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Ethnobotanical survey of medicinal plants in Annamayya District, Andhra Pradesh, India

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Abstract
Ethnobotany plays a significant role in understanding the traditional relationship between humans and plants, particularly the utilization of medicinal plants in healthcare practices. The present ethnobotanical investigation was carried out in Annamayya District of Andhra Pradesh, India, to document the traditional medicinal plants used by indigenous and rural communities for the treatment of various human ailments. Extensive field surveys were conducted between 2021 to 2023 in different villages, forest regions, and tribal habitations. Ethnomedicinal information was collected through personal interviews, group discussions, and semi-structured questionnaires involving traditional healers, tribal elders, shepherds, and knowledgeable local informants. The study documented a total of 84 medicinal plant species belonging to 47 families. Herbs constituted the dominant life form, followed by shrubs, trees, climbers, parasites, and epiphytes. Leaves were the most frequently utilized plant part, followed by roots and whole plants. Herbal remedies were prepared in various forms such as decoctions, pastes, juices, powders, extracts, oils, and infusions. Oral administration was found to be the predominant mode of treatment, while topical applications were mainly employed for wounds, skin diseases, swellings, and rheumatic disorders. The documented medicinal plants were used for treating a wide range of ailments including fever, asthma, jaundice, diarrhoea, dysentery, cough, gastrointestinal disorders, wounds, skin infections, reproductive disorders, urinary complaints, and body pains. Several medicinal species such as *Andrographis paniculata*, *Boerhaavia diffusa*, *Phyllanthus niruri*, *Tinospora cordifolia*, and *Tridax procumbens* were frequently cited because of their high therapeutic importance and effectiveness in traditional healthcare practices. The study highlights the rich ethnomedicinal knowledge prevailing among rural and tribal communities of Annamayya District and emphasizes the urgent need for proper documentation, conservation, and scientific validation of medicinal plants and associated indigenous knowledge systems. The recorded medicinal species provide valuable baseline information for future phytochemical, pharmacological, and biodiversity conservation studies.

Keywords: Ethnobotany, medicinal plants, indigenous knowledge, annamayya district, traditional medicine, andhra pradesh

Introduction

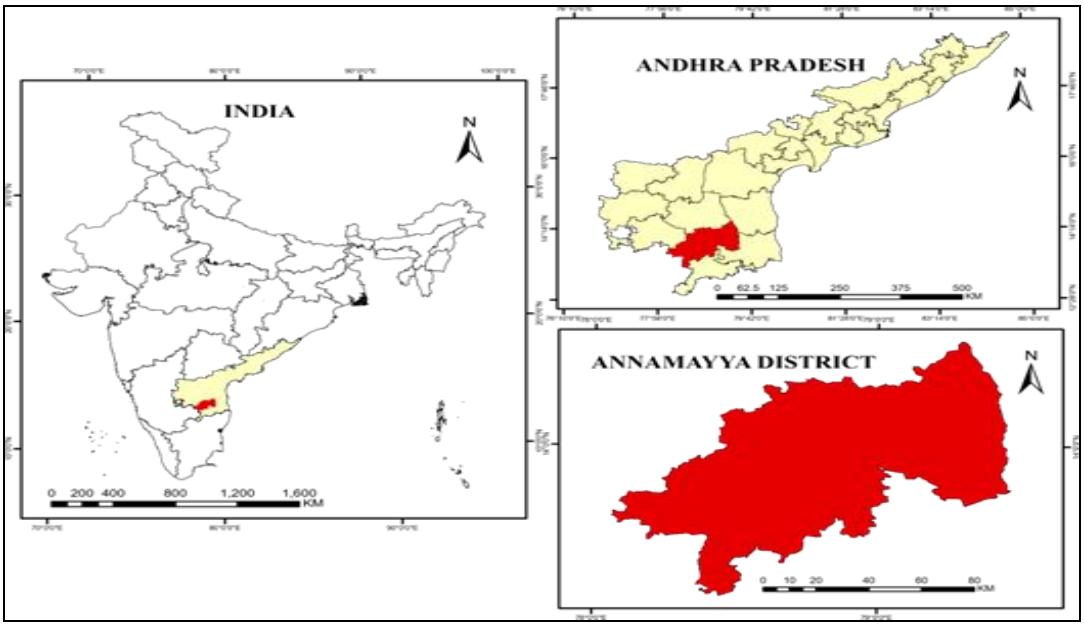
Ethnobotany is an important interdisciplinary science that deals with the relationship between human societies and plants, particularly the traditional knowledge associated with the utilization of plants for medicine, food, shelter, rituals, and other cultural purposes. Since ancient times, medicinal plants have served as the backbone of traditional healthcare systems throughout the world. Indigenous and rural communities largely depend on locally available plant resources for treating various ailments because of their accessibility, affordability, and effectiveness (Jain, 1987; Cotton, 1996) [3]. Traditional medicinal knowledge has been transmitted orally from one generation to another and forms an integral part of cultural heritage in many developing countries. India is one of the world's mega-biodiversity countries and possesses enormous wealth of medicinal plants distributed across different phytogeographical regions(Husain M.K *et al*,2019) [10]. The country has a long history of traditional systems of medicine such as Ayurveda, Siddha, Unani, and folk medicine, which extensively utilize plant resources for therapeutic purposes (Kirtikar and Basu, 1999;Pratap GP *et al*,2019) [17, 24]. It has been estimated that a large proportion of the rural population in India still relies on traditional herbal remedies for primary healthcare management (Farnsworth, 1988) [4]. Ethnobotanical investigations carried out in different parts of India have revealed the immense diversity of medicinal plants used by tribal and rural communities for curing various human diseases (Jain, 1991; Balick and Cox, 1996) [2, 14]. Andhra Pradesh is floristically rich due to the presence of diverse ecosystems, including dry deciduous forests, scrub jungles, hill ecosystems, and Eastern Ghats vegetation(Pullaiah T.*et al*,2018) [30] Several ethnobotanical studies conducted in the state have documented the extensive use of medicinal plants among tribal and rural communities for the treatment of fever, respiratory diseases, gastrointestinal disorders, skin infections, wounds, reproductive disorders, and other ailments (Reddy *et al*., 2006; Savithramma *et al*., 2011 [34, 36]; Goli Penchala Pratap *et al*,2009;2010; G.Sudharshanam *et al*,2006;). Traditional healers and indigenous people possess valuable knowledge regarding the identification, collection, preparation, and administration of herbal medicines derived from wild and cultivated plants. Annamayya District, situated in the Rayalaseema region of Andhra Pradesh, is characterized by undulating terrain, hill ranges, semi-arid climatic conditions, and dry deciduous vegetation associated with the Eastern Ghats(Sudarsanam G *et al*, 2025,N. Savithramma *et al*,2015) [35]. The district supports rich biodiversity and harbors numerous medicinally important plant species. Local communities inhabiting rural and forest fringe areas traditionally depend on medicinal plants for healthcare practices and the

