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Crop-specific Differences in the Seasonal Abundance of Four Major Predatory Groups on Sorghum and Short-duration Pigeonpea

S J Duffield (ICRISAT Asia Center; Current address: Department of Biology, University of Southampton, Southampton, Hants, SO16 7PX, UK)

Predators and parasites can cause significant mortality to *H. armigera* populations in the field (Kyi et al. 1991, Van den Berg and Cock 1994). However, the abundance and impact of natural enemies varies from crop to crop. For example, parasitism by egg parasites of the genus *Trichogramma* can be as high as 80% on sorghum, whilst the levels on pigeonpea are much lower (Duffield 1994). The same type of preference for specific crops may also be true for predators.

This paper describes an experiment conducted to determine whether crop-specific differences occur in the seasonal abundance of four predatory groups on sorghum, and short-duration pigeonpea. Field abundance was recorded by whole plant searching on six genotypes of sorghum, and six genotypes of short-duration pigeonpea in the rainy season of 1992. Sampling was performed at weekly or biweekly intervals from 14 Aug until 25 Nov. On each sampling date, ten plants were randomly selected from each genotype. Invertebrate density was assessed by visual inspection on pigeonpea. On sorghum, the plants were first inspected visually, the panicles were then removed and dissected in the laboratory to collect any hidden stages.

The seasonal abundance of Anthocoridae, adult Coccinellidae, Neuroptera eggs, and Araneae on both crops is illustrated in Figure 1. The anthocorids were dominated by the species of *Orius* which accounted for over 90% of the anthocorids sampled. Anthocorids showed a clear seasonal peak in the middle of Sep on both sorghum (3.6 per plant) and pigeonpea (0.45 per plant) (Fig. 1), with significantly higher numbers detected on sorghum. Numbers on both crops then declined rapidly.

Coccinellids were dominated by *Menochilus sexamaculatus*, although *Brumoides suturalis*, and *Illeis indica* were also recorded. Numbers peaked at the beginning of Sep on both crops, and then declined slowly. Significantly higher peak densities were recorded on sorghum, 1.62 per plant compared to 0.56 per plant on pigeonpea.

Species of *Chrysopa* dominated the Neuroptera. The seasonal abundance of Neuroptera eggs showed a bimodal peak on sorghum, with highest numbers (3.2 per plant) detected at the end of Sep. The number of neuropteran eggs found on pigeonpea was very low (peak 0.15 per plant and showed no clear seasonal patterns.

The Araneae consisted primarily of Araneidae, Linyphiidae, Thomisidae, Clubionidae and Theridiidae. Spider numbers failed to show the clear seasonal peaks in density detected for the other groups. Number of both crops tended to increase slowly through the season as the crop developed, and then decline slowly as the crop senesced. Although a significantly higher peak density was recorded on sorghum (1.16 per plant compared to 0.67 per plant), the difference in numbers on the two crops was less than that detected for the other three groups.

Therefore, significantly higher densities of all four of the predatory groups studied were recorded from sorghum compared to short-duration pigeonpea. However, the significance of these differences in predator abundance on the survival of pests such as *H. armigera* is unclear. Figure 2 shows the seasonal abundance of *H. armigera* eggs and I-II instar larvae on the two crops, during the same sampling period. This figure indicates that although higher peak densities of *H. armigera* eggs were recorded from sorghum, the number of young larvae was much lower than that found on pigeonpea. Intuitively it would seem that this difference in *H. armigera* survival could be accounted for by the higher density of predators found on sorghum. However losses due to 'unknown causes' dominate any analysis of *H. armigera* mortality (Kyi et al. 1991, Van den Berg and Cock 1994) and actually proving that differences in predation lead to differences in overall mortality remains difficult.

