Egypt. Acad. J. Biolog. Sci., 6(3): 39 -47 (2013) A. Entomology
Email: egyptianacademic@yahoo.com ISSN: 1687–8809
Received: 25 / 9 /2013 www.eajbs.eg.net

# Diversity of arthropod harbored Mitnan, *Thymelaea hirsute*, shrub under rain-fed conditions of Habbes valley, Matrouh, Egypt

**Imam, A. I.[1] and Rabab F. Sawaby[2]**
1- Plant Protection Department, Desert Research Center, Mataria, Cairo, Egypt
2- Entomology Department, Faculty of Science, Ain Shams University, Cairo, Egypt

## ABSTRACT

Mitnan, *Thymelaea hirsute* (L.), is one of the abundantly distributed endemic shrubs in Matrouh's valleys. It acts as an alternative host for a vast range of arthropod species that may cause great damage for the economic cultivations. So the present work was carried out to study the arthropod diversity harbored Mitnan shrub. The collected species were belonging to 8 orders among which, order Hemiptera was the highest represented one, followed by Thysnoptera, Scorpions, Hymenoptera and Lepidoptera, respectively. While, orders Diptera, Collembola and Coleoptera showed the lowest representation. Scouting process using the direct count method showed the surpassing of both species and individuals of the order Hemiptera with higher representation of herbivorous individuals than beneficial ones. Among arthropod species that recovered by sweeping net method, Hymenopterous ones came on the top of the list, whereas swept individuals showed that, dipterous species that belonged to family Cecidomyiidae came firstly by 6 total collected individuals. During the context of this study, the olive scale insect; *Parlatoria oleae* (Colvée) was recorded for the first time on Mitnan. Calculated diversity indices exhibited that, arthropod community harbored Mitnan shrub had high species richness (14), but as it was dominated by 3 species so that the diversity of this community is moderate.

**Keywords:** Mitnan shrub, *Thymelaea hirsute*, Arthropod diversity, North western coast, Rain-fed condition, Habbes valley, Matrouh Governorate and Egypt.

## INTRODUCTION

Egyptian north western coast, Matrouh Governorate, is characterized by great number of valleys. These valleys have huge amount of wild endemic flora that became highly adapted to the prevailing environmental conditions of such valleys (temperature, relative humidity, water deficiency, salinity...*etc*.). This wild flora harbored great diversity of arthropod fauna. The main two categories are plant feeders (herbivores) and natural enemies (insectivores). All these fauna survive together under a state of balance that ensure neither eradication nor outbreak of any. Due to the capability of both olive and fig trees to withstand the severe environmental conditions characterized such valleys (the drought, intense heat during summer season, rain-fed irrigation and salinity), Matrouh's Bedouins are strongly motivated for the agricultural expansion of both olive and fig orchards within these valleys as a source of their income increase. Such type of monoculture extension disturbs the balanced state and consequently leads to the outbreak of certain herbivorous species inducing economic injuries of these plants. At the end of injury inducing season, such herbivore may return to its wild host that act as a source of nourishment and safe refuge during the off-season (non-injury season). On such alternative host more than one reason can participate in hindering the population buildup of such herbivorous species; the adverse environmental conditions that may responsible for the natural death of huge

numbers of herbivore individuals, the few census of this alternative hosts and the endemic natural enemies. On the other hand, these wild hosts may act as a starting point for the herbivores to attack economic crops during the next injury season. Accordingly, this study aimed to explore the arthropod diversity that harbored one of the commonly distributed endemic shrubs in Matrouh's valleys, which is Mitnan shrub, *Thymelaea hirsute* (L.), to detect the herbivorous species that may migrate from it to attack the economic cultivations and to measure their diversity.

## MATERIALS AND METHODS

### Study site and sampling methods

Habbes valley, approximately 17 km north western of Mersa Matrouh City, Matrouh Governorate was selected for carrying out the present study. In this valley all traditional agricultural practices that performed in all western coast valleys were performed. To study the faunastic composition harboured Mitnan plant, two monitoring methods were applied.

