

Original Research Article

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Knowledge Level of Tribal Farmers Regarding Parthenium (*Parthenium hysterophorus* L.) Weed and their Control Actions

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ABSTRACT

The study was conducted in Kandhamal district of Odisha State during the year 2015-2016. *Parthenium hysterophorus* is a weed, which produces allelopathic substances that deter other plants from germinating and growing near it. Study revealed that majority (60.95%) of the respondents had medium level of knowledge about Parthenium weed, majority (56.25%) respondents had medium level of knowledge regarding control measure practices of Parthenium weed. Majority (50.78%) of the respondents had medium level of knowledge about total spread area 33.59 about 48 per cent respondents had low level of knowledge about life cycle. About 49 per cent respondents had low level of knowledge about seed production. Majority of the respondents (49.23%) had low level of knowledge about type and condition of soil for seed germination. Maximum (58.59%) of the respondents had low level of knowledge regarding knowledge about harmful effect. Most of the respondents (85.15%) had low level of knowledge regarding knowledge about harmful effects on human health. Most of the respondents (94.54%) had low level of knowledge regarding knowledge about identification of skin allergy through patch test. maximum number of the respondents (87.50%) had low level of knowledge regarding knowledge about scientific methods of Parthenium weed control. Majority of the respondents (60.94%) had low level of knowledge regarding knowledge about uprooting method, cent per cent respondents had low level of knowledge regarding knowledge about legal method. Majority of the respondents (99.22%) had low level of knowledge regarding knowledge about for making acid and biogas form. Majority of the respondents (100%) had low level of knowledge regarding knowledge about bacterial method that majority of the respondents (99.22%) had medium low level of knowledge regarding knowledge about cultural method.

Keywords

Allelopathic substance, Control measures, Knowledge level, Parthenium weed.

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Introduction

Parthenium hysterophorus L. commonly called as carrot weed, white top or congress grass in India is a herbacious erect and annual plant belongs to family Asteraceae (Compositae). The origin of Parthenium is considered to be Mexico, America, Trinidad and Argentina. Within last 100 years, it has

found its way to Africa, Australia and Asia. In Australia and India, Parthenium has achieved the status of “worst weed”. It’s surmised that Parthenium possibly got entry from USA through the imported food grains (Vertak, 1968) or through the cereals got for experimental purpose (Lonkar *et al.*, 1974). In

most of the publications, first occurrence of *Parthenium* in India has believed to be in 1956 when it was first noticed by a retired horticulturist Prof. Paranjape and described by Rao (1956).

According to Mahadevappa (1996), *Parthenium* status, in terms of its seriousness in different states of India is Uttar Pradesh, Karnataka, Maharashtra, Tamil Nadu, Andhra Pradesh, West Bengal, Madhya Pradesh, Gujarat, Orissa and Bihar, in that order of magnitude, contrary to earlier observations when it was categorized as serious weed of Maharashtra, Karnataka, Andhra Pradesh and Delhi (Krishnamurthy *et al.*, 1976). The *Parthenium* intensity has been estimated less in high elevation. It is estimated that about 5 million ha area has been invaded by *Parthenium* in India.

Environmental and other impacts

Parthenium hysterophorus has been reported to cause skin rashes (dermatitis), on those parts of the body that come in contact with the weed on a regular basis, watery eyes, swelling and itching of the membranes of the mouth and nose, constant coughing especially at night, continually running nose and sneezing, itching of the roof of the mouth and fatigue.

Allergy-prone people are particularly susceptible to both the dermatitis and respiratory problems. The weed is unpalatable to livestock so its invasion results in grazing shortages. If it is mixed with fodder, it taints meat and milk. In Southern Africa, this weed is particularly problematic in sugarcane and banana plantations.

It produces allelopathic substances that deter other plants from germinating and growing near it and hence can “take over” native grassland and improved livestock pastures as well as the understory in woodlands.

