

COMPARATIVE STUDY OF SEASONAL ABUNDANCE OF *IDIOSCOPUS CLYPEALIS* (LETH.) AND *AMRITODUS ATKINSONI* (LETH.) (HEMIPTERA: CICADELLIDAE) IN WESTERN UTTAR PRADESH

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Abstract

The observations on seasonal abundance of *Idioscopus clypealis* (Leth.) and *Amritodus atkinsoni* (Leth.) have been conducted in four districts - Aligarh, Bulandshahar, Bareilly and Badaun, located in Western Uttar Pradesh. The study revealed that *I. clypealis* appeared in the month of February and remained active throughout the year except from November to first half of February. However, the peak population of this species was recorded in second half of May. On the other hand, *A. atkinsoni* appeared a bit later than *I. clypealis* at all the experimental sites. Moreover, *A. atkinsoni* showed two peaks of high population, during month of May and August 2006, respectively.

Keywords

Seasonal abundance, *Idioscopus clypealis*, *Amritodus atkinsoni*.

Introduction

Among seven continents of globe, mango, *Mangifera indica* (Linn.) is grown in 85 countries, of there, 63 developing countries produce more than 1000 metric tones mango per year. Asia and more precisely India is most productive belt of mango, which has the top position with 54% of 98% production of Asia (Srivastava, 1998; FAOSTAT, 2006). The decreased production of mango is due to the incidence of various insect pests. Among them, mango leafhoppers are the most destructive and economically important insects, causing loss of 25-60 per cent yield (Hiremath and Hiremath, 1994). There are two species of mango leafhoppers, namely *Idioscopus clypealis* (Leth.) and *Amritodus atkinsoni* (Leth.), which are most abundant familiar in different parts of India (Babu et al., 2001; Dwivedi *et al.*, 2003; Varshneya and Rana, 2006). These hoppers damage mango crop by sucking the sap from tender shoots, leaves and inflorescence, which results in flowers shriveling, turning brown and ultimately affecting the fruit setting. In another way, hoppers also secrete honeydew, which attracts the development of sooty mould on leaves, branches and fruits in moist weather. On heavy infestation, mould covers whole plant with a black coating and prevents photosynthesis that results in dropping of immature fruits (Butani, 1993). Injury to fruits is also caused by insertion of ovipositor for egg laying by the female hoppers (Srivastava, 1997).

There are few studies on the population dynamics of these hoppers but as far as the comparative seasonal abundance in different environmental conditions are concerned, not even a single reference is on record from western Uttar Pradesh. As this information is essential for the effective management of these pests, the present study, therefore is designed on seasonal abundance

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of *Idioscopus clypealis* and *Amritodus atkinsoni* on mango orchards in different ecological niches of Western Uttar Pradesh.

Materials and Methods

The experiments were carried out in four districts of Uttar Pradesh viz., Aligarh, Bulandshahar, Bareilly and Badaun. Initially, five mango trees were randomly selected in each mango orchard of above districts and the observations were taken on the inflorescence of respective tree at two week interval. The hopper populations were recorded from January to April through bagging trap methods as suggested by Verghese and Rao (1987). In this method, the terminal part of inflorescence was covered with a polythene bag (60 x 30 cm), provided with a cotton swab, soaked in ethyl acetate. After the trapping of hoppers, bags were brought to the laboratory, and nymphs and adults were separated. During the month of May to December, the population of adults was abundant as compared to nymph. This time, another method i.e. sweeping was applied for collection of the hoppers. In sweeping, five sweeps on the turn of respective tree were taken at each of the four geographical directions. On the other hand, the hoppers were collected between 4.00 to 6.00 pm during winter; whereas, on summers collection was done between 5.00 to 7.00 pm.

The hoppers of both species i.e. *I. clypealis* and *A. atkinsoni* were identified on the basis of their morphological variations, as *I. clypealis* is light brown, smaller in size and the scutellum is creamish with two triangular dark spots. On the other hand, *A. atkinsoni* is dark-brown to blackish, larger sized and scutellum with arrow marking. After identification, adults of each species were segregated and species composition was worked out.

Results and discussion

The observations on the seasonal abundance of *I. clypealis* and *A. atkinsoni* revealed that initially, nymphs appeared in the second half of February at all the experimental sites. The nymphal population was recorded 0.36, 0.44, 0.16 and 0.24 nymphs/ bag at Aligarh, Bulandshahar, Bareilly and Badaun, respectively (Figure 1). Thereafter, it increased rapidly and reached to maximum of 2.76, 2.96, 2.44 and 2.56 nymphs/ bag at Aligarh, Bulandshahar, Bareilly and Badaun, respectively, in the first half of April. Later on, a steep decline was vanished by the first half of May with the mean population of 1.36, 1.52, 0.92 and 1.24 nymphs/ bag at Aligarh, Bulandshahar, Bareilly and Badaun, respectively (Figure 1).

