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ETHNOMEDICAL STUDY AND IRON CONTENT OF SOME MEDICINAL HERBS USED IN TRADITIONAL MEDICINE IN BUXWAHA (CHHATARPUR) REGION FOR THE TREATMENT OF ANEMIA

Dr. Meera Madhuri Mahant, *Asst. Prof. of Botany, PMCoE, Govt. P. G. College Damoh*

* **Muhammad Sakeel Mansoori,** *Research Scholar – Botany, MCBU Chhatarpur*

Abstract:

Anemia is one of the most common nutritional deficiency disorders affecting rural and tribal populations in India, particularly women and children. Traditional medicinal systems have long utilized locally available medicinal herbs for the treatment of anemia. Medicinal plants have been a source of succour in the control of many diseases in developing countries and anemia is no exception. The present study focuses on the ethnomedical practices and iron content analysis of selected medicinal herbs used by traditional healers in the Buxwaha region of Chhatarpur district, Madhya Pradesh. Ethnobotanical information was collected through field surveys and interviews with local herbal practitioners and tribal communities. Selected medicinal plants commonly prescribed for anemia were collected and analysed for iron concentration using standard laboratory techniques. The study revealed that several medicinal herbs possess considerable iron content and are widely used in indigenous healthcare practices. These plants may serve as affordable and accessible alternatives for managing iron deficiency anemia in rural populations. The findings support the importance of conserving traditional knowledge and scientifically validating medicinal plants for future therapeutic applications**.** Number of twenty five (25) medicinal plants, covering 25 genera and 15 families were recorded. These plants were used to prepare 25 receipts for the treatment of anemia and aggravating factors such as malaria and gastro-intestinal helminthic. Number of ten (10) of these medicinal plants are showed presence of highly iron in various quantities. The most promising were *Moringa oleifera*, *Tectona grandis*, *Amaranthus spinosus* and *Chenopodium album* which contained the highest iron contents viz; 28.2, 26.6, 21.7 and 16.2 (mg/100 g) respectively. They were followed by *Glycine max. Coriandrum sativum*, *Cajanus cajan*, *Spinacia oleracea* and *Sesamum indicum*. These results lend credence to the traditional use of these ethonmedicinal plants in Buxwaha (Chhatarpur) region for the treatment of anemia.

Keywords: Anemia, Ethnomedicinal, Medicinal Herbs, Iron Content, Buxwaha Region, Traditional Medicine

Introduction:

Anemia is a condition characterized by a decrease in the number of red blood cells or haemoglobin concentration in blood, resulting in reduced oxygen-carrying capacity. Iron deficiency is considered the major cause of anemia worldwide. In India, anemia remains a serious public health problem, especially among women, children, and economically weaker populations. Anemia is one of the most common nutritional deficiency disorders affecting rural and tribal populations in India, particularly women and children. Traditional medicinal systems have long utilized locally available medicinal herbs for the treatment of anaemia. Medicinal plants have been a source of succour in the control of many diseases in developing countries and anemia is no exception. Traditional medicinal systems have played a significant role in healthcare since ancient times. Rural and tribal communities depend heavily on medicinal plants for treating various ailments, including anemia. The Buxwaha region of Chhatarpur district in Madhya Pradesh is rich in biodiversity and traditional medicinal knowledge. Local healers and tribal communities use several herbs and plant preparations to improve blood levels and general health. Scientific evaluation of these medicinal herbs is essential to validate their therapeutic potential. Determination of iron content in medicinal plants can help identify effective natural sources of iron supplementation.

Objectives of the Study:

1. To document medicinal herbs traditionally used for the treatment of anemia in Buxwaha region.
2. To identify their botanical and family names.
3. To evaluate their iron content and medicinal importance.
4. To preserve indigenous ethno medicinal knowledge.

