



Taxonomic Studies of Some Cryptostigmatic Mites species inhabiting soil in Baghdad (Al-Jadiriya)

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Abstract

The soil acari fauna (Cryptostigmat) in soil of Baghdad in Jadiriya area was studied in a total of 16 monthly samples through a period of 12 months (December 2009-November 2010). A new record of one genus for Iraq named (*Malloconthrius* sp.), and one species named *Eupelops plicatus* out of seven mite group Cryptostigmata which isolated from the soil. Two species were recorded during the present study as dominants named (*Ceratozetes gracilis*, *Perlohmania dissimilis*). The Cryptostigmatid mites are the most common soil inhabiting and saprophagous animals the ordinal composition of the soil acari fauna was predominantly Cryptostigmata sp disturbance of these factors generates modifications of numerical densities and the presences of mites in a favorite ecosystem depend on these factors.

Keywords: Cryptostigmata, Mites. predominantly

دراسة تصنيفية لبعض أنواع الحلم من رتبة Cryptostigmata التي تقطن التربة في بغداد (الجادرية)

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الخلاصة

درست مجموعة الحلم من نوع Cryptostigmata التي تقطن التربة الطبيعية (الغير معاملة بالاسمدة الكيماوية) في بغداد منطقتي الجادرية من مجموع 16 نموذجاً شهرياً خلال 12 شهر. سجلت 7 نماذج خلال الدراسة الحالية منها نوع واحد *Eupelops plicatus* والجنس *Malloconthrius* تسجل لأول مرة في العراق. أيضاً سجلت نوعين منها كأنواع سائدة بالتربة (*Ceratozetes gracilis*, *Perlohmania dissimilis*)، ثم اتخذ بنظر الاعتبار العوامل المؤثرة على تواجد وكثافة الأنواع والتي تشمل رطوبة نسبية وحرارة الجو ورطوبة وطبيعة وحمضية التربة حيث ان اي تغيير في هذه العوامل سوف يؤثر على كثافة تواجدها.

Introduction

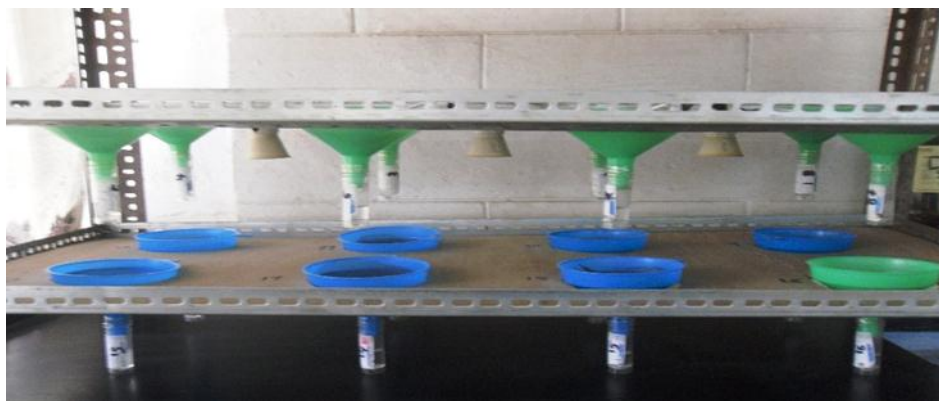
It is well known that the soil arthropoda is one of an essential part in biological fertility of the soil. Their activity contributes greatly to organic decomposition, the synthesis of humus, the restitution of biogenic element and the stimulation of fungal and bacterial metabolism, the mesofauna which includes subclass acari are involved both directly [1, 2] and indirectly [3] in this process. The acari fauna of soil has been studied extensively by many workers among them [4-10]. The Investigation on soil acari fauna in Iraq is scarce. The only work on this fauna that which reported by [11] from Palms-Citrus orchards and that by [12] this fauna Checklist by [13].

The main objective of this study is to investigate the soil acari Cryptostigmata in Baghdad providing more information regarding the checklist of this fauna.

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Materials and Methods

A total of 16 monthly samples were collected randomly from the natural soil in Baghdad (Al-Jadiriya) over a period of 12 months from December 2009 to November 2010. All the samples were taken from the top of 10 cm by a steel Core-Sampler with case hardened cutting edge [14] consisted of a 6.3 cm diameter cylinder narrowing to 5.8 cm at the cutting edge, to avoid compression of soil sample. These samples were individually extracted in the laboratory through a modified Tullgren funnels extractor plat-1. This area is grass and arable land, contains several plant sp. which include: (*Aster subulatus*, *Convolvulus pilosellaefolius*, *Chenopodium album*, *Cynodon dactylon*, *Datura innoxia*, *Glycerrhiza glabra*, *Lycium barbarum*, *Malva parviflora*, *Silybum marianum*, *Solanum nigrum*, and date palme trees)



Plat 1- The extraction apparatus (Tullgren funnels)

The extracted mites were cleared by heating in 50% Lactic acid then mounted in Moyer's medium on glass slides, and examined under a phase-contrast microscope. The analysis of soil where the samples were taken showed that it was clay loamy with 0.81 percentage of organic matter with 7.9pH.