Seasonal Abundance of *Idioscopus clypealis*

The first appearance of adult *I. clypealis* was recorded in the second half of February with a population of 0.36, 0.56, 0.20 and 0.28 adults/ sweep at Aligarh, Bulandshahar, Bareilly and Badaun, respectively (Figure 2). Thereafter, the population increased rapidly and reached to the maximum of 9.04, 9.28, 7.76 and 8.28 adults/ sweep at Aligarh, Bulandshahar, Bareilly and Badaun, respectively, during second half of May. Moreover, the hopper population declined by

the second half of October at Bareilly and Badaun. The mean hopper population at corresponding sites was recorded 0.88 and 0.96 adults/ sweep, respectively; whereas, at Aligarh and Bulandshahar the population vanished by the first half of November, with the mean population of 0.52 and 0.72 adults/ sweep, respectively (Figure 2). These findings are well supported by Verghese and Rao (1987), Dalvi and Dumbre (1994), Srivastava (1997) and Dwivedi *et al.* (2003).

Seasonal Abundance of *Amritodus atkinsoni*

Initially, adult *A. atkinsoni* appeared in the first week of March at all the experimental sites. The population was recorded as 0.16, 0.24, 0.08 and 0.12 adults/ sweep at Aligarh, Bulandshahar, Bareilly and Badaun, respectively (Figure 3). Thereafter, hopper population increased and the peak population was found 4.84, 5.28, 4.40 and 4.60 adults/ sweep at Aligarh, Bulandshahar, Bareilly and Badaun, respectively, during second half of May. The hopper population declined till the first half of July. Later on, it increased again and achieved a second peak in first half of August, which was not much higher than the first one. This time the mean population of hoppers was recorded as 4.64, 5.04, 4.16 and 4.36 adults/ sweep at Aligarh, Bulandshahar, Bareilly and Badaun, respectively. Thereafter, hoppers again showed a fall in their population. However, they were found on the stems of trees till the end of December. During second half of December, the population was recorded as 0.24, 0.32, 0.16 and 0.20 adults/ sweep at Aligarh, Bulandshahar, Bareilly and Badaun, respectively (Figure 3). In another experiment, Butani (1993) recorded two distinct generations of mango hoppers in northern India. The spring generation starts from February and remain active till April. But, the summer generation is recorded from June to August. Other corroborative records on the activity of this pest are Patel *et al.* (1990 & 1994), Babu *et al.* (2002) and Dwivedi *et al.* (2003).

It can be concluded from the present findings that *A. atkinsoni* breeds on inflorescence as well as on newly developed leaves. Therefore, it showed two peaks of highest population during May and August at each experimental sites; whereas, *I. chypealis* breeds only on inflorescence and exhibits only single peak in the month of May in different ecological conditions of Western Uttar Pradesh.

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Figure - 1 Seasonal abundance of nymphs of mango leaf hoppers at different districts of Western Uttar Pradesh

