

THE SYMBIOTIC RELATIONSHIP BETWEEN ANTS SPECIES WITH APHIDS SPECIES, SOME SPECIES OF INSECTS AND NEGATIVE OF THE RELATIONSHIP WITH BEES.

Alaa S. Jabbar

College of Agriculture, University of Basra

ABSTRACT

The research showed that diagnosis thirteen species of ants of family Formicidae in Basrah province which are returning to two Sub families: Subfamily Myrmicinae *Monomorium schultzei* (Forel), *Triglyphothrix lanuginose* (Mayr), *Tetramorium depressiceps* (Menozzi), *Crematogaster luctans* (Forel), *Messor infotestaceus* (Forster), *Acantholepis dolobellae* (Forel), *Tetramorium caldarium* (Roger). Sub family Formicinae *Componotus xerexs* (Forel), *Anoplolepis anoplolepi* (Menozzi), *Polyrhachis simplex* (Myr), *Plagiolepis pygmaea* (latreille), *Paratrechina jaegerskjoelds* (Mayr), *Plagiolepis tumidula* (Emery). the study was diagnosis five of ants for the first time in Iraq. The symbiotic relationships studied between seven species of ants with eleven species of aphids which infected various of plants *Aphis gossypii*, *Mysus persicae*, *A. fabae*, *A. craccivara*, *Sgraminum*, *R. maidis*, *R. padi*, *A. nerii*, *M. dimodum*, *Mysus rosae*, *U. jacerae*. as well as the symbiotic relationship between the three species of ants *M. schultzei*, *C. luctans* and *P. pygmaea* with larvae of *Tarucus rosaceae* which infected the leave of zizyphus trees and two species of ants *C. luctans* and *M. caldarium*, have symbiotic relationship with mealybugs *Nipaecoccus vastator*. There were three species of ants *M. rufatestacus*, *C. xerexs* and *A. anoplolepi* infected the fruits of date trees. so as the negative relationship between five species of ants *C. luctans*, *C. xerexs*, *A. anoplolepi*, *M. infotestaceus* and *P. simplex* with honey bee hives, Ants infested bee brood those eggs, larvae, pupa and the adults of bees and also consume honey, pollen and wax discs. The three species of ants *T. lanuginose*, *T. caldarium* and *M. infotestaceus* which damage the seeds of tomato crop in zabair region.

Keywords: Ants species, Aphids species, Symbiotic relationship

INTRODUCTION

The insects of ants return to family Formicidae of Hymenoptera which features the life of a social caste system Financing of queens, workers and males (Yassin, 2010). Ants ability to adjust and adapt to different environments with abundant reproductive as exceeding 12,000 species in the world and the mass of vital Biomass more than 20% of organisms (Anon, 2006). For most ant species evolutionary relationship with the species of aphids belonging to Homoptera. As more insect groups with relationship symbiotic through the ants which get honeydew as food source produced by most species of aphids while ants to provide effective protection against predators and parasites those attack aphids as well as the positive impact of ants to stimulate some of species of aphids for growth and mature faster (Volkl *etal*, 2007). There are some signs that show a positive relationship between the ants species with the species of aphids. Elahe Shiran *etal* (2013) from Iran explained the symbiotic relationship between the 20 species of ant of three Sub families have to do with 33 species of aphids infect different species economic and wild plants. Also pointed Ozdermir, *etal* (2008) from Turkey about the existence of a symbiotic relationship between the 16 species of ant with 19 species of aphids present within different botanical families. In Arab countries Kamel *etal* (2001)from Egypt was recorded that 27 species of ants, most of them were presence of *Cataglyphis*, *Monomorium* and *Carbonorium* symbiotic relationship them with different species of insects .In Iraq few of references about the ants do with other insects. Othman and Abdullah (2010) explained on the species of ants *Monomorium* sp and *Tapinoma simrothi* with aphids of *Aphis* sp also Jaber (2006) pointed that three species of ants used in Biological control to insects of termites. The study of ants species which were symbiotic relationship with the species of aphids require research and diagnosis with effect on species of infected plants . The ants were reducing the influence of natural enemies on the aphids. The study showed that the positive and symbiotic relationship between the ants species with another insects, the insects which infect zizyphus trees like *Tarucus rosacea* and *Nipaecoccus vastator*. and the date palm trees that direction of the ants which feed the fruits of palm trees and falling from infection by insect *Batrachedra amvdracula* in Basrah province. For some species of ants attack hives of honey bees by feeding on the immature stages of eggs, larvae and pupae as well as wax discs and feeding on honey and pollen. also Observed some ants species damage planting the seeds of tomato in the farms desert in Basrah province, the ants transfer the seeds to nests. the farmers suffered from ants ,and they used mixing of pesticides with seeds before planted them to prevent and kill the ants or else caused severe losses in germination of seeds.

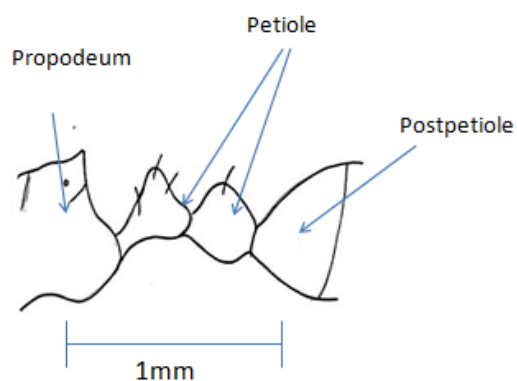
MATERIALS AND METHODS

The study was conducted during the agricultural seasons in 2011 and 2014 to show the impact of symbiotic relationship between ant species and species of aphids on different plant species, as well as some species of ants do with the larvae of insect *Tarucus rosacea* on the zizyphus trees and reference to its relationship to the palm trees, as well as the negative impact in places of farms desert in Zubair region. The study was conducted at seven regions from Basra province, 1- the Shatt al-Arab region in Hassan river, Aljbasi and Allioph 2. Karmat Ali region and the Faculty of Agriculture 3- Abu Al khzeb in Hamdan and Mhajeran and Yousfan 4- Hartha region 5- Qurna region 6- Zubair farms 7- center of Basrah province. The ant species and the species of aphids collected which have a symbiotic relationship within the affected plants by soft brush and spirator, preserved in glass bottles capacity of 7 and 4 cm in diameter and height, respectively. The study focused at the presence of aphids and ants during the year especially spring season, in the second, third and fourth months, Diagnosed species of aphids using taxonomic keys. (Lehr, 1988; Stoetzel and Miller 2001) and the study conducted by Abdul Razaq (2012). Diagnosed ant species using taxonomic keys (Coolingwood and Agosti 1996; Buttiker and Krupp 1985; Wheeler and Wheeler 1986) and by prof. Dr. Kadhim S. Hassan from the College of Science, University of Basrah and The study conducted by Yassin (2010) on the species of ants. Complementary diagnostic study of ant species was conducted through drawing the waist and separation of the head and legs by anatomy tools, and then put the model of insect in the KOH solution 15% to more transparent and suppleness to make it for a period of one day for small models and two days for large models then washed with distilled water and then passed escalating concentrations of ethanol, 100, 90, 70, 50, 35%, respectively, for a period of ten minutes for each concentration and then submerged in xylene solution for one day and then loaded onto a glass slide containing a Canada balsam and then covered with glass after the cap placed on the surface of Hot plate for a day to remove air bubbles and then transferred for examination under the Compound Microscope and Camera Lucida painted ants species studied. The numbers of the aphids and ant species calculated according to the size of the plants and Sampling. In the Solanaceae of Tomato (*Lycopersicon esculentum*), eggplant (*Solanum melongena*) and pepper (*Capscum annum*) and family Cucurbitaceae of cucumber (*Cucumis sativa*) and family Malvaceae of okra (*Abelmoschus esculentus*), family Chenopodiaceae of chard (*Beta cicla*), and family Cruciferae of Radish (*Raphanus sativus*) by taking four leaves from top infection of Aphids randomly and that have relationship with the species of ants. The family of Graminaceae wheat (*Triticum aestivum*), maize (*Zea mays*) and reeds (*Phragmitis anstralis*) are also taking four leaves with flowers and grains in maize, and family Leguminosae of alfalfa (*Medicago sativa*) and Bean (*Vicia faba*) as calculated by taking 5-7 of terminal leaves. Henna (*Lawsonia inermis*) of family Lythraceae by taking four branches with leaves in plants. family Apocynaceae of Oeander (*Nerium oleander*), family Polygonaceae of Knotgrass (*Polygonum aviculare*). family Fabaceae of Melilot (*Melilotus indicus*). family Asteraceae of chrysanthemum green (*Glebionis*