### Direct count

This method was applied to monitor non-flying and immature stages of some investigated arthropods. From 2 specific sites in Habbes valley in which Mitnan shrub is spreading out, such sampling technique was carried out from October 2011 till July 2012 (autumn, winter and spring seasons). In the neighbor of these selected sites, wide olive and fig cultivated areas are present beside some scattered grapevines. The count was timed during early morning where insects still settled within the plant canopy. The whole vegetative (shooting) system of Mitnan plant was bi-weekly inspected (3 canopy/ inspection date).

### Sweeping net

Sweeping net is the most important technique to retrieve flying arthropods. Where, ten double sweeps were carried out after the inspection of non-flying arthropods also in a fortnight manner and during the previous investigation period. Samples that collected by both techniques were emptied in labeled collecting jars and transferred to the laboratory.

### Arthropod identification

Adult specimens that have been caught were killed using 70% ethanol solution and examined under stereomicroscope, whereas immature ones were incubated till adult emergence. Such arthropods were categorized according to Maleque *et al*. (2007) to functional groups based on feeding habits: herbivores, natural enemies, pollinators and scavengers. Number of individuals and species of each sample were recorded. All collected arthropods were identified to families based on specific identification keys. Identification of collected arthropods was carried out using the following keys; Priesner and Alfieri (1953), Borror *et al*. (1976), Imms (1977), Goulet and Huber (1993) and The Fauna Europaea database (2004). Scale insect specimens were kindly identified by Prof. Dr. / Ekram I. Helmy, Plant Protection Research Institute, Agricultural Research Centre, Dokki, Giza, Egypt.

### Species richness and species diversity:

### Species richness

Species richness (R) is based on the number of species found in a given area and does not reflect the relative dominance of any species (Marshall *et al*., (1994). The formula for species richness is:

$R = s$ Where,

s = number of species

Simpson's Diversity Index

Simpson's Index (D) is depending on the number of species and their relative dominance (Danks (2006). The formula is:

$$D = 1 - \sum_{i=1}^{s} \left(\frac{ni}{N}\right)^2$$ Where,

s = number of species

*i* = a given species

n*i* = number of individuals of species *i*

N = total number of individuals collected (for all species)

D will approach 1 as diversity is maximized.

## RESULTS AND DISCUSSION

Mitnan plant that is abundantly distributed in an endemic state throughout the whole North Western coast, especially in valleys, showed great arthropod diversity. Such arthropod species, as shown in Table (1), were belonged to 8 orders. Among which, order Hemiptera was the highest represented one, which repeated 22 times throughout the whole investigation period. On the contrary, each of Diptera, Collembola and Coleoptera showed the lowest representation by only one appearance. Thysnoptera and Scorpions through their 7 and 6 times frequencies shared both second and third ranks, respectively. Eventually, Hymenoptera and Lepidoptera occupied fourth and fifth levels, respectively by 3 and 2 times incidence.

Representation percentages of each order were graphically illustrated in Fig. (1). Where, as order Hemiptera took the maximum share by about 51.16%, orders Diptera, Collembola and Coleoptera were of minimal representation (2.33% for each one). Remaining orders were of in-between representation.

Table 1: Representation percentages of detected arthropod orders associated with Mitnan plant, Matrouh Governorate, Egypt

| Detected orders | Hemiptera | Thysanoptera | Scorpions | Hymenoptera | Lepidoptera | Diptera | Collembola | Coleoptera | Total |
|---|---|---|---|---|---|---|---|---|---|
| Frequency | 22 | 7 | 6 | 3 | 2 | 1 | 1 | 1 | 43 |
| % representation | 51.16 | 16.28 | 13.95 | 6.98 | 4.65 | 2.33 | 2.33 | 2.33 | 100.00 |