Material and methods:

- **Study area:** Buxwaha is located in Chhatarpur district of Madhya Pradesh, India. The region is characterized by dry deciduous forests, rural settlements, and tribal populations. Traditional knowledge regarding medicinal plants is preserved among local healers, elderly villagers and tribal communities. The ethnobotanical surveys were conducted in part of Bundelkhand region.
- **Climatology and Diversity of Buxwaha:** Buxwaha, located in the Chhatarpur district of Madhya Pradesh, experiences a subtropical, semi-arid climate characterized by extremely hot summers, a well-defined monsoon season, and mild winters. The region typically sees temperatures soaring above. The Buxwaha protected forest in Madhya Pradesh's Chhatarpur district boasts a rich dry deciduous ecosystem. It is an ecologically vital region, home to over 57 tree species and serving as a critical wildlife habitat and migration corridor between the Panna Tiger Reserve and Nauradehi forests in summer and dipping below in winter, with the majority of its annual rainfall occurring between July and September.
- **Ethnomedical survey**: Ethnomedical information was collected during the interviews following the instructions on ethnobotanical and ethno pharmacological surveys proposed by Etkin (1983), Waller (1983) and Hedberg (1983). The surveys were conducted in the Buxwaha (Chhatarpur) region, which were selected because some of us are natives of Moringaceae (*Moringa oleifera*) and Fabaceae family. This was an advantage for the interviews. During 6 semi-structured interviews, a questionnaire was applied to the healers and traditional practitioners who were known to be knowledgeable in medicinal uses of plants. The ages of all the people used ranged between 20 and 55 years. We used 30 persons in the town of Buxwaha and the surrounding villages of fewer than 15 KM. in Buxwaha, 3 people were interviewed. Each person was interviewed three times during the periods of February to May 2025 and March to April 2026 for the Buxwaha region. In each occasion, we took again the same questionnaire in order to confirm the robustness of the received information. The questionnaire included the local name and plant parts used, other diseases treated, practices of harvest, receipts, modes of administration, side-effects, etc. In most case, we accompanied the healers in the bush to see the plants that they indicated to

us at the time of the interviews. Voucher specimens of the recorded medicinal plants were collected by us with the informant, dried and processed according to standard practice, identified and then stored together at the Laboratory of Botany of the Sager Centre of Scientific Research.

- **Selection of plant species for quantification of iron content:** For the determination of iron content, 25 plant species were selected among the most available, accessible and known by the populations for the treatment of anemia and associated diseases (Table 1). The plant parts were collected or bought in November 2025 in Buxwaha because of its proximity with Buxwaha where the laboratory analyses were carried out.

Table (1): Iron-Rich Medicinal Plants Used in Traditional Treatment of Anemia

S. No.	Botanical Name	Family	Local Name	Parts Used	Iron Content (mg/100 g)	Medicinal Importance in Anemia
1	*Amaranthus viridis*	Amaranthaceae	Chaulai	Lvs, St	**21.7**	Natural iron tonic and nutritional supplement
2	Arachis hypogaea	Fabaceae	Ground nut / Mungfali / Peanut	Sd	**4.5**	Supports haemoglobin formation and provides energy during anemia
3	*Beta vulgaris*	Amaranthaceae	Chukandar / Beetroot	Rt	**11.3**	Enhances blood production
4	*Brassica juncea*	Brassicaceae	Sarson	Lvs, Sd	**1.6**	Helps maintain healthy blood levels
5	*Cassia tora*	Fabaceae	Chakauda / Puwar	Lvs	**3.6**	Iron-rich leafy vegetable
6	*Cicer arietinum*	Fabaceae	Chana	Lvs, Sd	**3.9**	Good iron and protein source
7	*Chenopodium album*	Amaranthaceae	Bhathua	Wp	**16.2**	Iron-rich leafy vegetable
8	*Coriandrum sativum*	Apiaceae	Dhaniya	Wp	**12.7**	Traditionally used to improve blood quality
9	*Emblica officinalis*	Phyllanthaceae	Amla	Ft, Lvs	**9.5**	Improves iron absorption due to Vitamin C
10	*Glycine max*	Fabaceae	Soyabean	Sd	**15.2**	Rich protein and iron supplement
11	Ipomoea aquatica	Convolvulaceae	Kalmi Saag	Lvs	**2.5**	Traditionally used for blood deficiency
12	*Jaggery*	Saccharaceae	Gud	St	**11.0**	Traditional remedy for iron deficiency
13	*Linum usitatissimum*	Linaceae	Alsi	Sd	**5.5**	Helps improve haemoglobin levels,
14	*Lens culinaris*	Fabaceae	Mansoor Dal	Sd, Lvs	**3.3**	Enhances RBC formation

