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Ethnomedicinal Utilization of Tuberos Plants for the Treatment of Human Ailments in the Polavaram Area of West Godavari District, Andhra Pradesh, India

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Abstract

An ethnomedicinal survey was conducted in the Polavaram region of West Godavari District, Andhra Pradesh, India, to document the traditional utilization of tuberos medicinal plants by indigenous communities. Field investigations employing semi-structured interviews, guided field walks, and quantitative ethnobotanical indices recorded 14 tuberos species belonging to 10 families, representing 23 use-reports (UR). Family-wise analysis revealed the dominance of Dioscoreaceae (21.43%), followed by Liliaceae and Cucurbitaceae (14.29% each). Gastrointestinal disorders constituted the principal therapeutic category (34.78%), indicating a strong reliance on underground plant parts for digestive ailments. *Pueraria tuberosa* emerged as the most culturally significant species (5 UR; 21.74%), with reported applications in cough, rheumatism, nervous disorders, and skin diseases. Other frequently cited taxa included *Asparagus racemosus* and *Cyperus rotundus*. Comparative evaluation with earlier ethnobotanical and pharmacological studies supports the therapeutic relevance of these taxa. However, destructive harvesting of underground organs poses conservation challenges, necessitating sustainable management strategies and scientific validation. The study contributes region-specific quantitative data to the ethnomedicinal literature of Andhra Pradesh and underscores the importance of preserving indigenous knowledge systems.

Keywords: Ethnomedicine; Tuberos plants; Use reports; Indigenous knowledge; Polavaram; Andhra Pradesh.

1. Introduction

India possesses rich ethnobotanical heritage, particularly among tribal communities that rely extensively on plant-based healthcare systems (Jain, 1964). Ethnobotanical documentation plays a vital role in preserving indigenous knowledge and identifying pharmacologically active species (Martin, 1995). Tuberos plants are especially important in traditional medicine due to their storage organs rich in bioactive compounds including alkaloids, glycosides, flavonoids, and saponins. Underground plant parts are widely used in Ayurvedic and folk medicine systems (Phillips & Gentry, 1993). The tribal communities inhabiting the Polavaram region of West Godavari District depend on forest flora for primary healthcare. Previous studies in Andhra Pradesh have documented medicinal plants for gastrointestinal, respiratory, and dermatological disorders (Raju & Reddy, 2005; Reddy et al., 2007; Suneetha et al., 2013). However, specific documentation of tuberos medicinal plants in the Polavaram area remains limited. The present investigation aims to systematically document and analyze tuberos medicinal plants used in the region.

2. Study Area

Polavaram is situated in the northern part of West Godavari District along the Godavari River basin. The region is characterized by tropical deciduous forests and supports diverse flora. The local tribal populations maintain strong ethnomedicinal traditions.



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3. Materials and Methods

3.1 Data Collection

Field surveys were conducted using semi-structured interviews, guided field walks, and personal discussions with traditional healers, following standard ethnobotanical methodologies (Martin, 1995). Use Reports (UR) were calculated following the quantitative approach of Phillips and Gentry (1993). Disease categories were grouped to evaluate therapeutic trends.

3.2 Identification and Authentication

Plant specimens were identified using regional floras viz. Hooker (1872-1897), Gamble and Fischer (1915), Pullaiah (1997), Prayaga Murty (2009) and few other local floras and standard botanical literature and cross-verified with standard botanical references.

4. Results

A total of 14 tuberous medicinal plant species belonging to 10 families were recorded. Dioscoreaceae was the dominant family (21.43%), followed by Liliaceae and Cucurbitaceae (14.29% each). A total of 23 use-reports were documented. Gastrointestinal disorders accounted for the highest percentage (34.78%), followed by respiratory ailments (17.39%). The most cited species was *Pueraria tuberosa* (5 UR; 21.74%), indicating high cultural and therapeutic significance. The complete information is provided in Tables 1–3.

