

SEASONAL ABUNDANCE OF APHIDS AND THEIR NATURAL ENEMIES IN WHEAT FIELDS IN UPPER EGYPT.

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ABSTRACT

Seasonal abundance of certain biocontrol agents associated with aphids in wheat fields was studied for the two seasons 1988/89 and 1989/90 in two districts of each of Assiut and Sohag Governorates in Upper Egypt. Four species of aphids were recorded infesting wheat plants during the study. The highest rates of aphid infestation were observed during March. Six groups of predators were counted weekly. Highest numbers of predators were recorded during April. Coccinellids were the most abundant predatory species in wheat fields. Highest parasitism % was estimated in early April and late of February in 1988/89 and 1989/90 seasons, respectively in the two Governorates. Four hymenopterous parasitoid species were identified parasitizing aphids in wheat fields.

KEY WORDS : Aphids, Predators, Parasitoids, Wheat, Egypt.

INTRODUCTION

Wheat is the most important cereal crop in Egypt. It is constrained by a variety of insect pests, vertebrates and diseases. Aphids are serious insect pests attacking wheat plants in Egypt, their losses to the crop were estimated by Tantawi (1985b) as 7.5-18.7% in middle and upper Egypt.

It was reported that four aphid species; *Rhobalosiphum padi* L., *Rh. Maidis* F., *Shizaphis triticeum* R. and *Sitibion avenae* Fab. were recorded infesting wheat plants in Egypt (El-Ariry, 1979 and Tantawi, 1985b). Recently, Attia and El-Kady (1988) added *Diuraphis noxia* Mord. as the fifth aphid species infested wheat plants in middle Egypt. Few studies concerning the role of natural enemies in wheat fields have been carried out in Egypt. Ghanim and El-Adl (1983) studied the role of predators in suppressing wheat aphids. El-Heneidy and Attia (1989) surveyed seven groups of predators and three species of parasitoids associated with aphids on wheat in middle Egypt.

The present study dealt with the seasonal abundance of aphids and their natural enemies in wheat fields in upper Egypt. Such ecological information are essential for developing an integrated control program against the insect pest infesting wheat.

METHODS AND TECHNIQUES

The study was carried out in wheat fields located at four districts; Assuit and Abo-Teeg (Assuit Governorate), Shandaweel and El-Maragha (Sohag Governorate) for the two successive growing seasons 1988/89 and 1989/90. The studies were undertaken in an area of about 10 feddans of wheat in each of the four locations. Surrounding crops were Egyptian clover, vegetables and Faba bean. Sampling was conducted weekly during the two seasons of study, starting from early January till the late of April, in the four districts.

APHID INFESTATION

- Infested samples of wheat plants were collected throughout the season for identification of aphid species.
- Rates of aphid infestation were estimated weekly by examining 100 wheat plants randomly/district. depending on the following relative grades (Hafez, 1964):

0 = No infestation	1 = Light infestation
2 = Moderate infestation	3 = Severe infestation

NATURAL ENEMIES

- Direct counting of predator species on 100 wheat plants/district was undertaken weekly.
- Samples from infested wheat plants were collected weekly and transferred to the laboratory for:
 - 1- estimating parasitism % by dissecting 100 living aphids/district.
 - 2- identifying parasitoid species by keeping infested samples in glass jars until emergence of parasitoid adults.

RESULTS AND DISCUSSION

APHID INFESTATION

Aphid species: Four species of aphids, i.e. *Rhobalosiphum padi* L., *Rh. maidis* F., *Shizaphis graminum* R. and *Sitibion avenae* Fab. were recorded infesting wheat plantations in Assiut and Sohag Governorates during the two seasons of the study.

Seasonal abundance: Field and laboratory observations on different aphid species showed that:

- *Rh. padi*: occurred from late December until the end of April (16-18 weeks).
- *S. graminum*: occurred from early January until early April (12-14 weeks).
- *Rh. maidis*: occurred from early February until mid-April (10-12 weeks).
- *S. avenae*: occurred from early March until the end of April (8-10 weeks).

Rh. padi dominated the other species of aphids in wheat fields all over the season, this fact

was in agreement with the findings of Tantawi (1985a) and El-Heneidy and Attia (1989).

Rates of aphid infestation: According to the relative four grades (0-3) of infestation, highest population densities of aphids were observed mostly during March as grades 2 and 3 were recorded in the experimental areas. Percentages of infested plants in the two Governorates ranged 8-32 and 6-30% in Assuit and Sohag, respectively in the season 1988/89. Respective figures were 6-23 and 4-28% in the season 1989/90.

