

Antidiabetic Plants Used By Tribals At Satpura Hills, Betul-District (M.P.) In Central India

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DOI: 10.18811/ijpen.v11i01.25

ABSTRACT

A survey was taken between the year of 2020-2023 in Satpura hills, Betul district of Madhya Pradesh, in Central India. It is very rich in biodiversity specially for availability of various rare and medicinally important plant species. Gonds and Korkus are local tribal people. They use these plants for treatment of diabetes and its complications. In Ayurveda, Homeopathy and Unani medicine system, these herbs play an important role in modern therapy. All herbal medicines are cost-effective and also free from serious side effects. We found a total of 26 herbal plants species distributed in 18 families in this Satpura region. These potent medicinal plants are used in diabetes or related complications. In this work, we mainly focused on hypoglycemic herbs used by tribals of Satpura hills.

Highlights

- Identify new potent antidiabetic traditional herbal medicines in Satpura region (Betul, M.P., India).
- Give a platform to the new researcher for the identification of novel antidiabetic phytoconstituents.
- Suggest treatment of diabetes and its related complications with fewer side effects.
- Highlight rich biodiversity and tribal culture of the Satpura region in the Betul district of M.P., India.
- Help to conserve many plant species or biodiversity in the Satpura region.

Keywords: Antidiabetic, Betul District, Medicinal plants, Satpura hills, Tribals

International Journal of Plant and Environment (2025);

ISSN: 2454-1117 (Print), 2455-202X (Online)

INTRODUCTION

According to District Survey Report District Betul M.P. (2016), Betul is a district located in south of Madhya Pradesh state (Fig.1A). Most of which is situated on Satpura Plateau. It is situated between 21° 22' and 22° 24' North latitude and 77° 04' and 78° 33' East Longitude. It is geographically compact shape and mostly square with slight projections to the east and west. Betul district is spread over the Satpura mountain ranges at an altitude of 365 meters above sea level (Fig.1B). This mountain range is higher on the east side. This goes down towards the west. The average height is 653 meters high. The series is divided into four parts (1) Satpura Mountain Range (2) Tawa Morand Valley (3) Between Satpura Plateau (4) The Valley of Tapti River.

Total area of Betul district is 10,078 Sq.km and forest area is 3,967 Sq.km. Apart from dry deciduous forests, many moist and semi-evergreen species are found in the vegetation (Fig. 1C). The area receives an average rainfall of 1085 mm annually. Gond and Korku are the main tribes in this area. Prima facie Betul is a tribal district. 39.43% of the total population is of the Gond and Korku tribes (District Survey Report 2016). Although, detailed studies conducted on forest of Satpura had been carried out by Bagul *et al.*, 2006; Bagul and Yadav, 2007; Bagul and Patil, 2011; Bagul, 2011; Bagul, 2013; Bagul, 2015; Jafri *et al.*, 2021; Chaudhari *et al.* 2022. In most of the studies known till now, there has been no specific study of anti-diabetic medicinal plants in the Satpura mountain ranges of the Betul district. Therefore, it is very important to collect information about anti-diabetic plants in these tribal areas. In this survey, information has been collected from local rural health practitioners through personal communication. The use of plant medicines as anti-diabetic agents is a huge topic. There is a lot of literature available on the use of these medicines in the treatment of diabetes, especially in Indian conditions.

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How to cite this article: Choudhary, S. (2025). Antidiabetic Plants Used By Tribals At Satpura Hills, Betul-District (M.P.) In Central India. *International Journal of Plant and Environment*. 11(1), 225-229.

Submitted: 20/03/2024 **Accepted:** 18/02/2025 **Published:** 28/03/2025

There is a need to encourage the use of these plant medicines further. The present work represents the profile of Indian medicinal plants commonly used by tribals living in Satpura hills of Betul district, M.P., India, that have been practiced and used to be effective as anti-diabetic herbs. The profile describes the scientific name, family and usage of these medicinal plants for the treatment of diabetes. These tribal people have not received any formal education, but they have kept very good knowledge of the medicinal importance of plants from generation to generation. Even in the face of economic poverty, they are giving life to the needy by using these medicinal plants in the treatment of various incurable diseases.

MATERIALS AND METHODS

An intensive ethnobotanical survey was conducted between July 2020 and April 2023 in various bodies of the Satpura region under Betul district in Central India. During this, information was collected from people from different tribal communities using the interview method. The local people call them Bhagat, Maharaj, a knowledgeable person, or a witch doctor.

