



Parthenium Weed: A Food Security Risk in Bangladesh

Introduction

Parthenium (*Parthenium hysterophorus* L. (Family: Asteraceae)), locally called carrot weed in Bangladesh (*Gajar ghas*), is an invasive weed native to Central and South America that has been accidentally introduced to many tropical regions of the world, including Australia, Asia, Africa, and the Pacific islands (CABI, 2020). The International Union of Conservation of Nature named parthenium one of the 100 worst invasive species in the world (GISD, 2018). The weed was first observed at Rajshahi in Bangladesh in 1988, presumably by way of India. Now, it is one of the most destructive weeds in Bangladesh, especially among upland crops.

Parthenium significantly reduces pollination in maize, brinjal, tomato, and chili. It also hampers seed germination and retards growth of chickpea, mustard, wheat, linseed, and other crops, due to the presence and release of allelochemicals. It has already invaded 29 crops, including jute, sugarcane, potato, and maize, and causes 40-50% reduction in yields (Karim, 2012; Karim and Ilias, 2022). Parthenium causes skin disease, eczema, and bronchitis in humans, and ulcers in the mouths of cattle and goats (Karim and Ilias, 2022). It spreads from place to place through wind, water, vehicles, and contaminated crop seeds.



Fig.1: Parthenium in Papaya Orchard

Distribution

Parthenium was accidentally introduced to Australia in the 1950s and India in the 1960s, most likely as a contaminant of grain or pasture seeds, and now it has reached a major weed status. Since its introduction to Rajshahi in Bangladesh in 1988, it has spread to 48 districts (Karim and Ilias, 2022). Recent reports of the weed from different countries indicate that its geographic range continues to expand, as it has spread to 44 countries in its native range and 48 countries in the introduced range (Shabbir *et al.* 2019).

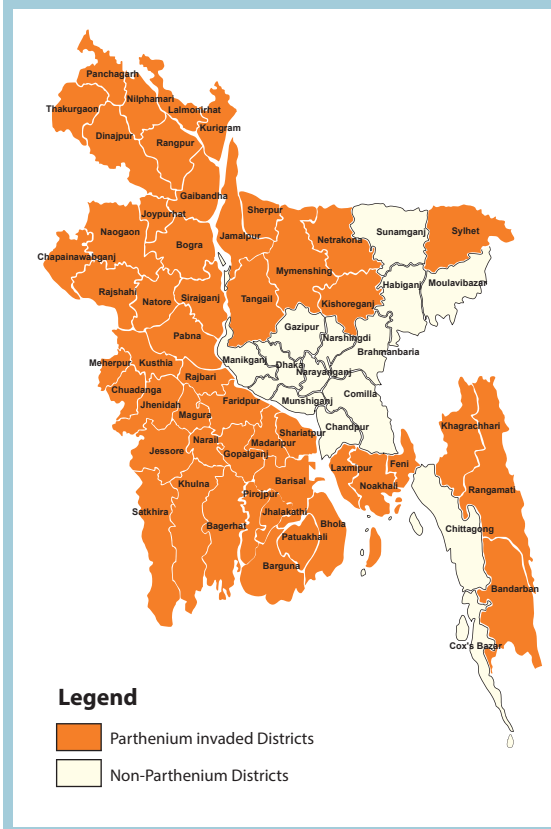


Fig.2: Distribution of Parthenium weed in Bangladesh (Source: Karim & Ilias, 2022)

Parthenium Weed



Fig. 3: Parthenium weed; Photo credit: K. Dhileepan

Biology and Ecology

Parthenium is an annual herb with an erect stem and lobed leaves; it grows to a height of up to 2.0 m in good soil and moist conditions, though most individuals do not exceed 1.0 m (Hasseler, 1976). It produces flowers 4-6 weeks after emergence in appropriate soil moisture and temperature conditions (Navie *et al.*, 1996). A single plant has been estimated to produce 39,192 flowers or c.156,768 seeds (Dhileepan, 2012). It reproduces by seeds and continues to flower and fruit until senescence. The weed grows from hot-arid and semi-arid-to-humid habitats in altitudes from sea level to over 2,500 m and survives in cool climates (McConnachie *et al.*, 2011). It is able to germinate, grow, and flower over a wide range of temperatures and photoperiods. Optimum preferred pH is 5.5-7.0 (Parsons and Cuthbertson, 1992). In Bangladesh, parthenium is found among arable land, perennial crops, orchards, pastures, riverbanks, canal sides, roadsides, wastelands, and railway tracks (Karim and Ilias, 2022).

Management

- Quarantine regulation: Quarantine regulation should be strengthened to prevent the spread of parthenium into non-invaded regions.
- Survey: A dedicated survey should be carried out to

confirm the presence of natural enemies of parthenium in Bangladesh.

- Awareness-building: Attention should be brought to policy makers, scientists, and extensionists in Bangladesh to inform stakeholders of the biology, ecology, methods of control of parthenium, and its adverse impact on human, animal, agricultural, and environmental health.
- Biological Control: Australia, India, Pakistan, and South Africa have taken up classical biological control of this weed by introducing its host specific natural enemies (*Zygogramma bicolorata*) from its center of origin with promising results.



Fig. 4: Parthenium beetle (*Zygogramma bicolorata*)

Photo Credit: India Biodiversity Portal.

Conclusion

Parthenium is a noxious weed in Bangladesh and has been identified in various crop fields. It causes reduction of crop yields and affects human and livestock health. It is crucial to address this weed and develop management actions for its control before it further impacts on food security and livelihoods throughout Bangladesh.

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