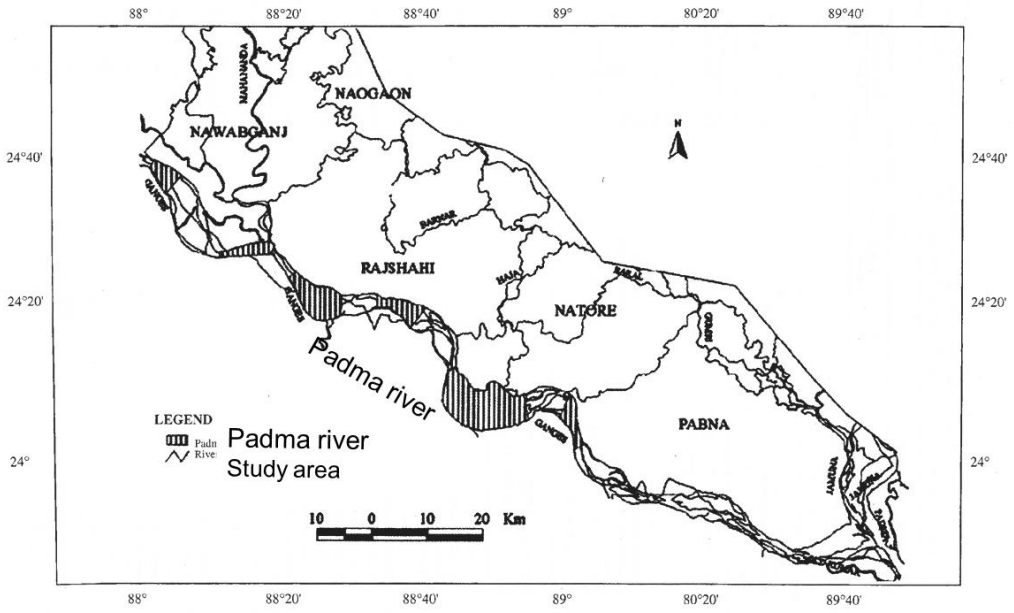

Fig. 1. Diagrammatic sketch of the section of the river Padma and adjacent area.

RESULTS AND DISCUSSION

Amphibia: Five amphibian species including frogs and toad were recorded from the study area (Table 1). Of the herpeto-mammalian fauna, amphibian species were five (10%) in number (Fig. 2). Of these, three species were common, one species, *Microhyla ornata* fairly common and one species, *Microhyla rubra* was few in number. Toad (*Bufo melanostictus),* skipper frog (*Euphlyctis cyanophlyctis*) and bull frog (*Haplobatrachus tigerinus)* were common in number. Toads (*Bufo melanostictus*) were recorded from the bushy and dark place of the study area and bull frog were recorded from aquatic habitat near human habitation. In respect to the national status two species were under lower risk and three species were vulnerable (Table 1).

Reptilia: A total of 20 (40%) species of reptiles was recorded from the Padma river and its adjacent areas (Fig. 2). Of these, one gharial, seven turtles and tortoises, seven lizards and five species of snakes were recorded (Table 1). More than 20 people of the adjacent areas reported that a gharial was seen in June, 1995 near the Sultangonj ghat at Godagari and some people also reported its presence during the flood near Rajshahi town in June, 1996. A baby gharial was caught by the fisherman in the Padma river near Kadamtoli in Manikgonj (The Daily Star; 23rd October, 1997). Among the turtle and tortoises, red necked river turtle (*Kachuga kachuga*) was found in the river and the highest number

Table 1. Checklist of the herpeto-mammalian fauna recorded from the Padma River and its adjacent area, Rajshahi