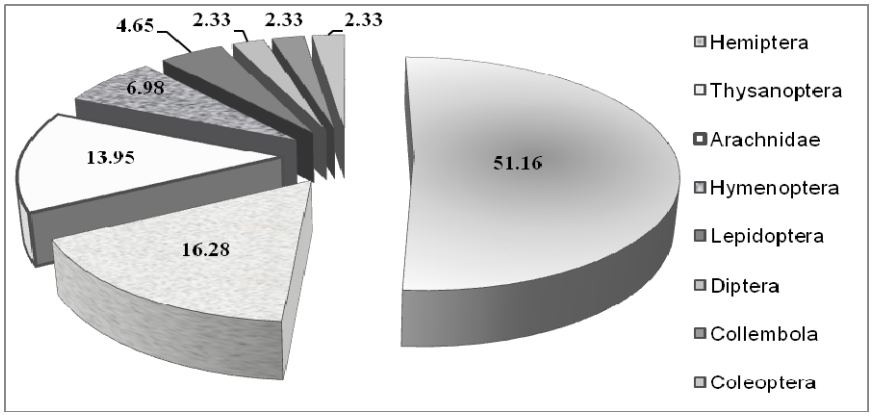


Fig. 1: Representation percentages of detected arthropod orders associated with Mitnan plant.

The detected species of each order that caught by direct count method was illustrated in Table (2). Where, due to the misidentification of Scorpion species, such species weren't represented herein. Represented data declared the surpassing of the total number of Hemipterous species, which represented by 5 species; 4 pest and 1 natural enemy species. The remaining orders were of only one detected species. Through comparing the different categorized species, Table (2) revealed the highest representation of herbivorous species that represented by 6 species comparing with 2 and 1 species for natural enemy and scavenger species, respectively.

Table 2: Number of arthropod species harboured Mitnan plant caught by direct count method, Matrouh Governorate, Egypt

| Orders | Number of species | | | Total |
|---|---|---|---|---|
| | Pest species | Natural enemy species | Others | |
| Hemiptera | 4 | 1 | 0 | 5 |
| Lepidoptera | 1 | 0 | 0 | 1 |
| Thysanoptera | 1 | 0 | 0 | 1 |
| Collembola | 0 | 0 | 1* | 1 |
| Coleoptera | 0 | 1 | 0 | 1 |
| Total | 6 | 2 | 1 | 9 |

* This species was scavenger.

On the same sequence, detected numbers of individuals of each order that caught by direct count method were illustrated in Table (3). Detected Hemipterous individuals came on the top of the list by 122 total caught individuals. Of which, 98 individuals were belonged to herbivorous species and 24 individuals were of the predacious bug, *Orius albidipennis* Reuter. Among Hemipterous herbivores, certain immature stage was observed as a leaf feeder (field observation) and from which 37 individuals were surveyed through the whole study period. Thereafter, 33 individuals of olive scale, *Parlatoria oleae* (Colvée), were detected attacking Mitnan plant. Where, among its all documented hosts, the detection of such sap sucker species on *Thymelaea hirsute* (L.) shrub was documented for the first time. In Algeria, Biche and Sellami (2011) and Kennett (1967) decided that, among the species belonging to the tribe Parlatorini, *P. oleae* was known as pest of *Olea europaea* and many other fruit trees. Accordingly, Abd-Rabou *et al*., (2012) in Egypt stated that, scale insects are the major pests infesting apple, apricot and pear orchards. Where, during the present study, *P. oleae* (Colvée) was of twice detection during December 2011 and February 2012. That is to say, after *P. oleae* attacks olive tree during spring and autumn seasons (Biche and Sellami, 2011), it spend winter season on Mitnan shrub. Therefore, such observation could be exploited through managing this herbivore species on Mitnan plant before its migration to attack olive tree. The remaining Hemipterous species were represented by 27 and 1 individuals for *Oxycarenus hyalinipennis* (A. Costa) and *Aphis gossypii* Glover, respectively. Order Thysanoptera was represented by 92 individuals under only one species *Thrips tabaci* Lindeman. True predacious spiders that belonged to order Scorpions were represented by 10 individuals and occupying the third rank. During field survey, 8 lepidopterous larval stages of the European grapevine moth, *Lobesia botrana* (Denis & Schiffermüller) were detected attacking Mitnan plant during January 2012 and February 2012. Many authors previously confirmed that Mitnan shrub is the wild host of *L. botrana*. The grape berry moth, *L. botrana*, according to Dimitrios and Mathilde (1998) is the major pest in vineyards of southern Europe. *L. botrana* is a polyphagous species with reported host plants belonging to 27 plant families, including Vitaceae, Thymelaeaceae, Rosaceae, Oleaceae, Ranunculaceae, Polyggonaceae, Apiaceae, Asteraceae, Convolvulaceae and