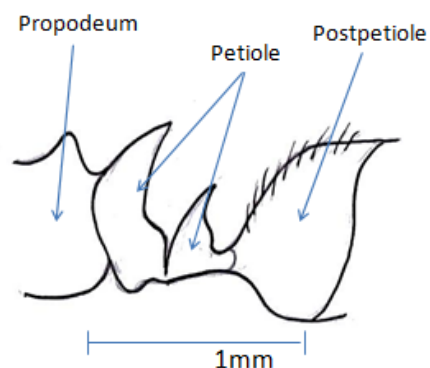
coronaria) and sow thistle (*Sonchus oleraceus*).family convolvulaceae of field bind weed (*Convolvulus arvensis*).family Asclepiadaceae of (*Synanchum acutum*). family Malvaceae of Hibiscus (*Hibiscus rosa-chinesis*) and Hollyhock (*Alcea rosea*). To calculate the number of ants by putting a sign on the stems of plants after 15cm from the soil surface were calculated through which ants passing on stem to the top of the infection of aphids within five minutes and also calculated the number of ants which found in places of Aphids infection .For relationship ant species with larvae of an insect *Taurcus rosacea* on zizyphus plants which are feeding of the leaves .the insect of *Tarucus rosacea* dignosis by Dr. Dheaa C. khlef in the College of Education , University of Basrah. The study focused on the seed variety, especially the young ages of 1-3 years ,in the case of severe infection of insect larvae to do death the plant. Experience shows the importance of symbiotic relationship conducted by identifying zizyphus plants infected by insect with ants and other plants infected without ants. Calculated the Numbers of larvae and the number of ants in the tops of the infection by taking ten leaves of each branch from the three main branches of each plant as well as the infection ratio through a number of leaves infect mealy bugs have been diagnosed with ant species on the zizphus trees and *Rosa* spp. and Diagnosed species of ants on the stems of palm trees and fruits fallen on the soil as well as dates in the store. Diagnosed species of ants that have a negative effect on the hives of honey bees through the account numbers of ants on the soil within five minutes and the amount of damage in the wax discs in the hives of honey bees .The seeds of Tomato were planted in the desert farms in the Zubair region, the ants damage the seeds ,calculated the number of ants within five minutes after identifying ants on soil and passing to their nests.

RESULTS AND DISCUSSION

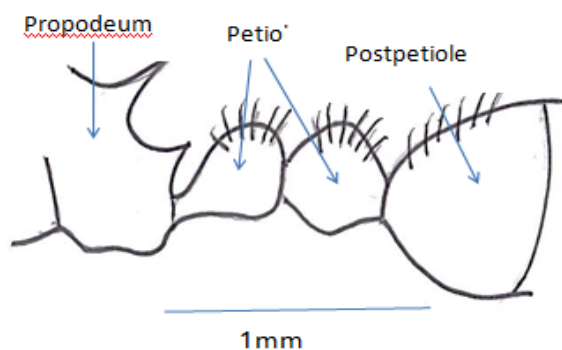
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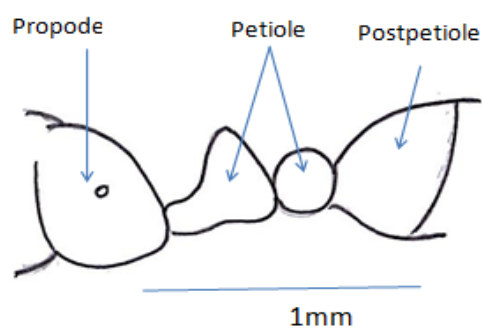
Messor rufotestaceus



