Abundance of aphid species and their natural enemies in Babylon Governorate / Iraq

Saadi Muhammed Hilal

College of science for women Univ. of Babylon

Abstract

A comprehensive survey for the natural enemies of aphid species infesting different plant host was carried out during the period from 1.10.2009 – 30.9.2010 in Babylon governorate .

The results reveald that there are four predatory Coccinellids namely : *Coccinella septempunctata* , *C.transversogotata* L. , *C. undecimpuncatata* L. and *Pharoscymnus setulosus* (Coleoptrea : Coccinellidae) that prey on different aphid species . Another predators on aphids were recorded during this study , these consist of *Chrysopa carnea* and *Chrysopa sp.* , (Neuroptera : Chrysopidae) and *Syrphus balteatus* (Diptera : *Syriphidae*)

Two parastic Hymenopteran insects were also recorded during this research , *Aphidus sp.* and *Aphelinus sp.* (Braconidae) . The result , showed that some aphid species were found to be infected with an entomopathogenic fungi *Beauveria bassiana*

The seasonal abundance of all natural enemies recorded in the present study was recorded . too .

More than 16 aphid species were indentified during this study :

1. *Aphis fabae* Scopoli 1763 .2. *A. punica* (Passrini)

3. *A. gossypii* Glover 1877 4. *A. nerii Boyer* de Fonscolombe 1841

5. *A. pomi* De Geer 6. *A. craccivora* Koch 1854

7. Therioaphis trifollii (Monell) (T. maculate Buck.)

8. Rhopalosiphum maids (Fitch) 9. Schizaphus (Toxoptera) graminum (Rond.) 10. *Brevicoryne brassicae* (L. , 1758)

11. *Myzus persicae* (Sulzer) 12. *Brachycaudus amygdalinus* (Schout)

13. *Macrosiphum sanborni* (Gillelle) 14. *Macrosiphum rosae* (L. , 1758)

15. *Acyrthosiphon pisum* (Harris) (= *Macrosiphum si pi*) and 16. *Uroleucon chi son* (L. , 1767)

The seasonal abundance and host_plants of these aphid species were recoded , too .

الخلاصة :

أجريت عملية مسح شاملة لانواع الاعداء الطبيعية لانواع المَنْ التي تصيب مختلف العوائل النباتية في محافظة بابل وذلك خلال الفترة من 2009/10/1 ولغاية 2010/9/30 في محافظة بابل .

اوضحت النتائج بأن هناك اربعة أنواع من خنافس ابي العيد التي تعود الى عائلة الدعاسيق Coccinellidae هي :

ISSN 2072-3875

1. *Coccinella septempunctata* و 2. L *C.transversogotata*

3. *C. undecimpuncatata* L. و 3. *Pharoscymnus setulosus*

والتي وجدت تتغذى على مختلف انواع حشرات المَنْ أما المفترسات الأخرى التي تم تسجيلها فهي : *Chrysopa carnea* و *Chrysopa sp.* (Neuroptera : Chrysopidae) و *Syrphus balteatus* (Diptera : *Syriphidae*) كما تم تسجيل نوعين من اشباه الطفيليات هي : *Aphidus sp.* و *Aphelinus sp.* (Hymenoptera: Braconidae)

أما بالنسبة الى المسببات الممرضة فقد تم تسجيل الفطر *Beauveria bassiana* على مَنْ الدفلة ومَنْ القصب من خلال هذه الدراسة ايضاً .

تم تشخيص 16 نوعاً من أنواع المن خلال هذه الدراسة هي :

1. *Aphis fabae* Scopoli 1763 .2. *A. punica* (passrini)

3. *A. gossypii* Glover 1877 4. *A. nerii Boyer* de Fonscolombe 1841

5. *A. pomi* De Geer 6. *A. craccivora* Koch 1854

7. Therioaphis trifollii (Monell) (T. maculate Buck.)

8. Rhopalosiphum maids (Fitch) 9. Schizaphus (Toxoptera) graminum (Rond.) 10. *Brevicoryne brassicae* (L. , 1758)

11. *Myzus persicae* (Sulzer) 12. *Brachycaudus amygdalinus* (Schout)

13. *Macrosiphum sanborni* (Gillelle) 14. *Macrosiphum rosae* (L. , 1758)

15. *Acyrthosiphon pisum* (Harris) (= *Macrosiphum si pi*) and 16. *Uroleucon chi son* (L. , 1767)

كما تم تسجيل التواجد الموسمي والعوائل النباتية لتلك الانواع من الحشرات .

Introduction :

Aphids are small to a very small insects , They have soft body and usually wingless , their body is like pear_shaped .

