

## Noctuid Moths in North of Syria (Aleppo and Idleb Provinces) (Lepidoptera: Noctuidae)

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### ABSTRACT

Forty-four Noctuid species in 31 genera belonging to seven subfamilies are recorded in North of Syria; eleven of these species are recorded for the first time. A total of 843 noctuids were collected by light traps from several natural and agricultural ecosystems from Aleppo and Idleb Provinces, from March 2012 until March 2013. The collected specimens were preserved at the University of Aleppo, Faculty of Science, Department of Zoology. The aim of this study is to survey the Noctuidae of north Syria, and to prepare a species list that contributes to the study of insect diversity in Syria. A systematic list of Noctuidae in North of Syria is presented with scientific name, distribution, flight period, total number, number of generations, and images of each species.

**Keywords:** Lepidoptera, Noctuidae, Moths, Taxonomy, Syria.

### INTRODUCTION

The order Lepidoptera belongs to holometabolous endopterygotes, scale winged insects, which includes butterflies and moths (Richards, 1977). Lepidoptera is the group of insects, which consists of many large and showy species, there are thought to be 150,000 to 250,000 different species of moth, with thousands of species yet to be described (Gurule *et al.*, 2011). Lepidoptera is probably one of the most suitable groups for most quantitative comparisons between insect faunas to be valid, for the many reasons elaborated by Holloway (1980,1984 and 1985), especially their abundance, species richness, response to vegetation and

climate, their ease of sampling using light traps and the relatively advanced taxonomy (Aslam, 2009). The superfamily Noctuoidea is one of the largest groups among the order Lepidoptera which includes dominating families like Noctuidae, Erebidae and Notodontidae etc. (Gurule *et al.*, 2011). Among these families, the Noctuidae is dominating, both in terms of species diversity and numerical strength. This is probably the largest macrolepidopteran family with approximately 45,000 described species and many unknown as well as unnamed species, particularly from tropical areas (Zahiri *et al.*, 2011). The Noctuid moths are very important component of natural and agricultural ecosystems. Due to the high diversity of species, the abundance of many species is highly reproductive, migratory and phytophagous feeding of their larvae, many species have posed serious problems as agricultural and forest pests (Kononenko and Pinratana, 2005).

The Noctuid moths mainly inhabit areas in moderate climate and their general distribution throughout the world and exhibit among themselves in the imago stage

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immense variety in size, shape, coloration, but are all alike and extremely homogeneous (Kitching, 1984). The earlier study of the family Noctuidae refer to its founder, Linnaeus in 1758, and in 1775 it considered as a distinct and separate unit in order Lepidoptera by Denis and Schiffermüller (Kitching, 1984). The "Noctua" means in Latin the night, therefore, the members of this family achieved their common name "Owlet moth", because most of them are nocturnal and they are active during the hours of darkness and usually they are attracted to light, and their eyes reflect the light as bright yellow. However, a few species in the family are adjusted to daylight or diurnal activity, such as species of subfamily Heliiothinae (Karrom, 1976).

Recent studies placed the subfamily Catocalinae, which is the largest among the family Noctuidae in family Erebidae, as a tribe of the subfamily Erebiniae (Lafontaine and Schmidt, 2010). Also subfamilies, Hadeninae and Xyleninae were placed in the subfamily Noctuinae as tribes Hadenini and Xylenini (Lafontaine and Schmidt, 2013). However, herein they are treated as classical subfamilies of the family Noctuidae.

North of Syria is considered the north gate to Turkey and Europe, and it is located between 36° East to 37° West longitudes and 35° South to 36° North latitude, with eight divisions which belong to Aleppo Province and five ones to Idleb Province (Map 1). It is biologically and geologically diverse and includes hills, mountains and plains, which is considered one of the largest plains of Syria. The climate is moderately hot; the temperature ranges between 29°C-37°C in summer and between 5°C-8°C in winter with warm weather. Biogeographically it belongs to Palaearctic region (Keshera and Semsom, 2009).

Studies of the Syrian Lepidopteran fauna, especially the family Noctuidae are very limited, although numerous papers have been published on these moths as

agricultural pests (Ahmad, 2006) and (Al-Allam, 2009), but the taxonomical studies are comparatively poorly known from Syria (El Hariri, 1968 and 1976), where he mentioned 15 noctuid moths from Syria, without giving their exact localities in Syria.

Other works include Wiltshire (1952), Talhouk, (1996), Hacker (2001) and Gyulai and Ronkay (2006), the last added nine new species from different provinces of Syria (Damascus and Lattakia). Nevertheless, till now, there is no a comprehensive checklist of Syrian Noctuidae. Noctuid moths are known to be one of the most appropriate taxonomic groups for environmental evaluation. They are not only a large family numerically, but also extremely important economically by damaging many important crops, especially in their larval stages, which are well known as army-worms, cutworms, bollworms and stem-borers, and considered as serious agricultural pests in much of the world (Zahiri *et al.*, 2011). Nevertheless, their control being at present primarily chemical is also expensive and it can influence health, pollute water supplies through runoff, and can actually kill plants (Zahiri *et al.*, 2011). Consequently, the aim of this research study is to survey the Noctuidae of north Syria (Aleppo and Idleb Provinces) and to prepare a species list that contributes to the study of insect diversity in Syria.

