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A zoogeographic analysis of noctuid fauna in Uzbekistan

Analiza zoogeograficzna nocnych motyli Uzbekistanu

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Streszczenie. Praca przedstawia opis i analizę fauny nocnych motyli Uzbekistanu. Fauna nocnych motyli tego kraju jest bardzo zróżnicowana pod względem pochodzenia zoogeograficznego. Analiza taksonomiczna tej grupy owadów została przeprowadzona na podstawie podziału na sześć głównych grup, tj.: endemity Azji Środkowej, motyle należące do grup Setinus, Tethys, Palearktycznej i Holarktycznej oraz gatunki poliregionalne. W pracy przedstawiono listy gatunków należących do tych sześciu grup, ich udział procentowy oraz liczbę gatunków w podrodzinach nocnych motyli.

Słowa kluczowe: motyle nocne, ekologiczna właściwosc, regiony zoograficzne.

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INTRODUCTION

Noctuid is any of numerous, usually dull-colored night-flying moths of the family *Noctuidae*, having a well-developed proboscis for sucking nectar and larvae such as the cutworms and armyworms that are destructive to young trees and other crops (Krzhyzhanovsky 1965). Noctuids are one of the chief threats to cotton, which is probably the most important crop in the region (The National Strategy 1998). Noctuids are also called *owlet moths*. The faunistic composition

of noctuids in Uzbekistan varies extremely in its zoogeographic origin (Insects of Uzbekistan 1993). Quite common species occupy a significant place in the formation of fauna together with a large part of endemics of autochthonic origin. The ranges of these species cover the territories of large zoogeographic regions. In Uzbekistan, the origin and ecological peculiarities are equally reflected in the distribution of these species (Petrov 2001; Bekhanov 2007). The aim of the review is to present the zoogeographic analysis of noctuid fauna in Uzbekistan.

GROUPS OF NOCTUID SPECIES

In grouping of the noctuids by range types we primarily based on the available data on geographic distribution and trophic links of separate species. Uzbekistan stretches from the east to the west for more than 1000 km and in zoogeographic respect, is situated in the center of Tethys (ancient Mediterranean). Territorially, it is included into the Iran-Turanian subregion of Setinus (Sahara-Gobi) desert region of the Palaearctic part of the Holarctic (Emelyanov 1974). As it was mentioned above, the noctuid fauna in our region was formed by the species of autochthonic origin and allochthonic species widespread throughout the entire Tethys area or even the Palaearctic and beyond this region.

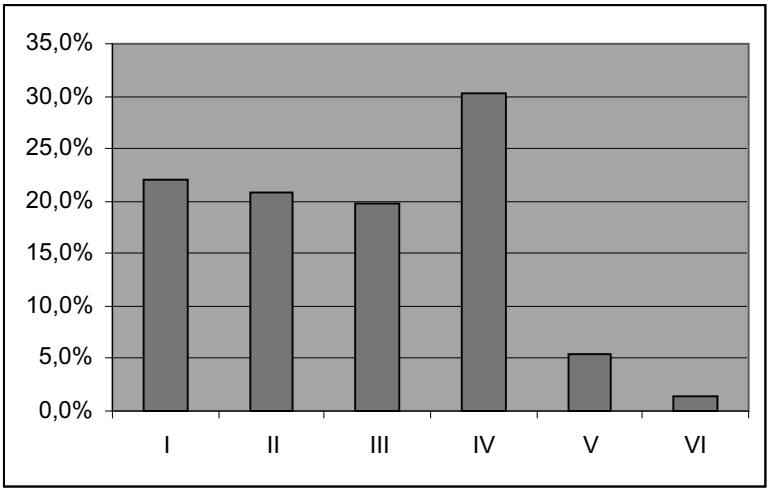
Proceeding from a significant biodiversity of ranges we united the revealed noctuid species into six groups:

1. **Endemics** of Central Asia (in zoogeographic perception) – species with ranges within the South-Turanian and North-Turanian flatland provinces, as well as the Turkestan mountain province with adjoining transitional territories.
2. **Setinus** (Sahara-Gobi) species inhabiting in the deserts and steppes of Northern Africa and arid zones of Asia.
3. **Tethys** species with ranges covering the territory of Ancient Mediterranean.
4. **Palaearctic** species, which are characterized with wide ranges of distribution in arid and damp parts of the Palaearctic.
5. **Holarctic** species – their ranges cover vast territories of the Palaearctic and Nearctic.
6. **Polyregional** species – their ranges cover, at least, two zoogeographicregions.

