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Ethnobotany and plant diversity of the Kanum tribe in South Papua, Indonesia

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Kanum is an indigenous tribe domiciled in several villages in Merauke, South Papua, Indonesia. Despite the tribe's rich ethnobotanical knowledge, comprehensive documentation and widespread publication of traditional plant use remain limited. This research explored the ethnobotanical resources of the Kanum tribe using a mixed-methods approach. Data were collected from July to November 2024 in three villages of Sota District, Merauke Regency, Indonesia. Eight community leaders and traditional elders with in-depth knowledge of the plant species used in daily life were among the key responders. Data were collected through field observations, in-depth interviews with key respondents, and demonstrations of medicinal plant preparations. The results showed that a total of 83 types of ethnobotanical plants spread across 71 genera and 42 families were recorded. Approximately 59% of the plants are native to the eastern part of Indonesia, New Guinea, Australia, and the Pacific Islands. They are primarily used in traditional rituals, medicine, and food, with wounds being the most common condition they are used to treat. These results contribute to the preservation of cultural heritage while also providing an ethnomedicinal basis for further drug study, discovery, and biodiversity conservation.

Keywords: Ethnomedicine, Kanum tribe, Traditional knowledge

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Plant biodiversity is a vital natural resource that meets various human needs, such as food, medicine, building materials, firewood, and cultural rituals, especially in remote areas[1]. In rural communities, plants are crucial for nutrition due to their accessibility and affordability[2]. Plants are vital for culturally relevant, affordable healthcare, sustainable livelihoods, and biodiversity conservation[3]. In regions rich in traditional knowledge, plant diversity sustains cultural practices, while both biodiversity and culture are key to environmental sustainability and preserving traditional knowledge[4].

The Kanum tribe, like many other local communities, possesses a wealth of knowledge about the plants used in construction, traditional ceremonies, medicine, and food. The way their ancestors utilised natural resources remains fundamental to their survival today and is deeply ingrained in their culture. The use of medicinal plants is deeply rooted in traditional medicine, particularly in developing countries, and remains a vital health resource. Traditional knowledge and increasing scientific evidence highlight their therapeutic value for various ailments, including gastrointestinal, wound, and respiratory conditions. *Aloe vera*, ginger, turmeric, tulsi, and mint are frequently used as remedies for respiratory conditions. These plants contain bioactive compounds such as tannins, alkaloids, terpenoids, and flavonoids with therapeutic properties. Species like *Echinacea purpurea* and *Zingiber officinale* show potential in treating bronchitis, asthma, the common cold, chronic obstructive pulmonary disease, cough, and whooping cough[5]. Their effectiveness against respiratory conditions is also linked to antioxidant activity[6].

Traditionally, *Curcuma longa*, *Azadirachta indica*, and *Aloe vera* are used for wound healing due to their anti-inflammatory and antibacterial properties[7]. Plants from the Asteraceae, Apiaceae, and Lamiaceae

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families are commonly used for gastrointestinal disorders, with ginger specifically treating nausea and indigestion[8]. The Odisha and Soliga tribes in India maintain a deep bond with plants and forests, integrating them into diverse socio-cultural practices. Odisha's indigenous communities manage forests to protect both culture and biodiversity[9,10]. Similarly, the Acehnese in Indonesia use various plants in traditional wedding and funeral rituals[11].

Plant biodiversity in the Kanum tribal area remains poorly documented, hindering assessment efforts. Many regions, including the Upper Sand Creek Research Natural Area in Utah, also lack comprehensive records of plant species and ethnobotanical use[12]. Recent systematic surveys of biodiversity and ethnobotany have been conducted in areas such as Pakistan's Gilgit District, Jhilmil Lake, Chamla Valley, and Bara Gali Forests[13-16].

This research is important for preserving the traditional knowledge of the Kanum Tribe, which is threatened by modernization, supporting biodiversity conservation, and identifying plants with medicinal potential for the development of herbal remedies in community medicine. This study employs a utilization matrix to enable cross-disciplinary research, uncover undocumented ethnobotanical knowledge, identify local plants with potential for modern medicine, support medical and pharmaceutical sciences through traditional approaches, and map ethnobotanical knowledge within a socio-cultural context. The study focuses on the Kanum tribe's use of ethnobotanical resources.

Materials and Methods

Study area

Interviews and plant specimen collection were conducted in three villages, namely Rawa Biru, Yanggandur, and Sota Villages, Sota District, Merauke Regency, South Papua (S 8.6328° and E 140.8571°), from July to November 2024. This area is part of Wasur National Park's forest, and almost all forest areas have flat topography characteristics, with altitudes ranging from 0 to 60 m above sea level. Figure 1 shows the map of the research area.

Data collection

This study employed a mixed-methods approach. Key respondents included eight Kanum tribal elders and community leaders, who possessed extensive knowledge of the plant species used in daily life. Data on functional plant diversity (ethnobotany) were obtained through field observations, in-depth interviews with key respondents, and demonstrations of medicinal plant preparation. Ethnobotanical specimens were collected, processed, and identified, with voucher specimens deposited at the Herbarium Bogoriense, Directorate of Scientific Collection Management, National Research and Innovation Agency (BRIN). The verified specimens were then organized alphabetically by family, local name, and ethnobotanical use.

Data analysis

The cultural significance value (Index of Cultural Significance, ICS) of useful plants was calculated using the formula proposed by Turner[17] to assess their importance in the lives of local communities. The formula is as follows:

$$ICS = \sum_{i=1}^{n} (\mathrm{q}i \times \mathrm{i}i \times \mathrm{e}i)$$

ICS = index of cultural significance
qi = quality of use value
ii = intensity of use of plant species in everyday life value
ei = exclusive value of the use of plant species based on preference

Results

Diversity of ethnobotanical plants

The Kanum tribe utilise 83 plant species, representing 71 genera and 42 families. These species are classified morphologically into trees, shrubs, undershrubs, herbs, climbers, treelets, and grasses (Fig. 2; Table 1).