Results and Discussions

Table 1- Occurrence of Cryptostigmata species in soil. D: dominance (% of total individuals), F: frequency (% occurrence in samples)

| Species | Occurrence % | |
|--|--------------|-----------|
| | Frequency | Dominancy |
| <i>Ceratozetes gracilis</i> (Michael). | 66.0 | 82.2 |
| <i>Oribella paolii</i> (Ouds) | 4.8 | 29.1 |
| <i>Oribatula sp.</i> | 1.6 | 14 |
| * <i>Malaconthrius sp.</i> | 0,03 | 0.5 |
| <i>Perlohmania dissimilis</i> (Hewitt) | 6.5 | 33.8 |
| <i>Eupelops plicatus</i> . | 0.03 | 0,5 |
| <i>Oppia sp.</i> | 0.06 | 1.04 |

This table depended on this rules:

$$\alpha = \frac{S - 1}{\log e N}$$

Whereas α is the index of diversity

S is the number of species

e is the base of natural logarithm

N is the number of individuals

.Dominancy- :

$$D = \frac{\text{No. of individuals}}{\text{Total No. of mites}} \times 100$$

1-Dominant: -5% or more of the total number of individuals.

2-Influent: -5-2% of the total number of individuals.

3-Resident: -2% or less of the total number of individuals.

.Frequency- :

The following frequency classes used by Krogerus (1932) have been adopted in this study- :

$$F = \frac{\text{No. of positive samples}}{\text{No. of total samples}} \times 100$$

- 1-Constant: -species occurs in more than 50% of the samples.
- 2-Accessory: -species occurs in 25-50% of the samples.
- 3-Accidental: -species occurs in less than 25% of the sample

The statistical analysis system –SAS (2004) program was used to the effect of factors in study traits. The least significant difference (LSD) test was used to the significant compare between means. Calculated of correlation between density (total no. of mites) and study traits in SAS program.

A new record of one genus for Iraq named (*Malloconthrius* sp.), and one species named *Eupelops plicatus* out of seven mite group Cryptostigmata which isolated from the soil, However the remaining (5) species were previously reported from Iraq by [15- 21]. Table-1.

The dominancy and frequency of occurrence of these species varied from one species to another, the most dominance and frequency species were *Ceratozetes gracilis* (Michael). The species occurred in 66.0% of the total samples respectively.

The seasonal changes in the ordinal composition of Cryptostigmatized mites are shown in Figure-1 the highest percentages of occurrence were obtained in September 96.5 for Cryptostigmata.

The highest occurrence of Cryptostigmatic Mites during these months could be attributed to the change of the environmental conditions and also to the presence of other invertebrate groups, as a source of food for predatory species [22, 23].

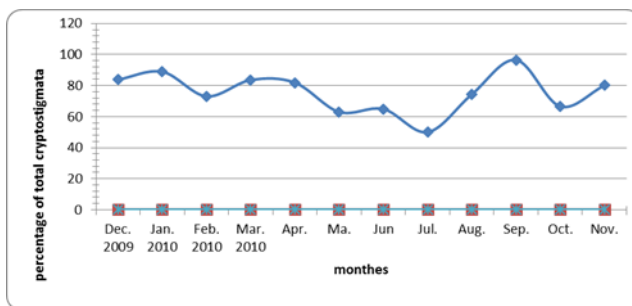


Figure 1- The seasonal changes in the ordinal composition of Cryptostigmatic Mites during the study period (Dec. 2009-Nov.2010).

The environmental changes (temperature and relative humidity) as illustrated in Figure-2 and Figure-3.

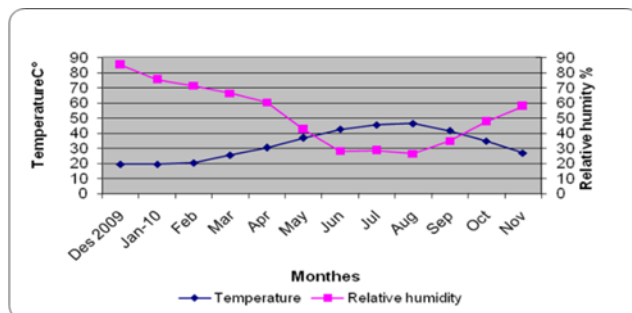


Figure 2- The mean temperature of air and relative humidity in Baghdad during the period of study from (Dec. 2009-Nov. 2010)

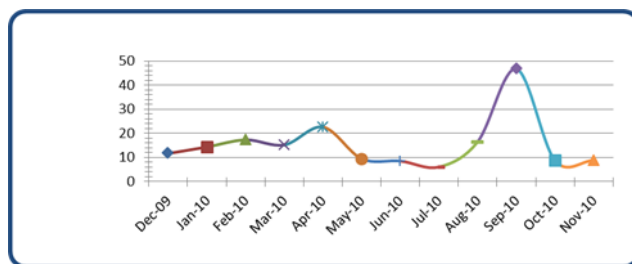


Figure 3- The mean of soil moisture of monthly samples based on the wet weight during the study period from December 2009-November 2010.

The researchers [24, 25] reported that the presences of mites in a favorite ecosystem depend on the biotical factors, like: relative humidity, temperature of air, moisture and pH of soil. Any disturbance of these factors generates modifications of numerical densities.



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