treatment of common diseases. Herbal remedies prepared from leaves, roots, bark, fruits, seeds, flowers, latex, and whole plants are widely used for curing ailments such as fever, asthma, jaundice, wounds, dysentery, diabetes, skin diseases, rheumatism, and reproductive disorders. Several previous ethnobotanical investigations conducted in different regions of India and other countries reported that herbs constitute the dominant life form in traditional medicinal practices, while leaves are the most frequently utilized plant part because of their easy availability and rich phytochemical composition (Giday *et al*., 2003; Kumara Swamy *et al*., 2007; Mesfin *et al*., 2013) [6, 18, 20]. Similar observations were also made in tribal areas of Andhra Pradesh where indigenous communities rely heavily on plant-based healthcare systems (Uniyal *et al*., 2006, Sudarsanam G *et al*,1995 [39, 43];). Scientific studies have further validated the pharmacological potential of many medicinal plants traditionally used in folk medicine. For instance, Andrographis paniculata possesses antipyretic and antimicrobial properties (Akbar, 2011 [1]; Goli Penchala Pratap *et al*, 2009; Nagaraju, N., K. N,. 1990), while *Tinospora cordifolia*, *Boerhaavia diffusa*, and *Phyllanthus niruri* are recognized for their hepatoprotective, immunomodulatory, and antidiabetic activities (Kirtikar and Basu, 1999) [17]. Despite the rich ethnomedicinal heritage of the region, traditional knowledge is gradually declining because of modernization, deforestation, habitat degradation, migration, and lack of interest among younger generations. Overexploitation of medicinal plants and environmental disturbances are also threatening the survival of many valuable species (Hamilton, 2004;Sudarsanam G *et al*,1994) [7, 40]. Therefore, systematic documentation and conservation of ethnobotanical knowledge have become essential for preserving cultural heritage and biodiversity. Ethnobotanical surveys not only help safeguard indigenous knowledge but also provide baseline information for phytochemical, pharmacological, and clinical studies aimed at discovering novel therapeutic compounds (Schultes and Reis, 1995) [38]. Hence, the present ethnobotanical survey was undertaken in Annamayya District of Andhra Pradesh to document the medicinal plants traditionally used by local communities along with their vernacular names, plant parts used, methods of preparation, modes of administration, and therapeutic applications. The study aims to preserve valuable indigenous knowledge and contribute toward biodiversity conservation and future herbal drug development.

Materials and Methods

Study Area

The present ethnobotanical survey was conducted in Annamayya District, located in the Rayalaseema region of Andhra Pradesh.Annamayya district is located in the southeastern part of Andhra Pradesh, between 13°19′55″–14°42′32″ N latitudes and 78°18′55″–79°20′26″ E longitudes. The district is characterized by semi-arid climatic conditions, undulating topography, hill ranges, dry deciduous forests, and scrub vegetation associated with the Eastern Ghats. The region experiences hot summers, moderate rainfall, and seasonal variations that support diverse floristic composition, including numerous medicinally important plant species. Rural and forest fringe communities inhabiting the district largely depend on agriculture, livestock, and forest resources for their livelihood and healthcare practices.



Ethnobotanical Survey

Extensive field surveys were carried out during different seasons between 2021to 2023 in various villages, forest areas, and tribal habitations of Annamayya District. Ethnobotanical information was collected through repeated field visits and direct interaction with local inhabitants, traditional healers, tribal elders, shepherds, herbal practitioners, and knowledgeable informants. Data were collected using semi-structured questionnaires, personal interviews, and group discussions following standard ethnobotanical methods described by Jain (1989) and Cotton (1996) [3, 13]. The collected information included vernacular names of plants, plant parts used, methods of preparation, dosage, mode of administration, and ailments treated. Prior informed consent was obtained from the informants before documenting the traditional knowledge. Repeated

verification of information was carried out among different informants to ensure the reliability and authenticity of ethnomedicinal claims.

Collection and Identification of Plant Specimens

Medicinal plant species reported by the informants were collected during field explorations with the assistance of local people and traditional healers. Collected specimens were processed into herbarium sheets using standard herbarium techniques(Jain S.K and Rao R.R. (1977). Taxonomic identification of plant specimens was carried out with the help of regional floras, standard taxonomic literature, and comparison with authenticated herbarium specimens (Gamble, J. S. Fischer, C. E. C(1915 [5]-1936) and Hooker, J.D.(1897), Pullaiah T (2018) [30]. Scientific names were verified using available botanical databases and standard floristic references such as *Indian Medicinal Plants* by Kirtikar and Basu (1999) [17], Indian flora online web site. Special attention was given to medicinal plants frequently used by indigenous communities and species facing threats due to overexploitation and habitat degradation. Photographs of important medicinal plants and their utilization practices were documented during fieldwork. The collected ethnomedicinal knowledge was carefully recorded to preserve traditional healthcare practices and provide baseline information for future phytochemical, pharmacological, and conservation studies.

