RESEARCH ARTICLE

Phytosociological Aspects of Some Weed Flora of Post harvested Rice Fields in Shahapur, Bhandara (MS) India

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ABSTRACT

Generally weeds are treated as waste plants in crop fields and considered harmful to the crops and eradicated during cultural operations, may be fruitfully utilized to serve the medicinal purposes against diseases. In view of this, Shahapur village near Bhandara is selected for the study of phytosociological aspects of some weed flora in post harvested rice fields. Extensive field survey was conducted two months in post harvested paddy fields during late winter season (Jan.-Mar.). The present survey is useful for the identification of weed species and phytosociological relationships of dominant species. These weeds provide ample opportunities to study them critically for new drug development through chemical analysis without disturbing biodiversity. The probable reasons for the phytosociological relationship of dominant weed species were discussed in the present investigation.

Key words: *Paddy, Phytosociological aspects, Post harvest, Weed flora*

INTRODUCTION

The over dependence on the use of tree roots and bark in preparing medicine has detrimental effects on their sustainable supply since most trees are killed lead to scarcity of medicinal trees. Therefore, in place of tree, it is better to use weeds as medicinal plants. On the other hand most of the weeds are annuals and treated as waste plants in crop fields and considered harmful to the crops and eradicated during cultural operations, may be fruitfully utilized to serve the medicinal purposes against diseases. The weeds in post harvesting fields provide ample opportunities to study them critically for new drug development through chemical analysis without disturbing biodiversity.

In view of this, Shahapur village is selected for the study of phytosociological aspects of some weed flora in post harvested rice fields. Paddy is the most prominent crop in Bhandara district. Bhandara is one of the backward districts of Maharashtra state with large forest cover , and is situated in north east part of Vidarbha region of central

India. Bhandara taluka covered the area of 575.2 square kilometres and is situated at an altitude of 800 ft (243 mtr) above sea level.

The present survey is made to screen the weed flora commonly occurring in post harvesting paddy fields of Shahapur, which is a small village just 6km away from Bhandara town. In the present study, 20 acres of paddy fields were surveyed for ecological aspects and ethno botanical study of weed flora. Extensive field survey were conducted two months after paddy harvesting during late winter season (Jan.-Mar.). Weeds were collected from all the sites of the study area randomly

MATERIAL AND METHODS

The present survey is made to screen the weed flora commonly occurring in paddy fields of Shahapur, Bhandara. (Fig: 1&2). The latitude of Shahapur, Bhandara, Maharashtra is 21° 10' 12.0000'' N and the longitude is79° 39' 0.0072'' E, and elevation is 860 feet from the sea level.

In the present study, 20 acres of paddy fields in Shahpur were surveyed for ecological aspects and ethno botanical study of weed flora.

The collected weed plants were photographed and properly identified with the help of available literature monograph and conformed from the authentic regional floras. Some specific weeds exclusively grown in crop fields were used for preparing Herbarium and deposited in the Botany laboratory of J.M.Patel College, Bhandara.

Weed phytosociological parameters were taken from 1.0× 1.0 m quadrate placed randomly in post harvested rice fields. Fifty quadrate samples were taken for the study of ecological aspects i.e. abundance, density, and frequency by using the following principle as presented.

$$\text{Frequency (f)} = \frac{\text{No. of quadrant in which sp. occurred}}{\text{Total no. of quadrat studied}} \text{ X } 100$$

$$\text{Abundance (A)} = \frac{\text{Total no. of individual of species in all the quadrats}}{\text{No. of quadrat in which species occurred}} \text{ X } 100$$

$$\text{Density (D)} = \frac{\text{Total no. of individual of species in all the quadrats}}{\text{Total No. of quadrat in species X area in } m^2 \text{ of a quadrate}} \text{ X } 100$$

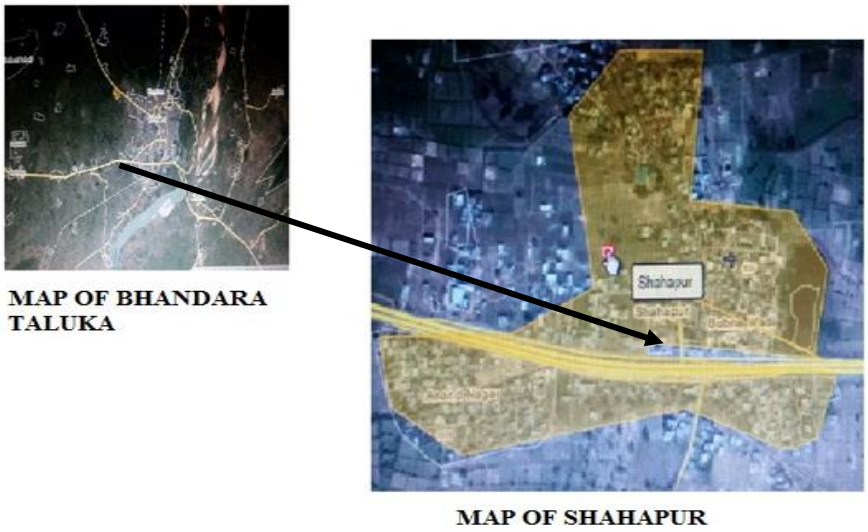

Fig: 1&2. Maps of study site

RESULTS

I. Phytosociological aspects

In the present study 20 acres of paddy field in Shahapur were surveyed for Phytosociological aspects of weed flora associated with *Spheranthus indicum*. Similarly *Heliotropium* was always associated with *Gnaphallium* in most of the fields. On the other hand *Coldenia procumbens* was grown as independent colony. It never associated with any other species. i.e. abundance, density, and frequency. In general, the dicotilydon species much outnumbered the monocots.

