NEW HOST RECORDS OF THE PARASITOID *LYSIPHLEBUS DELHIENSIS* (SUBBA RAO & SHARMA) AND THE HYPERPARASITOID *ALLOXYSTA PLEURALIS* (CAMERON)

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DURING October-February 1986–87 an extensive survey for natural enemies of the aphids was carried out in the terai belt of northeast Uttar Pradesh. As a result two new host associations of a parasitoid *Lysiphlebus delhiensis* (Subba Rao & Sharma) (Aphidiidae: Hymenoptera) and a hyperparasitoid *Alloxysta pleuralis* (Cameron) (Alloxystidae: Hymenoptera) were observed.

L. delhiensis was reared from the maize aphid, *Rhopalosiphum maidis* (Fitch) (Aphididae:Hemiptera), a pest of bajra (*Pennisetum typhoides* Staf.). The extent of parasitism was 90%. *L. delhiensis* was earlier recorded as a monophagous species (reared from the sugarcane aphid, *Melanaphis sacchari* (Zehnt.)[1,2]. Recently, it was reared from another aphid host *Toxoptera aurantii* (Boyer)[3]. Therefore, this parasitoid is certainly a polyphagous species. There are records of 7 more aphidiids parasitizing *R. maidis*[4].

A. pleuralis was observed emerging from the mummies of *R. maidis* parasitized by *L. delhiensis*. The extent of hyperparasitism caused by *A. pleuralis* was < 5%. The emergence hole of *L. delhiensis*, as in other species of the genus[5], is situated more to the left or right on the dorsum of mummy, the emergence lid being more or less circular and bears one of the cornicles. The lid is either detached or feebly attached to the margin of the hole. The emergence hole of *A. pleuralis* is located anywhere on the dorsum of the mummy and is of irregular margin and shape with varying sizes and without a cap. *A. pleuralis* was earlier considered to be highly host-specific restricting to only two *Trioxys* spp. viz. *T. indicus* Subba Raq & Sharma through *Aphis craccivora* Koch[6] and *T. angelicae* Haliday through *A. pomi* De Geer[7]. There is no previous record of hyperparasitism of *L. delhiensis*.

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POLLINATION STUDIES IN ALMOND (*PRUNUS AMYGDALUS* L.)

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VARIETIES of commercial almond are generally self-incompatible and require cross-pollination by insects to produce a crop. Maximum yield is possible only through efficient and sufficient pollinators. This study reports the relative abundance of different insect pollinators of almond and their role in fruit setting. To assess the role of insect pollinators in fruit setting 100 unopened flower buds were covered with muslin cloth and 100 uncovered buds served as control. It was found that flowers covered with muslin cloth did not set any fruit while those left for open pollination set 30 fruits. This reveals that almond exclusively depends on insect pollinators for fruit setting. Observations on the flowering phenology and insect visitors were recorded during March–April 1987. For this purpose, 5 branches of almond trees were marked and the number of opened flowers on these branches was counted on alternate days throughout the flowering season. Similarly, the number of bees of each species visiting these branches was recorded for 5 min at half-hourly intervals from 09.00 to 16.00 h following Abrol and Kapil[1]. Simultaneously, air temperature and relative humidity were recorded with a dry and wet bulb thermometer. General weather conditions were also recorded. The data presented in table 1 reveal that flowering began on 14 March, peaked on 24th and then gradually declined. Evidently a period of 10–12 days is the most crucial time for almond pollination. Figure 1 shows that *Apis cerana indica*, *Xylocopa fenesterata* and *Lassioglossum* sp. visited the almond

Table 1 *Flowering phenology of almond during March–April, 1987*

Date of observation	Number of opened flowers/branch (mean of 5 observations)	Percentage bloom
March 1987		
14	2.00	0.31
16	14.10	2.18
18	83.40	12.95
20	182.09	28.38
22	572.80	88.94
24	644.00	100.00*
26	492.00	76.39
28	415.00	64.44
30	353.00	54.82
April 1987		
2	175.40	27.33

* The peak of flowering was considered as 100% bloom and based on this, percentage bloom for whole flowering season was calculated; Weather condition was cloudy in general.

flowers. The former two species of bees were seen on both clear and cloudy days (figures 1 and 2) whereas *lassioglossium* sp. was not observed on cloudy days (figure 2). However, cloudiness was found to decrease the number of *A. c. indica* and *X. fenesterata*. Some Dipteran flies were also observed in interrupted hours but their population was very low. The data further reveal that *A. c. indica* and *X. fenesterata* could commence their field activities at a low temperature of 8°C whereas this requirement was found to be 13.5°C for *Lassioglossum* sp.