NATURAL ENEMIES

Predators and parasitoids were the biocontrol agents taken in consideration. No insect pathogen diagnosis was observed on aphids during the study.

PREDATORS

- Six groups of common aphidophagous predators; coccinellids, chrysopids, anthocorids, syrphids, staphylinids and true spiders were considered in the study of seasonal abundance of predators in wheat fields (Fig.1). As shown in the figure, number of predators in wheat fields varied from one season to another but similar seasonal trend was observed in the two Governorates. Gradual increase towards the end of the season was obvious. Highest numbers of predators were recorded by mid-April and end of March in 1988/89 and 1989/90 seasons, respectively. The same phenomenon was reported by El-Heneidy and Attia (1989).
- Coccinellids, chrysopids and true spiders were the most abundant predators found on wheat plants in the season 1988/89, while the respective groups were coccinellids, true spiders and syrphids in the season 1989/90 in the two Governorates. *Coccinella undecimpunctata* L. was the abundant species in wheat fields during the study.

PARASITOIDS

- Percentages of parasitism on different aphid species in wheat fields were estimated weekly all over the two seasons, in the four districts. Obtained data are illustrated in fig. 2. The pattern of parasitism % in wheat fields change from one season to another. It reached its maximum by early April and by end of February in 1988/89 and 1989/90 seasons, respectively in the two Governorates.

Diaeretiella rapae M., *Aphidius* spp., *Trioxys* spp. and *Praon* spp.

(Hymenoptera, Braconidae, Aphidinae) were identified parasitizing aphid species in the wheat fields of the study.

In conclusion, highest period of aphid infestation in wheat fields (mostly March) coincided with high rates of parasitism, and it was earlier than that of predators (mostly April), what might reduce the role of predators as biocontrol agents in wheat fields. The same observation was reported by El-Heneidy and Attia (1989) in middle Egypt.