Table:1. Ecological aspects of some weed flora of rice field

S.No	Name of the species	TNI	TOI	Density	Frequency	F-class	Abundance
1.	*Aerva lenata* (Linn.)	30	15	150	75	D	200
2.	*Alterlathera sessilis (*Linn.*)*	12	3	60	15	A	400
3.	*Amania bachifera(*Linn.*)*	54	15	270	75	D	360
4.	*Anagulus arvensis(Linn.)*	5	2	251	10	A	250
5.	*Azeratum conysoides(*Linn.*)*	24	6	120	30	B	400
6.	*Blumea larva (*Burn. E)(L.)	18	7	90	35	B	257.1
7.	*Chenopodium album(*Linn.)	10	3	50	15	A	333.3
8.	*Coldenia procumbers(*Linn.*)*	25	12	125	60	C	208.3
9.	*Commelia bengalensis(*Linn.*)*	10	6	50	30	B	166.6
10	*Chrozophora plicata (*Vah.*)*	55	16	275	80	D	343.7
11.	*Cyperus rotundus (*Linn.)	31	7	110	35	B	542.8
12.	*Cynodon dectylon(*Linn.)	25	5	125	25	B	500
13.	*Euphorbia hirta*(Linn.)	10	4	50	20	A	250
14.	*Euphorbia maculate* (Linn)Poir	2	1	10	5	A	200
15.	*Grangea madaraspatana (*Linn.)	140	20	700	100	E	700
16.	*Gnaphallium luteoablum(*Linn.) Hilhard	98	18	490	90	E	544.4
17.	*Heliotropium indicum(*Linn*)*	95	20	475	100	E	475
18.	*Nicotiana plumbagivifolia* (Viv Elerch)	12	5	60	25	B	240
19.	*Oxalis articulate (*viv Elerch)	25	8	125	40	B	312.5
20.	*Parthenium hysterophorus (*Linn.*)*	15	5	75	25	B	300
21.	*Phyllanthus niruni* (Ajry Shaw & G. L. Webster*)*	20	8	100	40	B	250
22.	*Polygonum plebeinun (*R.Br.)	82	20	410	100	E	410
23.	*Partulacea oleraceae (*Linn.)	5	2	25	10	A	250
24.	*Rorippa sylvestris (*Linn. Besser.)	2	1	10	5	A	200
25.	*Rumex dentatus(*Linn.*)*	50	16	250	80	D	312.5
26.	*Salvia plebein(*Linn.*)*	115	20	575	100	E	575
27.	*Sphearanthus indicum(*Linn.*)*	120	20	600	100	E	600
28.	*Spilantus paniculata(*Linn.*)*	12	5	60	25	B	240
29.	*Tridax procumbens(*Lin*n.)*	15	5	75	25	B	300
30.	*Vernonia cinerea(*Linn.*)*	18	7	90	35	B	257.1

Key: TNI- Total number of individual weeds; TOI- Total occurrence of individual weeds; D-Density; F- Frequency; A- Abundance.

Table:2. Per cent of Species in different Frequency classes

Frequency %	Frequency class	Observed values	% of species in each class
0-20	A	7	7x100/30= 23.33
21-40	B	12	12x100/30= 40.00
41-60	C	1	1x100/30= 3.33
61-80	D	4	4x100/30= 13.33
81-100	E	6	6x100/30= 20.00

