A preliminary study on the amphibian diversity in different habitats of Amravati district, Maharashtra

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Abstract
The present paper deals with amphibian diversity of Amravati district in the different habitats including Melghat forest of the Satpura range. This study was carried out on the basis of previous photographic records and extensive survey conducted during the period of June 2016 to September 2016 in study area. A rapid survey method was involved in careful visual estimation and photographic evidences of amphibians were recorded in all possible habitats of the study area. A total of 11 species of amphibians belonging to 4 families and 9 genera were recorded. This study showed that the Amravati District including, Melghat forest area was found rich in amphibian diversity and support many more species. It was a preliminary study on the amphibian diversity but further studies are needed for addition of new species, and habitat use by amphibians.

Keywords: Amphibians, diversity, Amravati district, Melghat and Satpura

1. Introduction
The amphibian fauna of the Vidarbha region is less studied as compared to the Western Ghats range of the Maharashtra state. It was found that very less work has been conducted and published on Amphibians from Amravati district of the Vidarbha region. However, Amravati district is very much rich in biodiversity. The land of the Amravati district covers 30% forest area including, Melghat forest, Mahendri forest of the Satpura range and Pohra-Malkhed forest as a mixed forest remaining 70% land utilizes for the cultivation as well as human habitation. The Amravati District with Melghat like dense forest of Satpura range showing high percent of rainfall, more humidity and low temperature as well as Pohra – Malkhed like mixed scrub forest. Also saline belt in some talukas, orange belt and variety of crop pattern such as Jowar (Sorghum vulgare), Cotton (Gossypium arboreum), Soybean (Glycine max), Toor (Cajanus cajan), Mung (Vigna radiata), Pigeon pea (Citer species) and sunflower (Helianthus annuus) provides the ideal environment and habitats for the occurrence of the amphibians. These kinds of habitats well attracted to amphibian species and may use of various purposes such as food and home ground etc. Changing in agricultural pattern, the large expanses of agricultural lands and urbanization severely affecting the diversity of amphibian fauna directly and indirectly but its impact is largely remaining unknown in the study area. Though the large number of herpetofauna with special reference to snake fauna was reported from the district (Wadatkar [1], Nande and Deshmukh, [2]) but till the diversity of the anurans remains unknown, hence attempt has been made to study the diversity of amphibian in the Amravati district.

Around the world there are 7,546 species of Amphibians have been reported (Frost [3]). Amphibians in India are mostly diverse with 382 species including 32 species listed recently from Goa. 217 species of amphibians have been reported from Western Ghats of India (Dinesh and Radhakrishan [4], Biju et al. [5], Zachariah et al. [6, 7], Dinesh et al. [8]). Hence large number of species is remains to be explored.

In Vidarbha region initial work on anurans was done by Sawarkar & Kasambe [9]. He reported the 10 species of frogs and toad from the Nagpur city and its adjoining areas. Dhande & Khandare [10] reported first record of Painted Kaloula or Indian Painted frog (Kaloula taprobanica) from Daryapur taluka of the Amravati District but the data from the Amravati district in concern of species occurrence, and population abundance concerned is lacking.

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In the present study we surveyed five different microhabitats viz. Cultivated fields (CF), Pohra-Malkhed mixed type forest (PMF), Melghat forest (MF), Semi urban land (SUL) and water bodies (WB). On the basis of extensive survey data gathered and prepared in the form of checklist of Amphibians of the Amravati District. During the study some direct and indirect threats to the Amphibian diversity was also enlisted at the study area.

2. Materials and Methods
2.1 Study Area
Amravati district is a District of Maharashtra state in central India. The district is situated between 20°32’ and 21°46’ North latitudes and 76°37’ and 78°27’ East longitudes. The district occupies the geographical area of 12,235 km². There is Satpura range towards the North of Amravati district.75% of Amravati district area is covered by Deccan trap while 25% area covered by Purna alluvium. Out of the total land of the district 30% covered by forest while 70% utilized for cultivation and human habitation. The climate of the district is hot and dry. The year can be divided into three clear seasons, cold season is from November to February, hot season is from March to May and the monsoon season is from June to October. The area receives rainfall during southwest monsoon. The average rainfall is 800-1000 mm. Average temperature of the district ranges from minimum of 10°C in winter to a maximum of 42°C in summer with the humidity ranges from 10-15% to 60-95%.

Melghat region is a part of the Satpura Range of Hills in the Amravati district. The crests of this range attain an average elevation about 1000 meter. Melghat has Southern Tropical Dry Deciduous type of forest (Champian & Seth [11]). Tapi, Sipna, Khandu, Dolar, Khandu Chandrabhaga are the major rivers and many seasonal streams flows through Melghat. Melghat experiences tropical climate with temperatures ranging between 13°C and 22°C during winter and between 23°C and 42°C during summer. In Melghat the annual rainfall ranges between 1000mm and 2250mm.

2.2 Amphibian sampling
Present study was carried out on the basis of previous photographic collection during various visits of last five years and extensive survey during rainy season from June to September 2016 in the study area. The survey was performed at a weekly interval in all possible habitats and microhabitats such as open land, cultivated field, water bodies, dense forest and mixed forest during the rainy seasons. The timing of the survey is in between 7.00 pm to 11.00 pm in night and 5.30 am to 8.00 am in early morning. The Road transect method was mainly applied. Anurans species were recorded by direct sighting method and also by recording the calls from the concerned species. No specimen was collected from the study area during the study period. Photographs of the sighted animals were taken by Nikon camera D7000 and lens 60 mm micro for documentation and identification purpose. The identification was confirmed by using various diagnostic keys and publications (Das & Dutta [12], Chanda [13], Daniel [14], Daniels [15]). Also some identification was confirmed by consulting herpetologists.

