

Seasonal incidence of major insect pests on okra in Mizoram, India

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Okra (*Abelmoschus esculentus*) is one of the most important vegetables grown in subtropical part of India. It is grown in India over an area of 3.25 lakh ha with annual production of 33.8 lakh tones. In Mizoram, it is cultivated over 2749 ha with annual production of 11270.9 MT during 2008-2009. Okra is subjected to attack of as many as twenty insect and non-insect pests in the country, which accounts for 8 to 76 percent loss in yield (3). An attempt was made to study the pest complex and their succession in okra under subtropical climatic conditions of Mizoram.

The field experiments were conducted during 2009 at the ICAR Research Complex for NEH Region, Mizoram Centre, Kolasib, Mizoram, India. 'Green Challenger' variety was sown on 15th April, 2009. The net plot size was 4x5m with spacing of 30x60 cm plant to plant and row to row in Completely Randomized Block Design with four replications. All the recommended agricultural practices were followed in raising the crop. No plant protection measure was taken throughout the crop season. Observations on the incidence of insect pests were recorded at weekly interval starting from initial appearance to final disappearance or up to final harvest. Five plants per treatment were selected randomly and tagged the plant for recording observations. The number of insects on each of these selected or tagged plants were recorded to know the reaction of these cultivars of okra against important insect pests. Observations continued up to the harvest.

The okra was found to be invaded by eleven

insect pests, one mite and four natural enemies in Mizoram. Among them, the *Mylabris pustulata* and *Dysdercus cingulatus* were found as major pest. The incidence of *Mylabris pustulata* and *Dysdercus cingulatus* were noticed during reproductive stage and attained the peak level of infestation on first week of July and first week of August. The second most important and dominant insect pest was *Nodostoma* sp. and was also categorized as major insect pests of okra and it was noticed throughout the cropping period attaining the peak level of infestation on last week of July.

The periodic mean incidence of important insect pests was worked out. The arc-sine transformation was adopted for percentage of stem borer damage and square root transformation was used in other insect pests.

During the season *Nodostoma* sp. was the first to invade the crop at seedling stage i.e., third week of May (Fig. 1). The population of *Nodostoma* sp. per plant varied from 0.10 to 7.10. The peak population (7.10) of *Nodostoma* sp. per plant was noticed at last week of July during the reproductive stage. Therefore, *Nodostoma* sp. was active from the third week of May to first week of August with a peak level of population during month of July. Jalgaonkar *et al.*(4) and Thul *et al.*(8) reported that relatively lowest percentage of flea beetle, *Monolepta signata* on germplasm of okra.

The incidence of *A. gossypii* commenced from second week of June (Fig 1). The *A. gossypii* population reached the peak infestation level

(30.50) at last week of June. The aphid population varied from 0 to 30.50 per plant. Kalaisekar *et al.* (5) reported that the aphid population relatively high during June and July. The abundance of *M. pustulata* started from first week of July. The peak population was recorded during first week of July (3.30). The *M. pustulata* population varied from 0 to 3.30 per plant. Boopathi and Pathak (7) and Shylesha *et al.* reported that blister beetle damage starts in the month of April at flowering of frenchbean. The infestation of *D. koenigii* was recorded from second week of July (Fig. 1). The peak level of population (10.30) was noticed at first week of August. The mean population of *D. koenigii* varied between 0 - 10.30 per plant. *D. koenigii* was active from second week of July to first week of August. Kalaisekar *et al.* (5) reported that the population was relatively highest during fruit formation stage. The abundance of *Sylepta derogata* was recorded from third week of May (Fig. 1). The peak level of infestation (0.40 per plant) was noticed during May. The mean population of *S. derogata* varied from 0 to 0.30 per plant.

