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Wild leafy vegetables used by tribals of Jamtara Forest Division, Jharkhand, India

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Abstract

The use of wild leafy vegetables (WLV) by tribal communities has been studied throughout the world. These studies highlighted the importance of WLV and raised concerns about the loss of Indigenous knowledge about them. The aim of the present study was to document the WLV consumed traditionally by the local tribal communities to highlight the importance of local plants in ensuring food security and sustainable development in the Jamtara Forest Division (JFD), Jharkhand, India. A survey was carried out in 2023 using standard methods and enumerated 20 WLV along with their Santali names. It was noted that all the enumerated leaves are commonly consumed as vegetables by the communities of JFD. It was observed that they also have medicinal and economic values. Results clearly indicate that there is a need for an awareness programme on local resources in the division to achieve sustainability in all conceivable spheres of life.

INTRODUCTION

Biodiversity provides enough life stuff to human beings (Kumar 2015; Das et al. 2022; Kumar et al. 2022c) which are facing a lot of threats (Kumar et al. 2023). Among them, wild

food plants play a vital role, like wild leafy vegetables. WLV are those that are not cultivated and grow naturally in wild habitats. It was estimated that Humans might have utilized more than 8,000 plants from the wild, but most of these remain underutilized (Kumar et al. 2015; Das et al. 2020; Kumar and Kumar 2020; Mishra et al. 2022; Saha et al. 2022; Devi et al. 2022; Kumar et al. 2021a; Kumar et al. 2021b; Sundar et al. 2023; Nayak and Kumar 2023; Agarwal et al. 2023; Kumar 2023; Sethi et al. 2023; Nayak et al. 2023) and we are still using only a fraction of them. Some plants are also added to the floral wealth of the states of India, which could be future food, medicines and will be helpful to the ecological balance (Devi et al. 2020; Devi et al. 2021; Kumar et al. 2021c; Kumar et al. 2021b; Mishra et al. 2021a; Mishra et al. 2021b; Mishra and Kumar 2021; Devi et al. 2021; Devi and Kumar 2022; Kumar et al. 2022a; Kumar et al. 2022b; Kumar et al. 2022d; Kumar et al. 2022e; Devi et al. 2023) We are forgetting about all those nutritious plants that helped us survive on this planet thousands of years ago (Golait et al. 2021). Due to its seasonal and natural growth, the wild leafy vegetable contains a larger amount of nutrients than cultivated vegetables. These plants can be used as seasonal food or as a valuable supplement for a nutritionally balanced diet, especially in developing countries (Gupta et al. 2017; Pandey et al. 2023). India is blessed with a variety of landscapes, varying climates, and seasons that provide varied species of WLV. Many leaves from different sources, such as perennial trees, aquatic plants, and annuals, are being consumed (Kumar et al. 2020), and these vegetables are important for human nutrition in terms of proteins, fibres, vitamins, minerals, and non-nutritive phytochemical compounds (phenolic compounds, flavonoids, bioactive peptides, etc.), which have proven health-promoting effects (Hora and Topno 2015; Salvi and Katewa 2016). WLV have not only nutritional potential but also medicinal values. The health benefits of WLV include improving digestive health, maintaining weak eyesight, balancing cholesterol levels, enhancing youthful skin, treating anaemia, strengthening the scalp, fighting free radicals, supporting cardiovascular health, promoting weight loss, boosting energy levels, increasing lifespan, etc. (Voster et al. 2007; Ravishankar et al. 2015). The importance of leafy vegetables can also be realized through their economic value. It creates a great opportunity for communities that dependent on forests and forest products. Their knowledge about forests is vast and contained within them. A good number of vegetables are collected by them from the forest throughout the year, which also helps in maintaining their livelihood. Normally, the tribal inhabitants earn their livelihood by selling these nutritious leafy vegetables, which contribute to household food security (Kumar and Shiddamallayya 2014; Ghosh 2015). Studies on these WLV could provide food security and important information to develop

policies on the exploitation of natural resources for human sustenance, and the wild foods contribute to improving food security in rural areas. Their documentation is also an important step towards their conservation. The role of wild leafy vegetables in food security is recognized in many developing countries. Though many investigations have been carried out in different parts of India on wild edible plants, many of the traditional and rural leafy vegetables remain underutilized in our country (Modi et al. 2006; Borah and Sarkar 2008). Keeping this in mind, an attempt has been made to document the WLV of Jamtara Forest Division, Jamtara, Jharkhand.

