Additional report of anurans from Durgapur subdivision, Paschim Bardhaman, West Bengal

Amphibians have been known to be good indicators of environmental degradation, yet they are one of the least studied groups in most biodiversity related studies. They are highly vulnerable to various anthropogenic pressures and most recently there have been a great concern about their conservation all around the globe.

Studies on anuran diversity were carried out in different parts of India and West Bengal covering various habitat types (Deuti 1995; Padhye & Ghate 2002; Pratihar & Deuti 2011; Deuti et al. 2014; Deuti et al. 2017). In several previous studies on anurans, 11 anuran species were reported from the present study location (Pal et al. 2012, Dutta & Mukhopadhyay 2013, Chatterjee & Mondal 2014).

However, it was felt important to repeat the study since new species were observed in the later years.Thus, the present study was undertaken to update the checklist of anurans from Durgapur Subdivision.

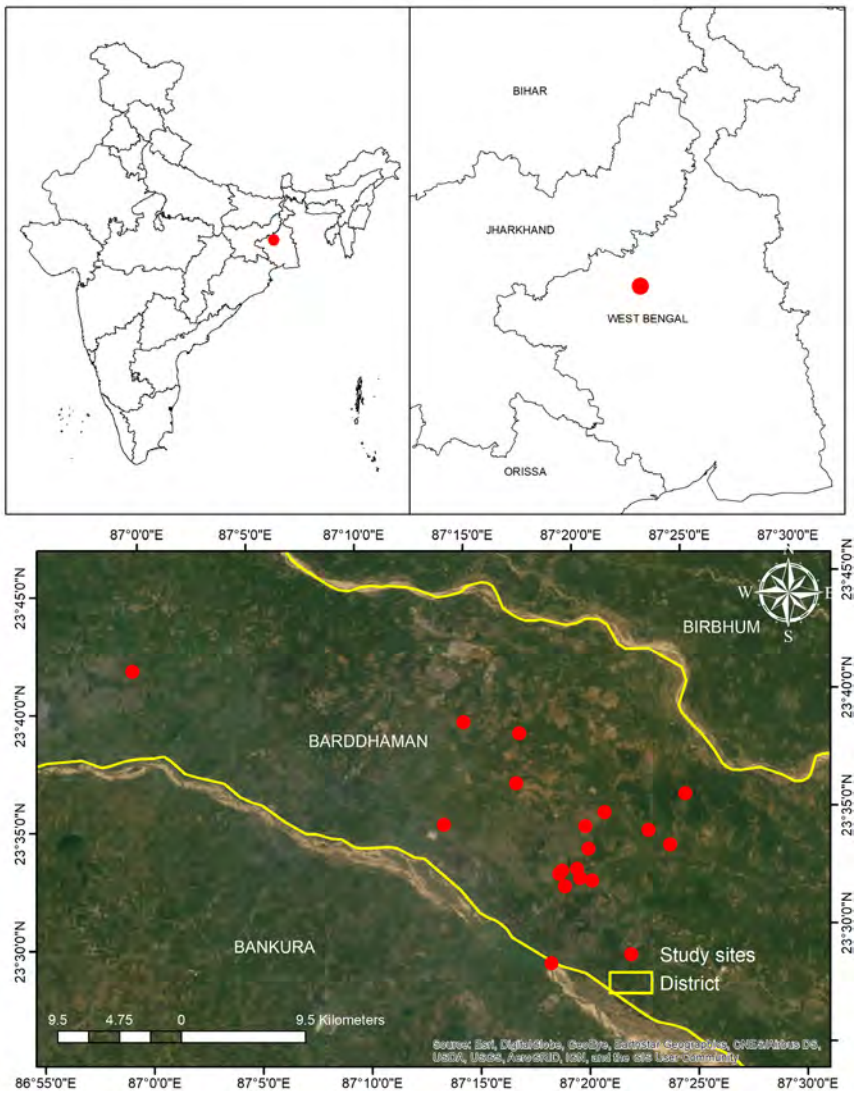

Image 1. Study area under present investigation from Durgapur of Paschim Bardhaman District from West Bengal, India.