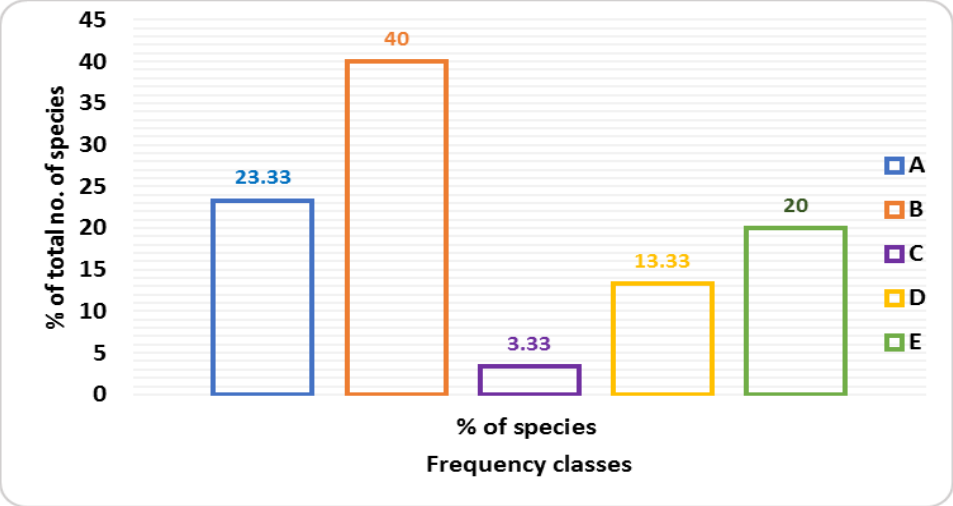

Fig. 3: Frequency diagram of weed community in paddy field

Among monocots, Poaceae and Cyperaceae top the list and among dicots Asteraceae and Euphorbiaceae. Phytosociological observations revealed that, the species *Grangea madaraspatana* was dominant and which was always associated with *Spheranthus indicum.* The most frequent species recorded in all localities were *Grangea madaraspatana, Spheranthus indicum, Heliotropium indicum, Polygonum plebeinun, Salvia plebeians*. On the other hand *Rorippa sylvestris and Euphorbia maculate* were located only at one location, which was very important observation from biodiversity point of view. Per cent of species was highest (40.00%) in Frequency class-B and lowest (3.33%) in C-class category. Fruiting period for most of the weeds in the fields were March –June.

On the basis of percent frequency values as per above table, various species are then distributed into five frequency class (Raunkaier's life forms, 1934), observed values, % of species in each class were incorporated in the table 2. Raunkier's frequency diagram of weed flora of paddy field fig. 3.

II. Ethnobotanical aspects of some weed flora

The harmful effect of weeds is greatest felt in agriculture but weeds are also useful in several aspects. Besides their use in traditional systems of medicines, they have applications in ethno- tribal and veterinary medicines and have also been exploited by modern research in drugs as sources of novel phyto-compounds.

Plants are generally rich sources of many natural herbal products which have mostly used for human welfare. From the ancient period man has been used several different plants to cure body pain and different disease. Now a day throughout the world several thousands of plants mostly weed plants are medicinal but very few drug plants are cultivated (Upma Dobhalet et.al.2006). Many of the drugs used in modern medicine were initially used in crude from traditional uses and other biological activity. Quite a number of plants considered as weed in modern science have significant values in ethno botany. Weeds are generally liable and phenotypically plastic; such characters enable them to pass through successfully in adverse habitats. They easily invade crop fields which

are favorite ground for their quick growth. The presence of weeds in the field and their impact on the crop production and environment has been well documents. Role of weed in Ayurveda medicine was described by Govindish (1981). In the present study, a total of 30 weeds belonging to 17 families were recorded. Among these five dominant weed species were selected for ethno botanical study by interacting with local people in Shahapur village.

DISCUSSION

From the ancient period man has been used several different plants to cure all body pain and different disease. Plants are generally rich sources of many natural herbal product which have mostly used for human welfare especially to cure diseases. Now a day throughout the world several thousands of plants mostly weed plants are medicinal but very few drug plants are cultivated (Upma Dobhalet et.al.2006). Quite a number of plants considered as weed in modern science have significant values in ethno botany. Weed is generally liable and resistant to draught and diseases, such characters enable them to pass through successfully in adverse habitats. They easily invade crop fields which are favorites ground for their quick growth. Many of the drugs used in modern medicine were initially used in crude from traditional uses and other biological activity. But the role of weed in ayurvedic medicine was described by Govindish (1981). Actually all weeds are not that much dangerous as they are projected to be, many weeds are really useful and extremely beneficial to mankind in many respects. Most of the weeds are known to have medicinal attributes (Parrotta, 2001), traditional, ethno-and tribal-medicinal uses (Siddalingam and Vidyasagar, 2013), and traditional and local veterinary medicinal usages (Tiwari and Tiwari, 2003). Useful and effective formulations for controlling termites , nematodes (Joshi et.al., 2012) have been indigenously developed from weeds and many of these unwanted plants are gainfully looked upon as sources of anti-microbial compounds (Rathore, 2009) as well as novel lifesaving phytochemicals (Yogesh et.al,. 2013). Therefore, the present work is designed with an objective of providing identification of dominant medicinal weeds in post harvested rice fields for formulation of ethno medicinal uses of weeds.

CONCLUSION

In view of recent demand on medicinal plants, most of the perennial plants (trees & shrubs) are exploited. For preventing this tree exploitation, it is essential to intensify the utilization of weeds as medicinal plants.
The present survey is useful for the identification and phytosociological relationships of dominant weed species. These weeds provide ample opportunities to study them critically for new drug development through chemical analysis without disturbing biodiversity. Further this study will be useful for the acclimatization of weeds into cultivated plants. Generally weed plants are disease and drought resistant, therefore, the commercial cultivation of these medicinal weeds will be more profitable than crop plants

Conflicts of interest: The authors stated that no conflicts of interest.

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