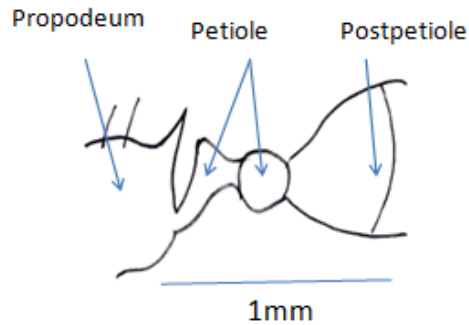
Acantholepis dolabellae



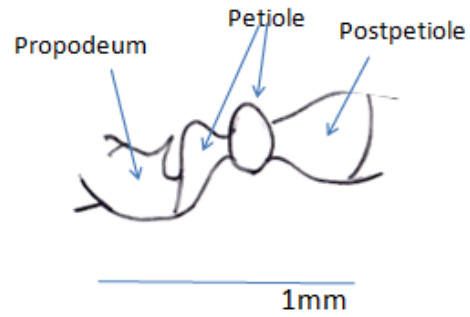
Triglypharthrix lanuginosa



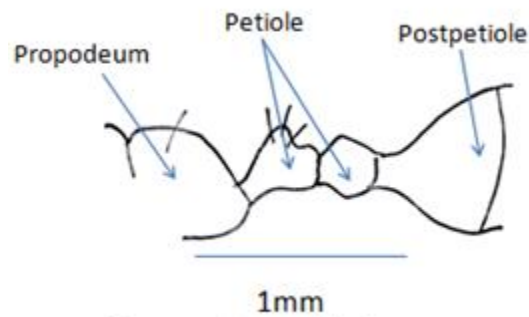
Monomorium schultzei



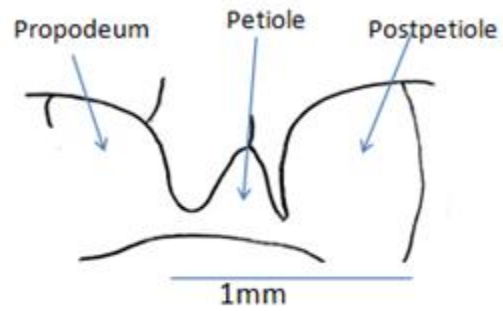
Crematogaster luctans



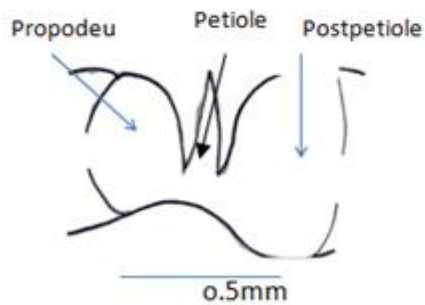
Tetramorium depressiceps



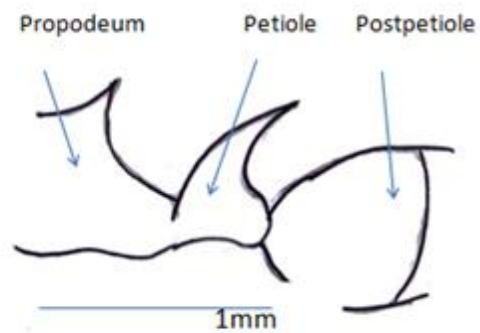
Tetramorium caldarium



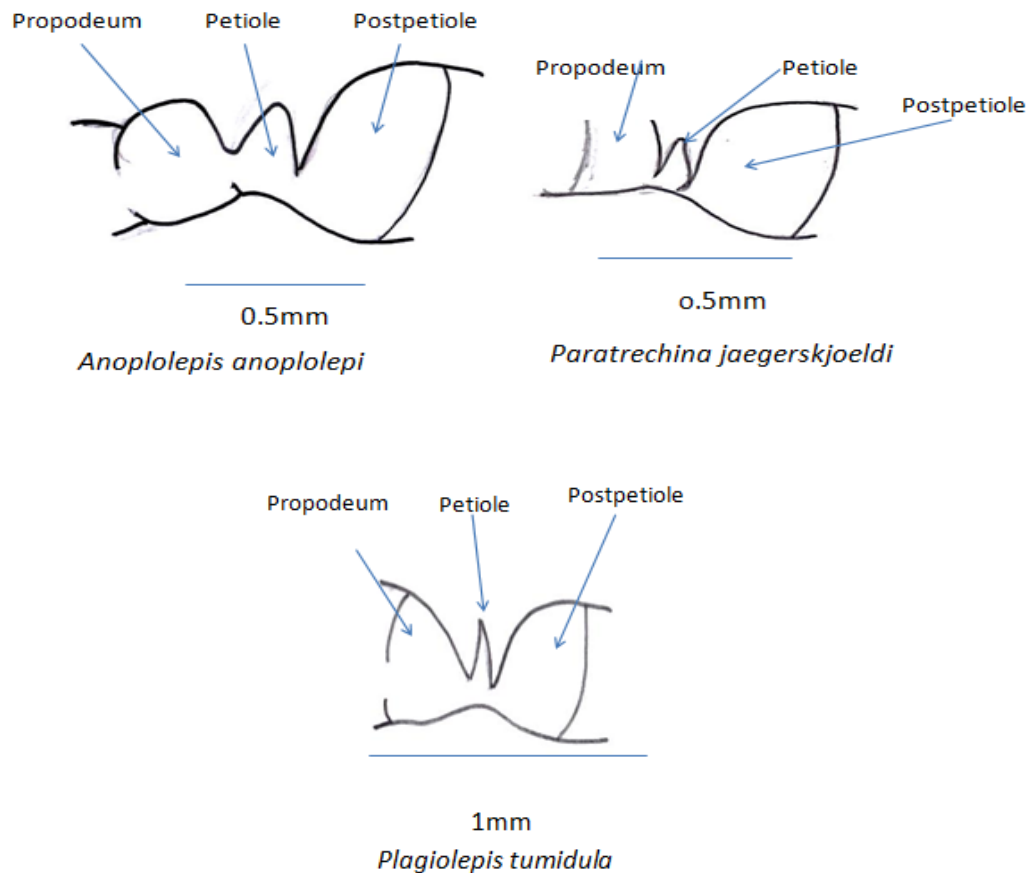
Compositus xerxes



Plagirolepis pygmaea



Polyrhachis simplex



The aphids consume phloem sap of the host plant and excrete sugar-rich honeydew. The ants derive carbohydrates from aphid honeydew and protect aphids from predators, parasitoids and fungal infections which due to the aggressive behavior of attendant ants (Stadler and Dixon, 2008). Delabie (2001) explained Homoptera are obligate guests of annual or perennial plants, with different degrees of specialization to their host. because they remove plant sap, damage the tissues or inject toxins or viruses in many plants. The liquid diet depends clearly on the nature of the host plant, but is constituted mainly by nitrogenous components, amino acids, organic acids, amides, carbohydrates and a range of secondary compounds. the survival rate of 'Homoptera' also depends on the aggressiveness of its protective ant or whether the attendant ant is dominant. Arange of parasitic wasps of several families specialize in attacking isolated or aggregated Sternorrhyncha or Auchenorrhyncha at different stages: Aphelinidae, Braconidae Aphidiinae, Dryinidae, Encyrtidae, Eupelmidae and Mymaridae . The Beetles of the family Coccinellidae and Syrphidae flies are among their main predators. Figure 1 showed through the presence of ant species symbiotic relationship with species of aphids on different plant species, noting that the aphid of *Aphis gossypii* found in plants leaves of tomato (*L. esculentum*), eggplant (*S. melongena*) and okra (*A. esculentus*) in region of Shatt al-Arab as well as okra in Karmat Ali

region was 38.5, 28, 47.7 and 41.3 insect / leaf, respectively. the symbiotic of ant species *Monomorium schultzei* with aphid ,the number of ants passing the stem of plants were 14.2, 10, 13.4 and 12.6 worker / 5 minutes, as well as its presence in infection place of aphid 7.6, 4.2 , 6.4 and 8.5 worker, respectively in figures 2 and 3.

Ozdemir *et al.* (2008) reported 16 different species of ants associated with 19 aphid species. The most encountered ant species associated with many aphid species were *Camponotus aethiops*, *Camponotus piceus*, *Formica glauca*, *Lasiusparalienus* and *Crematogaster ordidula*. Elahe Shiran *et al* (2013) explained Ants consumer store the honeydew which is secreted by aphids or other homoptera insects. Major benefit of ant attendance for aphids is protection against natural enemies. Which carried to determine the mutualistic association between ants and aphids on different host plants. A total of 20 ant species belonging to12genera and 3 subfamilies were collected and identified. Among them, four species are new to Iranian ant fauna, *Monomorium libanicum*, *Monomorium qarahe*; *Monomorium mayri* and *Lasius paralienus*. The collected myrmecophilous aphids were 33 species belonging to 3 families and 5 subfamilies. the aphid of green peach *Myzus persica* observed its presence in tomato and eggplant plants were 42 and 32 insect/leaf in the Shatt al-Arab and the numbers of ants in its path were 17.5 and 12. worker/5minutes to species of ant *Monomorium schultzei* and in infection place on the plant was 7.8 and 4 worker, respectively and the pepper plant (*C. annum*) in the same species of aphids and the region was 22.9

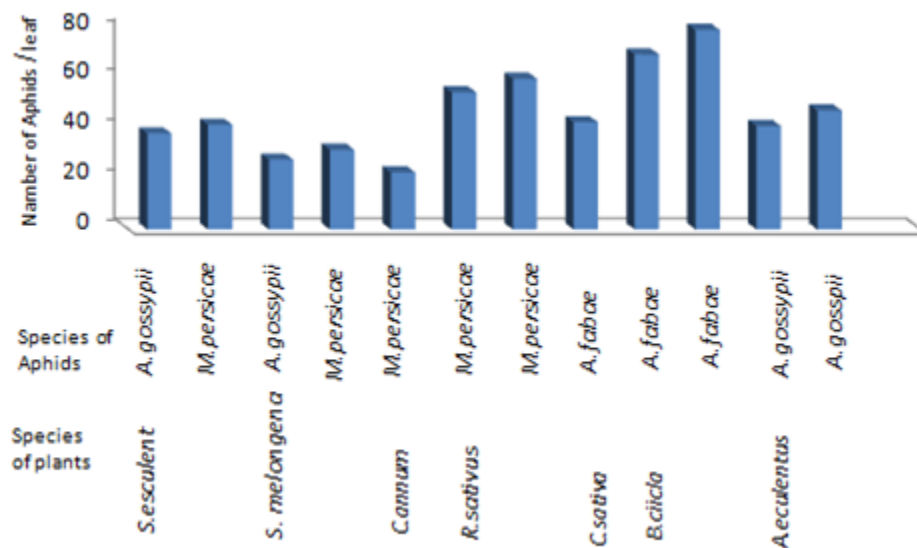


Figure 1 The population density of species Aphids on some vegetables.

