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Short Communication: Ethnomedicinal plants used as antiglycemic by tribes around Achanakmar Amarkantak Biosphere Reserve, Madhya Pradesh, India

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Abstract. *Baghel BS, Verma M, Chaudhry S. 2024. Short Communication: Ethnomedicinal plants used as antiglycemic by tribes around Achanakmar Amarkantak Biosphere Reserve, Madhya Pradesh, India. Asian J Ethnobiol 7: 122-129.* The diabetes issue has become severe in Indian society, where most people consume carbohydrate-rich foods. The real problem in addressing the issue of diabetes is the duration of the course of treatment using allopathic medications, which creates problems of side effects and are not affordable for rural people. Hence, people of such regions resort to traditional ethnomedicinal practices as most healers are known to them. The study aims to document the indigenous plants used for treating diabetes around Achanakmar Amarkantak Biosphere Reserve (AABR), Madhya Pradesh, India. The data were collected with a semi-structured questionnaire by interview method with all the selected healers by identifying plants used for diabetes treatment. We interviewed 200 traditional healers across 48 villages in Madhya Pradesh. Forty plant species belonging to 35 genera, and 30 plant families were used as antidiabetics. Most of the plants were Apocynaceae (4), and Malvaceae (3), remaining had less contribution; mostly herbs were used 42.5%, trees 32.5% and shrubs 25%. The most frequent part used was leaf 28%, and the common method of preparation was infusion 33%. The Fidelity Level (FL) was highest at 98% for *Terminalia arjuna* and *Pterocarpus marsupium*, followed by *Bauhinia vahlii* at 92% and *Tinospora cordifolia* and *Moringa oleifera* at 88%. The greatest ICF was ranked at 0.602 for *T. arjuna* and *P. marsupium*, followed by *B. vahlii* at 0.589 and *M. oleifera* at 0.581. Studying indigenous plant ingredients for medicinal benefits and how they work could lead to safe, effective natural drugs through refinement and processing.

Keywords: Diabetes, dosage, ethnobotanical indices, ethnomedicinal plants, traditional healers

INTRODUCTION

Hyperglycemia, or excess of glucose present in human blood, is commonly referred to as diabetes, which is characterized by a reduction in insulin production resulting in diabetes mellitus (ADA 2010). A study conducted in 2017 showed that there were about 462 million people affected by diabetes mellitus throughout the world, which roughly corresponds to 6.28% (Khan et al. 2020). In India, most people follow a carbohydrate-rich diet (Joshi et al. 2014), and sweets are commonly used in times of festivals or celebrations. There has been a rapid rise of urbanization and globalization across the world, and according to UN reports 2018, by 2050, 68% of the world will be urban. The rapid rise in urbanization and increase in population leads to an atmosphere that makes life stressful. Increased population in urban centers will ultimately lead to a competitive and stressful environment for its residents (Srivastava 2009). Though urban areas provide numerous opportunities for their residents for livelihood, there is an increase in stress levels due to competition, which often leads to lifestyle-related disorders and stressful mental conditions (Pelgrims et al. 2021). In turn, this makes the urban population insecure about lifestyle diseases such as diabetes, increased blood pressure, and increased blood cholesterol, thereby increasing the risk of mortality (Pappachan 2011).

Diabetes mellitus itself is a disease that requires long-term allopathic medications; there is a growing concern about the safety of patients on allopathic medicines when they are on long-term treatment. In treating lifestyle-related disorders such as blood pressure and cardiac problems, such side effects may be particularly prominent (Malhotra 2018). A recent review on diabetes covering the antidiabetic medicinal plants reported that patients on oral antihyperglycemic medications were very likely to experience side effects tend to have adverse effects, such as drug resistance, toxicity, and hyperlipidemia (Salehi et al. 2019). There are various groups of allopathic medicines used in the treatment of hyperglycemia; among them, the sulfonylurea groups are known to lose efficacy when administrated over six years. There are also known complications for patients when they are on combined medications, such as those of high blood pressure, and known to lead to risk of heart failure and death (Petrie et al. 2018). Additionally, the long-term costs of allopathic treatment are unaffordable for low-income groups in rural areas; in developing countries, most people cannot afford expensive medicines and treatments.

