

About Some Moths and Butterflies (Lepidoptera) - Potential Forest Wreckers of National Park "Alania", Republic North Ossetia-Alania, Russian Federation

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Abstract

Seventeen species of butterflies were record from 2010 to 2018, from March to September months as potential forest wreckers in the territory of National park "Alania".

For achievement of the purpose of the research standard methods of visual observations, collecting biomaterial, photo fixing and cameral processing of entomological materials, shooting of geodetic data with pocket GPS navigators (coordinates are specified in WGS-84 system) were used to carry out the following tasks: 1) field and cameral researches at stationary checkpoints and on routes; 2) the taxonomical structure is provided and the list of the established species is made; 3) initial data on abundance of the established species is defined and primary accounts were carried out.

In total 17 species relating to 17 genera of 6 families are established. Flashes of mass reproduction of any of noted species, is not recorded.

Further identification of taxonomical structure of potential forest wreckers and monitoring of number of already revealed species is recommended.

Keywords: Mountain Digoria; National Park "Alania"; Moths; Butterflies; Lepidoptera; Potential Forest Wreckers

Introduction

In the middle of the 19th century the National park "Alania" was located in the territory of the wood of Mountain Digoria, it occupies about 57% of the wood territory.

However, in the course of economic activity as it was shown by researches of scientists [1], by 1968 woodiness in upper courses of the basin of the Uruk River was 13%. At the same time, optimum woodiness has to be 36%.

Now near settlements there are no woods per se. On the bottoms of valleys and in the neighborhood of settlements post forest vegetable communities, with prevalence of bushes remained. On valleys of the rivers separate bio groups of an alder at sulfur, willows, sea-buckthorn thickets, dogroses, single plants of a tamarix, etc. grow. The main forest forming breeds in the woods of the park are: pine, birch (3 species), linden (2 species), maple (3 species), and juniper (2 species), etc. In total, now, 175 species of trees and bushes are registered here [1]. The pine, birch, lime and mixed woods grow in different places of the general gorge. The birch woods generally grow from 1300 to 2500 m above sea level, in Uallagkom, and Skattikom, in upper courses of all rivers and small rivers. The pine woods grow at the heights from 1000 to 1800m above sea level, generally on slopes of the southern and east expositions.

From all species of ligneous plants of the park, 9 - are endemics of the Caucasus: mountain maple (*Acer trautvetteri*), Bush's honeysuckle (*Lonicera buschiorum*), Georgian oak (*Quercus iberica*), Biberstein currant (*Ribes biebersteinii*), begonia leaf linden (*Tilia begonifolia*) and 4 species of willows (*Salix*). Here relicts - representatives of ancient geological eras remained the east beech (*Fagus orientalis*), bilberry (*Vaccinium myrtillus*), Caucasian and yellow rhododendrons (*Rhododendron caucasicum*, *Rh. luteum*), Radde and Litvinova birches (*Betula raddeana*, *B. litwinowii*), east fir-tree (*Picea orientalis*), Caucasian fir (*Abies nordmanniana*), Greek mountain ash (*Sorbus graeca*).

In some places there was an undesirable change of the main forest forming breeds by an invaluable, for example, alder, a willow, etc. This phenomenon is observed in gorges Bilagidonskoe, Geby, Bartuiskoye and Karaugomskoye.

Since 1950 of the 20th century for 2000, nearly 90% of the woods of Mountain Digoria were passed by cabins of various ways are frequent with gross violations.

Since 1998 the main massifs of the woods, generally got to especially protected natural territory - National park "Alania". They entered here especially protected functional zone of the park in which only sanitary and improving forestry and landscape events which are a part of a complex of forest shelter measures with prohibition of continuous cabins are held. According to forest management of 1984 the area of the woods in Mountain Digoria was 8136 hectares. By our calculations, so far, due to natural renewal and restoration, the area of the woods was expanded up to 12 thousand hectares. Forest shelter events are held for the purpose of maintaining biological stability of plantings, prevention of broad development of pathological processes, decrease in damage from wreckers and diseases [1].

