



# IMPORTANCE VALUE INDEX ANALYSIS OF SOME MEDICINAL WEED COMMUNITY IN WHEAT FIELDS OF AMBADI VILLAGE, BHANDARA DISTRICT (M.S), INDIA

Dr. Padmavathi S. Rao

Assistant Professor

P.G. Dept. of Botany, J.M.Patel College, Bhandara (M.S), India

padmavathirao6@gmail.com

**Abstract:** Weeds are the plants which affect the crops and compete with the cultivated plants for sunlight, water and nutrients. These weeds are treated as waste plants in crop fields and are considered harmful to the crop. The weeds which are eradicated during cultural operations can be fruitfully utilized to serve the medicinal purposes against diseases. In view of this, for studying Importance Value Index (IVI) of weed flora in wheat fields, Ambadi village in Bhandara district is selected. This study would be useful for the identification and status of dominant weed species in the community. These weeds provide many opportunities to study them critically for new drug development through phytochemical analysis. The probable reasons for dominance of some specific weed species and their IVI values are discussed in the present investigation.

**Index Terms-** Ambadi, Dominant species, Importance Value Index, Weed flora

## INTRODUCTION

The over dependency on the roots, leaves, seeds and bark of the trees in preparing medicine has detrimental effects on their sustainable supply. Most of the trees are killed which leads to scarcity of medicinal trees. Therefore, it is better to use weeds as medicinal plants instead of trees. On the other hand, most of the weeds are annuals and treated as waste plants in crop fields. The weeds are considered harmful to the crops and are eradicated during cultural operations. This can be fruitfully utilized to serve the medicinal purposes against diseases.

The present survey is made to screen the weed flora commonly occurring in wheat fields of Ambadi village. In this study, wheat fields were randomly surveyed for ecological aspects and ethno botanical study of weed flora. Extensive field survey was conducted for four months in wheat fields from February till May in 2019. The weeds were randomly collected for ethno-sociological study.

## MATERIAL AND METHODOLOGY

Periodical field trips were under taken in Ambadi village, which is situated 3 Km. away from Bhandara town on the bank of Wainganga River.

The utilization of some medicinal plants was recorded from farmers, village heads, and senior women by questionnaires to them. The communication with these people was in Marathi and Hindi. For most of the plants ethnobotanical information was gathered from review of literature.

Weed phytosociological parameter were taken from 1.0× 1.0 m quadrat placed randomly in crop fields. Twenty quadrat samples were taken from each field for the study of ecological aspects (Relative Abundance, Relative Density, Relative Frequency and IVI ) by using the following principle as presented.

$$\text{Frequency (F)} = \frac{\text{Number of quadrates in which species occurred}}{\text{Total number of Quadrates studied}} \times 100$$

$$\text{Relative Frequency (RF)} = \frac{\text{Frequency of individuals of a species}}{\text{Total number of Quadrates studied}} \times 100$$

$$\text{Density (D)} = \frac{\text{Total number of individuals of the species}}{\text{Total frequency of all species}}$$

$$\text{Relative Density (RD)} = \frac{\text{Density of individuals of a species}}{\text{Total density of all species}} \times 100$$

$$\text{Abundance (A)} = \frac{\text{Total number of individuals of the species}}{\text{Number of quadrates in which species occurred}}$$

$$\text{Abundance (RA)} = \frac{\text{Abundance of individuals of a species}}{\text{Total abundance of all species}} \times 100$$

$$\text{Importance Value Index (IVI)} = \text{Relative frequency} + \text{Relative density} + \text{Relative Abundance}$$

