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PERCEPTION OF LOCAL PEOPLE ABOUT PARTHENIUM WEED (RUMPAI MIANG MEXICO) IN KEDAH, MALAYSIA

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ABSTRACT

Parthenium weed (*Parthenium hysterophorus* L.) is a weed of global significance since it causes significant losses in terms of economic, environmental, animal and human health, which has recently been detected in Malaysia. A socio-phytology survey was conducted in Kuala Muda, AlorSetar and Kulim districts of Kedah, Malaysia by selecting six villages[Taman Victoria and Sidam Kiri (Kulim), Taman Bandar Baru and Kg. Ladang Jabi (AlorSetar), and Kg. Konggsi 6 and Kg. Zainal Abidin (Sg. Petani)]from the study area. A number of 120 respondents (20 respondents per village) were interviewed with early prepared questionnaire to collect the data on their perception and understanding about this weed. Open structured questions were used to collect data with a view to know the current status of their knowledge and the factors affecting their understanding about this nasty immigrant weed. It was noted that most of the villagers realized the existence of Parthenium around 1-5 years ago. Only one respondent had knowledge about the morphological features of *Parthenium* plant. To measure the level of the awareness and knowledge of people, a 'knowledge index' was prepared by taking different dimensions such as morphological features, life - cycle and adverse impacts of *Parthenium* weed on human beings and animals. A score range from 0-10 was used where 10 is the score for the very good knowledge and 0 is the least.It was revealed that most of the respondents were not aware about the adverse effects of *P. hysterophorus* on crop production, animal and human health. The people are also unaware about the biological, physical and chemical method of control of the

weed. However, the people from Kampong Zainal Abidin have comparatively more knowledge about the ill impacts of the weed and they have developed a device to uproot the allergic weed without touching by hand. A few people reported about the utilization of *P. hysterophorus* as medicine. Therefore, there is an urgent need that people of agriculture and media resources should carry out regular awareness creating programmes on parthenium hazard to enhance the knowledge and perception of the people about the danger of the *Parthenium* weed, and their sustainable management.

Keywords: Socio-phytological survey, *Parthenium hysterophorus*, Parthenium awareness, Perception on parthenium hazards

INTRODUCTION

Parthenium hysterophorus L., an obnoxious weed has been reported as a main source of nuisance and health hazard to mankind and animals, as well as threat to biodiversity and danger to environment [1]. It is one of the worst weeds of the world and has been listed in the global invasive species database [2]. It is an annual flowering plant, native to Mexico, which can cause severe skin diseases, respiratory problems and hay fever in humans. It is also toxic to livestock such as goats and cows, causing fevers, ulcers, anorexia, and intestinal damage due to its allelopathic property. Can quickly replace native flora and compete with crops causing massive crop loss [3]. *Parthenium* complete its life – cycle within 4 weeks which helps in quick spreading and generation of adverse impacts on the surrounding vegetation [1]. It also grows freely by the roadsides, fallow lands and housing area posing a problem to the residents.

In Malaysia, it was first detected in September 2013 at Ulu Yam, Selangor [4]. Presently the highly-allergenic plant has been spotted in Perak, Perlis, Melaka, Johor, Pulau Pinang, Kedah and Negeri Sembilan including Sabah. Itis suspected that it may spread throughout the country if proper management is not done.

The Malaysian Department of Agriculture believes that the weed arrived in Malaysia by the way of seeds being carried through imported machinery, seeds or in fertilizer. Unfortunately, till today no functional survey was conducted to study the awareness and knowledge level of the peoples about this hazardous weed. Creatingpublic awareness is important to avert the ill effects of *P. hysterophorus* on human beings, livestock and crops and in the management. With these

ends in view, present investigation was carried out to study the awareness on and knowledge level of people about the *Parthenium* weed in three districts of Kedah. It is expected that this study will provide baseline information on the basic of which the development of future strategies for eco-friendly and safe management of *Parthenium* weed could be done.

MATERIALS AND METHODS

Preliminary socio-phytology survey was conducted in Kuala Muda, Alor Setar and Kulim districts of Kedah State, Malaysia during December 2014 to February 2015using early prepared questionnaires through face-to-face interview.

Geographical Position of the Study Site

AlorSetar (latitude 06° 09' 52.4 N and longitude 100° 30' 41.0 E, 25 m above the sea level) is an administrative district of Kedah state in northern Malaysia. Meanwhile, Kulim district is located in southern of Kedah (latitude 05° 30' 27.7 N and longitude 100° 34' 34.0 E, 28 m above the sea level), and Kuala Muda is the major city of Kedah (Plate 1). These three districts were selected for the study because of the presence of dense colonies of *P. hysterophorus* in these regions.

Plate 1. Map of Kedah (central brown colour), Malaysia where the survey was done (Source: Internet)

Six villages from three different districts e.g. Taman Victoria and Sidam Kiri (Kulim), Taman Bandar Baru and Kg. LadangJabi (AlorSetar), and Kg. Konggsi 6 and Kg. Zainal Abidin (Sg. Petani, Kuala Muda) were selected to collect the data. Twenty respondents from each village were randomly selected between the ages of 18 - 65 years for interview including both male and female respondents.