Purpose of the Study

The purpose of the research was identification of moths and butterflies (Lepidoptera) - potential wreckers of the woods and further control over a condition of their populations.

Materials and Methods

The study area

The research was conducted in National Park "Alania", Republic North Ossetia-Alania, and Russian Federation from 2010 to 2018 from March to September months.

The satellite map of study area is shown in the screenshot from Google Earth program (Figure 1).

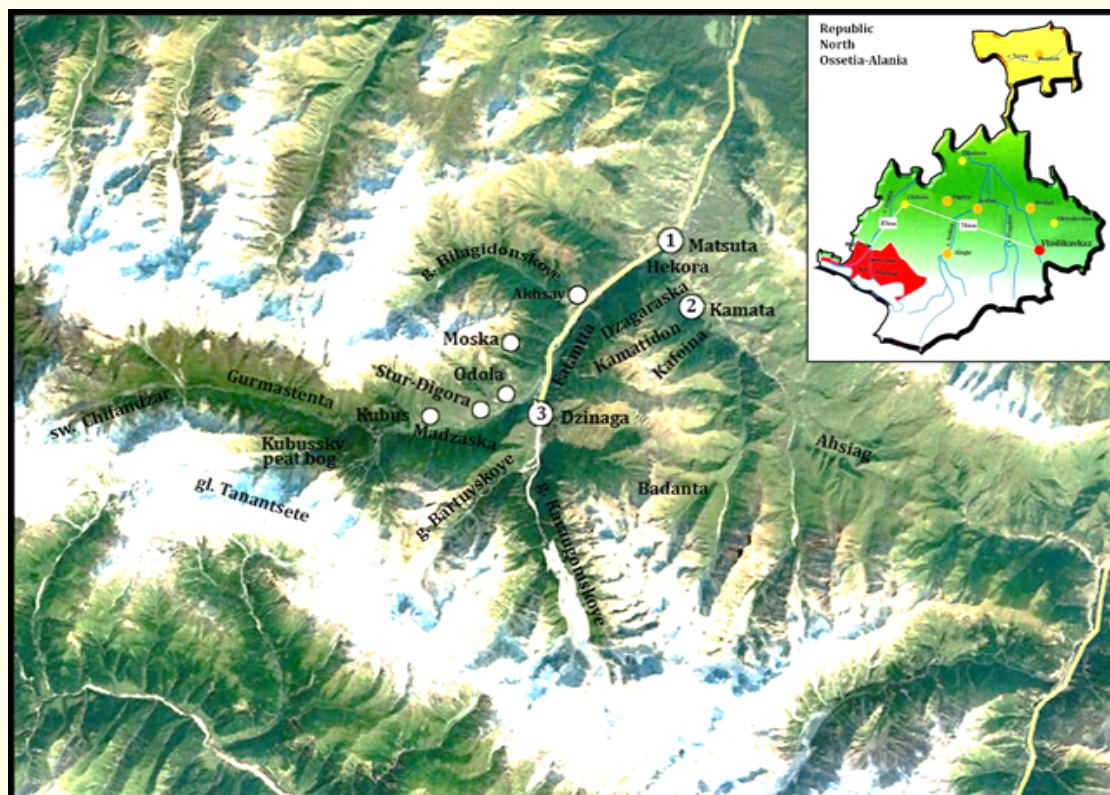


Figure 1: Study area (topographical basis digital globe 2018).

1, 2, 3: Stationary Checkpoints

■ : National Park's "Alania" territory

Materials and equipment: References (see the List of references), the Garmin eTrex 20x GPS navigator, cameras digital (Samsung ES28, Sony DSH-H300), glow lamps of 200 W, air entomological nets, killing jars, setting boards, pins, tweezers, etc., a binocular microscope of MBS-1.