Result

The present ethnobotanical study documented 84 medicinal plant species traditionally utilized by indigenous communities for the treatment of a wide range of human ailments. The recorded taxa belonged to diverse angiospermic families, indicating rich floristic diversity and extensive indigenous knowledge associated with herbal healthcare practices in the study area. The documented medicinal flora comprised herbs, shrubs, trees, climbers, parasites, and epiphytes, among which herbs represented the dominant life form. The predominance of herbs in traditional medicine has also been reported in several ethnobotanical studies conducted in different regions of India and may be attributed to their wide distribution, easy accessibility, rapid regeneration, and higher concentrations of bioactive compounds. Family-wise analysis revealed that Euphorbiaceae, Asteraceae, Amaranthaceae, Solanaceae, Fabaceae, and Periplocaceae were among the dominant families represented by multiple medicinal species. Members of these families are widely recognized for their therapeutic importance in traditional systems of medicine due to the presence of pharmacologically active secondary metabolites such as alkaloids, flavonoids, tannins, glycosides, terpenoids, and phenolic compounds. The occurrence of several medicinally important taxa within these families highlights their ethnopharmacological significance and their continued utilization by local healers for primary healthcare management. Different plant parts were employed in the preparation of herbal remedies, including leaves, roots, whole plants, fruits, stem bark, seeds, latex, rhizomes, flowers, shoots, corms, stems, and twigs. Among these, leaves constituted the most frequently utilized plant part, followed by whole plants and roots. The extensive use of leaves may be associated with their easy availability, comparatively high phytochemical content, and sustainable harvesting practices, since leaf collection generally causes minimal damage to the survival of plants. Root and whole-plant utilization was also found to be significant, particularly in remedies prepared for chronic and systemic diseases. Similar observations regarding the predominance of leaves in ethnomedicinal preparations have been reported from various tribal and rural communities across the Indian subcontinent. The medicinal plants documented during the investigation were used for the treatment of numerous ailments including asthma, fever, jaundice, dysentery, diarrhoea, stomach disorders, wounds, eczema, cough, cold, anemia, leucorrhoea, body pains, piles, skin diseases, rheumatism, epilepsy, cataract, and reproductive disorders. Several species were also reported for aphrodisiac activity, post-delivery care, body cooling, memory enhancement, and general health maintenance. Plants such as *Acalypha indica*, *Aerva lanata*, and *Tylophora indica* were commonly employed for asthma treatment, whereas *Boerhavia diffusa*, *Phyllanthus niruri*, and *Decalepis hamiltoni* were widely utilized for jaundice. Similarly, *Blumea obliqua*, *Catharanthus roseus*, *Lantana camara*, *Tridax procumbens*, and *Heliotropium indicum* were frequently used in wound healing and treatment of skin-related disorders. The mode of administration of herbal formulations indicated the predominance of topical applications, followed closely by oral administration. Topical preparations were mainly employed for external ailments such as wounds, cuts, swelling, eczema, boils, body pains, scabies, insect bites, and dermatological infections. These remedies were generally prepared as fresh pastes, medicated oils, latex applications, decoctions, or ash formulations and were directly applied to the affected body parts. Oral administration was commonly practiced for internal diseases including asthma, jaundice, dysentery, diarrhoea, gastric disorders, anemia, dysuria, and reproductive problems. Decoctions, juices, infusions, powders, and extracts constituted the principal forms of orally administered remedies. Various additives such as jaggery, milk, buttermilk, honey, turmeric powder, sesame oil, and castor oil were incorporated into preparations to improve therapeutic efficacy and palatability. The present findings demonstrate that indigenous communities possess profound traditional knowledge regarding the identification, preparation, and therapeutic utilization of medicinal plants. The continued dependence on plant-based remedies reflects the cultural importance and effectiveness of traditional healthcare systems in rural areas where modern medical facilities remain limited. Furthermore, the ethnobotanical information documented in the present study provides valuable baseline data for future phytochemical, pharmacological, toxicological, and conservation-oriented investigations. Scientific validation of these traditional claims may contribute significantly toward the discovery of novel bioactive compounds and development of plant-derived therapeutic agents. Preservation and documentation of such indigenous knowledge systems are therefore essential for safeguarding both cultural heritage and medicinal plant biodiversity for future generations.

No	Botanical name, Vernacular name	Family	Habit	Plant part	Ethnobotanical Claim	Applied Method	Disease
1	*Abutilon indicum* (L.) Sweet,Tutturubenda.	Molvaceae	Herb	Root	Root paste is applied to the infected area regularly for one month.	Topical	Piles
2	*Acalypha indica* L. Kuppintaku.	Euphorbiaceae	Herb	Whole plant	Plant decoction is taken for one month.	Oral	Asthma
3	*Acanthospermum hispidum* DC. Verri palleru.	Asteraceae	Herb	Leaf	Leaves are boiled with *Nyctanthes arbor-tristis* and *Cissampelos pareira* and administered orally.	Oral	Fever
4	*Achyranthes aspera* L. Uttareni.	Amaranthaceae	Herb	Root	Root paste is applied to the affected portion.	Topical	Cuts and Wounds
5	*Adiantum capillus-veneris* L.Magapakshi.	Pteridaceae	Herb	Leaf	Leaf decoction is used for one week.	Oral	Cough and Cold
6	*Aegle marmelos* L. Maredu.	Rutaceae	Tree	Fruit	Fruit pulp mixed with jaggery is prepared as a squash and administered orally.	Oral	Gastric trouble
7	*Aerva lanata* (L.) Juss.ex Schult. Thelaga pindi.	Amaranthaceae	Herb	Whole plant	Whole plant decoction (10 ml) is taken once daily for one month.	Oral	Asthma
8	*Alysicarpus monilifer* DC. Amera.	Fabaceae	Herb	Root	Root juice is administered orally to women as a contraceptive.	Oral	Stomachache
9	*Amaranthus spinosus* L. Kotijuttuaku.	Amaranthaceae	Herb	Root	Root decoction mixed with common salt is taken twice daily.	Oral	Loose motions
10	*Andrographis paniculata* (Burm.f.)Wall.exNees. Nelavemu.	Acanthaceae	Herb	Shoot	Leaf decoction is taken on an empty stomach for two days.	Oral	Fever
11	*Argemon mexicana* L. Kusama chettu.	Papavaraceae	Herb	Latex	Latex is applied to the affected part.	Topical	Eczema
12	*Aristolochia indica* L. Gadidagadapa.	Aristolochiaceae	Climber	Root	Root paste mixed with water is administered orally.	Oral	Snake bite
13	*Bauhinia purpurea* L. Deva kanchanam.	Caesalpiniaceae	Tree	Stem bark	Bark decoction (5 ml) is administered orally twice daily.	Oral	Fever
14	*Biophytum sensitivum* (L.) DC. Nelagaddalu.	Oxalidaceae	Herb	Whole plant	Plant ash is consumed for relief from stomachache.	Oral	Stomachache
15	*Blumea obliqua* (L.) Druce. Pichi pogaku.	Asteraceae	Herb	Leaf	Fresh leaf juice is applied to the affected area.	Topical	Wounds
16	*Boerhavia diffusa* L. Atakamamiidi.	Nyctaginaceae	Herb	Root	Root decoction is administered three times daily for 11 days.	Oral	Jaundice
17	*Bombax ceiba* L. Tellaburuga.	Malvaceae	Tree	Root	Roots from young plants are ground with water, mixed with jaggery and cow milk, and administered orally three times daily.	Oral	Spermatorrhea
18	*Capparis decidua* (Forsk.) Edgew Uppi.	Capparaceae	Tree	Root	Two hundred grams of root are boiled in one litre of water until reduced to 100 ml and administered orally.	Oral	Stomachic
19	*Capparis zeylanica* L. Peddauppi.	Capparaceae	Climber	Leaf	Leaf paste mixed with turmeric powder is applied to the affected part.	Topical	Boils
20	*Cassia tora* L. Tagirisa.	Caesalpiniaceae	Herb	Leaf	Leaf paste is applied to the affected area.	Topical	Itch
21	*Catharanthus roseus* (L.)G.Don. Billaganneru.	Apocynacaeae	Herb	Leaf	Leaf paste is applied to the affected wound area until cured.	Topical	Wounds
22	*Centella asiatica* (L.) Urb. Sraswathiaku.	Apiaceae	Herb	Whole plant	Whole plants are ground with candy sugar and administered continuously for 21 days.	Oral	Memory booster
23	*Chrysopogon zizaniodes*(L.)Roberty Vatti veru.	Poaceae	Shrub	Leaf	Leaf oil is applied to the affected areas twice daily until cured.	Topical	Skin diseases
24	*Cissampelos pereira* L. Pateru teega.	Menispermaceae	Climber	Leaf	Leaf powder (10 g) is mixed with buttermilk (200 ml) and administered three times daily for three days.	Oral	Dysentery
25	*Cleome viscosa* L. Kukkavamint.	Cleomaceae	Herb	Leaf	Leaf juice is poured into the ear for relief from earache.	Topical	Earache
26	*Coccinia grandis* (L.) Voigt Kakidonda.	Cucurbitaceae	Climber	Leaf	Leaf paste mixed with turmeric powder is applied to the affected area three times daily for three days.	Topical	Cracks and Wounds
27	*Croton bonplandianum* Baill. Galivanamoka.	Euphorbiaceae	Herb	Latex	Latex is applied until relief is obtained.	Topical	Toothache
28	*Cucumis sativus* L.	Cucurbitaceae	Climber	Leaf	Ten ml of fresh leaf decoction are	Oral	Whooping

