tially 25 larvae were taken for each host food. The effect of food was examined daily.

The data presented in Table 1 show that larval and pupal mass of larvae fed on wild pigeonpea flowers and F_1 hybrid were significantly lower than those for larvae fed on the cultivated pigeonpea. The developmental period for the larvae fed on wild pigeonpea flowers was longer than larvae which fed on cultivated pigeonpea flowers. Similarly, pupal length was significantly reduced when larvae fed on wild species and F_1 hybrid compared to cultivated pigeonpea. The growth and development of *H. armigera* were adversely affected on flowers of all wild species. The larval mortality during first 7 days was higher for the larvae fed on wild relatives than pigeonpea. Very few larvae survived to the pupal or adult stages when reared on flowers of wild species as compared to cultivated pigeonpea. Growth index and fecundity were also adversely affected for the larvae reared on wild species and F_1. The adults emerged from larvae reared on wild species were smaller than the adults which emerged from cultivated pigeonpea.

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Type and Distribution of Trichomes on Pigeonpea Leaves

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The different types of trichomes found on pigeonpea pods (*Cajanus* spp) have recently been described (Shanower et al. 1996). This study was part of a project to evaluate plant characteristics which may contribute to the low levels of *Trichogramma* (Hymenoptera: Trichogrammatidae), the egg parasitoids of the pigeonpea pod borer, *Helicoverpa armigera* (Lepidoptera: Noctuidae) (Romeis and Shanower 1996). Plant trichomes are often found to interfere with the searching behaviour of natural enemies of insect pest (Obrycki 1986). Even though *H. armigera* eggs are laid preferentially on pigeonpea reproductive structures, the leaves probably play an important role in the pigeonpea-*Trichogramma* interaction since they provide a large surface area and are perhaps the main landing place for the parasitoids.

C. cajan (ICPL 87) leaf samples were scanned under an electron microscope to identify the types of trichomes and their orientation and distribution. The upper surface (Fig. 1a) has a dense layer of erect nonglandular trichomes. These trichomes are longer and more appressed to the surface closer to the leaf edge than in the middle areas of the leaf. Additionally, two glandular trichomes (Type A; Shanower et al. 1996) can be seen in this figure. A close-up is given in Figure 1b. These trichomes were found at a very low density (<1 cm^{-2}), and were much smaller in size than similar trichomes on the pods (unpublished results). The lower surface (Fig. 1c) is more densely covered with erect nonglandular trichomes which are slightly longer than the ones on the upper surface. Glandular trichomes were not observed on the lower surface. Leaf veins (including the leaf edge) are also covered by longer, flattened trichomes like those found on the upper surface. No differences were visible in the density of the oily liquid filled yellow bag-like structures (Type E; Shanower et al. 1996) on the upper and lower surfaces.

This is the first report of glandular trichomes on pigeonpea leaves (compare with Bisen and Sheldrake 1981, Navasero and Ramaswamy 1991). Preliminary results have shown that the leaf surface structure has some impact on the searching parasitoids. They walked much slower on the lower than on the upper surface. The wasps prefer to walk on the leaf veins on the lower surface or along the leaf edge, where the trichomes are appressed to the surface. It is possibly easier to walk on these parts of the leaf than elsewhere for these tiny insects.

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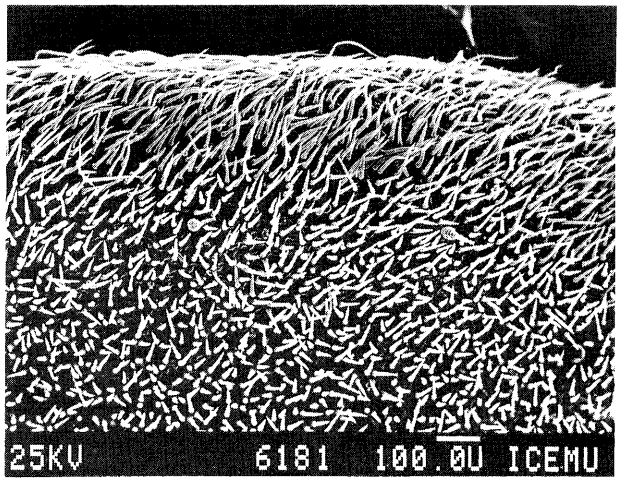

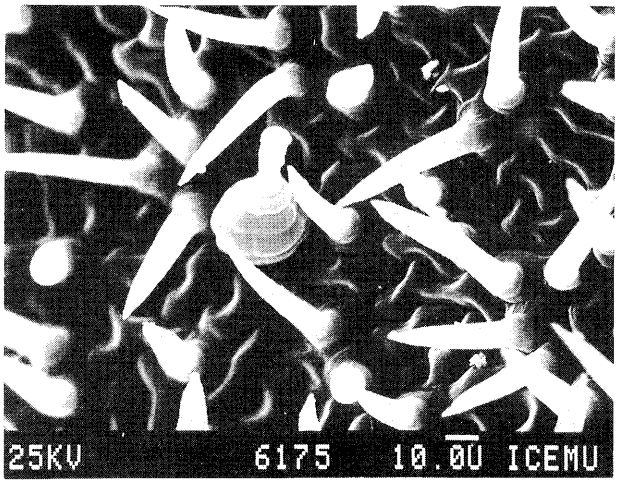

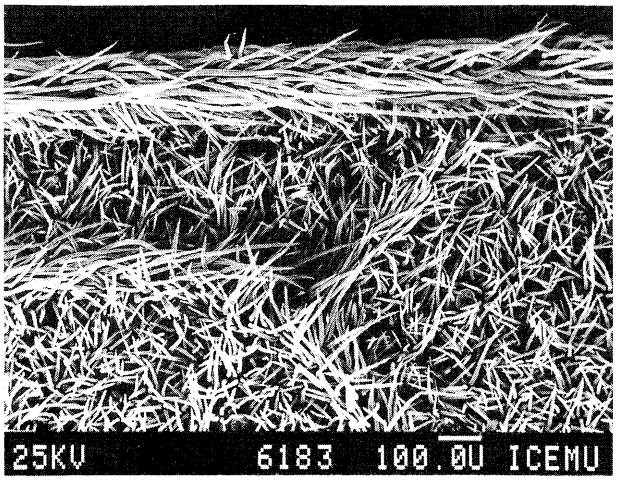

Figure 1. Electron micrographs of pigeonpea leaf surface: (a) upper surface, (b) trichome Type A on the upper surface, and (c) lower surface.

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Using Sticky Traps to Monitor Populations of *Trichogramma* egg Parasitoids

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Helicoverpa armigera (Lepidoptera: Noctuidae) is one of the most serious pests of pigeonpea. Many *H. armigera* natural enemies, including egg parasitoids belonging to the genus *Trichogramma* (Hymenoptera: Trichogrammatidae), appear to be less effective on pigeonpea than on other crops (Romeis and Shanower 1996). One possible way to enhance the efficacy of naturally occurring *Trichogramma* parasitoids may be the manipulation of the cropping system as reported by Duffield (1994). He reported high levels of egg parasitism on pigeonpea intercropped with sorghum and concluded that *Trichogramma* populations could move from sorghum to pigeonpea when the two crops flowered at similar times. He was able to detect *Trichogramma* using sticky traps and egg cloths within both intercrops (Duffield 1993).

In this study sticky traps were used to continuously monitor the population dynamics of naturally occurring *Trichogramma* egg parasitoids in pigeonpea and sorghum in the 1995 rainy season. The field (0.25 ha) had a