Editorial

Parthenium hysterophorus, an emergent weedy plant species expands its geographical ranges in Pakistan

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Parthenium hysterophorus [commonly known as Carrot grass; native to American tropics; family Asteraceae] is a flowering, short-lived perennial or an annual invasive-weedy plant. In the recent few years, the plant is spread (in epidemic proportions) vigorously, at least, in the two provinces (KP and Punjab) and the twin capital cities (Islamabad and Rawalpindi). The weed came in the lame light soon after the monsoon rains and floods of September 2012 and August 2013 that hit larger areas of KP and Punjab provinces of Pakistan. The massive boom in the weed was witnessed in areas under floods of the river Kabul and the Indus Ocean. It is speculated that after initial entry into the flood zones, the seeds then germinated and dispersed into the near and farther areas in the country, including hilly areas. The plant is categorized as a poisonous weed, and a source of skin allergies and itching. It may be a cause of increased reports of asthma, cough, fever, and allergies related to eyes in these areas (Mohmad 2019; Khan et al. 2013).

Due to its vigorous growth and allelopathic effects, the plant soon dominated over all other weeds and crop plants. Furthermore, it has a tremendous potential to withstand abiotic and biotic stresses. Its vigorous growth has resulted in the loss of local floral biodiversity (Ali & Khan 2017). Specifically in Islamabad, it has dominated completely the wild cannabis (weeds). However, this year, the cannabis weed seems to overcome gradually the parthenium dominance. The coming years may witness the revival of other plant species suppressed by parthenium. Although the plant seems to be resistant/tolerant to biotic stresses, very few plants were identified with leaf rolling, vein yellowing, stunting and bunchy-top like diseases, indicative of begomovirus infection. PCR amplification and sequencing confirmed a symptomatic parthenium plant positive for the viral infection (unpublished observation; Figure 2). Previously, only a single report is available of parthenium being infected with geminiviruses (Kumar et al. 2016).

Currently, no weedicide is available to eradicate the weedy plant. The only available alternative is to drag the plants out of soil along with their roots before they bear seeds. The presence of the plant everywhere on barren lands, streets, along the drains, hilly terraces, orchards, in lawn grass, and in crop fields makes complete eradication almost impossible (Figure 1a-c). Increased ailment linked with parthenium like – toxicity in the livestock and insect pollinators, skin allergies in humans and reduced agricultural productivity necessitates that the government and non-government stakeholders should take stringent measures to save human health, livestock and agricultural production.

Figure 1a-c. *Parthenium hysterophorus* L. invasion in Khyber Pakhtunkhwa, Punjab and the twin cities

Figure 2. *Parthenium hysterophorus* L. showing leaf-curl disease symptoms

References

Ali S & Khan IA (2017) Distribution of *Parthenium hysterophorous* L. in the Swabi district of Khyber Pakhtunkhwa. Sarhad Journal of Agriculture. **33(2)**: 269-275. Doi: 10.17582/journal.sja/2017/33.2.269.275

Khan H, Marwat KB, Hasan G, Khan MA (2013). Socio-economic impact of parthenium (*Parthenium hysterophorus* L.) in Peshawar valley Pakistan. Pakistan Journal of Weed Science Research. **19(3)**: 275-293

Kumar S, Srivastava A, Jaidi M, Chauhan PS, & Raj SK (2016) Molecular characterization of begomovirus, α-satellite and β-satellite associated with leaf curl disease of *Parthenium hysterophorous* in India. *Plant Disease*. **100**: 1-7.

Mohmad A (2019) Parthenium in Khyber Pakhtunkhwa: An asbestos around farmers' neck. Naya Daur. https://www.nayadaur.tv/2019/03/parthenium-in-khyber-pakhtunkhwa-an-albatross-around-farmers-neck/. Retrieved on March 31, 2019.

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