



Seasonal Ecology of *Deraeocoris pallens* (Hemiptera: Miridae) in Cotton

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ABSTRACT

Deraeocoris pallens Reut. is the most commonly observed predator in cotton fields of Çukurova region in Turkey. Population developments *D. pallens* and other cotton pests were monitored in four different cotton fields in 1992 and 1993. The number of aphids, spider mites, thrips and whiteflies were counted on fifteen cotton leaves randomly taken from each field at weekly intervals. *D. pallens* populations were monitored by using insect net and vacuum samples. In both years, adults of *D. pallens* were first observed alongside the increase of aphid populations, reaching a peak by late June and then declining as aphid populations declined. Populations of *D. pallens* stayed at low levels in the absence of aphid populations and then started to increase again with the population increases of thrips, whiteflies, and spider mites. Winter surveys indicated that *D. pallens* overwintered as adult on various plants, including citrus and pine trees, winter vegetables, and some other wild flora.

Introduction

Efficient IPM programs require the identification of natural enemies and their role in given agro-ecosystems. *Deraeocoris pallens* Reut. is one of the most common polyphagous predators in cotton fields in East Mediterranean and South Eastern Anatolia regions of Turkey (Karaat *et al.*, 1986; Ozgur *et al.*, 1988; Atakan, 1994). It was also reported in open vegetable fields (Ulubilir and Yabas, 1996). *D. pallens* controlled *Bemisia tabaci* Genn. by between 7.6 to 70.5 % in release studies (Ulubilir *et al.*, 1995).

The population changes of *D. pallens* and certain other cotton pests, its sex ratio and overwintering sites are discussed.

Material and Methods

Population changes. Studies were carried in 0.5 ha cotton field at Balcalı, and a 1.0 ha cotton field in Haciali for two years (1992 and 1993). Sampling was started from the seedling stage of cotton and continued weekly until after harvest. Fifteen plants from each field were selected randomly and all the pests on whole plants were counted during the seedling stage. After this stage, 3 leaves from top, middle and bottom were

taken from each of fifteen plants, and brought to the laboratory in ice-box. Counts of all individuals of *Aphis gossypii* Glov., larvae and nymphs of *Tetranychus cinnabarinus* Boisd., *Thrips tabaci* Lind., cicadellids and nymphs and pupae of *Bemisia tabaci* Genn. were made under the stereomicroscope. When the figures were prepared, all stages were combined for each species. *D. pallens* was sampled by taking 25 sweep nets in each field. In addition, 25 vacuum samples (5 s each) were also taken. Sweep net and vacuum samples were combined for presentation.

Sex ratio. To determine the sex ratio, all the samples of *D. pallens* from both fields for two years were examined under the stereomicroscope. A total of 3614 specimen was used to determine sex ratios.

Overwintering. After the removal of cotton plants from the fields, surrounding habitats were visited at irregular intervals during winter. Samples from both agricultural and natural habitats were brought to the laboratory and examined for the presence of *D. pallens*. Samples were also kept in cages for emergence of the individuals.

Results and Discussion

Population changes. Although the number of adults and nymphs varied from field to field and from year to year, population changes of *D. pallens* showed three peaks. The population density of *D. pallens* was much higher in Balcali than that of Haciali for both years (Figs. 1-4). This was probably due to differences in the locality, since the field in Balcali was surrounded with very diverse agricultural and natural habitats whereas Haciali is located in a large cotton increase in *B. tabaci* populations. Due to low *T. cinnabarinus* densities, it is difficult to draw any conclusions for the contribution of this species to the population changes. A number of cicadellids and thrips did not seem to be suitable prey for *D. pallens*. During the population increase of these species, *D. pallens* stayed at relatively low levels. The mobility of thrips and cicadellids might have protected them from being preyed on by *D. pallens*.

Sex ratio. The sex ratio obtained from the field collected specimens is given in Table 1.

Overwintering. Surveys during the winter of 1992 and 1993 indicted that *D. pallens* can pass winter in variety of habitats. Annual plants such as various weeds, alfalfa, winter vegetables, and perennial plants including pine and citrus trees were among the winter host plants of *D. pallens*. The polyphagous habit of *D. pallens* and its ability to overwinter in a variety of habitats may place it among the important natural enemies in undisturbed cotton fields.

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growing area. The high population density of *A. gossypii* in Balcali might also have contributed to the differences between to sites. Population densities of *D. pallens* increased rapidly after the population increase of *A. gossypii* in both fields in 1992 and 1993 and then declined with decreased aphid populations (Figs. 1-4). *D. pallens* populations stayed steady at low levels and increased again with the

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Table 1. The sex ratio of *D. pallens* from field collected specimens.

Location and Date	Total number of specimen	Sex ratio (Male/female)
Balcali, 1992	1116	0.63:1

Balcali, 1993	1000	0.85:1
Haciali, 1992	830	0.78:1
Haciali, 1993	668	0.72:1
Mean		0.75:1

Figure 1. Population changes of *Deraeocoris pallens* and cotton pests in Balcalı (1992).

