Libyan Journal of Ecological & Environmental Sciences and Technology
(LJEEST)

LJEEST
ISSN: 2710-5237
www.srcest.org.ly/jou

DOI: https://doi.org/10.63359/wdg1c358

Introductory Survey of the Moths Species Under Grassland Created in Alghyran Park, Janzour Libya

Asmhan B Atia, Hussein S Msellati, Othman S Dakhli , Laylay S Mousay.

ARTICLE INFO

Vol. 3 No. 1 June, 2021
Pages (1- 4)

Article history:
Revised form 07 December 2020
Accepted 31 January 2021

Authors affiliation
Plant Protection Department, The higher and intermediate institute of agricultural technology, AL Ghyran– Janzour – Libya.
Othman504@yahoo.co.uk-

Keywords:
Survey, moths, species, grassland, ALGhyran.

ABSTRACT

A *preliminary* study of the moths species in AL Ghyran park, Janzour city which located in (the west coast of Libya) this study was conducted from June 2020 to September 2020 in grassland created Habitats. A total of 7 species (*Heliothis peltigera, Tetracis cachexiata, Sesamia nonagrioides, Pyrausta despicata, Agriphila inquinatella, Cornifrons ulceratalis* and *Acronicta aceris)* were recorded belonging to 3 families, including to (Noctuidae, Geometridae and Crambidae). there three very common species were recorded (*Pyrausta despicata, Heliothis peltigera and Sesamia nonagrioides*). nonetheless, there was one species seen two time on restore grassland (*Tetracis cachexiata*).

مسح تمهيدي لأنواع العث تحت المراعي المُنشأة في منتزه الغيران، جنزور، ليبيا

أسمهان بن عطية، حسين س المسيلاتى، عثمان س دخلى، ليلى س موساي.

أجريت دراسة أولية لحصر أنواع حشرات العث في منتزه الغيران بمدينة جنزور التي تقع في (الساحل الغربي لليبيا) أجريت هذه الدراسة في الفترة من يونيو 2020 إلى سبتمبر 2020 في البيئات العشبية التي تم إنشاؤها. تم تسجيل 7 أنواع وهى (*Heliothis peltigera, Tetracis cachexiata , Sesamia nonagrioides ,Pyrausta despicata* ، *Agriphila inquinatella, Cornifrons ulceratalis and Acronicta aceris*) وتنتمي إلى 3 عائلات ، بما في ذلك (Noctuidae، Geometridae و Crambidae). تم تسجيل ثلاثة أنواع شائعة جدًا (*Pyrausta despicata، Heliothis peltigera و Sesamia nonagrioides*). ومع ذلك ، كان هناك نوع واحد شوهد مرتين في الأراضي العشبية (*Tetracis cachexiata*).

INTRODUCTION

Insects have been the most species-rich taxon represented by nearly one million species in the world, more than half of all commonly recognized species (Gullan and Cranston, 2010; Resh and Cardé 2009). With 160,000 organisms described, Lepidoptera (butterflies and moths) has become one of the largest insect orders, of which 95 percent are moths (Van Nieukerken, et al., 2007; New ,2004). In several species, moths play a vital role as pollinators, herbivores and prey for a wide variety of organisms such as birds and bats (Vaughan N ,1997; Wickramasinghe, et al., 2004). The distribution and ecology of moths are well known in comparison to many

other invertebrates (Fox, et al., 2013) In recent decades, steep declines of moth populations have been observed. For instance, in Great Britain, the abundance of macro-moths decreased by 28% between 1968 and 2007 (Fox, et al., 2013) . Such declines are due to human activities and anthropogenic pressures have become one of the major causes of the loss of biodiversity and natural habitats around the world, including grasslands, forests, woodlands and wetlands (Bergman and Landin, 2002). In addition, agricultural practice and the other forms of land use are the greatest cause of habitat loss and fragmentation (Andren, 1994). nonetheless, there have been comparatively studies of the recent status of butterfly and moths species in these area especially Mediterranean basin .. In the Mediterranean Region, scientific studies on these species began in the 20th century, when many of the species and subspecies were described. The biogeography of Native to the mediterranean moth species, including over 4,500 species in sub-Saharan Africa, Arabia and Madagascar, was already studied extensively (Ackery et al. 1995; Larsen, et al, 2005). Documenting the diversity of moth fauna may lead to new insights through evolution and a first step throughout the development of conservation goals for the lepidopteron insects (Gadhikar et al., 2015). Being herbivorous predominantly, moths lead to the expectation that they will measure the quality of the vegetation in any location (Kitching et al., 2000). Unfortunately, there is no much scientific studies have been done on moths species in Libya with the exception of some references and technical reports on parks and nature reserves. The main objective of the study was to annotate an inventory of moths species in AL Ghyran park (the west coast of Libya).

