THE ROLE OF CERTAIN ENVIRONMENTAL AND BIOLOGICAL FACTORS ON APHID ATTACKING COTTON AND VEGETABLES

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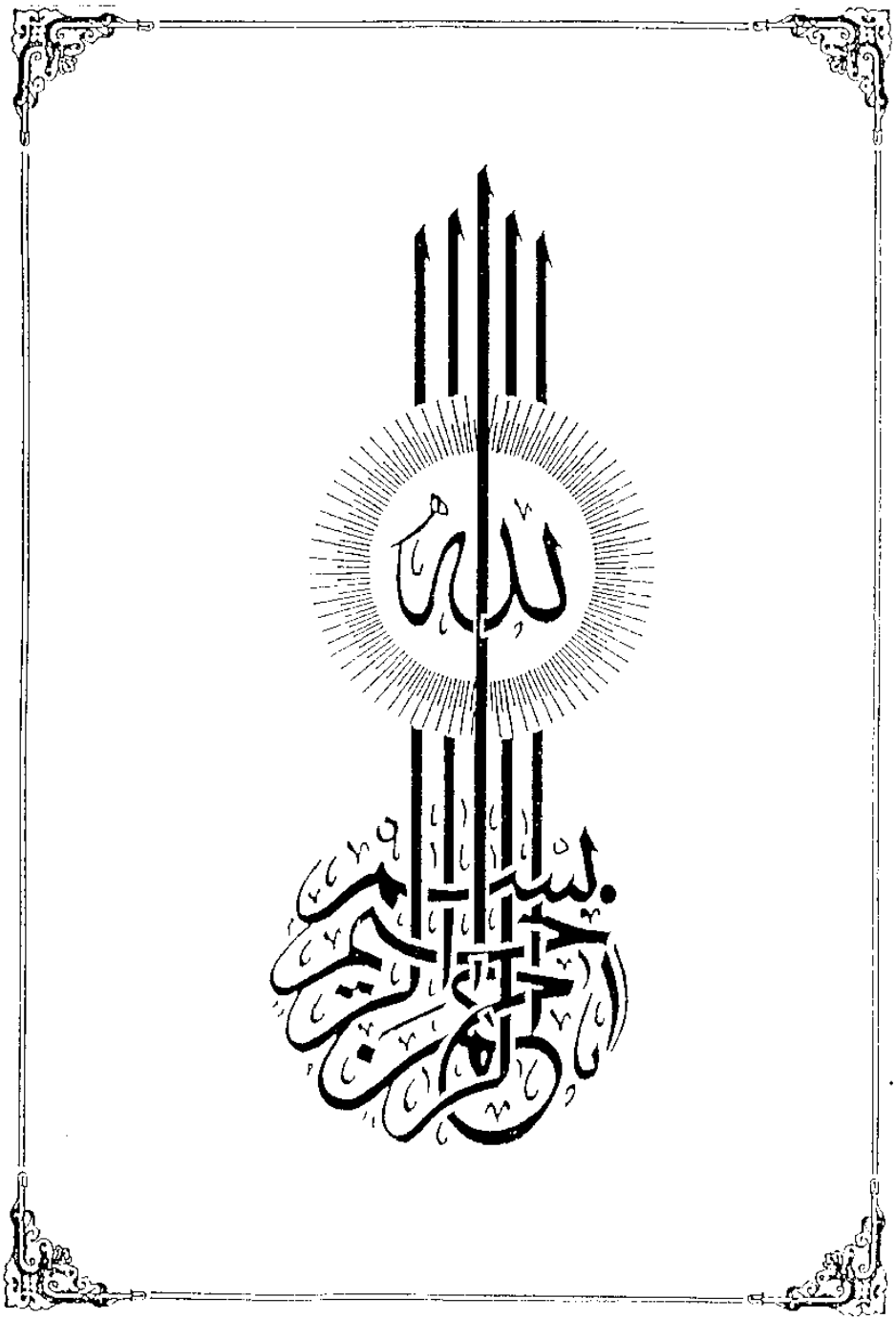

APPROVAL SHEET

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ABSTRACT

Cotton aphid, ***Aphis gossypii*** Glover is considered as a target pest on cotton plants as well as a wide range of hosts. This aphid species tends to be a key pest on cotton fields throughout some seasons. Factors responsible for this phenomenon are undetectable. The role of some environmental factors on seasonal fluctuations of ***Aphis gossypii*** were investigated in cotton and okra fields at Kaha - Qualioubiya Governorate throughout two successive seasons (1992 & 1993).

Results showed that ***Aphis gossypii*** had two main peaks of seasonal abundance on the two hosts. The first one occurred during seedling stage; while the second peak occurred during flowering and fruiting stages. The aphid population was found to disappear during early summer (June to mid-July). Seven environmental factors (3 biotic and 4 abiotic) were tested to clarify their simultaneous effects on the seasonal fluctuation of this aphid species on both hosts. Seasonal activities of three predator species found associated with aphid population (which represented biotic factors viz. ***Coccinella undecimpunctata***, ***Orius*** spp. and ***Chrysopa carnea*** had negative effects on aphid population throughout both seasons. Four climatic factors viz. maximum, minimum, mean temperature and mean percentage of relative humidity (abiotic factors) showed miscellaneous effects on aphid population on the two hosts throughout both seasons. The combined effects of the seven factors (as a group) on seasonal fluctuation of aphid population were effective by 36.1%, 41.2% on cotton plants and 46.3%, 43.9% on okra plants during 1992 and 1993 seasons, respectively. The other remaining percentages are probably due to the phenology of host plants.

Horizontal distribution of ***Aphis gossypii*** at cotton fields showed that South and East directions harboured the highest numbers of aphid population, while North and West directions harboured the least numbers. This distribution may be attributed to wind directions which mostly blows from North and West directions and drift aphid populations to South East direction. Vertical distribution of cotton aphid showed that this aphid species preferred leaves of lower or middle levels than leaves of upper leaves of cotton plants. This phenomenon is due to that cotton aphid always found to prefer lower surface of leaves which are shady and avoid strong slight of upper surface.

Host preference of five summer malvaceous hosts to ***Aphis gossypii*** infestation showed that two okra varieties were the most susceptible to aphid infestation, while Kenaf, cotton and rosal were less susceptible. Density and length of hairs or spines on the lower surface of the leaves of these hosts had significant positive relationship with aphid population. Therefore, okra plants could be used as plant trap in cotton fields.

Key words

Aphis gossypii, Coccinella undecimpunctata, Chrysopa carnea, Orius spp., Environmental factors, Biotic and abiotic factors, population density, seasonal fluctuation, horizontal and vertical distribution, host preference, plant trap, cotton, okra.

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