



Analysis of *Parthenium hysterophorus*-a review

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SUMMARY

Parthenium hysterophorus is native to America and belongs to Asteraceae family. This weed is distributing across whole world and easily survived in almost all the places such as canal sides, crop fields, forests, railway tracks, riversides, roadsides, waste land, etc. *P. hysterophorus* has high adaptability and germination ability. This is documented to be one of the ten most dangerous species of the planet. There are many methods viz. biological, chemical, cultural, and mechanical to manage it, however this weed cannot be managed by utilizing a single method. In the end of twentieth century, it is noted that of *Parthenium hysterophorus* is utilized in ethnomedicine to treat ailments viz. Dysentery, fever, inflammation, malaria, and pain, etc. This weed can be utilized as bioremediation agent and to produce enzymes, fertilizers and biogas. The aim of review is to investigate negative and positive impacts of *Parthenium hysterophorus* in whole world.

Keywords: *Parthenium*, Alien species, Invasive species, Traditional medicine

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INTRODUCTION

Invasive alien species are introduced from origin area to other area either intentional or unintentional by human activities. *Parthenium hysterophorus* is the invasive alien weed and negatively impacts on flora and fauna. *P. hysterophorus* belongs to Asteraceae family, an invasive plant. This species was endemic to America native and native in north-east Mexico but nowadays it is highly distributed in worldwide. *Parthenium* is called with diverse names in different countries such as bitter-broom, bitter weed, carrot weed, congress grass, ragweed, scourge star weed, white top, wild feverfew, *Parthenium* weed and etc. Uncontrolled growth of *Parthenium* weed has been noted to cause of high loss to diversity by replacing flora and fauna in the natural landscape, occasionally causing whole alteration in landscape (Akter and Zuberi, 2009; Lalita, 2018; Umair, 2020). The aim of review is to investigate negative and positive impacts of *Parthenium hysterophorus* in whole world.

CLASSIFICATION

Parthenium hysterophorus belongs to family Asteraceae, and fast maturing, much branched ephemeral or annual herb. It represents two phases in life; i) rosette, the

vegetative or juvenile stage and ii) mature, reproductive or adult stage (Lakshmi and Srinivas, 2007).

ORIGIN AND DISTRIBUTION

This species was endemic to America native and native in north-east Mexico but nowadays it is highly distributed in worldwide including mainland and island. This species has spread very fast in India, China, Pakistan, Bangladesh, Nepal, Australia, Ethiopia and South Africa (Bhowmik *et al.*, 2005).

China

Parthenium hysterophorus is spreading rapidly in China. At the present it is distributed in Fujian, Guangdong, Guangxi, Guizhou, Hainan, Shandong and Yunnan Provinces. Approximately all districts of Guangxi have been infested by *P. hysterophorus* (Tang, 2012).

India

Parthenium weed was documented in 1956 and now documented everywhere in India. This weed has serious threats for agriculture land and grazing land in all states viz. Uttar-pradesh, Madhya Pradesh, Karnataka, Bihar, Haryana, and Andhra Pradesh, India. At that time India has become one of the most infested countries of worldwide (Rao, 1956; Kumar and Varsheny Jay, 2007; Kumar, 2014).

Pakistan

It is documented that *parthenium* weed has become second most common occurring weeds in Pakistan. The weed is very swiftly spreading in Pakistan and has replaced the local species (Kumar and Varsheny Jay, 2007; Shabbir and Bajwa, 2007; Umair *et al.*, 2013; Umair *et al.*, 2017).

Bangladesh

Bangladesh has good conditions for invaders and borders of country are unprotected for exotic species of flora and fauna. Although *parthenium* weed and other alien species are growing swiftly in this country, but these species are still ignored, thus having a good chance to distribute in all country. Very little has been done *parthenium* weed and other alien species in the country so far. A very few accounts of *parthenium* weed and other alien species Bangladesh are available (Biswas *et al.*, 2007; Akter and Zuberi, 2009).

Nepal

This weed is an invasive species of both natural ecosystems and agricultural, spreading swiftly in Nepal. Control of *Parthenium* in country of Nepal has been partial, due to = lack of distribution data (Shrestha *et al.*, 2019).