People in certain areas rely heavily on plant-based medication since it is readily available and reasonably priced (Rahman et al. 2022). For tribal, rural, and forest-dependent people, forests contribute to generating alternate forms of income that will serve as important financial inducements to prevent destruction and offer additional livelihood benefits from preserving and restoring forest ecosystems (Patra et al. 2022). A recent study in Mizoram, India suggested that due to mass deforestation, rural depopulation, and younger generations' lack of interest in traditional treatment methods, traditional medicinal practices have been steadily declining in recent years (Ralte et al. 2024). The use of medicinal plants by the local communities for their healthcare system should be documented (Srivastava 2018). Most of the tribes in India live near forested areas whose lives are dependent on food, fuel, fiber, and medicines from these areas (Newton et al. 2016). In a health survey conducted in Oman, it was found that people held a view that traditional medicines had no side effects over prescription medicines (Al-Saadoon 2015). The WHO states that herbal remedies are the most frequently used traditional medicine and are the first choice of primary health care for 70-80% of people in the African region. One of the main reasons is that wild leafy green leaf grasses used for traditional medicine are essentially free, as most of them grow close to household areas (Ahmed et al. 2023). Traditional herbal medicinal plants show great promise not only for the upcoming discovery of drugs but their value is equally revered by people because of their low side effects and affordability in rural areas worldwide (Salehi et al. 2019).

In India, about 280 medicinal plants are documented to be used for treating diabetes. Different formulation doses are used in Ayurvedic, Homeopathy, Unani, Siddha, and Allopathic medicine. About 175 medicinal plants are found in the Himalayan region of India (Kumar et al. 2019). Most of the works in Central India have been on the documentation of the ethnomedicinal plant species (Roy et al. 2022). There are only very few references regarding the use of medicinal plants to treat certain diseases (Sofowora et al. 2013). However, it is reassuring to note that herbal medicines, which are derived from these plants, are very popular among people due to their fewer adverse effects on health. In India, most of the forests are under varying stages of destruction due to developmental activities. There are several reasons why it is crucial to record native knowledge regarding the use of medicinal herbs. Primarily, it assures that the cultural wealth of indigenous peoples is safeguarded and not lost, benefiting both the current and coming generations (Boadu and Asase 2017). For primary care, a significant proportion of the population in developing nations still depends on herbal remedies and traditional healers. Up to 90% of people in Africa and 70% in India, respectively, rely on traditional medicine to help them with their medical needs (Benzie and Wachtel-Galor 2011).

However, due to increased urbanization, understanding of their applications has decreased. Many researchers have suggested that urbanization leads to modifications that affect the identification, utilization, and administration of natural resources by diminishing their natural areas. Compared to the less urbanized population, which used and knew more about wild plants (Arjona-García et al. 2021). In a study conducted in Ethiopia, it was found that social and economic conditions are the drivers of preference for traditional medicinal practices (Chali et al. 2021). In Mexico, a similar study reveals that factors like urbanization and modern lifestyle may erode the knowledge of traditional medicinal plants (Arjona-Garcia et. al. 2021). A diverse range of plant species are frequently used in ethnomedical practices. Local communities can contribute to the preservation of biodiversity by acknowledging the importance of these plants (Alves and Rosa 2007). In an attempt to document the traditional knowledge in relation to anti-hyperglycemic plants used in this biodiversity-rich part of central India, the people living in this part have fewer amenities to modern healthcare and often resort to traditional healers for addressing their ailments.