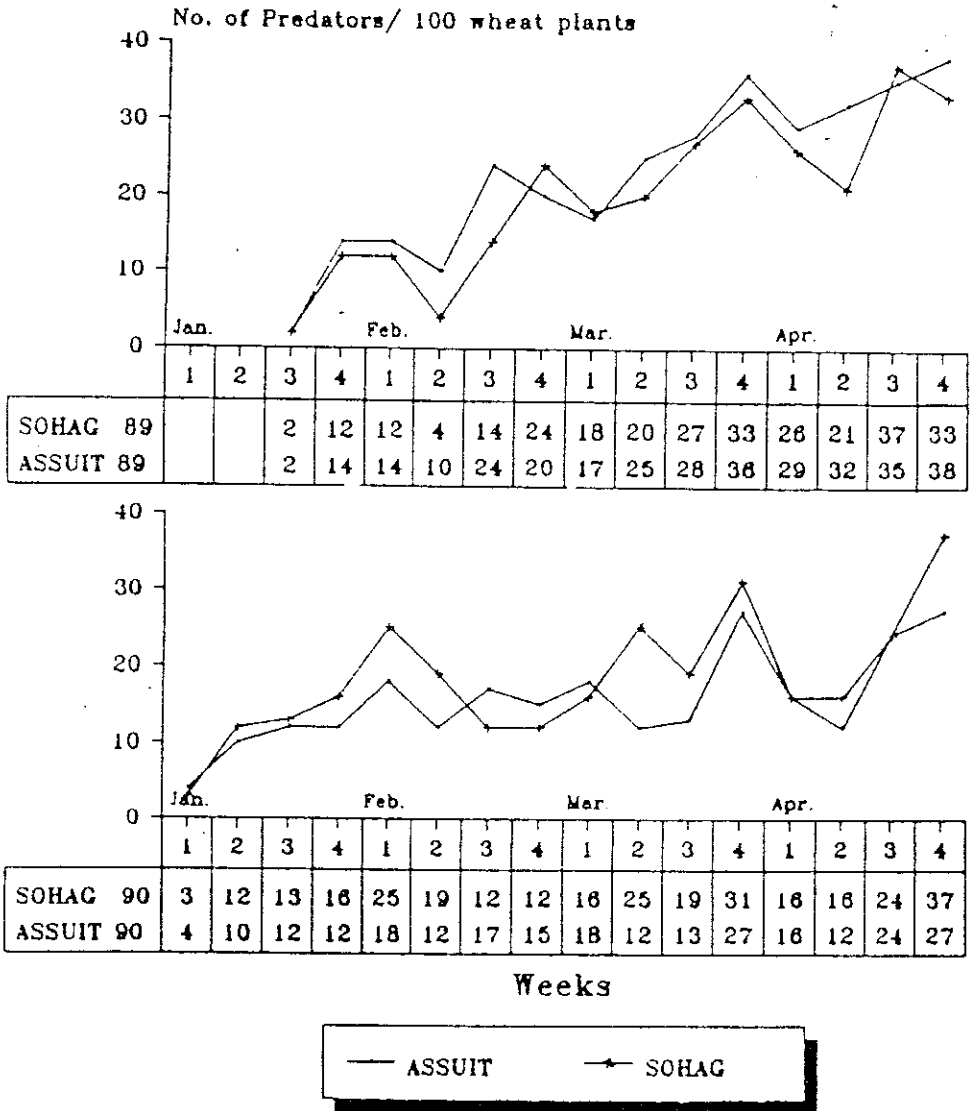


Fig. 1: Weekly counts of predators / 100 wheat plants associated with aphids in wheat fields at Assuit and Sohag Governorates during 1988/89 and 1989/90 seasons.

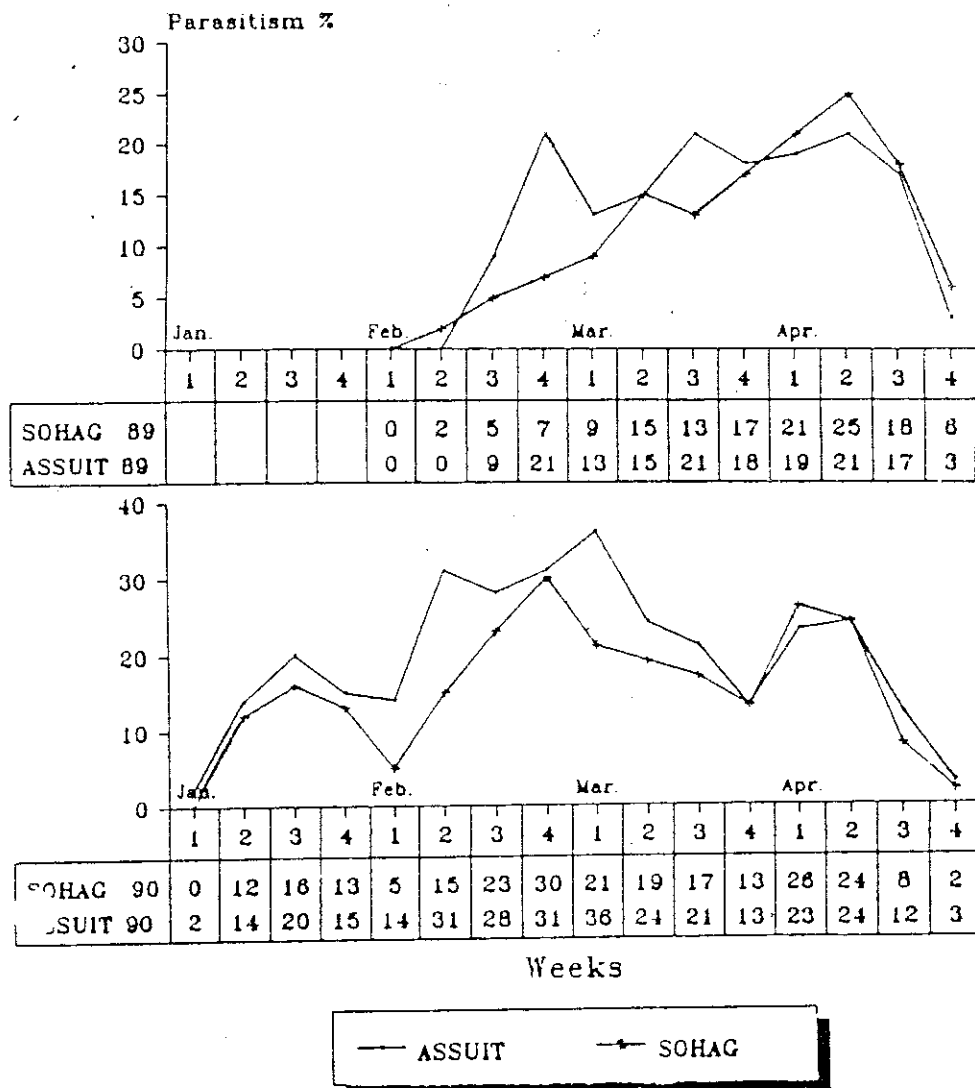


Fig. 2: Weekly percentages of parasitism on aphids in wheat fields at Assuit and Sohage Governorates during 1988/89 and 1989/90 seasons.

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