Sl. No.	Taxon	Scientific name	English name	Local name	R/A	N/S
	Class Amphibia					
	Order Anura					
	Family					
1	Bufonidae	*Bufo melanostictus*	Toad	Kuno bang	C	NO
2	Microhylidae	*Microhyla ornata*	China frog	China bang	FC	VU
3	"	*M. rubra*	Red frog	Lal bang	F	VU
4	Ranidae	*Euphlyctis cyanophlyctis*	Skipper frog	Kotkoti bang	C	NO
5		*Hoplobatrachus tigerinus*	Bull frog	Shonabang/kolabang	C	VU
	Class Reptilia					
	Order Crocodilia					
	Family					
6	Gavialidae	*Gavialis gangeticus*	Gharial	Ghorial	O	CR
	Order Chelonia					
	Family					
7	Emydidae	*Kachuga kachuga*	Red necked river turtle	Lal griba kashim	F	CR
8	"	*K. tecta*	Common roofed tortoise	Kari kaitta	FC	NO
9	"	*Melanochelys trijuga*	Black Pond turtle	Kalo kaitta	FC	EN
10	Trionychidae	*Aspideretes gangeticus*	Ganges soft shell turtle	Ganges kashim	FC	EN
11	"	*Chitra indica*	Narrow-headed Soft shell turtle	Nadi kashim	FC	CR
12	"	*Lissemys punctata*	Spotted flap shell turtle	Dhum kashim	FC	VU
13	"	*Pelochelys cantorii*	Cantors soft shell turtle	Cantor kashim	F	CR
	Order Lacertilia (Squamata)					
	Family					
14	Gekkonidae	*Gekko gecko*	Wall lizard	Takkhak	VC	VU
15	"	*Hemidactylus brooki*	Common wall lizard	Tiktiki	VC	NO
16	"	*H. flaviviridis*	House lizard	Tiktiki	VC	NO
17	Agamidae	*Calotes versicolor*	Common garden lizard	Rokto chosa	VC	NO
18	Scincidae	*Mabuya carinata*	Common skink	Anjoni	VC	NO
19	Varanidae	*Varanus bengalensis*	Grey land monitor	Maita guishap	C	VU
20	"	*V. flavescens*	Yellow water monitor	Holud guishap	C	EN

Table 1. Contd.

Sl.No.	Taxon	*Scientific name*	English name	Local name	R/A	N/S
	Order Serpents (Squamata)					
	Family					
21	Colubridae	*Amphiesma stolatum*	Stripped keelback snake	Dhora shap	C	NO
22	"	*Enhydris enhydris*	Common smooth water snake	Paina shap	FC	NO
23	"	*Ptyas mucosus*	Rat snake	Darash	FC	VU
24	"	*Xenochrophis piscator*	Cheekered keel back water snake	Dhora shap	C	NO
25	Elapidae	*Bungarus fasciatus*	Banded krait	Shankini shap	F	EN
	Class Mammal					
	Order Insectivora					
	Family					
26	Soricidae	*Suncus murinus*	White tailed shrew	Chika	C	DD
	Order Chiropter					
	Family					
27	Pteropidae	*Pteropus giganteus*	Flying fox	Badur	C	NO
28	Megadermatidae	*Megaderma lyra*	False vampire	Daini badur	FC	NO
29	Vespertilionidae	*Pipistrellus coromandra*	Pipistrelle	Chamchika	FC	NO
30	"	*P. mimus*	Pigmy pipistrelle	Khudey chamchika	F	NO
	Order Carnivora					
	Family					
31	Canidae	*Cania aureus*	Asiatic Jackal	Shial	FC	VU
32	"	*Vulpes bengalensis*	Bengal fox	Khek shial	FC	VU
33	Felidae	*Felis chaus*	Pearson jungle cat	Banbiral	FC	EN
34	"	*Prionailurus viverrinus*	Fishing cat	Mecho bag	F	EN
35	Herpestidae	*Herpestes auropunctatus*	Small mongoose	Choto beji	F	NO
36	"	*H. edwardsii*	Grey mongoose	Beji	F	VU
37	Mustelidae	*Lutra lutra*	Common otter	Ud biral	O	CR
38	"	*L. perspicillata*	Smooth-coated otter	Bhodor	F	EN
39	Viverridae	*Viverra zibetha*	Large civet	Khatash	FC	EN
40	"	*Viverricula indica*	Small civet	Gondhogokul	FC	VU

Table 1. Contd.

Sl. No.	Family	Scientific Name	English Name	Local Name	R/A	N/S
	Order Cetacea Family					
41	Platanistidae	*Platanista gangetica*	Gangetic dolphin	Sushok	F	EN
	Order Lagomorpha Family					
42	Leoporidae	*Lepus nigricollis*	Black napped hare	Khargosh	O	EN
	Order Rodentia Family					
43	Sciuridae	*Callosciurus pygerythrus*	Irrawarddy squirrel	Badami katbirali	FC	NO
44	"	*Funambulus palmarum*	Three striped palm squirrel	Dhora katbirali	FC	NO
45	"	*F. pennanti*	Five striped palm squirrel	Dhora katbirali	C	NO
46	Muridae	*Rattus rattus*	Black rat	Indur	VC	NO
47	"	*R. norvegicus*	Brown rat	Badami indur	C	DD
48	"	*Mus musculus*	Waterhouse house rat	Negti indur	VC	NO
49	"	*Bandicota bengalensis*	Lesser bandicoot rat	Indur	FC	NO
50	"	*B. indica*	Large bandicoot rat	Dhari indur	C	NO

