

### III impacts of parthenium weed on human health, livestock production and environment

S. M. Rezaul Karim<sup>1</sup>

Faculty of Agro Based Industry, University Malaysia Kelantan, Jeli Campus, 17600 Jeli, Kelantan

**Abstract:** Parthenium weed (*Parthenium hysterophorus* L) an environmental pollutant, causing enormous losses to human health, animal health, crop production and biodiversity, in a number of countries. India and Australia are severely affected countries. Although Malaysia is not infested with this notorious weed but edaphic and climatic conditions of the country may favour to establish the weed if the peoples of the country are not alert about the invasion of the species from infested countries. Awareness must be created among the inhabitants of the countries especially in Asia Pacific region to combat the menace. Well planned research should be carried out to eradicate or to control the weed effectively in the infested countries.

#### A. Background and Importance:

Parthenium weed (*Parthenium hysterophorus* L.) is a notorious environment pollutant weed under the family Asteraceae. It is an annual plant with erect stem and lobed leaves, plants ranging from 0.5 m to 2.5 m tall. This weed can complete their life cycle within 4 to 6 weeks and can produce a huge number of seeds per plant. It can spread from one place to another just like a wild fire through wind, vehicles or crop seeds. The leaf and stem of the plant contain *Sesquiterpene lactone*, which causes allergic effects to human and livestock body. Asthma, skin dermatitis, hay fever etc. are the common diseases which may occur when the plants come in contact of body for longer time (Oudhia & Tripathy, 1998). When pollen of the flowers enter the nose respiratory problems are occurred to human body. If the plants are consumed by the livestock allergic swelling may occur on the face and toxicity may develop in the stomach of the livestock (Chippendale & Panetta, 1994). The meat and milk of the cows become unsuitable for human consumption. When the dermatitis become severe they are very difficult to cure by medical treatments. In India more than 10 peoples are died due to this weed attack. It has also negative impact on crop production. When plants are incorporated with the soil it releases allelochemicals which decrease the seed germination of different crops. It may compete for nutrients and water when grow in highland crops like barley, maize, upland rice etc (Khosla & Sobti, 1979). When the pollens fall on the inflorescence of maize grain filling is reduced to a great extent. Due to its allelopathic effects it excludes other vegetation in the close proximity and damage our biodiversity.

Earlier literatures indicate that parthenium weed is the native of Mexico. From there the weed has spread in many countries probably through seed aids. Among the infested countries the names of

---

<sup>1</sup> Contact e-mail of the author: [rezaul@umk.edu.my](mailto:rezaul@umk.edu.my), Tel: +609-9477119

India, Australia, Papua New Gueny, Nigeria, Tanzania, Srilanka, Pakistan, Nepal, Bangladesh are mentionable. The scientists have speculated that due to availability of suitable soil and climate in many other countries the pollutant weed may spread to those countries like Malaysia, Indonesia, Phillipines, Thailand etc (Navie *et al.* 2003).

**B. How the weed looks like?**

It is an annual herb with deep tap-root and erect, much branched stem, lobed leaves (Figs. 1a to 1f), may grows upto 2 m height. It produces creamy white, 5-lobed terminal flowers (Figs. 3 & 4). Seeds are small, 1 to 2 mm across, flattened, triangular, dark brown to black with thin white spoon-shaped appendages.



**Fig.1a. A single young plant**



**Fig. 1b. Parthenium seedlings**



**Fig.1c. A matured plant**



**Fig.1d. Flowers of parthenium**



**Fig.1e. Rosette form of Parthenim**



**Fig.1f. Roadside infestation in Bangladesh**

### III impacts of the weed on human, livestock and crops

#### a) III impacts on human health (Fig. 2a to Fig. 2b):

- Contact of weed causes asthma, bronchitis, dermatitis and hay fever
- Contact with skin causes eczema. Pollens in contact with body causes swelling and itching of mouth & nose; also causes constant coughing (Fig. 6)
- Consumption of weed roots cause excessive water loss from the body (Oudhia & Tripathy, 1998)

#### b) III impacts on livestock production (Fig. 2c to Fig. 2d):

- Contact causes inflamed udder, fever and rushes in cows,
- Causes allergic inflammation in the mouth of cattles
- Buffalo & bullcalves suffer from toxicity, ulceration in mouth & digestive tracts (Chippendale & Panetta, 1994)
- Produce taints in mutton when weed is consumed by the cattle,
- Destroys quality of dairy milk if cows are feed on the weed

