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# Diversity and documentation of ethnomedicinal plants from Naneghat & Daryaghat regions in Junnar tehsil, Maharashtra, India

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## ABSTRACT

The ranges of Western ghats extended in Maharashtra represents biodiversity and abundance of traditional knowledge systems. The uses of medicinal plant species have a long and varied history in various cultural traditions. Ethnomedicinal plants play a significant role in traditional healing practices in rural areas of India. The tribal communities in the Junnar tehsil with diverse plant wealth and repository of medicinal plants. However, survey show that there is under exploration on ethnomedicinal plants from the interior areas of Junnar Tehsil. Keeping this in view, the present investigations were initiated in tribal-dominated areas of Naneghat and Daryaghat regions in Junnar Tehsil. Documentation of such ethnomedicinal plants and their utilization of knowledge is vital because knowledge is disappearing daily in the younger generations. In the present study, a total of 90 medicinally important plant species belonging to 84 genera and 54 families have been recorded. The local tribes utilized the medicinal plants listed along with their scientific name, family, local name, parts used, medicinal properties, and traditional uses. Ethnic communities utilize these as home remedies to cure various diseases. These medicinally important plants may need to be explored and used in the pharmaceutical sector to prepare new medications. Therefore, efforts have been made to document the traditional applications and customs of ethnomedicinal plants used in domestic remedies by the local tribes near Naneghat and Daryaghat in Junnar Tehsil, Pune District.

**Keywords:** Ethnomedicinal, Traditional uses, Ethnic communities, Botanical Exploration

## 1. INTRODUCTION

In India, a total of 47,513 plant species are reported to represent 11.4% of world flora (Singh and Dash, 2014). Approximately 43% of the total angiosperms were already documented as medicinal plants (Pushpangadan, 1995; Upadhyay et al., 2007). The

variety of endemic and native medicinal plants has greatly influenced the use of herbal and traditional remedies by forest dwellers (Samudra and Shinde, 2021). The utilization of plants for ethnomedicinal purposes in India has been documented since ancient times in literature. The field of ethnomedicinal plant research has increased significantly over the last decades (Ayyanara and Ignacimuthub, 2011). One of the primary reasons is that natural products are developed in the pharmaceutical industries (Ghimire et al., 2012).

Furthermore, the rapid growth of the human population has increased demand, which has accelerated the search for new plant resources (Laldingliani et al., 2022). Therefore, these natural plant resources have become under the threat category. The diverse natural medicinal plant diversity of the inhabitant area in a rich repository and used for various purposes such as food, fiber, fodder, medicine, spices, dyes, etc. (Pant et al., 2009). Comparing the usage of these herbal medicines to modern medicine, they are not only safe, but also nearly devoid of significant side effects. They are very inexpensive and readily available in the surrounding environment (Ekor, 2014).

The village elders, locals, and tribal people have excellent traditional knowledge of remedies to cure health issues and they are still used in medicine by people in many regions in India (Ram, 2015). The majority of the Indigenous population occurs in remote areas of hilly regions of Northern, Western, and Northwestern regions of Maharashtra (Kamble et al., 2010). There were 45 distinct Scheduled Tribes recognized in Maharashtra as per the 2011 census, which showed a 9.35% tribal population. The tribal population is primarily concentrated in Junnar tehsil and includes tribes: *Bhils, Mahadeo Koli, Dongar Koli, Thakar,* and *Pardhi*. These different communities of tribes have developed therapeutic medication based on their traditional knowledge. This pharmacopeia is now part of our cultural heritage (Kamble et al., 2010).

Tribes of these forests use a variety of medicinal plants for the treatment of various ailments such as Snakebites, Scorpion bites, fever, headache, migraine, urinary disease, bronchitis, cough, asthma, joint pain, rheumatic disease, stomach pain, toothache, dysentery, diabetes, Piles, and fistula, etc. as a natural remedy (Qureshi et al., 2017). Junnar tehsil forest area is rich in diverse flora, which might have played an important role in ethnobotanical practice. The widely concentrated tribes in Junnar Tehsil form one of the regions primarily known for their repository of Indigenous knowledge and practices. Generally, each generation has been taught how to use herbal plants through trial and observation, learning how they work as medication.

Traditional knowledge is transmitted orally, but there is no documented record of the use of therapeutic herbs for proper medical treatment (Aher, 2021). Tribal inhabitant areas where the older folk medicinal practices are under threat of extinction due to environmental degradation, deforestation, and migration of traditional medicinal healers (Islam et al., 2014). Therefore, it is essential to identify and assess the medicinal plants utilized in this area to document their use and determine their efficacy (Govindaraghavan and Sucher, 2015). However, until now, no study has been conducted to collect and preserve the traditional knowledge of herbal practices in this area. It is necessary to create and maintain a digital database of conventional medicine for the benefit of present and future generations.