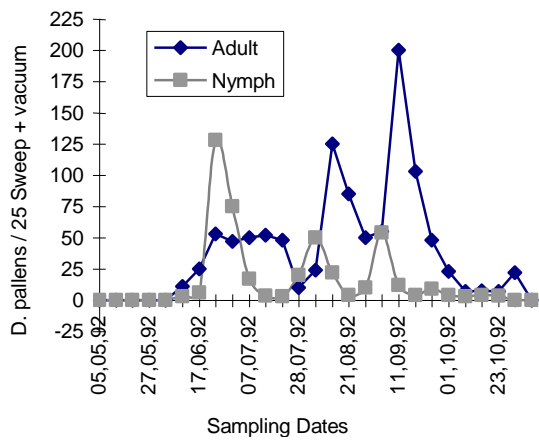
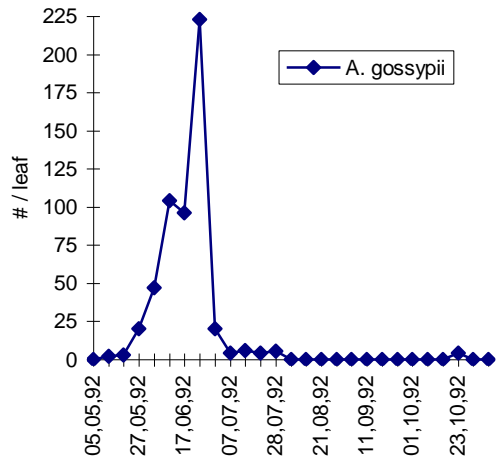
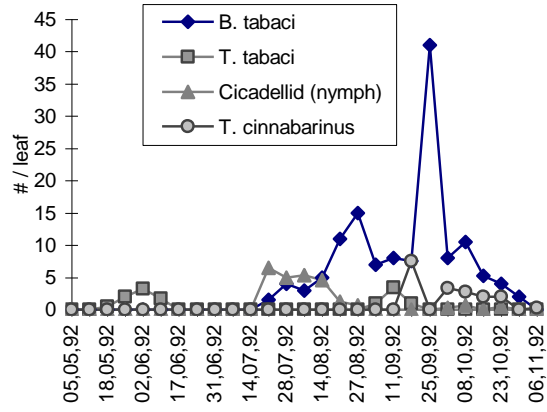


Figure 2. Population changes of *Deraeocoris pallens* and cotton pests in Balcali (1993).

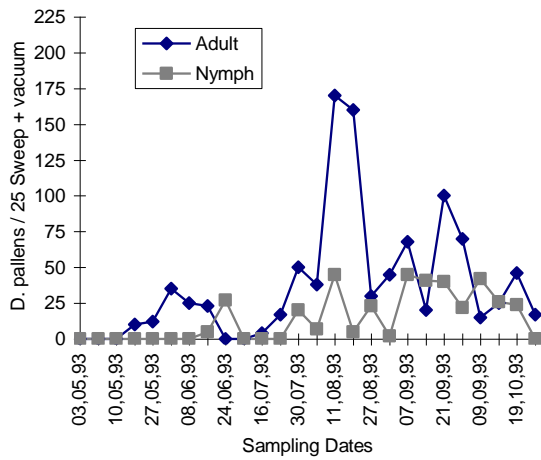
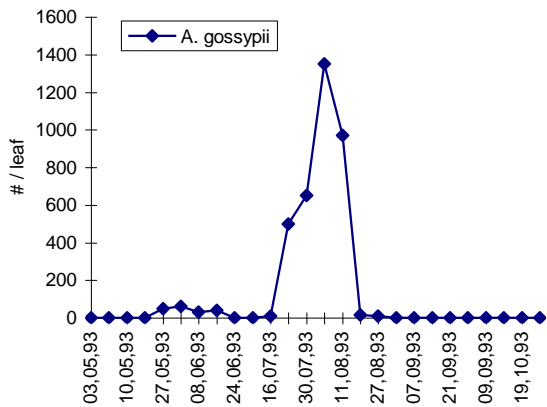
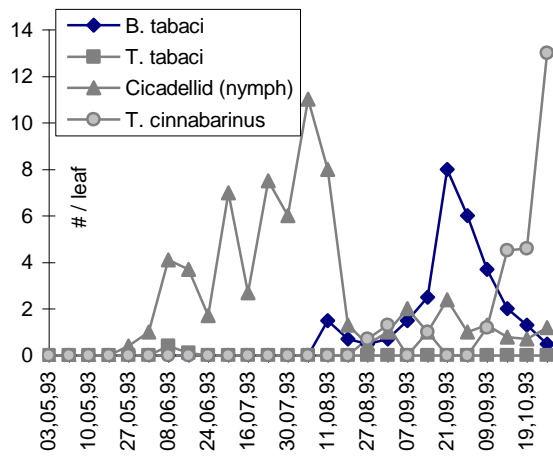


Figure 3. Population changes of *Deraeocoris pallens* and cotton pests in Haciali (1992).

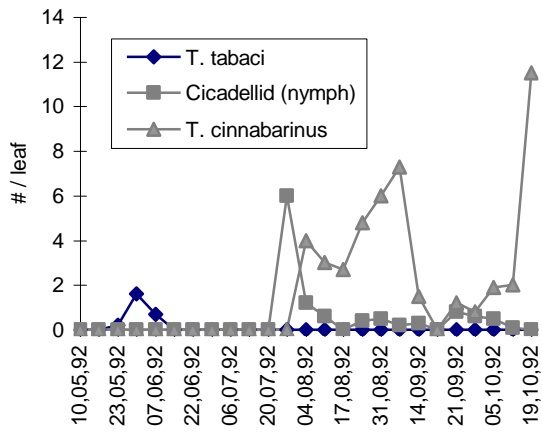


Figure 4. Population changes of *Deraeocoris pallens* and cotton pests in Haciali (1993).