#### c) III impacts on crops production (Fig. 2e. to Fig. 2f)

- Yield loss may occur up to 40% in Rice & others through competition (Khosla & Sobti, 1979)
- Grain filling in maize reduced by 50% due to allelopathic effects of pollens on floral parts
- Chickpea, mustard & linseed are killed due to allelopathy through root exudation
- Seed germination is reduced in tomato, brinjal & chilli by weed allelopathy
- Pasture production is reduced by 90% through crop-weed competition



Fig. 2a. Skin rash on arm due to Parthenium



Fig. 2b. Dermatitis on face due to Parthenium



Fig. 2c. Goats are eathing Parthenium



Fig. 2d. Allergic effects on goat mouth due to Parthenium



**Fig. 2e. Barley is infested with Parthenium**



**Fig. 2f. Maize is infested with Parthenium**

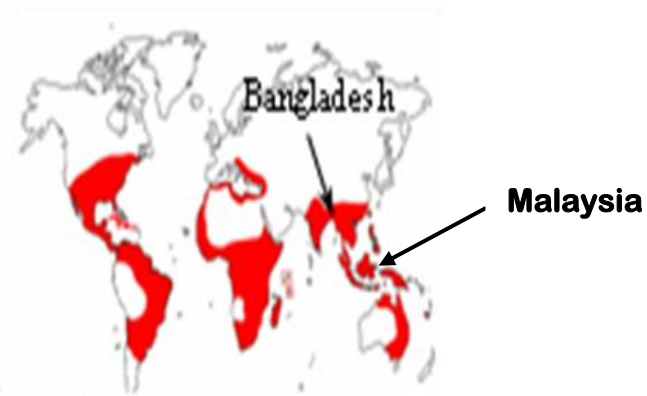
It is important for the peoples of those countries to understand the problem and identify the weed so that they can be careful about future invasion to their countries. The impacts in details, present scenario of weed infestation in the Indo-pak subcontinent and probable wayouts has been discussed. The photographs of the weed and some of the impacts are shown as above –

### **C. Distribution of the weed in the globe**

Navie *et al.* (2003) used the computer program CLIMEX to predict the distribution of the weed based on environmental factors including temperature, soil moisture, light intensity and various stresses that may be important to a plant's growth. It is to be noted that Bangladesh and Malaysia are in high risk of parthenium infestation.



**Fig. 3a. Actual distribution**



**Fig. 3a. Probable distribution**

### **D. Control measures:**

Although few herbicides (e.g. Bactril Super @ 0.67 ml/L water) can control the weeds, the huge amount of parthenium plants can not be controlled economically by chemicals. Moreover, using a big amount of herbicides may lead to environmental pollution. Biological control using appropriate insect (e.g. *Zygogramma bicolorata*, *Epiblema strenuana* etc.) and diseases (e.g. *Puccinia abrupta*)

and growing parthenium-competitive grasses (e.g. *Cenchrus ciliaris*) and legumes (e.g. *Clitoria terneata*) are the best ways to control the weed.

#### **E. Conclusions:**

Awareness must be created among the inhabitants of the countries about the ill impacts of Parthenium. How this weed looks like, how the seeds are spread from one place to another and the possible methods of control should be taught to all of the peoples so that all the members of the community can be involved in combating the weed. If identified in any place we should take immediate action for its eradication. Since it spreads just like wild fire, we should not wait until it is wide spread. Special care should also be taken by the Plant Quarantine peoples so that it cannot enter Malaysia through any seed material. Particularly any import from Parthenium-prone country like India, Australia etc. must be checked properly for presence of parthenium seed, if any.

**F. Acknowledgement:** The author is grateful to the University Malaysia Kelantan for supporting the visit to West Virginia University, USA in the form of research grant **(R/SGJP/A03.00/00601A/001/00057)** for presenting the paper.

#### **g. References**

- Chippendale, J.F. and F. D. Panetta. 1994. The cost of parthenium
- Khosla, S.N. and S.N. Sobti. 1979. Pesticides 13, 121-127
- Navie, S.C. 2003. The biology of *Parthenium hysterophorus* L. in Australia. PhD thesis, The University of Queensland, Australia.
- Oudhia P, Tripathi RS. 1998. Proc. First Int. Conf. on Parthenium Management, University of Agril. Sciences, Dharwad, India, 6-8 Oct. 1997. p 136 – 139,