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**SEASONAL FLUCTUATIONS IN POPULATION  
DENSITY OF THE LACE BUG *STEPHANITIS  
TYPICA* (DISTANT) AND ITS PREDATOR  
*STETHOCONUS PRAEFECTUS* (DISTANT)**

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The lace-bug *Stephanitis typica* (Distant) gained importance as a pest of the coconut palm and as a vector of the root (wilt) disease of coconut which is prevalent in Kerala. Vectoral role of *Stephanitis typica* was established by transmitting the pathogen (MLOs) to healthy coconut seedlings under insect-proof conditions in field cages by Mathen *et al.* (1990). Seasonal abundance of the pest was studied by Mathen *et al.* (1968). The role of the mirid bug *Stethoconus praefectus* as a predator of *S. typica* was reported and a brief description of the predator and its life history were furnished by Mathen *et al.* (1973).

Fluctuations in the population density of *S. typica* and its predator on young coconut seedlings below the age of three years were studied during the period of January 1990 to June 1991 in relation to meteorological factors.

Two plots each comprising 250 seedlings below the age group of three years were selected. The plots were divided into five subplots of 50 seedlings each. From each subplot 10 seedlings were selected at random each week to record populations of *S. typica* and its predator *S. praefectus*. Since the number of leaves in the young seedlings were few, the youngest single leaf was selected from seedlings having seven and less than seven leaves. In seedlings with eight to 12 leaves the two youngest leaves and those with 13 to 17 leaves the three youngest leaves and so on, were selected to record the observations. From the selected leaves, leaflets falling within 41 to 60 per cent from the base of petiole were observed and the total number of adults and nymphs of both *S. typica* and its predator were recorded. The estimated population of the pest was worked out by multiplying the total observed population with the factor 3.76

(Mathen *et al.*, 1973). Meteorological observations at CPCRI, Kayangulam were utilised for the study.

The population fluctuations of *S. typica* and its predator in plots I and II (Table 68.1) show more or less the same pattern. The nymphal population was observed to be higher than that of the adult for both the plots.

Table 68.1: Estimated population of *S. typica* and *S. praefectus* and per cent distribution in plots I and II.

| Year/<br>month | PLOT I           |     |       |                    |      |      | PLOT II          |     |       |                    |      |      |
|----------------|------------------|-----|-------|--------------------|------|------|------------------|-----|-------|--------------------|------|------|
|                | <i>S. typica</i> |     |       | <i>Stethoconus</i> |      |      | <i>S. typica</i> |     |       | <i>Stethoconus</i> |      |      |
|                | Adult            | %   | Nymph | %                  | Nos. | %    | Adult            | %   | Nymph | %                  | Nos. | %    |
| 1990           |                  |     |       |                    |      |      |                  |     |       |                    |      |      |
| Jan.           | 297              | 7.8 | 285   | 7.5                | 0    | 0.0  | 505              | 8.1 | 431   | 6.9                | 12   | 4.9  |
| Feb.           | 157              | 4.1 | 189   | 5.0                | 8    | 14.8 | 174              | 2.8 | 269   | 4.3                | 19   | 7.0  |
| Mar.           | 38               | 1.0 | 68    | 1.8                | 8    | 14.8 | 102              | 1.6 | 86    | 1.4                | 0    | 0.0  |
| Apr.           | 62               | 1.6 | 181   | 4.8                | 0    | 0.0  | 36               | 0.6 | 91    | 1.5                | 0    | 0.0  |
| May            | 83               | 2.2 | 153   | 4.0                | 0    | 0.0  | 110              | 1.8 | 197   | 3.2                | 0    | 0.0  |
| Jun.           | 104              | 2.7 | 366   | 9.6                | 0    | 0.0  | 343              | 5.5 | 673   | 10.8               | 0    | 0.0  |
| Jul.           | 91               | 2.4 | 225   | 5.9                | 19   | 35.2 | 294              | 4.7 | 627   | 10.0               | 158  | 64.8 |
| Aug.           | 24               | 0.6 | 49    | 1.3                | 4    | 7.4  | 72               | 1.2 | 101   | 1.6                | 4    | 1.6  |
| Sep.           | 49               | 1.3 | 55    | 1.4                | 0    | 0.0  | 101              | 1.6 | 157   | 2.5                | 0    | 0.0  |
| Oct.           | 136              | 3.6 | 177   | 4.7                | 11   | 20.4 | 362              | 5.8 | 426   | 6.8                | 0    | 0.0  |
| Nov.           | 179              | 4.7 | 300   | 7.9                | 0    | 0.0  | 307              | 4.9 | 494   | 7.9                | 17   | 7.0  |
| Dec.           | 308              | 8.1 | 230   | 6.0                | 4    | 7.4  | 133              | 2.1 | 149   | 2.4                | 34   | 14.0 |
| 1991           |                  |     |       |                    |      |      |                  |     |       |                    |      |      |
| Jan.           | 131              | 2.9 | 260   | 5.7                | 34   | 26.2 | 97               | 1.1 | 67    | 0.8                | 50   | 11.2 |
| Feb.           | 113              | 2.5 | 180   | 3.9                | 8    | 6.2  | 110              | 1.3 | 223   | 2.6                | 15   | 3.4  |
| Mar.           | 178              | 3.9 | 320   | 7.0                | 0    | 0.0  | 427              | 5.0 | 608   | 7.1                | 0    | 0.0  |
| Apr.           | 83               | 1.8 | 229   | 5.0                | 0    | 0.0  | 201              | 2.4 | 385   | 4.5                | 4    | 0.9  |
| May            | 108              | 2.3 | 272   | 5.9                | 8    | 6.2  | 418              | 4.9 | 456   | 5.3                | 82   | 18.4 |
| Jun.           | 143              | 3.1 | 281   | 6.1                | 15   | 11.5 | 457              | 5.4 | 813   | 9.5                | 72   | 16.1 |