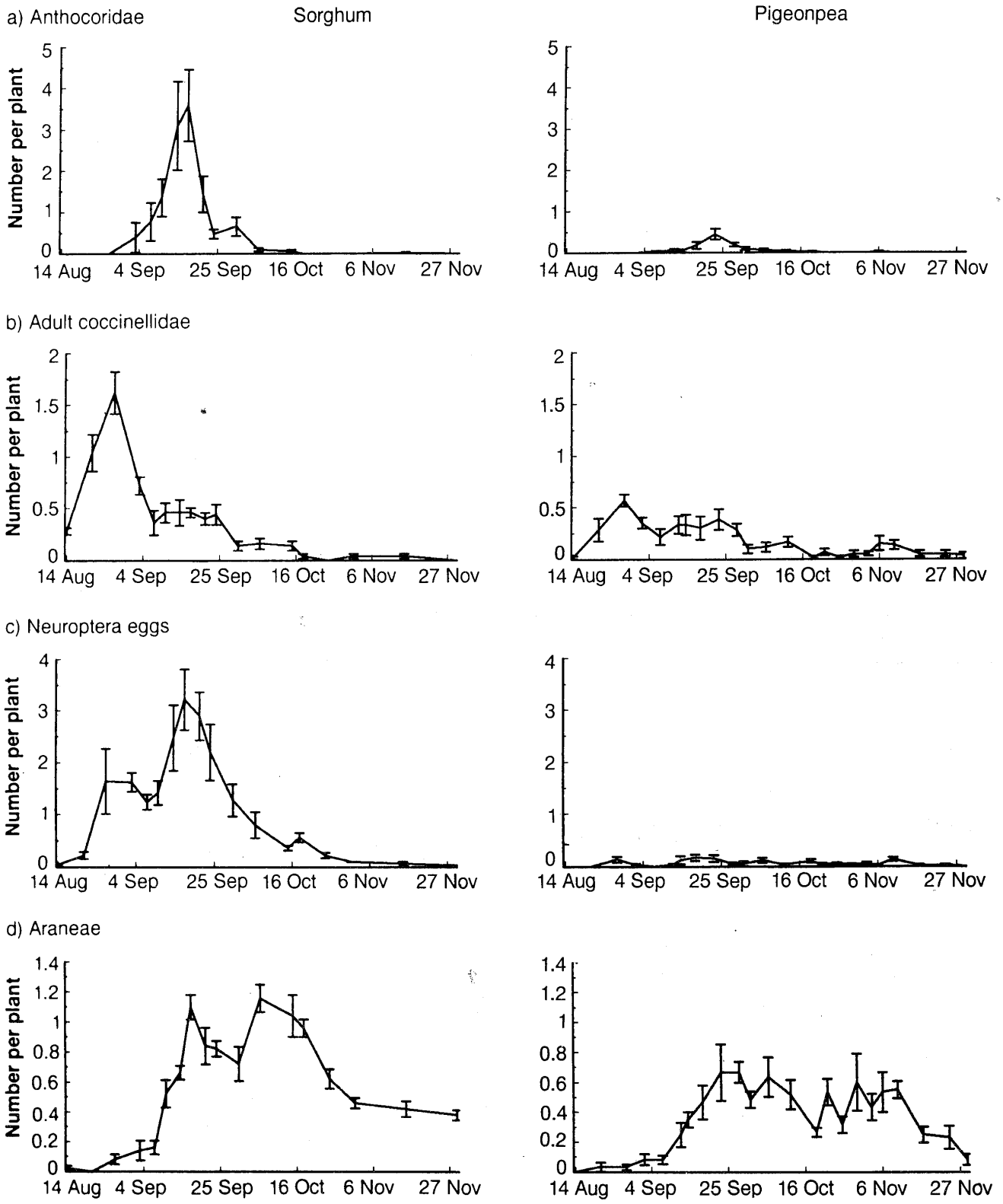

Figure 1. Distribution of a) Anthocoridae, b) Adult coccinellidae, c) Neuroptera eggs, and d) Araneae on sorghum and short-duration pigeonpea.