The incidence of *Amrasca biguttula biguttula* was active during second week of June (Fig. 1). The peak level of incidence (0.30 per plant) was noticed during second week of July. The mean population of *A. biguttula biguttula* varied from 0 to 0.30 per plant. Pathak and Boopathi (6) recorded during early stage of the crop and it might continue till harvest. The infestation of *Bemisia tabaci* commenced from third week of May (Fig.1). The highest per cent of infestation (0.80 per plant) was recorded during third week of June. The per cent of infestation varied from 0 to 0.80 per plant. Boopathi and Pathak (2) reported the abundance during early stage of the crop growth.

The sucking insect pests viz., *A. gossypii*, *A. biguttula biguttula* and *B. tabaci* were more abundant during last week of June, second week of July and second week of June, respectively. A number of natural enemies were recorded during the period of investigation. Three species of lady bird beetles were found to predate upon aphid. Both the grub and adult were found abundantly during later stage of crop growth. Syrphid flies were found within aphid colony. A number of species of spiders were found predated upon *S. derogata* larvae and *A. gossypii* nymphs and adults. On the other hand, the stem borer, *Alcidodes affaber* was mostly found during later stage of the crop, the *Mylloceris* spp. was mostly found during early stage even up to harvest and the grasshopper was found during new flush period. Amongst the non-insect pests, red spider mite was more dominant pest and it could cause severe damage to the crop. This red spider mite can also be categorized as major pests of okra in Mizoram.

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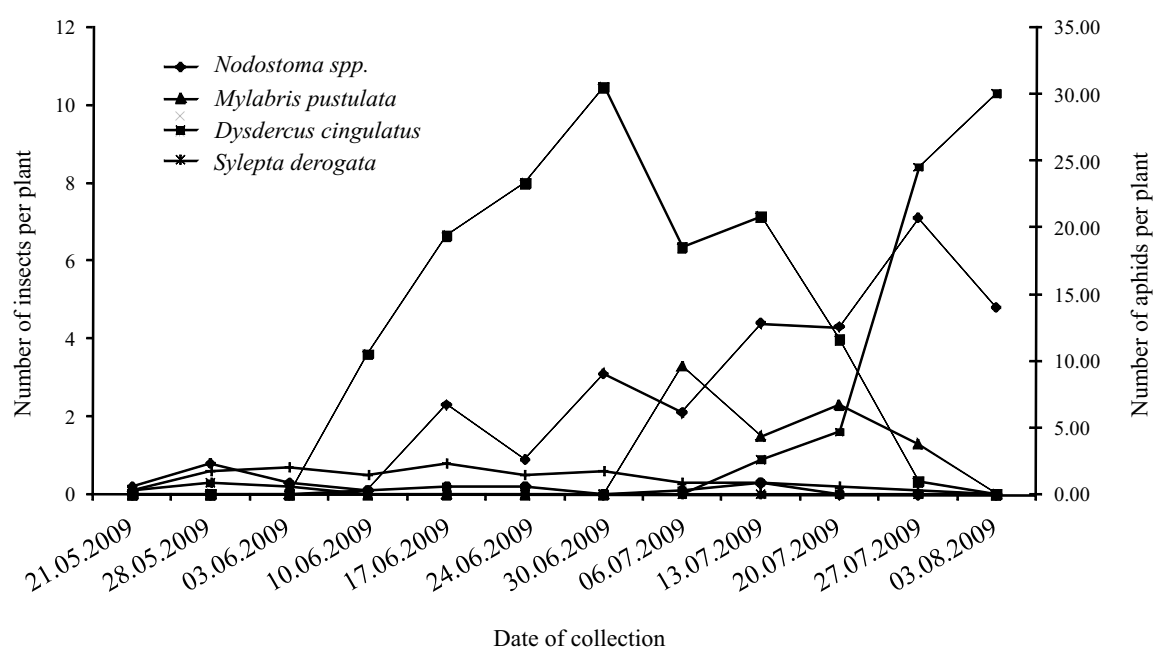


Fig. 1 Seasonal incidence of important insect pests of okra