

SHORT COMMUNICATION

SWARM FORMATION OF BLACK APHID, *APHIS FABAE* SCOP (HOMOPTRA: APHIDIDAE) IN KARACHI WITH REFERENCE TO THEIR BIOLOGY, ECOLOGY AND THEIR DAMAGE TO SUGARBEETS AND BEANS

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ABSTRACT

A swarm of black aphid, *Aphis fabae* Scop is reported in Karachi on March 15th, 2006 at about 1:30pm which has lasted until dusk. The collected specimens were identified as *Aphis fabae* Scop. Some studies were also conducted on their biology, ecology and damage to sugarbeets and beans.

Key-words: Black aphid, sugarbeet, bean, swarm, Karachi, Pakistan.

INTRODUCTION

On March 15, 2006 swarms of tiny black insects were observed in various places of Karachi city e.g. Malir, North Karachi, F-B Area, Gulshan-e-Iqbal etc. at about 1:30 pm up to dusk. The population was so high that it made the whole wind screen of vehicles black, even the cloth of pedestrians were covered with the tiny insects. Specimens were brought into the laboratory and identified as black aphid.

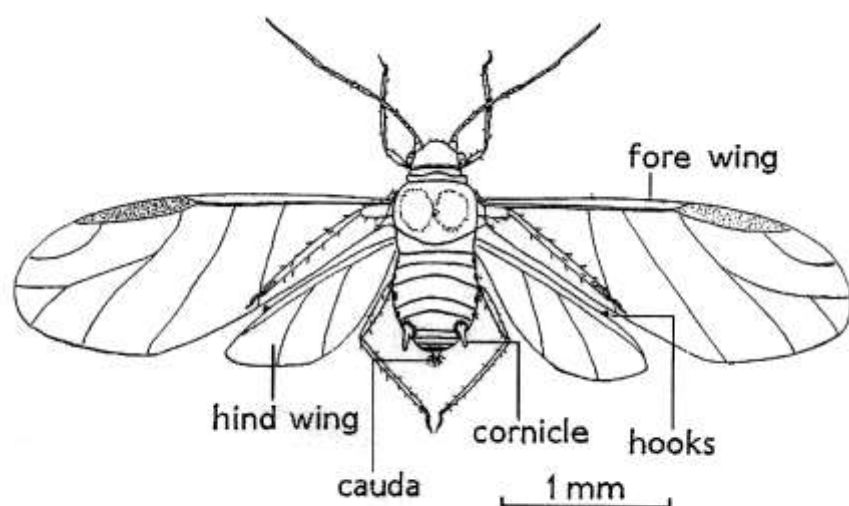
These aphids are ovoid and plum in general shape. They are about 0.5 to 7.0 mm in length. Collected specimens are alate. The head and thorax are strongly sclerotised and the abdomen membranous. The abdomen consists of 8-segments. The 9th segment is represented by primary rhinarium. The last segment is again divided into a thick base and a thinner apical part called the processes terminals. The abdomen bears a pair of siphunculi (cornicales) arising from the 6th segment.

Black aphid, *Aphis fabae* Scop has remained in confusion many years with a whole complex of closely related black species under the name of *Aphis rumicis* L, the easiest to separate from the complex (Jones, 1942). Apparently, still it is not easy to distinguish *A fabae* from *A. gossipii* and *A. craccivora*. *A. fabae* has heterocyclic life history, typical of other aphids, eggs are found on winter host plants, mostly resistant to cold season tree host, however, herbs and shrubs are not uncommon. Colonies of viviparous females are transferred to many summer host plants such as beans, beet and poppies, but the black aphids *A. fabae* on these plants are not necessarily the only pest. *A. gossipii* is also found on these and allied host species. Therefore at first look the present specimens were also called by the field entomologists as *A. gossipii*.

The life cycle of *A. fabae* starts with shining black eggs. These eggs are found in the axils of buds and in the crevices in the twigs of the host winter plant. They hatch in April or earlier in mild springs, into apterous females, known as fundatrices. These fundatrices differ slightly from the later apterae, being somewhat smaller with 5-jointed antennae. They mature in about 3 weeks, depending on the temperature and then produce young parthenogenetically and viviparously. The first generation produced by the fundatrices are apterous, but the second generation contains some winged or alate forms, the spring migrants which fly away from the host tree to establish summer colonies on one of the summer host plants. These immigrants occasionally form swarm as was seen at Karachi. Here apterae are first produced but in the succeeding generations alatae appear and in turn migrate to new host plants. The colonies then continue on the herbaceous plants and the woody plants become least attractive to the winged aphids (Kennedy, Ibbotson and Booth, 1950; Kennedy and Booth, 1951). Generally the young growing points or the succulent leaves of the summer host plants attract the aphids more than the mature leaves. If the primary infestations on summer hosts is heavier and the weather is favourable, the aphid population begins to take on epidemic proportions. Summer host plants are increasingly colonized vegetables, beans and sugar beet suffer badly (Gould and Graham, 1970,) and the epidemic spills over on to the less favoured hosts like potatoes, peas, sometimes epidemics are local but sometimes widespread subsequently. Fungi appear and take a toll, aided by the return of longer nights and heavier dews (Kennedy et.al.1962).

During August, the aphid population progressively declined and reduced almost to extinction by late August, when colonies become very difficult to find.

The primary infestation remains light when the weather shows adverse, wet and rather cold feature. Consequently no epidemic appears. Odd plants become infested throughout the summer, and by late August colonies, the size of half a crown can be found on the lower surfaces of beet leaves. In the autumn, a change occurs in the colonies on the summer host plants. Return migrants or gynoparae are produced. These are alatae, slightly bigger than the alatae with a large number of secondary, plate-like sensorial on the antennae, which return to the winter host plant, the succulent leaves of which are now attractive, and these give rise to apterous oviparae. These are distinguishable from other apterous forms by thickened hind tibiae, bearing plate-like sensorial. At the same time as the production of gynoparae, winged males are found in the colonies on the summer host plants. These males also fly to the winter host and mate with the oviparous females. As a result fertile winter eggs are laid by the oviparae in sheltered positions on the twig. At first they are dark green but soon become black shiny. They remain dormant until the spring. Reportedly epidemics tend to occur in alternate years, because following epidemics year there is a light deposit of eggs (Jones and Dunning, 1972). During the following year, the aphids slowly recover and give rise to a heavy deposit of eggs in the following autumn. Epidemics depend very much on the weather as well. The great epidemic years are usually drought years, or years in which the weather has prevented the early sowing of crops. Fine weather in spring and autumn favours the migration away from and back to the winter host plants. It is observed that there is close relationship between bud burst and egg hatching, they are synchronized. Conclusively, it is expected that following year black aphid swarm would not appear and their populations would remain low provided the weathers in favour of farmers of Karachi region.



Aphis fabae: alate female

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