MATERIALS AND METHODS

Study area

The present study was carried out around Achanakmar Amarkantak Biosphere Reserve (AABR), in six districts of Madhya Pradesh, India, i.e.: Anuppur, Balaghat, Chhindwara, Dindori, Mandla, and Seoni (Figure 1). Out of the six districts and 48 villages, the number of villages in each district is Mandla (14), Dindori (10), Seoni (5), Chhidwara (9), Anuppur (8), and Balaghat (2).

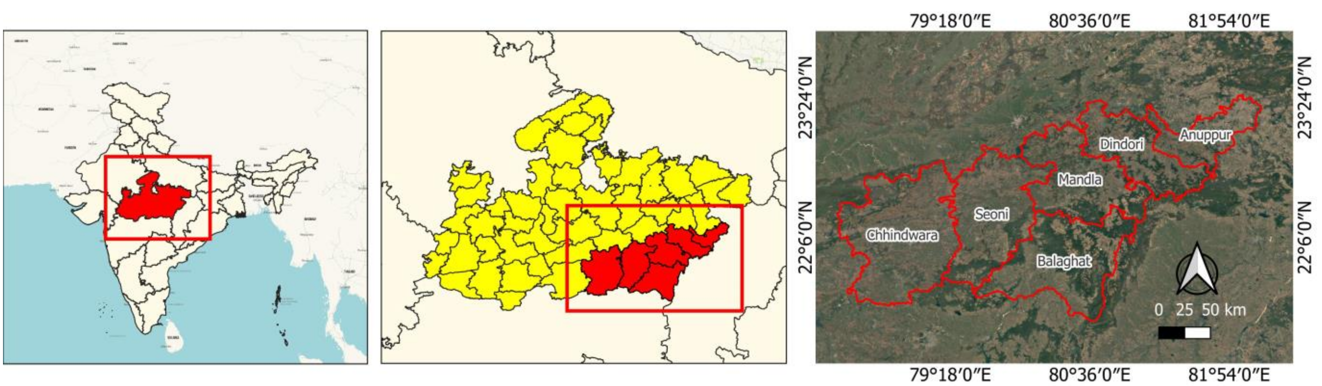

Figure 1. Study area around Achanakmar Amarkantak Biosphere Reserve (AABR), in six districts of Madhya Pradesh, India

Anuppur District had an estimated population of 749,237 as per the 2011 Indian Census. The district experiences a subtropical climate Balaghat District had a population of about 1,701,156 according to the 2011 Census. The Gonds and Baigas, indigenous tribes, form a significant portion of the population. Chhindwara District had a population of 2.09 million as per the 2011 Census. The district is known for its dense forests, wildlife reserves, and sanctuaries that help preserve biodiversity. Dindori District had a population of 704,524, according to the 2011 Census. Tribal populations, particularly the Gond and Baiga tribes, make up a significant portion of the district, contributing to its unique cultural landscape. Mandla District, home to about 1.05 million people, is known for its rich biodiversity. The district has tropical dry deciduous and moist deciduous forests. There are 1.4 million people living in the Madhya Pradesh State's Seoni District. Monsoon rainfall during occur during months June to September which drives the agriculture from otherwise dry weather from October-May. Temperature may soar to 45°C in summer while it may reach 2°C in December (www.cgwb.gov.in)

Data collection

Field survey to identify herbal practitioner prescribing medicine for hyperglycemia (diabetes). A total of 200 practitioners were located across 6 districts of Madhya Pradesh in 48 villages study area (Figure 1). A structured questionnaire was developed following by Dewangan and Sharma (2022) to record local names, plants used, part used, life form, plant source, mode of administration and mode of preparation. Plants used by healers for treatment were identified by comparison of herbarium specimens (Souza and Hawkins 2017) at BSI Allahabad also using field guides i.e. A Tree Spotters: Jungle Tree Field Guides of Central India (Krishen 2014), Common Indian wild Flowers (Khemikar 2000), Wild Edible Fruit Plants of Eastern India (Mahapatra and Panda 2009), Flowers of the Himalaya (Polunin and Stainton 1984), a Field Guide to the Flowering Plants of Central India (Chaudhry et al. 2019).

