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Short Communication

Population dynamics of sawfly *(Athalia lugens proxima* (Klug)) in relation to weather parameters in radish crop

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Radish (*Raphanus sativus* Linnaeus), an important vegetable crop suffers heavily due to the attack by sawfly, *Athalia lugens proxima* (Klug) (Hymenoptera : Tenthredinidae). The larvae feed on leaves, flower buds, flowers and green pods. Sometimes due to severe infestation resowing becomes necessary (Patel,1967; Rohilla and Kumar, 1991). For developing effective control measures, information on population dynamics in relation to weather is not available for *A. proxima* in radish crop. Therefore, the present study was undertaken at College farm of B. A. College of Agriculture, Gujarat Agricultural University, Anand.

Seedling of radish, cultivar Pusa Rashmi sown in third week of July,1994 were raised following 30cm x 7.5cm spacing in a seedbed plot of 5m x 6m. The seedling were transplanted during last week of October, 1994 for seed production following 60cm x 30 cm spacing in a plot of 44m x 15m. Twenty five randomly selected plants were observed to record number of larvae per plant at weekly interval starting from one week after germination in seedbed and from one week after transplanting in the seed production plot. The data on larval population were correlated and regressed stepwise with the meteorological data recorded in the meteorological observatory located about 100 m away from the experimental plot.

In this seedbed plot, the larval population started building up after 2nd week of germination (IV week of July), increased gradually (Figure 1), reached the peak after 9 weeks of germination (II week of September) and then decreased gradually. Thus, the population of *A. proxima* larvae was higher in the later stage (September - October) of the seedlings.

In transplanted crop, the population appeared first after 2nd week of transplating (I week of November), increased gradually, persisted for a short period and disappeared abruptly in the later period of crop. Thus, the larval population remained higher and for a longer period in seedling stage as compared to that in transplanted crop. Similar observations were reported by Shah(1940) in the Punjab, Tripathi (1963) in Utter Pradesh, Patel (1967) in Gujarat and Shirke *et al.* (1968) in Madhya Pradesh.

The larval population (Y) has significant negative correlation (Table 1) with bright sunshine hours (X_{10}) and significant positive correlation with rest of the weather parameters except maximum temperature (X_2) and wind speed (X_{12}).

Table 1: Correlation and regression value of *A.proxima* with respect to weather parameters

Sr. No		Weather parameters	Correlation co-efficient	Regression co-efficient
1	(X_1)	Minimun temperature (^{0}C)	0.677*	------
2	(X_2)	Maximumtemperature (^{0}C)	0.213	------
3	(X_3)	Mean temperature (^{0}C)	0.604*	------
4	(X_4)	Morning vapour pressure (mm)	0.707*	0.295
5	(X_5)	Evening vapour pressure (mm)	0.621*	------
6	(X_6)	Mean vapour pressure (mm)	0.672*	------
7	(X_7)	Morning relative humidity (%)	0.444*	------
8	(X_8)	Evening relative humidity (%)	0.524*	0.091
9	(X_9)	Mean relative humidity (%)	0.531*	------
10	(X_{10})	Bright sunshine hours (hrs day^{-1})	-0.379	0.801
11	(X_{11})	Rainfall (mm)	0.402*	------
12	(X_{12})	Wind spee (km hours^{-1})	0.133	------
13		A value	------	-12.95
14		R^2	------	0.674

* Significant at 5% level

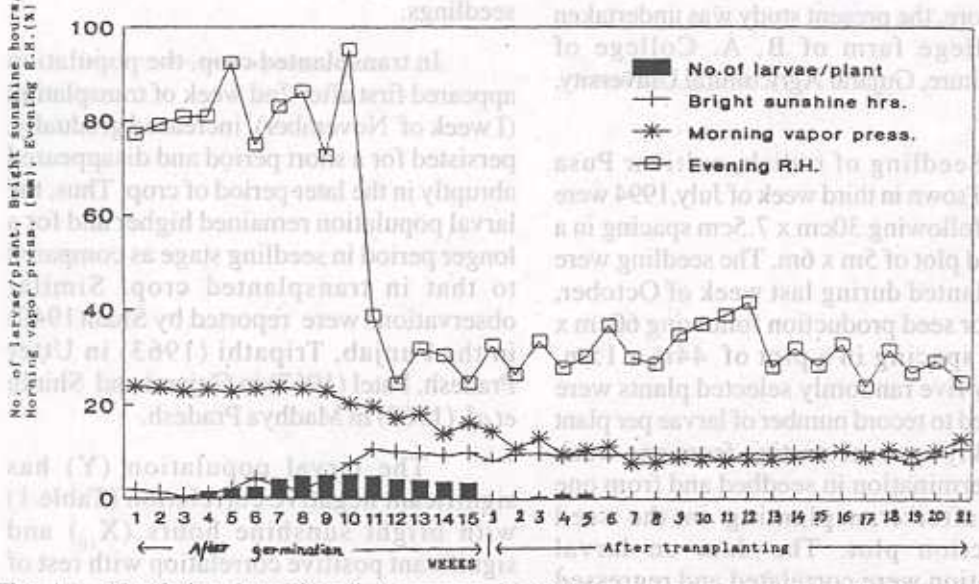

Fig. 1 : Population dynamics of *A. proxima* in relation to weather parameters having significant regression.

The regression equation fitted to the data taking sawfly larval population (Y) as a dependent variable and meteorological parameters having significant correlation coefficient values as independent variables was :

$$Y = -12.956 + 0.295\ X_4 + 0.091\ X_8 + 0.801\ X_{10}. \qquad (R^2=0.674)$$

As much as 67 % variation in the population of *A. proxima* was a attributable to the effect of above three parameters viz., Morning vapour pressure (X_4), evening relative humidity (X_8) and bright sunshine hours (X_{10}). During higher activity of the pest this ranged respectively between 20 to 23 mm, 55 to 85 % and 1 to 5 hours, while during lower activity this ranged between 7 to 20 mm, 24 to 55 % and 7 to 10 hours. Shah (1940) reported higher activity of *A. proxima* on cauliflower plants in nursery towars the close of rainy season, which closely tallies with present report.

REFERENCES

Patel, B.K. 1967. The Bionomics of the mustard sawfly, *Athalia lugens* proxima (Klug) (Tenthredinidae : Hymenoptera). M. Sc. (Agri.) Thesis, BACA, Gujarat Agricultural University, Anand, 84pp.

Rohilla, H.R.and Kumar, P.R.1991. Managing the insect pests of mustard and rapeseed. Indian Farming, 40 (12): 21-23.

Shah, A.H. 1940. Seasonal activity of *Athalia proxima* (Klug). Indian Journal of Entomology, 2 (1): 243-246.

Shirke, D.B., Rawat, R.R. and Dhamdhere, S.V. 1968. Studies on the biology of *Athalia proxima* (Klug) (Hymenoptera : Tenthredinidae). Madras Agriculture Journal, 55 (5): 228-234.

Tripathi, R.L.1963. Biology of *Athalia proxima* (Klug), the mustard sawfly. Indian Journal of Entomology, 25 (2): 179-181.