METHODOLOGY

Study area

Jamtara Forest Division (JFD) is situated in the eastern part of Jharkhand state in Jamtara district (Figure 1). Jamtara is located at 23.95°N 86.8°E and has an average elevation of 155 metres. It enjoys diverse vegetation like Dry Deciduous forests, Sal forests, etc. JFD is divided into four ranges, namely: Jamtara, Nala, Kundhit, and Narayanpur. The biodiversity is very diverse at all levels of habitat and species, and the rich diversity of plants has produced many food plants of immense economic value. The area experiences extremes of climate, with the mean temperature varying from 17°C to 32°C. The minimum temperature is 2°C in winter, and the maximum temperature shoots up to 45°C in the months of April and May. The monsoon starts in July and lasts until October. The average annual rainfall in the Jamtara and Kundahit Ranges of the Division is slightly greater than that of the rest of the areas (Mukherjee et al. 2018).

Data collection

A field survey was conducted in the month of May 2023, and the ethno-botanical information was documented through semi-structured questionnaires, key informant interviews, frequent interactions, and discussion with the local villagers, mainly farmers, old people, and housewives (Plate 2). The questions focused primarily on the local name (Santali) of the plant and knowledge of the uses of plants for consumption, collection, mode of food preparation, and storage. Sometimes the collected plants were taken to the elderly people of the village to authenticate their edibility. Field visits were undertaken along with the villagers, who collect those vegetables from the places in and around their houses as well as from the nearby forest areas. Local food markets where the leaves are sold were also visited so that seasonal availability and demand could be assessed. Collected data were documented and tabulated

with respect to their botanical name (according to alphabetical order), habit, edible parts, season of availability, methods of consumption, etc. (Konsam et al. 2006; Kumar et al. 2017). The enumerated plants are identified by Dr. Sanjeet Kumar, Ambika Prasad Research Foundation, India.