**Study Area**

Junnar is one of the tehsil of Pune district in Maharashtra. It occupies 591.89 sq. km (10.16% forest area) covered out of the total geographical area of 5826 sq. km. Due to the extensive of the forest, the majority of tribe communities like *Mahadev Koli, Dongar Koli, Bhill, Pardhi,* and *Katkari* were reported in the study regions. The Tribal communities in Junnar tehsil have good traditional knowledge and its applications. Therefore, the primary occupation of ethnic communities is to collect wild plant resources for edible and medicinal purposes. The Junnar tehsil is known for the fort of Shivneri, which was the birthplace of Chhatrapati Shivaji Maharaj, the founder of the Maratha Empire.

Junnar tehsil lies in western ghat (19.2032° N 73.8743°E), consisting hills extending approximately 60 km in a north-south direction. The tehsil forms a part of the Deccan upland, which has a maximum height in the west with an average altitude of 689m. Based on its physical features, the tehsil is traditionally divided into two distinct regions: the hilly mountain areas of Naneghat and Daryaghat, and the remaining plain land (Figure 1). The Naneghat and Daaryaghat are different microhabitats because of high rainfall, soil texture, and relative humidity. The study area Naneghat and Daryaghat reported annual rainfall of 700 to 1200mm, respectively.

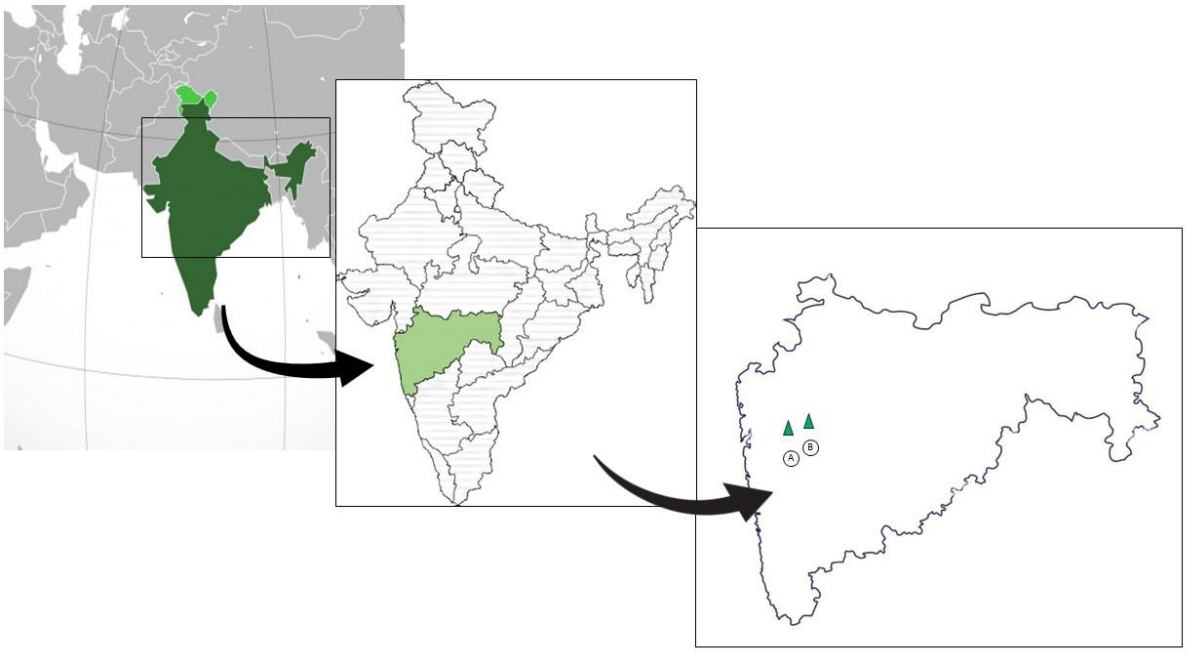


**Figure 1** Distributional map of study areas; A: Naneghat, B: Daryaghat.

## 2. MATERIAL AND METHOD

The field surveys were carried out from January 2022 to September 2024 in the Naneghat and Daryaghat regions to document the medicinal plants and their utilization. Bhagat et al., (2016) in the study area regions in Junnar tehsil, ethnomedicinal plants are used by local practitioners for daily medicine purposes. The surveys were made across all seasons to get maximum information provided by the local informants such as traditional healers, members of the forest department, old knowledgeable villagers, rural elderly women, local vegetable dealers, and members of local ethnic communities (Magar et al., 2023). The collected plant specimens were identified with the help of different floras and manuals (Cooke, 1958; Singh and Karthikeyan, 2000; Singh et al., 2000).

