

## **A preliminary survey on the herpetofauna of Rajagala, Ampara, Sri Lanka**

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### **Abstract**

The Rajagala Forest Reserve (RFR) is an archaeological site surrounded by a typical monsoon forest located in the dry zones of Sri Lanka. No comprehensive biodiversity survey of any sorts has been conducted at the RFR so far. Therefore, a preliminary survey was conducted at this site to assess its Herpetofauna diversity. An opportunistic Visual Encounter Survey (VES) was undertaken to observe the diversity of the amphibian and reptilian communities in the RFR. Selected habitats that provide refuge for amphibians such as tree hollows, water ponds, rock crevices, streams and tanks were observed. All encountered specimens were examined carefully, photographed, and calls of amphibians were recorded for the identification of certain species. A total of 11 species of amphibians were observed, identified, and recorded from the RFR in this survey. Out of these, 4 species (*Uperodon rohani*, *Microhyla mihintalei*, *Hydrophylax gracilis* and *Polypedates cruciger*) are endemic whilst 9 are of least concern to the IUCN conservation status due to increasing population. In addition to the endemic species, 7 other species were identified and recorded including *Duttaphrynus melanostictus*, *Duttaphrynus scaber*, *Microhyla ornata*, *Euphlyctis mudigere*, *Hoplobatrachus crassus*, *Minervarya agricola* and *Polypedates maculatus*. In addition to this, 8 significant reptile species were observed and identified. These reptiles include *Hemidactylus hunae*, *Hemidactylus frenatus*, *Calotes ceylonensis*, *Otocryptis nigristigma*, *Calotes versicolor*, *Calodactylodes illingworthorum*, *Fowlea asperrimus* and *Crocodylus palustris*. Anthropogenic activities such as forest clearance, unauthorized agriculture such as cattle farming, and man-made forest fires currently threaten this valuable forest ecosystem. If such trends continue it may lead to the reduction of herpetofauna diversity within this area in the future.

**Keywords:** *Herpetofauna, Rajagala, Amphibians, Reptiles.*

## 1. INTRODUCTION

Rajagala is an archeological reserve in Sri Lanka which is now in the tentative list on UNESCO World Heritage Sites. The surrounding forest area of the Rajagala archeological site have been declared as a forest conservation area under the Flora and Fauna Protection Ordinance No. 2 of 1937 of the Sri Lankan constitution making it a valuable forest reserve. Several ongoing archaeological researches are conducted in the site but comprehensive biodiversity studies in the surrounding reserve area are lacking. The area belongs to the dry zone of the country, around 26 km distance from Ampara town ( $7^{\circ}29'25.22''$  N,  $81^{\circ}36'59.05''$  E, 179 m) (Fig. 1). The current study attempts to survey the diversity of herpetofauna within the archaeological site and surrounding forest reserve area. Sri Lanka is resident to 120 amphibian species and 219 reptilian species. Of these 107-amphibian species (IUCN Red List of Threatened Species, 2020) and 120 reptilian species (Janssen & Silva, 2019) are endemic to the country. 18 of these endemic amphibians are now extinct. Findings of this survey can help in understanding the impacts of human interference and adaptations of herpetofauna in this ecosystem.

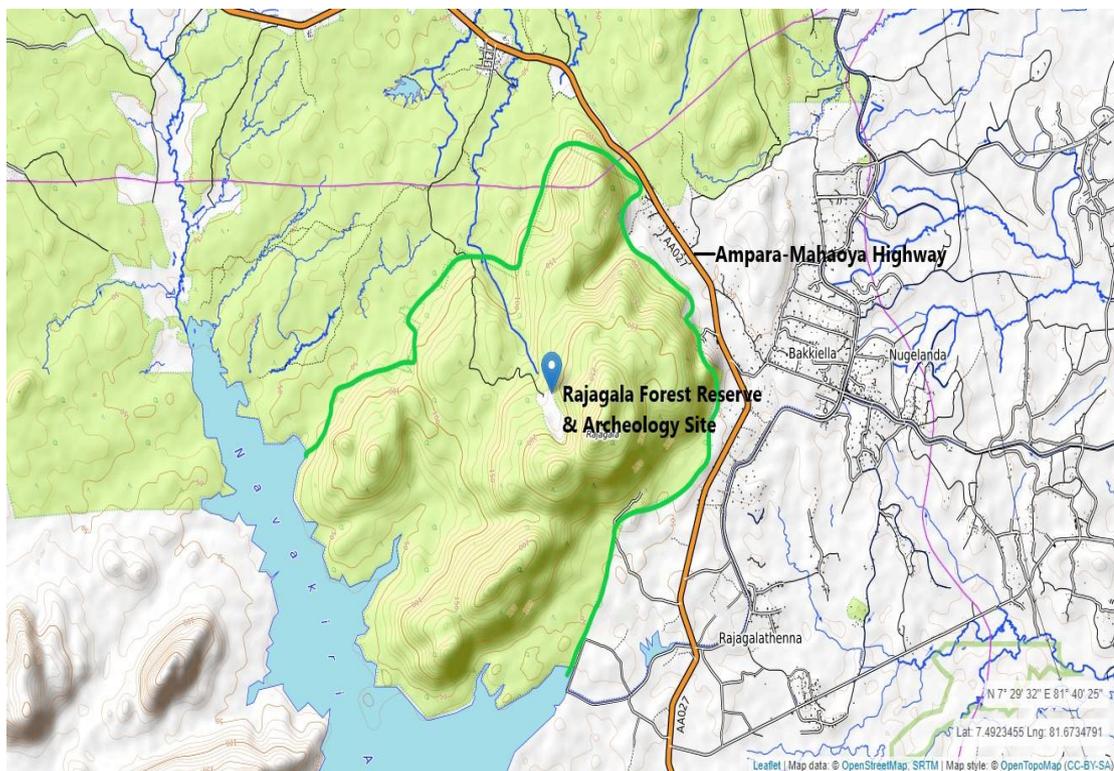


Fig. 1. Map of Rajagala Forest Reserve (Green line indicates the approximate borders of the forest reserve) (Source: Elevation Map. Topographic Map, 2020).