15	*Mentha spicata*	Lamiaceae	Pudina	Lvs	**5.3**	Enhances digestion and iron absorption
16	*Moringa oleifera*	Moringacea	Sahjan / Drumstick / Munga	Lvs, Ft	**28.2**	Increases haemoglobin, improves blood formation
17	*Nelumbo nucifera*	Nelumbonaceae	Kamal Kakadi	St, Sd	**1.4**	Supports blood purification
18	*Petroselinum crispum*	Apiaceae	Ajmod	Lvs	**6.2**	Mineral-rich herb for improving blood health
19	*Pisum sativum*	Fabaceae	Matar	Sd	**1.5**	Supports nutrition during anemia
20	*Punica granatum*	Lythraceae	Anar	Sd, Ft	**13.0**	Improves haemoglobin level
21	*Sesamum indicum*	Pedaliaceae	Til	Sd	**14.6**	Used in traditional iron supplements
22	*Spinacia oleracea*	Amaranthaceae	Palak	Lvs	**15.6**	Rich source of iron and folic acid
23	*Trigonella foenum-graecum*	Fabaceae	Methi	Lvs, Sd	**18.4**	Used for weakness and anemia
24	Murraya koenigii	Rutaceae	Kari Patta	Lvs	**6.0**	Traditionally used for anamia and fatigue
25	*Urtica dioica*	Urticaceae	Bichu Booti	Lvs	**3.1**	Used traditionally to treat anemia and fatigue

{Symbols: Lvs = Leaves, Rt = Roots, Sd = Seeds, St = Stems, Ft = Fruits, Wp = Whole plant}

Table (2): Listed of 10 highly iron-rich medicinal plants of Buxwaha (Chhatarpur) region

S. No.	Botanical Name	Family	Local Name	Iron Content (mg/100g)
1	*Moringa oleifera*	Moringacea	Sahjan / Munga	**28.2**
2	*Amaranthus viridis*	Amaranthaceae	Chaulai	**21.7**
3	*Trigonella foenum-graecum*	Fabaceae	Methi	**18.4**
4	*Chenopodium album*	Amaranthaceae	Bhathua	**16.2**
5	*Spinacia oleracea*	Amaranthaceae	Palak	**15.6**
6	*Glycine max*	Fabaceae	Soyabean	**15.2**
8	*Sesamum indicum*	Pedaliaceae	Til	**14.6**
9	*Punica granatum*	Lythraceae	Anar	**13.0**
10	*Coriandrum sativum*	Apiaceae	Dhaniya	**12.7**
	Beta vulgaris	Amaranthaceae	Chukandar	**11.3**