Data anaysis

Ethnobotanical indices such as the Fidelity Level (FL%) and Information consent factor were calculated using the formula below:

$$FL\ (\%) = \frac{Np}{N} \times 100 \text{ (Alexiades 1996)}$$

The fidelity Level (FL%) determines the most preferred species by traditional healers. Np denotes the number of use reports cited for a given species, and N is the total number of use reports cited for a given species. Hence, values closer to 100 would imply their higher use.

The Information Consent Factor (ICF) was calculated as follows:

ICF= Nur-nt / Nur-1

Number of use citations for each ailment minus the number of species used for that ailment, divided by the number of use citations for each ailment minus one (Rodrigo and Saldanh 2005).

RESULTS AND DISCUSSION

Elucidation of taxonomic diversity

It is critical to document the ethnobotanical knowledge of the Indigenous communities around the globe as this serves as a tool for helping in the conservation of biodiversity and cultural heritage and also aids in pharmacological research (Weldegerima 2009). There are challenges to the preservation of traditional knowledge in present-day contexts, like rural-to-urban migration and adopting a modern lifestyle as opposed to traditional and rural living. Documentation of traditional knowledge on medicinal plants leads to the conservation and sustainable utilization of bioresources and is also shown to be positively correlated to the development of future drugs (Kumar and Singh 2022). It was found that most of the indigenous knowledge in relation to the use of ethnomedicinal plant use lies with communities living in remote and forested areas. Hence, the simplest means to document using the field survey methodologies. The present study conducted across six Madhya Pradesh districts suggests 40 plant species belonging to 35 genera and 30 plant families used as antidiabetic. Among the plant families, the species contribution was Apocynaceae (4), Malvaceae (3), and Fabaceae (3). Combretaceae (2), Lamiaceae (2), and Moraceae also contributed two species, and the remaining 24 families contributed a single species each. In a study conducted in Morocco on ethnomedicinal plants used for diabetes treatment, most antidiabetic species were found to belong to the Lamiaceae (8), followed by Fabaceae (3) (Skalli et al. 2019). Similar results were obtained from the Vindhya region of India (Dharm and Pramod 2017). In a study in Ugandan forests found that in treatment of various ailments, the plant family Fabaceae was the most dominant (Tugume et al. 2016). Hence, it could be concluded that some plants dominate the diabetes treatment, probably due to their availability and medicinal properties.

Habit and parts useful

One of the commonest visual methods of segregation of medicinal plants is on the basis of their habit, i.e., trees, shrubs, and herbs. At the same time, some other forms may exhibit other adaptations, such as epiphytic, parasitic, and lianas (woody climbers); some may even show a preference for aquatic habitats. The life form or the habit analysis of ethnomedicinal plant species reveals that mostly herbs were used 42.5%, followed by trees 32.5%, and the least in the case of shrubs 25% (Table 1). While the plant part used enumeration suggests leaf (28%), bark (20%) was used predominantly, other parts such as root (10%), fruit (8%), other part used in conjunction are bark; leaf (2.5%), bark; seed (2.5%), black leaf (2.5%), bulb (2.5%), leaf; stem (2.5%), leaves; root; bark (2.5%), root; fruit (2.5%), seed (2.5%), stem (2.5%), tuber (2.5%), leaf; bark (2.5%), leaf; root (2.5%), leaf; stem (2.5%), and leaf; root; bark (2.5%) (Figure 2). The most important aspect of traditional ethnomedice is documentation of its does, which dertimines its safety and accuracy, this practice has evolved through centuries of trail-and error methods. Tribal healers in the research region utilize a variety of remdial prepration, the most common of which are infusion (33%) pills (23%), decoction (22%), powder (12%), and chewing (10%) (Figure 3). Most of these medicinal plants were sourced from the wild at 57.5%, while 22.5% were cultivated, and the remaining 20% were sourced from both wild and cultivated (Table 1). The primary collectors reported that antidiabetic plants based on ease of availability were easy at 45%, moderate at 35%, and difficult at 20%. This reveals that most of these plants either have good natural regeneration or are cultivated. Different parts of plants possess different amounts of active constituents (Rabizadeh et al. 2022) and are being identified by traditional healers across the globe through centuries of trial and error (Petrovska 2012). Recent studies on ethnomedicinal plant use also suggest that useful alkaloids are found mostly in leaves, which helps the recovery of both human and animal ailments (Mekonnen et al. 2022), and our study also affirms this fact. Hence, it is important to identify the plants and know the parts used and availability with respect to the season. Plants within the same family or even genus may often exhibit comparable chemical constituents and similar therapeutic applications. This intriguing phenomenon is exemplified in the Asteraceae family, where most species in the genus share anti-inflammatory, antimicrobial, and wound-healing properties (Rolnik and Olas 2021). This shared potential across plant families and genera is a fascinating area of study, further enhanced by the development of chemotaxonomy, a branch of taxonomy based on the chemical similarity of plants (Elbalola and Abbas 2024).