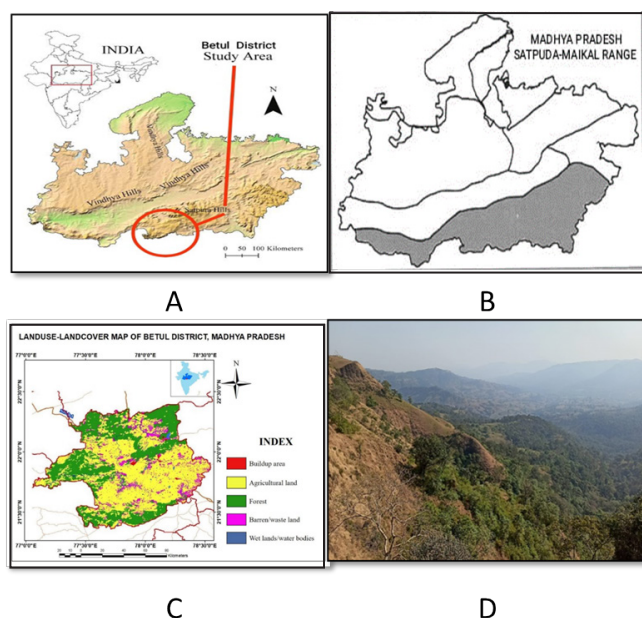


Fig. 1: A. Showing Betul - District in MP, India Map B. Satpura Plateau in MP C. Betul District Map showing Landuse (Including forest area) D. Kukru (Betul) Satpura Mountains

The medicinal uses of local plants, especially those used in diabetes and its related problems, were carefully discussed. For this work, data was collected through a simple questionnaire (Buwa-Komoren *et al.*, 2019). Voucher specimens of various plants were collected from the visited area and identified on the basis of the available literature (Singh *et al.*, 2001, Patekar *et al.*, 2017, Rathi *et al.*, 2021). Also, the herbarium prepared using the standard method (Das, A. 2021) has been deposited in the Botany Department of Government College, Shahpur, District Betul, Madhya Pradesh. Personal information of the respondents like age, gender, education, community status (medicine man, doctor, nurse), and details about herbs like habit and habitat of the plants, occurrence, type of forest in which the plant was found, availability in nature (rare, common, occasional, frequent, etc.), mode of administration (oral, external), plant parts used to treat, doses given with and how many times, doses of drugs (teaspoonful, paste, glassful), etc. were collected. A description of the scientific names and local names of various medicinal plants, along with their useful parts, mode of administration and dosage is given in Table-1.

RESULTS AND DISSCUSION

Details about Respondents

It is the natural tendency of the tribal community to treat with natural herbs. They have been doing this work for many generations. These traditional healers are called 'Bhagat'. A total of 9 Bhagats were interviewed during this survey. All of them live in small villages located on the Satpura mountain ranges under the Betul district. The age of all was between 45 to 88 years. They had treatment experience ranging from 7 to 35 years. They were completely dependent on farming, labor,

or forest products. All these tribes communicate in Gondi and Korku languages. They also have knowledge of Hindi language. Most of them had received only primary education. Tribals also worship nature including trees.

Ethnobotanical Data

During the survey, authentication and documentation (Table-1) of 26 plant species from 18 families were done (Fig. 2). This was being used by the tribal people in the study area to cure diabetes and its related problems. Among these, four species each of the Apocynaceae family, three species of Fabaceae, two species each of Amaryllidaceae, Cucurbitaceae, and Rutaceae and one plant species each from the remaining families were used in the treatment of diabetes. All the information was given by the informant in the local language. This was transcribed and collected through questionnaires.