Methods: The standard methods of visual observations and collecting biomaterial, photo fixing and cameral processing of entomological materials [2], shooting of geodetic data with pocket GPS navigators (coordinates are specified in WGS-84 system).

For achievement of the purpose of this research, the following tasks were carried out:

- 1) Field and cameral researches at stationary checkpoints and on routes were conducted (Table);
- 2) The taxonomical structure was created and the list of the established species was made;
- 3) Initial data on number (occurrence, abundance) of the established species are defined and primary accounts were carried out.

To quantitative accounting of moths, we applied a method of attraction of moths on an electric lighting source (the glow lamp of 200W) with calculation of the arrived specimens through everyone half an hour of observations during the night - with further recalculation on quantity of specimens in 1 hour.

Method of quantitative accounting of butterflies for the biogeographical purposes. According to this method, the number of species of butterflies is considered of visual accounting of quantity of the met specimens on a route per a unit of time. Species which for an hour were met in number of 100 specimens and more are considered as very numerous; from 10 to 99 specimens - numerous; from 1 to 9 specimens - usual; from 0,1 to 0,9 specimens - not numerous and rare, 0,09 specimens/hour - very rare. This method, despite many critical remarks for high relativity (inaccuracy), allows to gain an impression about the number of species of territories of national park without mass catching (and, respectively, destruction) butterflies [3,4].

Results and Discussion

As a result was defined the following taxonomical list of Lepidoptera - potential forest wreckers.

Tortricidae family: *Archips podana* (Scopoli, 1763) (Figure 2.1) [5,6,9], the village of Kamata (42°57'21.77" N; 43°47'23.38" E, 1375m above sea level), 15.07.2010, the village Dzinaga (42°54'9.83" N; 43°42'15.90" E, 1542m above sea level), 27.06.2015, on glow lamp light, it is usual; *Acleris bergmanniana* (Linnaeus, 1758) (Figure 2.2) [9], the village of Kamata (42°57'21.77" N; 43°47'23.38" E, 1375m above sea level), 15.07.2010, 25.06.2011, the village Dzinaga (42°54'9.83" N; 43°42'15.90" E, 1542m above sea level), 10.07.2012, 27.06.2015, on glow lamp light, it is usual; *Spilonota ocellana* (Denis et Schiffermüller, 1775) (Figure 2.3) [6,9], the village of Kamata (42°57'21.77" N; 43°47'23.38" E, 1375m above sea level), 10.08.2010, the village Dzinaga (42°54'9.83" N; 43°42'15.90" E, 1542m above sea level), 07.09.2015, on glow lamp light, it is usual; *Tortrix viridana* (Linnaeus, 1758) (Figure 2.4) [5,7,9], the village Dzinaga (42°54'9.83" N; 43°42'15.90" E, 1542m above sea level), 25.05.2012, 10.07.2013, on glow lamp light, it is not numerous.

Geometridae family: *Bupalus piniaria* (Linnaeus, 1758) (Figure 2.5) [7-9], gorge Karaugomskoye (42°52'4.23" N; 43°41'48.96" E, 1650m above sea level), 15.06.2010, 20.06.2011, 10.07.2016, in the pine wood, it is few; gorge Bilagidonskoye (42°57'41.58" N; 43°41'55.28" E, 1600m above sea level), 17.06.2010, 22.06.2011, 10.07.2017, 12.06,2018, in the pine wood, it is few; *Erannis defoliaria* (Clerck, 1759) (Figure 2.6) [7-9], the settlement of Madzaska (42°54'6.92" N; 43°37'11.68" E, 1700m above sea level), 25.09.2010, 05.10.2015, on glow lamp light, it is usual; *Geometra papilionaria* (Linnaeus, 1758) (Figure 2.7) [8], the village of Kamata (42°57'21.77" N; 43°47'23.38" E, 1375m above sea level), 15.07.2010, the village Dzinaga (42°54'9.83" N; 43°42'15.90" E, 1542 m above sea level), 27.06.2015, on glow lamp light, it is usual; *Abraxas grossulariata* (Linnaeus, 1758) (Figure 2.8) [8], gorge Karaugomskoye (42°52'4.23" N; 43°41'48.96" E, 1650 m above sea level), 15.06.2010, 20.06.2011, 10.07.2016, in the pine wood, it is ordinary.