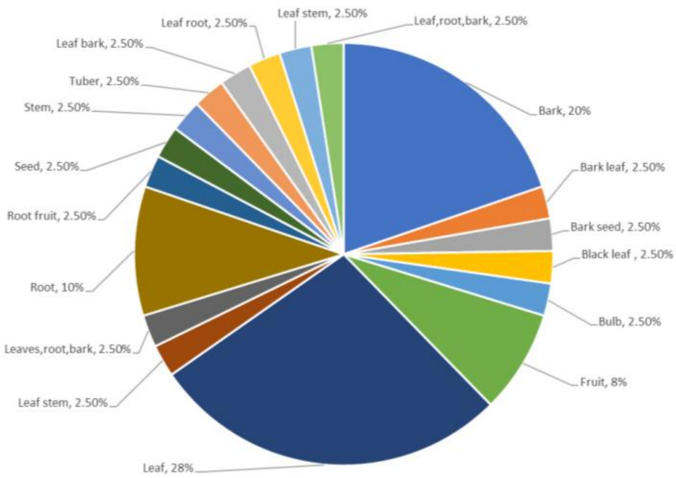

Figure 2. Different plant parts used for antidiabetic treatment

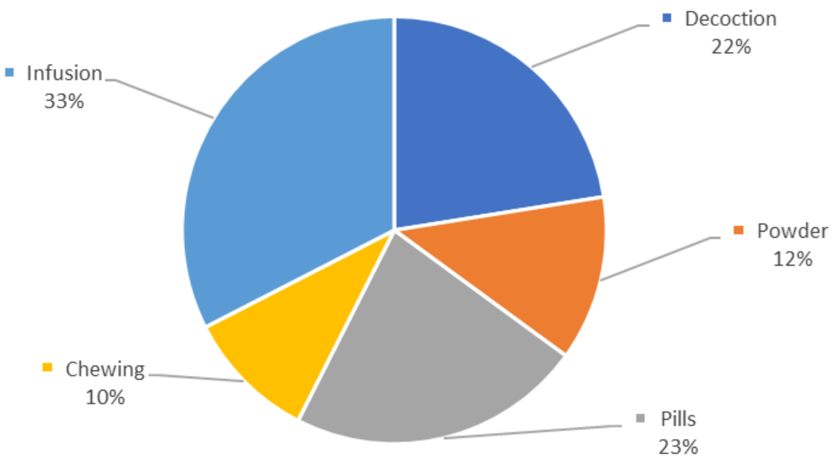

Figure 3. Different modes of administration of antidiabetic formulations

Table 1. Quantitative documentation of ethnomedicinal plant species of Anuppur, Chhindwara, Dindori, Mandla, Balaghat and Seoni Districts, India