The voucher specimens housed in the herbaria, Department of Botany, Chandmal Tarachand Bora College Shirur, for future reference. The data recorded with scientific names, families, local names, functional plant parts, seasonal availability, and their utilization of medicinal plant species. The identified plants were arranged alphabetically with scientific names and their families (Rahangdale and Rahangdale, 2014). The acquired information was cross-checked with available literature Agharkar, (1953), Chopra et al., (1969), Jain, (1991) about these medicinal plants and their traditional uses.

## 3. RESULTS

In the present investigation, (Table 1) data revealed that resource of ethnomedicinal plants in the Naneghat and Daryaghat regions of Junnar tehsil, highly utilized by tribal communities in their daily traditional practices for curing various ailments. The tribal communities in Junnar tehsil, such as *Katkari, Dongar Koli, Mahadeo Koli, Bhil, Pardhi* and *Thakar* tribes, possess a tremendous knowledge of wild medicinal plants and their uses in various diseases. In the present survey, 90 plant species with a high potential for ethnomedicinal properties were recorded from wild habitats of study regions. All recorded 90 plant species were systematically arranged into 84 genera belonging to 54 families (Figure 2). The details are provided in (Table 1) with their botanical name, common name, family, habit, plant parts used, and medicinal uses (Magar et al., 2023; Muthu et al., 2006).

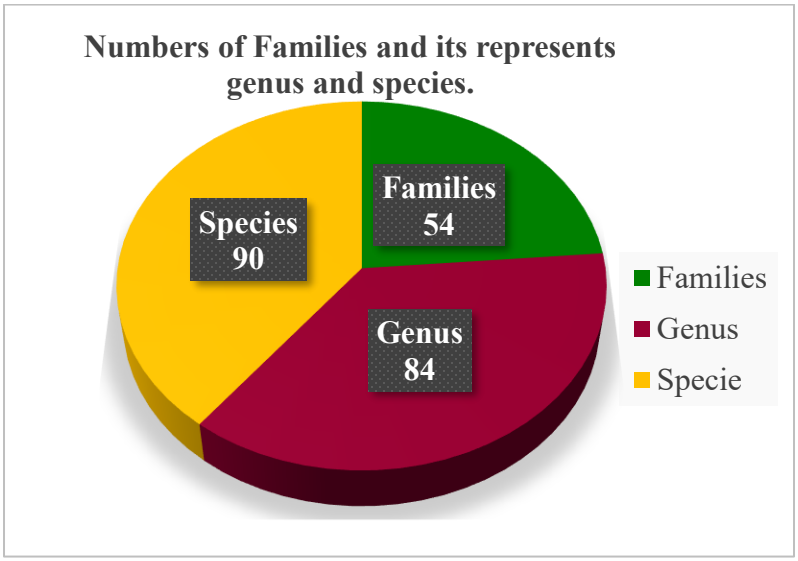


**Figure 2** Numbers of Families represent genus and species.

**Table 1** Traditionally underutilized ethnomedicinal plants from study area.

| Botanical Name | Family | Common Name | Plant parts Used | Habit | Medicinal uses |
|---|---|---|---|---|---|
| *Abrus precatorius* L. | Fabaceae | Gunj | Leaves, Seed | C | Ash made from the whole plant is applied to wounds. Seed extract can be used as a blood purifier. Leaves are used for the preparation of Pan Masala. |
| *Acalypha paniculata* Miq. | Euphorbiaceae | Kunda | Leaf | H | Leaf paste is applied over pimples regularly once a day until cure. |
| *Aegle marmelos* (L.) Corr. | Rutaceae | Bel | Fruit | T | Fruit's aromatic pulp is eaten with sugar to cure fever and vomiting. |
| *Ageratum conyzoides* L. | Asteraceae | Ghanera | Leaves | S | The plant leaves are utilized to cure, skin diseases, ulcers, and *wound therapy.* |
| *Amorphophallus bulbifer* (Roxb.) Blume. | Araceae | Ran suran | Tuber, Rhizome | H | Tuber paste is used in the treatment of piles, abdominal pain, tumors, rheumatism, and skin diseases. |
| *Amorphophallus commutatus* (Schott) Engl. | Araceae | Shevala | Rhizome, tubers | H | Rhizomes and tuber are useful in piles, and bacterial infections. |
| *Anagalis arvensis* L. | Primulaceae | Ran- drakshe | Fruit | C | Fruit juice is applied *for liver, and kidney diseases, wound healing, infections, and joint pain.* |
| *Andrographis lineata* Wallich ex Nees. | Acanthaceae | Kalmegh or biteer plant | Leaves | H | A paste of leaves is applied externally on the bitten site of the scorpion and snake. |
| *Arisaema murrayi* (J.Graham.) Hook. | Araceae | Sarpkanda | Tuber | H | *Tuber paste is used medicinally to treat asthma, bronchitis, and colds.* |
| *Artocarpus heterophyllus* Lam. | Moraceae | Phanas | Fruit | T | Ripe fruits are eaten raw and also used for making pickles, jams, and vegetables. |