Australia

Parthenium hysterophorus poses a risk to most cropping and grazing habitats in northern and eastern Australia. At that time, large infestations are documented in Queensland, and high outbreaks in the west and south of Queensland, and there are

sporadic incidents in central and northern New South Wales (Haseler, 1976; Belgeri *et al.*, 2020).

Ethiopia

Parthenium weed was first recorded in 1968 from Ethiopia. It is colonizing very aggressively in croplands, forests and pastures by replacing native flora and fauna. It has been documented to be widespread in whole Ethiopia. At the first time, the weed was limited to barren areas, railway tracks and roadsides, but now noted to colonize cropped areas and pasturelands rapidly in Ethiopia (Nigatu and Sharma, 2013).

South Africa

Parthenium weed has invaded “southern and eastern Africa”, “Asia” and “Australia”, causing economic losses in many countries. In South Africa, this Parthenium weed is negatively impact on agricultural production, grazing and crop yields as well as affecting biodiversity. Animal and human health is impacted as regular contact to Parthenium weed causes skin allergic reactions and respiratory in human (Strathie, 2015).

CHEMICAL ANALYSIS

Chemical analysis of Parthenium weed consists of sesquiterpene lactones (toxins), glycoside parthenin, sesquiterpene lactone, 3, 7-dimethylether, 3-arabinoglucoside, 6-hydroxyl, kaempferol, alcohols, ambrosin, anisic acid, caffeic acid, chlorogenic acid, coronopilin, coumaric, dihydroisoparthenin, ferulic acid, fumaric acid, hymenin, hysterin, hysterothorin, p-anisic acid, parthenin, P-hydroxy benzoin, quercelaetin, sitosterol, tetraeurin and vanillic acid, sesquiterpene lactones (Gupta *et al.*, 1996; Juana *et al.*, 1997; Maishi *et al.*, 1998; Lata *et al.*, 2008), hydroxyproline-rich glycoprotein (Das *et al.*, 2007) acetylated pseudoguaianolides, sesquiterpenoid, charminarone, secopseudoguaianolide (Venkataiah *et al.*, 2003) and ambrosanolides (Chhabra *et al.*, 1999).

HARMFUL IMPACT ON ANIMAL AND HUMAN

The parthenium weed is recognized to cause many health impacts viz. elicit allergic problem (Morin *et al.*, 2009), dermatitis (Akhtar *et al.*, 2010), cytotoxicity (Narasimhan *et al.*, 1984), allergic rhinitis, asthma, black spots, blisters around eyes, burning, eczema, fever, skin inflammation, causes diarrhoea, choking and breathlessness (Maishi *et al.*, 1998).

BENEFICIAL IMPACTS

It is noted that of *Parthenium hysterophorus* is used in traditional medicine and also utilized as bioremediation agent and to produce enzymes.

Traditional medicine

Parthenium weed has been utilized in ethnomedicine to cure diarrhea, dysentery, fever, malaria, neurologic disorders, urinary tract infections (Gurib-Fakim *et al.*, 1996), cold, gynaecological ailments, heart trouble, herpes, heumatic, inflammation, muscular rheumatism, pain, skin rashes, therapeutic for neuralgia, vermifuge (Maishi

et al., 1998), hepatic amoebiasis, anticancer property (Venkataiah *et al.*, 2003), Hela cancer cell lines (Ramos *et al.*, 2001; Das *et al.*, 2007) and diabetes (Patel *et al.*, 2008; Sahrawat *et al.*, 2018).

Enzymes production

Xylanase is enzymes that cleave “xylans”. The “xylans” produce industrial uses for fauna feed production, artificial sweetener, baking biofuel, clarification of coffee extraction, fruit juices and textile industry (Dwivedi *et al.*, 2009).

CONCLUSION

It is concluded that, *P. hysterophorus* is the most destructive invasive species, threatening agro-ecosystems and natural ecosystems in whole world. *P. hysterophorus* is spread in China, India, Pakistan, Bangladesh, Nepal, Australia, Ethiopia and South Africa very swiftly as it has high growth and produced lot of seeds. There is the requirement to enhance the study on biological control.

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