	Donda.				taken three times daily.		cough
29	*Cyanodon dactylon*(L.) Pers. Garika.	Poaceae	Herb	Shoot	Juice prepared from fresh shoots mixed with jaggery is administered regularly for one month.	Oral	Anemia
30	*Datura innoxia* Mill. Nallaummetha.	Solanaceae	Shrub	Leaf	Leaf paste mixed with warm castor oil is applied to the painful body parts.	Topical	Body pains
31	*Datura metel* L. Ummetha.	Solanaceae	Herb	Flower and Seed	Flowers and seeds are boiled in castor oil and applied to the affected area.	Topical	Swollen knee joints.
32	*Decalepis hamiltoni* Wight&Arn. Maredu kommulu	Periplocaceae	Climber	Root	Root paste mixed with lukewarm water is taken (5 ml) twice daily.	Oral	Jaundice
33	*Dendrophthoe falcata* (L.F.) Etting. Vepabadanika.	Loranthaceae	Parasite	Leaf	Leaf decoction is administered before sunrise for three days.	Topical	Migraine
34	*Desmodium triflorum* DC. Munthamandu.	Fabaceae	Herb	Leaf	Leaf paste mixed with hot castor oil is applied to the affected area.	Topical	Cuts and wounds
35	*Dichrostachys cinerea* (L.) Wight & Arn. Veluthuru chettu.	Mimosaceae	Shrub	Leaf	Leaf paste mixed with ghee is administered daily for 21 days.	Oral	Aphrodisiac
36	*Drimia indica* (Roxb.) J.p. Jossop Adavi vulli.	Asparagaceae	Herb	Corm	Corm paste is used for treatment.	Topical	Gonorrhoea
37	*Eclipta prostrata* L. Guntagalagara.	Asteraceae	Herb	Whole plant	One cup of whole plant decoction is administered topically.	Topical	Hair tonic
38	*Elaeodendron glaucum* (Rottb.) Kuntz. Neridi.	Celastraceae	Tree	Stem bark	Bark paste is applied over the swollen body parts.	Topical	Body Swelling
39	*Euphorbia hirta* L. Pedabayaku.	Euphorbiaceae	Herb	Whole plant	Whole plant extract mixed with hot water and buttermilk is taken daily.	Oral	Dysentery
40	*Euphorbia tirucalli* L. Kallimanu.	Euphorbiaceae	Climber	Latex	Latex is applied to the swollen body part.	Topical	Body swelling
41	*Evolvulus alsinoides* L. Vishnukrantha.	Convolvulaceae	Herb	Whole plant	Whole plant paste is applied to the affected area to relieve pain and strengthen the gums.	Topical	Toothache
42	*Ficus bengalensis* L. Marrichettu.	Moraceae	Tree	Twig	A spongy sugar cake mixed with fruit is consumed every morning for 21 days.	Oral	Spermatorrhea
43	*Ficus religiosa* L. Ravi chettu.	Moraceae	Tree	Stem bark	Bark ash is applied to the affected area.	Topical	Breast abscess
44	*Flacourtia indica* (Burm.f.)Merr. Thaliperu.	Salicaceae	Shrub	Leaf	Two spoonfuls of leaf powder mixed with half a spoonful of dried ginger powder are administered twice daily for three days.	Oral	Fever
45	*Gmelina asiatica* L. Chinna adavigummadi.	Verbinaceae	Shrub	Fruit	Fruit juice mixed with turmeric powder is heated and applied to the affected body parts.	Topical	Wounds, Inflammation.
46	*Grewia hirsuta Vahl.* Janichettu.	Tiliaceae	Shrub	Fruit	Fruit pulp is consumed in two-spoonful doses once daily for three days.	Oral	Dysentery
47	*Gymnema sylvestre* (Retz).R.Br.ex Roem, Podapatri.	Periplocaceae	Climber	Leaf	Leaf paste is applied immediately to the bitten area after an insect bite.	Topical	Insect bite
48	*Heliotropium indicum* L. Nagadanti.	Boraginaceae	Herb	Leaf	Leaf paste is applied to the affected portion of the body.	Topical	Wounds
49	*Hemidesmus indicus* (L.) R.Br. Sugandapala.	Periplocaceae	Herb	Root	After removing the outer black skin, fresh roots are chewed and eaten for body cooling.	Oral	Coolant
50	*Hugonia mystax* L. Pentapedda.	Linaceae	Shrub	Root	Root bark paste mixed with turmeric powder is applied to swollen body parts.	Topical	Body swellings
51	*Indigofera linnaei* Ali. Chalapachi.	Fabaceae	Herb	Whole plant	Whole plant paste is applied to the affected area.	Topical	Sores and wounds
52	*Kigelia africana* (Lam) Benth. Enuguthondam.	Bignoniaceae	Tree	Leaf	Warm leaf paste is applied to the affected area.	Topical	Scorpion sting
53	*Lantana camara* L. Beliyaku.	Verbinaceae	Shrub	Leaf	Leaf paste mixed with turmeric powder is applied to wounds.	Topical	Wounds
54	*Lepidagathis cristata* Willd. Nakkapintuka.	Acanthaceae	Herb	Whole plant	Whole plant paste mixed with turmeric powder is applied over the body.	Topical	Scabies
55	*Leucas aspera* L. Thummi.	Lamiaceae	Herb	Flower	Inflorescences collected on Tuesday are worn around the neck, and relief is obtained within seven	Topical	Cough and Cold