Quantitative and percentage ratios of noctuid species included into these groups are given in the graph below (fig. 1) and (table 1).

GROUP I – ENDEMICS OF CENTRAL ASIA

This is the second largest group comprising 78 species or 21,1% of the total number of revealed noctuid species. It includes the species whose ranges are situated in the territory, the borders of which stretch in the west through the Lower Povolzhie (the Lower Volga) and the eastern coast of the Caspian Sea; in the south, along Kopetdag, the north of Khurasan and along the beds of the Amudarya and Vakhsh rivers; in the east, along the alpine Pamirs, central Tien-Shan and Zailijsky Ala Tau; in the north, along northern part of Lake Balkhash, central Kazakhstan, Ural steppes to the Lower Povolzhie. The endemics in this region have been developing for a long time under the influence of similar arid nature-climatic conditions. The flora in the region has a common historic evolutionary way, which is characterized by adaptation to arid conditions.



I – Endemics; II – Setinus (Sahara-Gobi) species; III – Tethys species; IV – Palaearctic species; V – Holarctic species; VI – Polyregional species.

I – Endemity; II – gatunki Setinus (Sahara-Gobi); III – gatunki Tethys; IV – gatunki Palearktyczne; V – gatunki Holarktyczne; VI – gatunki poliregionalne.

Fig 1. Percentage ratio of the number of species of separate zoogeographic noctuid groups in the fauna of Uzbekistan

Rys. 1. Udział procentowy liczby gatunków poszczególnych grup zoogeograficznych nocnych motyli w faunie Uzbekistanu

Detailed analysis of the species composition by individual groups is presented below. The following species are attributed to endemics of Central Asia:

- Subfamily ***Pantheinae***
  Raphia approximata Alph., *R. corax* Drt.
- Subfamily ***Stirinae***
  Paraegle ochracea Ersh., *Turacina ceratopyga* Pungl.
- Subfamily ***Heliothinae***
  Erythrophaia suavis Strg., *Heliothis feildi* Earsh.
- Subfamily ***Cuculliinae***
  Cucullia naruenensis Strg., *Metopoceras erschoffi*
- Subfamily ***Noctuinae***
  Euxoa mollis Strg., *E. leaena* Pungl., *E. acuminifera* Ev., *E. cognita* Strg., *E. nomas* Ersh., *Dichagyrus melanuroides* Kzn., *D. kirghisa* Ev., *D. jacobsoni* Kzn., *D. argentea* Kzn., *D. improba* Strg., *D. turbans* Strg., *D. petersi* Christ., *D. lasciva* Stgr., *Parexarnis violetta* Strg., *R. ignobilis* Strg., *R. subbecora* Strg., *R. hampsoni B.-H., Eugnorisma tamerlana* Hmp., *Eugraphe funkei* Pungl., *Eicomorpha antique* Stgr., *Xestia erschoffi* Stgr.
- Subfamily ***Hadeninae***
  Odontelia sitiens Pungl., *O. arbusculae* Skhr., *O. arenicola* Stshr., *Hadena dealbata* Stgr., *O. fissilis* Christ., *H. thecaphaga* Drt.
- Subfamily ***Ipimorphinae***
  Mervia kuznetzovi Dart., *Cteipolia isotima* Pungl., *Hypsophila jugorum* Ersh., *Lithophane ledereri* Stgr., *Bryoxena centralasiae* Stgr., *Auchmis detersina* Stgr., *Pseudohadena indigna* Christ., *Pseudopseustis elinguis* Pungl., *P. striolata* Flpv., *Diadochia saca* Pungl., *Heterographa zelleri* Christ., *H. fabrilis* Pungl., *Marsipiophora christophi* Ersh., *Pseudoligia similiaria* Mntr., *Pinacoplus didymogramma* Ersh., *Chortodes abrupta* Ev., *Coenagria nana* Stgr., *Eremodrina vicina* Stgr., *Rhabinopleryx turanica* Ersh.
- Subfamily ***Catocalinae***
  Anydrophila imitatrix Christ., *A. simiola* Pungl., *A.mirifica* Ersh., *Drastreria langi* Ersh., *D. obscurata* Stgr., *D. baigakumensis* Jn., *D. sesquistria* Ev., *Anumeta palpangularis* Pungl., *A. fricta Christ., Metoponrhis karakumensis* Grm., *Epharmottomena nana* Stgr., *Drasteriodes kisilkumensis* Ersh., *Iranada secunda* Ersh., *Armada clio* Stgr., *Apopestes centralasiae* Wrr., *Autophila maculifera* Stgr., *A. glebicolor* Ersh., *Zethes monotonus* Wltr.
- Subfamily ***Plusiinae***
  Syngrapha alaica Glvg.