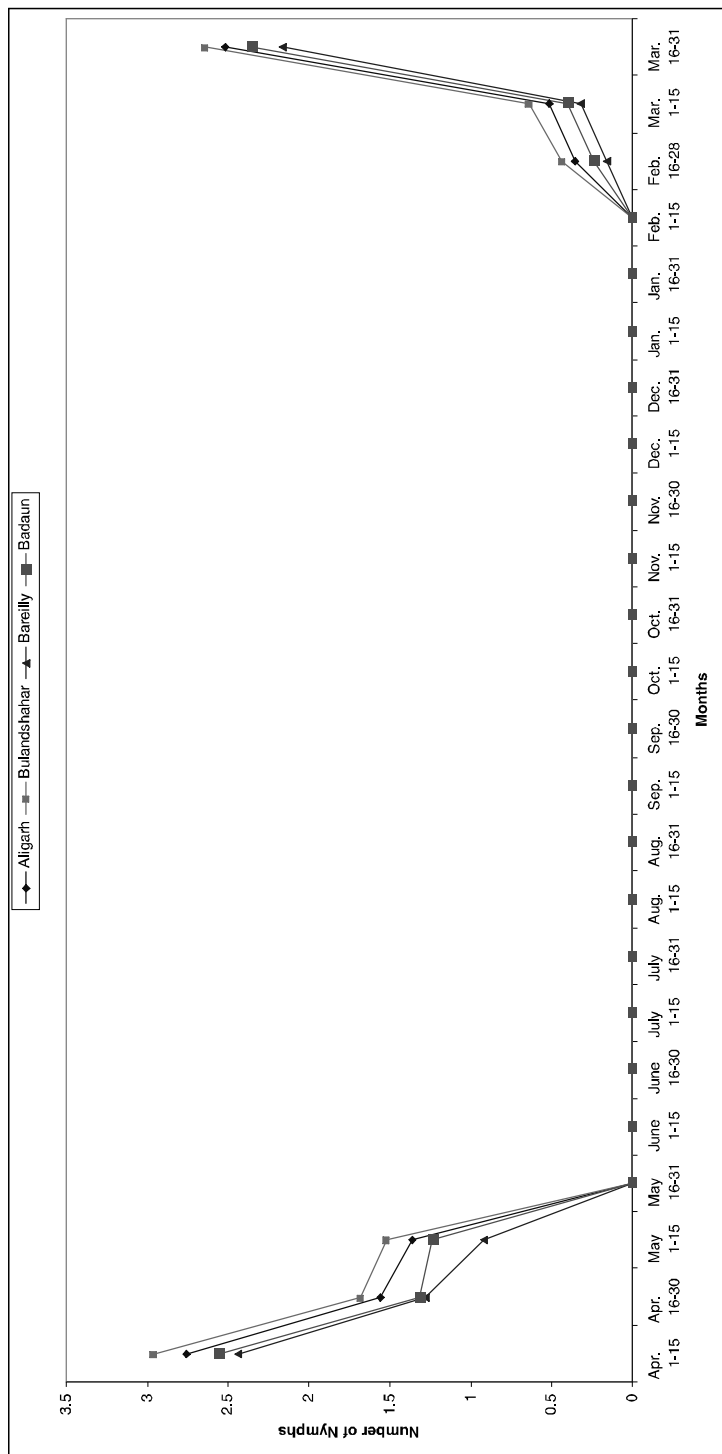


Figure 2. Seasonal abundance of *Idioscopus clypealis* (Leth.) at different districts of Western Uttar Pradesh

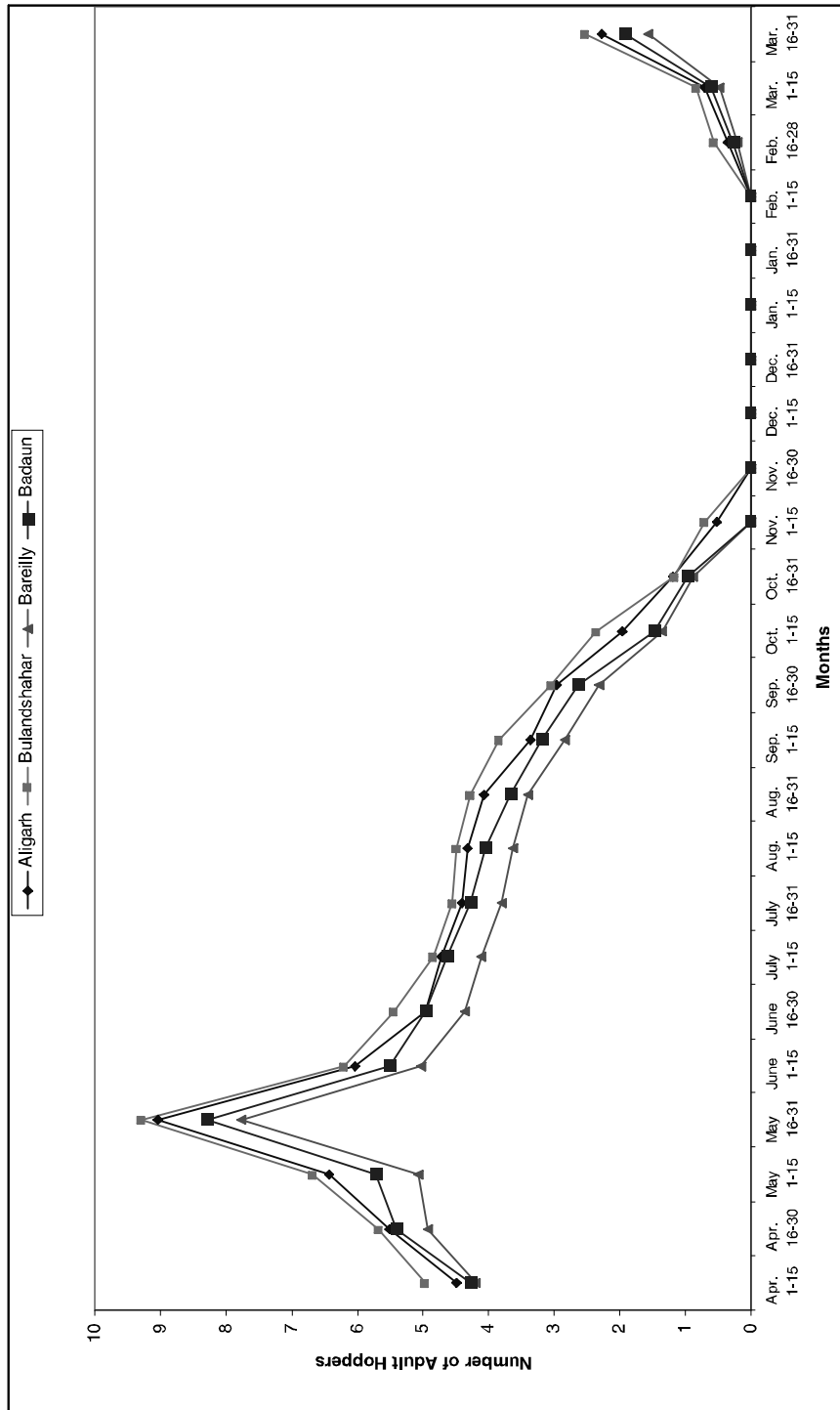


Figure 3. Seasonal abundance of *Amritodus atkinsoni* (Leth.) at different districts of Western Uttar Pradesh