Lasiocampidae family: *Dendrolimus pini* (Linnaeus, 1758) (Figure 2.9) [7,9], the village of Kamata (42°57'21.77" N; 43°47'23.38" E, 1375m above sea level), 15.07.2016, the village Dzinaga (42°54'9.83" N; 43°42'15.90" E, 1542m above sea level), 15.07.2016, 27.06.2017, on glow lamp light, it is rare; *Malacosoma neustria* (Linnaeus, 1758) (Figure 2.10) [9], the village of Kamata (42°57'21.77" N; 43°47'23.38" E, 1375m above sea level), 15.07.2010, the village Dzinaga (42°54'9.83" N; 43°42'15.90" E, 1542m above sea level), 27.06.2015, on glow lamp light, it is usual.

Erebidae family: *Lymantria dispar* (Linnaeus, 1758) (Figure 2.11) [7, 9], the village of Kamata (42°57'21.77" N; 43°47'23.38" E, 1375m above sea level), 15.07.2010, the village Dzinaga (42°54'9.83" N; 43°42'15.90" E, 1542m above sea level), 27.06.2015, on glow lamp light, it is usual; *Leucoma salicis* (Linnaeus, 1758) (Figure 2.12) [9] the village of Kamata (42 °57'21.77" N; 43°47'23.38" E, 1375m above sea level), 15.07.2010, the village Dzinaga (42°54'9.83" N; 43°42'15.90" E, 1542m above sea level), 27.06.2015, on glow lamp light, it is usual; *Calliteara pudibunda* (Linnaeus, 1758) (Figure 2.13) [9], the village of Kamata (42°57'21.77" N; 43°47'23.38" E, 1375m above sea level), 15.07.2010, the village Dzinaga (42°54'9.83" N; 43°42'15.90" E, 1542m above sea level), 27.06.2015, on glow lamp light, it is usual; *Orgyia antiqua* (Linnaeus, 1758) (Figure 2.14) [9], the village of Kamata (42°57'21.77" N; 43°47'23.38" E, 1375m above sea level), 15.07.2010, the village Dzinaga (42°54'9.83" N; 43°42'15.90" E, 1542m above sea level), 27.06.2015, on glow lamp light, it is usual; *Arctornis l-nigrum* (Müller, 1764) (Figure 2.15) [9], the village of Kamata (42°57'21.77" N; 43°47'23.38" E, 1375 m above sea level), 15.07.2015, the village Dzinaga (42°54'9.83" N; 43°42'15.90" E, 1542 m above sea level), 27.06.2016, on glow lamp light, it is usual.

Sphingidae family: *Sphinx pinastri* (Linnaeus, 1758) (Figure 2.16) [9], the village of Kamata (42°57'21.77" N; 43°47'23.38" E, 1375m above sea level), 25.05.2015, the village Dzinaga (42°54'9.83" N; 43°42'15.90" E, 1542m above sea level), 07.06.2016, on glow lamp light, it is rare.

Pieridae family: *Aporia crataegi* (Linnaeus, 1758) (Figure 2.17) [9], is universal in the woods, since May - until July, is usual.