## RESULT AND DISCUSSION

Some weed species unlike most crop plants are well adapted to higher soil moistures while others are not so. Weed interference in annual cropping systems can be highly variable from year-to-year, as well as spatially heterogeneous (McDonald *et al.*, 2009). The most persistent and abundant weeds are easily dispersed and persist a long time in the soils as dormant seeds (Bukun, 2004). In the present study, a total of 39 weeds belonging to 17 families were recorded in wheat fields (**Table**). Importance Value Index (IVI), which determine the overall importance of each species in the weed community structure of the wheat fields in Ambadi village. For calculating this index, the percent values of the relative frequency, relative density and relative abundance are summed up together and this value is designated as importance value index of the species. In the present investigation, all weed species are herbs, so that here instead of Relative Dominance, Relative Abundance is considered for calculating the IVI of the species of the Community. It provides the idea of the sociological structure of a species in its totality in the community. These ecological attributions revealed that the ten most dominant species in the present investigation were *Ammannia baccifera* L., *Blumea lacera* (Burm.f.) DC, *Chrozophora rottleri* (Geis) Juss., *Grangea maderaspatana* (L.) Poir.in Lam., *Heliotropium ovalifolium* Forssk., *Polygonum plebeium* R.Br., *Rumex dentatus* L., *Salvia plebeia* R.Br., *Sphaeranthus indicus* Linn., *Spilanthes paniculata* Wall. ex. DC. (**Figure**). The Ethno-botanical aspects of all these weeds were gathered from local people and the review of the literature (Table). The different environmental conditions determine the specific weed spectrum, composition and population of each region (Memon *et al.*, 2007). The reduction in yield due to weed-crop competition mainly depends on weed species and their densities as well as crop species (Muhammad Tauseef *et.al.* 2012) . As the distribution and infestation intensity of each weed is different, so the extent of crop yield reduction will mainly depend on the number and kind of weeds found in the field (Frisbie *et al.*, 1989).

Traditionally man has been utilized several plants for curing different diseases. Plants are generally rich source of many natural herbal products 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). Many weeds in modern science have significant role in Ayurveda as well as in Allopathy medicine. Weed is generally liable and resistant to draught and diseases, such characters enable them to pass through successfully in adverse habitats. Agricultural fields are favourite place for the vigorous growth of weeds. Some weeds are important due to their possible allelopathic effects on cultivated crop (Hussain, 1980 & 1983). On the other hand, Hussain *et.al.* in 1985, studied on the weeds of wheat in Quetta, Baluchistan. Weeds have specific characteristics that help their survival. These characteristics may be deep root system. Most of the weeds are annual which propagate by seeds only. Most weeds with small population are unimportant but they share the habitat resources.(Ranjana kumara, 2016). Pooja, A. *et.al.* in 2019 reported A Complete Review on Medicinally Active Herbal Weed. Weeds have specific characteristics that help their survival. These characteristics may be deep root system. Most of the weeds are annual

which propagate by seeds only. Most weeds with small population are unimportant but they share the habitat resources. (Ranjana Kumara, 2016). Weeds compete with crop for water, nutrients, and light; has been great concern for the growers (Rajput *et al.* in 2008, Sultan & Nasir, 2007). The losses caused to agricultural crops by *Avena*, *Cyperus rotundus* and *Chenopodium albumaree* significant (Marwat *et al.*, 2006). The weed species with high IVI and frequency might compete better to reduce growth and yield of associated crop (Ranjana Kumara 2016).

Weeds possess abundant seed production, rapid population establishment, seed dormancy, long term survival, adaptation of vegetative reproductive structures and, ability to occupy sites disturbed by human activities. The present study suggests that a variety of weeds are infesting the crops quite heavily in agricultural fields that may cause losses to yield of different crops. So phenological study of weeds in a particular crop is compulsory for a weed control.

Many of the drugs used in modern medicine were initially used in crude form from traditional uses and other biological activity. The role of weed in ayurvedic medicine was described by Govindish in 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 aspects. Most of the weeds are known to have medicinal attributes (Parrotta, 2001), traditional, ethno- and tribal-medicinal uses (Siddalingam and Vidyasagar, 2013).