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| *Asparagus racemosus* Willd. | Asparagaceae | Wild Shatavari | Leaves | C | A paste of tender and mature leaves is applied topically on the heels before going to bed. |
| *Atalantia racemose* Wight ex Hook. | Rutaceae | Makad limbu | Fruit | S | Fruit juice is used for curing rheumatism, and used for making pickles. Leaves and fruits are also used against skin disease and blood purifiers. |
| *Bambusa arundinacea* (Retz.) willd. | Poaceae | Wild Bamboo | Leaves | S | Paste of leaves is used to *treat inflammatory and* ulcer disease. |
| *Barleria prionitis* L. | Acanthaceae | Kate Koranti | Leaves | S | The root bark is used to control the dysentery. |
| *Bigonea crenata* Dryand. | Begnoniaceae | Berki | Leaves | H | Leaves juice is effective in *curing liver problems, digestive anomalies, body inflammation, and fungal infections.* |
| *Bombax ceiba* L. | Bombaceae | Kate savar | Bark and flowers | T | The bark is useful for treating wounds, and skin diseases. Flowers paste with sugar is a good tonic. |
| *Butea monosperma* (Lam.) Taub. | Fabaceae | Palas | Flower Bark, seed | T | Flowers juice is used to remove body toxins, inflammation, and swelling. Seeds are anthelmintic, and laxative. Stem Bark is used to treat Asthma, cough, and cold. |
| *Caesalpinia bonduc* (L.) Roxb. | Caesalpiniaceae | Sagargota | Leaves | S | Leaves juice is used for curing wounds, fever, tumors, hernia, smallpox, toothache, and inflammation. |
| *Calotropis gigantea* (L.) Ait. | Asclapidiaceae | Padhari Rui | Leaves | S | Leaves paste prepared with coconut oil and applied externally over the stomach for reduced pain of stomach. |
| *Calotropis procera* (Ait.) R. Br. | Asclapidiaceae | Rui | Latex | S | The milky latex is directly applied to the muscle for muscle pain. |
| *Canscora diffusa* (Vahl) R.Br.ex.Roem.& Schult. | Gentianaceae | Bhui Neem | Leaves | H | Leaf ash is mixed with coconut oil and is applied to the skin to prevent the fall of hairs. |
| *Careya arborea* Roxb. | Myrtaceae | Jangali Peru | Fruit, Leaves, Flower | S | Leaves and flower paste are useful to curing skin disease. Fruit is edible and used as an antinode of Snake venom and bronchitis disease. |
| *Carisa congesta* Wight | Apocynaceae | Karvand | Fruit | S | Fruits are edible and used in pickle preparation. Leaves are used as an antioxidant. |
| *Carvia Callosa* Nees. | Acantahceae | Karvi | Leaves | S | Leaf juice is used to cure stomach ailments. |
| *Centella asiatica* (L.) Urb. | Apiaceae | Thankuni | Leaves | H | The juice of the leaf is mixed with an equal amount of goat's milk and taken orally for seven days for treatment of jaundice, and dysentery. |

