PSU-USM International Conference on Humanities and Social Sciences

Updated Checklist of Amphibians of Pulau Jerejak, Penang, Peninsular Malaysia

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Abstract

A survey was carried out at Jerejak Island, Penang, Peninsular Malaysia from August 2008 to January 2011 to inventorise the amphibians contained therein. Specimens were either captured at night by hand or fishnets and then identified. The results showed that a total of 10 species of amphibians from 5 families were recorded during this survey, three of which have not previously been recorded in the Jerejak Island. The most common anuran species were the Common Asiatic Toad (Duttaphrynus melanostictus) and the Common Treefrog (Polypedates leucomystax) while the least common amphibian was the White-lipped Frog (Hylarana labialis).

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Keywords: Amphibian, Jerejak Island, Malaysia.

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1. Introduction

Amphibians play crucial roles in our natural ecosystem. They are the mid-level consumers in the food web, meaning that they help to transfer energy from primary producers to higher trophic levels. Besides, they also act as important biological indicators of environmental health and degradation and can be used to predict the level of disturbance and degradation in a habitat as well as ecosystem stress [1, 2, 3].

Currently, worldwide amphibian numbers are declining and their populations are threatened by habitat destruction and loss, diseases and pollution [4, 5, 6]. In Malaysia, forest frog species are threatened by logging and development and as a result, they are vulnerable to extinction [7, 8].

Quah et al. [9] reported the presence of 8 species of amphibians on Jerejak Island, Penang, Malaysia. This survey provides an updated and revised checklist of the amphibians of Jerejak Island with addition of 3 new species records. The main objectives of our survey were to gauge the amphibian diversity and to list the amphibian species of the island.

2. Materials and Methods

2.1 Study Site

Jerejak Island (5.31667° N, 100.3000° E) is a 3.62 km2 island located off the southeastern coast of Penang Island, Malaysia and one of the eight islands in Penang State (Fig. 1). It is an island rich with history, flora and fauna. Sandwiched between the main island of Penang and Seberang Perai on the mainland, Jerejak Island is surrounded by the waters of the South Channel. Because of its long years of isolation, this coastal forest is rich with numerous floral species. Jerejak Island is covered with thick coastal forest with about 210 species from 71 families of plants. The main communities of plant that can be found there are Lowland Dipterocarp, Mangrove, Riverine Coastal and Weedy species [10].

2.2 Sampling Methods

Ten field surveys were conducted (12-13 August 2008, 9 August, 29 September, 20 October, 22 and 29 December 2010, 5, 12 and 19 January 2011) which mainly covered three trails on the island namely the Balqis Trail, Hill Trail and Prison Trail. Amphibians were captured mainly at night by hand or with fishnets by field parties consisting of 5-7 persons working from 2000 hrs to 2300 hrs. Identification of the collected specimens followed Inger and Stuebing [11] and Norhayati et al. [12]. Voucher specimens were preserved in 10% formalin and stored in 70% ethanol, and deposited at the Amphibian and Reptile Collections, Universiti Sains Malaysia (USMARC) of the Biodiversity Reference Laboratory, Universiti Sains Malaysia, 11800 Minden, Penang, Malaysia for future reference.
Fig. 1: Location of study site (Source: Google Maps, 2010).

3. Results

A total of 10 species of amphibians were collected during this survey, three of which are new records for Jerejak Island. An updated checklist of amphibians (Table 1) is presented below with discussions on new species records and taxonomic updates.
Table 1: Amphibians of Jerejak Island, Penang, Peninsular Malaysia

<table>
<thead>
<tr>
<th>Taxa</th>
<th>Quah et al. [9]</th>
<th>This study</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bufonidae</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Duttaphrynus melanostictus</em></td>
<td>X X</td>
<td></td>
</tr>
<tr>
<td><strong>Dicroglossidae</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Fejervarya cancrivora</em></td>
<td>X X</td>
<td></td>
</tr>
<tr>
<td><em>Fejervarya limnocharis</em></td>
<td>X X</td>
<td></td>
</tr>
<tr>
<td><em>Limnonectes laticeps</em></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td><em>Occidozyga laevis</em></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td><strong>Microhylidae</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Kaloula pulchra</em></td>
<td>X X</td>
<td></td>
</tr>
<tr>
<td><em>Microhyla butleri</em></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td><em>Microhyla heymonsi</em></td>
<td>X X</td>
<td></td>
</tr>
<tr>
<td><strong>Ranidae</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Hyalarana erythraea</em></td>
<td>X X</td>
<td></td>
</tr>
<tr>
<td><em>Hyalarana labialis</em></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td><strong>Rhacoporidae</strong></td>
<td></td>
<td></td>
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<tr>
<td><em>Polypedates leucomystax</em></td>
<td>X X</td>
<td></td>
</tr>
</tbody>
</table>

4. Discussion

A total of 10 species of amphibians were recorded in this study while Quah et al. [9] reported that 8 species of amphibians have been discovered on the same island. Our study added three new species namely *O. laevis*, *M. butleri*, and *H. labialis*. In contrast, the presence of *Limnonectes laticeps* as reported in Quah et al., [9] was not recorded in this study. This study, however, indicates that the number of amphibians of Jerejak Island remains incompletely known and additional new records can be expected. This low amphibian diversity in our study may be largely attributed to the limited sampling period (10 search days) and restricted to three main trails (Balqis Trail, Hill Trail and Prison Trail) on the island. Repeated samplings over a long period of time, encompassing varying microhabitats, during different seasonal periods, are needed before the biodiversity of a selected area can be fully understood [13]. Thus, a reasonable checklist of amphibian fauna can be compiled if a longer period of survey had been conducted and a more extensive study area covered.

5. Conclusion

To date, 11 species of amphibians have been recorded for Jerejak Island. In any conservation plan of a habitat, checklist data and inventories are important so that the planners and conservationists are aware of the diversity
and variety of wildlife present in the area. This will help in better conservation and management of the ecosystem.

6. Acknowledgements

The authors wish to acknowledge and thank the School of Distance Education, Universiti Sains Malaysia for the research facilities provided. We also wish to express our heartfelt gratitude to: Universiti Sains Malaysia for provision of USM research university grant (No. 1001/PJJAUH/815030) to the first author and to M. Shara, A. Ismail and S. Kamarudin for general fieldwork help. We also thank The Animal Ethics Committee Universiti Sains Malaysia for the animal ethics approval.

References