MATERIALS AND METHODS

The study was carried out from June 2020 to September 2020, regarding their seasonal abundance the activity of moths was found higher in month of August (Gadhikar et al. 2015) in AL Ghyran park Janzour city which located in the west coast of Libya (13.0577534 "N, 32.8369041 "E) (Fig ,1). The study area was about 19h, The study region's landscape is dominated primarily by small forests and the region is covered by arable land and other land cover types (mires, parks, woodland). The field study was conducted semi-natural meadow patches that differed. Sites were selected through GIS shortlisting as well as recommendations from farm advisers. The aim was to select grassland fields that had been restored more than two years ago,

Fig. 1: the Location map of study areas

A light-source was used to sample moths at several sites (Muirhead-Thomson, 1991). The type used in these studies was a 250 W mercury-lithium (HgLi) bulb suspended next to the top edge of a vertical white sheet (1.8 × 1.8 m square). moths were identified with the help of field guides by Kehimkar (2008). moths were photographed by Digital camera with 40mm lens for further identification. In some cases, moths were captured that could not be identified directly by using insect collecting net. All scientific names and common names follow Kunte (2000). All sites were surveyed twice a week during the period of the study under good-weather between 4:00 to 7:00 PM. The abundance status provided here is based in to 4 categories: Very Common (VC), Common(C), Not Rare (NR) and Rare (R) on the basis of their count from the study area. Any species with count less than 10 times were placed in rare category, count between 10 and 15 were placed in not rare category, count between 15 and 20 were categorized as common while species with count more than 20 times were placed in very common category. (Solis, M. & Pogue, 1999)

RESULTS AND DISCUSSION

The field study resulted in the recording seven species of moths (**Table 1)** under 3 families were observed, (*Heliothis peltigera, Tetracis cachexiata , Sesamia nonagrioides ,Pyrausta despicata, Agriphila inquinatella , Cornifrons ulceratalis and Acronicta aceris)* were recorded belonging to 3 families, including to (Noctuidae , Geometridae and Crambidae). In the context of Family-level analysis of the number of species revealed that Highest numbers of individual observed (122) were under family Crambidae, followed by family Noctuidae (89) and family Geometridae (69).

Table 1. A list of butterfly species were recorded in in Janzour city (the west coast of Libya)

Common Name	Scientific Name	Family	Genus
The Bordered Straw	*Heliothis peltigera*	Noctuidae	Heliothis
White Slant-line Moth	*Tetracis cach exiata*	Geometrida e	Tetracis
The Mediterranean corn borer	*Sesamia nonagrioides*	Noctuidae	Sesamia
Straw-barred Pearl	*Pyrausta despicata*	Crambidae	Pyrausta
Small Moth	*Agriphila inquinatella*	Crambidae	Agriphila
Cornifrons ulceratalis	*Cornifrons ulceratalis*	Crambidae	Cornifrons
The Sycamore Moth	*Acronicta aceris*	Noctuidae	Acronicta

The result of this study showed that three very common species were recorded (**Table** 2**)** everywhere during period study (*Pyrausta despicata, Heliothis peltigera and Sesamia nonagrioides*). were present in all habitats and also because many species of these families are active fliers, which helps them to forage larger areas. However, one of the possible reasons for this difference could be due to the difficulties in observing moths because of their dull color and ability to fly rapidly following any disturbance. Many studies have reported the relationship between habitat heterogeneity and species diversity, The host plants of these moths species are known and common and for other moths species list recorded during this inventory all use larval host plants, These include *Senecio viscosus*, *Calendula officinalis*, *Atropa belladonna* and *Salvia pratensis* (Brown, K.S., 1997; Atauri and Lucio 2001; Tews et al. 2004).