Rhamnaceae (Roditakis, 1989 and Moleas, 1988). As previously mentioned, the detection of alternative host of *L. botrana* could be served as an early step for the controlling program of such pest. *Sminthurius* sp., which was the only detected species of order Collembola, was represented by 4 individuals. Such species according to Wallace (1967) was of scavenger behaviour. The lowest represented species was the predacious ladybird, *Coccinella septempunctata* Linnaeus (O: Coleoptera), which represented by only one individual. As shown in Table (3), the total numbers of collected individuals were 237 ones, from which herbivores occupied the maximum share by 198 individuals followed by 35 individuals from predacious species and 4 scavenger ones.

Table 3: Number of detected arthropod individuals harboured Mitnan plant that caught by direct count method, Matrouh Governorate, Egypt.

| Orders | Family | Pest species | | | Natural enemy species | | | Others | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No. of individuals | | Total | No. of individuals | | Total | No. of individuals | | Total | |
| Hemiptera | --- | Immature species* | 37 | 98 | --- | 0 | 24 | --- | 0 | 0 | 122 |
| | Diaspididae | *Parlatoria oleae* (Colvée) | 33 | | --- | 0 | | --- | 0 | | |
| | Lygaeidae | *Oxycarenus hyalinipennis* (A. Costa) | 27 | | --- | 0 | | --- | 0 | | |
| | Aphididae | *Aphis gossypii* Glover | 1 | | --- | 0 | | --- | 0 | | |
| | Anthocoridae | --- | 0 | | *Orius albidipennis* Reuter | 2<br>4 | | --- | 0 | 0 | |
| Thysanoptera | Thripidae | *Thrips tabaci* Lindeman | 92 | 92 | --- | 0 | 0 | --- | 0 | 0 | 92 |
| Arachnidae | --- | --- | 0 | 0 | --- | 0 | 0 | --- | 0 | 0 | 10 |
| Lepidoptera | Torticidae | *Lobesia botrana* (Denis & Schiffermüller) | 8 | 8 | --- | 0 | 0 | --- | 0 | 0 | 8 |
| Collembola | Sminthuridae | --- | 0 | 0 | --- | 0 | 0 | *Sminthurius* sp. | 4 | 4 | 4 |
| Coleoptera | Coccinellidae | --- | 0 | 0 | *Coccinella septempunctata* (Linnaeus) | 1 | 1 | --- | 0 | 0 | 1 |
| Total | | 198 | | | 35 | | | 4 | | | 237 |

*The feeding behavior of the immature species as herbivores was determined according to field subsequent observations

Similar to that stated for the direct count method, swept arthropod species were also arranged. Hymenopterous and hemipterous species came firstly by 2 species. Hymenopterous species were 1 natural enemy and 1 pollinator whereas; hemipterous ones were represented by 2 herbivores. Thereafter, dipterous species came later by 1 herbivore. Accordingly, the total swept species was 5 ones; 3 of which were herbivores and the other 2 were belonged to beneficial species (1 natural enemy and 1 pollinator).

Through considering the swept individuals, Table (5) declared that, dipterous species that belonged to family Cecidomyiidae came firstly by 6 total collected individuals, whereas swept individuals of order Hymenoptera (4 individuals) occupied the second rank. Such hymenopterous species were of beneficial behavior. Where, *Brachymerya femorata* Panzer (F: Chalcididae) is pupal parasitoids, on harmony with Kamal, (1937) *B. femorata* is an important parasite attacking the fresh pupae of the cabbage worm, *Pieris rapae*. The remaining hymenopterous species *Apis mellifera* Linnaeus played its role in the pollination process (transferring pollens from male flowers to female ones). In the last category, order Hemiptera came by 3 herbivorous individuals belonged to family Cicadellidae.