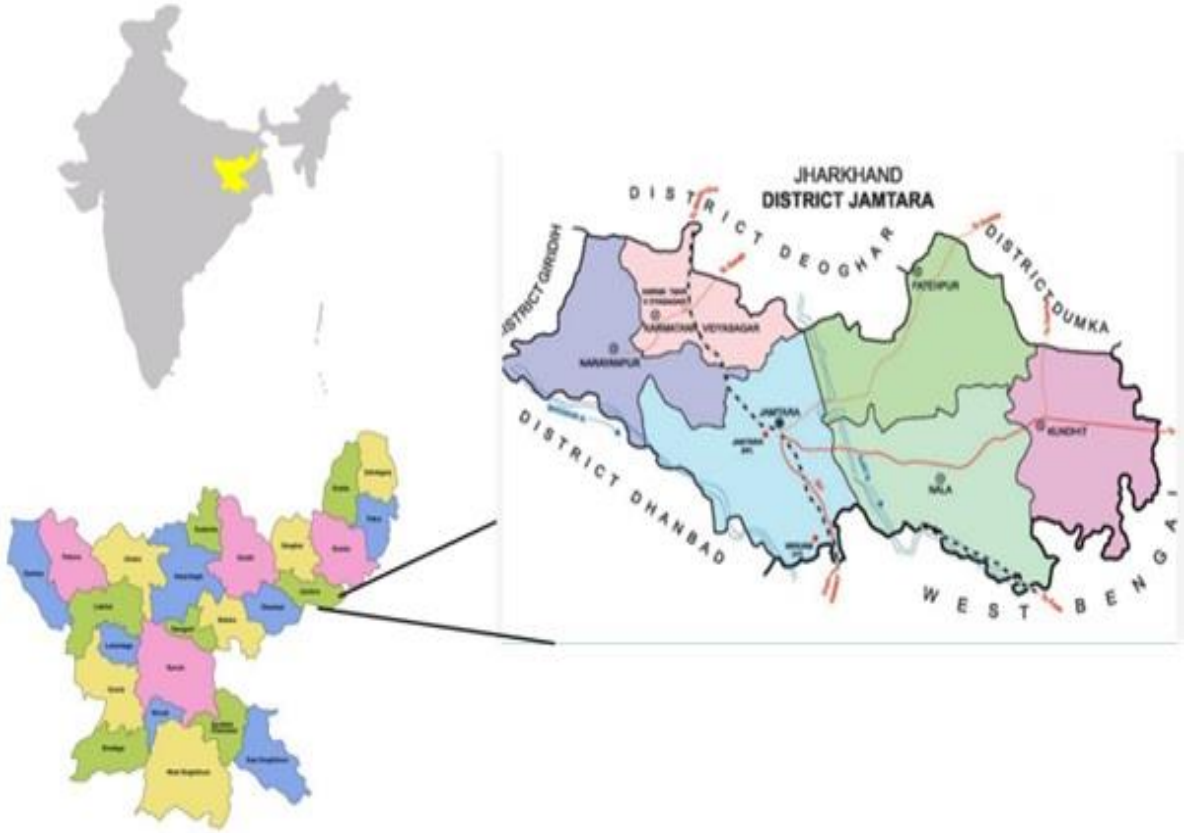

Figure 1: Geographical location of study area

RESULTS AND DISCUSSION

Food security is an important aspect of any nation. India is known for its traditional food systems, sustainability, and balanced relationship with nature. Leafy vegetables play a vital role in providing food to the tribal people. In the present study, 20 species of wild leafy vegetables are enumerated with their Santali name(s) that are commonly consumed by the tribal and rural peoples across JFD. Results revealed that the enumerated species belong to 15 families. It was observed that herbs are the major source for wild leafy vegetables, followed by trees and climbers (Figure 2). The maximum number of species belong to the Amaranthaceae family, followed by Rubiaceae. It was also noticed that 28 % of enumerated leafy vegetables belong to the Amaranthaceae family (Figure 3). It was noticed that “Ala” or “Ada” is a common name for leafy vegetables in the tribal languages of JFD. The details are listed in Table 1.