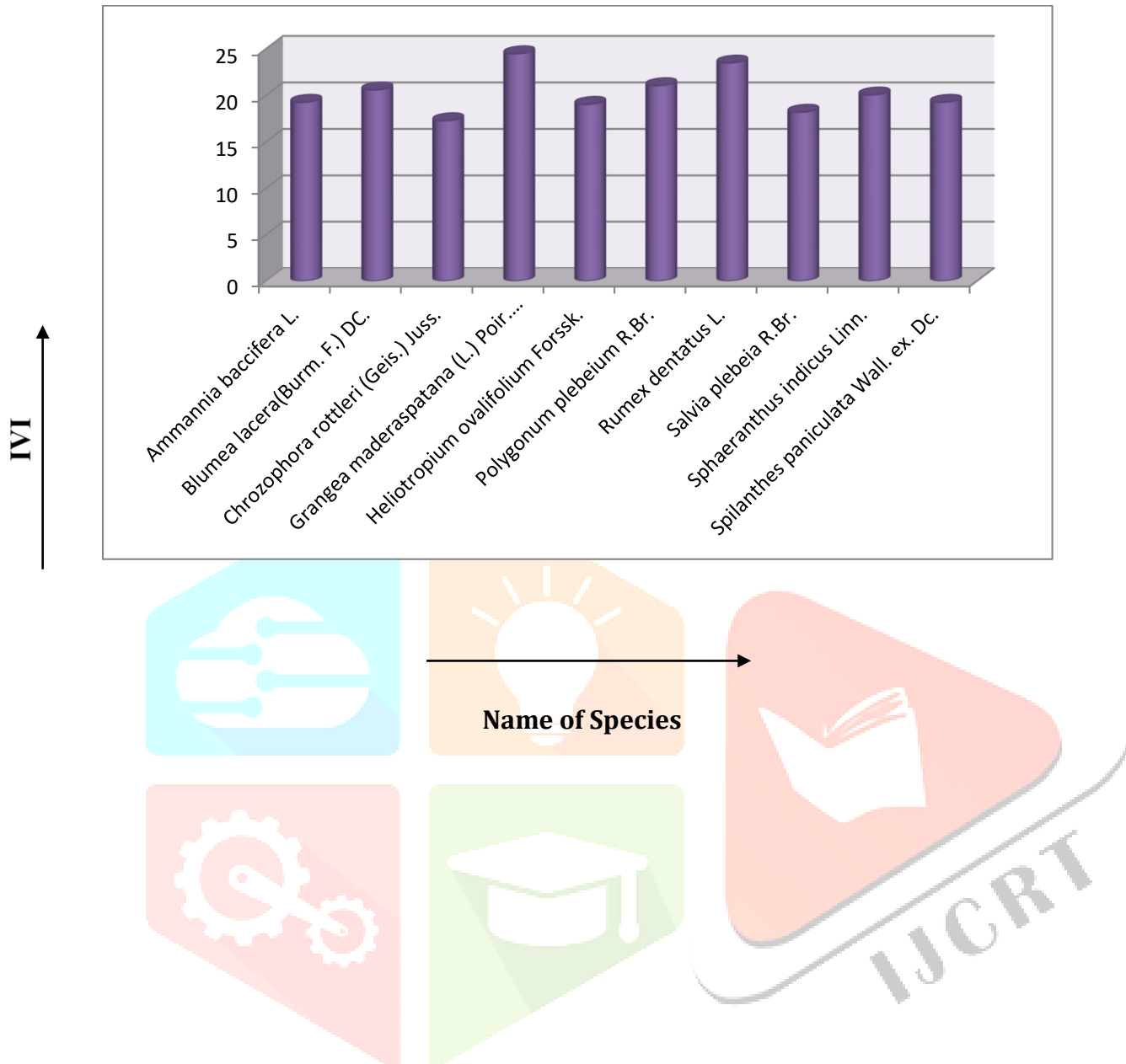
## CONCLUSION

Many plants are on the verge of extinction due to unplanned use. Bhandara district is predominantly tribal area and people are traditionally dependent on plants for the treatment of many diseases. Most of the valuable medicinal flora growing in the region remains undocumented. Bhandara district has sufficient amount of medicinal plant resources among the district of Vidarbha region according to review study. Indigenous knowledge existing with old aged persons living in remote villages needs to be tapped by systematic documentation and making the people aware about the medicinal species. Many plants are exploited for the extraction of numerous medicinal and local food purposes thus the population of these precious medicinal plant wealth is fast depleting. Hence, the present study is an attempt to identify the dominant weeds in crop fields and their use for treating diseases, information gathered from local Vaidyas and other knowledgeable senior people of Ambadi.

