

The study of moth fauna in the Bamu National Park (protected area), Iran

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Abstract

The importance of environmental issues, the study of the species that exist in the ecosystem and ecology of them are important in the qualitative and quantitative balance in the ecosystem. The aim of present study was to identify moths of Bamu National Park that some of them are considered pests in forests and pastureland. For this purpose, research area divided to five stations and was sampled manual and using light traps using light traps and cyanide jars. Insects are collected and transferred to the laboratory and were isolated the moths of them. Then they were formed and identified according to taxonomic keys and morphologic characters. A total of 154 specimens belong to 6 families (Noctuidae, Sphingidae, Notodontidae, Arctiidae, Lymantridae, Geometrida) were identified and confirmed by authoritative. The obtain results showed that this protected area has a high diversity of insects such as moths. Identify this group of insects that many of them are agricultural pests at larval period, will help to preserve the ecosystem.

Keywords: Bamu Park, Diversity, Lepidoptera, Moth

INTRODUCTION

Bamu National Park with more than 50000 hectare vastness is located in the north-east of Shiraz (Fars Province) and it is a protected area. It encompasses three parallel mountain ridges extending in an east-west direction and the hilly plains between. Elevations are 1,600—2,700 m. Climate is semi-arid temperate and continental (Fig 1). This park with 112 known species of vertebrate animals include 32 species of mammals, 91 species of birds, 16 species of reptiles, 3 species of amphibians and unknown species of insect. The flora of park is arid scrubland dominated by almonds and thorns. The various species of wildlife and flora this area due to tourist attractions (Mehdzadeh, 2014).

Lepidoptera is one of the most suitable groups for most quantitative comparisons between insect faunas. More than 160,000 species of them are known in different regions from north lands to tropical forests and arid deserts (Powell et al . 2009).

Moths are not only extraordinarily diverse in color, shape and size, they also offer a huge array of ecological benefits, from Pollinating plants to feeding birds. They are a major part

of our biodiversity and play vital roles in the ecosystem (Danner & Surholt, 2010).

Moths also play a vital role in telling us about the health of our environment. Conservation of the natural habitats is very essential for the existence of many species of lepidopterans (Mathew et al., 1993). There are about 20000 species of Hence, considerable research in Iran has been concerned with lepidoptera, while only about a quarter of them were known (Naderi, 2013).

16 species of Sphingidae family were identified in Fars Province by Ghassemi and et al (2012) and Identification of Noctuidae fauna was obtained in Fars and Khozestan Province (Asfandiari et al., 2011). *Walker postica* belong to Noctuidae that is the most important pest, was reported from Bosheher Province (Farrar et al., 2002). Zahiri introduced some species of Noctuidae (Zahiri and Fibiger, 2005; 2006, 2007, 2008; Yela and Zahiri, 2011) and identified the new species of sphingidae (Kitching and Zahiri, 2007).

The main objective of this research study was to collect and identify family of moths of Bamu Park. This region have rich flora and fauna. Since the study of moths as the one of essential member is necessary.

MATERIAL AND METHODS

Park Bamu is divided to five stations that are vary in altitude and flora (Table 1). Moths were sampled manual and using light traps for attracting insects and cyanide jars for collection them in the night. Collected insects were transferred to the laboratory and the moths were isolated. Then they were formed and identified according to taxonomic keys and morphologic characters in available literature (Modares Aval, 2002; Heppner, J. B. 2008). The samples preserved in Islamic Azad University, Jahrom branch museum.

Table 1 The characters of research station

vegetation	Altitude	station
Cypress and Pine	1619	1
<i>Stipa barbata</i> , <i>stipa atriseta</i> , thorns	1650	2



<i>Stipa barbata, stipa atriseta</i>	16844	3
<i>onobrychis melanotricha</i> grasses, shrubs	1823	4
Pasture plants, Astragalus. Spp	1855	5

RESULTS

The results clearly showed a total of 249 specimens Lepidoptera, 154 specimens were identified as moth that belongs to 6 families as follow:

Noctuidae, Sphingidae, Notodontidae, Arctiidae, lymantridae, Geometridae, that respectively from highest to lowest frequency (table 2).