Family	Botanical name	Local name	Life form	Part used	Plant source	Finding	Mode of administration	Mode of preparation	FL (%)	ICF
Acanthaceae	*Justicia adhatoda* L.	*Adusa*	Shrub	Leaf, root, bark	Cultivated	Moderate	Oral	Its roots, leaves and bark should be chewed and eaten	61.290	0.480
Amaryllidaceae	*Allium cepa* L.	*Lal pyaj*	Herb	Bulb	Cultivated	Easy	Oral	The bulb is crushed and juice is drinking	48.148	0.391
Annonaceae	*Annona squamosa* L.	*Sitafal*	Shrub	Leaf	Cultivated	Easy	Oral	Grind dry leaf make powder and drink with one glass of water	36.986	0.264
Apiaceae	*Trachyspermum ammi* (L.) Sprague	*Ajawain*	Herb	Seed	Cultivated	Moderate	Oral	Grind the dry seeds into powder and make pills and eat them twice a day	36.054	0.250
Apocynaceae	*Alstonia scholaris* (L.) R.Br.	*Kuraya*	Herb	Bark	Cultivated and wild	Moderate	Oral	Grind dry bark make powder and drink with one glass of water	30.719	0.152
Apocynaceae	*Calotropis procera* (Aiton) W.T.Aiton	*Akawan*	Shurb	Root	Wild	Easy	Oral	Grind the root and drink with warm water	25.786	0.025
Apocynaceae	*Carissa spinarum* G.Lodd	*Karonda*	Shurb	Bark	Cultivated and wild	Moderate	Oral	As a decoction Take half a cup in a small disposal of tea	31.579	0.170
Apocynaceae	*Gymnema sylvestris* R. Br.	*Gudmar*	Shurb	Leaf	Cultivated and wild	Moderate	Oral	Grind dry leaves and make powder and drink one spoon twice a day	85.185	0.571
Asteraceae	*Eclipta prostrata* (L.) L.	*Bhringraj*	Herb	Leaf	Wild	Easy	Oral	Grind the leaves, dissolve them in water and drink it with half a cup of water	35.135	0.035
Burseraceae	*Boswellia serrata* Roxb.	*Salhe*	Tree	Bark	Wild	Difficult	Oral	Dry the bark, make a decoction in half a cup of hot water, and drink it	27.389	0.071
Caesalpiniaceae	*Caesalpinia sappan* L.	*Patrang*	Herb	Root	Wild	Difficult	Oral	The root has to be dried, ground and then taken in pill form twice a day	28.205	0.093
Combretaceae	*Terminalia arjuna* (Roxb. Ex DC.) Wight & Arn.	*Kahwa*	Tree	Bark	Cultivated and wild	Moderate	Oral	Grind dry bark, add one spoon to a glass of Simple water and drink	98.620	0.602
Combretaceae	*Terminalia chebula* Retz	*Harra*	Tree	Fruit	Wild	Easy	Oral	You have to dry and grind the fruit, then make a pills and eat it twice a day	36.054	0.250
Convolvulaceae	*Convolvulus arvensis* L.	*Sakhpushpi*	Herb	Leaf	Wild	Moderate	Oral	The leaf has to be dried, ground and then taken in pill form twice a day	25.786	0.025
Cucurbitaceae	*Momordica charantia* L.	*Karela*	Herb	Leaf	Cultivated	Easy	Oral	Grind dry leaves and make powder and drink one spoon twice a day	76.991	0.547
Dioscoreaceae	*Dioscorea bulbifera* L.	*Bundi kanda*	Herb	Tuber	Wild	Difficult	Oral	To make an infusion, crush the tuber pieces with water and then drink it	42.857	0.339
Euphorbiaceae	*Euphorbia hirta* L.	*Dudhi*	Herb	Leaf stem	Wild	Easy	Oral	Dry the leaves and stem, then grind it into powder and take it in pill form twice a day	35.135	0.235
Fabaceae	*Bauhinia vahlii* Wight & Arn.	*Mohalain*	Tree	Stem	Wild	Difficult	Oral	Dry the stem and grind make powder and drink one spoon twice a day	92.308	0.589
Fabaceae	*Dalbergia sissoo* Roxb. ex DC.	*Shisham*	Herb	Leaf	Cultivated and wild	Easy	Oral	Grind dry leaves and make powder and drink one spoon twice a day	42.857	0.339
Fabaceae	*Pterocarpus marsupium* Roxb.	*Beeja, telia beeja*	Tree	Bark	Wild	Difficult	Oral	Put its stalk in cold water and drink a glass of water after some time	98.020	0.602