Table 4: Number of arthropod species harboured Mitnan plant caught by sweeping net method, Matrouh Governorate, Egypt.

| Orders | Number of species | | | Total |
|---|---|---|---|---|
| | Pest species | Natural enemy species | Others | |
| Hymenoptera | 0 | 1 | 1* | 2 |
| Hemiptera | 2 | 0 | 0 | 2 |
| Diptera | 1 | 0 | 0 | 1 |
| Total | 3 | 1 | 1 | 5 |

* This hymenopterous species was pollinator.

Accordingly, the total numbers of the swept arthropod individuals as shown in Table (5) were 13 individuals; 9 of which were herbivores, 3 were pupal parasitoids and the last individual was pollinator.

Table 5: Number of detected arthropod individuals harboured Mitnan plant that caught by sweeping net method, Matrouh Governorate, Egypt

| Orders | Family | Pest species | | Natural enemy species | | | Others | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | | No. of individuals | Total | No. of individuals | | Total | No. of individuals | | Total | |
| Diptera | Cecidomyiidae* | 6 | 6 | --- | 0 | 0 | --- | 0 | 0 | 6 |
| Hymenoptera | Chalcididae --- | 0 | 0 | *Brachymerya femorata* Panz. | 3 | 3 | --- | 0 | 1 | 4 |
| | Apidae --- | 0 | | --- | 0 | | *Apis mellifera* Linnaeus | 1 | | |
| Hemiptera | Cicadellidae* | 3 | 3 | --- | 0 | 0 | --- | 0 | 0 | 3 |
| Total | | 9 | | 3 | | | 1 | | | 13 |

* Unidentified species were represented by their families.

**Species richness and species diversity**

The benefits of the aforementioned data could be maximized through exploiting it to give a synopsis insight about the diversity indices of Mitnan's arthropods (Species richness (R) and Simpson's (D) indices). As, R value based solely on the number of species found in a given area and does not reflect the relative dominance of any species, so species richness value (R) was 14 with the exception of Scorpion species (Table 6). The more species present in a sample the 'richer' the area. Species richness as a measure on its own, takes no account of the number of individuals of each species present, *i.e*., it gives equal weight to those species with very few individuals and those with many individuals. A better measure of diversity should take into account the abundance of each species. Simpson's index (D) is a measure of diversity, which takes into account both species richness and an evenness of abundance among the species present. On harmony, Danks (2006) stated that, Simpson's Index (D) is a vital way for real assessment of diversity since it depends on the number of species and their relative dominance. Accordingly, data illustrated in Table (6) declared that, arthropod community harbored Mitnan shrub was of moderate diversity. That is to say, as such community had high species richness (14), but it was dominated by only three species (*Thrips tabaci*, immature hemipterous species and *Parlatoria oleae*) so that the diversity of this community is moderate. In the same context, Routledge (1979) stated that community dominated by one or two species is considered to be less diverse than one in which several different species have a similar abundance.

Such moderate diversity of arthropod harbored Mitnan shrub may be attributed by the changing of the balanced system (ecosystem) characterized Hobbes valley into

agro-ecosystem with great spreading of mono-crop agricultural profile (fig and olive orchards). Marshall *et al*., (1994) suggested that low species diversity maybe due to:

1- Relatively few successful species in the habitat
2- The environment is quite stressful with relatively few ecological niches and only few organisms are really well adapted to that environment
3- Food webs are relatively simple.
4- Change in the environment may have quite serious effects

Table 6: Species richness and species diversity of arthropods harboured Mitnan shrub, Matrouh Governorate, Egypt.