#### MATERIALS AND METHODS

For collecting the adult Noctuid moths light traps were used (220V, 20watt Black light UVB tubes), which are considered one of the best methods to collect adults of a wide range of noctuid species (Ayberk *et al.*, 2010). In this study, the adult Noctuid moths were collected from several natural and agricultural ecosystems, from divisions of two provinces Aleppo and Idleb in North of Syria from March 2012 to the end of March 2013. Collected moths were killed by freezing and hereafter they were kept in relaxed conditions ready for pinning

and spreading. The preserved specimens were studied by a Binocular Microscope SC-S100. The photographs of moths were taken by a Canon SX40HS Digital Camera. Identification of moths was carried out by keys, standard reference books, and internet sources and with the help of some professional Lepidopterists, Prof. Dr. Ahmet Ömer Koçak from the Faculty of Science, Yüzüncü Yil University, Van, Turkey, Dr. Wolfgang Speidel the Zoologische Museum Witt, München, Germany, Dr. Peter Gyulai from the Hungarian Plant protection organization, Hungary, Dr. Reza Zahiri from the Biodiversity Institute of Ontario University of Guelph, Canada. The classification was based on Fibiger and Lafontaine (2005). All specimens examined were deposited in Department of Zoology, Faculty of Science, University of Aleppo, Syria.

#### RESULTS AND DISCUSSION

The present work gives the detailed information on Noctuid moths of North of Syria, along with their distribution in various regions (Table 1). In addition, the moths' flight periods, total number and number of generations of each species were presented (Table 2). All newly recorded (11 species) from the North of Syria (Aleppo and Idleb Provinces) were marked by an asterisk (Table 1). All 44 species are illustrated by images (Plates 1 -5).

The total 843 collected specimens of Noctuid moths belonged to 44 species, 31 genera, and 7 subfamilies (Table 3), which were recorded during the study period from 13 divisions of two provinces of Aleppo and Idleb.

The seven subfamilies were Bryophilinae, Catocalinae, Hadeninae, Heliiothinae, Noctuinae, Plusiinae, and Xyleninae. The last was the dominating subfamily, it consisted of 11 species (25% of the total number of species), Noctuinae was the second largest subfamily with 10 species (23%), the third was Hadeninae, consisted of 7 species, (16%), the fourth was

Catocalinae, with 6 species (14%), the fifth was Plusiinae with 5 species (11%), the sixth Heliiothinae with 4 species(9%), the seventh subfamily Bryophilinae with one species (2%) (Figure 1) and (Table 3).

The most abundant species at the study area were; *Agrotis segetum* ([Denis & chiffermüller], 1775), then *Caradrina montana* Bremer, 1861 follows by *Mythimna unipuncta* (Haworth, 1809) and then *Noctua pronuba* Linnaeus, 1758 (see Table 2). The rare species appeared as a single individual during the study period and were represented by 35% of the total number of species (see Table 2). The common species were *Mythimna unipuncta*, *Mythimna vitellina*, *Agrotis segetum*, *Noctua pronuba*, *Trichoplusia ni*, and *Spodoptera exigua*, which appeared in all study sites (see Table 1). The highest diversity of Noctuid moths during the study period was in spring and autumn, while in May 25 species were recorded that represented 56.8% of total number of recorded species. In October, 23 species were recorded that represented 52.2% of total number of the recorded species (see Table 2). The number of generations per year for the recorded species were indicated in the Table (2).

The number recorded in this study (44 species) is considered less than what was recorded in the existing literature. There are many of Noctuids species which were recorded from Syria and must be present in Syria, but only one species *Hadena (Anepia) syriaca* was found in the study site. Therefore, extensive survey of all the regions is required to understand the overall stock of the group, thus, it can be expected that with further research, in different parts of Syria, the recorded Syrian noctuid fauna will be considerably increased, which would not only help in assessment of its diversity, but also monitoring, conservation and management.

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## الفراشات الليلية في شمال سورية (محافظة حلب و إدلب) (Lepidoptera: Noctuidae)

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### ملخص

تمثلت الفراشات الليلية في شمال سورية بسبع فصائل، وضمت واحداً وثلاثين جنساً، وأربعاً وأربعين نوعاً، وسُجِّل منها إحدى عشر نوعاً لأول مرة في سورية. جُمعت الفراشات البالغة باستخدام المصائد الضوئية من مفترشات بيئية مختلفة، طبيعية وزراعية، خلال عام واحد اعتباراً من شهر آذار 2012 حتى شهر آذار 2013. بلغ عدد العينات المجموعة 843 عينة، وحُفظت العينات في كلية العلوم في قسم علم الحياة الحيوانية في جامعة حلب. يهدف هذا البحث إلى حصر الفراشات الليلية في شمال سورية في محافظتي حلب وإدلب، ومساهمتها في دراسة التنوع الحيوي للحشرات في سورية، ويتضمن البحث الاسم العلمي للأنواع المصنفة، مناطق جمعها، فترة تواجدها أو طيرانها، العدد الكلي وعدد الأجيال والصورة لكل نوع مُسجل.

**الكلمات الدالة:** رتبة حرشفية الأجنحة Lepidoptera، فصيلة الفراشات الليلية Noctuidae، الفراشات الليلية (العث) Moths، علم التصنيف Taxonomy، سورية.

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