insect/leaf and ant species of ant *Messor rufotestaceus* it reaches 6.2 worker / 5 minutes through pass it on the stem and 3.5 worker on infection place of Aphid. the results showed that the number of aphids on the plant radish (*R. sativus*) was 55 insect / leaf and the species of ant *Monomorium schultzei* was 15.5 worker/5 minutes and the rate of its presence in places of infection of Aphid 4.8 worker for the Karmat Ali, while in the Shatt al-Arab region was 60.4 insect / leaf and the number of ant-species *Crematogaster luctans* on stem was 18.1 worker / 5 minutes while was 6.5 worker on infection place. Takallo ozadeh (2010) from Iran also reported *Aphis gossypii* attacking more than 70 species of different host plants. Major hosts of the aphids in agriculture fields of Vadodara were *Gossypium arboreum*, *Vigna unguiculata*, *Solanum tuberosum* and *Solanum melongena*. Whereas ornamental plants such as; *Hibiscus mutabilis*, *A. gossypii* is one of the major pest to Cotton. *A. Hibiscus rosa-sinensis*, *Chrysanthemum* sp. *gossypii* was mainly found on Malvaceae, Solanaceae and Asteraceae family having strong interaction with *Camponotus compressus*, *Monomorium* sp. Plant species belonging to family Malvaceae (17%), Fabaceae (16%), Solanaceae (12%) and Asclepiadaceae (10%. Ian Billick (2007) explained the Interaction between ants and aphids range from mutualistic to antagonistic. because ants can simultaneously have positive and negative effects upon aphids. The aphids *Uroleucon escalantii* are occasionally tended by *Formica obscuripes* Forel .To compare the relative effects of protection and predation by ants on aphid abundance

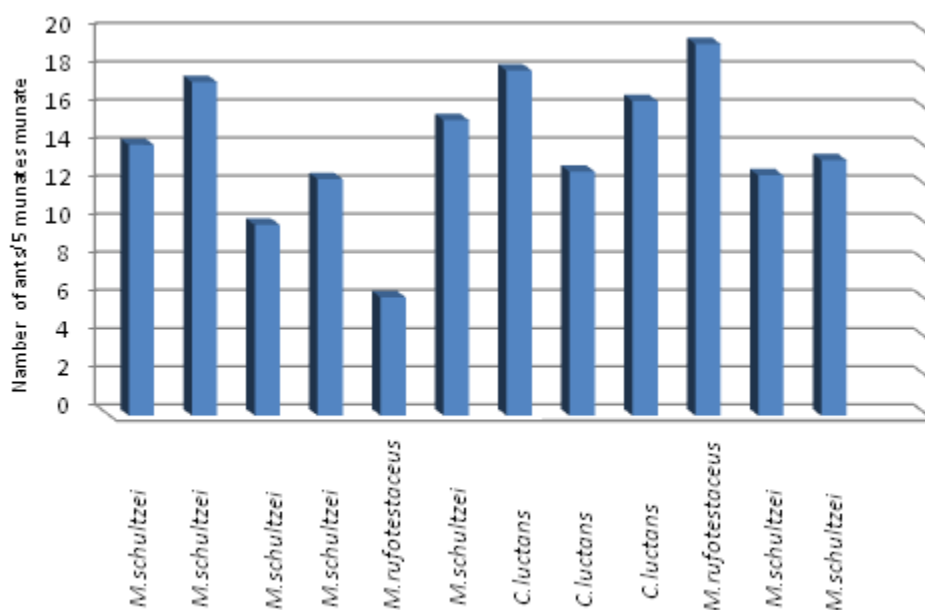
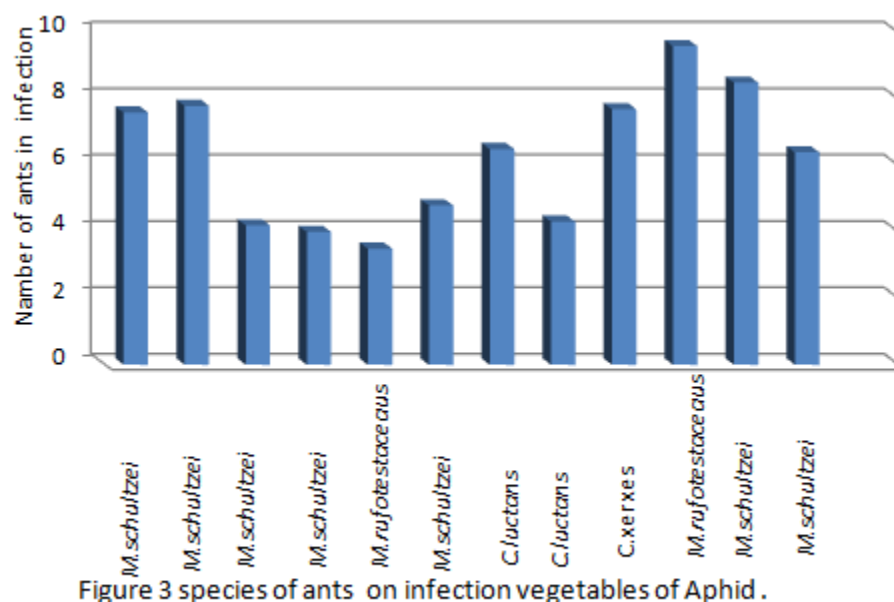


Figure 2 species of ants pass on stem of vegetables during 5 minutes.



the presence of the ants and other predators on host plants. gative impact on aphid depended on numbers of aphids and behaviour of ants to aphids and other enemies which determine the forces of ant-aphid mutualisms . For crops cucumber (*C. sativa*) and chard (*B. cicla*) the infection was infested *Aphis fabae* reaches 43 and 80 insect / leaf, respectively in Karmat Ali region and the number of ants passing of the species *Crematogaster luctans* was 12.8 and 19.5 worker / 5 minutes, respectively and the numbers of ants who is on infection place was 4.3 and 9.6 worker, respectively so as in the Hartha region the infection of aphids to plant chard was 70.2 insect / leaf but deferent in the ant species it was *Messor rufotestaceus* the numbers passing on track was 16.5 worker / 5 minutes and the infection place 7.7 worker. In Figure 4 shows infected of crops maize, wheat , bean and alfalfa, on the maize (*Zea mays*) was a population density of species of aphid corn leaves *Rhopalosiphum maidis* was 55 insect / leaf and in the inflorescence floral 92 insect / flower and the number of ants

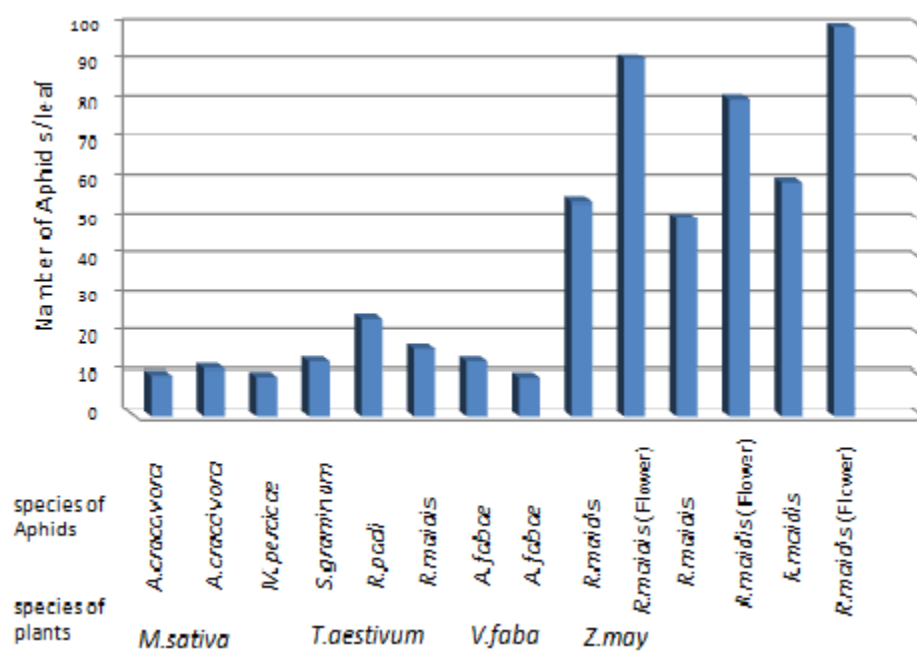


Figure 4 the population density of Aphids on some crops.