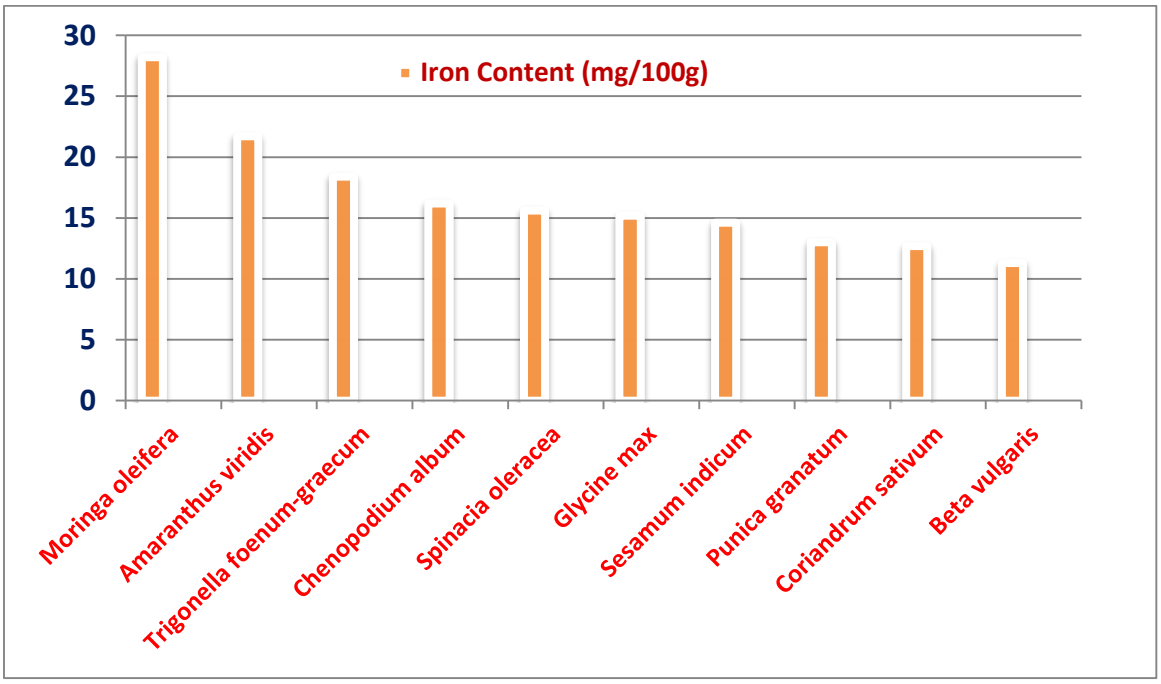

Figure (1): Highly iron content medicinal plants found in Buxwaha region

Table (3): family wise listed number of plants from Buxwaha (Chhatarpur) region

Sr. No.	Name of Family	No. of Plant
01	*Amaranthaceae*	04
02	***Fabaceae***	**07**
03	Apiaceae	02
04	Moringacea	01
05	Rutaceae	01
06	Lythraceae	01
07	*Phyllanthaceae*	01
08	Pedaliaceae	01
09	*Brassicaceae*	01
10	*Urticaceae*	01
11	Convolvulaceae	01
12	Nelumbonaceae	01
13	Saccharaceae	01
14	Lamiaceae	01
15	Linaceae	01