Materials and Methods

The study was conducted in Kandhamal district of Odisha State during the year 2015-2016. Out of total twelve blocks in Kandhamal district only two blocks namely G. Udayagir and Rakia were selected purposively for this study. Eight villages from each block were selected randomly and 8 farmers from each village were selected randomly, the total 64 farmers from each block were selected. Thus, the total 128 farmers from two blocks were selected randomly for the study. Data was collected through appropriate pre-tested interview schedule. Collected data was analyzed through appropriate statistical tools.

Results and Discussion

The data presented in table 1 indicate that out of total respondents majority (56.25%) of them had medium level of knowledge regarding control measure practices of *Parthenium* weed, whereas, 35.93 and 7.82 per cent of the respondents were having high and low level of knowledge, respectively. It can be concluded that majority of the respondents had medium level of knowledge regarding control measure practices of *Parthenium* weed.

The data represented in table 2 indicated that majority of the respondents (60.95%) had medium level of knowledge about *Parthenium* weed; followed by 21.87 per cent respondents were having high level of knowledge about *Parthenium* weed, whereas 17.18 per cent respondents had low knowledge about *Parthenium* weed. It was found that majority of the respondents (58.59%) had low level of knowledge about distribution on field, whereas, 26.56 and 14.85 per cent of the respondents were having medium and high level of knowledge, respectively knowledge about distribution on field.

It was observed that majority of the respondents (50.78%) had medium level of knowledge about total spread area 33.59 and 15.63 per cent of the respondents were having low and high level of knowledge, respectively knowledge about total spread area.

It was found that majority of the respondents (75.00%) had low level of knowledge about other name, whereas, 14.06 and 10.94 per cent of the respondents were having high and medium level of knowledge, respectively regarding knowledge about other name. It was observed that majority of the respondents (50.00%) had medium level of knowledge about propagation, whereas, 40.63 and 9.37 per cent of the respondents were having low and high level of knowledge, respectively regarding knowledge about propagation.

It was observed that majority of the respondents (47.65%) had low level of knowledge about life cycle, 32.81 and 19.54 per cent of the respondents were having medium and high level of knowledge, respectively regarding knowledge about life cycle. It was found that maximum number of the respondents (49.22%) had low level of knowledge about seed production, whereas, 31.25 and 19.53 per cent of the respondents were having medium and high level of knowledge, respectively regarding knowledge about seed production. It was found that majority of the respondents (58.59%) had low level of knowledge about identification of seed, whereas, 26.56 and 14.85 per cent of the respondents were having medium and high level of knowledge, respectively regarding knowledge about identification of seed.

It was found that majority of the respondents (49.23%) had low level of knowledge about type and condition of soil for seed germination, whereas, 35.15 and 15.62 per cent of the respondents were having medium and high level of knowledge, respectively

regarding knowledge about type and condition of soil for seed germination. It was observed that majority of the respondents (67.96%) had low level of knowledge about reason of Parthenium weed distribution, 20.33 and 11.71 per cent of the respondents were having medium and high level of knowledge, respectively regarding knowledge about reason of Parthenium weed distribution.

It was found that majority of the respondents (58.59%) had low level of knowledge regarding knowledge about harmful effect, whereas, 28.90 and 12.51 per cent of the respondents were having medium and high level of knowledge, respectively regarding knowledge about harmful effect. It was observed that majority of the respondents (85.15%) had low level of knowledge regarding knowledge about harmful effects on human health, 8.59 and 6.26 per cent of the respondents were having medium and high level of knowledge, respectively regarding knowledge about harmful effects on human health.

It was found that majority of the respondents (94.54%) had low level of knowledge regarding knowledge about identification of skin allergy through patch test, followed by 5.46 per cent respondents who were having medium knowledge regarding knowledge about identification of skin allergy through patch test, whereas none of the respondents were having high level of knowledge regarding knowledge about identification of skin allergy through patch test.

It was observed that majority of the respondents (97.66%) had low level of knowledge regarding knowledge about harmful effect on animals, 1.56 and 0.78 per cent of the respondents were having medium and high level of knowledge, respectively regarding knowledge about harmful effect on animals.

