STUDIES ON THE APHID, *APHIS CRACCIVORA*, KOCH. (HOMOPTERA : APHIDIDAE) IN EGYPT.

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INTRODUCTION

Cowpea is one of the important leguminous vegetable crops in Egypt. The cowpea aphid, *Aphis craccivora* Koch., is considered to be the common injurious species to attack its plantations. It causes direct damage by sucking the plant sap and indirect damage by transmitting many virus diseases to the plants.

A. craccivora has been reported by several authors in many parts of the world as an injurious pest to cowpea plants and to many other host plants (Waghmare & Pokharkar 1976, Saharia 1982 and Marfo 1985) and as a vector for many virus diseases (Abeygunawardena &Perera 1966, Herold & Munz 1969 and Sachidananada & Verma 1974).

In Egypt, Willcocks (1922) and Hall (1926) recorded *A. craccivora* (= *A. leguminosae* Theo.) on leguminous crops, mainly cowpea and lentil. Saleh *et al.*, (1974) studied the population density of this aphid on broad bean as well as cowpea in Assiut Governorate. Bishara *et al.*, (1984) revealed the population levels of the cowpea aphid on faba bean Vicia faba in Beni-Suef Governorate. Available literature showed that no studies have been done on the parasites of *A. craccivora*, in Egypt.

This present work was conducted to survey aphid species infesting cowpea plantations, to study the seasonal abundance of *A. craccivora*, on cowpea and to estimate percentage of parasitism on this species, in Egypt.

MATERIAL and METHODS

Survey of aphid species infesting cowpea plantations was carried out during the season of 1985 in Assuit (Upper Egypt), Beni-Suef & Giza (Middle Egypt) and Qalubia, Dakahlia and Alexandria (Lower Egypt). Seasonal abundance of aphid species attacking cowpea plantations as well as their percentage of parasitism were undertaken during the summer season of 1986 (from early April until the end of September 1986) at Giza region. An area of about half feddan cultivated in March 1986 with cowpea was chosen for this study. This area was not subjected to any chemical control.

Sampling

Survey of aphid species : Infested samples of cowpea plants were biweekly collected from the previously mentioned Governorates, kept in paper bags, transferred to the laboratory and mounted in Swan's medium for identification.

Seasonal abundance : Experimental area of cowpea plants was examined weekly to record the first date of occurrence of aphid infestation and then to follow their fluctuations, all over the season. Fifteen infested cowpea plants were picked up at random; three leaves from the terminal, middle and basel leaves were chosen to represent each plant, this means that forty five infested leaves were examined weekly. Actual number of different forms and stages of aphids on both surfaces of the infested leaves were counted and recorded.

Percentage of parasitism : Weekly samples of infested cowpea plants were collected from the experimental area and transferred to the laboratory, for twelve weeks, starting from early June to the end of August 1986. Number of parasitized aphids were counted and recorded weekly to estimate percentage of parasitism, they were put under glass jars covered with muslin cloth until emergence of adult parasites to serve as material for identification of parasite species.

RESULTS and DISCUSSION

Survey of aphid species on cowpea plants : Survey of the different species of aphids associated with cowpea plantations during the season of 1985 in the six Governorates of study revealed the following three species of aphids: *Aphis gossypii* Glover, *Aphis craccivora* Koch and *Acyrthosiphum pisum* Harris.

Cowpea plants were found to harbour few alatae forms of each of *A. gossypii* and *Acyrthosiphum pisum* without any apparent damage to the leaves. They were observed on the new leaves during the period from March to May. The alatae forms were able to reproduce, but the newly born nymphs died within twenty four hours. No colonies of these two species of aphis were recorded on cowpea plants during the whole period of survey.

A. craccivora proved to be the most injurious and dominant species found on cowpea plants. It was found to attack the plants after opening their flower buds (about 45 days from sowing). Infestation by *A. craccivora* started on the lower surface of the leaves, especially around the mid ribs and then dispersed to the leaf stalk, flower buds and pods especially apical pods of the cowpea plants.

High number of alatae was noticed on cowpea plants at the beginning of the season. This was due to the migration of these alatae from other winter hosts (broad bean, lentil and leguminous weeds).

Seasonal abundance of A. craccivora : Seasonal abundance of *A. craccivora* was studied during the season 1986 at Giza region. Direct count of the different forms of aphids, average number of each form per leaf was recorded (Table I & Fig. I).

A. craccivora in the experimental area was observed to start by two alatae forms per leaf about mid-June (7 weeks from sowing date). Aphid population seemed to be increased gradually and reached its climax of 229 individuals / leaf by 20 July then seemed to be decreased gradually until the end of the season, when it disappeared completely by 28 September.

Apterous forms was observed on the cowpea plants two weeks later after the appearance of alatae forms. Data (Table I & Fig. I) showed that July was the top season of infestation by *A. craccivora* on cowpea plantations at Giza region. This was in agreement with that of Saleh *et al.*, 1974.

Percentage of parasitism : In all the collected samples, emerged parasites indicated the occurrence of an aphidiid parasite species (specimen of the parasite was sent to the Natural History Museum of London for identification) belongs to family Aphidiidae, order Hymenoptera. Percentage of parasitism are summarized in Table I and Fig. I. Rate of parasitism was relatively high during June and reached its climax of 10% by the end of the month (28/6). In July, it was generally less than in June till the last week of the month, when it dropped to zero by 26 July, and continued as zeroes till the end of August.

