

# Effect and Management of Parthenium Hysterophorus Linn. – A Weed of Global Significance

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## ARTICLE DETAILS

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## ABSTRACT

*Parthenium hysterophorus* Linn. (ASTERACEAE) is much-branched, annual herb, with role as environmental medical and agricultural hazards. The prime objective of this paper (=work) is to provide general information about the physiology, distribution, ill – effects and management of parthenium. Successful management of this weed can be achieved by an integrated approach with biological control as the key element.

## INTRODUCTION

According to L.Ho/m *et al.* (1997), this noxious invasive species is supposed to be one of the worst weed of global significance which is responsible for severe human and animal health issues such as dermatitis, asthma and agricultural losses. It is a widely held belief that the seeds of this weed came to India with grains imported from USA under the US PL-480 scheme also known as "Food for Peace" which is a food assistance programme of the US government and spread like a wild blaze to almost all the states in India and were established as a naturalized weed. Biological control the intentional manipulation of natural enemies, insects, bioherbicides, nematodes snails, and competitive plants to control harmful weeds is gaining momentum as it is an effective and ecofriendly alternative to conventional method of weed control (Rs Rao, 1956 ; W. Roxburg, 1814, S.Kumar, 2009)

- **Distribution :** Mexico, Central America, West Indies ( SC Navie *et al.* 1996)
- **Name :** The genus name parthenium is derived from the latin word parthenice – a reference to the plant now know as Tanacetum parthenium L. Benth or "Feverfew", hysterophorus was derived from the Greek hystera (=womb) and phoros (=bearing), referring to the prolitic seeding habit of the plant ( WT Parsons, 1992)
- **Morphology of Plant :** Pantheism hysterophorus is a fast maturing plant, with two distinct phases in life i.e. juvenile, rosette or the vegetative stage juvenile stage exhibits a rosette with Large lower leaves are spread on the ground like a carpet, without allowig any vegetation underneath it. The flowers are arranged in terminal capitulate measuring 4mm across.

## • Harmful effects :

- **Effect on ecosystem :** Parthemium is an aggressive colonizer of wasteland, ruderal, railway tracks, fallow fields and crop fielfs.
- **Effect on crops :-** This weed contains chemicals like parthenin, hysterin, hymenin and ambrosin, and due to presence of these chemicals the weed exerts strong allelopathic effect on standing crops (KR Anjua, 1991; SN. Khoshala, 1981). The weed also act as a collateral host for many diseases caused by viruses in crops plants.
- **Effect on animals :** This weed is toxic to animal causing dermatitis with pronounced skin lesions.
- **Effect on human beings :** The pollen grains cause various allergies like contact dermatitis, hay fever, asthma and bronchitis in human beings.

## MATERIALS AND METHODS

Excursion trips were organized to collect the plant from different habitat of our area at the beginning and end of every month allaround the year. The collected plants were dried under herbarium press for a week and mounted on herbarium sheet measuring 42 x 28 cm. The mounted plant species were poisoned in 2% mercuric chloride solution to protect the plant from insects. The mounted plants were then brought to National Botanical Research Institute, Lucknow to compare with type specimen placed at its herbarium for proper identification.

**RESULTS AND DISCUSSIONS**

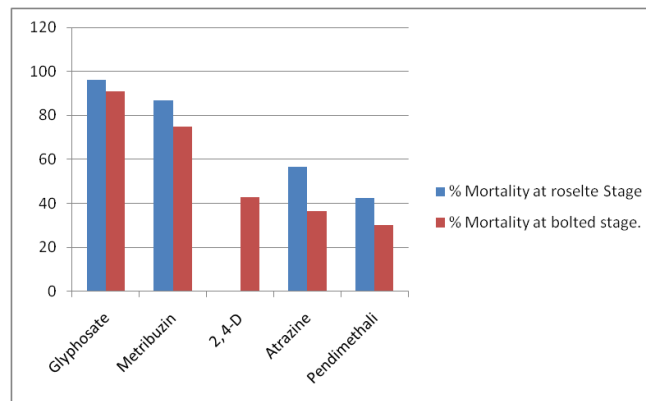
**Control of Parthenium**

Singh (1997) considered use of biocontrol agents i.e. insects and fungal pathogens. Various methods i.e. physical, chemical, biherbicide and integrated are being practiced to manage the weed as such –

- Physical Control : Manual uprooting of parthenium before flowering and seed setting is the most effective method.
- Chemical Control : It is an effective method to control parthenium in the area where its natural enemies are absent. Use of chemical herbicide, such as atrazine, glyphosate, ametryn and mestulfuron are very effective in controlling this weed. Application of 2, 4-D EE (0.2%) and metribuzin (0.25 and 0.5 % were found more effective for controlling parthenium at 15 days after spraying, causing complete kill of parthenium (A Javiad, 2007; J.S. Mishra *et al.* 1994; CB Gaikwad *et al.* 2008).

Table : Showing Parthenium weed control at rosette and bolted stage with different herbicidal application at 4 weeks after treatment.

Herbicides	%Mortality at rosette stage	% Mortality at bolted stage
Glyphosate	96	91
Metribuzin	87	75
2, 4-D	71-80	43
Atrazine	56.5	36.5
Pendimethalin	42.5	30



- Allelopathic control : The term allelopathy was coined by molisch (1937) which refers to the detrimental effect of one plant species and seed germination, growth and reproduction of another plant species. In India crop rotation practice during the rainy season, instead of the usual crop, has been found effective in reducing parthenium infestation in cultivated crop fields.
- Biological Control : It is an environmentally sound and effective means of mitigating (=reducing) pests and pest effects through the use of natural enemies. There are two basic strategies to implement the biological control of weeds : the introduction of foreign pathogenic organisms and the augmentative bioherbicide approach where the pathogenic organisms are already present and their population is increased by mass rearing (W.EL Sayed, 2005).

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