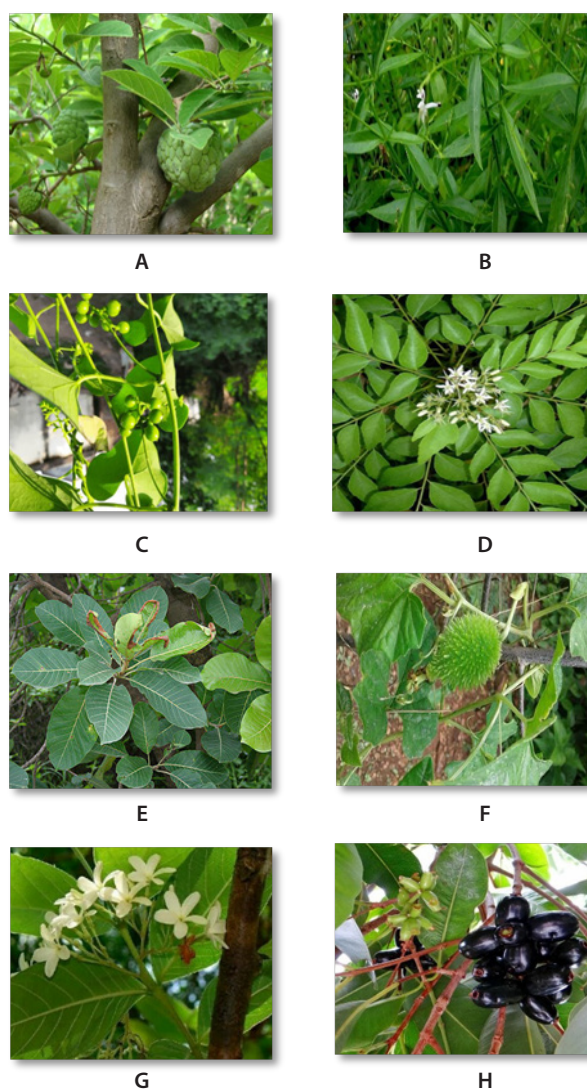


Fig. 2: Some Traditional antidiabetic plants used by tribals at Satpura hills

A. *Annona squamosa* B. *Andrographis paniculata* C. *Tinospora cardifolia* D. *Murraya koenigii* E. *Madhuca longifolia* F. *Momordica dioica* G. *Holarrhena antidysenterica* H. *Syzigium cumini*