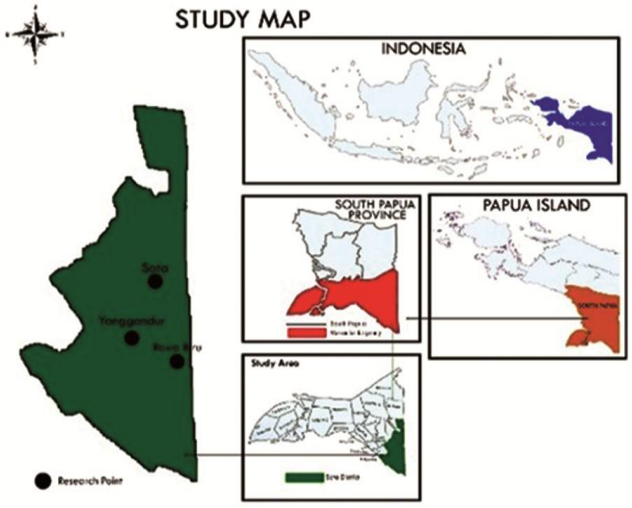

Fig. 1 — Research location in Sota District, South Papua, Indonesia (Source: Authors)

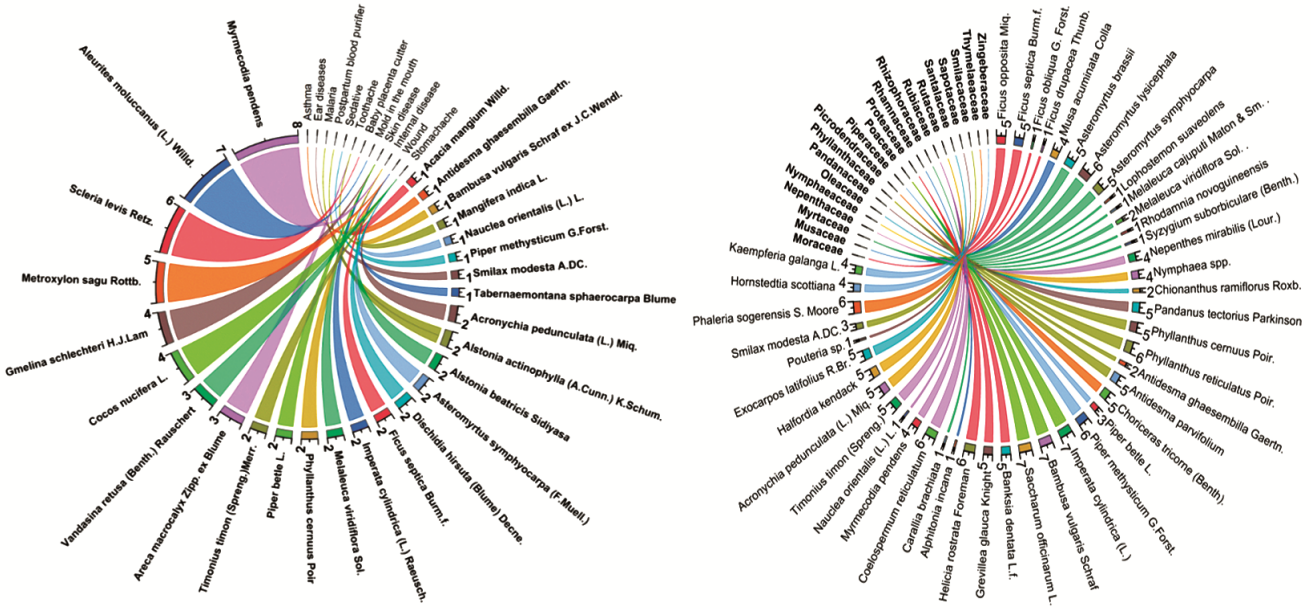

Fig. 2 — Families, species, and morphological categories of ethnobotanical plants used by the Kanum Tribe
Caption. 1: trees; 2: treelets; 3: climbers; 4: herbs; 5: shrubs; 6: undershrubs; 7: grasses

Table 1 — Ethnobotanical recipes, preparation methods, uses, and ICS values

Family and Species	Local Name (Kanum)	Part used	Preparation and Utilization	Ethnobotanical use	ICS Value
Anacardiaceae					
Mangifera indica L.	Wewi/ mangga air	Inner bark	Cut into small pieces, heated over a fire, and chewed	Toothace	19
		Leaves	Pounded into a fine paste, mixed with lime and water until thickened	Facial dye for traditional ceremonies	
		Ripe fruit	Consumed	Edible	
Semecarpus australiensis Engl.	Mepa	Seeds	Burned to remove the hard, allergenic outer layer, after which the cooked seed flesh	Edible	5
Annonaceae					
Huberantha nitidissima (Dunal) Chaowasku.	Sikupre	Straight mature stem	Placed beside the *wati* plant (*Piper methysticum*)	Serve as support	4
Uvaria rufa Blume	Weweku	Ripe fruit	Consumed directly	Edible	3
Uvaria leichhardtii (F.Muell.) L.L.Zhou, Y.C.F.Su & R.M.K. Saunders	Kend-kend	Ripe fruit	Consumed directly	Edible	3
Apocynaceae					
Alstonia actinophylla (A.Cunn.) K.Schum.	Suri, kent	Inner bark	Boiled and consumed	Malaria and cleanse the blood after childbirth	24
Alstonia beatricis Sidiyasa	Beya	Fresh leaves	Chewed into a paste and applied.	Wound	9
Alstonia spatulata Blume.	Tern	Roots	Carved into animal forms, affixed to the head crown	Sago feasts (keyang yu)	8
Dischidia hirsuta (Blume) Decne.	Nturantun	Leaves	Chewed until softened, the juice is swallowed, and the pulp is applied to the abdomen.	Stomach	9
Tabernaemontana sphaerocarpa Blume	Bawang-bawang	Inner bark	Chewed until softened and succulent; its juice is swallowed, and the pulp is applied	Wounds of venomous snake bites	12

… *Contd.*

Table 1 — Ethnobotanical recipes, preparation methods, uses, and ICS values (Contd.)

Family and Species	Local Name (Kanum)	Part used	Preparation and Utilization	Ethnobotanical use	ICS Value
Arecaceae					
Areca macrocalyx Zipp. ex Blume	Konisi/ konci	Roots	Cleaned, boiled, and gargled adequately.	Toothache	42
		Leaves	Torn	Traditional sign of marital validity	
		Fruits	Suspended around ritual venues.	Traditional ritual	
Cocos nucifera L.	Tapolu	Young coconut flesh	Consumed directly	Food	53.5
		Mature flesh	Processed into coconut milk or chewed into a paste	Wound treatment	
		Dry shell	Serves as a water container or fuel	Household tools	
		Coconut water	Consumed directly	Beverage	
		Leaves	Woven into baskets	Household tools	
		Dried midribs	Burned to ash	Substitutes for salt	
		Young shoots	Consumed	Edible	
		Midrib fibers	Filters for freshly processed sago	Household tools	
		Leaf veins	Bundled into brooms.	Household tools	
		Coconut fiber	Burned as fuel	Substitute for matches	
Corypha utan Lam.	Mawan/ gebang	Pith of trunk	Processed like sago to produce flour	Food	16
		Old leaves	Used as a roofing material	Building materials	
		Young leaves	Twisted into ropes	Household tools	
Livistona benthamii F.M.Bailey	Pupu	Tubers at the tips of young stems	Cleaned and consumed either directly or as vegetables	Food	9
		Leaf stalks	Tied to the back as tassels resembling cassowary feathers	Traditional dances and festivities	
Ptychosperma propinquum (Becc.) Becc. ex Martelli	Kerepi	Tubers at the tip of young stems	Cleaned and consumed directly		4
		Hard outer stem	Used to make bows and arrows	Household tools and traditional ritual	
Araceae					
Colocasia esculenta (L.) Schott	Tente (keladi rawa)	Stem tubers	Boiled or roasted	Daily consumption or during traditional events	24
		All parts	Used as decorations	Ceremonial venues	
Metroxylon sagu Rottb.	Keyang (sagu)	Flour	Grilled for consumption	Daily consumption	71
		Raw flour	Serves as decoration	Traditional events	
		Diluted flour	Coated	Burns or smallpox	
		Young leaf sheets	Woven	Roof	
		Ribs of leaf	Used as arrows	Children’s archery	
		Broad fronds	Containers for pressing sago pulp	Household tools	
		Dry fronds	Store sago sediment, serve as hut walls	Household tools	
			Burned	Charcoal dye	
		Outer layer of the hard trunk	Split into sheets	Building material for floors or walls	
		Root	Boiled and used as a gargle	Toothache	
Bignoniaceae					
Deplanchea tetraphylla (R.Br) F. Muell.	Mbuningga	Tips	Chewed with lime and areca nut	Substitute the betel in the practice of 'nyirih' (betel chewing).	2