Table 2: Showed The abundance status of Moths species

No	Species	The abundance status
1	*Pyrausta despicata*	VC
2	*Heliothis peltigera*	VC
3	*Sesamia nonagrioides*	VC
4	*Cornifrons ulceratalis*	C
5	*Acronicta aceris*	C
6	*Agriphila inquinatella*	NR
7	*Tetracis cachexiata*	R

Very Common (VC), Common(C), Not Rare (NR).

Rare (R). (Solis, M. & Pogue, 1999)

In most habitats, plant communities determine the physical structure of the environment, and therefore have considerable influence on the distributions and interactions of animal species (Bell et al. 2012). The highest diversity, minimum dominance, and occurrence of seven unique species of moths recorded may be attributable to its vegetation complexity and multi-layered canopy, which facilitate different sets of microclimates, making the habitat distinct for different moths species. Significant species which are rare and important moths species were recorded (*Tetracis cachexiata*) during the survey in study area, If confirmed, the sampling marks the first occurrence of this unusual moth in in the AL Ghyran park. The relative rarity of this species in collections, the lack of supporting literature, mean that more study should be done to confirm the resident status of this species at AL Ghyran park.

The moths fauna of the study area are very low when compared to the moths fauna of different protected areas Within the geographical scope of North Africa, the reason for this is there were few studies conducted Because of the high rate of land exploitation for housing and agriculture in the coastal strip, which directly and indirectly affected the abundance and diversity of these species.

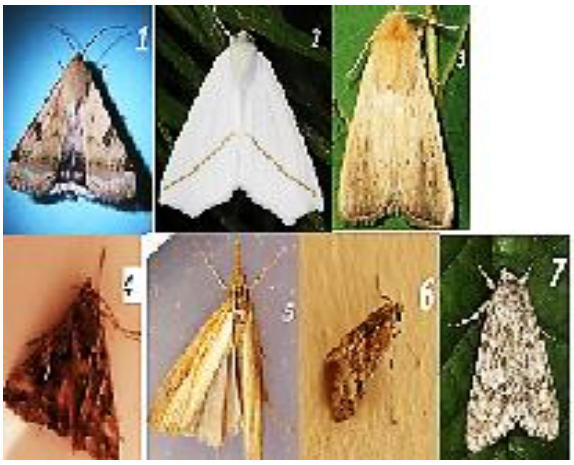

Fig. 2. of moth species recorded.

(1)*Heliothis peltigera* . (2) *Tetracis cachexiata.* (3) *Sesamia nonagrioides* . (4) *Pyrausta despicata* . (5) *Agriphila inquinatella* . (6) *Cornifrons ulceratalis and* (7) *Acronicta aceris.*

CONCLUSION

Our preliminary Inventory of the moths species in different habitat and patches adds to the burgeoning evidence that public parks and gardens and other natural

habitats are potential storehouses of biodiversity in transformed landscape. These small patches are able to support resident populations of moths Species richness and abundance., Thus, these relict forests are serving to foster persistence of moths species across a landscape matrix that is largely devoid of suitable habitat. It is evident that public parks and gardens would not replace large forest reserves due to their relative smaller sizes., We, therefore, strongly recommend that an integrated approach to forest and Natural Reserves management and conservation work should be adopted in this area.

REFERENCES

Ackery, P. R., Smith, C., & Vane-Wright, R. (1995). Carcasson's african butterflies: An annotated catalogue of the papilionoidea and hesperioidea of the afrotropical region CSIRO PUBLISHING.

Andren, H., 1994. Effects of habitat fragmentation on birds and mammals in landscapes with different proportions of suitable habitat: a review. Oikos, pp.355-366.

