PHENOLOGY AND RESPONSE OF CLIPPING IN RELATION TO INVASIVENESS OF *PARTHENIUM HYSTEROPHORUS* L.

A Dissertation Submitted to

The Central Department of Botany, Tribhuvan University

for Partial Fulfillment of the Requirements of the Masters' Degree of Science in Botany

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CERTIFICATE

This is to certify that the disstertation work entitled **"Phenology and Response of Clipping in Relation to Invasiveness of *Parthenium hysterophorus* L."** submitted by Kusum Pokhrel has been carried out under our supervision. The entire work was based on the results of her primary fieldwork and has not been submitted for any other academic degrees. We therefore, recommend this dissertation to be accepted for the partial fulfillment of Masters of Science in Botany from Tribhuvan University, Kathmandu, Nepal.

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LETTER OF APPROVAL

This dissertation paper entitled **"Phenology and Response of Clipping in Relation to Invasiveness of *Parthenium hysterophorus* L."** submitted at the Central Department of Botany, Tribhuvan University by Kusum Pokhrel, has been accepted for the partial fulfillment of requirements for Masters of Science in Botany.

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Kusum Pokhrel

CONTENTS

ABSTRACT

Phenology of parthenium weed (*Parthenium hysterophorus* L.) was monitored for a year from May 2011 to April 2012 in Sundarighat, Kirtipur of Kathmandu district, Central Nepal. In permanently marked plots, different parameters such as maximum height, density and number of seedling cohort produced were noted assuming that they might have critical role in determining the invasiveness of this weed. The study also focused on the response of this weed to clipping (mechanical damage) in terms of seed output, height and number of branches produced. To meet the objectives of the study, two approaches, field sampling and the clipping experiment were applied in green house. In field sampling a total of eight transects (1 m × 10 m) in pair, each transect having five plots (1 m × 1 m) selected randomly were sampled. In each plot, number of vascular plant species present and number of individuals of parthenium seedling, juvenile and flowering individuals and their maximum height were recorded every month for a year. In clipping experiment, out of 60, 15 plants were selected randomly as a control and remaining 45 were subjected to single, double and triple clipping. At last, seeds were harvested separately for each treatment and the maximum height and number of branches produced were recorded for each plant. There was no significant difference among the seedling density in rainy, fall and summer seasons. The four cohorts of seedlings emerged in the study site in a year. The highest seedling density was recorded in February. Whereas, density of reproductive individual showed significant difference between rainy and fall seasons but no significant difference between winter and summer seasons. Flowering was observed in 8 out of 12 months showing peak in July. The vascular plant species richness did not show any relationship with parthenium density but it showed negative relation with the height in July which was the month with highest height. The significant difference was obtained in seed output and mean height among control, single clipping, double clipping and triple clipping. Number of branches increased with increasing clipping frequency. This weed did not compensate in seed production and growth following repeated clippings. It can be concluded that prolonged period of flowering and production of several cohort of seedling could be the contributing factor for high invasiveness of parthenium.

Keywords: Management, Plant species richness, Seedling cohort, Kathmandu.

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LIST OF ABBREVIATION AND ACRONYMS

c.f.	Cited from
N	North
E	East
m asl	Meter above sea level
GoN	Government of Nepal
TUCH	Tribhuvan University Central Herbarium
KATH	National Herbarium, Godavari, Kathmandu
Lat.	Latitude
Long.	Longitude
ANOVA	Analysis of variance
SPSS	Stastistical Package for Social Science
p	Level of significance
d.f.	Degree of freedom