… *Contd.*

Table 1 — Ethnobotanical recipes, preparation methods, uses, and ICS values (Contd.)

Family and Species	Local Name (Kanum)	Part used	Preparation and Utilization	Ethnobotanical use	ICS Value
Chrysobalanaceae					
Parinari nonda F.Muell. ex Benth.	Walu	Ripe fruit	Consumed directly	Food	6
Cyperaceae					
Carex sp.	Ponto	Black fibrous roots	Used to weave black patterns	Traditional bags	12
Scleria levis Retz.	Bebesi	All parts	Cleaned and burned to ashes, which are mixed with breast milk to form a thick paste	To accelerate the healing of the newborn's placental wound	24
Lepidosperma longitudinale Labill	Semin	Leaves	Dried and woven into mats	Household tools	20
Dilleniaceae					
Dillenia alata (R.Br. ex DC.) Banks ex Martelli	Mero	Young reddish leaves	Used to wrap ant larvae for raw consumption	Food	12
		broad mature leaves	Wrap food for stone grilling	Food	
		The outer layer of the white rice-like seeds	Consumed directly	Edible	
Dioscoreaceae					
Dioscorea esculenta (Lour.) Burkill	Kumbili (nai)	Tubers	Boiled or roasted	Consumed daily and during traditional events	33
Dioscorea alata L.	Kumbili (nai)	Tubers	Boiled or roasted	Consumed daily and during traditional events	33
Elaeocarpaceae					
Elaeocarpus arnhemicus F. Muell.	Soe-soe	Mature blue fruit	Consumed directly in the forest	Food	3
Erythroxylaceae					
Erythroxylum ecarinatum Hochr.	Sempewar	Small pieces of bark	Chewed with betel and lime in the absence of betel nut	Betel chewing or "nyirih"	3
Euphorbiaceae					
Aleurites moluccanus (L.) Willd.	Takupi	Sap from the bark	Dripped	Treat infants' oral fungal infections	19.5
		Seed flesh	Processed into a paste to extract oil	Burn treatment	
			Burned	Nighttime light	
			Applied to bows and arrows	To deter borer insects as a botanical pesticide.	
Codiaeum variegatum (L.) Rumph. ex A.Juss.	Ntal-talkin	Leaves	Placed in a "wati" plant bundle alongside three other "anggin" leaves	Traditional rituals	16
Fabaceae					
Acacia mangium Willd.	Tarbi	Water from the inner bark	Scraped and applied	Sharp-object wounds	34.5
		Dried trunk and bark	Burned	Serve as long-lasting, high-heat firewood.	
		Bark fibers	Twisted into ropes	Fencing and hut construction	
		Bark	Burned into ash	Salt substitute	
Vandasina retusa (Benth.) Rauschert	Tarika	Roots	Cleaned, heated, and chewed, the extracted juice is ingested	Stomachaches and diarrhea	12
		Young leaves	Used to wrap ant larvae, and consumed	Food	

… *Contd.*

Table 1 — Ethnobotanical recipes, preparation methods, uses, and ICS values (Contd.)

Family and Species	Local Name (Kanum)	Part used	Preparation and Utilization	Ethnobotanical use	ICS Value
Haemodoraceae					
Haemodorum coccineum R.Br.	Ngantu nagrin	Grated rhizome roots	Used as a red dye	Traditional garments and equipment.	6
Lamiaceae					
Gmelina schlechteri H.J.Lam	Kowiro	Mature and large-diameter stems	Cut for percussion instrument (tifa) construction and	Traditional rituals	18
		Fresh leaves	Wrap food	Stone grilling	
		Ripe red fruit	Consumed	Prevent boils	
Lauraceae					
Endiandra glauca R.Br.	Nto	Young leaves	Chewed with betel nut and lime as a gambir skin	Substitute for “nyirih”	6
		Small pieces of bark	Chewed	Betel nut substitute	
Lecythidaceae					
Barringtonia acutangula (L.) Gaertn.	Gii	Bark	Stripped from the trunk, the fibers are separated, cleaned, air-dried, and woven	Traditional bag “noken”	2
Linaceae					
Hugonia jenkinsii F.Muell.	Bebelpi	Liana stems	Used as frameworks for round fish-catching nets.	Household tools	4
Malvaceae					
Abelmoschus manihot (L.) Medik.	Ngontobr/ gedi	Leaves	Cooked or stone-grilled.	Vegetables	6
Colona serratifolia Cav.	Kuwat pari	Bark	Stripped, fibers separated, cleaned, air-dried, and woven	Traditional clothing “cawat” (loincloth)	16
Melastomataceae					
Melastoma malabathricum L.	Nte-nterna	Leaves	Chewed until smooth and then applied to the body	Believed to prevent misfortune	1
Moraceae					
Ficus opposita Miq.	Yon	Coarse sandy leaves	Used to smooth rough surfaces	Sandpaper substitute	5.5
		Dark ripe fruit	Consumed directly	Edible	
Ficus septica Burm.f.	Gambirku	Leaves	Heated over a fire and applied to areas of pain	Bruising, swelling, or inflammation	6
Ficus obliqua G.Forst.	Tun	Strong fibers from hanging roots	Used to attach arrowheads to shafts.	Traditional equipment	12
Ficus drupacea Thunb.	Telegi	Strong fibers from aerial roots	Employed to bind arrowheads to shafts	Traditional equipment	12
Musaceae					
Musa acuminata Colla	Weu/ wew	Ripe or unripe fruit	Grilled	Consumption	24
		Bunches of fruit	Displayed	Traditional ritual venues	
Myrtaceae					
Asteromyrtus brassii (Byrnes) Craven	Mor	Outer bark	Twisted into rope for fencing and hut construction	Building materials	18
		Leaves	Spread around the “wati” plant	Deter insect pests	
Asteromyrtus lysicephala (F.Muell. & F.M. Bailey) Craven	Mpilen	Dried stems and leaves	Used for sweeping houses and yards	Household tools	10
		Stems, leaves, and flowers	Served as decorations	Traditional rituals	
Asteromyrtus symphyocarpa (F.Muell.)	Ware-ware	Leaves	Crushed and inhaled or applied to the abdomen	Stomachache or nausea	12
		Steam	Steamed	Therapeutic steaming	

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Table 1 — Ethnobotanical recipes, preparation methods, uses, and ICS values (Contd.)