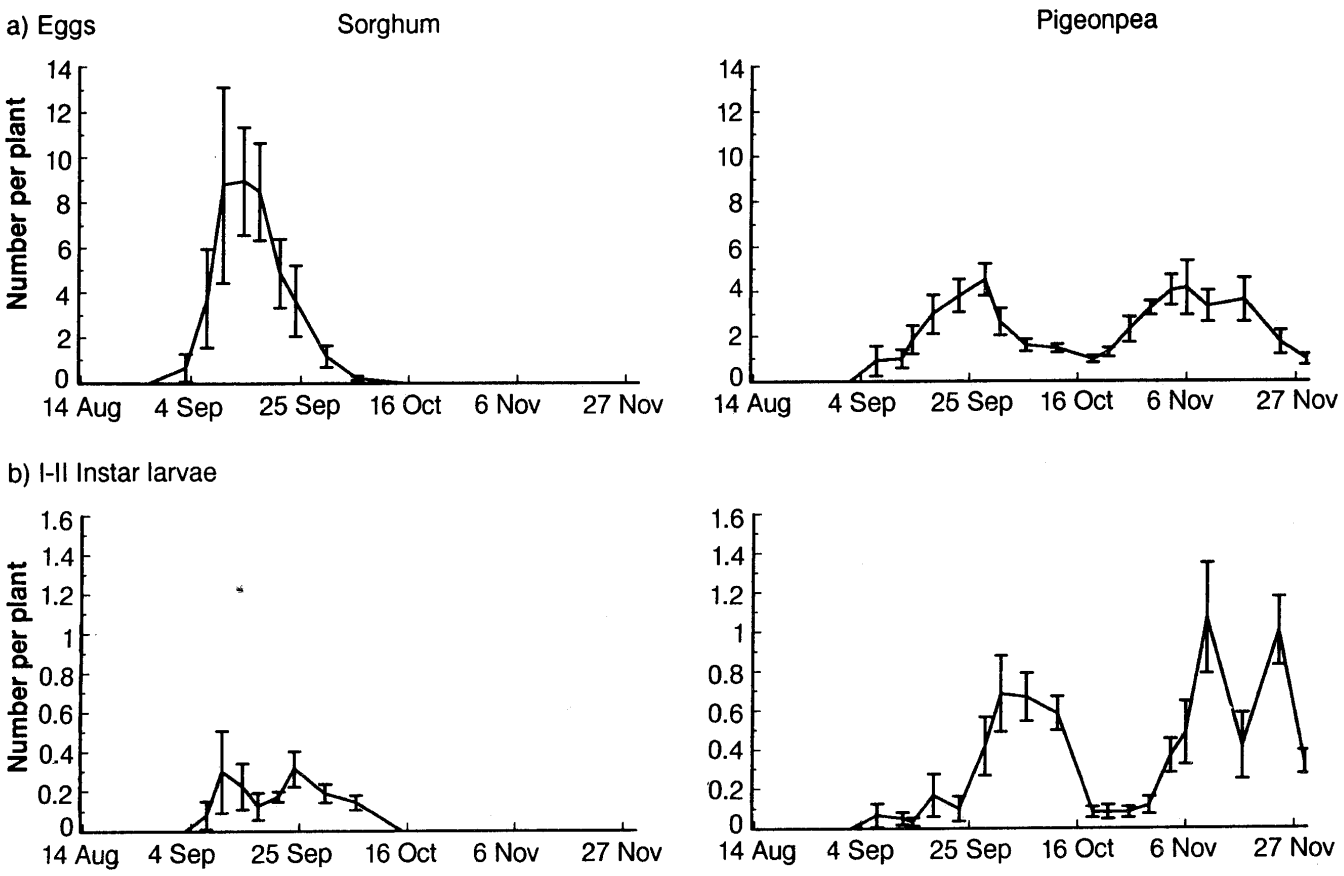

Figure 2. Seasonal abundance of a) *Helicoverpa armigera* eggs, and b) I-II instar larvae on sorghum and short-duration pigeonpea.

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Observations on Insect Damage to Pigeonpea in Nigeria

O Ajayi[1], M I Ezueh[2], R Tabo[1], J E Asiegbu[2], and **Laxman Singh[3]**
(1. ICRISAT, Nigeria; 2. Department of Crop Science, Faculty of Agriculture, University of Nigeria, Nsukka, Nigeria; 3. ICRISAT Asia Center)

Though more than 200 species of insects are recorded as pests of pigeonpea (Lateef and Reed 1980), there are relatively few published accounts of insect damage to this crop in Africa. Materu (1970) reported that more than 50% of pigeonpea seeds were damaged by pod bug in Tanzania, while in Uganda, Kohler and Rarochie (1971) recorded 5% seed damage due to *Helicoverpa armigera*. In Kenya, Okeyo-Owuor (1978) reported seed loss by lepidopteran borers (13%), and podfly, *Melanagromyza* sp (11%). In this note we report observations on insect pest damage to pigeonpea in Nigeria, collected during surveys to assess pigeonpea production and utilization (see Tabo et al., this issue).