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Diversity of Reptiles in the Eastern and Southern parts of the Sinharaja Rain Forest

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Abstract

The Sinharaja Forest Reserve is located in the Southern as well as Sabaragamuwa provinces in the wet zone, between latitudes 6º21-6º26 N and longitudes 80º21-80º34 E is one of the biologically unique Tropical Forest in Sri Lanka. Although Sinharaja is considered a lowland rain forest, the Eastern part of the forest consists montane and sub-montane forests. Many scholars have already researched on reptiles in the lowland rain forests of Sri Lanka including Sinharaja, however, they have not significantly attended to the diversity of reptiles in the Eastern and Southern parts of the Sinharaja forest. Considering this gap, the research focuses on studying diversity of reptiles in diverse lowland rain forests, montane and sub-montane forests in the Southern and Eastern parts of Sinharaja. Giguruwa-Kosmulla and Pitadeniya sites in the Southern part, and Hadpanella and Morningside in the Eastern part are selected as study areas of the research. 16 line transects (as four from each site) and quadrate 16 samples (as four from each site) are used for primary data collecting. Lowland rain forests, montane and sub-montane forests are identified as biologically sensitive habitats of reptiles. High number of native reptile species are recorded in lowland rain forests than in montane and sub-montane forests. 36 reptile species are identified in Southern and Eastern parts of the Sinharaja forest and 19 species of them are endemic to Sri Lanka. Among them, 05 vulnerable species, 04 endangered species, 05 critically endangered species are recorded. Many threats have been found, however, among them issues of bio piracy loss of forest genetic resources and wildlife smuggling, illegal forest utilisation practices, gem mining, illegal forest encroachments and unethical tourism practices are major issues. Thus, state forest department and other responsible authorities must attend to minimize the effects of these negative human impact on these vulnerable areas to protect sensitive reptile species in their habitats in order to conserve their diversity.

Key words: Sinharaja forest reserve, lowland rain forests, montane sub-montane, reptiles, diversity

1. Introduction

The Sinharaja forest reserve is a one of the biologically unique tropical forest in Sri Lanka. The forest spans over four administration districts namely, Galle, Matara, Rathnapura and Kalutara. The forest spreads over 11,187 hectares of land and an elevation range of 150-1,170 m. As a rainforest with rich and complex diversity of flora and fauna, Sinharaja provides habitats for a variety of animals (Kumara, 2010). Importantly, the Sinharaja forest is the last viable remnant of Sri Lanka's tropical lowland rain forests and more than 60% of the trees here which are very rare in other areas of the country are endemic to Sri Lanka (Kumara, 2016). Within the Sinharaja forest, there are thousands of small streams of crystal cool fresh water making habitats for verity of fishes, toads, and crabs, especially for the endemic species. So, as a Biological unit Sinharaja holds a prominent place in the island (De Zoysa and Raheem, 1990). According to many scholars, reptile species have special ecological position to keep the balance of natural ecosystems and they are directly and indirectly contributing sustainability of

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ecosystems (Atauri and de Lucio, 2001; Bomford et al., 2009; Nijman and Shepherd, 2011; Blaustein et al., 2011).

Rain forest eco systems in the world provide habitats to reptile and facilitate their population dynamic and diversity (Raxworthy and Nussbaum, 1994; Gehring et al., 2010). However, reptiles species are threatened with extinction due to the current trend of world rain forest bio system degradation (Reider, 2013; Jenkins et al, 2014). Thus, it is important to attend immediately to protect and conserve numerous reptiles and their habitats in the world.

Rain forest eco-systems of Sri Lanka provide important habitats for many rare and endemic reptile species (Kudavidanage et al., 2012). As a result, their diversity, behavior patterns, ecological role as well as habitats have intermittently been studied. For example; Karunarathne and Amarasinghe, have researched on 'reptile diversity of a fragmented lowland rain forest patch in Kukulugala area and they identified 708 individual reptiles belonging to 41 genera and 13 families. According to their findings, 44% of reptile species of this rain forest area are endemic to Sri Lanka and among them 19% are endangered (Karunarathna and Amarasinghe, 2011). Same researchers have attended to a small-scale rain forest, namely, Beraliya Mukalana which is a proposed rain forest reserve situated in Galle districts. Even if the forest is considered small scale, they identified it as a biologically important habitat for Sri Lanka reptiles, since they found 35% endemic reptile species and among them one specie has been critically endangered, 3 are endangered, 6 are vulnerable, 14 are near-threatened and 4 are data-deficient (Karunarathna and Amarasinghe, 2012).