- Subfamily ***Sarrothripinae***
  Characoma musculana Ersh.
- Subfamily ***Acontiinae***
  Eublemma gratiosa Ev. Totally 78 species.

The above list shows that the subfamily *Noctuinae* contains the highest number of species (23), followed by *Ipimorphinae* and *Catocalinae* (19 and 18 species, respectively). At the level of the genus many endemics from the subfamily *Noctuinae* have the following genera *Euxoa* (5 spp.), *Dichagyris* (8 spp.) and *Rhiacia* (4 spp.). In *Hadeninae*, the genus *Odontelia* has 4 out of 6 species; in *Catocalinae*, the genus *Drasteria* is comprised of 4 species.

Most species are encountered in plain lands and foothill areas of Central Asia. Of endemics, whose biology has been studied, about 40 species are monovoltine, adapted to dry hot conditions and having a diapause art one of the development stages. By trophic links, the most representatives from this group are monophages feeding on such plants as the saxaul, glasswort, wormwood and other plants typical for deserts.

GROUP II – SETINUS (SAHARA-GOBI) SPECIES

The ranges of species included into this group cover a significant territory situated from the west part of North Africa to the Gobi desert in the east. This territory is characterized with a dry and hot climate. The northern border passes along the black-sea coast of Turkey, eastern part of Transcaucasia, Lower Povolzhie and northern Kazakhstan. The southern border passes through the center of Arabia, Iran-Pakistan coast of the Indian Ocean, to the east of the River Indus and the watershed of Hindu Kush and the Himalaya. The main territory lies in such great deserts as Sahara, Arabian Desert, Kara Kum, Kyzyl Kum, Taklamakan and Gobi. The climate is damp only in the south-east and north. Group II is comprised of 73 species, i.e. 20,9% of the total number of revealed species.

The species composition is following:

- Subfamily ***Acronictinae***
  Acronicta centralis Ersh., A. elaeagni Alph.
- Subfamily ***Bryophilinae***
  Cryphia maeonis Ld.
- Subfamily ***Cuculliinae***
  Cucullia improba Christ., *C. maracandica* Stgr., *C. hemidiophana* Grr., *C. khorossana* Brdt., *Lophoterges centralasiae* Stgr.

- Subfamily ***Noctuinae***

Euxoa mustelina Christ., *E. parnassiphila* Stgr., *Trichosilia plumba* Alph., *Dichagyris melanura* Kol., *D. eremicola* Stgr., *D. tyrannus* B.-H., *D. umbrifera* Alph., *D. amoena* Stgr., *D. truculenta* Ld., *D. glaucescens* Christ., *D. juldussi* Alph., *Parexarnis obumbrata* Stgr., *P. sellers* Christ., *P. ala* Stdr., *Spaelotis degeniata* Christ., *Eugnorisma trigonica* Alph., *Eugraphe marcida* Christ., *Ammogrotis suavis* Stgr., *Xestia senescens* Stgr.

- Subfamily ***Hadeninae***

Thargelia discincta Christ., *Hadultt ptochica* Pungl., *H. sabulorum* Alph.