Family and Species	Local Name (Kanum)	Part used	Preparation and Utilization	Ethnobotanical use	ICS Value
Myrtaceae					
Lophostemon suaveolens (Sol. ex Gaertn.) Peter G.Wilson & J.T.Waterh.	Potol	Fibrous outer bark	Employed to make rope	For fences and huts	12
Melaleuca cajuputi Maton & Sm. ex R.Powel.	Musinsya	Old dry bark	Peeled, rolled, and burned	Lighting or illuminating traditional nighttime event venues	4
Melaleuca viridiflora Sol. ex Gaertn.	Talar	Leaves	Chewed until smooth and juicy; the liquid is sprayed, and the pulp is applied	Measles, allergies, or itching	12
Rhodamnia novoguineensis A.J.Scott	Seki	Inner bark	Scraped or pounded until smooth and applied	Substitute for animal blood to affix the tanned hide to one end of the tifa drum	2
Syzygium suborbiculare (Benth.) T.G.Hartley & L.M. Perry	Ngkamperom	Inner bark	Scraped, smoothed, and mixed with lime	Natural dye for loincloths	34
			Combined with blue mud (mbarkau)	Black dye	
		Leaves	Chewed and sprayed over the body	Protection against lightning	
		Leaves and twigs	Placed at the doorway	Protection against lightning	
		Ripe red fruit	Consumed directly in the forest	Edible	
Nepenthaceae					
Nepenthes mirabilis (Lour.) Druce	Kolmalin	Roots	Chewed until smooth and juicy, and the liquid is sprayed on areas afflicted by magical or spiritual disturbance	Ward off evil spirits and bad luck	12
		Stems	Woven into bracelets	Ritual ornaments	
		Leaves	Inserted or tied to traditional clothing	Ritual ornaments	
Nymphaeaceae					
Nymphaea spp.	Pertaru	Stems growing in the substrate	Consumed	Edible	6
		Ripe fruits submerged in water	Consumed	Edible	
Oleaceae					
Chionanthus ramiflorus Roxb.	Ngoripl	Small pieces of bark or leaves	Chewed with areca nut and lime	Substitute the betel in the practice of "nyirih" (betel chewing).	6
Pandanaceae					
Pandanus tectorius Parkinson	Bas	Young roots	Pounded into a paste, leaving long fibers that are twisted into rope	Tying fences or constructing huts	2
Phyllanthaceae					
Phyllanthus cernuus Poir.	Katuk hutan	Leaves	Boiled and drunk	Various internal ailments	6
Phyllanthus reticulatus Poir.	Mei-meipel	Leaves	Stacked around the "wati" plant to support its growth	Household tools	7
		Small pieces of stem bark	Chewed with betel and lime as a substitute in *nyirih* (betel chewing).	A substitute for "nyirih" (betel chewing).	
Antidesma ghaesembilla Gaertn.	Tauri mpalngka	Pepagan	Scraped, squeezed for its extract, mixed with water, and consumed	relieve asthma or shortness of breath	18
		Ripe fruit	Eaten directly	Edible	
Antidesma parvifolium F.Muell.	Mpalngka	Ripe fruit	Consumed directly	Edible	6
Picrodendraceae					
Choriceras tricorne (Benth). Airy Shaw	Ntawar	Fresh leaves	Burned to produce a whistling sound	It is believed to repel evil spirits or witchcraft.	8

… *Contd.*

Table 1 — Ethnobotanical recipes, preparation methods, uses, and ICS values (Contd.)

Family and Species	Local Name (Kanum)	Part used	Preparation and Utilization	Ethnobotanical use	ICS Value
Piperaceae					
Piper betle L.	Talmo/ saka	Leaves	Boiled, once cooled, and washed over	Face and eyes as a remedy	42
		Leaves	Chewed mixed with lime	Treatment of boils	
		Fruit and leaves	Consumed with betel nuts	Chewing	
		stems, leaves, and fruit	Hung with sugarcane during the burning of “sep”	Traditional ceremonies	
Piper methysticum G.Forst.	Wati/ kariro	Roots or stems	Cleaned, pounded, or chewed until smooth and moist. The extracted liquid is collected in a glass until it reaches one whole portion, and then consumed	Producing a calming and refreshing effect upon waking	64
		All plant parts	Wrapped in banana leaves or *Melaleuca* bark	Used as essential offerings in traditional ceremonies and rituals	
Poaceae					
Imperata cylindrica (L.) Raeusch.	Seu	Leaves	Rubbed until smooth and applied.	Wounds caused by sharp objects	24
		Leaves	Layered evenly on the wati plant beds	Retain soil moisture as organic mulch	
		Entire plant	Twisted into a rope	Mark prohibitions against entry or resource use	
		Midribs of cogongrass leaves	Fashioned into traditional archery toys	Train children's dexterity	
Bambusa vulgaris Schraf ex J.C.Wendl.	Yeria	Bamboo shoots	Cleaned and cooked	Vegetables	107.5
		Mature straight twigs	Fashioned into arrows	Traditional equipment	
		Old stems	Split and shaped into bows or sharpened into hunting spears	Traditional equipment	
		Green stem	The surface is scraped, and the resulting powder is applied	Stoop the wounds bleeding	
		Dry culms	Rubbed together	Ignite fire in the absence of matches	
		Fresh stalks	Shaved into thin, flexible strips for bowstrings	Traditional equipment	
		Old dry culms	Cut into 3–4 meter poles for pushing boats	Traditional equipment	
			Arranged horizontally as fences or storage walls for tubers	Household tools	
Saccharum officinarum L.	Ku	Stem	Chewed to extract its water	Drink and natural sweetener	14
		Intact stem and leaves	Used as decoration in settings	Traditional ceremony	
Proteaceae					
Banksia dentata L.f.	Ntermpe	Leaves	Tied to traditional clothing or hung around ceremonial areas	Traditional ceremony	9
		Flower	Flowering is regarded as an indicator of the approaching dry season	Natural symptom marker	
		Floral nectar	Consumed directly as a natural sweetener.	Natural sweetener	
		Dried fruit	Ignited at one end and used as a long-lasting ember	Matches substitute	

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Table 1 — Ethnobotanical recipes, preparation methods, uses, and ICS values (Contd.)