Sinharaja, which is the biggest rain forest of the island, is distinguished for its high biodiversity among all the rain forests of the island (Neela and Raheem, 1993).Many scholars have contributed to generate knowledge regarding reptile in this forest (Surasinghe, 2007; Ishwaran and Erdelen, 1990).71 reptile species are recorded in Sinharaja and among them 34 are identified endemic species and 33 species have been declared nationally threatened species (Bambaradeniya et al., 2003). Many researchers have paid attention to diversity, potential threats and conservation needs of reptile and amphibian of Sinharaja after 1990s (Bambaradeniya et al., 2003; Surasinghe and Jayaratne, 2010). However, most of the researches about reptile are carried out in the northern section of Sinharaja and a few researches are based on the Eastern section of the Sinharaja (morning site) since it has been identified a different biological unit and habitat for reptile species. According to Jansen and Bopage (2011), the eastern section of Sinharaja which has different biological, geographical and environmental characteristics compared with the northern section of the forest has been identified as an exceptional area of Sri Lanka for its highly endemic reptile species. Their diversity patterns depend on geo-spatial factors as well as time-special factors (Hallam, 1974). Various human and environmental factors have influenced to create diverse range of geo-special landscapes and ecosystems in the Southern and Eastern parts of Sinharaja. Even if many scholars have researched about reptiles in the low land rain forests of Sri Lanka including Sinharaja (Ishwaran and Erdelen, 1990; De Silva, 2006; Kudavidanage et al., 2012), they have not paid enough attention on studying diversity of reptile in the Southern and Eastern parts of the Sinharaja. Number of habitats based on rain forest, montane and sub-montane forest such as primary forests, secondary forests, degraded forests, ridge forests, scrublands, forest patches, marshlands, riverine forests and abandoned Chena cultivation lands can be seen in this area (Figure 1) (Wijesinghe and Brooke, 2005). The literature survey of the research identified a potential 'knowledge gap' in nature of diversity of reptile in the Southern and Eastern parts of the forest and based on this gap the research objectives and questions were formed. Considering this situation, this research focuses to examine diversity of reptile in the Southern and Eastern parts of the Sinharaja rain forest.

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2. Methodology

A total of 30 days (12 hrs per day both day and night) have been spent on field work during April and November 2017. The study area (Figure 1) stretched from Giguruwa-Kosmulla, Pitadeniya Hadpanella Morningside in the Sinharaja Forest. The study was conducted in three different forest habitats in the area namely montane, sub-montane and low land rain forest. In each habitat, data were collected from five line transects (100 m×2 m) and quadrate sampling methods (8 m×8 m) per habitat. Within each major habitat, different microhabitats (such as tree trunks, under rocks, tree holes, water puddles etc.) were searched for reptiles. Three person were involved in the sampling of each transect. One person searched 1.5 m above on trees for arboreal species while a second person searched under logs, leaf litter, tree trunks etc. and a third person searched water puddles and streams. The different species of reptiles were handpicked or collected using a hand net and observed. No specimens have been collected, transported or deposited from the outside the forest.

The species are identified in the field using diagnostic keys given by De Silva (1980), Greer (1991), Wickramasinghe and Somaweera (2003), Whitaker and Captain (2004), Das and De Silva (2005). After the survey period, some specimens are confirmed to species level using Batuwita and Bahir (2005), Somaweera (2006), Vogel and David (2006), Batuwita & Pethiyagoda (2007), Manamendra-Arachchi et al. (2007), Wickramasinghe et al. (2007), Maduwage et al. (2009), Rooijen and Vogel (2009), Somaweera and Somaweeera (2009), Bauer et al. (2010), Praschag et al. (2011), Vogel and Rooijen (2011) and Conservation status was given according to IUCN National red list. (The National Red List 2012 of Sri Lanka 2012).