Table 2. The moth families in Bamu Park

Family	Number	Station	Figur
Noctuidae	42	1,2,3, 4,5	2(A,B,C,D)
Sphingidae	35	4, 5	3(A,B,C,D)
Notodontidae	32	2, 3, 4	4
Arctiidae	25	1,4	5
lymantridae	11	2, 4	6
Geometridae	9	2	7



Fig1. Map of Iran(Bamu Park)

Fig 2. Noctuidae. SPP

Fig



Fig 3. Sphingidae. SPP



Fig 4. Notodontidae. SPP

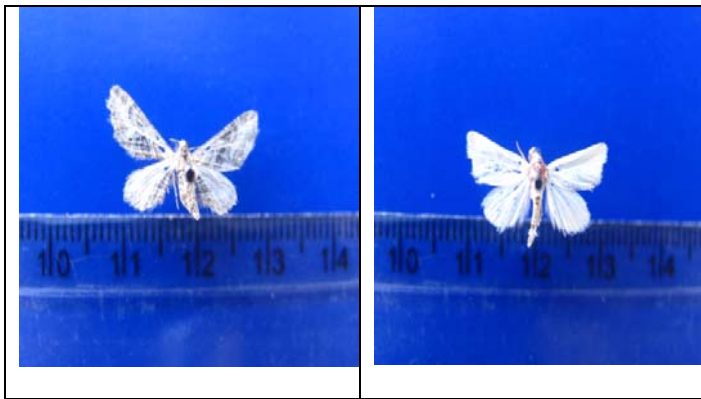


Fig5. Arctiidae. SPP



Fig 6. Lymantridae. SPP



Fig 7. Geometridae family

DISCUSSION

The obtained results showed that Bamu Park is appropriate habitat for Lepidoptera. It appears that abundance of moth and species richness moths in at all research stations, response to vegetation and climate of this area (Zhang, 2011). Two-thirds of the total sample is moth, so we can say that moths are the most population of Lepidoptera in this area. This is matching with previous finding (Farrar & Sadeghi, 2002; Zahiri & Fibiger, 2008). Although these insects were classified in 6 families, but the families Noctuidae and Sphingidae (Fig. 6, Fig) were seen a lot of variation.

It has long been recognized that the distribution of the moth is largely determined by climate and distribution of host plants. The variable weather of current and preceding seasons effects on the rate of development of an insect, the number of individuals and the number of generations in a year (Powell, 2009).

Lymantridae with about 25,000 species of lepidoptera are found all over the world spatially concentrated in Southeast Asia, that according the result of this survey.

In this study according to previous finding (Heppner 1991; Nader, 2013), Noctuidae (Figure 2) is the largest family of moth in both the number and diversity (Table 2). This family is also very important economically and their larvae cause great economic damage to the agriculture (Sphandiari, 2011). Large diversity of the family Sphingidae (Figure 6) also depends on the local climate and flora of this area. The altitude of the valley (1855 m) is a suitable habitat (Table 1). More collected moths of Sphingidae were detected in the highlands that corresponded to the cold weather and the presence of grasses, shrubs and thorns. The altitude of the valley (1855 m) is a suitable habitat for this family (Table 1). vegetation plays an important role for the existence of insect fauna in a community as it provides the main source of food (Mathew & Rahamathulla, 1993).

Vegetation of this area include (*Stipa barbata*, *stipa atriseta*, *onobrychis melanotricha*) cause diversity of the order of

insect. Cold climate and semi-humid, with different plant types are suitable for them (Mehdi zadeh, 2014).

CONCLUSION

According to our study, the mountainous region of Fars is a suitable habitat for insect such as moths. Due to grate variety and of them in limited area, can be predicted that high population and richness fauna exist in overall of Fars Province with four different types of climate. Probably vegetation and climate of this region are operative in the fitness of these animals.

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