- Subfamily ***Ipimorphinae***

Polymixis apoteinae Brd., *Pseudohadena laciniosa* Christ., *P. armata* Alph., *P. siri* Ersh., *Anamecia maltiosa* Alph., *Scythocentropus scripturosa* Ev., *Margelana versicolor* Stgr., *Eremodrina expansa* Alph., *E. fergana* Stgr., *Chilodes distracta* H.-S.

- Subfamily ***Hypeninae***

Phynchodontodes ravalis H.-S., *R. ravulalis* Stgr., *R. separata* Wr., *L. revolutalis* Zll., *R soricalis* Pungl.

- Subfamily ***Catocalinae***

Catocala deducta Ev., *C. lupina* H.-S., *C. optima* Stgr., *C. remissa* Stgr., *Dysgonia rogenhoferi* Bht., *Gonospileia munita* Hon., *Drasteria sinuosa* Stgr., *D. tenera* Stgr., *D. catocalis* Stgr., *D. saisani* Stgr., *D. cailino* Ld., *D. sesquilina* Stgr., *D. sesquistra* Ev., *D. rada* Bsd., *D. aberrans* Stgr., *Anumeta spilota* Ersh., *A. henkei* Stgr., *A. fractistrigata* Alph., *A. dentistrigata* Stgr., *A. cestina* Stgr., *Drasterioides limata* Christ., *Armada dentata* Stgr., *A. panaceorum* Men., *Tarachephia hueberi* Erch., *Pandesma robnsta* Wlk., *Autophi'in gracilis* Stgr.

- Subfamily ***Acontiinae***

Eublemma pallidula H.-S., *E. uniformis* Stgr. Totally 73 species.

In this group the highest number of species in the subfamily *Catocalinae* (26 spp.) followed by *Noctuinae* and *Ipimorphinae* (19 and 10 species, respectively).

Table 1. The numbers of species in some noctuid subfamilies in zoogeographic groups (I–VI – zoogeographic groups)

Tabela 1. Liczba gatunków w podrodzinach nocnych motyli w grupach zoogeograficznych (I–VI – grupy zoogeograficzne)

No *Nr*	**Subfamilies** *Podrodzina*	**I**	**II**	**III**	**IV**	**V**	**VI**
1	*Pantheinae*	2	–	–	–	–	–
2	*Acronictinae*	–	2	–	4	–	–
3	*Bryophilinae*	–	1	–	2	–	–
4	*Stirinae*	2	–	2	–	–	–
5	*Heliothinae*	2	–	4	3	1	1
6	*Cuculliinae*	3	5	7	8	1	–
7	*Noctuinae*	23	19	19	32	1	3
8	*Hadeninae*	6	4	8	29	6	–
9	*Ipimorphinae*	19	10	5	18	7	
10	*Hypeninae*	–	5	–	–	–	–
11	*Catocalinae*	18,	26	16	4	1	–
12	*Chloephorinae*	–	–	–	2	–	–
13	*Plusiinae*	1	–	3	3	2	1
14	*Eutelinae*	–	–	1	–	–	–
15	*Sarrothripinae*	1	–	–	–	–	–
16	*Acontiinae*	1	2	5	2	–	–
	Total	**78**	**74**	**70**	**107**	**19**	**5**

There are genera comprised of several species, e.g.: *Dichagyrus*, 8 spp., *Catocala*, 4; *Drasteria*, 9; *Anumeta*, 5. Of interest is the fact that all five representatives of the subfamily *Hypeninae* encountered in Uzbekistan are Setinus species. Perhaps their belonging to one genus *Rhynchodontodes* was reflected on their ranges. Trophically, they are related to the camel's thorn, *Alhagi maurorum*, which is a xerophyte of desert and semi-desert biocenoses. There are polyphages in this group (*Noctuinae*, *Hadeninae* and *Ipimorphinae*), which feed on ephemers and ephemeroids typical of arid climatic conditions. The species of this group are mainly monocyclic developing in Uzbekistan in one generation with a summer diapause at one of the development stages. In general, the representatives of the Setinus group, as well as the endemics of Central Asia, are noted for a high

adaptation to arid conditions, albeit with wider ranges of distribution covering partially subtropics and mountain areas as high as 3 200 m above sea level.