| Arthropod species (s) | Number of individuals of each species | | | |
|---|---|---|---|---|
| | n | n / N | $(n / N)^2$ | $\sum_{i=1}^{s} \left(\frac{ni}{N}\right)^2$ |
| *Oxycarenus hyalinipennis* | 27 | 0.108 | 0.011664 | |
| Immature sp. | 37 | 0.148 | 0.021904 | |
| *Thrips tabaci* | 92 | 0.368 | 0.135424 | |
| *Parlatoria oleae* | 33 | 0.132 | 0.017424 | |
| *Lobesia botrana* | 8 | 0.032 | 0.001024 | |
| *Aphis gossypii* | 1 | 0.004 | 0.000016 | |
| *Orius albidipennis* Reuter | 24 | 0.096 | 0.009216 | 0.19776 |
| *Coccinella septempunctata* | 1 | 0.004 | 0.000016 | |
| *Sminthurius* sp. | 4 | 0.016 | 0.000256 | |
| F: Cicadellidae | 3 | 0.012 | 0.000144 | |
| F: Cecidomyiidae | 6 | 0.024 | 0.000576 | |
| *Brachymerya femorata* | 3 | 0.012 | 0.00008 | |
| *Apis mellifera* | 1 | 0.004 | 0.000016 | |
| Scorpions | 10 | 0.108 | 0.011664 | |
| Total number of insects (N) | 250 | | | |
| Species richness (R)* = s | | | | 14 |
| Simpson's index (D) $= 1 - \sum_{i=1}^{s} \left(\frac{ni}{N}\right)^2$ | | | | 0.80224 |

* Species richness was measured without considering scorpion species due to their misidentification.

In order to give a real estimate of biodiversity, predation and parasitization behaviors that characterize natural enemy-pest relationships must be taken into consideration, which needs further studies.

## REFERENCES

Abd-Rabou, S.; Noha, A. and Hoda B. (2012): Scale insects (Hemiptera: Coccoidea) infesting apple, apricot, pear trees and their abundant parasitoids in Egypt. Egypt. Acad. J. Biolog. Sci., 5(1): 25-29.

Biche, M. and Sellami, M. (2011): Biology of *Parlatoria oleae* C. (Homoptera, Diaspididae) in the area of Cap-Djenet (Algeria). Agric. Biol. J. N. Am., 2011, 2(1): 52-55

Borror, J. D.; Delong, D. M. and Triplehorn, C. A. (1976): An introduction to the study of insects. New York, 852 pp.

Danks, H. V. (2006): How to assess insect biodiversity without wasting your time. Published by the Biological Survey of Canada (Terrestrial Arthropods) Ottawa1996 [Reprint edition 2006].

Dimitrios, G. S. and Mathilde, S. S. (1998): Larval performance on and oviposition preference for known and potential hosts by *Lobesia botrana* (Lepidoptera: Tortricidae). Eur. J. Entomol., 95: 55 – 63.

Goulet, H. and Huber, J. (1993): Hymenoptera of the world: an identification guide to families. Agriculture Canada Publication 1894\E. 668pp.

Imms, A. D. (1977): A general text book of Entomology. Methuen & co. LTD. London. 698 pp.

Kamal, B. A. (1937): *Brachymeria femorata* Panz. (Hymenoptera: Chalcididae) a primary parasite of the cabbage worm *Pieris rapae* L. Bull. Soc. Roy. Entomol. Egypt., Séance du 25 janvier, 5 – 26.

Kennett, C. E. (1967): Biological control of oliver scale, *Parlatoria oleae* (Colvée), in a deciduous fruit Orchard in California. Entomophaga, 12 (4): 461 – 474.

Maleque, A. M.; Ishii, H. T.; Maeto, K. and Taniguchi, S. (2007): Line thinning fosters the abundance and diversity of understory Hymenoptera (Insecta) in Japanese cedar (*Cryptomeria japonica* D. Don) plantations. J. For. Res., 12: 14-23.

Marshall, S. A.; Anderson, R. S.; Roughley, R. E.; Behan-Pelletier, R.E. and Danks. H. V. (1994): Terrestrial arthropod biodiversity: planning a study and recommended sampling techniques. A brief. Bull. Entomol. Soc. Canada, 26(1): 1 - 33.