Majority of the respondents (100%) had low level of knowledge regarding knowledge about hair loss of animals due to consumption of Parthenium weed, whereas, none of the respondents were having medium and high level of knowledge, respectively regarding knowledge about hair loss of animals due to consumption of Parthenium weed. It was found that maximum number of the respondents (95.32%) had low level of knowledge regarding knowledge about problem of diarrhoea causes by consumption of Parthenium weed in animals, whereas, 2.34 and 1.56 per cent of the respondents were having medium and high level of knowledge, respectively regarding knowledge about diarrhoea causes by consumption of Parthenium weed in animals.

Majority of the respondents (96.87%) had low level of knowledge regarding knowledge about skin allergy causes by consumption of Parthenium weed in animals, whereas, 2.35 and 0.78 per cent of the respondents were having medium and high level of knowledge, respectively regarding knowledge about skin allergy causes by consumption of Parthenium weed in animals. It was found that majority of the respondents (72.65%) had low level of knowledge regarding knowledge about effects on agriculture, whereas, 19.53 and 7.82 per cent of the respondents were having medium and high level of knowledge, respectively regarding knowledge about effects on agriculture, It was observed that majority of

the respondents (60.93%) had low level of knowledge regarding knowledge about effects on crop production area and production, 29.68 and 9.38 per cent of the respondents were having medium and high level of knowledge, respectively regarding knowledge about effects on crop production area and production.

Majority of the respondents (60.95%) had low level of knowledge regarding knowledge about effects on seed germination and growth of other crops, whereas, 30.46 and 8.59 per cent of the respondents were having medium and high level of knowledge, respectively regarding knowledge about effects on seed germination and growth of other crops.

It was found that majority of the respondents (58.59%) had low level of knowledge regarding knowledge about more effects on different crops, whereas, 27.35 and 14.06 per cent of the respondents were having medium and high level of knowledge, respectively regarding knowledge about more effects on different crops.

It was observed that majority of the respondents (65.62%) had low level of knowledge regarding knowledge about effects on soil condition, 24.21 and 10.15 per cent of the respondents were having medium and high level of knowledge, respectively regarding knowledge about effects on soil condition.

Table.1 Distribution of respondents according to their overall level of knowledge regarding control measure practices of Parthenium weed (N=128)

S. No.	Overall level of knowledge	Frequency	Percent
1	Low (below 56 score)	46	35.93
2	Medium (56-69 score)	72	56.25
3	High (above 69 score)	10	7.82
	Total	128	100.00

\bar{X} = 62.50 SD= 5.59

Table.2 Distribution of respondents according to their level of knowledge regarding control measures practices Parthenium weed (N=128)