GROUP III – TETHYS SPECIES (ANCIENT MEDITERRANEAN)

The borders of the ranges of distribution of this group are expanded northwards to the line passing along the north of Pyrenees, southern France, central Alps, north of Balkans, south Carpathians, central Ukraine, Mid-Povolzhie, south Pre-Ural region, South Siberia, Altai and to the south of Primorye province. The eastern border lies along the line of Khingan-Qìnglín, eastern Tibet and eastern Himalayas; the western across Madeira, Azores and Canary Islands. The south borders of Ancient Mediterranean coincide with the borders of Setinus region. The territory of Tethys includes Hisperian, Orthrian, Scythian and Setinus regions, forming the southern arid part of the Palaearctic. The species composition of the Tethys group including 70 species (19.8%) is the following:

- Subfamily ***Stirinae***
  Aegle subclava Ersh., *Mycteroplus puniceago* Bsdv.
- Subfamily ***Heliothhinae***
  Periphanes delphinii L., *Heliothis peltigera* Den.et Schiff., *//. nubigera* H.-S., *H. incarnata* Frr.
- Subfamily ***Cuculliinae***
  Cucidlia spectabilis Hbn., *C. splendida* Cr., *C. boryphora* F.-W., *C. biornata* F.-W., *C. scrohpulariae* Den.et Schiff., *Omphalophana anatolica* Ld., *Amphipyra tragopoginis* Col.
- Subfamily ***Ipimorphinae***
  Lithophane lapidea Hbn., *Apamea leucodon* Ev., *Pseudohadena chenopodiphaga* Rmbr., *Oria musculosa* Hbn., *Eremodrinae clara* Schw.
- Subfamily ***Noctuinae***
  Euxoa conspicua Hbn., *E. fallax* Ev., *E. cos* Hbn., *E. deserta* Stgr., *K. foeda* Ld., *E. hilaris* Frr., *Agrotis obesa* Bsdv., *A. lasserrei* Obrt., *Dichagyris squalorum* Ev., *D. candelisequa* Den.et Schiff., *D. forficula* Ev., *D. eureteocles* Bours., *D. multicuspis* Ev., *Chersotis vicina* Corti., *Ch. hahni* Chr., *Ch. larixia* Gn., *Rhyacia musculus* Stgr., *Eugnorisma chaldaica* Bsdv., *Eugrapheminiago* Trr.
- Subfamily ***Plusiinae***
  Euchalcia herrichi Stgr., *Macdunnoughia confusa* Stph., *Cornutiplusia circumflexa* L.

- Subfamily ***Hadeninae***

Discestra dianthi Tsr., *D. sociabilis* Grsl., *Saragossa siccanorum* Stgr., *Conisania leineri* Frr., *Laconobia blena* Hbn., *L. praedita* Hbn., *Leucania zeae* Dupn., *L. loreyi* Dapn.

- Subfamily ***Acontiinae***

Glossodice polygramma Dupn., *Eublemma ostrina* Hbn., *E. rosea* Hbn., *E. purpurina* Den.et Schiff., *Acontia lucida* Hfh.

- Subfamily ***Eutelinae***

Eutelia adulatrix Hbn.

- Subfamily ***Catocalinae***

Catocala puerpera Grn., *C. neonympha* Esp., *Prodotis stolida* F., *Dysgonia algira* L., *Clyde syriaca* Bgn., *C. illunaris* Hbn., *Perycima albidentaria* Frr., *Drasteria caucasica* Kol., *D. picta* Christ., *D. flexuosa* Mentr., *Anumenta cestis* Mentr., *Apopestes spectrum* Esp., *Autophila cataphanes* Hbn., *A. dilucida* Hbn., *A. asiatica* Stgr., *Acantholipes regularis* Hbn. Totally 70 species.