Atauri, J. A., & de Lucio, J. V. (2001). The role of landscape structure in species richness distribution of birds, amphibians, reptiles and lepidopterans in mediterranean landscapes. *Landscape Ecology*, *16*(2), 147-159.

Bell, S. S., McCoy, E. D., & Mushinsky, H. R. (2012). *Habitat structure: The physical arrangement of objects in space* Springer Science & Business Media.

Bergman, K., & Landin, J. (2002). Population structure and movements of a threatened butterfly (lopinga achine) in a fragmented landscape in sweden. *Biological Conservation, 108*(3), 361-369.

Brown, K. S. (1997). Diversity, disturbance, and sustainable use of neotropical forests: Insects as indicators for conservation monitoring. *Journal of Insect Conservation*, *1*(1), 25-42.

Cranston, P. J. G. (2010). *The insects: An outline of entomology/Penny J. gullan, peter S. cranston.*

Fox, R., Parsons, M., Chapman, J., Woiwod, I., Warren, M., & Brooks, D. (2013). The state of Britain's larger moths 2013. *Butterfly Conservation and Rothamsted Research, Wareham, Dorset, UK,*

Gadhikar, Y., Sambath, S., & Yattoo, I. (2015). A preliminary report on the moths (insecta: Lepidoptera: Heterocera) fauna from amravati, maharashtra. *International Journal of Science and Research*, *4*(7), 883-887.

Kehimkar, I. D. (2008). *Book of indian butterflies* Oxford University Press.

Kitching, R., Orr, A., Thalib, L., Mitchell, H., Hopkins, M. S., & Graham, A. W. (2000). Moth assemblages as indicators of environmental quality in remnants of upland australian rain forest. *Journal of Applied Ecology, 37*(2), 284-297.

Kunte, K. (2000). *India, a lifescape: Butterflies of peninsular india* Universities Press.

Larsen, T. H., Williams, N. M., & Kremen, C. (2005). Extinction order and altered community structure rapidly disrupt ecosystem functioning. *Ecology Letters*, *8*(5), 538-547.

Muirhead-Thomson, R. (1991). Plant pest responses to visual and olfactory 'sticky'traps. *Trap Responses of Flying Insects.Academic, CA,* , 180-196.

New, T. (2004). Moths (insecta: Lepidoptera) and conservation: Background and perspective. *Journal of Insect Conservation*, *8*(2-3), 79-94.

Resh, V. H., & Cardé, R. T. (2009). *Encyclopedia of insects* ,Academic press. 2nd Edition, Academic Press, Elsevier Science Publisher, London, Oxford, Boston, New York and San Diego, 953-957

Solis, M. A., & Pogue, M. G. (1999). Lepidopteran biodiversity: Patterns and estimators. *American Entomologist*, *45*(4), 206-212.

Tews, J., Brose, U., Grimm, V., Tielbörger, K., Wichmann, M. C., Schwager, M., & Jeltsch, F. (2004). Animal species diversity driven by habitat heterogeneity/diversity: The importance of keystone structures. *Journal of Biogeography*, *31*(1), 79-92.

Van Nieukerken, E. J., Kaila, L., Kitching, I. J., Kristensen, N. P., Lees, D. C., Minet, J., . . . Simonsen, T. J. (2011). Order lepidoptera linnaeus, 1758. in: Zhang, Z.-Q.(ed.) animal biodiversity: An outline of higher-level classification and survey of taxonomic richness. *Zootaxa*, *3148*(1), 212-221.

Vaughan, N., Jones, G., & Harris, S. (1997). Habitat use by bats (chiroptera) assessed by means of a broad-band acoustic method. *Journal of Applied Ecology*, , 716-730.

Wickramasinghe, L. P., Harris, S., Jones, G., & Vaughan Jennings, N. (2004). Abundance and species richness of nocturnal insects on organic and conventional farms: Effects of agricultural intensification on bat foraging. *Conservation Biology*, *18*(5), 1283-1292.

Wilson, R.J. P. J. Gullan and P. S. Cranston: The insects: an outline of entomology (4th edition). J Insect Conserv 14, 745–746 (2010). https://doi.org/10.1007/s10841-010-9351-x