

Agric., Faisalabad). Due to their active feeding and large populations in cropped fields, it was thought necessary to evaluate them as biological control agents. For this purpose, the extent of feeding of dragonflies on insect pests of various crops had to be determined under seminatural conditions or in the laboratory. Efforts were made to feed them in both situations but they did not feed due to their captivity. In view of this, it was felt necessary to find some method of their feeding in captivity.

Many ways and alternatives were tried for feeding the dragonflies in cages. For example, a single individual, a pair, or many individuals of a species were released separately in laboratory cages (60x46x64 cm) of muslin cloth and field cages (178x118x180 cm) of wire-gauze, and different insect pests of cotton (jassid, aphid, whitefly and thrips) were provided as food on potted cotton plants. In some experiments, water containers were also placed in the cages. In certain cases, the dragonflies were familiarized with the captive conditions continuously for 2-3 days, but in no case did they show any activity and interest in their prey.

It appears that the dragonflies have a strong realization of their confinement, for they again became very active and started feeding when released in the field. In view of this dragonfly attitude, the following method adopted for feeding proved to be the most successful.

Dragonflies were captured at day-break before the start of their activity and released in a small cage. Adults of cotton jassid, aphid, whitefly and thrips were collected with an aspirator and put into a test tube which was closed with a wooden cork having a very narrow slit on one side to act as an exit for the imprisoned insects. At the time of feeding the dragonflies, their wings were held up vertically on their backs with the help of rings made of cellophane paper. After bringing the mouth of a dragonfly near the slit, the exit of the captive insects was regulated with a thumb so that came out one by one, and they were eaten by the dragonfly. The number of insect pests thus eaten was counted. Hemipterous insect pests of rice like green leafhopper, white leafhopper and white-backed planthopper were also fed by this method.

Lepidoptera like the white stem borer, the

#### A NEW AND EASY METHOD OF FEEDING DRAGONFLIES IN CAPTIVITY

In summer, large populations of dragonflies, such as *Orthetrum sabina*, *Crocothemis servilia*, *C. erythraea*, *Pantala flavescens*, *Brachythemis contaminata* and *Diplacodes lefebvrei* have been reported actively feeding on insect pests of cotton, rice, maize, Egyptian clover and tomatoes in Pakistan (cf. e.g. M.A. ALI, 1983, *Studies on population and feeding habits of dragonflies on insect pests of cotton*, M. Sc. thesis, Univ. Agric., Faisalabad; — M.A. NAJAM, 1984, *Population and feeding habits of dragonflies on insect pests of rice*, M. Sc. thesis, Univ.

yellow stem borer and the leaf-folder attacking rice were collected and picked up one by one with a forceps and brought near the mouth of a dragonfly for feeding. They were also taken readily.

Adults of cotton aphid and thrips were also brought to the laboratory on original cotton leaves. When the mouth of a dragonfly with its wings ribboned up was brought near the leaf surface, the prey insects were eaten very eagerly.

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