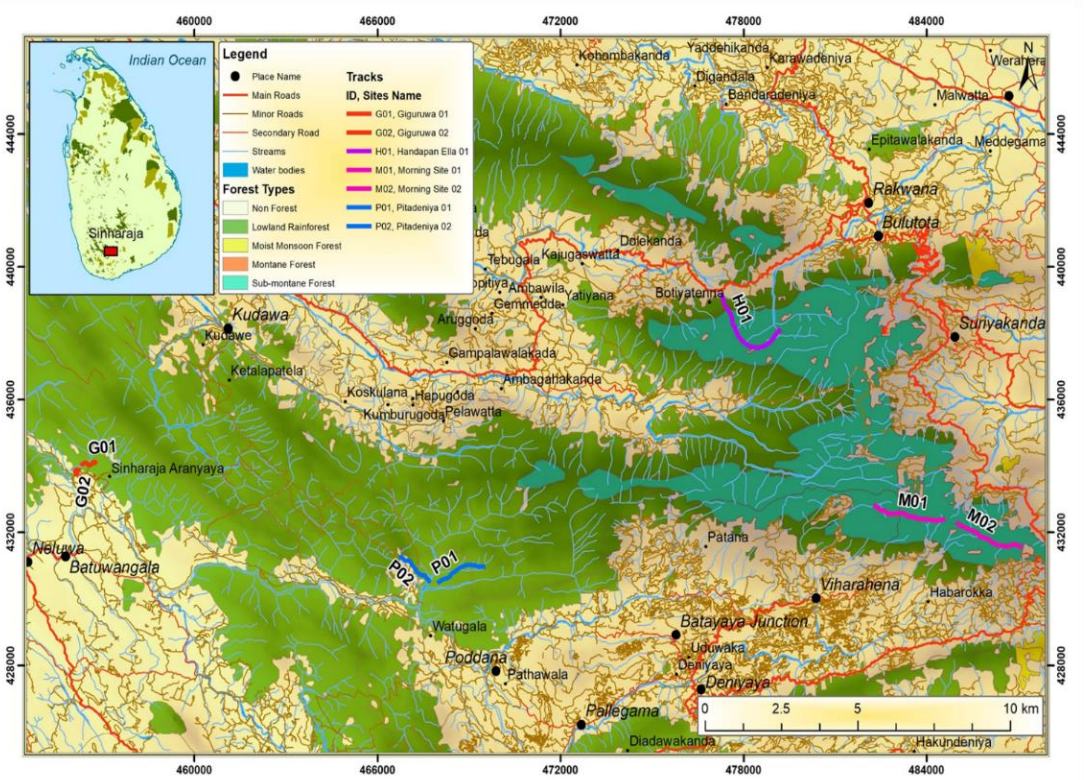

Figure 1: Location of the study area.

3. Results and discussion

According to the findings, montane, sub montane forests and lowland rain forest can be identified biologically sensitive and important sites for reptile diversity. There are 209 native reptile species in Sri Lanka and among them 125 species are endemic to the island (Biodiversity Secretariat of the Ministry of Environment, 2012) while total of 36 reptile species are identified in the Southern and Eastern parts of the Sinharaja forest and among them 19 species are endemic to Sri Lanka. While 5

vulnerable species, 4 endangered species, 5 critically endangered species. Figure 2 showing species diversity comparison between the study area and the island. Among the identified species, there were four species restricted to the Sinharaja rain forest, including three agamid lizards namely *Ceratophora erdeleni*, *Ceratophora karu*, *Calotes desilvai* and one Gecko species *Cnemaspis pulchra*, are endemic and critically endangered. According to the figure recorded tetrapod reptile species higher than recorded serpent species.

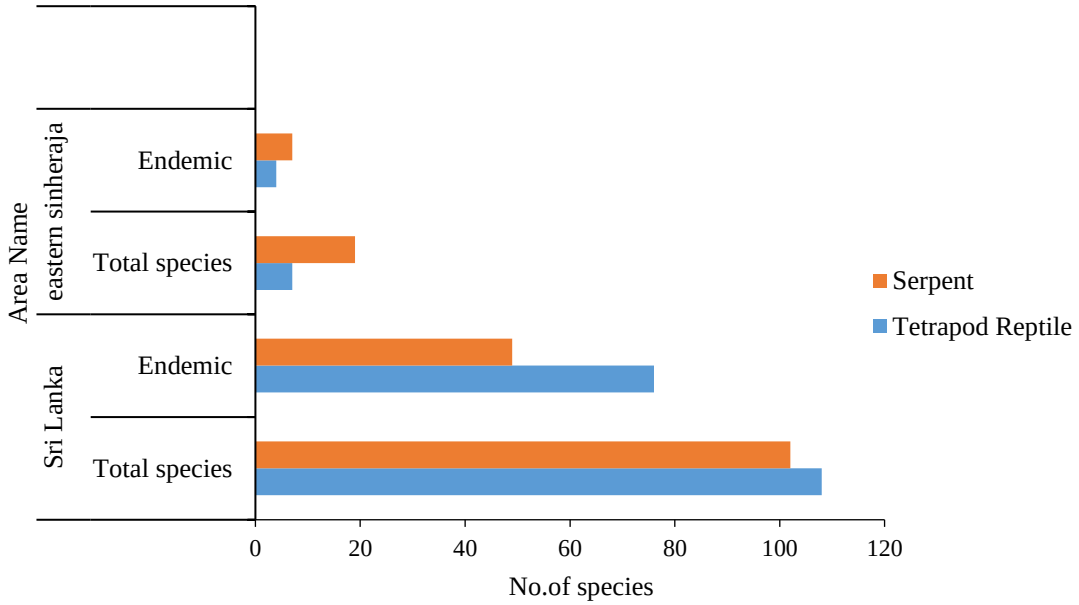

Figure 2: Species diversity comparison between Sri Lanka and The Study area (Eastern Sinharaja Rain Forest).