Lamiaceae	*Ocimum sanctum* L.	*Tulsi*	Herb	Black, leaf	Cultivated	Easy	Oral	Dry the leaves, take half a cup of tea in a small container, and drink it twice a day	31.579	0.170
Lamiaceae	*Ocimum tenuiflorum* L.	*Kali tulsi*	Shurb	Leaf	Wild	Moderate	Oral	Dry the leaves, make a decoction in half a cup of hot water, and drink it	73.684	0.530
Malvaceae	*Bombax ceiba* L.	*Semal*	Tree	Bark	Wild	Moderate	Oral	Grind dry bark make powder and drink with one glass of water	44.928	0.361
Malvaceae	*Helicteres isora* L.	*Marodfali*	Shurb	Leaves, root, bark	Cultivated and wild	Difficult	Oral	Its green leaves and dry root have to be chewed and eaten twice a day. chewing the root bark	51.515	0.418
Malvaceae	*Thespesia populnea* (L.) Sol. ex Corrêa	*Bijnora*	Shrub	Bark, leaf	Wild	Difficult	Oral	Grind dry bark and leaves and mix one spoon in a glass of plain water and drink	36.986	0.264
Meliaceae	*Azadirachta indica* A.Juss.	*Neem*	Tree	Leaf	Cultivated and wild	Easy	Oral	Boil green leaves in water, then filter and drink a glass of water	78.571	0.552
Menispermaceae	*Tinospora cordifolia* (Willd.) Hook.f.& Thomson	*Gurber, gurbel*	Shrub	Leaf, stem	Wild	Moderate	Oral	Dry the leaves and stem, then grind it into powder and take as a decoction	80.180	0.557
Moraceae	*Ficus benghalensis* L.	*Bar*	Tree	Fruit	Wild	Easy	Oral	Eat 3 to 4 ripe tree fruits daily	26.582	0.049
Moraceae	*Ficus racemosa* Willd.	*Dumar*	Tree	Fruit	Wild	Easy	Oral	Eat 2 to 3 ripe tree fruits daily	41.844	0.328
Moringaceae	*Moringa oleifera* Lam.	*Munga*	Tree	Root, fruit	Cultivated	Easy	Oral	Dry the root and fruit, then grind it into powder and take as pills	88.679	0.581
Myrtaceae	*Syzygium cumini* (L.)	*Jam, jamun*	Tree	Bark, seed	Wild	Easy	Oral	Grind the bark and seeds and make a decoction and drink it	70.940	0.524
Nyctaginaceae	*Mirabilis jalapa* L.	*Gulbas*	Herb	Root	Cultivated	Moderate	Oral	Dry the root then grind it into powder and take as pills	29.870	0.133
Plantaginaceae	*Scoparia dulcis* L.	*Chana buti*	Herb	Leaf	Wild	Moderate	Oral	Grind green leaves and drink it with water	27.389	0.071
Poaceae	*Cynodon dactylon* (L.) Pers.	*Maanju ghas*	Herb	Root	Wild	Easy	Oral	Boil root in water, then filter and drink a glass of water	26.579	0.049
Rubiaceae	*Paederia foetida* L.	*Pasaran*	Herb	Leaf, root	Wild	Moderate	Oral	Dry the root and fruit, then grind it into powder and take as pills	31.579	0.170
Rutaceae	*Aegle marmelos* (L.) Corrêa	*Bel*	Tree	Leaf, bark	Cultivated and wild	Easy	Oral	Dry the leaves and bark then grind it into powder and take as a decoction	58.730	0.466
Sapindaceae	*Schleichera oleosa* (Lour.) Oken	*Kosum*	Herb	Bark	Wild	Moderate	Oral	Dry the bark then grind it into powder and take as pills	27.389	0.071
Sapotaceae	*Madhuca longifolia* (L.) J.F.Macbr.	*Mahuwa*	Tree	Bark	Wild	Easy	Oral	Dry the wet bark then grind it into powder and take as a decoction	58.730	0.466
Solanaceae	*Withania coagulans* (Stocks) Dunal	*Paneer phool*	Shurb	Leaf	Wild	Difficult	Oral	Dry the leaf then grind it into powder and take as a decoction	30.719	0.152
Zingiberaceae	*Curcuma longa* L.	*Haldi*	Herb	Leaf	Cultivated	Easy	Oral	The green leaf is to be heated in water and drink a glass as tea	51.515	0.418