passing on the stem of species *Paratrechina jaegerskjoeldi* was 18 worker / 5 minutes and the number of ants in the place of the infection was 11.7 worker in Qurna region Figure 5 and 6. while in Karmat Ali region was the number of aphids 51 insect / leaf and 81.5 insect / flower and the ants for the same species 22.2 worker / 5 minutes and the content in the place of the infection 12.8 worker. in the Shatt al-Arab region was 60.3 insect / leaf and floral inflorescence 100 insect / flower and the number of ants passing on track 19.7 worker / 5 minutes and the content in the place of infection 5.9 worker. The results of wheat crop (*T. aestivum*) indicated that the existence of three species of aphids in Qurna region, wheat aphid *Schizaphis graminum*, *Rhopalosiphum maidis* and *Rhopalosiphum padi* The population density reaches 14 ,25.3 and 17.7 insect / leaf, respectively and the number of ants passing in their path on the stem of wheat to ant species *Messor rufotestaceus* and *Anoploepis anoplolepi* and *Messor rufotestaceus* 7.6 ,10.5and 7.1 worker / 5 minutes and on infection place 3.5, 6.2 and 3.3 worker, respectively. the plant of Bean (*V. faba*) infected by *Aphis fabae*, The density reaches14 insect / leaf and the presence of ants species *Monomorium schultzei*, it reached 3.9 worker / 5 minutes and 2.2 worker on infection place of aphid in the region of Shatt al- Arab while another place in the same region 10.3 insect / leaf and 5.6 worker / 5 minutes and 2.9 worker in the infection place of aphids to species of *Tetramorium depressiceps*. Othman and Abdullah (2010) from Mosul in Iraq was pointed that ant species *Monomorium* sp were found on Broad Bean plants. the average which recorded 21.91 and the *Aphis* sp was 514.8 in the Middle of April in 2004.anther species of ants

were appeared in 2005 *Tapinoma simrothi* the average which recorded 22.25 ant and the aphids was 476.1 at end of March.

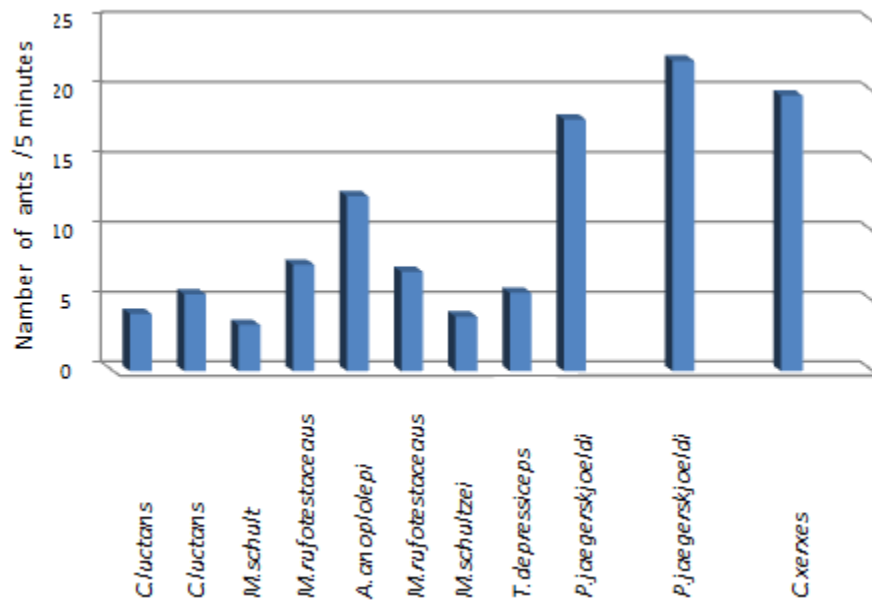


Figure 5 species of ants pass on stem of crops during 5 minutes.

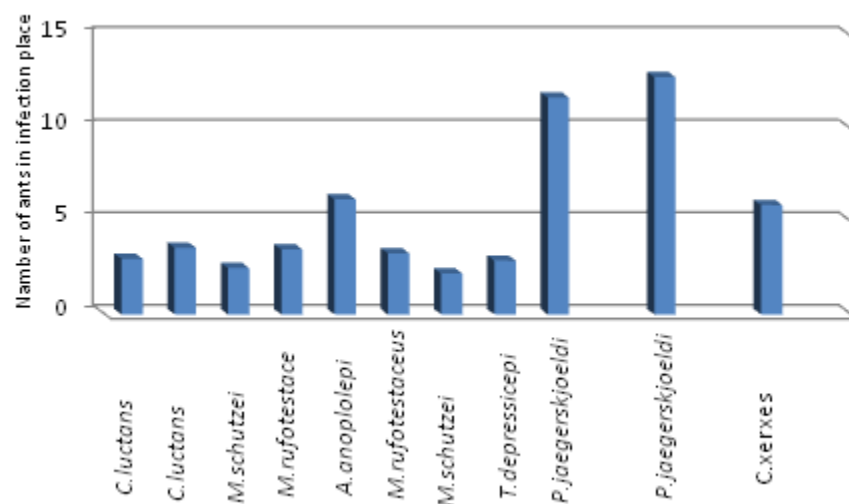


Figure 6 species of ants on infection crops of Aphid.

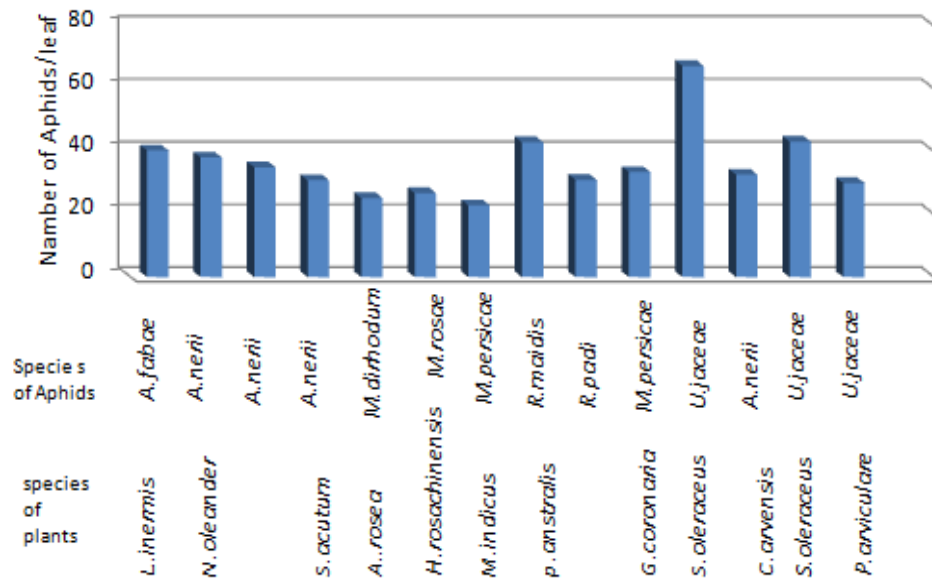


Figure 7 The population density of Aphids on some plants.