					days.		
56	*Martynia annua* L. Thelukondikaya.	Martyniaceae	Herb	Leaf	Leaf extract is used in the treatment of epilepsy.	Topical	Epilepsy
57	*Melastoma malabathricum* L. Pathudu chettu.	Melastomaceae	Shrub	Root	Root extract (10 ml) mixed with jaggery is administered three times daily for three days.	Oral	Blood dysentery.
58	*Mimosa pudica* L. Attipatti.	Mimosaceae	Herb	Root	Root decoction is taken daily for one month.	Oral	Leucorrhoea
59	*Mullugo pentaphylla* L. Verrichatraku.	Mulluginaceae	Herb	Fruit	Fruit powder (one teaspoon) is administered with hot water three times daily for 15 days.	Oral	Menstrual discharge
60	*Nelumbo nucifera* Gaertn. Kamalamu.	Nympheaceae	Herb	Rhizome	Rhizome powder mixed with a cup of hot water is administered orally.	Oral	Loose motions
61	*Nymphaea nouchali* Burm.f. Kaluva.	Nympheaceae	Herb	Rhizome	Rhizome mixed with jaggery is administered orally three times daily for three days.	Oral	Diarrhoea
62	*Opuntia stricta* (Haw.) Haw. Nagajamudu.	Cactaceae	Shrub	Stem	Stem paste is applied to the affected joints.	Topical	Joint pains
63	*Oxalis corniculata* L. Pulichinta.	Oxalidaceae	Herb	Whole plant	One cup of whole plant juice is administered every hour during the day.	Topical	Skin diseases
64	*Phyllanthus niruri* L. Nelausiri.	Euphorbiaceae	Herb	Whole plant	Fresh plant juice is consumed three times daily for seven days.	Oral	Jaundice
65	*Physalis minima* L. Buddabusada.	Solanaceae	Herb	Fruit	Ripe fruits are eaten raw.	Oral	Appetite
66	*Plumbago zeylanica* L. Chitramulam.	Plumbaginaceae	Herb	Root	Root extract is administered orally.	Oral	Sleep
67	*Pupalia lappacea* (L.) DC. Adaviuttareni.	Amaranthaceae	Herb	Leaf	Leaves are ground with heated sesame oil and applied externally.	Topical	Boils
68	*Ricinus communis* L. Amudamu.	Euphorbiaceae	Shrub	Seed	Seed oil is used as hair oil to remove lice. Warm leaves coated with mustard oil are applied to the stomach of infants.	Topical	Stomach pain
69	*Rubia cordifolia* L. Manjistamu.	Rubiaceae	Herb	Leaf	Leaf infusion is administered orally.	Oral	Antihelmentic
70	*Sarcostemma acidum* (Roxb.) Voigt Hort. Kondapala.	Asclepiadaceae	Climber	Latex	One drop of latex is instilled into the eyes once weekly during the early stages of cataract.	Topical	Cataract
71	*Scoparia dulcis* L. Dakshni.	Plantaginaceae	Herb	Root	Root powder is administered once daily for one month.	Oral	Post-delivery complaints
72	*Sida acuta* Burm.f. Medabirisaku	Malvaceae	Herb	Whole plant	Whole plant juice is massaged over the affected areas once daily.	Topical	Rheumatoid arthritis
73	*Solanum nigrum* L. Kasikaya.	Solanaceae	Herb	Fruit	Ripe fruits are consumed orally.	Oral	Diarrhoea
74	*Solanum torvum* Sw. Vustikaya.	Solanaceae	Shrub	Fruit	Berries and unripe fruits are edible.	Oral	Eatable
75	*Strychnos nux-vomica* L. Musti.	Loganiaceae	Tree	Leaf	Leaf paste is applied to the infected areas twice daily for three days.	Topical	Cracks and Wounds
76	*Syzygium cumini* (L.) Skeels. Nerudu.	Myrtaceae	Tree	Stem bark	Paste prepared from stem bark is applied to the affected area.	Topical	Blisters
77	*Tephrosia purpurea* Pers. Vempali.	Leguminosae	Herb	Whole plant	Paste prepared from all plant parts is applied to the affected area.	Topical	Eczema
78	*Terminalia arjuna* (Roxb.ex.DC).Wight & Arn. Tella maddi.	Combretaceae	Tree	Leaf	Leaf juice (10 ml) is administered orally twice daily for three days.	Oral	Dysuria
79	*Tinospora cordifolia* (Willd.) Miers. Tippateega.	Menispermaceae	Climber	Stem	One tablespoon of stem powder mixed with buttermilk (100 ml) is administered twice daily for three days.	Oral	Dysuria
80	*Tribulus terrestris* L. Peddapalleru.	Zygophyllaceae	Herb	Seed	Seed powder is administered with Mucuna pruriens seed powder in equal proportion along with water.	Oral	Premature ejaculation
81	*Trichodesma zeylanicum* R.Br. adavi nuugu teega.	Boraginaceae	Herb	Whole plant	Whole plant paste is applied around the affected area.	Topical	Wounds
82	*Tridax procumbens* L. Bellapaku.	Asteraceae	Herb	Whole plant	Plant extract is applied to the affected area.	Topical	Cuts and wounds
83	*Tylophora indica* (Burm.f.), Merril. Kukkapala	Periplocaceae	Climber	Leaf	Two tender leaves are chewed early in the morning before breakfast for 14 days.	Oral	Asthma
84	*Vanda tessellata* (Roxb.) Hook. ex G.Don Vadanika.	Orchidaceae	Epiphyte	Whole plant	Paste prepared from the whole plant mixed with warm castor oil is applied once daily at night.	Topical	Body pains