Materials and Methods

Study area

The present study was carried out in the industrial city of Durgapur, Paschim Bardhaman which covers

Table 1. Checklist of anurans in Durgapur Subdivision based on previous and present study.

Family	Common Name	Scientific Name	Local name	References
Bufonidae	Common Indian Toad	*Duttaphrynus melanostictus*	Kuno Bang	A, B, C, D
	Schneider's Dwarf Toad	*Duttaphrynus scaber*	Choto Kuno Bang	D
	Indian Marbled Toad	*Duttaphrynus stomatictus*	Kuno Bang	C, D
Dicroglossidae	Indian Skipper Frog	*Euphlyctis cyanophlyctis*	Churchure Bang	A, B, C, D
	Indian Pond Frog	*Euphlyctis hexadactylus*	Jar Bang	A, D
	Cricket Frog	*Minervarya sahyadrensis*	China Bang	A, B, C, D
	Jerdon's Bull Frog	*Hoplobatrachus crassus*	Choto Sona Bang	B, C, D
	Indian Bull Frog	*Hoplobatrachus tigerinus*	Sona Bang	A, B, C, D
	Terai Wart Frog	*Minervarya teraiensis*	China bang	D
Microhylidae	Indian Painted Frog	*Uperodon taprobanicus*	Vepu Bang	A, B, D
	Narrow Mouth Frog	*Microhyla sp*	Kath Bang	A, B, C, D
	Greater Balloon Frog	*Uperodon globulosus*	Phola Bang	A, B, D
	Variegated Globular Frog	*Uperodon variegatus*	-	D
Ranidae	Yellow Striped Frog	*Hylarana tytleri*	Pana Bang	D
Rhacophoridae	Common Indian Tree Frog	*Polypedates maculatus*	Gecho Bang	A, B, D
References: A: Pal et al. (2012); B: Dutta & Mukhopadhyay (2013); C: Chatterjee & Mondal (2016); D: Present study.				

an area of approximately 154 sqkm and is situated at the transition zone between Chotanagpur plateau and Gangetic plains (23.48^{0}N, 87.32^{0}E) (Image 1). The study area is presently dotted with a large number of industries and is surrounded by small forest patches. There are a number of permanent waterbodies and temporal water pools while agricultural lands and grasslands can be found sporadically that sustains wildlife amidst the industrial city (Gayen et al 2017).

Methods

The present study was carried out for more than three years from May 2016 to October 2019. Multiple methods like visual encounter survey, extensive searches in microhabitats, call analysis, information from local people, road kill study and opportunistic sightings were used in the present study. Different frogs and toads were identified using suitable literatures (Deuti & Ayyaswamy 2009; Mathhew & Sen 2010; Gururaja 2012).

Results and Discussion

A total of 15 anuran species belonging to five families were observed in the present study (Table 1). Among these 15 species, four species were not previously reported from this industrial area. The detailed accounts of the new findings are given below:

Family Bufonidae

1. *Duttaphrynus scaber* (Schneider, 1799)

Common Name- Dwarf Toad

Local Name- Choto Kuno Bang (Bengali)

Image 3. Female of *Duttaphrynus scaber*.

Image 2. *Duttaphrynus scaber*.

Distribution: It has been reported from various parts of the Indian subcontinent, mainly from the Central and southern India. But previously there are no records of this species from West Bengal. This species is quite recently added to the state checklist from Medinipore district of West Bengal (Mohapatra & Ghorai 2019).