All recorded species are belonging to 8 families. Among them the highest number 15 species are recorded under family colubridae, including 5 endemic species. Under family mabuyidae, 2 species are recorded while two of them are endemic to the island. Figure 3 is showing more details. Highest number of reptile species are recorded from the lowland rain forest than in sub montane and montane forests. Due to vast range of micro habitats, habitat specific species and some of species flavoring specific climatic conditions, most of species are found there. Following figures showing these habitats conditions.

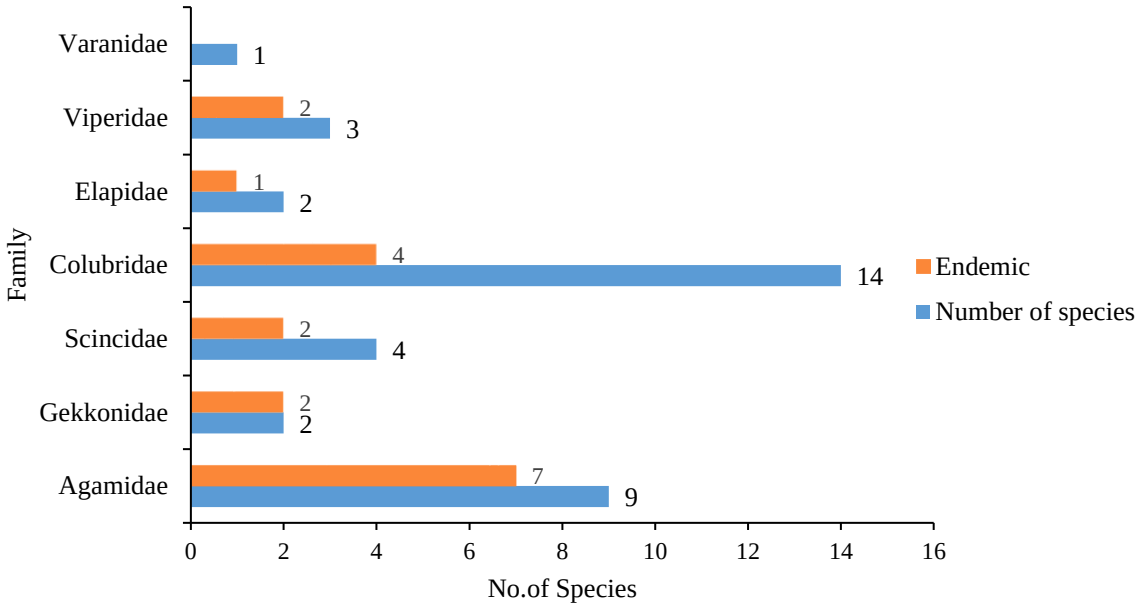

Figure 3: Family wise recorded species from the study area.

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Table 1: Recorded Reptile species from the study area.