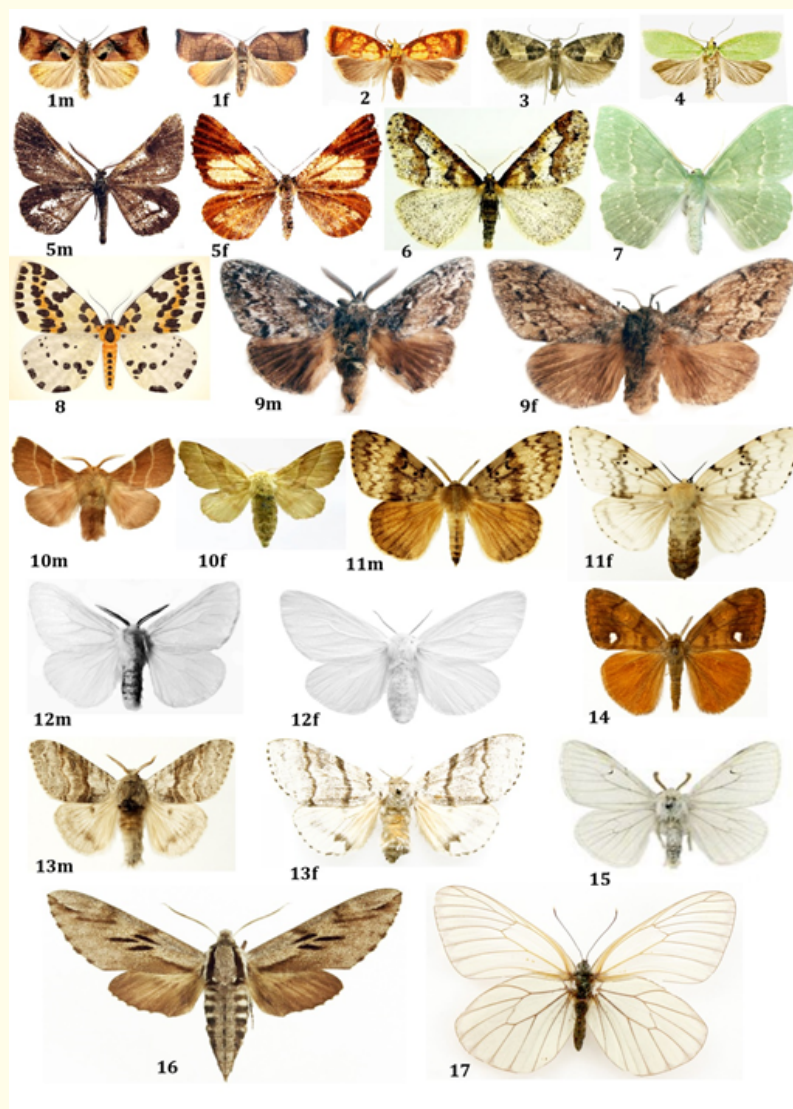


Figure 2: Lepidoptera species - potential forest wreckers.
m: Male; f: Female

The total of the revealed specimen made 17 species relating to 17 genera of 6 families. Their occurrence is ranging from rare, to usual.

Conclusion

During researches 17 species of Lepidoptera - potential forest wreckers we identified. *Archips podana* Sc., *Acleris bergmanniana* L., *Spilonota ocellana* Den. et Schiff., *Tortrix viridana* L., *Geometra papilionaria* L., *Erannis defoliaria* Cl., *Abraxas grossulariata* L., *Malacosoma neustria* L., *Calliteara pudibunda* L., *Orgyia antiqua* L., *Arctornis l-nigrum* Müll., *Aporia crataegi* L. can harm various deciduous trees and bushes.

Leucoma salicis L. can damage different species of willows and poplars

Bupalus piniaria L., *Dendrolimus pini* L., *Sphinx pinastri* L. can harm various coniferous trees and bushes.

Lymantria dispar L. can damage deciduous and some coniferous trees and bushes.

Flashes of mass reproduction and, because of considerable damages of forest breeds, during researches, are not noted. Further identification of taxonomical structure of potential forest wreckers and monitoring of number of already revealed species will be continued.

Conflict of Interest

There is no any financial interest or the conflict of interests exists.

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