Family and Species	Local Name (Kanum)	Part used	Preparation and Utilization	Ethnobotanical use	ICS Value
Proteaceae					
Grevillea glauca Knight	Yerb	Old hardwood	Plugged in	Prohibition marker poles "sasi"	7
			Used as hut construction poles	Building material for huts	
		Leaves	Inserted into bracelets or tied to traditional clothing	Adornments during rituals and special events	
Helicia rostrata Foreman	Teptepu	Ripe fruit	Consumed directly	Edible	6
Rhamnaceae					
Alphitonia incana (Roxb.) Teijsm. & Binn. ex Kurz	Bla	Bark	Burned to produce smoke	Used to repel mosquitoes	2
Rhizophoraceae					
Carallia brachiata (Lour.) Merr.	Want-want	Ripe fruit	Consumed directly in the forest	Edible	3
Rubiaceae					
Coelospermum reticulatum (F.Muell.) Benth.	Nggintu	Rhizome	Combined with "ngkamperom" and "engkop"	Produce a red dye for traditional loincloths	20
Myrmecodia pendens Merr. & L.M.Perry	Ntormpu/ njarmbu	Hypocotyl tubers	Peeled, boiled, and the decoction is consumed	Treat various diseases	9
Nauclea orientalis (L.) L.	Yambar	Inner bark	Scraped, squeezed, and the extract is consumed	Relieve sharp chest pain	6
Timonius timon (Spreng.) Merr.	Mpingku	Leaves	Chewed until smooth and juicy; the liquid is swallowed, and the pulp rubbed on the abdomen	Treat stomachache or diarrhea	12
		Small pieces of the tree bark	Chewed with betel and lime	Substitute the betel nut in the practice of "nyirih" (betel chewing)	
Rutaceae					
Acronychia pedunculata (L.) Miq.	Sindo-sindo	Ripe fruit	Consumed directly in the forest	Edible	9
		Leaves	Chewed until smooth and juicy; the liquid is swallowed, and the pulp discarded.	Relieve stomachache and diarrhea	
Halfordia kendack (Montrouz.) Guillaumin	Benetre	Old hardwood	Used as hut construction poles	Building material Climbing supports for betel plants.	7
		Fruit	Ripe fruit signals that taro tubers are not yet ready for harvest, as consuming them at this stage may cause oral irritation.	Environmental indicator	
Santalaceae					
Exocarpos latifolius R.Br.	Apeng	small pieces of bark	Chewed with betel and lime	Substitute the betel nut in the practice of "nyirih" (betel chewing).	9
		Ripe fruit	Consumed directly in the forest	Edible	
Sapotaceae					
Pouteria sp.	Blombin	Dried seed coats	Strung into necklaces worn by women during	Traditional celebrations	6
Smilacaceae					
Smilax modesta A.DC.	Ntol	Soft stem tip	The clear exudate is dripped	Treat an infected or pus-filled ear	18
Thymelaeaceae					
Phaleria sogerensis S. Moore	Mbaku	Fibers of inner bark	Peeled, dried, and prepared for weaving	Traditional loincloths	8

… *Contd.*

Table 1 — Ethnobotanical recipes, preparation methods, uses, and ICS values (Contd.)

Family and Species	Local Name (Kanum)	Part used	Preparation and Utilization	Ethnobotanical use	ICS Value
Zingeberaceae					
Hornstedtia scottiana (F.Muell.) K.Schum.	Ntorngko	Ripe fruit	Consumed directly	Edible	3
Kaempferia galanga	Wengkap	Rhizome	Hung on an infant's necklace or chewed and rubbed over the body	Ward off magic or evil spirits	6

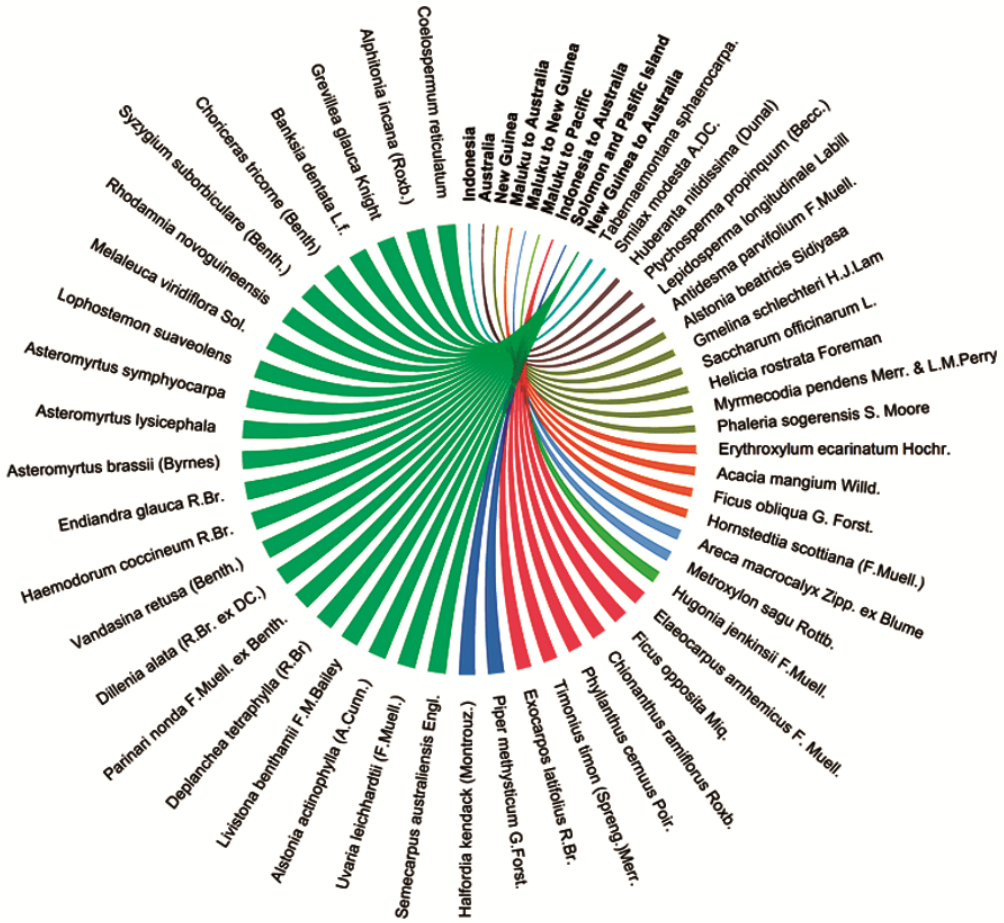

Fig. 3 — Native origin of plant species

Origin of the species

Figure 3 illustrates the distribution of ethnobotanical plants of the Kanum Tribe at the study site. Approximately 59% are native to eastern Indonesia, New Guinea, Australia, and the Pacific Islands, while the remaining 41% originate from tropical and subtropical Asia.

Diversity of plant utilization in ethnobotany

Figure 4 illustrates the various uses of plants, including as sources of medicine, food and beverages, materials for traditional rituals, household implements, and construction materials.

Medicinal plant parts and their associated ailments

Figure 5 illustrates plant parts utilised in traditional medicine and their associated ailments. Leaves (10 species) are the most frequently used, followed by stems and bark (9 species). Wounds are the most frequently treated condition among the Kanum tribe (8 species), followed by abdominal pain (8 species) and a variety of dermatological conditions, including burns, snake envenomation, and bruises.