No	Family	Species	Common name	National status
1	Agamidae	*Calotes calotes*	Green garden lizard	
2	Agamidae	*Calotes desilvai*	Desilvas' forest lizard	E/CR
3	Agamidae	*Calotes liolepis*	Whistling lizard / Forest lizard	E
4	Agamidae	*Calotes versicolor*	Common garden lizard	
5	Agamidae	*Ceratophora aspera*	Rough horn lizard	E/EN
6	Agamidae	*Ceratophora erdeleni*	Erdelen's horn lizard	E/CR
7	Agamidae	*Ceratophora karu*	Karunaratne's horn lizard	E/CR
8	Agamidae	*Lyriocephalus scutatus*	Lyre head lizard / Hump snout lizard	E/VU
9	Agamidae	*Otocryptis wiegmanni*	Sri Lankan kangaroo lizard	E
10	Gekkonidae	*Cnemaspis pulchra*	Rakwana day gecko	E/CR
11	Gekkonidae	*Cyrtodactylus subsolanus*	Rakwana forest gecko	E/CR
12	Ristellidae	*Lankascincus fallax*	Common lanka skink	E
13	Ristellidae	*Lankascincus taprobanensis*	Smooth lanka skink	E/EN
14	Mabuyidae	*Eutropisc carinata*	Common skink	
15	Mabuyidae	*Eutropis sp-01*	Skink	
16	Colubridae	*Ahaetulla nasuta*	Green vine snake	
17	Colubridae	*Amphiesmas tolatum*	Buff striped keelback	
18	Colubridae	*Aspidura brachyorrhos*	Boie'sroughside	E/VU
19	Colubridae	*Atretium schistosum*	The Olive keelback water snake	
20	Colubridae	*Balanophis ceylonensis*	Sri Lanka keelback	E/EN
21	Colubridae	*Boiga barnesii*	Barnes's cat snake	E/VU
22	Colubridae	*Boiga ceylonensis*	Sri Lanka cat snake	
23	Colubridae	*Chrysopelea ornata*	Ornate flying snake	
24	Colubridae	*Coeloganthus helena*	Trinket snake	
25	Colubridae	*Dendrelaphis caudolineolatus*	Gunther's bronze back	
26	Colubridae	*Lycodon carinata*	The Sri Lanka wolf snake	E/EN
27	Colubridae	*Lycodon aulicus*	Wolf snake, house snake	
28	Colubridae	*Oligodon arnensis*	Common kukri snake/ Banded Kukri	
29	Colubridae	*Oligodon sublineatus*	Dumerul' skuki snake	E
30	Colubridae	*Ptyas mucosa*	Rat snake	
31	Elapidae	*Bungarus ceylonicus*	Sri Lanka krait / Ceylon krait	E/VU
32	Elapidae	*Naja naja*	Indian cobra	
33	Viperidae	*Daboia russelii*	Russell's viper	
34	Viperidae	*Hypnale zara*	Hump-nosed viper	E/VU
35	Viperidae	*Trimeresurus trigonocephalus*	Green pit viper	E
36	Varanidae	*Varanus salvator*	Water monitor	

E-Endemic, CR-Critically Endangered, EN-Endangered, VU-Vulnerable.

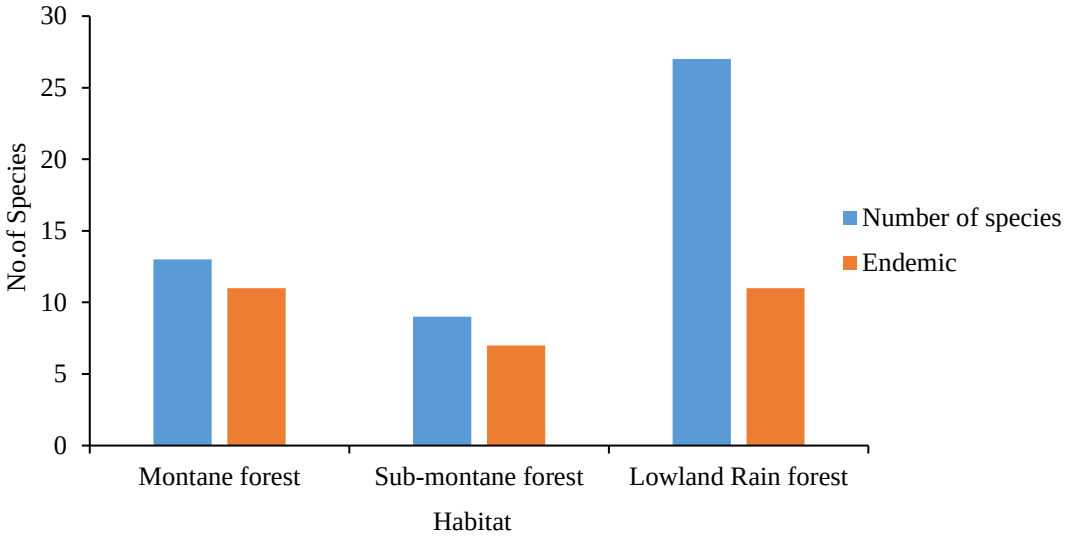

Figure 4: Species diversity in different forest habitats.

The study carried out in three main habitats namely montane, sub montane and lowland rain forests. Montane forests representing Morningside and Handapanella area. While lower Handapanella and sinharaja monastery area representing sub montane forest habitats. Pitadeniya, Batuwangala and Giguruwa area having low land rainforest habitats.