Table 1. List of Tuberous Medicinal Plants and Use Reports

S.No	Botanical Name	Family	No. of Use Reports (UR)	Relative Frequency (%)
1	<i>Asparagus racemosus</i>	Liliaceae	2	8.70
2	<i>Coccinia grandis</i>	Cucurbitaceae	1	4.35
3	<i>Curcuma pseudomontana</i>	Zingiberaceae	1	4.35
4	<i>Cyperus rotundus</i>	Cyperaceae	2	8.70
5	<i>Dioscorea bulbifera</i>	Dioscoreaceae	1	4.35
6	<i>Dioscorea glabra</i>	Dioscoreaceae	1	4.35
7	<i>Dioscorea oppositifolia</i>	Dioscoreaceae	1	4.35
8	<i>Gloriosa superba</i>	Liliaceae	2	8.70
9	<i>Habenaria plantaginea</i>	Orchidaceae	2	8.70
10	<i>Ipomoea hederifolia</i>	Convolvulaceae	1	4.35



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S.No	Botanical Name	Family	No. of Use Reports (UR)	Relative Frequency (%)
11	Mirabilis jalapa	Nyctaginaceae	2	8.70
12	Musa paradisiaca	Musaceae	1	4.35
13	Pueraria tuberosa	Fabaceae	5	21.74
14	Trichosanthes tricuspidata	Cucurbitaceae	1	4.35

Table 2. Family-wise Distribution of Species

Family	No. of Species	Percentage (%)
Dioscoreaceae	3	21.43
Liliaceae	2	14.29
Cucurbitaceae	2	14.29
Fabaceae	1	7.14
Cyperaceae	1	7.14
Zingiberaceae	1	7.14
Orchidaceae	1	7.14
Convolvulaceae	1	7.14
Nyctaginaceae	1	7.14
Musaceae	1	7.14

Table 3. Disease Category-wise Distribution of Use Reports

Disease Category	Use Reports (UR)	Percentage (%)
Gastrointestinal disorders	8	34.78
Respiratory ailments	4	17.39



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Disease Category	Use Reports (UR)	Percentage (%)
Skin diseases	2	8.70
Wounds	1	4.35
Muscle pain	1	4.35
Rheumatism	1	4.35
Nervous disorders	1	4.35
Burning sensation	1	4.35
Cooling agent	1	4.35
Abortions	1	4.35
Dysmenorrhoea	1	4.35
Leprosy	1	4.35

5. Discussion

The predominance of gastrointestinal treatments aligns with earlier reports from Andhra Pradesh, where digestive ailments constitute the primary therapeutic category (Raju & Reddy, 2005). Poor sanitation and water-borne infections may contribute to this trend. The extensive use of *Asparagus racemosus* for diarrhoea and dysentery supports earlier pharmacological findings highlighting its anti-diarrhoeal and adaptogenic properties (Goyal et al., 2003). *Cyperus rotundus* is widely recognized for its carminative and diuretic properties, corroborating its traditional use for stomachache (Singh et al., 2012). The multipurpose use of *Pueraria tuberosa* for cough, rheumatism, nervous disorders, and skin diseases is supported by antioxidant and anti-inflammatory studies (Pandey & Tripathi, 2010). Its highest citation frequency in the present study confirms its broad ethnopharmacological relevance. The presence of *Gloriosa superba* for abortion and skin diseases reflects deep indigenous knowledge of potent bioactive compounds, particularly colchicine, though the species is known to be toxic (Sivakumar & Krishnamurthy, 2002). The dominance of Dioscoreaceae corresponds with the widespread medicinal and nutritional importance of yam species in tropical regions (Coursey, 1967). Comparative analysis with other tribal regions of Andhra Pradesh indicates strong similarities in respiratory and dermatological applications (Reddy et al., 2007; Suneetha et al., 2013).

7. Conclusion

The present study documents 14 tuberous medicinal plant species used in Polavaram area of West Godavari District. Gastrointestinal ailments represent the dominant therapeutic category, while *Pueraria tuberosa* emerged as the most culturally significant species. The findings validate traditional knowledge through comparison with earlier ethnobotanical and pharmacological studies. However, destructive harvesting practices necessitate immediate conservation measures. Scientific validation and sustainable management are essential to preserve these valuable ethnomedicinal resources.



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