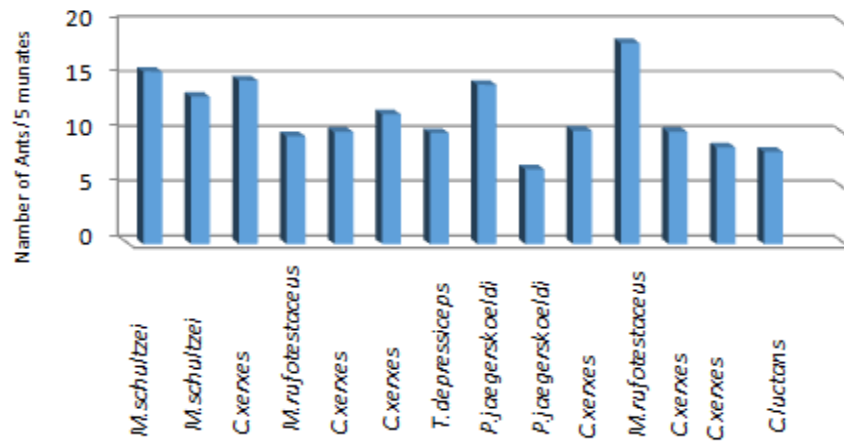


Figure 8 species of ants pass on stem of plants during 5 minutes.

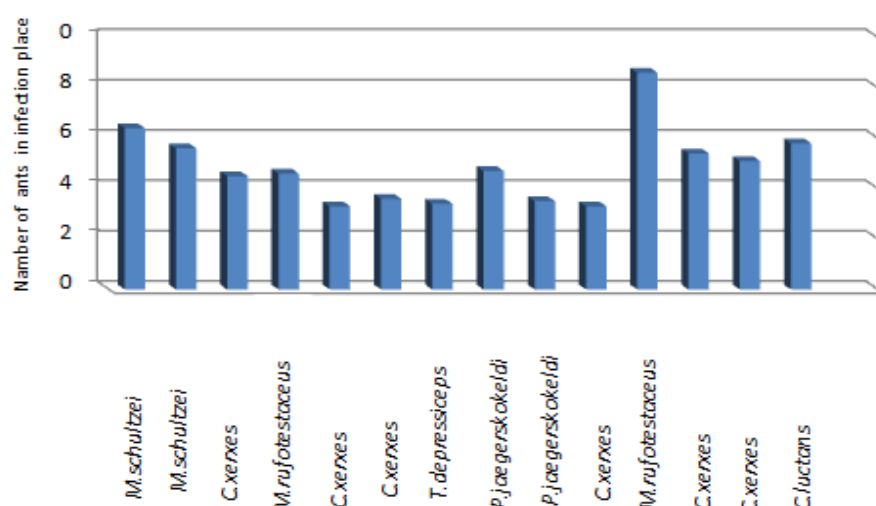


Figure 9 species of ants on infection plants of Aphids.

The ants species of *Crematogaster luctans* on plant of alfalfa (*Medicago sativa*) Observed in the Shatt Arab region and KarmatAli its living with lentils aphid *Aphis craccivora* The number of aphids 12.3 and 10.7 insect / leaf and the number of ants on the stem 5.5 and 4.1 worker / 5 minutes and in places of infection 3.6 and 3 worker, respectively. Kataria and Kumar (2013) reported that *Camponotus* sp. usually acted as one of the main cause of spread of aphids from one plant to other. aphid-ant association has strong interaction with various host plants. *Aphis craccivora* Koch is one of the major pests of agricultural plants and mostly recorded on the plants belonging to family Fabaceae.

In the same species of plant in another area of the Shatt al-Arab was found species of green peach *M.persica*, the number of aphids 10.4 insect / leaf and other species of ant *Monomorium schultzei* and the number of ants passing on track 3.3 worker / 5 minutes and the number of ants in places of infection 2.5 worker of *Tetramorium depressiceps*.

Ahmad, *etal* (2012) reported that survey of different districts of north east Bihar, 41 species of aphids on more than 122 plants species were recorded in the *A. craccivora* was recorded as most common polyphagous species in the target area and found During the association of *A. craccivora* with ants in different seasons, twelve species of aphidocolous ants *Camponotus compressus*, *Camponotus invidus*, *Camponotus* sp., *Monomorium latinode*, *Monomorium pharaonis* and *Polyrhachis hauxwelli*.

Bakr, *etal*. (2007) In spite of the aggressive behavior of ants, they are hostile to many organisms that can live in or near their nests and create symbiotic association with them; these organisms

are termed as Myrmecophiles. Wherever ants are found, intimate symbiotic relationships are established with most sap-sucking insects including aphids, mealybugs, scale insects, tree hoppers, and some lepidopterous larvae. In Henna plant (*Lawsonia inermis*) in Abe Khzeb, the aphid of *A. fabae* show that reached 40.4 insect/leaf and the number of ant species *Monomorium schultzei* reached 15.7 worker/5 minutes, and content in place of infection 6.4 worker. *Aphis nerii* found on plant oleander (*Nerium oleander*) in two regions symbiotic relationship with ants in center of province and Karmat Ali, the number of aphids 35 and 38.1 insect / leaf, respectively with a presence in some of the flowers in some branches. For the species of ants was *Monomorium schultzei* and the number of ants 14.9 worker / 5 minutes, and content in place of infection was 4.5 worker. The species of ant content in the Karmat Ali region was *Camponotus xerxes* and the number of ants in the passing of stem was 13.4 worker / 5 minutes and the number of ants in the place of infection was 5.6 worker. also observed on plant (*Synanchum acutum*) in Qurna region, the population density of aphid is 30.9 insect / leaf and ants *Messor rufotestaceus* and the number of ants was 9.8 worker / 5 minutes and in the place of infection 4.6 worker. It is noted that on plant Field bindweed (*Convolvulus arvensis*) in Qurna region, its infected also including oleander aphid. The infection rate reached 32.7 insect / leaf and the number of ants of the species *Camponotus xerxes* was 10.2 worker / 5 minutes and the number of ants 5.4 worker. the population density of roses aphid *Macrosiphum rosae* on Hibiscus (*Hibiscus rosa-chinensis*) and the aphid of *Metopolophium dirhoum* on plant Hollyhock (*Alcea rosea*) were reached 26 and 25.2 insect / leaf and the ants for the same species *Camponotus xerxes* and the number of ants on the stems 11.8 and 10.2 worker / 5 minutes and the number of content in places infection 3.6 and 3.3 worker. It was noted that there was a symbiotic relationship between ants *Camponotus xerxes* and green aphid of *M. persica* in plant of coronaria (*Chrysanthemum coronaria*) in the center of the province, as the number of aphids was 33.5 insect / leaf and the number of ants in passing of stem 10.3 worker / 5 minutes and 3.3 worker on infection place.

Kataria and Kumar (2013) reported about 30 host plants and 6 species of aphids namely *Aphis brassicae*, *A. crassivora*, *A. fabae*, *A. gossypii*, *A. nerii*, *Myzus persicae*. Most abundant species considered as major pests in Vadodara include ants commonly associated with aphids involve *Camponotus compressus*, *Pheidole* sp., *Monomorium* sp. Aphid-ant interaction is commonly seen on various host plants Malvaceae, Solanaceae and Asteraceae family. *Myzus persicae* mainly seen on the family Malvaceae, Brassicaceae, Amaranthaceae and Solanaceae and the associated ants are *Camponotus compressus* and *Monomorium* sp.

