Pakistan Parthenium Action Group (PPAG)

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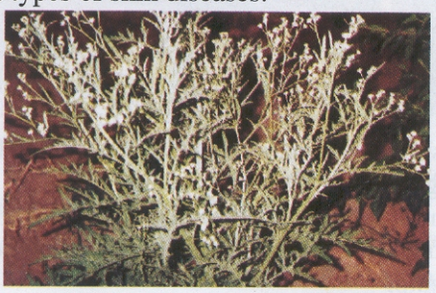
Parthenium NEWS

About Parthenium Weed

Asad Shabbir

Parthenium weed is amongst the ten worst weeds in the world. It is an Invasive Alien Species (IAS) harmful to human beings, animals, crops and a curse to bio-diversity. The scientific name of this weed is *Parthenium hysterophorus* L. Commonly it is known as Parthenium weed, White top, Congress weed, Baby flower, Booti etc. Parthenium weed is not a native to Pakistan and it came probably in late nineties of last century. The origin of this weed is Mexico. Scientific studies have revealed that Parthenium weed is harmful to human beings in more than one ways; the flowers of Parthenium weed emit millions of pollen, these pollen cause asthma and respiratory problems in humans. Small hair present on the stem of Parthenium weed, when come in contact with human beings and animals, cause different types of skin diseases.



The roots of this weed secrete many lethal chemicals harmful to other plants present in its vicinity. These chemicals are responsible for the fast spread of this weed, and are inhibiting the valuable medicinal plants present in our wastelands and forests. Earlier Parthenium weed infestation was limited to wastelands but it is now becoming a field weed and competing with our crops for light, moisture and nutrients.

Daily, thousands of farmers and their cattle are coming in contact of this obnoxious weed. Its spread in forests is becoming a problem for wildlife. It is hard to estimate the daily extent of damage to wildlife by this weed. Animals generally don't prefer this weed. If taken by mistake, it may be lethal to them. In Australia, thousands of dollars worth meat gets tainted by Parthenium weed. A single plant of Parthenium can produce more than 25,000 seeds.

Due to absence of natural enemies, the Parthenium weed is spreading very rapidly in Pakistan. Many agrochemicals are available that can control this weed, but these are not eco-friendly and it is, therefore, not advisable to solve one problem by creating another one i.e. pollution. In Australia eleven biological control agents have been released so far to control this weed. In India *Zygogramma bicolorata*, a defoliating beetle and rust species of Genus *Puccinia* have been released to control this weed. *Zygogramma* beetle was first reported by the author from Changa Manga, Pakistan in 2003. It has been found that this beetle is well established in Pakistan and can be further promoted to the new ecological zones for efficient biocontrol of this weed in Pakistan.

Pakistan Parthenium Action Group (PPAG)

It is a bitter truth that very few people are aware of harmful effects of Parthenium weed. Our government is not taking any steps towards its awareness campaign. Very few scientists around the world are working on the Parthenium weed, and there is lack of coordination among them. To provide a discussion forum to scientists, researchers, students, farmers, general public associated with Parthenium weed, an action group named **Pakistan Parthenium Action Group (PPAG)** was formed in 2002. PPAG came into act in leadership of Dr. Rukhsana Bajwa, Chairperson, Department of Mycology and Plant Pathology, University of the Punjab, Lahore.

HEC Symposium on Awareness of Parthenium Weed 6th –7th August 2004

Department of Mycology and Plant Pathology (MPPL), University of the Punjab, Lahore organized a symposium in collaboration with Higher Education Commission (HEC) on "Awareness of Parthenium Weed" on 6th & 7th August 2004. Scientists from all over the country participated in this symposium.

Dr. Rukhsana Bajwa, Chairperson, Department of Mycology & Plant Pathology, University of the

Punjab, highlighted vital facts about this noxious weed and the research going on in the department on the issue. Mr. Asad Shabbir, Organizing Secretary of the Symposium, delivered his lecture on the invasion of this weed in Rawalpindi-Islamabad. Dr. Altaf Sher, SSO, National Agriculture Research Centre, Islamabad enlightened the participants on invasion and impact of Parthenium on agriculture. In 2nd session Dr. Arshad Javed, shared his findings regarding the possibilities of using Parthenium as green manure whereas Ms. Tehmina Anjum, talked about allelopathic ways to contain the growth and spread of this weed.

The nucleus of technical sessions of the 2nd day was Parthenium weed & human health. In this session Prof. Dr. Atif Hasnain Kazmi, Head, Department of Dermatology, King Edward Medical University Lahore delivered his lecture on *Plants as agents of contact dermatitis.* Dr. Kazmi discussed the ill-effects of this weed on human health. Professor, Dr. Z.A. Cheema of Agronomy Department, University of Agriculture, Faisalabad shared his knowledge on *Allelopathy as weapon of invasive weeds.* Dr. Ghazala Nasim, Assistant Professor of the Department highlighted the misuse of parthenium in bouquets and its serious health hazards. Dr. Shahid Abbas, consultant allergist, National Institute of Health (NIH), Islamabad delivered a lecture on *Aerobiology of allergy-causing plants in Islamabad.*

After extensive panel discussions some recommend-dations were made from four constituted panels viz. Agriculture, Veterinary sciences, Mycology/Plant Pathology and Human Health disciplines. A copy of proceedings of HEC symposium is available from Department of Mycology & Plant Pathology on request.