The estimated average monthly populations of *S. typica* and its predator along with monthly average meteorological factors are presented in Table 68.2. The highest predator population was observed in July 1990 and January 1991. Temperature below 33°C favoured pest build up irrespective of wider diurnal variation. Temperature above 33°C may not affect pest build up provided the average variation between the maximum and minimum temperatures is narrow. Hours of bright sunshine influenced the population trend and fewer hours of sunshine were found to be related to higher peaks. The population build up showed a positive relation to rainfall, number of rainy days and relative humidity around 90 per cent and above. Dry spells seemed to be associated with low populations. The up and down trends in predator population were found to be closely related to prey population and the predator exercised a definite role in bringing down the prey population that had reached higher levels in spite of favourable meteorological parameters. A high predator population was

observed following peaks in *S. typica* populations in the month of February, June and December in 1990 and January, May and June 1991. The predator exercised a definite regulatory pressure on the pest population in spite of favourable meteorological factors in August and September, 1990 and April, 1991. Decline in prey population resulted in very low predator population.

Table 68.2: Population density of *S. typica* and *S. praefectus* in relation to meteorological data

| Year/<br>month | Per cent distribution<br><i>S. typica</i> |       |       | <i>S. prae-<br/>fectus</i> | Temperature<br>average |        | Rain-<br>fall<br>(mm) | No. of<br>rainy<br>days | RH | Hours of<br>sunshine<br>(%) |
|----------------|-------------------------------------------|-------|-------|----------------------------|------------------------|--------|-----------------------|-------------------------|----|-----------------------------|
|                | Adult                                     | Nymph | Total |                            | Max.°C                 | Min.°C |                       |                         |    |                             |
| 1990           |                                           |       |       |                            |                        |        |                       |                         |    |                             |
| Jan.           | 8.0                                       | 7.1   | 15.1  | 4.0                        | 32.8                   | 13.4   | 32.8                  | 2                       | 89 | 268.8                       |
| Feb.           | 3.3                                       | 4.6   | 7.9   | 9.1                        | 34.3                   | 15.3   | 4.4                   | 1                       | 91 | 283.8                       |
| Mar.           | 1.4                                       | 1.5   | 2.9   | 2.7                        | 34.7                   | 17.6   | 35.0                  | 2                       | 89 | 313.8                       |
| Apr.           | 1.0                                       | 2.7   | 3.7   | 0                          | 34.3                   | 18.9   | 83.0                  | 5                       | 89 | 255.4                       |
| May            | 1.9                                       | 3.5   | 5.4   | 0                          | 31.4                   | 17.7   | 657.7                 | 21                      | 95 | 142.8                       |
| Jun.           | 4.5                                       | 10.4  | 14.8  | 0                          | 31.3                   | 17.2   | 356.0                 | 19                      | 95 | 161.1                       |
| Jul.           | 3.8                                       | 8.5   | 12.3  | 14.3                       | 30.1                   | 16.1   | 585.0                 | 26                      | 95 | 130.1                       |
| Aug.           | 1.0                                       | 1.5   | 2.5   | 3.2                        | 30.8                   | 16.3   | 89.4                  | 10                      | 95 | 166.9                       |
| Sep.           | 1.5                                       | 2.1   | 3.6   | 0                          | 31.4                   | 16.4   | 79.2                  | 4                       | 93 | 237.0                       |
| Oct.           | 4.7                                       | 6.0   | 10.7  | 1.0                        | 31.4                   | 16.2   | 352.5                 | 20                      | 93 | 220.7                       |
| Nov.           | 4.9                                       | 7.9   | 12.8  | 1.3                        | 32.4                   | 15.6   | 42.7                  | 3                       | 93 | 278.6                       |
| Dec.           | 4.4                                       | 3.8   | 8.2   | 4.6                        | 33.3                   | 13.6   | 2.9                   | 1                       | 91 | 269.6                       |
| 1991           |                                           |       |       |                            |                        |        |                       |                         |    |                             |
| Jan.           | 1.8                                       | 2.5   | 4.3   | 16.2                       | 33.4                   | 16.5   | 0                     | 0                       | 91 | 294.6                       |
| Feb.           | 1.7                                       | 3.0   | 4.8   | 3.7                        | 34.3                   | 20.7   | 7.2                   | 1                       | 92 | 287.6                       |
| Mar.           | 4.6                                       | 7.1   | 10.7  | 0.0                        | 34.9                   | 24.0   | 20.0                  | 4                       | 92 | 295.1                       |
| Apr.           | 2.1                                       | 4.7   | 6.8   | 0.4                        | 32.5                   | 24.1   | 88.9                  | 8                       | 91 | 277.4                       |
| May            | 4.0                                       | 5.6   | 9.6   | 7.2                        | 34.4                   | 24.4   | 291.1                 | 9                       | 91 | 268.8                       |
| Jun.           | 4.6                                       | 8.4   | 12.9  | 5.2                        | 30.7                   | 23.3   | 1005.0                | 25                      | 96 | 78.2                        |

Mathen *et al.* (1968) observed that high temperature, low rainfall, low relative humidity and greater hours of sunshine favoured high population of *S. typica*. They observed a negative correlation with relative humidity and rainfall and positive correlation with temperature and sunshine. The period of study reported by Mathen *et al.* (1968) had heavy rainfall and very high relative humidity, above 95 per cent. The average maximum temperature recorded during the period was 34°C for one month under the entire period of study. Therefore, the conditions under which the above conclusions were made may not hold good in the present study. Therefore it is felt that studies on population for longer period may yield a realistic picture of the influence of different meteorological parameters on the population of *S. typica*.

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