Comments: On 24.viii.2018 and on 6.v.2019, we encountered a single individual (probably two females as they do not have any vocal sacs) each of an unknown variety of toad from Pardaha (23.5590^{0}N, 87.3382^{0}E) and Akandara (23.5768^{0}N, 87.3776^{0}E) of Durgapur Subdivision respectively and later identified it as *Duttaphrynus scaber* (not collected) based on the identification keys from suitable field guides. On 26.vii.2019 again we observed two individuals (two females again) of the same variety of toad from an agricultural field and road side puddles of Jhajra, Durgapur Subdivision (23.6409^{0}N, 87.3011^{0}E) and collected a single specimen for further studies. Later, male individuals of this species (probably more than 20, going by calling individuals) were recorded from various parts of Durgapur Subdivision like Malandighi (23.5613^{0}N, 87.4021^{0}E), Pardaha (23.5590^{0}N, 87.3382^{0}E) and Bijra (23.5846^{0}N, 87.3521^{0}E) areas of Durgapur Subdivision.

Small sized toad with depressed body (SVL= 36.42 mm), weak cranial ridges with closely set warts, distinct bony ridges on top of head, circular poison glands, tympanum

prominent (TYD= 2.57 mm) and rounded, head slightly wider than long (HW= 13.44 mm, HL= 10.47 mm), nostrils nearer to the snout (EN= 3.05 mm, SN= 0.89 mm), relative arrangement of fingers: I (2.73 mm) <II (2.77mm) <IV (3.26 mm) <III (4.57 mm), relative arrangement of toes: toes I (1.57 mm)<II (3.37 mm)<V (4.37 mm)<III (4.47 mm)<IV (6.57 mm), webbing present in toes, dorsum brownish coloured with cornified warts on back, fingers and toes ventral surface rough, warty and sand paper like, single vocal sac which is light yellowish in colour along with the distinct call pattern are the few morphological characters which helped in the identification of this toad as *Duttaphrynus scaber* (Image 2 & 3).

The specimen collected from Jhajra region of Durgapur (most probably a female) was preserved in 10% formalin and then transferred to 70% ethanol and submitted to Zoological Survey of India, Kolkata under the accession number ZSI A14491.

The males were recorded calling from the top of grasses and paddy plants from grasslands and agricultural fields in the monsoon months from mid-June to mid-September and the call can be described as “tre–tre–tre–tre”.

Family Dicroglossidae

2. *Minervarya teraiensis* (Dubois, 1984)

Common Name- Terai Cricket Frog

Local Name- Jhijhi Bang (Bengali)

Distribution: In India, recorded from Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland and Tripura (Mathew & Sen 2010). This species was first reported from West Bengal by Deuti & Ayyaswamy in 2009. It is widespread in West Bengal also (Pratihar & Deuti 2017, Deuti *et al* 2017).

Image 4. *Minervarya teraiensis*.

Comment: One male on 17.vii.2018 was first observed from Pardaha area (23.5590^{0}N, 87.3382^{0}E) of Durgapur subdivision. Later, seven males on 25.vii.2019 were again observed from the same location. They were also recorded from other areas of Durgapur Subdivision.

The species is identified on the basis of its medium size, presence of supratympanic fold, dorsal skin with fine glandular folds, snout pointed and projected beyond mouth, fingers and toe tips rounded, dorsum colour grayish to brownish with darker spots, presence of blackish brown bar between the eyes and black bars on the upper lips, presence of fejervaryan lines on both sides of the belly, blackish colour vocal sacs and

distinctive call pattern. This species is quite easily distinguishable from other cricket frogs found in this region by its larger size and call pattern (Image 4). The males were observed calling from the edges of the temporal water pools and rain puddles in agricultural lands during the monsoon months. The call was louder than other Cricket frogs and was like "creak–creak".

Family Microhylidae

3. *Uperodon variegatus* (Stoliczka, 1872)

Common Name- Variegated Globular Frog

Local Name- Holde putkijukto phola bang (Bengali)

Distribution: Found in Madhya Pradesh, Orissa, Tamil Nadu, Karnataka and Kerala in Indian subcontinent (Daniels 2005). The species was reported for the first time from West Bengal by from Jhargram (Deuti 1998).

