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Insects diversity in Kiphire District of Nagaland, North East India

Thsatila T. Sangtam¹, Magdalene Kiewhuo¹, F. Jerald Felix² & R. Nandakumar^{2,*}

¹ Department of Zoology, St. Joseph University, Dimapur, Nagaland, 797115, India

² Department of Zoology, Thiruvalluvar Government Arts College,
Rasipuram, Namakkal - 637401, Tamil Nadu, India

*E-mail address: drnkzoo@gmail.com

ABSTRACT

The goal of this research is to collect and identify the specimens of Insecta that are found in and around Kiphire, Nagaland. As per the research the data on 16 specimens were collected belonging to butterflies, moths, beetles, dragonfly etc. All the specimens belong to class Insecta. The research highlights the diversity and variety of the types of insects present in the Kiphire district of Nagaland, and also the possibility of discovering many more. We strongly require intensive studies to document insects. Conservation of biodiversity involving local communities would be the best possible option in Nagaland, as the forest area are largely owned by people. The species *Rosalia longicorn* (Linnaeus, 1758) and *Euthalia aconthea* (Cramer, 1777) a total of two species reported from the study area were found to be declared Vulnerable by IUCN 2.3. and WPA-II- The subspecies *andamensis* is legally protected in India under Schedule II of the Wildlife (Protection) Act, 1972. According to the European Environment Agency, the IUCN has not yet given this species, which includes *Brithys crini* (Fabricius, 1775), *Myrmeleon formicarius* (Linnaeus, 1767) and *Drepana curvatula* (Borkhausen, 1790) an official conservation threat status. Conservation of biodiversity involving local communities would be the best possible option in Nagaland, as the forest area are largely owned by people.

Keywords: Insects, Naga tribal, District Kiphire, *Rosalia longicorn*, *Euthalia aconthea*, *Myrmeleon formicarius*, *Drepana curvatula*, *Brithys crini*

1. INTRODUCTION

The Northeast Indian state, Nagaland, a fragment of the Indo-Himalayan faunal constituency, boundaries the species ironic Indo-Chinese zoogeographical sub region. The region is also a part of the vavilovian centre of biodiversity and origin of many important cultivated plant species and some domesticated animals. The Biodiversity Strategy and Action Plan for Northeast Eco-region recorded 3,624 species of insects and 50 molluscs from this region. Butterflies and moths are by far the best-studied invertebrate organisms of the region, which contributes the maximum number of species for this group in the country. Insects are extremely diverse and important to ecosystems and they are what make the ecosystems tick. Understanding the extent of insect diversity is one of the major challenges in modern ecology. They have permeated the diverse and essential natural processes that sustain biological systems, making up over 75% of known species of animals. Honey bees, another important insect, that render very valuable ecological services like pollinating wild and cultivated plant species besides producing honey, and their advanced eusocial behaviour has always been a source of fascination for mankind^(1&18). It is bounded by Tuensang District in the north, Phek District in the south, Zunheboto in the west and Myanmar in the east. It is headquartered at Kiphire, which is at an altitude of 896.42 m (2,940 ft) above sea level. Kiphire is about 254 km from Kohima, the capital of Nagaland. However, deforestation, degradation of forest resources, change in land-use patterns, hunting and illegal trade of wild flora and fauna are the major challenges that threaten the fragile ecosystems in the state. It is to be noted that no primary field surveys were carried out in forested areas during this study. The animals present in for Insects diversity in Kiphire District of Nagaland, North East India. The has been working in eastern Nagaland since 2022. Investigations were conducted in villages to record awards in household and class consumption as part of an effort to authenticate the indigenous people of eastern Nagaland's ecological knowledge (for a wider project). Insects observed while traveling on the road between August 2022 and October 2022 were included as well as other insightful observations.

2. MATERIALS AND METHODS

This research was carried out in different areas of Kiphire district i.e., forest, gardens, etc with the help of a camera by capturing the insects and identifying them with the help of Books and record the data for their results. This method helped in studying the different types of insect species present in the area.

The species of insects seen during the survey in the areas were either found resting on leaves, flowers, trees, walls etc. The found specimen were photographed and their habit and habitats were noted and recorded for further observations. All the specimens belong to class insecta.^(1&18)

3. RESULT AND DISCUSSION

A total of 16 taxa of Insecta (Butter fly - 4 , Moth - 4, Beetle-3, Grasshopper - 1, Antlion- 1, Praying mantis - 1, Ichneumonidae - 1, and Drogon fly - 1) belonging to were during this study (Table 1, Figs 1-16) was observed during this study.

Conservation of biodiversity involving local communities would be the best possible option in Nagaland, as the forest area are largely owned by people. This species *Rosalia longicorn* (Linnaeus, 1758) and *Euthalia aconthea* (Cramer, 1777). The total of two species reported from the study area were found to be declared Vulnerable by IUCN (2.3) and WPA-II- The subspecies *andamensis* is legally protected in India under Schedule II of the Wildlife (Protection) Act, 1972 ^(2&3).