Like most other Homopteran bugs they are sap_sucking insect , which cause serious damage to plants since they suck the sap of plants (Flint, 1990 , 2000) . Moreover most aphid species are able to transmite several plant viruses such as sugarcane mosaic poyvirus , leafroll viruse and potato mosaic viruses (Greer , 2000) . In addition , the damage caused by aphid colonies is mainly aesthetic due to the large amount of sticky honeydew produced by the colony members and the resulting black sooty mold that grows on the honeydew . Aphids can also cause stunted plant growth due to repeated heavey infestation throughout the year (Blackman and Eastop , 2000).

Aphids have many natural enemies especially : predatory Coccinellids ,parasitic hymenopteran such as *Aphidius spp.* and *Aphelinus spp.* which can be quite effective in controlling their populations (Hilal , 1983 : Hilal and Al_zubaidy, 2010 and Karaman *et. al.* , 2000) . The aim of the present research was to determine the most important predators ,

ISSN 2072-3875

parasites , and pathogenic microbid agents that attack different species of aphids in Babylon governorate . Such attempts are useful for establishing a data_base of information about the role of these natural enemies in controlling aphid species . In addition , the present project represents the first step of a series of studies about the biodiversity in this part of Iraq .

Materials and Methods :

Specimens of aphids and their natural enemies were collected from different locations in Babylon Governorate including Mahaweel , Mussaiabe , Madhatia , Kefeel in addition to the city center (Hillah) , over aperiod of one year lasting from 1.10.2009 to 30.9.2010 . The specimens were weekly sampled from infested plants with aphids . These plants includes , herbs ,weeds , shrubs , field crops , vegetable plants , leafy vegetables , foliage crops , fruit trees , and ornamental plants . Twigs or leaves infested with aphids were collected and kept in plastic bags then brought to the laboratory for identification using classification keys constructed by Stoetzel (1987) , Stoetzel (1990) and Al – Hamdani (2010)

Predatory Insect , parasitiodes and entomopathogenic microbial agents associated with aphid species were collected , too , during the same period of collecting aphid speciemens , then brought to the laboratory for identification by the author .

Seasonal abundance of both the aphids and their natural enemies was made . Plant species were identified by Proff. Dr. Abdulkareem Al-Bearmany , (Ph.D. in plant Taxonomy) . All necessary weather and other environmental informations were recorded during times of speciemens collection , close – up photographs were taken for all aphids and their natural enemies using digetial – camera .

Results and discussion :

Table (1) summarize the most abundant predators , parasitoids and entemopathogenic microbial control agents that were found attacking different times in Hillah governarate during the period of this study. Abundance of natural enemies were classified into three categories , there are : 1. small (1-5) 2. moderat (6-10) and 3. large (more than 10 individuals per sample) (Jason and James , 2010). It is obvious that both *C. septempunctata* and *C. undecimpuncatata* were the most abundant predators . There were two peaks of seasonal activities for these predators one during October and November ,while the second , was during Fab. To John .but the highest peak was during April . The abundance of *C. transversogotata* was restricted during October and November while , the Coccinelled *Pharoscymnus setulous* was active during Mars and April .

In addition , the later predator has been recorded for the first time study preying on A. *aerii* , This predator was known as predator of scale insects such as *Parlatoria planchardi* infesting data_palme leaves (Hilal and Al_Sarai , 1997) . The first two predators were also found to be more abundant in Al-Mussaibe and Al-Mahaweel districts infesting *G. glabra* which is widly and naturally grown on edges of rivers and water chanals .

However , Alfalfa and *G. glabra* were found to be the most favourable plants for breeding of most natural enemies recorded during this study . There results are in accordance with those of other researchers such as Ghaeeb (1978) and Gateh (1988) and Hilal *et. Al.* (2006) . The natural enemies attracted to the alfalfa and *G. glabra* plants may be due to the presence of plenty of their natural prey such as different species of aphids which is found almost alround the year or to the these natural enemies during extreme and hard environmental conditions .

The present results also revealed that all natural enemies recorded can feed and reproduce on different aphid species recorded here including some aphid species which feed on poisonous plants such as *A. nerii* on *Nerium oleander* , *Uroleunco sonchi* and *Macrosiphum rosa* on *Sonchus spp.* and *Macrosiphonella sanborni* on *Chrysanthemum spp.* this results agree with that

ISSN 2072-3875

of Al-Zubaidy (2007) and Miller and Stoetal (1997) . Who found that *C. undecimpuncatata* can feed and reproduce on *A. nerii* and other aphid species .