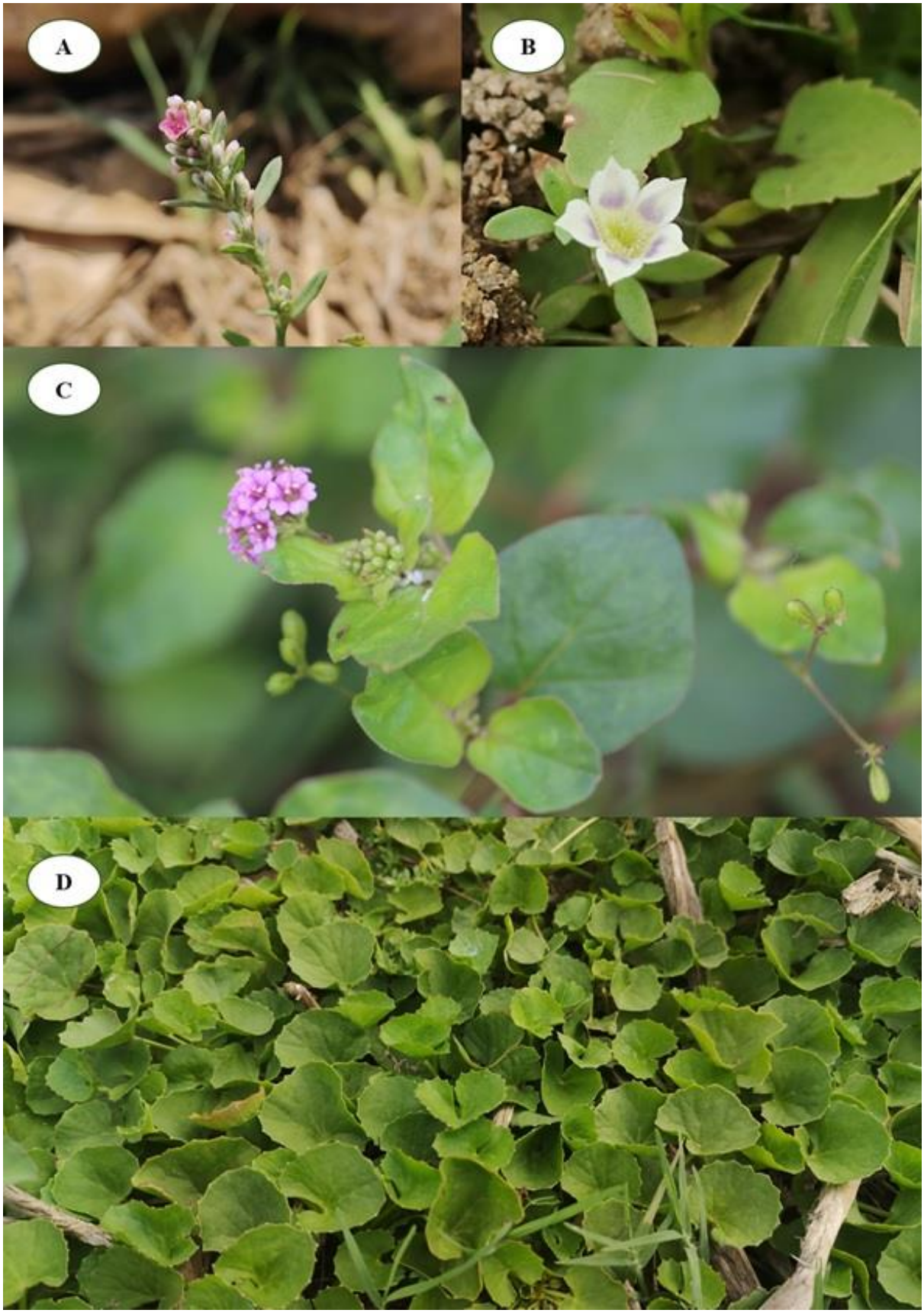

Plate 1: Some common leafy vegetable in Jamatara Forest Division A) *Polygonum plebeium*, B) *Dentella repens*, C) *Boerhaavia diffusa*, D) *Centella asiatica*

Plate 2: Field survey in Jamtara Forest Division, Jamtara, Jharkhand

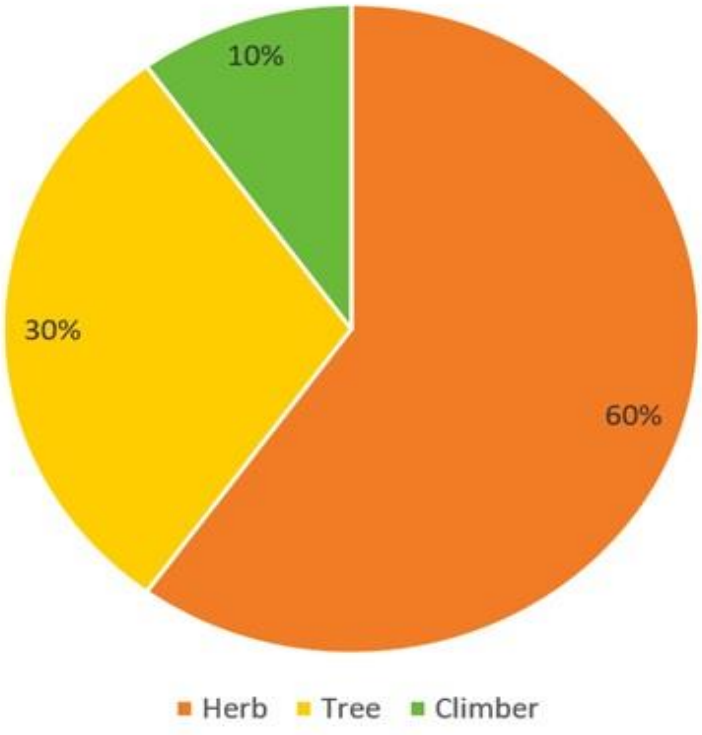

Figure 2: **Diversity (habit) of wild leafy vegetables from Jamtara Forest Division**