The above list shows that the highest number of species is represented by the family *Noctuinae* (19 species) and *Catocalinae* (16 species). At the genus level they belong to *Cucullia*, *Euxoa*, *Dichagyris*, *Chersotis*, *Heliothis*, *Drasteria*, *Autophila* and *Eublemma*. Although the general territory of distribution of species of this group occupies a vast area from Japan to Azores, for some species the ranges are quite limited. About 40 species are not encountered beyond the eastern border of Turkestan (mountain) province. Such species as *Mycteroplus puniceago*, *Cucullia foeda*, *C. splendida*, *C. boryphora*, *C. maracandica*, *Amphipyra tragopigonis*, *Euxoa conspicua*, *E. foeda*, *Dichagyris eureteocles*, *Chersotis hahni*, *Ch. larixia*, *Conisania leineri*, *Laconobia blenna*, *L. praedita*, *Litophane lapidea*, *Apamea leucodon*, *Catocala puerpera*, *C. neonympha*, *Autophila cataphanes*, *A. dilucida*, *Acantolipes regularis*, *Macdunnoughia confusa*, and *Glossodice polygramma* are encountered only in the central part of this territory.

By trophic links of the larvae, most representatives of this group are oligo- or polyphages. The expansion of the range of fodder plants occurred owing to mesophytes, which are the main vegetation in the north and marine regions of Tethys. By the cycles of development the number of monocyclic and polycyclic species is almost similar.

GROUP IV – PALAEARCTIC SPECIES

This is the largest group comprising 107 species of 11 subfamilies and 54 genera, which constitutes 30,3% of the total number of noctuids in Uzbekistan. The ranges of distribution of the species cover vast territories of Tethys and Giadiya with transitional areas with the exception of circumpolar region and joining territory of Extreme North of the Palaearctic. The Palaearctic species are characterized with their adaptation to arid-damp conditions, polyvoltine nature and polyphagy.

The following species are included into Group IV:

- Subfamily ***Acronictinae***

  Acronicta tridens Den.et Schiff., *A. psi* L., *A. rumicis* L., *Simyra nervosa* Den. et Schiff.
- Subfamily ***Bryophilinae***

  Cryphia algae F., *C. raptricula* Den.et Schiff.
- Subfamily ***Heliothinae***

  Schinia scutosa Den.et Schiff., *Heliothis viriplaca* Hfh., *H. maritima*
- Subfamily ***Cuculliinae***

  As the above list shows, in this group there are many species, which are potential pests of *Cucullia magnifica* Frr., *C. argentea* Hfn., *C. argentina* F., *C. xeranthemi* Bdw., *C. dracunculi* Hbn., *C. elongata*., *Oncocnemis strioligera* Ld., *Amphipyra tetra* F.
- Subfamily ***Noctuinae***

  Euxoa ochrogaster Gn., *E. cursoria* Hfn., *E. obelisca* Den.et Schiff., *J. tritici* L., *E. nigricans* L., *E. basigramma* Stdr., *E. aquilina* Den.et Schiff., *Agrotis segetum* Den.et Schiff., *A. exclamationis* L., *A. ripae* Hbn., *A. crassa* Hbn., *Dichagyris signifera* Den.et Schiff., *D. musiva* Hbn., *D. stenzi* Ld., *D. flammatra* Den.et Schiff., *Parexarnis fugas* Trtk., *Chersotis rectangula* Den.et Schiff., *Ch. sordescens* Stgr., *Ch. ocellina* Den.et Schiff., *Ch. alpestris* Bsd., *Ch. multangula* Hbn., *Ch. elegans* Ev., *Epipsilia grisescens* F., *Rhyacia simulans* Hfn., *Noctua pronuba* L., *N. orbona* Hfh., *Opigena polygona* Den.et Schiff., *Eugnorisma insignata* Ld., *E. depuncta* L., *Diarsia rubi* Vwg., *Xestia xanthographa* Den.et Schiff., *Spaelotis ravida* Den.et Schiff.
- Subfamily ***Hadeninae***

  Discestra marmorosa Brkh., *D. furca* Ev., *D. stigmosa* Christ., *D: sodae* Bsd., *Polia nebulosa* Hfn., *Sideridis reticulata* Gz., *Hadena bicruris* Hfn., *H. literata* F.-W., *H. luteago* Den.et Schiff., *H. compta* Den.et Schiff., *H. albimacula* Brkh., *H. magnolii* Bsd., *H. luteocincta* Rmb., *H. perplexa* Den.et Schiff., *Hecaptera*

biolorata Hfh., *H. dysodea* Den.et Schiff., *Ceramia pisi* L., *Laconobia splendens* Hbn., *L. oleracea* L., *L. thalassina* Hfn., *Lasionycta proximo* Hbn., *Cerapterix graminis* L., *Egira conspicillaris* L., *Orthosia gracilis* Den.et Schiff., *Mythimna conigera* Den.et Schiff., *M. vitellina* Hbn., *M. ferrago* F., *M. l-album* L., *Leucania comma* L.

