



SUSCEPTIBILITY OF DIFFERENT SUGARCANE VARIETIES (*SACHCHARUM OFFICINARUM*) AGAINST PYRILLA (*PYRILLA PERPUSILLA*) IN DISTRICT RAHIMYAR KHAN, PUNJAB, PAKISTAN

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ABSTRACT

The sugarcane is a member of genus *Saccharum* and family Poaceae. It is an important cash crop of Pakistan. *Pyriila perpusilla*, Wlk. (Homoptera: Lophopidae) is one of the most destructive sugarcane pest in Punjab, Pakistan. *Pyriila perpusilla* can suck the phloem sap of leaves and excretes honeydew on foliage leading to fungal diseases finally affecting the yield of sugarcane. There are many varieties of sugarcane cultivated in Punjab but in present studies UP234, UP235, CPF237, UP272, CP70, J69 and UP268 varieties have been discussed. The whole study carried out in field of Mouza Gahina Lar, District Rahimyar Khan, Punjab, Pakistan from April 2016 to December 2016. In present study the effects of leaf hopper *Pyriila perpusilla* infestation on seven different varieties of sugarcane from April to December were observed. The various parameters relating to height, number of leaves and internodes, length of internodes, quantity of juice, brix (sugar contents) and yield of plants were recorded. In this work the maximum infestation of *Pyriila perpusilla* was observed on UP234 with 102.2 adults per plant while minimum infestation on UP268 with 17.7 adults per plant was recorded. Maximum number of *Pyriila perpusilla* was noted during April, May and August during day time. In remaining months pest population size decreased due to environmental factors on each variety of sugarcane under research. Present study reveals that sugarcane variety UP234, UP235 and CPF237 are more susceptible as compared to UP272, CP70, UP286 and J69 to leaf hopper *Pyriila perpusilla*. Out of 7 varieties of sugarcane UP272 and J69 are more resistant to *Pyriila perpusilla* infestation and showed minimum loss in yield as compared to rest varieties of sugarcane. In present work overall effects of leaf hopper *Pyriila perpusilla* on selected varieties of sugarcane was recorded.

1. INTRODUCTION

Sugarcane, *Saccharum officinarum*, is a member of the grass family (*Poaceae*) and is widely cultivated around the world. It provides around 72% of the world's sugar. Sugarcane yields the highest number of calories per unit area of cultivation of any plant. Sugarcane cultivation requires a tropical or temperate climate, with a minimum of 60 cm (24 in) of annual moisture. The *Pyriila perpusilla* Walker, leaf hopper is serious pest of sugarcane, its adult and nymph both suck the phloem of leaf and caused sooty mold production after honey dew secretion from pest.

This mold interrupts the photosynthetic activity of plant leading to low yield of sugarcane. Williamson, H. (2006) reported that Sugar cane is now grown in more than 70 countries, mainly in the tropics, but also in some sub-tropical areas. Dahlia *et al.*, (2009) added sugarcane is one of the most efficient photosynthetic plant in the plant kingdom. Nadeem A. R. (2017) reported that sugarcane is an important cash crop of Pakistan. It is mainly grown for sugar and sugary production. Khan M.A. (2001) added that despite expansion in production, increase in the productivity per unit of area has been very low in Pakistan. Aslam S.M., (2001) reported, Pakistan is the 12th largest sugar-producing country. Total world sugar production is

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about 110 million tons (total from sugarcane and sugar beet) having break up ratio of sugarcane and sugar beet of 65 and 35% respectively. Zubair *et al.*, (2012) added that insect pests are one of the major causes for low yield of sugarcane in Pakistan. Different varieties of sugarcane are affected by insect parasitism in all over the world. Khan A. R., (2009) *Pyrilla perpusilla* is the notorious pest of sugarcane in Punjab. *Pyrilla perpusilla* is the most destructive foliage-sucking pest of sugarcane. Butani, 1964; Bindra and Asre *et al.*, (1983) reported that adults and the nymphs suck leaf sap from the under surface of the lower leaves, the affected leaves dry up. P. Kishore and G. Rai (2000) described this high level loss of sugarcane yields by leaf hopper *Pyrilla perpusilla*.

2. MATERIALS AND METHODS

a) Study area

The present study was carried out in Mouza Gahina Lar district Rahimyar khan from April 2016 to December 2016. Seven acres' area were selected for research work. One variety was cultivated in each acre. These seven varieties of sugarcane were like UP234, UP235, UP268, UP272, CP70, J69 and CPF 237. The field area located in east of District Rahim Yar Khan with 60 km distance.

b) Observation and collection of *Pyrilla perpusilla*

In order to count the number of *Pyrilla perpusilla* at young plant of sugarcane, suddenly plant was covered with cloth bait/net and all insects were killed by insecticide. The number of insects were counted, while at mature plant adult *Pyrilla* was counted on under surface of leaf. Maximum adult insects were observed at dawn and dusk. Nymph were mostly found at lower surface of leaf.

c) Sampling procedure

Samples were collected randomly from selected points in research field. Ten different sites were design for collection of samples in each acre. From every site five plant were selected for samples and counted mean infestation of *Pyrilla perpusilla*. Fifty infestation samples in all were collected from each acre of field. *Pyrilla*, the pest collection was carried out fortnightly from fifty different point in the field of sugarcane. The study carried out from April to December with two visits in each month for collection of *Pyrilla perpusilla*.