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**Fig. Importance Value Index of Some Dominant Weeds in Wheat Field**



**Table: Ethnosociological attributes of some weed flora of Wheat fields in Ambadi Village**

S. No	Scientific Name	Vernacular Name	F	RF	D	RD	A	RA	IVI	Medicinal Values
1	<i>Ammannia baccifera</i> L.	Aginbuti	100	6.50	4.08	7.15	4.08	5.62	19.27	Anti-inflammation
2	<i>Anagallis arvensis</i> L.	Ran Draksh.	24	1.68	0.45	0.79	1.74	2.40	4.87	Gall bladder stones, Liver cirrhosis
3	<i>Blumea lacera</i> (Burm.f.) DC	Janglimulli, Bamburdi	100	6.50	4.50	7.89	4.50	6.20	20.59	Astringent, anti-inflammatory
4	<i>Caesulia axillaris</i> Roxb.	Kala Maka	24	1.68	0.45	0.79	1.74	2.40	4.87	Antifungal
5	<i>Centaurium centaurioides</i> Roxb.	Barik Chirayata	75	4.83	2.20	3.85	2.94	4.05	12.73	Sedative and for treating snakebite
6	<i>Chrozophora rottleri</i> (Geis) Juss.	Suravarta	100	6.50	4.08	7.15	4.08	5.62	17.29	Healing wounds, treating Jaundice
7	<i>Coldenia procumbens</i> L.	Tripunkhi, Taripakshi	25	1.16	0.42	0.74	1.68	2.31	4.66	Rheumatic swelling and acts as an anti-inflammatory
8	<i>Desmodium triflorum</i> (L.) DC.	Chipti, Jangli methi	56	3.61	2.56	4.49	4.58	6.13	14.41	Diarrhoea, Laxative and Astringent
9	<i>Eclipta prostrata</i> (L.) L.	Bhringu raaja,	85	5.50	1.09	1.91	1.29	1.78	9.39	Skin diseases
10	<i>Euphorbia perbracteata</i> Gage.	Kokan dudhi	24	1.68	0.45	0.79	1.74	2.40	4.77	Gastrointestinal disorders.
11	<i>Euphorbia thymifolia</i> L.	Dhakti dudhi	56	3.61	2.56	4.49	4.58	6.13	14.41	Dysentery, Diarrhoea and Venereal diseases
12	<i>Gentalbuan urens</i> (Heyne ex Roth) Brem	Not Known	84	5.50	1.09	1.91	1.29	1.78	9.29	Stomach cancer, Diabetes, Blood pressure.
13	<i>Gnaphalium luteoalbum</i> L.	Butamy, Gomdo,	75	4.83	2.06	3.61	2.75	3.79	12.23	Diarrhoea, Gut infection
14	<i>Grangea maderaspatana</i> (L.)Poir. in Lam.	Mashipatri.	100	6.50	5.75	10.07	5.75	7.92	24.49	Antispasmodic
15	<i>Heliotropium ovalifolium</i> Forssk.	Kunden	100	6.50	4.01	7.03	4.01	5.52	19.05	Cough, Fever
16	<i>Hygrophila spinosa</i> T.Anderson	Talimakhna	83	5.50	1.09	1.91	1.29	1.78	9.19	Asthma, Jaundice, Liver disorders
17	<i>Indigofera linifolia</i> (L.F.) Retz.	Lal godhadi	72	4.65	1.76	3.08	2.45	3.78	11.51	Fever and Amenorrhoea
18	<i>Indigofera linnaei</i> Ali in Bot. Notiser	Bhingule	75	4.83	2.06	3.61	2.75	3.79	12.23	Rheumatism, Arthritis, Inflammation
19	<i>Justicia procumbence</i> Linn.	Karambal	62	4.00	1.06	1.86	1.71	2.36	8.29	Diaphoretic, Diuretic, Expectorant,
20	<i>Launaea procumbens</i> (Roxb.) & Ramayya & Rajgopal	Pathari	62	4.00	1.06	1.86	1.71	2.36	8.19	Skin diseases
21	<i>Mecardonia procumbens</i> (Miller)Sma	Makardana	71	4.65	1.76	3.08	2.42	3.78	11.50	Diabetes, Leukemia, Hypertension, Leucorrhoea