In plant reed (*P. australis*) in Qurna region was the number of yellow corn *R. maidis* 43 insect / leaf and the ant species *Paratrechina jaegerskjoeldi* was 14.5 worker / 5 minutes and 4.7 worker on infection place. so as infection of reeds by *R. padi* was 31 insect / leaf and the number of ant species *Paratrechina jaegerskjoeldi* on stem 6.8 worker / 5 minutes and its presence in the place of the infection 3.5 worker. as well as plant Melilot (*Melilotus indicus*) in the same region was 22.9 insect / leaf and the ant species *Tetramorium depressiceps* was 10.1 worker / 5 minutes

and 3.4 worker on infection place . in plants of Common sow milk (*Sonchus oleraceus*) in two places of Qurna region, the plant of knotgrass (*Polygonum aviculare*) was infection of aphid *Uroleucon jaceae* 67.3 , 43.2 and 30 insect / leaf , respectively with three species of ants, *Messor rufotestaceus* , *Camponotus xerxes* and *Crematogaster luctans* and the number of ants species were 18.3 , 8.8 and 8.4 worker / 5 minutes and on infection places 8.6, 5.1 and 5.8 worker, respectively.

Symbiotic relationship between the species of ants with larvae of insect *Tarucus rosacea* on the *Zizyphus* plant.

The existence of three species of ants were *Monomorium schultzei* , *Crematogaster luctans* and *Plagiolepis pygmaea* on the zizyphus plant, the symbiotic relationship with insect *Tarucus rosacea*. the results showed that the incidence of larvae *Tarucus rosacea* in Zizyphus leaves was 5.6 larvae / branch and infection ratio 65.3% in Shatt al-Arab region in presence of ants species *Monomorium schultzei* and the number of ants passing on track was 10 worker / 5 minutes and in the place of infection 3.3 worker. in absence of ants the larvae *Tarucus rosacea* was 2.1 larvae / branch and infection ratio 28.7%. In karmat Ali region the number of larvae *T. rosacea* 4.4 larvae / branch and infection ratio 58.2% and ants passing on the stem was *Monomorium schultzei* 6.7 worker / 5 minutes and 2.8 worker in infection In place . the absence of ants the larvae was 2.3 larvae / branch and the infection ratio 33.2%. In the Hartha region observed high population density and infection ratio of larvae *T. rosacea* as the larvae rate was 7.4 larva and infection ratio 83% and ants passing the ant species of *Crematogaster luctans* was 10.5 worker / 5 minutes and 4.1 worker. the number of larvae in the absence of ants 1.8 larva and infection ratio 37.4%. In Hamdan region that the infection rate was 7.5 larvae / branch and infection ratio 73% and the rate of ants *Monomorium schultzei* was 13.3 worker / 5 minutes and the number of ants 5.1 In absence of ant, the infection of larvae 1.9 larva and the larvae of *Tarucus*

Table 1 Effect presence or absence of some species of ants on *rosacea*.

The region	Sp. of ants	No.ants /5minute	No.ants in infection place of <i>T.r</i>	No.larvae of <i>T.r</i> with ant	Infection ratio%	No. larvae of <i>T.r</i> (with out)ants	Infection ratio%
Shat Al arab	<i>M.s</i>	10	3.3	5.6	65.3	2.1	28.7
Al hartha	<i>C.l</i>	10.5	4.1	7.4	83	1.8	37.4
Karmat Ali	<i>M.s</i>	6.7	2.8	4.4	58.2	2.3	33.2

Hamdan	<i>M.s</i>	13.3	5.1	7.5	73	1.9	29
Mhejran	<i>C.l</i>	12.9	5.3	8.7	91.5	2.5	42.2
Uesphan	<i>P.p</i>	12.2	4.2	6.3	80	2.1	31

infection ratio 29%. The highest infection was Mhajeran region, the larvae rate was 8.7 larva and infection ratio was 91.5% and the of ant species of *Crematogaster luctans* was 12.9 worker / 5 minutes and 5.3 worker on infection of larvae *T. rosacea*, and without the ants 2.5 larva and infection ratio was 42.2%. In Yousfan region was larvae 6.3 larva and the infection ratio was 80% and the rate of passing ant species of *Plagiolepis pygmaea* was 12.2 worker/5 minutes and the ants 4.2 on infection place, and the rate of larvae without ants was 2.1 larva and infection ratio was 31%. Konrad(1989) showed that's the association of Lycaenid larvae and species of ants termed myrmecophily and association positive correlation, the ants defended upon the larvae of family Lycaenidae from the predators. Palsson (2002) determined the relationship between the ant *Formica rufa* and the bird cherry oat aphids *Rhopalosiphum padi* on the bird cherry tree *prunus padus* noted that the population of aphids was increased in presenace of ants about 85% higher on trees with ants compared to tree without ants and looked that the ants didn't effect to reduce the number of predators but reduce the damage of them. Delabie (2001) showed that Some mutualistic relationships between ants and insects of Homoptera are known as trophobiosis .ants have developed several types of trophobiotic relationships with Lepidoptera larvae of the families Lycaenidae.

Diagnosis of some ant species and its relationship to the mealy bug insect *Nipaecoccus vastator* .

The ant species of *Crematogaster luctans* that have a symbiotic relationship with mealy bug *Nipaecoccus vastator* in zizphus plants of seed vareity in the middle of the fourth month, the number of ants on track of plant was 43 worker / 5 minutes in the Hamdan region also found other species *Monomorium caldarium* on roses *Rosa* spp and had symbiotic relationship with the mealybug *N.vastator* and the number of ants on track 16 worker /5 minutes in the center of the Basrah province . Adenuga (1975) reported those species of ants are associated with scale Insects mealybugs (Pseudococcidae) attended to varying degrees by ants Subfamily Myrmicinae *Crematogaster* spp only *C.luctans* *C. leneri* *C. boxi* Subfamily Formicinae only *Acantholelssis*, *Polyrachis*, *Camponotus*. Soleyman-Nejadian, and Dezhakam,. (2001). showed that the ant species of *Crematogaster antaris* was protected the mealbugs of *Nipacoccus viridis* against two wasp parasitoids on citrus in Dezful.

The diagnosis of certain species of ants in fruit of the palm trees.

The ant species of *Messor rufotestaceus* diagnosis in the falling fruits of the palm of Hillawi variety which infected by insect larvae of *Batrachedra amydraula* in Hamdan region in the middle of the fifth month, the ants were diffuse large area on the soil and has several tracks and the presence of ants were between 2-4 worker in each fruit. the species of ant *Camponotus xerxes* on palm of brahi variety and the number of ants 35 worker / 5 minutes, and also was prevalent on the the soil in the middle of the seventh month and also found the same species of ant in the store for dates in the orchard, the number of ants on track 42 worker/5 minutes and also observed species *A. aniolepis* in store of dates , the number of worker in track 21/5 minutes.

The relationship between ants species with hives of honeybees.

Results showed that there were five species of ants have a negative relationship with hives of honey bees through feeding and damage to both the contents of the discs of wax in the brood which were containing eggs , larvae and pupae, as well as feeding on honey and pollen.

Table 2 The species of ants which infected the hives of bees.