3. RESULTS AND DISCUSSION

The *Pyrilla perpusilla* Walker population was observed fortnightly from April to December in research field (table1). The pest population from April to May increases and from June to July decreases with the effect of high temperature. In August pest population once again increased but only during August, further *Pyrilla* population suppressed due to change environmental condition, temperature. *Pyrilla perpusilla* the leaf hopper of sugarcane sucks the phloem from midrib of leaf causing yellowness of leaf and suppressing photosynthetic activity of sugarcane plant that finally caused the reduction of plant height (table 2). The maximum *Pyrilla* population was found at UP234 variety and Minimum at UP268. The variety UP234 had high sugar contents which cause high population of leaf hopper on its leaves. The height of sugarcane plant affected by the presence of pest because the growth of plant directly related with photosynthetic avidity of plant. The honey dews secretion of *Pyrilla* cause sooty mold development on leaf surface result low growth and height of plant. The height of sugarcane plant also effects on the yield of sugarcane per acre, plants having suppressed photosynthetic activity ultimately suppressed photosynthetic activity ultimately with short height and low yield. The present study revealed that the height of UP234 was adversely affected as compared to other varieties of sugarcane (figure 1).

4. CONCLUSION

In present study the effects of leaf hopper *Pyrilla perpusilla* infestation on seven different varieties of sugarcane from April to December were observed. Maximum number of *Pyrilla perpusilla* was noted during April, May and August during day time. In remaining months pest population size decreased due to environmental factors on each variety of sugarcane under research. Present study reveals that sugarcane variety UP234, UP235 and CPF237 are more susceptible as compared to UP272, CP70, UP286 and J69 to leaf hopper *Pyrilla perpusilla*.

5. CONFLICT OF INTEREST

Author has declared that there is no conflict of interest regarding publication of this article.

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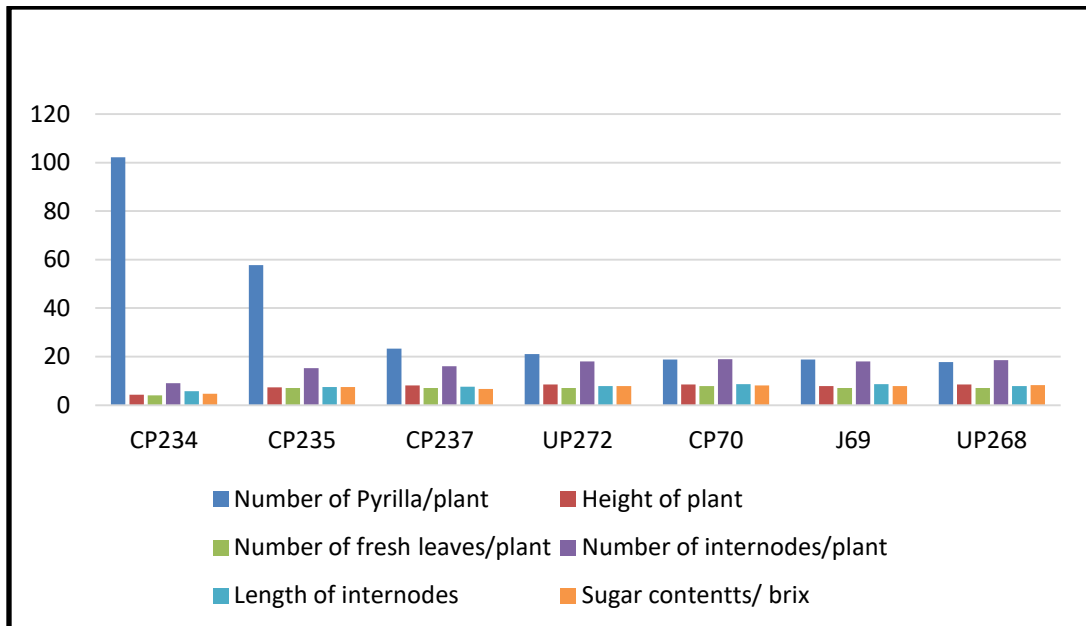


Figure 1: Comparative effects of *Pyrilla perpusilla* on sugarcane varieties

Table 1 *Pyrilla perpusilla* infestation rate from April to December per plant (No. of insect)

Month	UP234	UP235	CPF237	UP272	CP70	J69	UP268
April	150	80	35	30	25	30	30
May	170	85	40	35	30	35	25
June	130	70	30	25	20	23	20
July	100	50	20	20	15	15	15
August	120	70	25	30	25	20	22
September	90	60	20	25	20	18	20
October	80	50	20	15	15	13	15
November	50	35	10	5	10	10	8
December	30	20	10	5	10	6	5
Mean	102.2	57.7	23.3	21.1	18.8	18.8	17.7

Table 2 Height of Sugarcane plants in feet

Sr #	UP234	UP235	CPF237	UP272	CP70	J69	UP268
1	3	4.5	5	8	8	9	7
2	3	5.5	7	7	6	7	8
3	3.5	6	8	6	7	6	7
4	4.5	7	9	9	9.5	10	9
5	4.5	7	10	10	9	9	8
6	5.5	9	8	9	7.5	10	9
7	5	10	9	8	9	9	9
8	5	8	10	9	10	10	10
9	4.5	9	7	10	10	8	8
10	4.5	7	8	9	9	9	9
Mean	4.3	7.3	8.1	8.5	8.5	7.8	8.5