Discussion

The six most frequently utilized plant species were from Myrtaceae (8 species), Apocynaceae (5 species),

Arecaceae (5 species), Moraceae (4 species), Phyllanthaceae (4 species), and Rubiaceae (4 species). Trees constituted the largest proportion of ethnobotanical resources (23 species), followed by shrubs (19), undershrubs (10), herbs (9), climbers (8), treelets (8), and grasses (6). Myrtaceae species are typically distributed in mixed savanna habitats such as Rawa Biru, Yanggandur, and Sota. Certain tree species hold particular cultural value among indigenous peoples due to their symbolic significance and association with traditional beliefs and rituals[18]. The documented use of 83 plant species by the Kanum community in Sota, Merauke District, South Papua, reflects their extensive ethnobotanical knowledge.

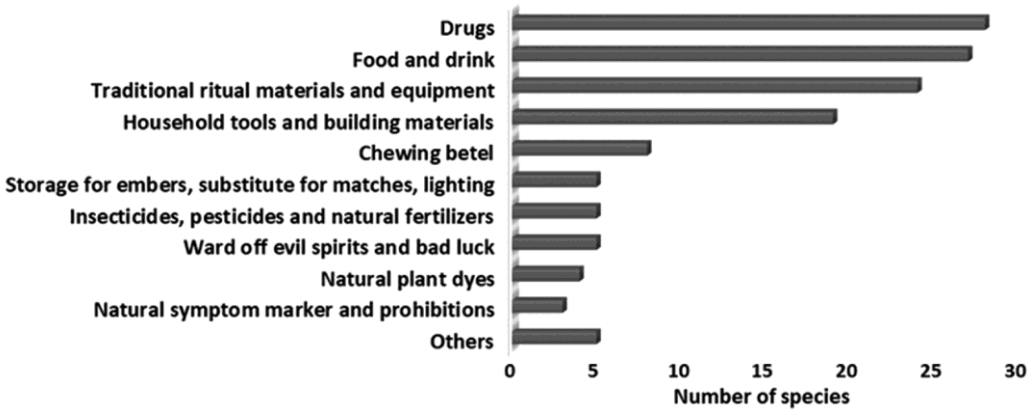

Fig. 4 — Ethnobotanical uses of plants of the Kanum tribe in the Sota District

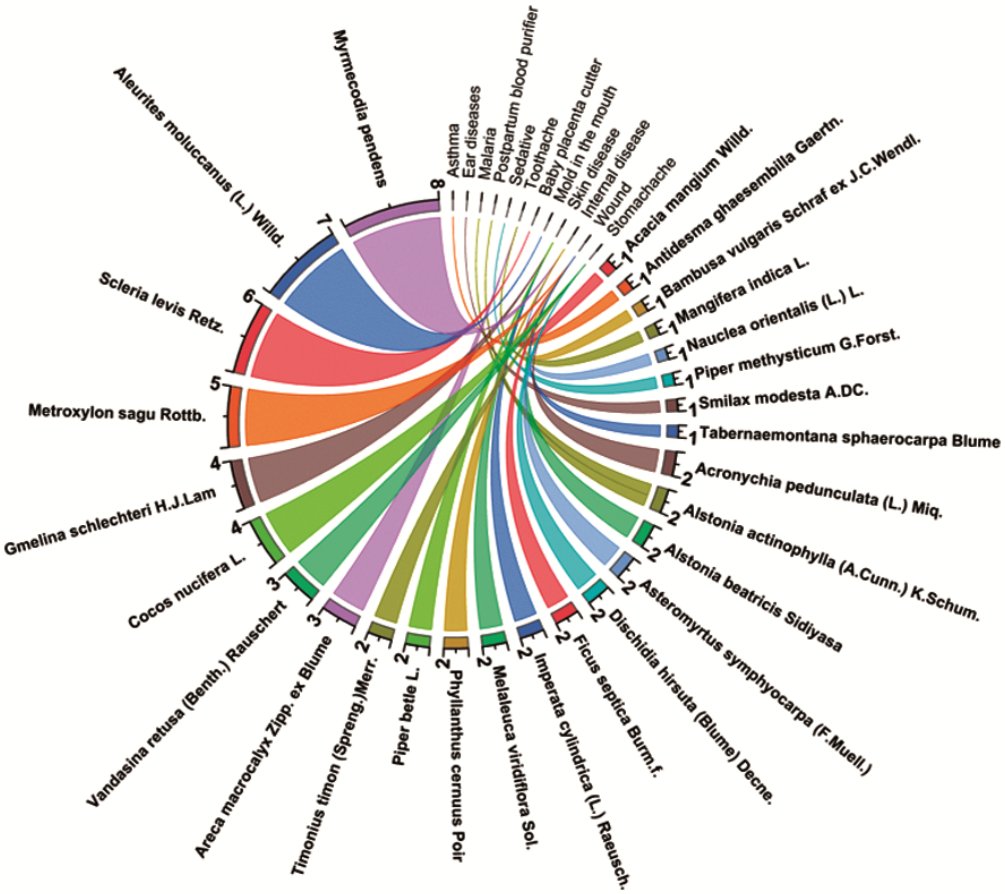

Fig. 5 — Medicinal plant parts and their associated diseases
Caption.1: stem or bark, 2: leaf, 3: root, 4: fruit, 5: starch, 6: whole part, 7: gum or resin, 8: hypocotyl tuber

Similar to the Kanum, the Soliga tribe of Tamil Nadu also maintains a strong bond with nature, utilising 47 plant species from 25 families in socio-cultural practices. It emphasizes the central role of plant biodiversity in sustaining cultural traditions across tribes globally. The use of local flora illustrates the significance of ethnobotanical knowledge in safeguarding cultural heritage, reinforcing the need for its documentation and preservation for future generations[10]. Ethnobotanical species in the study area are largely native to Australia, New Guinea, and the Pacific Islands, with some originating from tropical and subtropical Asia, reflecting the distinctive ecology and climate of the region.

Plants serve diverse functions, including sources of food and drink, medicinal remedies, materials for traditional rituals, betel chewing, natural indicators and prohibition markers, protection against misfortune, as well as natural dyes, insecticides, pesticides, and fertilizers. They are also used for household tools, construction materials, ember storage, fire substitutes, and lighting. Of these, medicinal uses were most common (28 species), followed by food and drink (27), ritual materials (24), and household or construction purposes (19). Comparable practices are reported elsewhere, such as the use of *Chamaemelum nobile* and *Helichrysum stoechas* as food and beverages in Northwest Spain[19].