Table (2) summarize the most abundant aphid species infesting different plant hosts in Hillah governarate during this study . It is obvious that most aphid species tend to appear in the field during late January to mid. of May then disappear during June , July and August with exeption of some aphid species such as *A. gossypii* on *cucurbita pepo.* which was recorded during August . Some other aphid species tend to attack and feed on their plant hosts during autumn and winter such as *trifolli* on *Medicago sativa* , *A. craccivora* on *Vigna sinensis* and *Luffa cylindrical* , *A. nerii* on *Cynanchium sp.* and *A. gossypii* on *Hibsous rosasinensis* . the result show that the most abundant aphid species seems to be *A. gossypii* and *A. craccivora* which can be seen moving from one host plant to another during almost all round the year except , howeover , *A. craccivora* was recorded for the first time during this study feeding on *Tamarix sp.* . and on *Luffa cylindrica* . The present results agrees with that found by Al_Hamdani (2010) Who studied aphids infesting Herbaceous plants and Shrubs in different localities of Iraq .

ISSN 2072-3875

ISSN 2072-3875

References

AL-Hamdani , H.B.A (2010) Taxonomic study on the subfamily Aphidinae (Homoptera :aphididae) infesting Herbaceous plants and shrubs in different localities of IRAQ.Ph.D. thesis / College of Science / Baghdad Univ. 363 pp.

AL-Zubaidy , A.H.M. (2007) . Effect of prey on some of biological performance Aspects of *Coccinella undicempunctate*_L. , Ph.D._ thesis / College Education / Univ. of ALQadisiya 132 pp.

Blackman,R.L. and Eastop , V.F. (2000) Aphid on the World's Crops : an Identification and information Guide , Wiley , New York .

ISSN 2072-3875

Flint , M.L. (1990). Pests of the Garden and small Farm . Pest Notes Publications 3332, Division of Agric . and Natural resources, Univ. of Cal. U.S.A 276 pp.

Flint, M.L. (2000) Aphids, Pest of the Garden and small Farm . Pest Notes Publications 3332, Division of Agric . and Natural res, Univ. of California U.S.A 4 pp.

Gateh, N.A.M. , (1988) Ecological Studies of some predatory Coccinellids in Basrah/Iraq. M.Sc. thesis College of Agriculture, Univ. of Basrah 85 pp.

Ghaeeb, W.A.W. (1978) Arthropods on alfalfa and their natural enemies in Abu – Ghareeb . M.Sc. thesis / College of Agriculture / Univ. of Baghdad 89 pp.

Greer, L. (2000) Greenhouse IPM. Sustainable Aphid control Pest Management Tech. Trans. for rural areas . 12 pp.

Hilal , S. M. (1983) Biology and behavior of *Coccinella septempunctata* L. in relation to the control of the green peach aphid *Myzus persicae* (Sulz.) . Ph. D thesis / Univ. of Newcastle Upon Tyne , U.K , 650 pp .

Hilal , S. M. and Al_Sarai , J.S.M (1997) , Seasonal abundance of two predators , on *Parlaroria Planchardi* Babylon J. of pure and applied sciences / Babylon Univ. , (2) 3 : 233-236 .

Hilal , S. M. and Gateh , N.A.M. (2006) . Seasonal abundance of predatory coccinellids of aphids on alfalfa in Basrah . Babylon J. of pure and applied science , Babylon Univ. (12) 3 : 616-619 .

Hilal , S. M. and Al_Zubaidy (2010) Food preference of adults *Coccinella septempunctata* L. for different aphid species on different plant host . Babylon J. of pure and applied science Babylon Univ. (8) 2 .

Jason , H. Byrd and James L. Castner (2010) " forensic entomology " the utility of Arthropods in legal investigation CRC press _ Boca Raton , F1 (BBN – 0 – 8493 – 81207) .

Miller , G.L. and Stoetzel , M.B. (1997) Aphids Associated with Chrysanthemum in the United states , Florida Entomologist 80 (2) : 218-239.

Stoetzel , M.B (1987) . Information on and identification of *Diuraphis noxia* and other aphid species Colonizing leaves of wheat and Barley in the United States . J. Econom Entomol . 80 (3) : 696-704 .

Stoetzel , M.B. (1990) Aphids (Homoptera : Aphididae) colonizing leaves of Asparagus in the United state , J. Econo. Entomol. 83 (5) : 1994-2002 .

ISSN 2072-3875

Karaman , G.A ; F ; Makady , M. and Hamowda , S (2000) effects of different aphid species and prey on development of the immature stages of the lady beetles *C. undecimpunctata* . Arab J. PL. Port . 18 (2) : 3-7 .

ISSN 2072-3875