Table 1: Antidiabetic plants used by tribals at Satpura hills in Betul-District

S. NO.	Botanical name	Local name/Family/Parts used	How to prepare medicine	Doses / Uses
1	<i>Aegle marmelos</i> (L) Corr.	Bel/Rutaceae/Fruits	Prepare fruit juice and add few drops of 'Ghee'.	50 ml. juice take early in the morning with empty stomach for one week.
2	<i>Allium cepa</i> L.	Pyaj/Amaryllidaceae/ Bulb	Raw bulb is used in diet	50 gm raw bulb is taken thrice daily in diet for 4 weeks.
3	<i>Allium sativum</i> L.	Lahsun/Amaryllidaceae/ Tuber	Used raw garlic tuber.	At least one clove or equivalent daily on an empty stomach.
4	<i>Alstonia scholaris</i> R.Br.	Saptaparni/Apocynaceae/ Stem Bark	The Bark of plant soaked in water overnight.	This water (One Cup) is given to the patient in the morning for 7 days.
5	<i>Andrographis paniculata</i> Nees.	Kalmegh/Acanthaceae/ Whole plant	Two to three fresh leaves are plucked in the morning.	Leaves are eaten in the morning on an empty stomach for 5 days.
6	<i>Annona squamosa</i> L.	Seetaphal/Annonaceae/Stem Bark	Bark of plant is crushed and processed.	40-50 ml decoction is taken daily for 7 days.
7	<i>Azadirachta indica</i> A. Juss.	Neem/Meliaceae/leaves	Some fresh leaves are plucked in the morning.	Seven leaves are eaten by patient in the morning for 7 days.
8	<i>Butea monosperma</i> (Lam.) Taub.	Palsha/Fabaceae/Flowers	Some fresh flowers are plucked in the morning.	Seven flowers are eaten every morning for 14 days.
9	<i>Calotropis gigantea</i> L.	Akav/Apocynaceae/Fresh Flowers	Some fresh flowers are plucked in the morning.	Seven flowers are eaten by patient in the morning for 21 days.
10	<i>Catharanthus roseus</i> L.	Sadavasant/Apocynaceae/Flower and leaves	Tea is made by boiling 10 leaves or 10 flowers in water.	This tea is sipped throughout the day till cured.
11	<i>Centratherum anthelminticum</i> (L) Kuntze	Jangalijeera/Asteraceae/ Seeds	2 gms seeds are ground to powder.	It is taken daily in the morning for 7 days.
12	<i>Ficus benghalensis</i> L.	Bad/Moraceae/Stem Bark	Decoction is prepared by bark.	50 ml. decoction is given in a dose.
13	<i>Curcuma longa</i> L.	Haldi/Zingiberaceae/ Rhizome	The rhizome is dried (5-7 cm) and made into powder.	This powder is taken twice a day with a cup of milk.
14	<i>Gymnema sylvestre</i> (Ritz.)	Gudmar/Asclepiadaceae/Fresh Leaves	Some fresh leaves are plucked in the morning.	One leaf is eaten in the morning on an empty stomach for 10 days.
15	<i>Holarrhena antidysenterica</i> (L.) Wall.	Kutuja/Apocynaceae/ Stem Bark	Bark of Kutuja is crushed and processed.	Decoction of bark (1/2 cup) is taken twice a day.
16	<i>Madhuca longifolia</i>	Mahua/Sapotaceae/Stem Bark	Pieces of stem bark are boiled in a glass of water.	This water is taken twice a day.
17	<i>Mengifera indica</i> L.	Aam/Anacardiaceae/ Seeds	Few seeds are powdered.	3-6 gm seed powder is taken for 7 days in the morning.
18	<i>Momordica charantia</i> L.	Karela/Cucurbitaceae/ Fruits	Prepare fresh fruit juice.	50 ml. juice is taken with empty stomach.
19	<i>Momordica dioica</i> Roxb. ex Willd.	Kakora/Cucurbitaceae/ Fruits	Used as cooked vegetable.	Twice per day for a week in diet.
20	<i>Murraya koenigii</i> (L.) Spreng.	Mithi Neem or Kadi patta/ Rutaceae/Leaves	Boil a glass of water and add 10-15 fresh leaves along with fresh mint leaves.	It is taken daily in the morning for 5 days.
21	<i>Phyllanthus emblica</i> L.	Aavla/Euphorbiaceae/ Fruits	Fresh fruits or Dry fruit powder.	This powder is given teaspoonful twice a day till cured.
22	<i>Pterocarpus marsupium</i> Roxburgh.	Beejak/Fabaceae/Stem Bark	The stem bark is finely ground.	This powder (teaspoonful) is given twice a day till cured.
23	<i>Rubia cordifolia</i> L.	Manjishtha/Rubiaceae/ Root or Stem	Prepare powder of root or stem.	Take 1/4 or 1/2 teaspoon powder by mixing it in warm water twice a day.
24	<i>Syzygium cumini</i> (L.) Skeels.	Jamun/Myrtaceae/Fruits, Seeds, Bark	Infusion is prepared from fruits or mixture of bark and seed is powdered.	Infusion (10 ml) is given orally or a teaspoonful powder taken orally 3 times a day for 3 weeks.
25	<i>Tinospora cardifolia</i> (Willd.)	Guduchi or Giloy / Menispermaceae/ Twigs	5-6 cm twig is ground to powder.	Prepared powder is taken by the patient twice a day (For 7 days).
26	<i>Trigonella foenum graecum</i> L.	Methi/Fabaceae/Seeds	The seeds (10 gm) are soaked in a glass of hot water and kept overnight.	These seeds are eaten in the morning on an empty stomach for five days.

Habit and Habitat

Betul district is rich in forests and biodiversity. Tropical dry deciduous forests are found in this region. Kukru is one of the hilly areas in this region with a high biodiversity (Fig.1D). Various