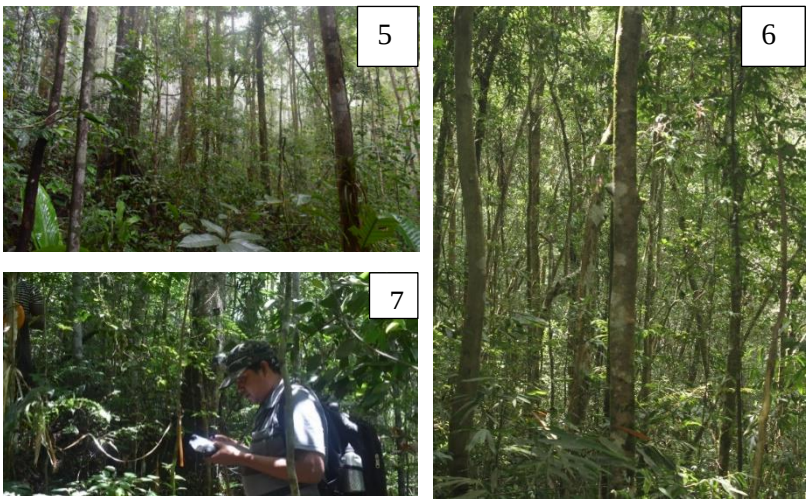

Figure 5-7: Lowland rainforest.

Figure 8: Sub-montane rainforest.

Figure 9: Montane rainforest.

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Figure 10: *Ceratophora aspera*

Figure 11: *Ceratophora karu*

Figure 12: *Ceratophora erdeleni*.

Figure 13: *Lyriocephalus scutatus*

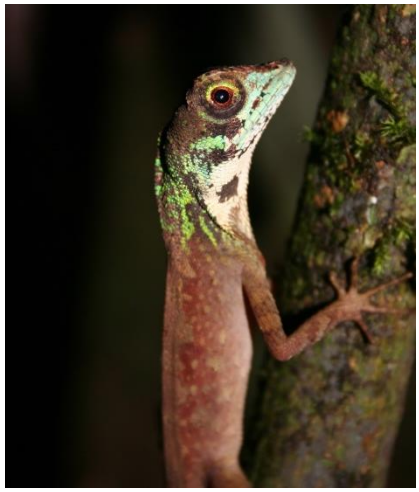

Figure 14: *Otocryptis wiegmanni*

Figure 15: *Calotes liolepis*

Figure 16: *Cnemaspis pulchra*

Figure 17: *Mabuya sp.01*

Figure 18: *Boiga barnesii*

Figure 19: *Cercaspis carinata*

Figure 20: *Hypnale zara*

Figure 21: *Trimeresurus trigonocephalus*

Figure 22: *Varanus salvator*

3.1 Threats for reptile species

Some issues are identified as main threats to reptile habitats in both lowland rain forests and sub-montane forests. Currently, Wallapatta smuggling *(Gyrinops walla)* has become a serious issue in Giguruwa-Kosmulla, Pitadeniya as well as Handapanella sites and it mainly contributes to accelerate the degradation of habitats of reptile and amphibian species. During our field research in the site, it is observed that people stay in the forest at nights for gathering forest materials, poaching and tree felling for timber (see below picture). These types of forest utilization practices have directly and negatively impacted on reptile habitats. Four such huts used by people who illegally utilise forest resources to stay temporarily in the forest at nights are observed in the Giguruwa-Kosmulla site (see figures 21, 22,23,24,25 and 26). It is a serious issue in the Handapanella area. This is a severe menace to small species such as reptiles and amphibians. Forest ecosystems in the Handapanella area have been used for illegal gem mining which is a threat to forest eco systems. During the fieldwork in the Pitadeniya site, we observed that irresponsible tourist behaviour, especially, local tourists' behaviour has negatively impacted on these systems.

Figure 23: Illegal forest encroachments.

Figure 24: Remains of pitfall trap used for poaching.

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Figure 25-28: primary forest areas to extract Wallapatta resin (*Gyrinops walla*).

4. Conclusion

Both lowland rain forests and sub-montane forests can be considered as biologically sensitive habitats of reptile's species. High number of native reptile species' habitats are located within lowland rain forests than in montane and sub-montane forests, however, highest parentage of endemic (E) and critically endangered (CR) species are recorded in the sub-montane forests, especially, in Morningside area. Currently this area is isolated from the Sinharaja world heritage site therefore, it is necessary to conserve immediately, with jointing of the Sinharaja world heritage site. There are many threats to the researched eco systems and issues of biopiracy. Loss of forest genetic resources and wildlife smuggling, other illegal forest utilisation practices, gem mining, illegal forest encroachments and irresponsible tourism practices are major among them. Thus, the state forest department and other responsible authorities must attend to minimise the impact of these possible threats to sensitive reptile habitats to protect their diversity.

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References

Atauri, J.A. and de Lucio, J.V., 2001. The role of landscape structure in species richnesss of birds, amphibians, reptiles and lepidopterans in Mediterranean landscapes. *Landscape Ecology*, 16:147-159.