3. Result and discussion
A total of 11 species of amphibians belonging to 4 families and 9 genera were recorded (Table 1 and Fig. 4). Among the recorded species the highest number of species recorded belonging to family Dicroglossidae and the minimum number of species recorded from the family Rhacophoridae.
### Table 1: Table showing the recorded anurans species with their scientific names, IUCN status and habitats.

<table>
<thead>
<tr>
<th>Family</th>
<th>Taxon</th>
<th>Common Name</th>
<th>IUCN Status</th>
<th>Habitat wise distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bufonidae</td>
<td>Duttaphrynus melanostictus</td>
<td>Asian Toad</td>
<td>Least Concern</td>
<td>MF, PMF, CF, SUA.</td>
</tr>
<tr>
<td></td>
<td>Duttaphrynus stomaticus</td>
<td>Marbled Toad</td>
<td>Least Concern</td>
<td>CF, SUA</td>
</tr>
<tr>
<td>Dicroglossidae</td>
<td>Euphlyctis cyanophlyctis</td>
<td>Indian Skittering Frog</td>
<td>Least Concern</td>
<td>MF, PMF, WB</td>
</tr>
<tr>
<td></td>
<td>Hoplobatrachus tigerinus</td>
<td>Indian Bull Frog</td>
<td>Least Concern</td>
<td>MF, PMF, CF, SUA.</td>
</tr>
<tr>
<td></td>
<td>Hoplobatrachus crassus</td>
<td>Jerdon’s Bull Frog</td>
<td>Least Concern</td>
<td>MF</td>
</tr>
<tr>
<td></td>
<td>Fejervarya limnocharis</td>
<td>Indian Cricket Frog</td>
<td>Least Concern</td>
<td>CF, PMF, SUA.</td>
</tr>
<tr>
<td></td>
<td>Fejervarya species</td>
<td>Indian Paddy Field Frog</td>
<td>Least Concern</td>
<td>CF. PMF, SUA.</td>
</tr>
<tr>
<td></td>
<td>Sphaerotheca breviceps</td>
<td>Indian Burrowing Frog</td>
<td>Least Concern</td>
<td>MF, CF</td>
</tr>
<tr>
<td>Rhacophoridae</td>
<td>Polypedates maculatus</td>
<td>Indian Tree Frog</td>
<td>Least Concern</td>
<td>MF, PMF, CF</td>
</tr>
<tr>
<td>Microhylidae</td>
<td>Microhyla ornata</td>
<td>Ornate Microhylid</td>
<td>Least Concern</td>
<td>CF, SUA</td>
</tr>
<tr>
<td></td>
<td>Kaloula taprobanica</td>
<td>Painted Kaloula</td>
<td>Least Concern</td>
<td>SUA, CF</td>
</tr>
</tbody>
</table>

In four months survey, family Dicroglossidae was found the most dominant family of frogs with 6 species followed by Bufonidae and Microhylidae with 2 species each and only single species of Rhacophoridae was found. It was observed that the *Duttaphrynus melanostictus*, *Euphlyctis cyanophlyctis* and *Hoplobatrachus* species were found in all the possible habitats. These three species had wide spread distribution throughout the Amravati district. While the *Duttaphrynus stomaticus*, *Fejervarya* species and *Microhyla ornata* were found mainly in agricultural fields and sub urban areas. The ample food availability and habitat suitability was the prime reason for their occurrence in those fields. The Indian burrowing frog *Sphaerotheca breviceps* and Indian tree frog *Polypedates maculatus* was found rare but dominantly in Melghat forest and agricultural fields. The forest area and agriculture field provides the suitable habitat for the burrowing frog and Indian tree frog hence they preferred that areas and showed widespread distribution. All the recorded species are least concern in the IUCN status.
Asian toad and Marbled Toad of family Bufonidae were found mainly near to the human habitations and in the agricultural fields. *Fejervarya* species showed widespread distribution and were relatively more common than other species. They can be observed in majority of the habitats, including grasslands, waterbodies, agricultural fields and human habitations. *Euphlyctis cyanophlyctis* showed restricted distribution and was found only in and around waterbodies. *Kaloula taprobanica* species was not reported during the four month survey but it was recorded earlier in the Paratwada city (Personal communication with Thakare Alkesh & Shrikant Kathoi, 2010) and in the Daryapur taluka of the study area (Dhande & Khandare [11]).

During the study also we have recorded some direct and indirect threats to the Amphibian diversity of the study area such as extensive use of insecticides and weedicide by farmers to control the agricultural pest inhabiting the same localities, urbanization, road kills, habitat fragmentation, habitat loss and also modern agricultural practices.

4. Conclusion
The observations showed the Anurans diversity richness in study area. This study generated the base line data for the anurans diversity in Amravati district. It was a preliminary study on the amphibian fauna diversity but further study is need to explore the diversity of anurans in the study area by addition of new amphibians species, habitat study, population estimation, and to find out the severity of the threats to diversity, and also to propose several conservation strategies in the study area.

5. Acknowledgement
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6. References