Population Dynamics of Chrysomelid Beetle, *Zygogramma bicolorata* Ballister and Its Role in Management of Congress Grass, *Parthenium hysterophorus* L.

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SUMMARY

For management of Parthenium weed a study was undertaken to know the population dynamics of *Zygogramma* and its role in management of congress grass. The highest number of *Zygogramma biclorata* were observed in month of May and August in year 2005 and 2006. Temperature, relative humidity and rainfall showed significant positive, whereas maximum temperature showed significant negative influence on grub and adult activity of this insect. Biocontrol efficacy of this predator was tested with ten treatments in caged pots which comprised of release of 1 adult/plant (T_1), 2 adult/plant (T_2), 3 adult/plant (T_3), 4 adult/plant (T_4), 5 adult/plant (T_5), 6 adult/plant (T_6), 7 adult/plant (T_7), 8 adult/plant (T_8) and 9 adult/plant (T_9) and0 adult/plant i.e control (T_{10}). The studies indicated that the release of *Zygogramma* 9 adult/plant (T_9) effectively reduced the no. of leaves (2.66), number of flowers (85.5) and plant height(39.36 cm) after 15 days of release of *Zygogramma biclorata* and plant showed, bushy appearance and stunted growth.

Key words : *Zygogramma bicolorata*, Congress grass, *Parthenium hysterophorus*, Management.

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Parthenium hysterophorus is commonly known as congress grass, carrot weed or hydra headed grass. It is widely distributed in India. It causes contamination of seed produce and change in total habitat in native vegetation. It also poses a series of human health problems causing fever, skin problem and asthema (Jayanath and Bali, 1993; Jayanath and Bali, 1994 and David, 1998). Use of chemical herbicides has been effective in controlling the weeds, but the excessive use of the chemical lead to various problems like degradation in the fertility of soil, environmental pollution and water contamination. The herbicides are not able to control the weed, so it is essential to manage this weed by bioagents. Keeping this in view, the present study has been undertaken to control the Parthenium weed by its natural enemy.

MATERIALS AND METHODS

Study on population dynamics of *Zygogramma biclorata* on *Parthenium hysterophorus* weed was undertaken at Students Instructional Farm, C.S. Azad University of Agriculture and Technology, Kanpur during two consecutive years 2005 and 2006. The grub and adult population of *Zygogramma biclorata* on Parthenium weed was recorded on 2 randomly selected congress grass plants at weekly interval starting from the appearances of *Zygogramma biclorata* till October. To study its biocontrol efficacy, the healthy and almost same aged plant of *Parthenium hysterophorus* were selected and caged. Such tem cages were used which comprised and release of 1 adult/plant (T_1), 2 adults/plant (T_2), 3 adults/plant (T_3), 4 adults/plant (T_4), 5 adults/plant (T_5), 6 adults/plant (T_6), 7 adults/plant (T_7), 8 adults/plant ((T_8)), 9 adults/plant (T_9) and 0 adult/plant *i.e.* control (T_{10}). The damage caused by grubs and adults were recorded after 8 and 15 days intervals. The biocontrol efficacy of *Zygogramma bicolorata* was defined as the number of leaves, number of flowers and height of the congress grass.

RESULTS AND DISCUSSION

The study carried out on incidence of *Zygogramma bicolorata* on Parthenium (Fig. 1 and 2) revealed that the activity of the insect started from 1st week of March on three week old plant and continued till 2nd week of October during both years *viz;* 2005 and 2006 (Table 1 and 2) . As regard the seasonal abundance of *Zygogramma bicolorata*, it was observed that the adult population gradually increased until it reached the peak in month of May (60 adult/2 plant in 2005 and 105 adult/2 plant in 2006) and thereafter the incidence declined. Further, its maximum population was found in month of August (135 adult/2 plant in 2005 and 80 adult/2 plant in 2006). Correlation with weather