Monthly percentages of parasitism showed 7.25, 3.70 and 0% in June, July and August, respectively. The mean percentage of parasitism in the whole period (12 weeks) was 3.60%. It is clear that the active season of the parasite on cowpea aphids, *A. craccivora* at Giza region seemed to be mainly during June, when percentage of parasitism increased till the last ten days of the month, it reached its maximum (8-10%), then began to decrease.

TABLE I

Weekly mean number of different forms of the cowpea aphids, *Aphis craccivora* Koch., per leaf on cowpea plants and their percentage of parasitism during 1986 season at Giza region.

Date	Winged Alatae	Winged Nymphs	Apterae	Nymphs	Total	Parasitism%
30/3/86	0	0	0	0	0	—
11/5/86	0	0	0	0	0	—
18/5	2	0	0	0	2	—
25/5	4	0	0	3	7	—
1/6	3	0	2	8	15	—
8/6	2	2	4	19	27	6
15/6	0	3	6	30	39	5
22/6	0	4	10	56	70	8
29/6	0	5	13	85	103	10
6/7	1	8	16	125	140	5
13/7	3	10	20	152	185	3
20/7	5	12	23	189	229	6
27/7	7	15	20	147	189	0
3/8	6	13	17	131	167	0
10/8	4	9	13	95	121	0
17/8	3	6	8	70	87	0
24/8	2	4	5	48	55	0
31/8	1	3	4	26	34	0
7/9	0	0	2	12	14	—
14/9	0	0	1	5	6	—
21/9	0	0	1	2	3	—
28/9	0	0	0	0	0	—

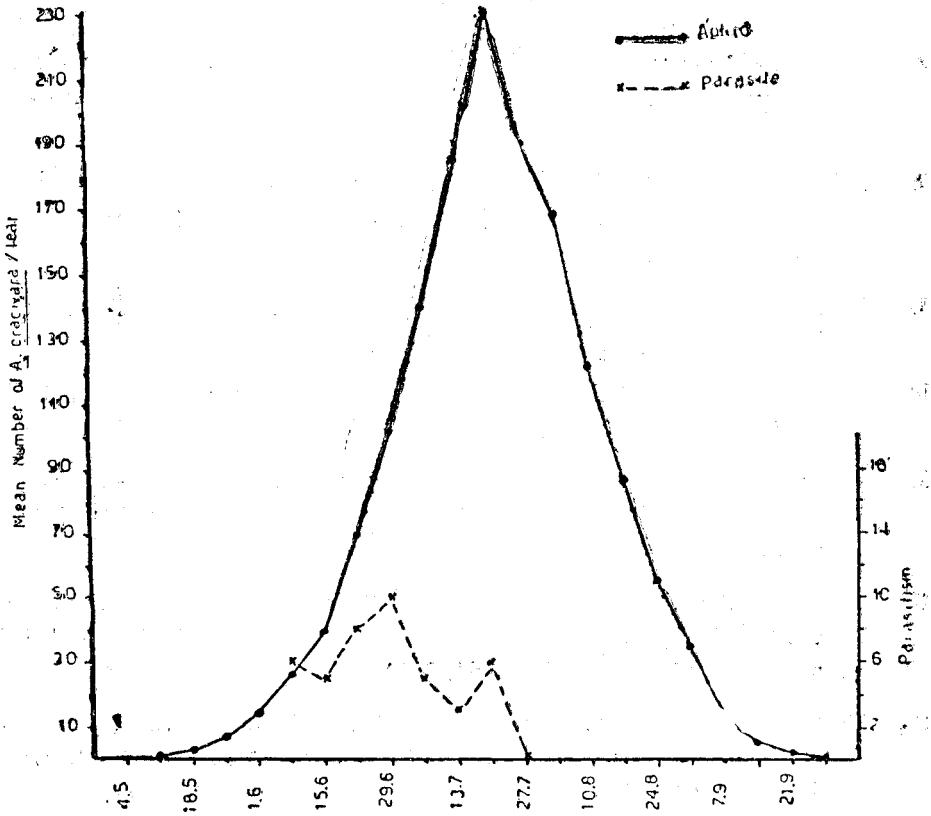

Fig.(1)- Weekly mean number of different forms of Cowpea aphid, Aphis craccivora Koch. per leaf on Cowpea plants and their percentages of parasitism during 1986 season at Giza region.

SUMMARY

Aphid craccivora Koch. is an injurious pest to cowpea and other leguimous crops in the world as well as in Egypt. This present work aims to survey different aphid species associated with cowpea plantations, to study the seasonal abundance of *A. craccivora* on cowpea plants and to estimate percentage of parasitism on this aphid species.

Aphis gossypii Glover, *A. craccivora* and *Acyrthosiphum pisum* Harris were recorded on cowpea plants, but *A. craccivora* was the dominant species. Seasonal abundance of *A. craccivora* in season 1986, at Giza region showed its presence on cowpea plants for a period lasted from mid-May till the end of September and reached its peak by mid-July. A relatively high percentage of parasitism (8 - 10%) was reported by the end of June.

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