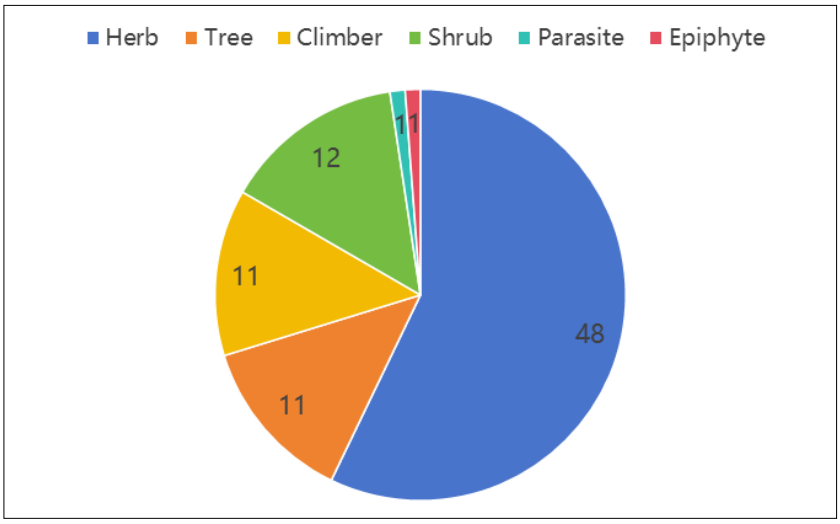


Fig 1: Habit wise distribution of plants

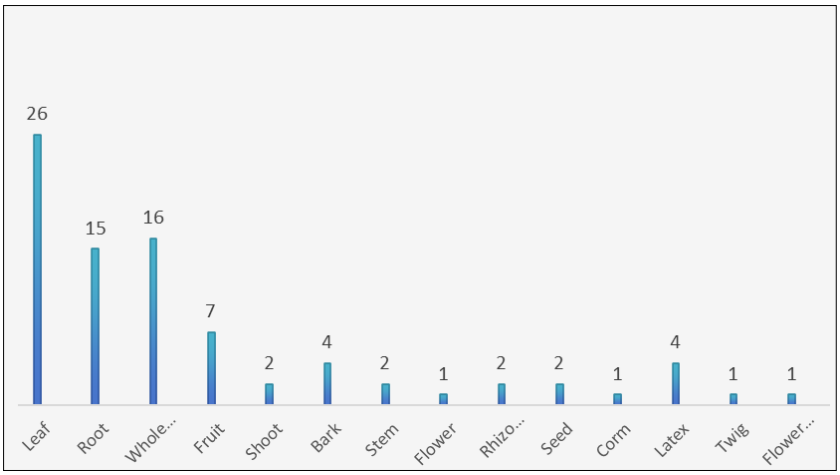
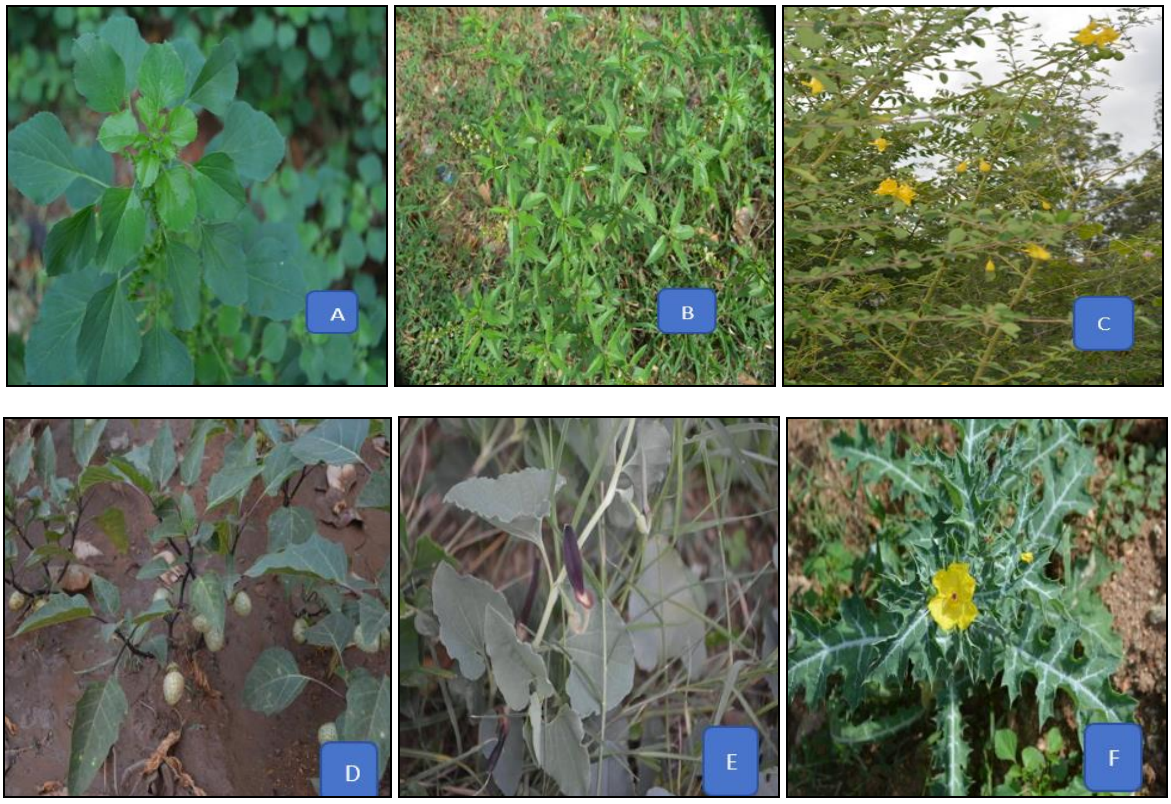