A briefing about the purpose of the interview and group discussion was made with the respondents in their local language prior to data collection to get their consent and to explain them that their cooperation is a valuable contribution for this study. First the respondents were asked to come to the field and other wasteland area and show the presence of *Parthenium* plants. Questionnaire was used during the survey for collection of the information about the growth pattern, life cycle, and habitat of *P. hysterophorus* plant, occurrence in that area, and their adverse impacts on the environment, domestic animals and the inhabitants themselves. To measure the level of the awareness and knowledge of people, a 'knowledge index' was prepared by taking different dimensions such as morphological features, life - cycle and adverse impacts of *Parthenium* weed on human beings and animals [5]. A score range from 0-10 was used where 10 is the score for the top performers and 0 is the worst.For each of the knowledge dimension different scores were given for the respondents who had knowledge of *P. hysterophorus* plant. A low score was assigned when the people have very less knowledge, a medium score was assigned when the people expressed their awareness to some extent and a high score was assigned when the respondents expressed their complete knowledge about the hazardous weed *P. hysterophorus.* Descriptive statistics including means and percentages were used to determine the perception levels.The data were analyzed properly and summarized in pie charts.

RESULTS AND DISCUSSION

It was clear from the survey that most of the people have no or very less idea about the parthenium weed and its bad impacts (Figs. 1 to 6). Special focus was given on the appearance of parthenium in, Malaysia, morphology of the weed, bad impacts on human and animal health, method of parthenium spread and about the control measure. The mean score of level of perception was low as well (Table 1).

Table 1: Perception of the peoples of survey area in Kedah, Malaysia on different aspects of parthenium hazards (N = 120)

Aspects of parthenium hazards	Frequency	Percentage	Mean score	Standard Deviation
Parthenium appearance in Malaysia				
1-5 years	**42**	**35**	**3.5**	**1.1**
>5 yrs	**78**	**65**		
Morphology of parthenium weed				
Yes	**28**	**23**	**3.0**	**2.3**
No	**92**	**77**		
Method of parthenium spreading				
Yes	**0**	**0**	**0**	**0**
No	**120**	**100**		
Bad impacts of parthenium on human health				
Yes				
No	**54**	**45**	**5.0**	**2.5**
	66	**55**		
Bad impacts of parthenium on animal health				
Yes				
No	**27**	**22**	**3.8**	**1.3**
	93	**78**		
Knowledge on control measure of parthenium				
Chemical method				
Don't know	**94**	**78**	**5.6**	**2.0**
	26	**22**		

Note: Level of perception was measured using score of 0 to 10.

Knowledge on the Morphological Features ofParthenium

Knowledge of people of PokokSena and Sidam Kiri about the morphological features of *P. hysterophorus* weed was analyzed by seven characteristics of *Parthenium* plant viz. habitat, shape and size of the plant, height of the plant, shape of the leaves, colour of the flower and life cycle of the plant. Almost 80% of the villagers of PokokSena and Sidam Kiri not knew the characteristics of the *Parthenium* plant (Fig. 2). The score was 3 to 4.

Knowledge on the Dispersion Method of Parthenium

Parthenium seeds are light, small and black in colour and they can spread with air, water and animals from one place to other. All of the respondents of PokokSena and Sidam Kiri had no knowledge regarding the dispersion methods of *P. hysterophorus* (Fig. 3).

Awareness on the Harmful Effects of Parthenium

*P. hysterophorus*is a hazardous weed and it causes different diseases in human beings and animals [6]. Chemical analysis of *P. hysterophorus* indicate that it contains several allele chemicals such as caffeic acid, coumaric acid, vanillic acid and hydroxyl benzoic acid [7] and leaves contain more allele chemicals in comparison to stem and root [8].