## 2. METHODOLOGY

To survey the Herpetofauna diversity in the RFR, fieldwork was conducted over two nights and a day within the archaeological site and the surrounding forest with the aid of headlamps and torches. The study was conducted during the month of November 2019. The Visual Encounter Survey (VES) was used to record and sample the different

species. The selected study area consists of aqueduct system, banks of small and a large tank, caves and deep forest. The observed deep forest area and the archaeological site consisted of different types of habitats such as tree hollows, dead logs, rock crevices, streams, stone water containment units and tanks that provide refuge for amphibians and reptiles. All encountered amphibian and reptilian specimens were examined carefully and photographed using Nikon D750 camera with Sigma 105mm f/2.8 EX DG OS HSM Macro Lens ensuring minimal disturbance. Bioacoustics of some amphibian species were recorded for identification. All observed amphibian and reptile species were identified using the following field guides and identification keys. All amphibian species were identified. Lizards were identified using Somaweera & Somaweera, (2009). Snakes were identified using De Silva & Jinasena (2009) and Somaweera (2006). And also, De Silva & Ukuwela (2017) and Das & De Silva (2011) were used to identify reptiles.

### 3. RESULTS AND DISCUSSION

During the field study the following 11 amphibian species belonging to 5 families and 8 reptilian species belonging to 3 families were observed.

Table 1. Amphibian species recorded in RFR (Endemic species to Sri Lanka marked with "\*" mark. Abbreviations: LC - Least Concern).

	Scientific name and author citations	IUCN
1	<i>Duttaphrynus melanostictus</i> (Schneider, 1799)	LC
2	<i>Duttaphrynus scaber</i> (Schneider, 1799)	LC
3	<i>Euphlyctis mudigere</i> (Joshy et al., 2009)	LC
4	<i>Hoplobatrachus crassus</i> (Jerdon, 1854)	LC
5	<i>Minervarya agricola</i> (Jerdon, 1853)	LC
6	<i>Uperodon rohani</i> *	LC
7	<i>Microhyla mihintalei</i> * (Wijaythilaka, Garg, Senavirathne, Karunarathna, Biju & Meegaskumbura, 2016)	LC
8	<i>Microhyla ornata</i> (Dumerill & Bibron, 1841)	LC
9	<i>Hydrophylax gracilis</i> * (Manamendra-Arachchi, Silva & Wickramasinghe, 2004)	LC
10	<i>Polypedates cruciger</i> * (Blyth, 1852)	LC
11	<i>Polypedates maculatus</i> (Gray, 1830)	LC

Table 2. Reptilian species recorded in RFR (Endemic species to Sri Lanka marked with "\*" mark. Abbreviations: LC - Least Concern, VU – Vulnerable).

	Scientific name and author citations	IUCN
1	<i>Calotes ceylonensis</i> * (Muller, 1887)	LC
2	<i>Otocryptis nigrigemma</i> * (Bahir & Silva, 2005)	LC
3	<i>Calotes versicolor</i> (Daudin, 1802)	LC
4	<i>Crocodylus palustris</i> (Lesson, 1831)	VU
5	<i>Hemidactylus hunae</i> * (Deraniyagala, 1937)	LC
6	<i>Hemidactylus frenatus</i> (Schlegel, 1836)	LC
7	<i>Calodactylodes illingworthorum</i> * (Deraniyagala, 1953)	LC
8	<i>Fowlea asperrimus</i> * (Boulenger, 1891)	LC

#### 4. CONCLUSION AND RECOMMENDATIONS

RFR is a typical monsoon forest located in the Ampara district in Sri Lanka. The archaeological site located inside the forest is currently listed in the UNESCO world heritage tentative list (UNESCO 2020). Even though the several archaeological research conducted in the location, no previous biodiversity studies were conducted in the area. In the current biodiversity study 11 amphibian and eight reptilian species were recorded during its two night visits and one-day visit. One of a significant amphibian species in the lowland dry zone of Sri Lanka is *Nannophrys naeyakai* also known as Sri Lanka tribal rock frog was expected to be observed during the field visits but unfortunately was not sighted. However, favourable habitats for *Nannophrys naeyakai* was observed in the RFR which are rock crevices with small water. It is suggested that further survey with advanced approaches may give more species number in the area. Considerably lower harmful human effects to biodiversity were observed in the deep forest area even though the area has human settlements for over 2135 years. Harmful anthropogenic activities like unauthorized agriculture, cattle farming, forest clearance and man-made forest fires were observed in the RFR borders and the banks of larger tanks. If these practices are not regulated or controlled, they may threaten the diversity in the reserve soon. As stated earlier, the number of field visits conducted in this survey is a limitation. It is recommended that an advanced survey on herpetofaunal diversity be conducted in the area with statistical enumeration to determine diversity indices and species richness.

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