Species of ants	No.ants in5minutes	Infecion ratio% of waxy discs in the hive of bees
<i>Crematogaster luctans</i>	46.7	20.5
<i>Camponotus xerxes</i>	24	100
<i>Anoploepis anoplolei</i>	33.5	50.6
<i>Messor rufotestaceus</i>	30.2	100
<i>polyrhachissimplex</i>	41	100

The results indicate that the number of ants species of ant *Crematogaster luctans* was 46.7 worker / 5 minutes, most of the direction and infection of this species were to the eggs, honey, pollen and some waste and wax. While the number of ants species *Camponotus xerxes* and species *Messor rufotestaceus* 24 and 30.2 worker / 5 minutes, respectively, to the two hostile behavior, as they both worked on the destruction of all phases of the honey bees, eggs , larvae and pupae and even worker bees inside the hive and also working on catch the worker and move it towards the nest and damage ratio 100% of wax discs and transfer its contents of honey and pollen. the species *Anoploepis anoplolei* most of the damage happening in the hive by feeding on

honey, eggs and larvae. Feeding of species *polyrhachis simplex* on honey and pollen and had hostile behavior to worker honeybees. all the damage that occurs in the hives was as the result of Beekeeper neglect to prevent ants to pass through the hive base and this is a problem of most beekeepers. through survey of the hives which placed on the iron bases, the infection ratio of ants was a few, especially in the summer months in the province of Basrah.

Diagnosis of ant species in the desert farms

Table 2 The species of ants which infected the hives of bees.

Species of ants	No. ants in 5 minutes
<i>Triglyphothrix lanuginose</i>	78
<i>Tetramorium caldarium</i>	55
<i>Messor rufotestaceus</i>	65

The three species of ants diagnosed in the desert farms in Zubair region, the ants those worked to damage of tomato seeds and trasfered to their nests. in the case of without used the pesticides with the seeds , cultivated lead to fail about 100%. the species of ants were in the farms 1 - *Triglyphothrix lanuginose* 2 - *Tetramorium caldarium* 3 - *Messor rufotestaceus*. the more number of ants on track was in ant species *T. lanuginose* its reached 78 ant in track on the soil.

REFERENCES

- Abud Al Razaq,K. J. (2012) Ataxonomical and Ecological study of some species of Aphids (Himiptera : Aphididae) and estimate predaition efficiency for two ladybird on them in Basrah . Athesis of Master ,Uni.of Basrah ,College of Agriculture.
- Adenuge ,A.O.(1975) Mutualistic association between ants and some Holoptera ,its significance in cocoa production.Uni. of Ire,Ile Ife (Nigeria).
- Anon,J (2006) Grasslands ant home for ants .J.Art.Sociobiol.42(2):259-368.
- Bakr, R. F. Fadl H. H. Badawy, R. M. and Sharaf M. R. (2007) Myrmecophile insecta associated with some ant species(Hymenoptera-Formicidae) in Egypt
2nd Inter. Conf. Ent. Soc. Egypt, Vol. I.

Buttiker, W. and Krupp, F. (1985) Fauna of Saudi ; Arabai ; Meteorology and Environmental protection Administration Fauna publication No.(7) :1-460.

Collingwood, C. A. and Agosti, D. 1996. Formicidae (Insecta: Hymenoptera) of Saudi Arabia (Part 2). Fauna of Saudi Arabia, 15:300-385.

Delabie J. H.C. (2001) Trophobiosis Between Formicidae and Hemiptera (Sternorrhyncha and no.4 Londrina Dec. Auchenorrhyncha): an Overview. *Neotrop. Entomol.* vol.30

Elahe Shiran, Mossadegh, M. S., and Esfandiari, M. (2013) Mutualistic ants (Hymenoptera: Formicidae) associated with aphids in central and southwestern parts of Iran Department of Plant Protection, College of Agriculture, Shahid Chamran University of Ahvaz, Iran. 12. *J. Crop Prot.* 2 (1): 1-12.

Ian Billick, Samantha Hammer Jennifer S. Reithel and Patrick Abbot (2007) Ant-Aphid Interactions: Are Ants Friends, Enemies, or Both *Ann. Entomol. Soc. Am.* 100(6):887-892.

Jaber ,F.N.(2006) Systematic and Ecological studies on Ternites in Basrah province and its Chemical and Biological Control. Athesis of Master, Uni. Of Basrah , College of Agriculture .

Konrad F.(1989) European and north west African Lycaenidae (Lepidoptera) and their associations with ants . *J. of Resarch on the Lepidoptera* (91).28(4):239-257.

Lehr, P.A. (1988) Keys to insects of the Far East of the USSR, Nauka publishing House, 158 pp.

Lokeshwari, D. Krishnakumar N. K . and Manjunatha , H. (2015) Record of ants (Hymenoptera: Formicidae) tending aphids with special reference to the melon aphid, *Aphis gossypii* Glover (Hemiptera: Aphididae) Pest Management in Horticultural Ecosystems, Vol. 21, No. 1 pp 31-37 .

Mossadegh, M. S., Esfandiari, M. and Heidarynia, Z. 2008. The effects of symbiotic ants on biological control of *Nipaecoccus viridis* (New.) by *Cryptolaemus montrouzieri* Mul. in citrus orchards of north Khuzestan. Proceedings of the 18th Iranian Plant Protection Congress, 24-27 Aug., Hamedan, Iran. p. 36.

Othman ,N. S. and Abdullah, S. I. (2010) The relationship between two ant species workers, aphids nymphs and the aphids being parasitized on in the case of Broad Bean plants . Plant Protection dept.- College of Agriculture & Forestry- Mosul University- Mosul / Iraq. *J. Agri. Al Rafden* (38) No 1.

Özdemir, I., Aktac, N., Toros, S., Kilincer, N. and Gurkan , M. O. 2008. Investigations of the association between aphids and ants on wild plants in Ankara province (Turkey). *Munis Entomology and Zoology*, 3: 606-613.

Pålsson, K.J.(2002). Ants tending host-alternating aphids in different habitats: Mutualism or exploitation. Department of Ecology and Crop Production Sciences. Swedish University of Agricultural Sciences. No 53. Uppsala.

Powell, B. E. and Silverman J. (2010) Population Growth of *Aphis gossypii* and *Myzus persicae* (Hemiptera: Aphididae) in the Presence of *Linerpithema hunile* and *Tapinoma sessile* (Hymenoptera: Formicidae) North Carolina State University, *Environ. Entomol.* 39 (5):1492-1499.

Soleyman-Nejadian, E. and Dezhakam, M. 2001. Investigation on the protection of *Nipacoccus viridis* (NEW.) by *Crematogaster antaris* Forel (Hym.: Formicidae) against two wasp parasitoids on citrus in Dezful. *Scientific Journal of Agriculture*, 23 (2):53-69.

Stadler, B. and Dixon, F. G. 2008. Ecology and evolution of aphid-ant interactions. *The Annual Review of Ecology, Evolution and Systematics*, 36: 345-372.

Stoetzel, M.B. and Miller, G.L. (2001) Aerial feeding Aphids of corn in the United State with reference to the root feeding *Aphis maidiradicis* (Homoptera: Aphididae) *Florida Entomologist* 84(1).

Takaloozadeh, H.M. (2010). Effects of host plants and various temperatures on population growth parameters of *Aphis gossypii* Glover (Homoptera: Aphididae). *Middle East Journal of Scientific Research* 6(1): 25-30.

Völkl, W., Mackauer, M., Pell, J. K. and Brodeur, J. 2007. Predators, Parasitoids and Pathogens. In: van Emden, H. F. and Harrington, R. (Eds.) *Aphids as Crop Pests*. CABI, Wallingford, pp. 187- 233.

Völkl, W., Woodring, J., Fisher, M., Lorenz, M.W. and Hoffmann, K. H. 1999. Ant-aphid mutualisms: the impact of honeydew production and honeydew sugar composition on ant preferences. *Oecologia*, 118: 483-491.

Wheeler, G.C. and Wheeler, J. (1986) *The ants of Nevada*. print Los Angeles County.

86:1-138

Yassin, S.M. (2010) Taxonomical and ecological studies of ants (Hymenoptera, Formicidae) in Basrah province. *Thesis of Master, Uni. Of Basrah, College of Agriculture*.