Parthenium, A Harmful Weed is Being Used in Bouquets Lahore. Oct 4: Dawn

Dr. Rukhsana Bajwa

Florists are excessively using Parthenium weed, one of the most dangerous weeds that cause different problems among humans and plants alike, in the preparation of bouquets. The weed causes diseases like allergic eczematous dermatitis, hay fever and allergic rhinitis that develop into bronchitis and asthma. A Punjab University Mycology and Plant Pathology Department research team, headed by department chairperson Dr. Rukhsana Bajwa, stated this after a survey of the weed in Lahore, Rawalpindi and Islamabad.

Dr Bajwa told this scribe on Saturday that the government should immediately ban the use of the weed in the preparation of bouquets. She also urged the government to create awareness among florists regarding the use of the weed. She said Australia had already introduced legislation to control Parthenium. She said the weed caused an estimated loss of $16 million per year to Australia and similar situation could emerge in Pakistan if effective measures were not taken to contain its spread.

Mycotrophy: A Weapon for Weeds to Win Ecological Success

Dr. Ghazala Nasim

Mycotrophy is the phenomena of developing a mutualistic symbiotic relationship between plant roots/ underground portions and fungi belonging to specific groups. This relationship facilitates a bilateral beneficent coordination. The fungus provides nutrients to plants and in turn gets prepared food materials from plants. Two major types include ectomycorrhiza and arbuscular mycorrhizae. Of these two, later is the most ubiquitous and more than 50% of land plants are obligatory involved in this relationship. The relationship has existed millions of years ago when plants came to land. It is well established that the plants which are ecologically predominant are able to establish strong mycotrophic relationship.

Parthenium hysterophorus, a notorious weed newly introduced in Pakistan, besides exhibiting other "weedy characters" is able to develop strong arbuscular mycorrhizal association. This association enables plants to out compete in ecologically diverse habitats. The year round active phase of the plant (except 1 ½ month in winter) enables AM fungi to actively absorb nutrients and save their energy from being concentrated to from spores and others perenating structures. Plant to plant colonization is also reported facilitating easy spread of the weed.

CONFERENCES

Second International Conference on Parthenium Management December 5-7, 2005, Bangalore, India

University Agricultural Sciences, Bangalore and Indian Council of Agricultural Research (ICAR) organized a second international conference on Parthenium management from December 5-7th, 2005. The International Conference on Parthenium was intended to update the status of this weed in different parts of the world, consolidate all research results and to come out with workable recommendations to manage this weed in different situations. The theme of this second international conference was "Integrated management of Parthenium to sustainable conservation of bio-diversity in our eco-system"

17th World Conference on Ecological Restoration 2005 Zaragoza Spain Europe

World Conference on Ecological Restoration was held from 12-18th September 2005 in Zaragoza, Spain. The 17th World Conference on Ecological Restoration was hosted by the Society for Ecological Restoration International, and was jointly organized by its European Chapter, the Spanish Council for Scientific Research (CSIC) and the International Centre for Advanced Mediterranean Agronomic Studies. Mr. Asad Shabbir, Lecturer in Department of Mycology and Plant Pathology, University of the Punjab, participated in this conference.

Mr. Shabbir gave his oral presentation entitled *"Senna occidentalis: a native plant to restore natural vegetation of Islamabad"* The talk covered potential of *Senna occidentalis* aqueous extracts in reducing the Parthenium weed infestation in natural habitats.

Plant Science Conference in University Of Sindh Jamshoro

11th conference of plant scientists was held in the Institute of Botany, University of Sindh Jamshoro from 13th –15th of February 2006. Mr. Asad Shabbir, Dr. Salik Nawaz Khan and Dr. Arshad Javaid of Deptt. of MPPL attended the conference. Mr. Asad Shabbir delivered an oral presentation on *Parthenium Invasion in Pakistan: A threat still unrecognized.* Dr. Arshad Javaid presented a talk on *Chemical and Biological Control of Parthenium weed.*

RESEARCH UPDATES ON PARTHENIUM WEED

Parthenium Weed: A New Emerging Threat To Agricultural Lands Of Pakistan

Mr. Asad Shabbir

Biological invasion by invasive alien species (IAS) is now recognized as one of the major threats to native species and agro-ecosystems.

A vigorous spread of *P. hysterophorus* has been noticed in wastelands, irrigation canal banks, drainage and irrigation channels, national parks and forest reserves of the country. There is an indication in present study that this weed is switching from wastelands to agricultural lands. Wheat, maize trifolium and sorghum crops in fields near district Lahore were noted with a heavy infestation of *P. hysterophorus*.