In traditional medicine, plants are widely employed to treat wounds, burns, snakebites, gastrointestinal disorders, and other ailments, with leaves and bark being the most commonly used parts. Species such as *Aloe vera*, *Azadirachta indica*, *Curcuma longa*, *Hypericum perforatum*, *Centella asiatica*, and *Pterocarpus santalinus* have shown significant wound-healing potential in laboratory studies[7], while *Terminalia superba* bark extracts demonstrated similar effects in animal models[20]. Root, leaf, and bark extracts of *Brucea antidycentrica*, *Rhamnus prinoides*, and *Dodonaea angustifolia* are traditionally applied for wound treatment in Ethiopia[21]. Likewise, *Anchusa strigosa* is used to treat wounds, stomach pain, and arthritis due to its flavonoid and phenolic content[22], and *Diospyros* leaves are valued for their wound-healing, antibacterial, anti-inflammatory, and antioxidant properties. These pharmacological activities are largely attributed to flavonoids, phenolics, and tannins, recognized for their antioxidant, anti-inflammatory, and antimicrobial effects[22,23].

Several plant species are central to the traditional lifestyle of the Kanum tribe. *Bambusa vulgaris*, with the highest ICS value (107.5), is primarily used for crafting bows and arrows employed in hunting and ceremonial practices. It also serves as boat poles, storage wall materials for tubers, and wound remedies, as fine stem powder is applied to stop bleeding. Beyond the Kanum, *B. vulgaris* is widely utilised in various cultures, with its stem and leaves reported to promote hemostasis, wound healing, collagen proliferation, and edema reduction. Traditionally, it is also used to treat typhoid fever, gonorrhea, and malaria, effects attributed to phytochemicals such as flavonoids, polyphenols, and alkaloids[24-26]. *Metroxylon sago*, with an ICS value of 71, constitutes the main staple food for many Papuan tribes, including the Kanum, and holds considerable socio-cultural and economic significance across Papua.

Raw sago flour is also used as decoration in traditional feasts, while most parts of *Metroxylon sago* support the daily needs of the Kanum people. Beyond the Kanum, sago serves as the staple food of the Marind-Anim tribe and is processed into traditional dishes such as *sep* and *papeda*. It holds considerable socio-cultural value, particularly in ceremonial contexts[27]. The wati plant (*Piper methysticum*), with an ICS value of 64, is traditionally prepared as a ceremonial drink used in Kanum rituals, including feasts marking *sar* (temporary cessation of resource use), child initiation, marriage, fine redemption, and other customary events.

In Kanum culture, *wati* (*Piper methysticum*) is regarded as sacred, symbolizing wealth, unity, and peace, and therefore cannot be freely exchanged or traded. Owing to its potential misuse in magical practices, cultivation is restricted to designated plots in remote hamlets, often decorated with ornamental plants such as crotons. For ceremonial use, the roots or stems are cleaned, pounded, and squeezed, with the extract shared communally during rituals. Beyond the Kanum, *wati* (or kava) holds deep cultural and spiritual significance across the Pacific, including in Tonga, Auckland, and Hawaii, where it is associated with divine offerings, healing, reconciliation, and preparation for conflict. Kava also serves medicinal purposes, such as treating venereal disease and alleviating anxiety, and has become an important trade commodity[28-30].

In addition to *wati*, several other plants are vital in Kanum traditions, particularly in the making and dyeing of loincloths (*cawat*) (Fig. 6). The bark of "kuwat pari" (*Colona serratifolia*) is woven into cloth, while natural dyes provide distinctive colors. Black

Fig. 6 — Production and dyeing of Kanum traditional loincloths (*cawat*): natural dyes from "nggintu, ngkamperom, and mbarkau" (a); weaving bark fibres into *cawat* (b); dyeing with plant-based colours (c)

dye is produced from a mixture of blue mud (*mbarkau*) and grated bark of "ngkamperom" (*Syzygium suborbiculare*); red from grated "nggintu" root (*Coelospermum reticulatum*) combined with coconut ash; and yellow from turmeric mixed with lemon juice.

Conclusions

The Kanum people inhabit the border region between Indonesia and Papua New Guinea, particularly in Merauke Regency, South Papua Province, and within Wasur National Park. They utilise 83 plant species, representing 71 genera and 42 families. About 59% of plants originate from eastern Indonesia, New Guinea, Australia, and the Pacific Islands. These plants are primarily employed in rituals, medicine, and food. The findings of this study are expected to support the preservation of local knowledge, enhance community welfare, safeguard culture and biodiversity, and provide a foundation for future research."

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Author Contributions

Conseptualization: YPP and IH; plant collection and interview: LH and ESK; writing original draft: DNW, ESK, YPP, LH; research design: TGRH; project administration: DW, YB, TN, IDP.

Conflict of Interest

There is no conflict of interest.

Ethic Statements

Ethics approval and consent to participate: Researchers obtained ethical approval from the Ethical Committee on Social Studies and Humanities National Research and Innovation Agency (NRIA) number 108/ KE.01/SK/02/2024.

Informed Consent

Informed consent was obtained from all the knowledge holders who share the data, including photographs, as and when required.

Use of Artificial Intelligence (AI)

This article does not use artificial intelligence (AI)

Data Availability

The data are exclusively retained by the authors.

References

1 Guo C A, Ding X Y, Addi Y W, Zhang Y, Zhang X Q, *et al*., An ethnobotany survey of wild plants used by the Tibetan People of the Yadong River Valley, Tibet, China, *J Ethnobiol Ethnomed*, 18 (28) (2022) 1-25. DOI:10.1186/s13002-022-00518-8.

2 Khan J, Saleem K, Asim S, Khan A, Ahmed S, *et al*., Cultural and socio-economic perspective of some promising edible plants from Northern Pakistan," In: Edible Plants in Health and Diseases, 77–105. Springer Nature Singapore. DOI:10.1007/978-981-16-4880-9_4.

3 Theodoridis S, Drakou EG, Hickler T, Thines M, Nogues-Bravo D. 2023. Evaluating natural medicinal resources and their exposure to global change." The Lancet Planetary Health 7 (2): e155–63. DOI:10.1016/S2542-5196(22)00317-5.

4 Coppola F. 2024. Geografie inaspettate. alla ricerca di nuovi linguaggi e relazioni tra comunità vegetali e persone, Ri-Vista, Research for Landscape Architecture, 21 (2) 184–95. DOI:10.36253/rv-14907.

5 Firdaus A, Yunus M H, Izhar S K, Afaq U, Medicinal plants in the treatment of respiratory diseases and their future aspects, *Recent patents on Biotechnology*, 19 (1) (2025) 2–18. DOI:10.2174/0118722083278561231212072408.

6 Soto K M, Bueno J J P, López M L M, Apátiga-Castro M, López-Romero J M, *et al*., Antioxidants in traditional Mexican medicine and their applications as antitumor treatments, *Pharmaceuticals*, 16 (4) (2023) 482. DOI:10.3390/ph16040482.

7 Biswas T K, Chakrabarti S, Pandit S & Mani R, Medicinal plants and products from traditional medicine systems contribute to clinical wound management, In: Chronic Wound Management, Cham: Springer International Publishing, 4 (2023) 117-140. doi:10.1007/978-3-031-26110-7_7.