Fig 2: Frequency of plant parts used in ethnobotanical study



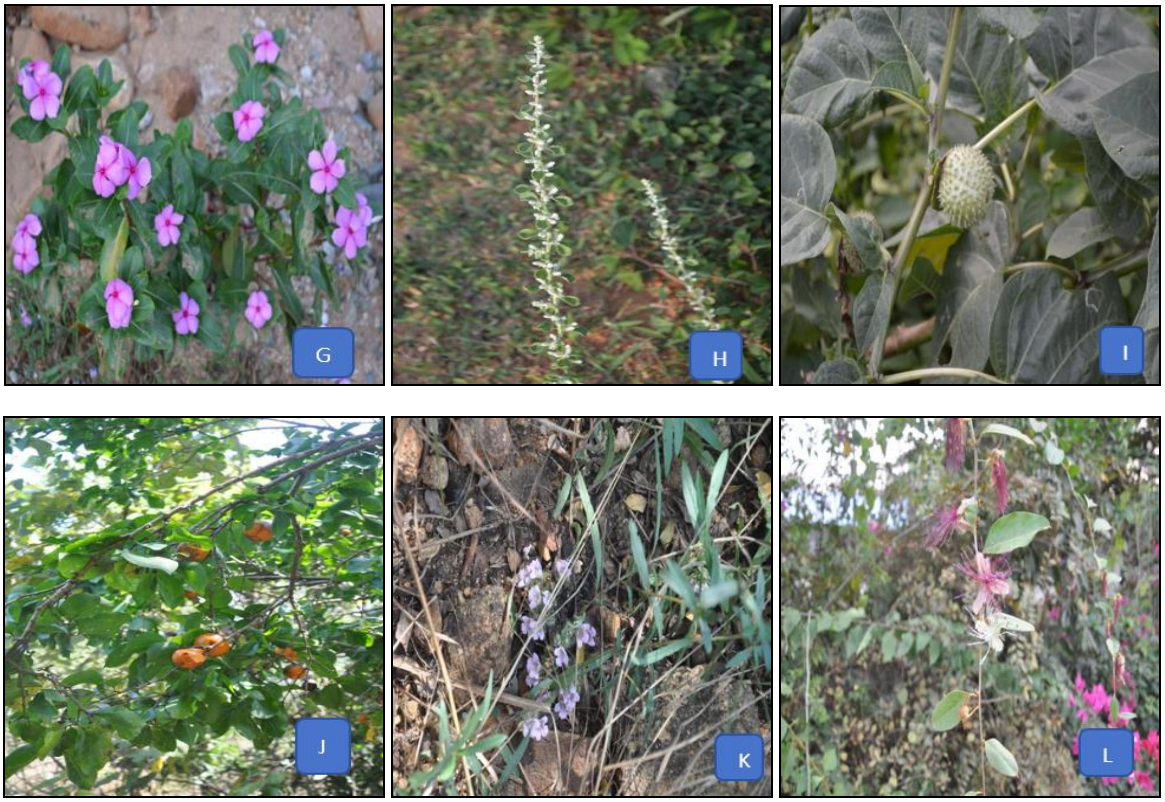


Fig 3: A -*Acalypha indica* L. B - *Croton bonplandianum* Baill. C -*Gmelina asiatica* L. D- *Datura innoxia* Maill. E - *Aristalochia indica* L. F - *Argemon mexicana* L. G - *Catharanthus roseus* (L.)G.Don. H - *Aerva lanata* (L.) Juss.ex Schult. I - *Datura metel* L. J - *Strychnos nux-vomica* L. K - *Lepidagathis cristata* Willd. L - *Capparis zeylanica* L.

Discussion

The present ethnobotanical investigation documented 84 medicinal plant species belonging to 47 families that are traditionally utilized by indigenous and rural communities of Annamayya District, Andhra Pradesh, for the treatment of various human ailments. The extensive utilization of medicinal plants observed during the study reflects the strong dependence of local communities on traditional plant-based healthcare systems. Similar findings have been reported from different tribal and rural regions of India and Andhra Pradesh where medicinal plants continue to play an important role in primary healthcare management due to their accessibility, affordability, and cultural acceptance (Jain, 1991; Kala, 2005; Uniyal *et al*., 2006;Sudarsanam G,1994;1995; Vedavathy S *et al*.,1999;1997;Madhava Chetty *et al*.,1998) [14, 16, 19, 39, 40, 43, 44, 45]. In the present study, herbs constituted the dominant life form among the recorded medicinal plants. The predominance of herbs in traditional medicine has also been reported in several ethnobotanical studies conducted in India and other countries (Giday *et al*., 2003; Kumara Swamy *et al*., 2007; Mesfin *et al*., 2013;Sudarsanam G,1994;1995,2006) [6, 18, 20, 39, 40, 41]. Herbaceous plants are generally preferred because they are easily available, abundant in natural habitats, rapidly regenerating, and rich in bioactive secondary metabolites. In addition, herbs can be collected conveniently throughout the year, making them highly suitable for routine healthcare practices among rural communities. Shrubs, trees, climbers, and parasitic species also contributed significantly to the traditional medicinal system of the study area. Leaves were found to be the most frequently utilized plant part in herbal preparations, followed by roots and whole plants. Similar observations were reported by Prabu *et al*. (2008), Savithramma *et al*. (2011), and Rajakumar and Shivanna (2009), Husain M.(2024),Pratap G.P,(2009, 2010, 2019) [11, 23, 24, 31, 36], who documented the predominance of leaf-based remedies in ethnomedicinal practices. The extensive use of leaves may be attributed to their easy availability, ease of collection, and high concentration of therapeutic phytochemicals such as alkaloids, tannins, flavonoids, phenols, and glycosides. Moreover, harvesting leaves causes comparatively less destructive impact on plant survival than root or bark extraction, thereby supporting sustainable utilization of medicinal plant resources. The majority of herbal remedies documented during the present study were prepared in the form of decoctions, pastes, juices, powders, and extracts. Decoctions and pastes were the most commonly used preparation methods because they are simple, effective, and require minimal processing. Similar preparation methods have been documented in ethnomedicinal surveys conducted among tribal communities of Andhra Pradesh, Karnataka, and Tamil Nadu (Reddy *et al*., 2006; Kumara Swamy *et al*., 2007; Prabu *et al*., 2008) [18, 23, 34]. The frequent use of fresh plant materials in remedy preparation further suggests the belief of local healers that freshly collected plant parts possess greater therapeutic efficacy. Oral administration was observed as the dominant mode of treatment, while topical applications were mainly employed for wounds, cuts, boils, swellings, skin diseases, muscular pains, and rheumatic disorders. Similar patterns of administration were previously reported in ethnobotanical studies conducted in Andhra Pradesh and other regions of India (Savithramma *et al*., 2011; Uniyal *et al*., 2006,Pratap G.P,(2009, 2010, 2019) [24, 31, 34, 36]). The prevalence of oral administration may be associated with the treatment of common internal disorders such as fever, asthma, jaundice, diarrhoea, dysentery, gastrointestinal problems, and reproductive ailments.