Bambaradeniya, C.N.B., Perera, M.S.J., Perera, W.P.N., Wickramasinghe, L.J.M., Kekulandala, L.D.C.B., Samarawickrema, V.A.P. and Samarawickrema, V.A.M.P.K., 2003. Composition of

faunal species in the Sinharaja world heritage site in Sri Lanka. *The Sri Lanka Forester*, 26:21-40.

Batuwita, S. and Bahir, M.M., 2005. Description of five new species of Cyrtodactylus (Reptilia: Gekkonidae) from Sri Lanka. In: Yeo, D.C.J., Ng, P.K.L. and Pethiyagoda, R., Contributions to biodiversity exploration and research in Sri Lanka. *The Raffles Bulletin of Zoology*, 12:351-380.

Batuwita, S. and Pethiyagoda, R., 2007. Description of a new species of Sri Lankan litter skink (Squamata: Scincidae: Lankascincus). *Ceylon Journal of Science (Biological Science)*, 36:80-87.

Bauer, A, Jackman, T. R, Greenbaum, E., De Silva, A., Giri, V. B., and Das, I., 2010. Molecular evidence for the taxonomic status of Hemidactylusbrookii group taxa (Squamata: Gekkonidae). *Herpetological Journal*, 20:129-138.

Biodiversity Secretariat of the Ministry of Environment, 2012. *The National Red List 2012 of Sri Lanka*, The Biodiversity Secretariat of the Ministry of Environment in Collaboration with the National Herbarium, Colombo, Sri Lanka: Department of National Botanic Gardens,.

Bomford, M., Kraus, F., Barry, S.C., Lawrence, E., 2009. Predicting establishment success for alien reptiles and amphibians: a role for climate matching. *Biological Invasions*, 11:713.

Das, I. and De Silva, A., 2005. *Photographic guide to the Snakes and other Reptiles of Sri Lanka*. Pennsylvania, USA: New Holland Publishers.

De Silva, A., 2006. Current status of the Reptiles of Sri Lanka. In Babaradeniya, C.N.B (Ed) *Fauna of Sri Lanka: Status of Taxonomy, Research and Conservation*, 134-163. Colombo, Sri Lanka: IUCN.

De Silva, P.H.D.H., 1980. *Snake Fauna of Sri Lanka, with Special Reference to Skull, Dentition and Venom in Snakes.* Colombo, Sri Lanka: National Museums of Sri Lanka.

De Zoysa, N. and Raheem, R., 1990. *Sinharaja, a Rain Forest in Sri Lanka*. Colombo, Sri Lanka: March for Conservation.

Gehring, P.S., Ratsoavina, F.M. and Vences, M., 2010. Filling the gaps-amphibian and reptile records from lowland rainforests in eastern Madagascar. *Salamandra*, 46:214-234.

Greer, A.E., 1991. Lankascincus, a new genus of Scincid lizards from Sri Lanka with descriptions of three new species. *Journal of Herpetology*, 25:59-64.

Hallam, A., 1974. Changing patterns of provinciality and diversity of fossil animals in relation to plate tectonics. *Journal of Biogeography*, 213-225.

Ishwaran, N. and Erdelen, W., 1990. Conserving Sinharaja: An experiment in sustainable development in Sri Lanka. *Ambio*, 237-244.

Jansen, P. and Bopage, M., 2011. The herpetofauna of a small and unprotected patch of tropical rainforest in Morningside, Sri Lanka. *Amphibians and Reptiles Conservation*, 5:1-13.

Jenkins, R.K., Tognelli, M.F., Bowles, P., Cox, N., Brown, J. L., Chan, L. and Bora, P., 2014. Extinction risks and the conservation of Madagascar's reptiles. *PLoS One*, 9:100-173.

Karunarathna, D.M.S.S. and Amarasinghe, A., 2012. Reptile diversity in Beraliyamukalana proposed forest reserve, Galle district, Sri Lanka. *Taprobanica: The Journal of Asian Biodiversity*, 4:20-27.

Kudavidanage, E.P., Wanger, T.C., Alwis, C., Sanjeewa, S. and Kotagama, S.W., 2012. Amphibian and butterfly diversity across a tropical land-use gradient in Sri Lanka; implications for conservation decision making. *Animal Conservation*, 15:253-265.

Kumara, H.I.G.C., 2010. *The policy intervention and the trends in forest utilization by local communities in Sinharaja* (Unpublished Master of Philosophy). University of Peradeniya, Kandy, Sri Lanka.

Kumara H.I.G.C., 2013. *Forest Utilization by Local Communities in Sinharaja Rain Forest: Focused on Policy Interventions and Trends*. Saarbrücken, Germany: Lap Lambert Academic Publishing.