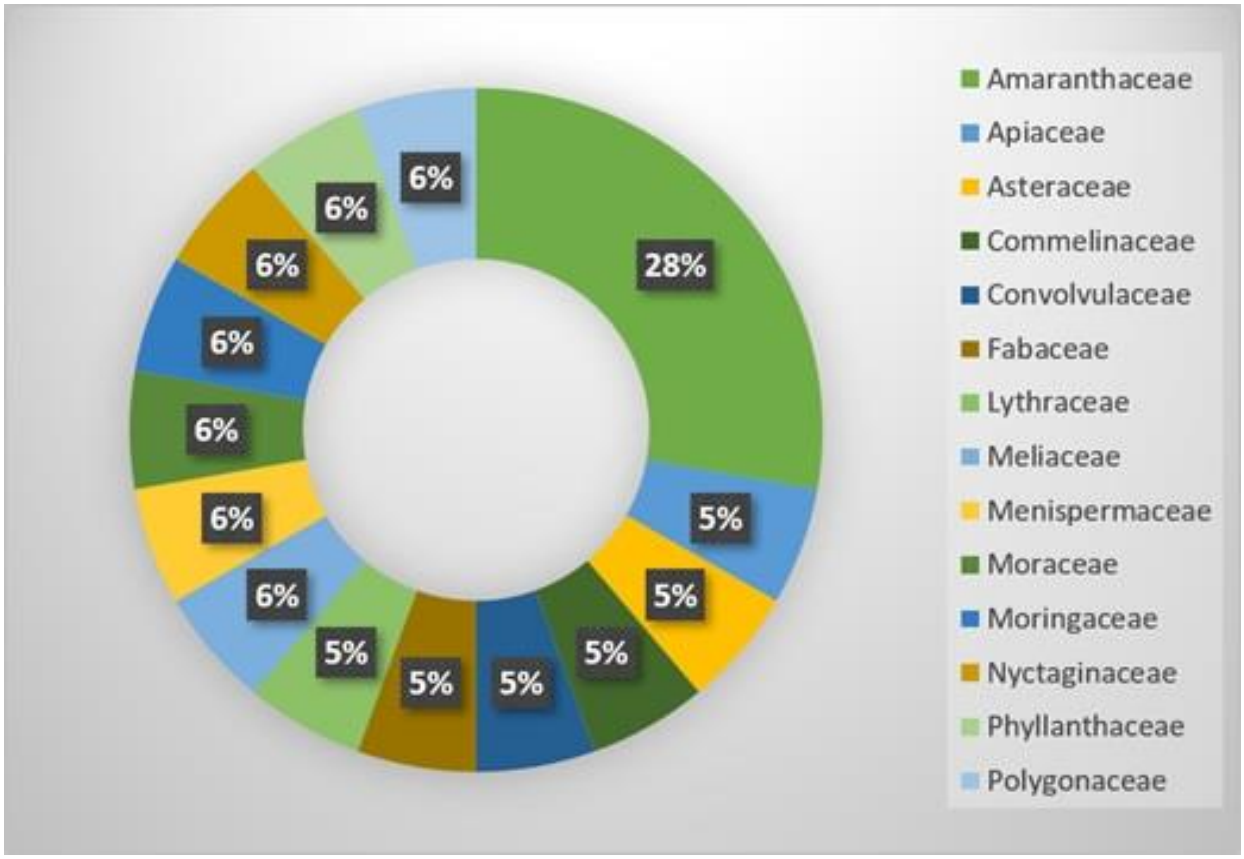

Figure 3: **Diversity (family) of wild leafy vegetables from Jamtara Forest Division**

Some other researchers have also reported WLV from other districts of Jharkhand, like Ravishankar et al. (2015) reported 57 leafy vegetables from the state whereas Horo and Topno (2015) documented 35 leafy vegetables from West Singhbum, Jharkhand. In 2017, Gupta et al. reported 26 leafy vegetables from Ranchi and Khunti districts of Jharkhand and in 2018, Sinha analyzed the nutritional values of selected leafy vegetables of the state.

Table 1: Wild leafy vegetables used by the tribal and rural communities of Jamtara Forest Division, Jharkhand

Santali Name	Botanical Name	Family	Availability
Bhalu	*Chenopodium album*	Amaranthaceae	Jun - Mar
Chetri	*Meyna spinosa*	Rubiaceae	Jun - Nov
Cheuri	*Rotala rotundifolia*	Lythraceae	May - Nov
Gurundi	*Alternanthera sessilis*	Amaranthaceae	Throughout the year
Hencha	*Enhydra fluctuans*	Asteraceae	Apr - Sept
Hesa	*Ficus religiosa*	Moraceae	In summer
Janum leper	*Amaranthus spinosus*	Amaranthaceae	Jun - Dec
Kaana	*Commelina benghalensis*	Commelinaceae	Jun- Oct
Kalama	*Ipomoea aquatica*	Convolvulaceae	Jun- Oct
Kanta	*Dentella repens* (Plate 1B)	Rubiaceae	May - Nov
Kidoo	*Cissampelos pareira*	Menispermaceae	Jun - Oct
Leper	*Amaranthus viridis*	Amaranthaceae	Jun - Dec
Matha	*Antidesma bunius*	Phyllanthaceae	July- Nov
Mui	*Polygonum plebeium* (Plate 1A)	Polygonaceae	Throughout the year
Munga	*Moringa oleifera*	Moringaceae	Throughout the year
Neem	*Azadirachta indica*	Meliaceae	Jan - Apr
Rote	*Centella asiatica* (Plate 1D)	Apiaceae	Throughout the year
Satha	*Boerhavia diffusa* (Plate 1C)	Nyctaginaceae	July- Nov
Shing	*Bauhinia purpurea*	Fabaceae	Jun- Apr
Sirguti	*Celosia argentea*	Amaranthaceae	July - Oct

CONCLUSION

Food problems are a global issue, particularly in developing countries. The solution to the problem lies in nature and traditional practices. The documentation of wild food plants provides a platform to know the process for getting sustainable food. In this aspect, the present study on wild leafy vegetables in Jamtara Forest Division, Jharkhand, provides baseline data for creating awareness about traditional food, adding value to local resources, and making strategies to achieve food security using traditional practices. The study suggests doing more exploration work and documenting traditional foods, medicines, and other practices to fight against health problems, food issues, inadequate livelihoods, climatic changes, and environmental predicament.

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