Comment: This species was first recorded from a grassland area near Heemsheela School (23.5438^{0}N, 87.3177^{0}E) in Durgapur on 10.ix.2017. Two males were observed calling from the temporal water pools while floating amongst the grasses. Later, on 15.vi.2019 more than seven calling males were also observed from Pardaha (23.5590^{0}N, 87.3382^{0}E). In respective years this species was observed from different parts of Durgapur, mainly around temporal water pools in agricultural fields, human habitations and in grasslands.

It was identified by its small size, blunt snout, triangular shaped body, absence of tympanum, presence of a strong fold from eye to shoulder, fingers with triangular dilations and presence of both inner and outer metatarsal tubercles, dorsum brownish in colour with yellow marbling and spots, ventrum whitish to off-whitish in colour, single vocal sac and distinctive call (Image 5-7).

Image 5-7. *Uperodon variegatus* (5 – side view; 6 – dorsal view, 7 – calling male).

The males were observed to call while floating amidst the grasses in temporal water pools in grasslands and agricultural fields during the monsoon from July to September and the call can be described as like "quay–quay–quay".

Family Ranidae
4. *Hylarana tytleri* (Theobald, 1868)
Common Name- Yellow-striped Frog/ Reed Frog
Local Name- Pana Bang (Bengali)

Distribution: In India reported only from eastern and north eastern parts. This species is reported from various parts of West Bengal (Pratihar & Deuti 2011, Deuti et al 2017).

Comment: During the present study two individuals were observed from Pardaha (23.5590^{0}N, 87.3382^{0}E) and Rabindrapally (23.4766^{0}N, 87.3319^{0}E) of Durgapur on 26.v.2019 and 27.vi.2019 respectively.

The frog is identified on the basis of following characters- small size with smooth dorsum, body elongated and torpedo shaped, tympanum large and prominent, presence of two dorsolateral folds from the eyes to the groin on both side of the body, fingers and toes elongated with discs at the tips, toes with partial webbing, dorsum with light greenish colour (adult) and yellowish brown in colour (sub-adult) with two yellow bands on each side of the body, ventrum whitish in colour and distinctive chirping type of call.

The lone individual from Pardaha was found to be sitting on the grasses in an agricultural field whereas the adult individual from Rabindrapally was observed to call from a grassland area. The call is very distinct and is often compared to the chirping of tailor bird (Image 8).

Image 8. *Hylarana tytleri.*

With the addition of these four new records, the total numbers of amphibians stand at 15 from Durgapur Subdivision which is quite encouraging for an industrial city. The records of *Fejervarya limnocharis* previously mentioned from this region are possibly misidentified and may point towards a complex of more than two species. It was also observed during this present study that those mentioned as *Fejervarya limnocharis* are generally *Minervarya sahyadrensis*, *Minervarya teraiensis* and other two unidentified species of *Minervarya*. Moreover the record of *Microhyla ornata* mentioned in the previous literatures is also possibly *Microhyla cf. mymensinghensis*.

The recent trends in the description of new species to science for the amphibians show that most of these are from the unexplored human habitation regions. The newly described *Sphaerotheca magadha* and *Polypedates bengalensis* are from human habitations in Jharkhand (Chotanagpur region) and West Bengal (Gangetic plain region) respectively which is in the vicinity of the present study area (Purkayastha et al 2019, Prasad et al 2019). As the present

study area lies in the transition zone of Chotanagpur plateau and Gangetic plain, so maybe more species including these two species can also be found here in the near future. Further studies covering more study sites and solving this confusion regarding identification of species will surely enrich our knowledge about the anuran populations of this industrial region. However, this area might face a huge decline in anuran diversity following various anthropogenic interventions and habitat. Furthermore, these new findings are really encouraging to carry out further extensive study of anuran diversity from this region which will surely help in the future conservation of these species from this industrial region.

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