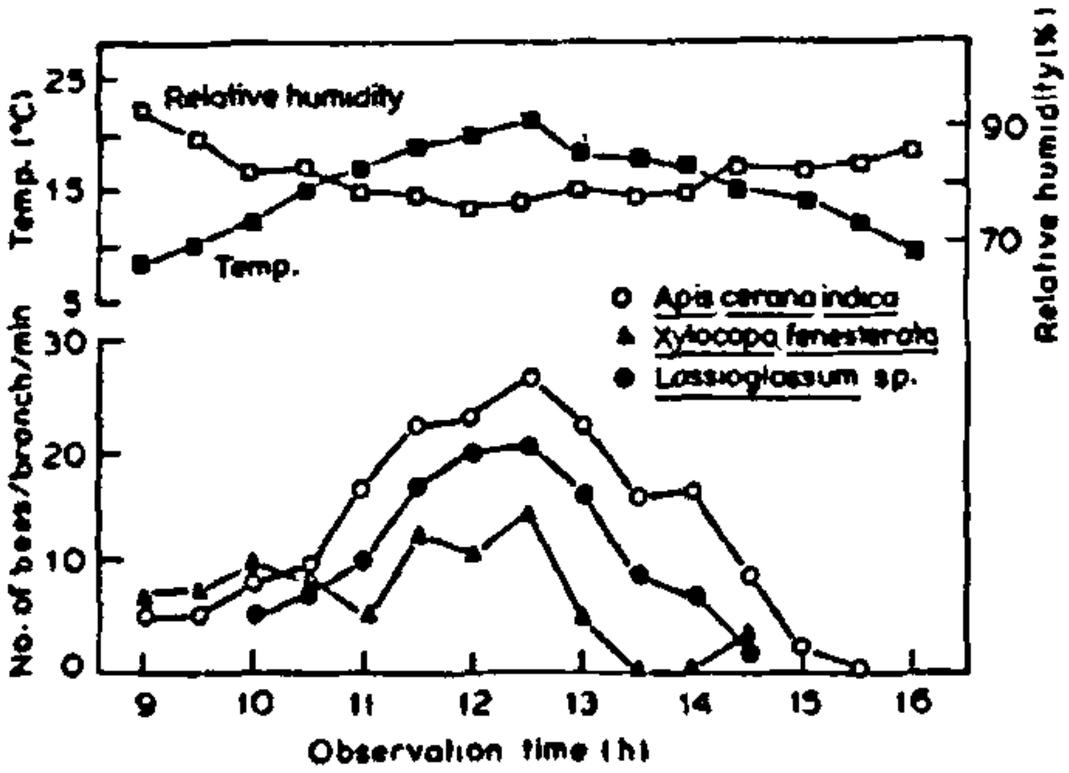

Figure 1. Diurnal activity pattern of bees visiting almond flowers on sunny days. Each point represents the mean for each sampling time on four separate days during the season.

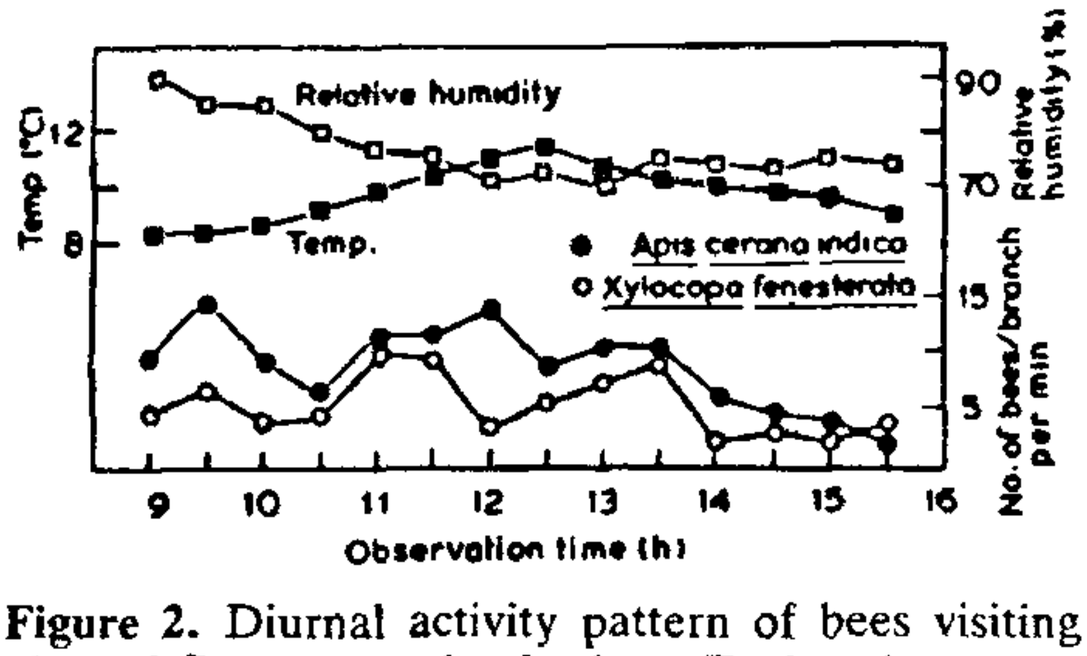

Figure 2. Diurnal activity pattern of bees visiting almond flowers on cloudy days. Each point represents the mean for each sampling time on six separate days during the season.

irrespective of the relative humidity values. Evidently during March when early almond varieties are in bloom, inclement weather limits foraging activity of insects. Efforts are, therefore, needed to explore the possibility of inducing late bloom by some hormonal/enzymatic action, Feeding of bees with 30–50% sugar solution may limit them from foraging for nectar and induce pollen foraging. Management to build a strong field force of *X. fenesterata* and *Lassioglossum* sp. may be of great applied significance in almond growing areas.

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TORUS LONGITUDINALIS IN *MYSTUS KELETIUS* (TELEOSTEI)

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In *Mystus keletius* the torus longitudinalis is seen with its greatest expansions in the sagittal section; its distal end is attached to the caudal end of periventricular layer of the optic tectum. Further, it is connected with the granular portion of the valvula cerebelli (figure 1). According to Kudo[1,2] as reported by Kuhlenbeck[3], the torus has no direct relations to the optic system, although it is known to have connections with corpus cerebelli[3]. Dhillon and Tandon[4] suggested that the presence of the tori appears to compensate for the absence of true optic