- Subfamily ***Ipimorphinae***
  Xylena exsoleta L., *Xanthia fulvago* L., *X. gilvago* Den.et Schiff., *Apamea crenata* Hfn., *A. furva* Den.et Schiff., *A. oblonga* Hfwr., *A. ferrago* Ev., *Pseudohadena immunda* Ev., *Amphipoea fucosa* Frr., *A. lucens* Frr., *Arenostola semicana* Esp., *Chortodes extrema* Hbn., *Argyrospila succinea* Esp., *Hoplodrina octogenaria* Gz., *H. blanda* Den.et Schiff., *H. ambiqua* Den.et Schiff., *Platyperigea albina* Ev., *Paradrina clavipalpis* Scop.
- Subfamily *Catocalinae*
  Catocala nupta L., *C. elocata* Esp., *Lygephila craccae* Den.et Schiff., *Tyta luctuosa* Den.et Schiff.
- Subfamily ***Chloephorinae***
  Earias clorana L.
- Subfamily ***Acontiinae***
  Eublemmaparva Hbn., *Emmelia trabealis* Scop.
- Subfamily ***Plusiinae***
  Panchrysia deaurata Esp., *Plusia festucae* L., *Syngrapha hochenwarthi* Hwr.

Many species of this group are potential pests of different agricultural crops. Due to their polyphagous nature at the larval stage, ecological plasticity and polyvoltine nature, these species show a constant tendency of expansion of their ranges. In the investigations carried out in agroecosystems during the peak of activity of the moth flights by means of light traps, some species, namely, *Schinia scutosa*, *Heliotihis viriplaca*, *Agrotis segetum*, *Aconobia oleracea*, *L. thalassina*, *Mythimna vittelina*, *Hoplodrina blanda*, *Tyta luctuosa*, *Dichagyris ftammatra* and *Emmelia trabealis* constituted the major part of these moths.

A taxonomic analysis showed that the largest number of species were found in the subfamilies *Noctuinae* (32 spp.) and *Hadeninae* (29 spp.). More than the half of species from the subfamily *Hadeninae* recorded in Uzbekistan are included into the group of palaearctic species, which is attributed to the polyvoltine nature of development and a wide choice of fodder plants for these species. There are relatively many species in the subfamily Ipimorphinae (18 species). At the genus level widespread are *Hadena* (8 spp.), *Euxoa* (7 spp.), *Chersotis* and *ucullia* (6 species each), *Agrotis*, *Apamea*, *Dichagyris*, *Discerta* and *Mythimna* (4 species each).

GROUP V – HOLARCTIC SPECIES

The ranges of the species from this group cover a vast geographical territory from the Palaearctic and Nearctic. This group is comprised of 19 species constituting 5.4% of the total number of noctuid species of Uzbekistan. The species composition is the following:

- Subfamily ***Heliothinae***
  Pyrrhia umbra Hfn.
- Subfamily ***Cuculliinae***
  Cucullia lunnula Hfn.
- Subfamily ***Noctuinae***
  Laconobia w-latinum Hfn., *L. suasa* Den.et Schiff., *Orthosia incerta* Hfn.
- Subfamily ***Hadeninae***
  Discerta trifolii Hfh., *Polia bombycina* Hfh.,
  Mamestra brassicae L.
- Subfamily ***Ipimorphinae***
  Episema glaucina Esp., *Xanthia ocellaris* Brks.,
  Parastichtis suspecta Hbn., *Apamea lateritia* Hfn.,
  A. remissa Hbn., *A.sordens* Hfh., *Spodoptera exiqua* Hbn.
- Subfamily ***Catocalinae***
  Scoliopteryx libatrix L.
- Subfamily ***Plusiinae***
  Trichoplusia ni Hbn., *Autographa gamma* L., *Xestia c-nigrum* L.