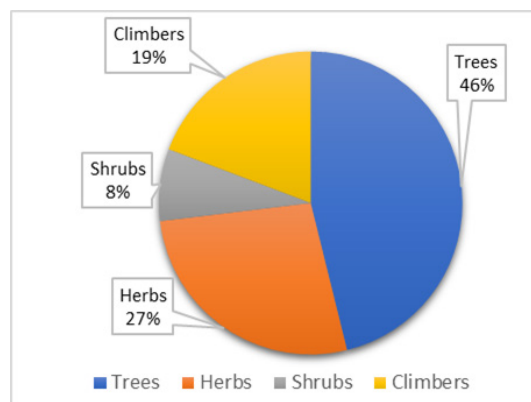


Fig.3 : Habit of anti-diabetic plants in the study area

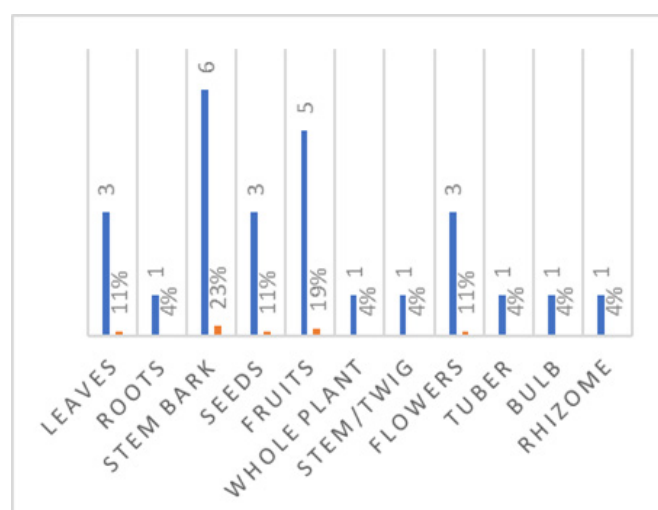


Fig.4 : Plants parts used (%) for preparation of anti-diabetic medicine

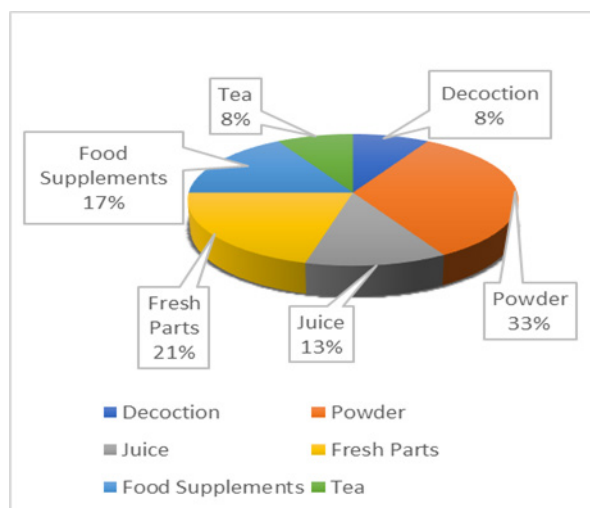


Fig.5: Herbal preparations and proportional contribution in the treatment

documented plant species in the study area are classified in Figure 3 based on their habits. A total of 26 plant species have been identified. Mainly, four types of habits were seen among them. These include 12 species of trees, 7 species of herbs, 2 species of shrubs, and 5 species of climbers. Hence, it is clear that 46.15% of trees and 26.92% of herbs were used by these traditional healers in the study area for the treatment of diabetes.

Collection of Plants parts used

Every part of the plant is important as a herbal preparation. Although it has been observed that stem bark (23.07%) has been used the most for medicinal purposes by most of the traditional healers, (Fig. 4) Apart from this, fruits (19.23%), leaves (11.53%), seeds (11.53%), flowers (11.53%), roots, whole plant, stems or branches, tubers, bulbs, and rhizomes (each 3.84%, respectively) have also been used. We know that using leaves as medicine is more important for plant survival than using the stem, root, or entire plant. This helps in the conservation of local fauna and flora.

These medicinal plants were used in the treatment of diabetes by traditional healers based on traditional knowledge. Mainly herbal preparations were used in the form of decoctions, juice, powder, tea, food supplements, and fresh plant parts. Herbal preparation powder was used in a maximum of 8 applications, while fresh parts, decoctions, and food supplements were used in 5, 4, and 4 applications, respectively. Tea and juice were used in 2 and 3 applications, respectively (Fig.5).

CONCLUSION

During the study, it was found that the people of the Gond and Korku tribes living in the forests located on the Satpura mountain ranges under the Betul district have been using medicinal plants for diabetes and its related problems on the basis of traditional knowledge. In this survey, 26 plant species belonging to 24 genera and 18 families were found to be used by the tribal people in the treatment of diabetes and its related complications. In which there is very little description of some plant species in the literature of Indian medicinal plants. Most of the medicinal plants have been used in fresh mode and powder form or in the form of cold decoction. Along with the conservation of all the plants mentioned in Table 1, it is very important to conduct research to identify their medicinal importance of their active ingredients and to know the mechanism of action. By planting these plants through social forestry or horticulture, the future needs of the traditional medicine market can be met.

ACKNOWLEDGEMENT

The author is thankful to Prof M. D. Waghmare, Principal and Dr. Nitesh Pal, HOD, Department of Botany, Govt. College Shahpur, District- Betul, M.P., India for providing the facilities and valuable support to complete this manuscript.

AUTHOR'S CONTRIBUTIONS

The research was designed by S. Choudhary (SC), Field visit, data collection done by SC, data analyzed by SC, Manuscript was written or prepared by SC and SC also prepared herbarium sheets.