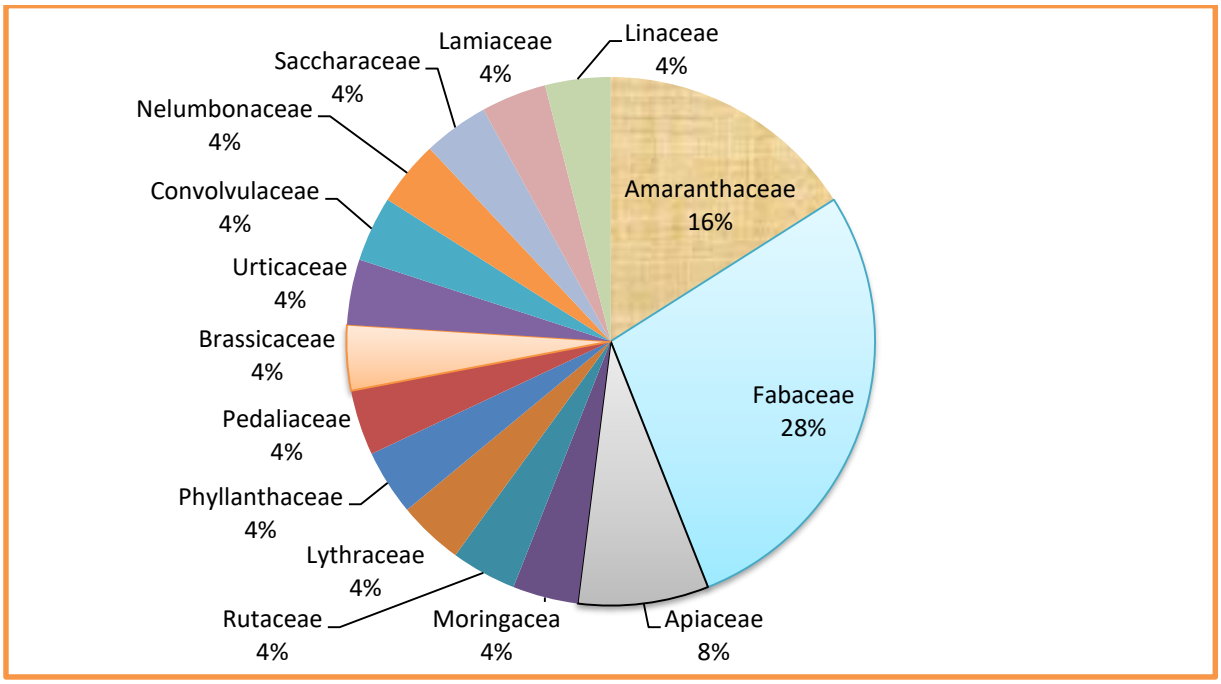

Figure (2): Pie Graph of Iron Content (mg/100g) in Medicinal Plants along with family wise

- **Preparation of plant samples:** Three gram (3g) of each plant samples were weighed and subjected to dry washing in a well cleaned porcelain crucible at 450°C in a muffle furnace during 24 hours. Ashes were allowed to cool at room temperature. The ashes (0.3g) were dissolved in 5 ml of concentrated hydrochloric acid in order to precipitate all the particles towards the bottom of the crucible. Final volume was adjusted to 50 ml with distilled water. The solution was filtered twice with filter paper. Quantification of iron content of plant samples, The total iron content in the standard solution and samples of selected plants was obtained by phenanthroline method (AOAC, 1975; Pearson, 1976) modified using analysis by absorption spectrophotometer. The principle of the reaction is based on the formation of an orange red complex of orthophenanthroline and ferrous ion **(fer2+)** detectable in UVVIS at 510 nm. To 1 ml of each solution to be studied, we added respectively 1 ml of hydrochloride hydroxylamine (10 gm. of hydro chlorate hydroxylamine in 50 ml of distilled water), 02 ml of the buffer solution of sodium acetate **(8.5 gm of sodium acetate, 12 ml of acetic acid and 88 ml of distilled water**), 2 ml of orthophenanthroline solution (0.1 g of orthophenanthroline in 80 ml of distilled water with 80 °C).

After 30 minutes of stabilization, the absorbance was measured with the spectrophotometer (510 nm). Iron determination was carried out for a range of concentrations from 0.01 to 0.06 mg/g of iron standard solution (100 mg/ml). Three measures were recorded, and then the arithmetic mean calculated. The iron concentration of each sample was calculated graphically using a calibration curve in the linear range by plotting the extract concentration vs. the corresponding iron content. Then, the content of iron of each sample is calculated by using the following

- **Formulae:** Iron content (mg/100 g) = (CxDFx10x100)/P;

C: Iron concentration of the sample, obtained from the calibration curve (mg/g); DF: Dilution Factor, P: Mass of ash (g)

Results:

Twenty five (25) plant species covering 25 genera and 15 families were recorded (Table 1). Among these medicinal herbs, 14 were recorded in the Buxwaha region and 11 in village's area. The richest families were Fabaceae, Amaranthaceae and Apiaceae with 13 plant species. From the table 2, highly iron content presence into *Moringa oleifera* (28.2 mg/100 g), *Amaranthus viridis* (21.7 mg/100 g), *Trigonella foenum-graecum* (18.4 mg/100 g) along with *Chenopodium album* (16.2 mg/100 g), *Spinacia oleracea* (15.6 mg/100 g) *and Glycine max* (15.2 mg/100 g). The interviewees did not mention side effects for any of the listed plants, which were reported to be used in the preparation of 25 medicinal

remedies for the treatment of anemia. The most used parts were the Leaves (56%), Seed (40%), followed by the stem and fruits (12%), whole plants (8%) and roots (4%).

Conclusion:

The Buxwaha region of Chhatarpur possesses rich ethnomedicinal knowledge regarding the use of herbal plants for the treatment of anemia. Plants such as Moringa oleifera, Amaranthus tricolor, Lepidium sativum, and Murraya koenigii are especially important because of their high iron content and therapeutic value. Scientific validation and conservation of these traditional medicinal plants can contribute significantly to rural healthcare and nutritional management.

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