The survey of maize fields revealed a total of seven weed species along with *P. hysterophorus*. The survey also showed a high relative frequency, relative density and importance value of *P. hysterophorus*. The ever-increasing infestation of this weed in urban areas and its soil seed bank poses a serious threat to the other major crops of the country.

First Report of Biological Control of *Parthenium hysterophorus* L. in Pakistan

Arshad Javaid and Rukhsana Bajwa,

Parthenium hysterophorus L., is rapidly spreading in Pakistan and replacing the local flora. During field surveys of different *Parthenium* growing areas of province Punjab from 2003-2005, in search

of a natural enemy of this weed in Pakistan, we found severe attack of an insect larvae on *Parthenium* in an undisturbed area in Punjab University, Lahore. The insect larvae were found feeding on leaves, stem and flower heads of *Parthenium.* The infected plants first showed symptoms of dieback and ultimately dried to death. Further studies regarding the identification and ecology of the insect are underway.

Chemical Control of *Parthenium hysterophorus* L.

Rukhsana Bajwa & Co-workers

A pot experiment was conducted to evaluate the herbicidal potential of Chwastox and Buctril Super against noxious alien weed *Parthenium hysterophorus* L. All the employed dosages of Buctril Super killed the target weed at all the three growth stages within 2 days of spray. Chwastox, however, was found to be a slow active herbicide in this case and effective control was delayed up to 7 days.

Herbicidal Effects of Aqueous Leaf Extracts of Allelopathic Trees Against *Parthenium hysterophorus* L.

Sobiya Shafique & Co-workers

Aqueous extract bioassays were conducted to evaluate the allelopathic potential of five tree species viz. *Azadirachta indica, Ficus bengalensis, Melia azadarach, Mangifera indica, Syzygium cumini* and *Alstonsa scholasis* to control the *Parthenium hysterophorus* L. Aqueous extracts of 2, 4, 6, 8 and 10% (w/v), obtained from dry leaves of test tree species were bioassayed on *P. hysterophorus* seeds. Aqueous extracts of 8 and 10% concentrations of all the test tree species invariably and significantly (P = 0.05) suppressed germination of *P. hysterophorus* seeds.

Effect of Aqueous Extracts of Allelopathic Crops on Germination and Growth of *Parthenium hysterophorus* L.

Shazia Shafique & Co-workers

Herbicidal effects of aqueous root and shoot extracts of three allelopathic crops viz. sunflower (*Helianthus annuus* L.), sorghum (*Sorghum bicolor* L.) and rice (*Oryza sativa* L.) were evaluated against germination and growth of noxious alien weed *Parthenium hysterophorus* L. The study carried out in petri plates using 5, 10, 15, 20 and 25% (w/v) aqueous root and shoot extracts of fresh plant materials of the test crops indicated insignificant effect on shoot length and seedling biomass while germination and root length were significantly reduced by extracts of all the test crops.

Control of *Parthenium hysterophorus* L. by Aqueous Extracts of Allelopathic Grasses

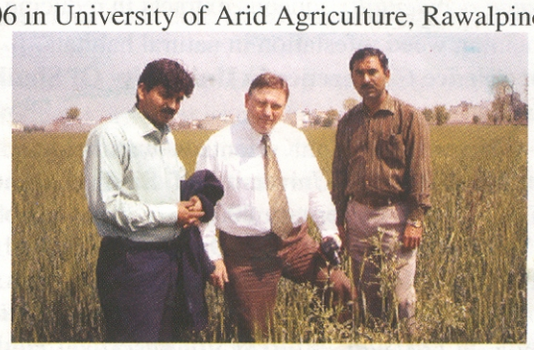
Arshad Javaid & Co-workers

Field survey revealed that the allelopathic grasses *Imperata cylindrica* (L). Beauv. and *Desmostachya bipinnata* Stapf. restrict the spread of this noxious weed. Aqueous extract bioassays showed that aqueous root and shoot extracts of *I. cylindrica, D. bipinnata* and three other allelopathic grasses viz. *Dicanthium annulatum* Stapf., *Cenchrus pennisetiformis* Hochest and *Sorghum halepense* Pers. markedly suppress the germination and seedling growth of *P. hysterophorus.*

Dr. Steve Adkins Visited Department Of MPPL

Dr. Steve Adkins, Associate Professor Department of Land and food resources, University of Queens land, Australia visited department of Mycology & Plant Pathology University of the Punjab on 16th March 2006.

Dr. Adkins is a world reknowned weed scientist working on Parthenium weed for the last 20 years in Australia and other countries. Dr. Steve, in his visit to MPPL, gave a seminar titled "Parthenium weed in Australia; Research progress and prospects". In his visit Dr. Adkins discussed about the possibilities of joint research projects on Parthenium weed management between the University of Punjab, Lahore and University of Queensland Australia. He also visited the various sites infested with Parthenium weed in Lahore and Changa Manga. Dr. Steve Adkins presented a lead paper in second International Weed Science Conference held from March 20 – 22, 2006 in University of Arid Agriculture, Rawalpindi.



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