S. No.	Practices	Level of knowledge		
		Low f/percent	Medium f/percent	High f/percent
1	Knowledge about Parthenium weed	22 (17.18)	78 (60.94)	28 (21.87)
2	Distribution on field	75 (58.59)	34 (26.56)	19 (14.84)
3	Total spread area	43 (33.59)	65 (50.78)	20 (15.62)
4	Other name	96 (75.00)	14 (10.94)	18 (14.06)
5	Propagation	52 (40.62)	64 (50.00)	12 (9.38)
6	Life cycle	61 (47.65)	42 (32.81)	25 (19.53)
7	Seed production	63 (49.21)	40 (31.25)	25 (19.53)
8	Identification of seed	75 (58.59)	34 (26.56)	19 (14.84)
9	Type and condition of soil for seed germination	63 (49.21)	45 (35.16)	20 (15.62)
10	Reason of Parthenium weeds distribution.	87 (67.96)	26 (20.31)	15 (11.72)
11	Harmful effect	75 (58.59)	37 (28.91)	16 (12.50)
12	Harmful effects on human health	109 (85.15)	11 (8.59)	8 (6.25)
13	Identification of skin allergy through patch test	121 (94.53)	7 (5.47)	0 (0.00)
14	Harmful effects on animals	125 (97.65)	2 (1.56)	1 (0.87)
15	Hair loss of animals due to consumption of Parthenium weed	128 (100)	0 (0.00)	0 (0.00)
16	Diarrhoea causes by consumption of Parthenium weed in animals	122 (95.31)	4 (3.12)	2 (1.56)
17	Skin allergy causes by consumption of Parthenium weed in animals	124 (96.87)	3 (2.34)	1 (0.78)
18	Effects on agriculture	93 (72.65)	25 (19.53)	10 (7.81)
19	Effects on crop production area and production	78 (60.93)	38 (29.69)	12 (9.38)
20	Effects on seed germination and growth of other crops	78 (60.93)	39 (30.47)	11 (8.59)
21	More effects on different crops	75 (58.59)	35 (27.34)	18 (14.06)
22	Effects on soil condition	84 (65.62)	31 (24.22)	13 (10.16)
23	Presence of lot of hidden disease	107 (83.59)	11 (8.59)	10 (7.81)
24	Scientific methods of Parthenium weed control	112 (87.50)	10 (7.81)	6 (4.69)
25	Mechanical method	92 (71.87)	25 (19.53)	11 (8.59)
26	Uprooting method	78 (60.93)	37 (28.91)	13 (10.16)
27	Precaution during uprooting method	101 (78.90)	19 (14.84)	8 (6.25)
28	Cultural method	101 (78.90)	23 (17.97)	4 (3.12)
29	Advantages of cultural method	111 (86.71)	12 (9.37)	5 (3.91)
30	Legal method	128 (100)	0 (0.00)	0 (0.00)
31	Utilization method	128 (100)	2 (1.56)	0 (0.00)

32	Use of Parthenium weed as insecticidal and nematicidal form	127 (99.22)	1 (0.78)	0 (0.00)
33	For making acid and biogas	127 (99.22)	1 (0.78)	0 (0.00)
34	For making card board	128 (100)	0 (0.00)	0 (0.00)
35	Use of Parthenium weed on sericulture	128 (100)	0 (0.00)	0 (0.00)
36	For making compost	128 (100)	0 (0.00)	0 (0.00)
37	Use of Parthenium weed which stage on composting	128 (100)	0 (0.00)	0 (0.00)
38	Nutrient status of Parthenium weed compost	128 (100)	0 (0.00)	0 (0.00)
39	Chemical method	120 (93.75)	4 (3.12)	4 (3.12)
40	Chemical quantity	126 (98.43)	0 (0.00)	2 (1.56)
41	When chemical method is applied according to day and time-interval	123 (96.09)	2 (1.56)	3 (2.34)
42	Precaution during chemical method	123 (96.09)	1 (0.78)	4 (3.12)
43	Salt solution method	127 (99.22)	0 (0.00)	1 (0.78)
44	Biological methods	127 (99.22)	0 (0.00)	1 (0.78)
45	Fungal method	127 (99.22)	0 (0.00)	1 (0.78)
46	Bacterial method	128 (100)	0 (0.00)	0 (0.00)
47	Insect method	127 (99.22)	0 (0.00)	1 (0.78)
48	Cultural method	127 (99.22)	1 (0.78)	0 (0.00)
49	Flowers method	128 (100)	0 (0.00)	0 (0.00)
50	Other methods	128 (100)	0 (0.00)	0 (0.00)
51	Surrounding area covered under Parthenium weed	42 (32.82)	51 (39.84)	35 (27.34)
52	Field area which is effected by Parthenium weed	71 (55.47)	35 (27.34)	22 (17.18)
53	Yield loss due to Parthenium weed	88 (68.75)	20 (15.62)	20 (15.62)

Majority of the respondents (83.59%) had low level of knowledge regarding presence of lot of hidden disease, 8.59 and 7.82 per cent of the respondents were having medium and high level of knowledge, respectively regarding presence of lot of hidden disease.

Maximum number of the respondents (87.50%) had low level of knowledge regarding knowledge about scientific methods of Parthenium weed control, whereas, 7.82 and 4.68 per cent of the respondents were having medium and high level of knowledge, respectively regarding knowledge about scientific methods of Parthenium weed control. It was found that majority of the respondents (71.87%) had low level of

knowledge regarding knowledge about mechanical method, whereas, 19.54 and 8.59 per cent of the respondents were having medium and high level of knowledge, respectively regarding knowledge about mechanical method.

