

FACTORS ASSOCIATED WITH RESISTANCE IN RICE TO THRIPS
(Stenchoatothrips biformis)

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ABSTRACT

Rice thrips, *Stencheatothrips biformis* (Bagnall) (Thysanoptera: Thripidae) are important as economic pest in South Asian countries including Sri Lanka. In Sri Lanka, it is considered as one of the major pests of rice. It damages the late-planted crop within the first few weeks after transplanting or seeding, especially if the crop is water stressed. It is estimated that around 10% of total cultivated area in Sri Lanka is affected by this pest and the yield loss is estimated to be around 1-2% valued at Rs 300-600 million per annum.

Thrips feed on the mesophyll cells of the young leaves through adaxial surface. Feeding gives scorching, stunting or death of seedlings and poor crop stand. When damage is severe, seedlings stunt and dry out. Short-duration varieties (3-3 1/2 months), planted late in the season, are more prone to thrips infestation and to severe yield losses due to shorter vegetative phase. At present application of chemicals is recommended for the control of this pest. In this respect development and cultivation of thrips resistant varieties are considered the best approach for the control of the pest.

There are a number of traditional rice varieties like Dahanala, Wannu Dahanala, Kalu Heenati, Heenati and Kalu Bala Wee possessing high level of resistance to the pest. Therefore objectives of this study were to determine mode of thrips resistance in rice with particular reference to trichome density, the most susceptible stage of the crop for thrips damage and genetic variation of thrips in Sri Lanka.

Eighty eight (88) accessions of Dahanala, Wann Dahanala, Kalu Heenati, Heenati and Kalu Bala Wee were collected from the gene banks at Plant Genetic Resources Center (PGRC) and Rice Research and Development Institute, Batalagoda and planting was done late in the season to ensure heavy insect pressure. The damage was evaluated according to standard evaluation system (SES) at 14 and 21 days after seeding. The resistant accessions were selected from all traditional varieties. The trichome density and damage were estimated from 88 accessions of traditional varieties and 13 popular commercial varieties under magnification of X3 on the upper half of the adaxial leaf surface of 3rd leaf of the above rice varieties. F1 generation was made using single crosses between Dahanala (Acc No: 03924: resistant to thrips), Bg 300 (moderately susceptible) and Suduru Samba (highly susceptible). The trichome density and damage reaction were estimated in F1, F2, and F3 generations. The traditional variety Dahanala Acc 3924 was used to estimate abrasion of trichomes on thrips resistance. When plants reached to 1st, 2nd and 3rd leaf stages, the trichomes were removed from the adaxial leaf surface using scotch tape and damage was rated according to SES. In order to estimate the most susceptible leaf for thrips damage, the thrips population in the first, second, third, forth, fifth and sixth leaf of Bg 300 and Suduru Samba were counted separately in detached leaves. According to the results, rice leaf trichomes were related to the thrips resistance but trichomes cannot be considered as the only criteria for thrips resistance. The thrips population was found to decline gradually when the seedlings grow older.