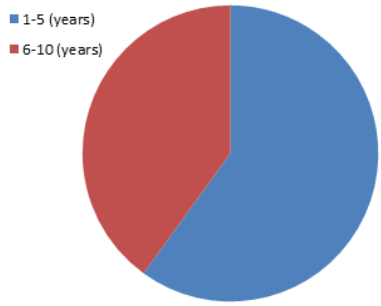

Fig. 1.Knowledge on the parthenium appearance in Malaysia

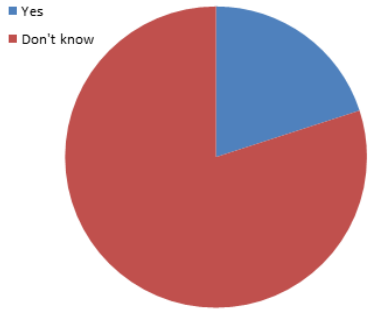

Fig. 2. Knowledge on the weed morphology

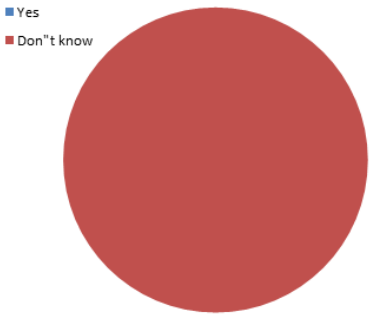

Fig. 3.Knowledge on parthenium spreading

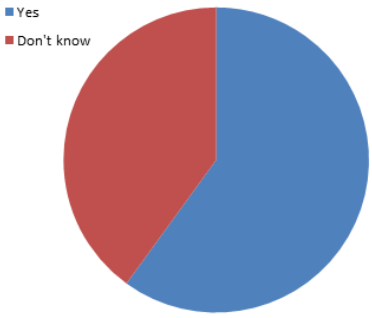

Fig. 4. Knowledge on bad impacts of parthenium on human

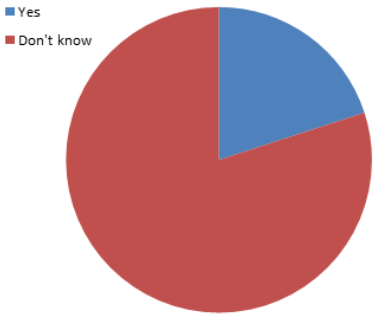

Fig. 5.Knowledge on bad impacts on animal health

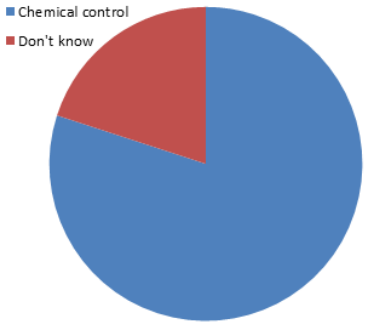

Fig. 6. Knowledge on control measure of parthenium

The sesquiterpene lactones viz. parthenin and coronipilin present in the trichomes of leaves and stems of *Parthenium* are responsible for causing various allergies in human beings and animals [9, 10]. The bitter and reduced milk yields have been reported in buffaloes and goats fed on grass mixed with *Parthenium* [11]. In the present study, awareness about the harmful effects of *Parthenium* weed was analyzed under four categories such as allergic diseases in human beings, harmful effects on the animals, and negative impact on the crop production and environmental biodiversity. The data revealed that majority of people in PokokSena and Sidam Kiri had no idea about the negative impact of *Parthenium* on crop growth and biodiversity. However, the

people from Kampong Zainal Abidin have comparatively more knowledge about the ill impacts of the weed and they have developed a device to uproot the allergic weed without touching by hand (Fig. 7). A few people had knowledge about the diseases such as asthma, fever and allergy caused in human beings and also diseases in livestock caused by *Parthenium* weed (Figs. 4 and 5).

Fig. 7. Locally developed tool for uprooting parthenium plant at Kg. Zainal Abidin

Knowledge on the Method of Parthenium Control

Ever since *Parthenium* assumed a menacing proportion in different parts of the country, several control methods such as manual, chemical, biological and integrated methods are being recommended in controlling the growth of this weed [12]. It was observed that people did not know about the utilization of the *Parthenium* weed such as production of compost, or pharmaceutical values. Meanwhile, the data presented in the (Fig.6) revealed that majority of people adopted chemical methods to control the obnoxious weed and they used to spray salt and glyphosate in their fields to check the growth of *P. hysterophorus*. Some local people informed that effort was made to manage *P. hysterophorus* by the people of the Department of Agriculture in their area.

It was also found out that majority of respondents possessed low level of knowledge about the harmful effect, mode of dispersion and eradication methods of *Parthenium* weed. Training and extension programmes need to be initiated among the people of the study area to enhance their awareness and knowledge level regarding the safe and eco-friendly management of *Parthenium* weed [13]. Media resources can play a pivotalrole in dissemination of education and awareness among the masses. Governmental and non-governmental organizations can play a significant rolefor

the improvement in the awareness and knowledge level of the villagers about the biological control methods of the weed as well as other eco-friendly techniques of control by utilization of the weed. There is an urgent need that media resources should carry out awareness creating programmes to enhance the knowledge level of the common people about the hazards of *Parthenium* weed and its management as it can help in combating the problem on a large scale.

CONCLUSIONS

It can be concluded that there is an urgent need to improve the awareness level of people in AlorSetar and Kulim district, Kedah in respect of *Parthenium* weed as most of the people were unaware about the toxic effect of the hazardous weed and they were not forwarded to solve the problem. Hence, in order to suppress the weed, some functional action plans have to be chalked out and awareness creating programmes at grass root level should be introduced in the area to educate the local communities about the adverse impacts of the weed. Correct and useful information should be provided to the people regarding the safe handling of the weed and personal protection by the government and private agencies. However, more efforts for creating awareness and possible preventive measures are needed to control its further invasion in the region and it should be supplemented with good publicity through mass media, video, posters, field visit, seminars and people's participation in uprooting the *Parthenium* weed before flowering and seed setting with all safety measures.

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