The largest number of holarctic species are found in the subfamilies *Hadeninae* (6 spp.) and *Ipimorphinae* (7 spp.). The genus *Apamea* of the latter subfamily is comprised of three species out of eight recorded in Uzbekistan. This fact is of interest as the genus *Apamea* are not wide polyphages; rather, they feed on the stems of cereals being inside them. In our view, a large-scale distribution of cereals all over the world has a crucial role in the expansion of the range of *Apamea*.

In general, all the holarctic species being mesophylous by their trophic links are polyphages preferring the herbal mesophytous vegetation. In their distribution holarctic species are not homogenous. Such species are *Autographa gamma* L., *Discerta trifolii* Hfn., *Mamestra brassicae* L. and *Laconobia suasa* Den.et Schiff. are more boreal while *Spodoptera exiqua* Hbn. is not distributed to the north of south Kazakhstan, Mongolia, south Europe and Central part of North America, and *Xestia c-nigrum* L. is recorded throughout the Holarctic being a cosmopolite in this zoogeographic dominion. By feeding links all holarctic

species are polyphages and serious pests of agricultural crops. Except the representatives of the genus *Apamea*, all the holarctic noctuids are polyvoltine. Such species as *Discerta trifolii* Hfn., *Laconobia w-latinum* Hfh., *Autographa gamma* L. and *Spodoptera exiqua* Hbn. develop in more than four generations in a year.

GROUP VI – POLYREGIONAL SPECIES

This group includes noctuids, the ranges of which cover more than two zoogeographic dominions or are distributed in the entire world. According to our data, five species from this group are reported from Uzbekistan, which constitutes 1.4% of the total number. They include the following species:

- Subfamily ***Heliothinae***
  Helicoverpa armigera Hfn.
- Subfamily ***Noctuinae***
  Agrotis ipsilon Hfh., *Ochropleura plecta* L., *Peridroma saucia* Hbn.
- Subfamily ***Plusiinae***
  Chrysoideixis chalcites Ev.

The range of *C. chalcites* is situated in three zoogeographic dominions – Palaearctic, Oriental (Indo-Malayan) and Australia. Originating from the Indo-Malayan dominion, it also spread along the south part of the Palaearctic northwards to the south of Europe and Kazakhstan, northern China; in the west, throughout Africa; in the south, throughout Australia. One of the most important agricultural pests, *H. armigera* is distributed practically throughout the eastern hemisphere, except boreal territories. Although this species is a polyphage by its trophic links, the favorite food for the larvae are the plants from the family *Fabaceae*, many species of which are widespread as cultural plants.

The noctuid *H. armigera* is a warm-loving species; it is not recorded farther to the north of the south Europe and Central Asia. *A. ipsilon* from the *Noctuinae* family is dangerous as a pest of agricultural crops and is recorded in the entire Holarctic, as well as in the Ethiopian, Indo-Malayan and Australian dominions. Two other *Noctuinae* species, *Peridroma saucia*, more known as *P. margaritosa*, and *Ochropleura plecta*, are eurytopic organisms widespread in both hemispheres, except the Extremer North. A zoogeographic analysis of revealed noctuid species, which was conducted on the basis of distribution and trophic links, enabled the separation of them into six groups:

I – Endemics of Central Asia (in zoogeographic perception) – 78 species (22.1% of the total number of species).

II – Setinus (Sahara-Gobi) species – 73 species (20.6%).
III – Tethys (Ancient Mediterranean) species – 70 species (19.7%).
IV – Palaearctic species – 107 species (30.3%).
V – Holarctic species – 19 species (5.4%).
VI – Polyregional species – 5 species (1.4%).

Mesophilous species trophically related to plants typical of the Ancient Mediterranean played a crucial role in the formation of noctuid fauna in Uzbekistan. They comprise more than 60% of the species composition and are not distributed beyond the southern arid part of the Palaearctic.

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