Majority of the respondents (60.94%) had low level of knowledge regarding knowledge about uprooting method, whereas, 28.91 and 10.15 per cent of the respondents were having medium and high level of knowledge, respectively regarding knowledge about uprooting method. It was found that majority of the respondents (78.90%) had low level of knowledge regarding knowledge about precaution during uprooting method, whereas,

14.85 and 6.25 per cent of the respondents were having medium and high level of knowledge, respectively regarding knowledge about precaution during uprooting method.

Majority of the respondents (78.91%) had low level of knowledge regarding knowledge about cultural method, 17.97 and 3.12 per cent of the respondents were having medium and high level of knowledge, respectively regarding knowledge about cultural method.

It was found that majority of the respondents (86.72%) had low level of knowledge regarding knowledge about advantages of cultural method, 9.37 and 3.91 per cent of the respondents were having medium and high level of knowledge, respectively regarding knowledge about advantages of cultural method.

Majority of the respondents (100%) had low level of knowledge regarding knowledge about legal method, whereas, none of the respondents were having medium and high level of knowledge, respectively regarding knowledge about legal method.

Majority of the respondents (98.44%) had low level of knowledge regarding knowledge about utilization method, followed by 1.56per cent respondents who were having medium knowledge regarding knowledge about utilization method, whereas none of the respondents were having high level of knowledge regarding knowledge about utilization method It was found that majority of the respondents (99.22%) had low level of knowledge regarding knowledge about use of Parthenium weed on insecticidal and nematicidal form, followed by 0.78per cent respondents who were having medium knowledge regarding knowledge about use of Parthenium weed on insecticidal and nematicidal form, whereas none of the respondents were having high level of knowledge regarding knowledge about use of Parthenium weed on insecticidal and nematicidal form.

It was found that majority of the respondents (99.22%) had low level of knowledge regarding knowledge about for making acid and biogas form, followed by 0.78per cent respondents who were having medium knowledge regarding knowledge about for making acid and biogas form, whereas none of the respondents were having high level of knowledge regarding knowledge about for making acid and biogas form.

It was found that majority of the respondents (100%) had low level of knowledge regarding knowledge about for making card board, whereas, none of the respondents were having medium and high level of knowledge, respectively regarding knowledge about for making card board.

It was found that majority of the respondents (100%) had low level of knowledge regarding knowledge about use of Parthenium weed on sericulture, whereas, none of the respondents were having medium and high level of knowledge, respectively regarding knowledge about use of Parthenium weed on sericulture.

It was found that majority of the respondents (100%) had low level of knowledge regarding knowledge about for making compost, whereas, none of the respondents were having medium and high level of knowledge, respectively regarding knowledge about for making compost. It was found that majority of the respondents (100%) had low level of knowledge regarding knowledge about use of Parthenium weed which stage on composting, whereas, none of the respondents were having medium and high level of knowledge, respectively regarding knowledge about use of Parthenium weed which stage on composting. It was found that majority of the respondents (100%) had low level of knowledge regarding knowledge about nutrient status of Parthenium weed compost, whereas, none of the respondents were having medium and high level of knowledge, respectively regarding knowledge about nutrient status of Parthenium weed compost.

It was found that majority of the respondents (93.75%) had low level of knowledge regarding knowledge about chemical method, whereas, 3.13 of the respondents were having medium and high level of knowledge, respectively regarding knowledge about chemical method.

It was found that majority of the respondents (98.44%) had low level of knowledge regarding knowledge about chemical quantity, followed by 1.56per cent respondents who were having high knowledge regarding knowledge about chemical quantity, whereas none of the respondents were having medium level of knowledge about chemical quantity. It was found that maximum number of the respondents (96.09%) had low level of knowledge regarding knowledge about when chemical method is applied according to day and time- interval, whereas, 2.35 and 1.56 per cent of the respondents were having high and medium level of knowledge, respectively regarding knowledge about when chemical method is applied according to day and time-interval.