According to the European Environment Agency, the IUCN has not yet given this species, which includes *Brithys crini* (Fabricius, 1775), *Myrmeleon formicarius* (Linnaeus, 1767) and *Drepana curvatula* (Borkhausen, 1790) an official conservation threat status: ^(14&17)

According to the State University of New York College Environmental Science and Forestry, this species, which includes *Citheronia regalis* (Fabricius, 1793) an official conservation status as Global Conservation Status Rank: Apparently or Demonstrably Secure globally - Uncommon to common in the world, but not rare; usually widespread, but may be rare in some parts of its range; possibly some cause for long-term concern due to declines or other factors. More information is needed to assign either G4 or G5 and S1- Critically Imperiled in New York - Especially vulnerable to disappearing from New York due to extreme rarity or other factors; typically 5 or fewer populations or locations in New York, very few individuals, very restricted range, very few remaining acres (or miles of stream), and/or very steep declines. ⁽⁶⁾

Reportedly arrived from Northeast India 16 species of Butter fly, Moth, Beetle, Grasshopper, Antlion, Praying mantis, Ichneumonidae, and Drogon fly. More research is absolutely need to catalog the taxa and other biota in Nagaland's Kiphire District. The best approach in Nagaland would be biodiversity conservation including local communities because the forest area is mostly owned by people.

Table 1. Insects diversity in Kiphire District of Nagaland, India

Sl.No	Scientific Name	Common Name	Conservation status
1	<i>Euthalia aconthea</i> (Cramer, 1777)	Simple baron	WPA-II (2,3) a
2	<i>Pseudozizeeria maha</i> (Kollar, 1844)	Pale grass blue	Not Evaluated (4)
3	<i>Heliophorus brahma</i> (Moore, 1857)	Golden sapphire	Not Evaluated (5)
4	<i>Citheronia regalis</i> (Fabricius, 1793)	Regal moth	G4 or G5 b & S1 c (6)
5	<i>Drepana curvatula</i> (Borkhausen, 1790)	Dusky hook-tip	Not Evaluated d
6	<i>Rosalia longicorn</i> (Linnaeus, 1758)	Alpine longhorn beetle	Vulnerable (IUCN 2.3) e (7)
7	<i>Orthetrum pruinosum</i> (Burmeister, 1839)	Crimson-tailed marsh hawk	Least Concern (IUCN 3.1) e (8)
8	<i>Xylotrupes gideon</i> (Linnaeus, 1767)	Rhinoceros beetle	Least Concern (9)

9	<i>Mesosa nebulosa</i> (Fabricius, 1781)	Fat-faced longhorned beetles	Not evaluated (10)
10	<i>Ctenochares bicolorus</i> (Linnaeus, 1767)	Black-Tipped Orange Ichneumon	Not evaluated (11)
11	<i>Melanoplus femurrubrum</i> (De Geer, 1773)	Red legged Grasshopper	Not evaluated (12)
12	<i>Castalius rosimon</i> (Fabricius, 1775)	Pierrot butterfly	Not Evaluated (13)
13	<i>Myrmeleon formicarius</i> (Linnaeus, 1767)	Common ant Lion	Not evaluated d (14)
14	<i>Polyspilota aeruginosa</i> (Goeze, 1778)	Madagascar marbled mantis	Not evaluated (15)
15	<i>Euclea delphinii</i> (Gray, 1832)	Spiny oak slug	Not evaluated (16)
16	<i>Brithys crini</i> (Fabricius, 1775)	lily borer	Not evaluated d (17)

Note: Conservation and Special status

a. WPA-II- The subspecies *andamensis* is legally protected in India under Schedule II of the Wildlife (Protection) Act, 1972.

b. G4 or G5- Global Conservation Status Rank: Apparently or Demonstrably Secure globally - Uncommon to common in the world, but not rare; usually widespread, but may be rare in some parts of its range; possibly some cause for long-term concern due to declines or other factors. More information is needed to assign either G4 or G5.

c. S1- Critically Imperiled in New York - Especially vulnerable to disappearing from New York due to extreme rarity or other factors; typically 5 or fewer populations or locations in New York, very few individuals, very restricted range, very few remaining acres (or miles of stream), and/or very steep declines.

d. Not evaluated (IUCN) & European Nature Information System (ENIS)

e. IUCN- International Union for Conservation of Nature

4. CONCLUSIONS

This study was an attempt to analyse some aspects of biodiversity of insects from Kiphire district. Since it is a preliminary study, a lot of research is necessary in this regard and further collections are essential for getting a detailed record of the faunal diversity of insects and development of standard monitoring procedures for assessing the environmental stability in this area. It shows us the unique habitat and the presence of different types of insects. The study concluded with 100% of the insects belonging to the class insect belonging Butterfly, Moth, Beetle, Grasshopper, Antlion, Praying mantis, Ichneumonidae, and Dragon fly. The data provides the information that there are many more insects residing in the area and the necessity for protecting the environment for better habitat and higher survival rate of the insects.

Most of the forests in Nagaland are owned and managed by local communities, and hence, conservation of biodiversity involving them is the best possible option. Nature awareness programme disseminating importance of species and existing legal options/ regulations are

required, and this would help understanding conservation issues, especially by the younger generations of the communities.

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Fig. 1. *Euthalia aconthea*



Fig. 2. *Pseudozizeeria maha*



Fig. 3. *Heliophorus brahma*



Fig. 4. *Citheronia regalis*



Fig. 5. *Drepana curvatula*



Fig. 6. *Drepana curvatula*



Fig. 7. *Orthetrum pruinosum*



Fig. 8. *Xylotrupes gideon*



Fig. 9. *Mesosa bebulosa*



Fig. 10. *Ctenochaeres bicolorus*



Fig. 11. *Melanoplus femurrubrum*



Fig. 12. *Castalius rosimon*



Fig. 13. *Myrmeleon formicarius*



Fig. 14. *Polyspilota aeruginosa*



Fig. 15. *Euclea delphinii*



Fig. 16. *Brithys crini*