Moleas, T. (1988): *Lobesia botrana* Den. et Schiff (Trotricidae: Lepidoptera), a potential danger to kiwi fruit (*Actinidia chinensis* Planchon). Inftore Fitopatol. 38 (12): 71 – 73.

Priesner, H. and Alfieri, A. (1953): A review of the Hemiptera-Heteroptera known to us from Egypt. Bull. Soc. Entomol. Egypt, 37:1-119.

Roditakis N. E. (1989): Factors affecting population size of grape berry moth *Lobesia botrana* Den. and Schiff. in Crete. In Cavalloro R. (ed.): Influence of Environmental Factors on the Control of Grape Pests, Diseases and Weeds. Proceeding of a Meeting of the EC Experts Group, Thessaloniki- Greece, 6 – 8 October 1987. A. A. Balkema, Rotterdam, pp. 69 – 76.

Routledge, R. D., (1979): Diversity indices: Which ones are admissible? J. Theoretical Biol., 76:503–515.

The Fauna Europeae database (2004): http://www.faunaeur.org.

Wallace, M. M. H. (1967): The ecology of *Sminthurus viridis* (L.) (Collembola). I. Processes influencing numbers in pastures in Western Australia. Australian J. Zool., 15 (6): 1173 – 1206.

## ARABIC SUMMARY

### تنوع مفصليات الأرجل المرتبطة بعشبة المثنان (L.) *Thymelaea hirsute* تحت ظروف الزراعة المطرية بوادى حابس – مطروح - مصر

**أحمد إبراهيم إمام و رباب فتحى صوابى**

1- قسم وقاية النبات – مركز بحوث الصحراء – المطرية – القاهرة – مصر

2- قسم علم الحشرات – كلية العلوم – جامعة عين شمس – القاهرة – مصر

تعتبر عشبة المثنان *Thymelaea hirsute* (L.), من أكثر النباتات المتوطنة والمنتشرة بأودية مطروح حيث تلجأ اليها العديد من أنواع مفصليات الأرجل كعائل بديل وأمن. وقد إستهدفت هذه الدراسة رصد تنوع مفصليات الأرجل المرتبطة بعشبة المثنان. وبحصر هذه الأنواع تبين أنها تنتمى لثماني رتب. كانت رتبة نصفية الأجنحة هى الأعلى تمثيلا تلاها رتب هدبية الأجنحة والعناكب الحقيقية وغشائية وحرشفية الأجنحة على التوالى. فى حين كانت رتب ثنائية وغمدية الأجنحة ورتبة قافزات الذنب هى الأقل تمثيلا. وقد أظهرت نتائج الحصر بإستخدام طريقة العد المباشر تفوق تعداد الأنواع والأفراد من رتبة نصفية الأجنحة بالإضافة الى التمثيل الأعلى لأنواع الآفات عن أنواع الاعداء الحيوية. ومن بين الأنواع التى تم حصرها بإستخدام شبكة كنس الحشرات جاءت الأنواع من رتبة غشائية الأجنحة على رأس القائمة بينما تفوق تعداد الأفراد من رتبة ثنائية الأجنحة والتى تنتمى لعائلة Cecidomyiidae بعدد ستة أفراد. وقد تم التسجيل الأول لعشبة المثنان كعائل بديل لحشرة الزيتون القشرية خلال سياق هذه الدراسة. وبحساب دلائل التنوع لوحظ أن مفصليات الأرجل المرتبطة بعشبة المثنان ذات ثراء كبير فى عدد الأنواع الممثلة (14 نوع) بينما كانت السيادة لثلاثة أنواع فقط وعلية فان مستوى التنوع الذى تم رصده أثناء الدراسة يعتبر تنوعا متوسطا.

الكلمات المفتاحية: عشبة المثنان - *Thymelaea hirsute* – تنوع مفصليات الأرجل – الساحل الشمالى الغربى – الزراعة المطرية – وادى حابس – محافظة مطروح – مصر.