



## **STATUS OF THE NOXIOUS WEED *PARTHENIUM HYSTEROPHORUS* AT ALLAHABAD AND ITS POSSIBLE ELIMINATION**

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### **Abstract**

*Weed Parthenium is directly responsible for health problem or allergies and indirectly for spread of diseases. Several attempts have been made to eradicate this weed by using physical, chemical and biological method but success is still eluding. In the present study survey of Parthenium in different localities of Allahabad was conducted, predominant and luxuriant growth of Parthenium were recorded. During survey Parthenium feeding insects, Parthenium replacing weeds and Fungi infested Parthenium plants were observed.*



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### **Introduction:**

*Parthenium hysterophorus*, native to Mexico had spread to N. America, S. America, Caribbean and many parts of Africa, Asia and Australia<sup>1</sup>. In India it is commonly known as congress grass or Gajarghas belonging to the family Asteraceae, is an annual herb. Since its first occurrence in Pune in 1955<sup>2</sup>, it has thoroughly spread throughout the country<sup>3,4,5</sup>. In the last two decades it has not only spread in India but to the other countries as well, such as Israel<sup>6</sup>, Taiwan<sup>7</sup>, Nepal<sup>8</sup> and Ethiopia<sup>9</sup>.

In U.P. the weed was first detected in 1969<sup>10</sup>, and after a decade or so it had started spreading to different localities of Allahabad too, encroaching into agricultural and vacant lands, parks, roadsides and private gardens causing health problems to citizens of Allahabad especially skin problem and asthma. It is well known that the weed constitutes public health hazard<sup>11</sup>.

### **Survey and Results:**

As this weed became a major problem, a thorough survey was started from the year 2002 . During the year 2002 it was observed that the weed was predominant and grew luxuriantly on all possible sites surveyed (Fig. 1a, 1b, 1c, 1d). In March 2003 an insect was observed feeding on *Parthenium* and damaging the plants in restricted localities for the first time at Allahabad (Fig. 2). In other areas plants grew normally. In the year 2004, the insects were

observed in other localities and roadsides as well. The plants were partially damaged and bore a burnt appearance (Fig.3). besides field observations and surveys, cage experiments were also conducted to confirm the insect infestation and damage. It as observed that larvae fed on *Parthenium* more ferociously than adults.

During the survey, it was detected that there was a sudden outbreak of insects in Allahabad and its adjoining areas(Fig. 4). The insects emerged in the month of February and remain active throughout summer and rainy season. During winter months the adult insects undergo diapauses in soil. The insect was identified as *Zygommatocolorata* belonging to order Coleoptera and family Chrysomelidae.

### **Discussion and Conclusion:**

Literature revealed that the insect as first imported from Mexican substation of Commonwealth Institute of Biological Control in April 1983 by Indian Institute of Horticulture, Bangalore<sup>12</sup>, to be released in field as biological control agent. Since then the insect has gradually spread throughout India causing moderate to heavy damage to the weed.

Surveys also revealed that wherever insect infested weeds were present the plants had fewer number of flower heads. Also, the plants were wilted and gave a burnt appearance. It was observed from 2004 onwards that after insect infestation of the weed, the number of *Parthenium* plants started diminishing where as other weeds started coming up. Similar observations were earlier recorded in Bangalore too<sup>13</sup>. At present barring a few places *Parthenium* plants were found scattered and scanty in most of the localities and is replaced by other weeds which are growing luxuriantly such as *Achyranthesaspera*, *Acalyphasp*, *Caesalpiniasp*, *Cassia occidentalis*, *Crotonbonplandianum*, *Malvastrumsp*, *Sidasp* and *Tephrosiapurpurea*(Fig.5).

Caged experiments were again performed in large scale to see whether insect infestation affects flowering. The overall results indicated one major point that insect infestation has led to total inhibition of flowering. The details of experiments will be communicated in a separate paper. Another important feature noticed during the last three years is that the insect is still monophagous and is not causing damage to other plants or weeds. In the current year two more insects were also detected on *Parthenium* plants but so far they were not observed to feed on the weed.

Mycoflora of healthy and insect infested plants were also screened. It was noticed that insect infested plants were secondarily infected with fungi especially members of Deuteromycotina and Ascomycotina, viz. *Alternaria*, *Bipolaria*, *Botrysporium*, *Curvularia*, *Fusarium*,

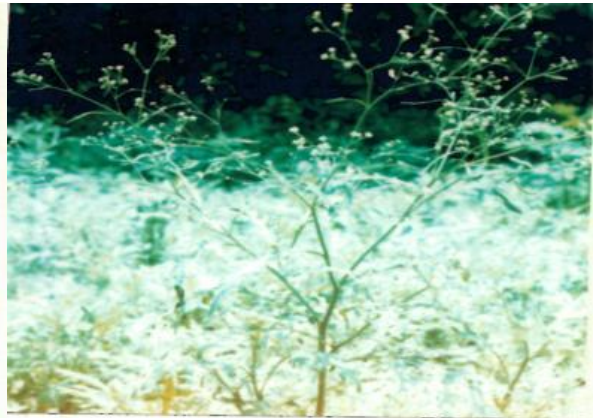
*Chaetomium*, and other perithecial member. Even some of the fungi were found to be good mycoherbicide.

Above observations have opened new dimension for the insect as viable biological agent which when introduced at an appropriate time, *Parthenium* can not only be eliminated rather in near future it could be eradicated also.

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**Fig. (1a)** Healthy vegetative plant



**Fig. (1b)** Healthy flowering plant



**Ic**



**Fig. (2a).** Detection of insect



**Id**

**Luxuriant growth on road side and vacant land**



**Fig. (2b).** Foliage damage



**Fig. (3)** Burnt appearance



**Fig.(4)**

**Outbreak of insects**



*Tephrosia purpurea*



*Caesalpinia*



**Fig.5 : *Achyranthesapsera***

**Replacement by other weeds**