It was observed that majority of the respondents (96.09%) had low level of knowledge regarding knowledge about precaution during chemical method, whereas, 3.13 and 0.78 per cent of the respondents were having high and medium level of knowledge, respectively regarding knowledge about Precaution during chemical method. It was found that majority of the respondents (99.22%) had low level of knowledge regarding knowledge about salt solution method, followed by 0.78per cent respondents who were having high knowledge regarding knowledge about salt solution method, whereas none of the respondents were having medium level of knowledge about salt solution method. It was observed that majority of the respondents (99.22%) had low level of knowledge regarding knowledge about biological method, followed by 0.78per cent respondents who were having high knowledge regarding knowledge about biological method, whereas none of the respondents were having medium level of knowledge about biological method.

It was found that majority of the respondents (99.22%) had low level of knowledge regarding knowledge about fungal method, followed by 0.78per cent respondents who were having high knowledge regarding knowledge about fungal method, whereas none of the respondents were having medium level of knowledge about fungal method.

It was found that majority of the respondents (100%) had low level of knowledge regarding knowledge about bacterial method, whereas, none of the respondents were having medium and high level of knowledge, respectively regarding knowledge about bacterial method. It was found that majority of the respondents (99.22%) had low level of knowledge regarding knowledge about insect method, followed by 0.78per cent respondents who were having high knowledge regarding knowledge about insect method, whereas none of the respondents were having medium level of knowledge about insect method.

It was observed that majority of the respondents (99.22%) had medium low level of knowledge regarding knowledge about cultural method, followed by 0.78 per cent respondents who were having medium knowledge regarding knowledge about cultural method, whereas none of the respondents were having high level of knowledge regarding knowledge about cultural method.

It was found that majority of the respondents (100%) had low level of knowledge regarding knowledge about flowers method, whereas, none of the respondents were having medium and high level of knowledge, respectively regarding knowledge about flowers method.

It was found that maximum number of the respondents (100%) had low level of knowledge regarding knowledge about other methods, whereas, none of the respondents were having medium and high level of knowledge, respectively regarding knowledge about other methods.

It was observed that majority of the respondents (39.84%) had medium level of knowledge regarding knowledge about surrounding area covered under Parthenium weed, whereas, 32.82 and 27.34 per cent of the respondents were having low and high level of knowledge, respectively regarding knowledge about surrounding area covered under Parthenium weed. It was found that majority of the respondents (55.46%) had low level of knowledge regarding knowledge about field area which is effected by Parthenium weed, whereas, 27.35 and 17.19 per cent of the respondents were having medium and high level of knowledge, respectively regarding knowledge about field area which is effected by Parthenium weed.

It was observed that majority of the respondents (68.76%) had low level of knowledge regarding knowledge about yield loss due to Parthenium weed, 15.62 per cent of the respondents were having medium and high level of knowledge, respectively regarding knowledge about yield loss due to Parthenium weed. It can be concluded that per cent of the respondents had medium level of knowledge regarding knowledge about Parthenium weed, 87.5 per cent, 71.87 per cent, 60.93 per cent, 78.90 per cent, 100 per cent, 98.43 per cent, 93.75 per cent, 99.21 per cent of the respondents had low level of knowledge regarding control measure practices of Parthenium weed, respectively, whereas the respondents 8.59 per cent scientific, 19.53 per cent mechanical, 28.90 per cent uprooting, 17.96 per cent cultural, and utilization, 1.56 per cent in other and 3.12 per cent chemical methods of the respondents had medium level of knowledge regarding of the

control measure practices of Parthenium weed, and 4.68 per cent scientific, 8.59 per cent mechanical, 10.15 per cent uprooting, 3.12 per cent cultural, and chemical methods and 0.78 per cent biological methods of the respondents had low level of knowledge regarding of the control measure practices of Parthenium weed.

After complementation of study, it is conclude that mostly respondents had low level of knowledge regarding control measure of parthenium weed followed by medium level of knowledge and only few respondents have high knowledge about control measure of parthenium weed.

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