8 Hosseini S H, Bibak H, Ghara A R, Sahebkar A & Shakeri A, Ethnobotany of the medicinal plants used by the ethnic communities of Kerman Province, Southeast Iran, *J Ethnobiol Ethnomed*, 17 (1) (2021) 31. DOI: 10.1186/s13002-021-00438-z.

9 Rath S & Ormsby A A, Cultural ecosystem services of the sacred groves of Kandhamal, Odisha, India." In: The Routledge Handbook of Cultural Ecosystem Services, London: Routledge, (2025) 107–117. DOI:10.4324/9781003414896-12.

10 Menaka C, Logamadevi A & Vignesh A, Unveiling the socio-cultural practices of medicinal plants used by the ethnic community of Soliga Tribes in Tamil Nadu, India, *Phytomedicine Plus*, 5 (2) (2025) 100799. DOI:10.1016/j.phyplu.2025.100799.

11 Sutrisno I H, Akob B, Navia Z I, Nuraini & Suwardi A B, Documentation of ritual plants used among the Aceh Tribe in Peureulak, East Aceh District, Indonesia, *Biodiversitas J Biol Diversity*, 21 (11) (2020). DOI:10.13057/biodiv/d211102.

12 Coles-Ritchie M, Adams P, Spence J R, Zharkikh A, Tuhy J, *et al*., A botanical framework for long-term research in the Upper Sand Creek Research Natural Area, Dixie National Forest, Utah, USA, Western North *American Nat*, 84 (3) (2024). DOI:10.3398/064.084.0307.

13 Hussain W, Abbas Q, Saleem S, Khan S W & Shah M A, Assessment of floristic diversity and traditional knowledge from the selected mountainous valleys of District Gilgit, Gilgit-Baltistan, Pakistan, *Ethnobot Res Appl*, (2024) 27. DOI:10.32859/era.27.46.1-22.

14 Bhatt M D, Joshi D R, Bhandari G S, Maharjan S, Guragain D, *et al*., Documentation of flowering plants and ethnobotany in Jhilmil Lake area, Kanchanpur, Sudurpaschim Province, Banko Janakari, 33 (1) (2023) 46–59. DOI:10.3126/banko.v33i1.52473.

15 Ullah N, Ullah B, Khan M N, Kaplan A, Dossou-Yovo H O, *et al*., Quantitative ethnobotanical study of medicinal plants used by local communities in Chamla Valley, Buner District, Pakistan, *Ethnobot Res Appl*, (2024) 28. DOI:10.32859/era.28.38.1-22.

16 Buddin S, Ibrahim M, Ullah A, Dastagir G, Bibi S, *et al*., Ethnobotanical studies and conservation status of the medicinal flora of Bara Gali Forests, District Abbottabad, Pakistan, *Ethnobot Res Appl*, (2024) 27. DOI:10.32859/era.27.53.1-22.

17 Turner N J, The Importance of a Rose': Evaluating the cultural significance of plants in Thompson and Lillooet Interior Salish, *American Anthropol*, 90 (2) (1988) 272–290. doi: 10.1525/aa.90.2.02a00020.

18 Bhattarai S, Bhatta B, Shrestha A K & Kunwar R M, Ecology, economic botany and conservation of *Diploknema butyracea* in Nepal, *Glob Ecol Conserv*, 51 (1) (2024) e02869. DOI:10.1016/j.gecco.2024.e02869.

19 Garcia-Oliveira P, Barral M, Carpena M, Gullón P, Fraga-Corral M, *et al*., "Traditional plants from Asteraceae family as potential candidates for functional food industry, *Food Funct*, 12 (7) (2021) 2850–73. DOI:10.1039/D0FO03433A.

20 Atto V, Zahui S O, Kpahie F Z & Bi A S N, Evaluation de l'activité cicatrisante de l'extrait aqueux de l'écorce de tronc de *Terminalia superba* (Combretaceae), *Int J Biol Chem Sci*, 16 (6) (2023) 2494–2505. DOI:10.4314/ijbcs.v16i6.3.

21 Tessema Z & Molla Y, Evaluation of the wound healing activity of the crude extract of root bark of *Brucea antidysentrica*, the leaves of *Dodonaea angustifolia* and *Rhamnus prinoides* in mice, *Heliyon*, 7 (1) (2021) e05901. DOI:10.1016/j.heliyon.2021.e05901.

22 Chebaro Z, Badran A, Maresca M, Baydoun E & Mesmar J E, Ethnopharmacology and therapeutic potential of *Anchusa strigosa*: a comprehensive review, *Front Pharmacol*, 14 (2023). DOI:10.3389/fphar.2023.1301154.

23 Khumaidi A, Murwanti R, Damayanti E & Hertiani T, Empirical use, phytochemical, and pharmacological effects in wound healing activities of compounds in *Diospyros* leaves: a review of traditional medicine for potential new plant-derived drugs, *J Ethnopharmacol*, 337 (2025) 118966. DOI:10.1016/j.jep.2024.118966.

24 Zulhilmi B, Amil M, Saikim F H, Ng S Y & Rusdi N A, A comprehensive review of the ethnobotanical, phytochemical, and pharmacological properties of the Genus *Bambusa*, *J Appl Pharm Sci*, 13 (5) (2023). DOI:10.7324/JAPS.2023.98082.

25 Lodhi S, Jain A P, Rai G & Yadav A K, Preliminary investigation for wound healing and anti-inflammatory effects of bambusa vulgaris leaves in rats, *J Ayurveda Integr Med*, 7 (1) (2016) 14–22. DOI:10.1016/j.jaim.2015.07.001.

26 Abe A S, Amonkan K A, Djetouan K M J & N'Da K P, Phytochemical and acute toxicity study of aqueous extract of *Bambusa vulgaris* leaves on Wistar rats, *Afr J Biol Sci*, 02 (04) (2020) 107. DOI:10.33472/AFJBS.2.4.2020.107-114.

27 Kadir A, Suharno, Reawaruw Y, Komari & Mahuze A, Ethnobotanical knowledge of Marind-Anim Tribe in utilizing sago (*Metroxylon sagu*) in Merauke, Papua, Indonesia, *Biodiversitas J Biol Diversity*, 23 (1) (2021). DOI:10.13057/biodiv/d230132.

28 Showman A F, Baker J D, Linares C, Naeole C K, Borris R, *et al*., Contemporary pacific and western perspectives on `awa (*Piper methysticum*) toxicology, *Fitoterapia*, 100 (2015) 56–67. DOI:10.1016/j.fitote.2014.11.012.

29 Economidis G, Lynch M, Taylor S, Asare-Doku W, Macpherson G, *et al*., Global perspectives on kava: a narrative systematic review of the health effects, economic and social impacts and policy considerations, *Drug Alcohol Rev*, 44 (6) (2025) 1601-1640. DOI:10.1111/dar.14080

30 Henry T, Photoessay: visual peregrinations in the realm of kava, : Te Koakoa, *Pac Journal Rev*, 28 (1 & 2) (2022) 206–21. DOI:10.24135/pjr.v28i1and2.1252