Kumara, H.I.G.C., 2016. Challenges of biopiracy: implementing community based ecotourism (CBET) in the Sri Lankan context. *Journal of Tropical Forestry and Environment*, 6:36-49.

Kumara, H.I.G.C., 2016. *Challenges to Implementing Community Based Ecotourism (CBET) as a Bottom up Development Approach in the Sinharaja Rain Forest (Sri Lanka)* (Doctoral dissertation, University of Waikato).

DOI: https://doi.org/10.31357/jtfe.v9i1.3948

Kumara, H.I.G.C., 2017. Challenges of biopiracy: implementing community based eco-tourism (CBET) in the Sri Lankan context, *Journal of Tropical Forestry and Environment*, 6:36-49.

Maduwage, K., Silva, A., Manamendra-Arachchi, K. and Pethiyagoda, R., 2009. A taxonomic revision of the South Asian hump-nosed pit vipers (Squamata: Viperidae: Hypnale). *Zootaxa*, 2232:1-28.

Manamendra-Arachchi, K., Batuwita, S. and Pethiyagoda. R., 2007. A taxonomical revision of the Sri Lankan day-geckos (Reptilia: Gekkonidae: Cnemaspis), with description of new species from Sri Lanka and India. *Zeylanica*, 7:9-122.

Nijman, V. and Shepherd, C.R., 2011. The role of Thailand in the international trade in CITES-listed live reptiles and amphibians. *PloS one*, 6:7825.

Praschag. P., Stuckas, H., Packert, M., Maran, J. and Fritz, U., 2011. Mitochondrial DNA sequences suggest a revised taxonomy of Asian flapshell turtles (Lissemys SMITH, 1931) and the validity of previously unrecognized taxa (Testudines: Trionychidae*). Vertebrate Zoology*, 61:147-160.

Raxworthy, C.J. and Nussbaum, R.A., 1994. A rainforest survey of amphibians, reptiles and small mammals at Montagne d'Ambre, Madagascar. *Biological Conservation*, 69:65-73.

Reider, K.E., Carson, W.P. and Donnelly, M.A., 2013. Effects of collared peccary (Pecaritajacu) exclusion on leaf litter amphibians and reptiles in a Neotropical wet forest, Costa Rica. *Biological Conservation*, 163:90-98.

Rooijen, J.V. and Vogel, G., 2009. A multivariate investigation into the population systematics of Dendrelaphistristis (Daudin, 1803) and Dendrelaphisschokari (Kuhl, 1820): revalidation of Dendrophischairecacos Boie, 1827 (Serpentes: Colubridae). *Herpetological Journal*, 19:193-200.

Somaweera, R. and Somaweera, N., 2009. *Lizards of Sri Lanka: A colour guide with field keys*. Frankfurt am Main, German: Edition Chimaira/Serpent's Tale NHBD.

Somaweera, R., 2006. *Snakes of Sri Lanka (Sinhala text).*Colombo. Sri Lanka: Wildlife Heritage Trust of Sri Lanka.

Surasinghe, T., Jayaratne, R., 2010. Diversity, Threats and Conservation of Herpetofauna in and around the Eastern Sinharaja. *Sabaragamuwa University Journal*, 6:3-12.

Surasinghe, T.D., 2007. Conservation overview of herpetofauna of Sinharaja man and biosphere reserve of Sri Lanka. *Zoos' Print Journal*, 22:2535-2538.

Vogel, G. and David, P., 2006. On the taxonomy of the Xenochrophis piscator complex (Serpentes, Natricidae). In *Proceedings of the 13th Congress of the Societas Europaea Herpetologica*, 241-246.

Vogel, G. and Rooijen, J.V., 2011. A new species of Dendrelaphis (Serpentes: Colubridae) from the Western Ghats-India. *Taprobanica*, 3:77-86.

Whitaker, R. and Captain, A., 2004. Snakes of India: *The field guide.* Mumbai, India: Draco Publication Limited.

Wickramasinghe, L.J.M. and Somaweera, R.K., 2003. Distribution and Current Status of the Endemic Geckos of Sri Lanka. *Gekko*, 3:2-13.

Wickramasinghe, L.J.M., Rodrigo, R., Dayawansa, N. and Jayantha, U.L.D., 2007. Two new species of Lankascincus (Squamata: Scincidae) from Sripada Sanctuary (Peak Wilderness), in Sri Lanka. *Zootaxa*, 1612:1-24.

Wijesinghe, M.R., Brooke, M.D.L., 2005. Impact of habitat disturbance on the distribution of endemic species of small mammals and birds in a tropical rain forest in Sri Lanka. *Journal of Tropical Ecology*, 21:661-668.