22	<i>Nicotiana plumbaginifolia</i> Viv.Elench.	Jangli Tambakoo	42	2.70	1.65	2.89	3.93	5.41	11.00	skin diseases
23	<i>Oldenlandia corymbosa</i> L.	Pitpapda	90	5.80	2.75	4.81	3.06	4.22	14.83	Renal diseases
24	<i>Phyla nodiflora</i> (L.) Greene	Gour Mundi	83	5.50	1.09	1.91	1.29	1.78	9.19	Ulcers, Boils and Cervical gland swellings
25	<i>Physalis minima</i> L.	Ran-popti	62	4.00	1.06	1.86	1.71	2.36	8.19	Urinary diseases
26	<i>Polygonum plebeium</i> R.Br.	Gulabi Godhadi	92	5.94	4.65	8.15	5.06	6.97	21.06	Healing on Wounds and Cuts.
27	<i>Rhynchosia minima</i> (L.) DC.	Kulthi	61	4.00	1.06	1.86	1.71	2.36	8.10	Haemorrhoids, diarrhoea and dysentery
28	<i>Rorippa indica</i> (L.) Hiern	Chamsuru	42	2.70	1.42	2.49	3.39	4.67	9.86	Cough, Cold, Measles
29	<i>Rumex dentatus</i> L.,	Jangli palak	100	6.50	5.75	10.07	5.75	7.92	23.49	Cures wounds, Cuts
30	<i>Salvia plebeia</i> R.Br.	Kamrkash	92	6.50	4.08	7.15	4.08	5.62	18.20	Gonorrhoea, Diarrhoea
31	<i>Sesseli diffusum</i> (Roxb. ex Sm.) Santapau & Wagh.	Kirmanjiajwan	41	2.70	1.57	2.75	3.73	5.13	10.58	Stomach-ache, anthelmintic
32	<i>Solanum nigrum</i> L.	Dudhi	42	2.70	1.42	2.49	3.39	4.67	9.86	Ulcers
33	<i>Solanum surattense</i> Burm. f.	Bhonyaringani	42	2.70	1.57	2.75	3.73	5.13	10.58	Cough, Asthma.
34	<i>Sphaeranthus indicus</i> Linn.	Gorakhmundi	100	5.94	4.65	8.15	5.06	6.97	20.06	Leprosy, Fever, Cough, , Hernia,
35	<i>Spilanthes paniculata</i> Wall. ex. DC.	Akkalkara	92	6.50	4.08	7.15	4.08	5.62	19.27	Toothache, Arthritis, Stomatitis, Ulcer
36	<i>Stemodia viscosa</i> Roxb.	Satmodi	95	6.13	3.06	5.36	3.23	4.45	15.94	Cold and Fever.
37	<i>Triumfetta rhomboidea</i> Jacq.	Jhinjhardi	42	2.70	1.42	2.49	3.39	4.67	9.86	Diarrhoea, Dysentery, and Gonorrhoea.
38	<i>Vicoa indica</i> (L.) DC.	Sonkadi	42	2.70	1.57	2.75	3.73	5.13	10.58	Rheumatic joints and Sore jaws.
39	<i>Zornia latifolia</i> (Linn.) Pers.	Kalarukh	95	6.13	3.06	5.36	3.23	4.45	15.94	Inflammation, Venereal diseases and Dysentery.

**F- Frequency, RF-Relative Frequency, D-Density, RD –Relative Density, A-Abundance, RA- Relative Abundance , IVI : Importance Value Index**

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