CONFLICT OF INTEREST

NONE.

REFERENCES

- Bagul, R.M. & Patil, D.K. (2011). Traditional Medicines and healthcare system of tribal's Of Shirpur Tehsil of Satpuda Forest. *Plant Archives* 11 (1):271-273. https://www.researchgate.net/publication/289143388_Traditional_medicines_and_healthcare_system_of_tribals_of_shirpur_tahsil_of_satpuda_forest
- Bagul, R.M. (2011). Ecofriendly Food and Vegetable Plants from Satpuda Forest region of East. Khandesh. *Plant Archives* 11 (1): 337-338. https://www.researchgate.net/publication/29865932_Ecofriendly_food_and_vegetable_plants_from_Satpuda_forest_region_of_East_Khandesh_MS_India
- Bagul, R.M. (2013). Traditional Medicines and Healthcare Systems of Tribal's of Satpuda forest region of east Khandesh, *World Journal of Pharmaceutical Research* 1(1):06-09. https://www.researchgate.net/publication/289143388_Traditional_medicines_and_healthcare_system_of_tribals_of_shirpur_tahsil_of_satpuda_forest
- Bagul, R.M. (2015). Traditional Ethnoveterinary Practices, Medicinal Plants from Satpuda Forest, East Khandesh, Maharashtra, India. *International Journal of Science and Research* 4(5): 2714-2720. <http://hdl.handle.net/10603/342284>
- Bagul, R.M. & Yadav, S.S. (2007). Threat Assessment of Some Medicinal Important Plants of Satpuda Forest East Khandesh: A Conservative Approach. *Plant Archives* 7(1): 367-370.
- Bagul, R.M., Yadav, S.S. & Garud, B.D. (2006). Medicinal Plants of East Khandesh Satpuda with Reference to Their Threat Status and Uses. *Plant Archives* 6(1): 357-358.
- Buwa-Komoren, L.V., Mayekiso, B., Mhinana, Z. & Adeniran, A.L. (2019). An ethnobotanical and ethnomedicinal survey of traditionally used medicinal plants in Seymour, South Africa: An attempt toward digitization and preservation of ethnic knowledge. *Pharmacognosy Magazine*. 15 (60): 115-123. DOI: 10.4103/pm.pm_259_18.
- Chaudhari, S. A., Patil, A. N. & Bagul, R. M. (2022). Documentation on antidiabetic Ethnomedicinal plants from Satpuda forest region of East Khandesh, India. *Plant Archives*, 300–303. <https://doi.org/10.51470/plantarchives.2022.v22.no1.047>
- Das, A. (2021). Herbarium Technique: Bhandari J.B. & Gurung C. (Ed.) Instrumentations manual in biology. Narosa Publishing House, India, pp.78-94. https://www.researchgate.net/publication/349640811_Herbarium_Technique
- Directorate of Geology and Mining Mineral Resource Department, Govt. Of Madhya Pradesh. (2016) *District survey Report District Betul M.P.*, <https://tinyurl.com/betulreport>
- Jafri, J.H., Bagul, R.M. & Uddin, A. (2021). Traditional Ethnoveterinary practices from Satpura forest region of Burhanpur district Madhya Pradesh, India. *International Journal of Multidisciplinary Research* 7 (6): 415-418.
- Patekar, R., Jaiswal, M.L., Neelam, Chaudhary, A. & Hivale, U. (2017). Anti diabetic potential of some selected traditionally used Medicinal Plants in Western Ghats of India w.s.r to Prameha. *International Journal of Ayurvedic and Herbal Medicine* 7(4): 2663-2671. DOI:10.18535/ijahm/v7i4.05.
- Rathi, B. J., Khobragade, P., Rathi, R., & Gupta, R. (2021). Ethno-botanical Survey on Medicinal plants used by Tribes of Karanja (Ghadge) Tahsil of Wardha District, Maharashtra, India. *International Journal of Ayurvedic Medicine* 12(1): 4352. DOI: <https://doi.org/10.47552/IJAM.V12I1.1764>
- Singh, N.P., Lakshminarasimhan, P., Karthikeyan & Prasanna, P. V. (2001). *Flora of Maharashtra State*. Vol. I, II, III, Botanical Survey of India, Calcutta. https://bsi.gov.in/uploads/documents/Public_Information/publication/books/state_flora_latest/Flora%20of%20Maharashtra%20State%20%20Dicotyledones%20vol%201.pdf