Note VC = Very Common, C = Common, F = Few, O = Occasional , CR = Critically Endangered, VU = Vulnerable, LR = Lower Risk, DD = Data deficient, NO = Not threatened, R/A = Relative Abundance and N/S = National Status.

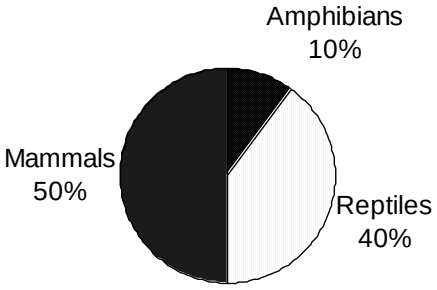

Fig. 2. Herpeto-mammalian fauna of the Padma river and its adjacent area.

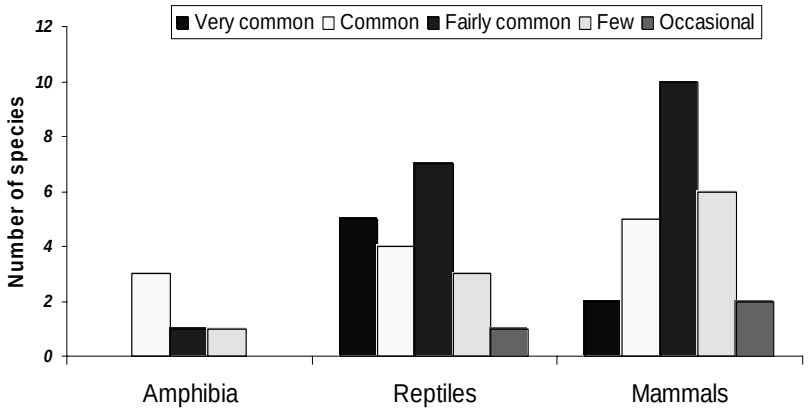

Fig. 3. Relative abundance of herpeto-mammalian fauna in the Padma river and its adjacent area.

was found in pond in January. Common roofed tortoise (*Kachuga tecta*), black pond turtle (*Melanochelys trijuga*) and narrow-headed soft shell turtle (*Chitra indica*) was also recorded at Godagari and Premtoli. These species were also recorded from the pond and the Padma river on October to February whereas spotted flap shell turtle (*Lissemys punctata*) was only recorded in the ponds of Char Alatui. Ganges soft shell turtle (*Aspideretes gangeticus)* and cantors soft shell turtle (*Pelochelys cantorii*) were also recorded in the Padma river while these species were caught by the fisherman. Out of seven species of lizards, five species were very common and two species were common. Among these two species, grey land monitor (*Varanus bengalensis)* is vulnerable and yellow water monitor (*Varanus flavescens*) is endangered nationally, but these species was available in the study area particularly in the paddy field and river. Out of five species of snakes, four were nonpoisonous and one poisonous; among these, two species were common and two fairly common and one few. Banded krait *(Bungarus fasciatus) was* not seen in the study period but local people reported their presence. Of the reptiles, five species were very common, four species

common, seven species fairly common, three species few and only one species occasionally found (Table 1). In respect to the national status of Bangladesh 12 species of reptiles were threatened out of which, four critically endangered, four endangered and four vulnerable nationally (Fig. 4).

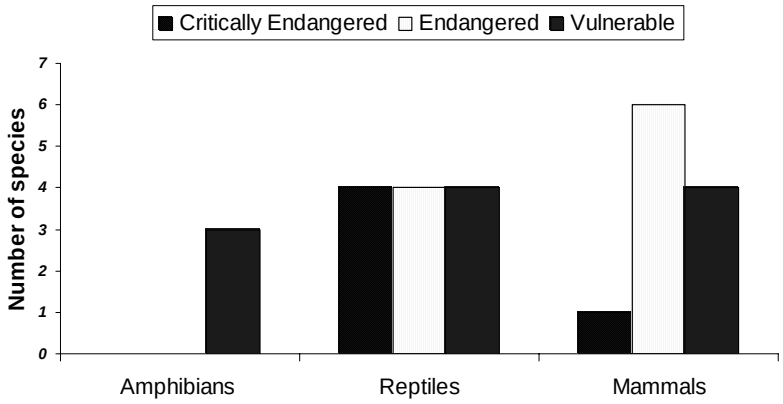

Fig. 4. Threatened status of herpeto-mammalian fauna in the Padma river and its adjacent area.