Interpretation using ethnobotanical indices

Most of the earlier ethnobotanical studies were chiefly concerned with the listing of medicinal plants; gradually, it was realized the ethnobotanical indices were required for cultural consensus, which eventually led to effective doses (Leonti 2022). Hence, a wider consensus on the use of ethnomedicinal plants would imply its wider effectiveness in countering disease and ailments. This eventually led to the discovery of new drugs and therapeutics, which is the basis of one of the popular branches of pharmacy, i.e., ethnopharmacology (Heinrich 2014). Ethnobotanical indices offer us useful insights into the use, knowledge, and popularity of an herbal formulation; this helps us zoom into the use value of a particular medicinal plant in the area. In this study area, tribal healers used 40 species of medicinal plants from 35 genera and 30 different families to treat diabetes (Table 1). The highest Fidelity Level (FL) at 98% was in *Terminalia arjuna* (Roxb. Ex DC.) Wight & Arn. and *Pterocarpu*s *marsupium* Roxb., followed by *Bauhinia vahlii* Wight & Arn. (92%), *Moringa oleifera* Lam. (88%), *Gymnema sylvestris* R. Br. (85%), *Tinospora cordifolia* (Willd.) Hook.f.& Thomson (80%). The highest ICF ranked *T. arjuna* and *P. marsupium* (0.602), followed by *B. vahlii* (0.589), and *M. oleifera* (0.581). The higher FL and ICF values for plants such as *T. arjuna* and *P. marsupium* indicate their greater acceptability and probably efficacy against the diabetics of this part of central India. In a recent review of Ayurveda, Chinese, and Unani medicine review of antidiabetic plants, the herbal formulation of Mehamudgara vati was found to be effective and had a synergetic effect when combined with modern drugs (Murudkar et al. 2022). Some commonly cultivated plants used in the treatment of diabetes were *Aegle marmelos* (L.) Corrêa, *Allium cepa* L., and *Curcuma longa* L., which were found to tally with those in Morocco and other parts of India as well (Devi et al. 2016; Saklli et al. 2019).

In conclusion, ethnomedicinal plants have evolved through centuries of trial and error to heal humans from different ailments; even today, most medicinal plants are from the wild. In the rural and underdeveloped parts of the world, the only source of treatment is probably traditional healers. The destruction of forests and rampant collection from the wild may eventually lead to the disappearance of some species. Hence, some should be brought under cultivation. Worldwide, there is a rise in urbanization and also competition for earning a decent living, which is pushing many young people under stress-related disorders. Diabetes is one such stress-related disorder where current treatment regimens are usually of longer duration, risking the side effects on the patients. In the above study, wild collection was mostly preferred; a few new species, like *P. marsupium*, *T. arjuna*, and *B. vahlii*, had shown higher acceptance with the local healers, suggesting their possible efficacy in treating diabetes. In other words, some plants have higher ethnobotanical indices, meaning there are chances to explore new drugs and formulate better drugs soon.

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