Topical applications, on the other hand, were found particularly effective for dermatological conditions and inflammatory disorders. The study revealed that dermatological disorders, gastrointestinal diseases, respiratory ailments, fever, jaundice, reproductive disorders, and urinary complications were among the major disease categories treated using herbal remedies. Similar ailment categories were reported as dominant in earlier ethnomedicinal studies among tribal populations in India (Reddy *et al*., 2006; Rajakumar and Shivanna, 2009) [31, 34]. The frequent occurrence of gastrointestinal and respiratory disorders in rural communities may be related to poor sanitation, contaminated drinking water, nutritional deficiencies, seasonal climatic variations, and limited access to modern healthcare facilities. Traditional herbal medicine therefore remains an important and affordable healthcare alternative in remote rural regions. Several medicinal plants documented during the present investigation possess scientifically validated pharmacological properties. *Andrographis paniculata*, extensively used for fever treatment, has been reported to exhibit antipyretic, anti-inflammatory, antimicrobial, and immunostimulatory activities (Akbar, 2011) [1]. *Boerhaavia diffusa* and *Phyllanthus niruri*, commonly used for jaundice treatment, are well known for their hepatoprotective and antioxidant properties (Kirtikar and Basu, 1999) [17]. *Tinospora cordifolia* has been widely recognized for its immunomodulatory, antidiabetic, and antimicrobial activities, while *Tridax procumbens* possesses wound-healing and antimicrobial properties (Saxena and Albert, 2005) [37]. These scientific validations strongly support the therapeutic reliability of the indigenous medicinal knowledge documented in the present study. Certain medicinal species such as *Andrographis paniculata*, *Phyllanthus niruri*, *Boerhaavia diffusa*, *Tridax procumbens*, and *Tylophora indica* were repeatedly cited by local informants because of their high effectiveness in curing specific ailments. Repeated citation of these species suggests their significant ethnomedicinal importance and indicates a high degree of community consensus regarding their therapeutic efficacy. Similar observations were also reported in ethnobotanical studies carried out among tribal communities of Ethiopia and India (Heinrich *et al*., 1998; Giday *et al*., 2003) [6, 8]. The present study further revealed that ethnomedicinal knowledge is mainly transmitted orally from elders and traditional healers to younger generations. However, rapid urbanization, deforestation, overexploitation of medicinal plants, changing lifestyles, migration, and declining interest among younger generations are threatening the preservation of this valuable indigenous knowledge. Similar concerns regarding the erosion of traditional ethnobotanical knowledge have been expressed by Cotton (1996) and Hamilton (2004) [3, 7], who emphasized the urgent need for documentation and conservation of medicinal plant diversity and associated cultural traditions. The destruction of natural habitats and unsustainable harvesting practices may also threaten the survival of several medicinally important species recorded during the present investigation. Therefore, conservation strategies including in situ and ex situ conservation, cultivation of medicinal plants, sustainable harvesting methods, and community awareness programs are essential for protecting medicinal plant resources and preserving traditional healthcare systems. In addition, phytochemical, pharmacological, and clinical investigations are required to scientifically validate the therapeutic claims of the documented species and to facilitate the development of novel plant-based drugs. Overall, the present ethnobotanical investigation highlights the immense medicinal plant diversity and rich indigenous healthcare knowledge prevailing in Annamayya District of Andhra Pradesh. The documented medicinal plants provide valuable baseline information for future pharmacological research, biodiversity conservation programs, and sustainable utilization of herbal resources. Furthermore, the study emphasizes the importance of preserving traditional ethnomedicinal knowledge as an integral component of cultural heritage and rural healthcare systems.

Conclusion

The present ethnobotanical investigation revealed the rich diversity of medicinal plants and the extensive traditional knowledge possessed by indigenous and rural communities of Annamayya District, Andhra Pradesh. A total of 84 medicinal plant species belonging to 47 families were documented for the treatment of a wide range of human ailments, including fever, asthma, jaundice, dysentery, skin diseases, wounds, gastrointestinal disorders, reproductive problems, and urinary complications. Herbs constituted the dominant life form, while leaves were the most frequently utilized plant part in herbal preparations. Decoctions, pastes, juices, and extracts were the major forms of remedy preparation, and oral administration was found to be the predominant mode of treatment. The study highlights the significant role of traditional herbal medicine in primary healthcare management, particularly in remote rural areas where access to modern medical facilities remains limited. Several medicinal species such as *Andrographis paniculata*, *Boerhaavia diffusa*, *Phyllanthus niruri*, *Tinospora cordifolia*, and *Tridax procumbens* were frequently cited by informants because of their high therapeutic value and effectiveness in curing specific ailments. The repeated use of these medicinal plants indicates their cultural importance and strong community confidence in traditional healing practices. The ethnomedicinal knowledge documented during the present study is mainly transmitted orally from one generation to another and is currently under threat due to modernization, deforestation, habitat degradation, overexploitation of plant resources, and declining interest among younger generations. Therefore, immediate efforts are necessary for the documentation, conservation, and sustainable utilization of medicinal plant resources and associated indigenous knowledge systems. Furthermore, detailed phytochemical, pharmacological, and clinical investigations of the recorded medicinal species are essential to scientifically validate their therapeutic potential and promote the development of effective plant-based drugs. Overall, the present study provides valuable baseline information for future ethnobotanical research, biodiversity conservation, and herbal drug development programs while contributing significantly to the preservation of traditional healthcare knowledge.

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Conflict of interest
The authors declare no conflict of interest.

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