Mammalia: A total of 25 species of mammals belonging to 15 Families under six Orders were recorded from the study area. These species were 50% of the total herpeto-mammalian fauna (Fig. 2). Among the mammalian fauna, only one species was insectivore, four species of bats, 10 species carnivores, eight species rats, mice and only one species of aquatic mammal and one species of hare (Table 1). Alam (1975) collected 13 species of rodents from different parts of Bangladesh and Sarker and Sarker (1988) reported a total of 123 species of mammals from Bangladesh. However, the presence of 25 species of wild mammals including a species of dolphin in this area was a characteristic feature. Three Gangetic dolphin were recorded in January 1996; the local people reported that the population of the Gangetic dolphin increased during the rainy season. Black rat (*Rattus rattus*) and house mouse (*Mus musculus)* were the pest of crops viz. rice, pulse, wheat, etc. Irrawarddy squirrel *(Callosciurus pygerythrus)* and three striped palm squirrel (*Funambulus palmarum)* were the main pest of fruits and also the peanut field in the area. Common otter (*Lutra lutra)* and smooth-coated otter (*L. perspicillata)* were reported by the local people. Of the mammals, two species were very common (*R. rattus* and *M. musculus),* five common, 10 fairly common, six few and two occasionally (*L. lutra* and *L. nigricollis*) found in the study area (Fig. 3). In respect of national status, 11 species were threatened nationally out of which, one was critically endangered (common otter, *L. lutra*), six species endangered and four species were vulnerable (Fig. 4).

Conservation issues and problems: There are many problems for the conservation of herpeto-mammalian fauna in the study area. As a result, all wildlife and their natural habitat are now threatened. Besides different types of natural calamities, such as cyclones, over flood, draught, etc. are destroying the habitats of the natural herpeto-mammalian fauna in the study area every year. Due to the rapid growth of human population and for their settlement, soil erosion, clearing of bushes and village thickets, exotic plantation, irrigation and use of agrochemicals are also responsible for the decrease of wildlife in this area. Some illegal traders are involved in collecting turtle and tortoise eggs, skin of monitor lizards, civets and sell these in the local markets. The fishermen also trap the dolphins by their net and collect oil from them. Many local visitors come to the Padma river for recreation specially in winter season and play engine boat in the river. This has been creating problems for the breeding of turtles and tortoise and others.

Recommendations: Herpeto-mammalian fauna should be protected by the government with the participation of local people. The communities should be made aware of the importance of herpeto-mammalian fauna in the environment. A management action plan should be prepared and implemented, so that local people can understand the values of wildlife and their habitat. The visitors should be restricted in the Padma river and over movement of motor engine boat should be controlled and banned. Wildlife protection Law 1974 (revised) should be strictly implemented through the local enforcement agencies. Illegal exploitation of trees by the traffickers must be stopped to protect the habitat of herpeto-mammalian fauna. Collection of turtle eggs, bull frog and other wildlife, and their body parts must be banned. The cooperation of National and International organizations is necessary for the conservation of the herpeto-mammalian fauna in the study area.

Summary and conclusion: This study revealed the relative abundance of 50 species of herpeto-mammalian fauna under 25 Families recorded in the Padma river and its adjacent areas during the study period. This study also investigated the factors responsible in ecological changes of the herpeto-mammalian species. There is no baseline data available on the herpets-mammalian faun aof Rajshahi and adjacent areas. Therefore, this study was highly desirable for the conservation of the recorded species and might be useful as a secondary data for future research work. From this study we assumed that the herpeto-mammalian species are declining day by day. Illegal trapping and catching, killing, destroying of habitat and human disturbances are the main causes for declining of these species. Awareness creation for the local communities, on the other hand, was very negligible. Therefore, this study site should be enlisted in the

threatened category and also should be declared as protected area in order to save the population and diversity of the herpeto-mammalian fauna in the study areas.

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