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| *Chlorophytum tuberosum* (Roxb.) Baker | Asparagaceae | Safed Musali | Tubers, Leaves | H | Leaves are used against various ailments like diabetes, diarrhea, cholera, and kidney stones, and Tuber is effective in enhancing sexual stamina. |
| *Clematis gouriana* Roxb. Ex. DC | Ranunculaceae | Churanhar | Leaves | H | A paste of leaves is applied topically on the affected part of the skin. |
| *Colobrokea oppositifolia* L. | Lamiaceae | Bhaman | Leaves | S | The leaf extract is used to cure the wound disease. |
| *Cordia macleodii* Hook | Boraginaceae | Bhokar | Fruit | T | Semi-ripe fruits are used in preparation for pickled and ripe fruits are eaten raw for gum and teeth problems. |
| *Crinum latifolium* L. | Amaryllidaceae | Milk lily | Corm. Leaves | H | Leaves and Corm paste is used to *treat rheumatism, fistula, tumors, earaches, painful swelling, and arthritis.* |
| *Curculigo orchioides* Gaertn | Hypoxidaceae | Kali Musali | Tuber | H | Tuber boils with water are useful for cough, jaundice, and asthma. Tuber paste is applied externally to cure the piles and arthritis of the lumbar and knee joints. |
| *Curcuma pseudomontana* Grah. | Zingiberaceae | Ran-halad | Tuber | H | Dried tuber extract mixed with milk is taken orally to cure cough, asthma, and bacterial disease. Tuber pastes mixed with coconut oils are directly applied for arthritis, joint pain, and rheumatism. |
| *Datura metel* L. | Solanaceae | Kala Dhotra | Leaves | S | Leaves extract is externally applied to the swelling part. |
| *Dioscorea oppositifolia* L. var. tomentosa. | Dioscoreaceae | Jangali Batata | Rhizome | C | A paste of rhizome is taken to treat the piles. |
| *Diospyros montana* Roxb. | Ebenaceae | Tendu | Fruit, bark | T | Fruits are edible and pulp is eaten raw. bark is used in the therapy of jaundice and gum. |
| *Drimia indica* (Roxb.) Jessop | Asparagaceae | Ran Kanda | Corm | H | Corm Juice is useful against cardiac diseases, asthma, and rheumatism. |
| *Elaegnus conferta* Roxb. | Elaeagnaceae | Aamboli or wild red berry | Fruit | T | Fruits are edible and good sources of vitamin C and fatty acids for enhancing antioxidant properties. |
| *Emblica officinalis* Gaertn. | Euphorbiaceae | Awala | Fruit | T | Mature fruits are eaten raw and also used made to Pickles and Murabba. Fruit is a rich source of antioxidants, iron, and vitamin C to enhance the immunity of the body. |
| *Ensete superbum* Cheesm. | Musaceae | Ran-keli | Fruit, Flower, seeds | S | Fruit, flower, and pseudo stem are used eaten raw. Seeds are effective in the treatment of diabetes, and kidney stone disease. |

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| *Erythrina variegate* L. | Fabaceae | Pangara | Seed | T | Seeds are useful to relieve pain and inflammation. widely used *in folk therapies.* |
| *Exacum Lawii* C. B. Clarke. | Gentianaceae | Chiravat | leaves | H | Leaves juice for the treatment of kidney problems and eye diseases. |
| *Ficus racemosa* L | Moraceae | Umbar | Bark, Fruit, latex | T | Bark extract is used to cure jaundice. Stem latex is used to treat piles and diarrhea. Fruits are edible, astringent, and carminative useful in relieving stomachache. |
| *Garcinia indica* (Thou.) Chois. | Clusiaceae | Aamsul, Ratamba | Fruit | T | Ripe fruits are eaten raw and also used in sarbat to boost the immune system of the body. Fruit covering is highly edible and used in curry. |
| *Gardenia gummifera* L.f | Rubiaceae | Dikamali | Gum, seed | T | Dikamali gum powder with honey is used for teething troubles in children. |
| *Gloriosa superba* L | Colchicaceae | Kal-lavi | Corm | S | Paste of Corms is externally applied to cure arthritis, rheumatism, inflammation, bleeding piles, skin diseases, and snakebites. |
| *Glossocardia bosvallia* (L.f.) DC. | Asteraceae | Dagad shapu | Leaves | H | The paste of the fresh leaves is applied to cure the healing of sores and wounds. Leaves are used by ethnic people to make vegetables. |
| *Gnidia glauca* (fresen.) Gilg | Thymelaeaceae | Datpadi | Leaf, Bark, Flower | S | Bark paste is used *for the treatment of Joint pain, burns, wounds, and abdominal pain. Leaves and flower paste are effective against snakebites and insecticides.* |
| *Habenaria grandifloriformis* Blatt. & McC. | Orchidaceae | Chickurkanada | Flower, Tuber | H | Flowers are used as vegetables and eaten and also used to cure the Stomachache. Tuber's juice is used as a tonic. |
| *Hemidesmus indicus* H.f. | Apocynaceae | Anantmul | Whole plant | C | Decoction of the whole plant is taken internally for stomach pain. |
| *Holarrhena pubescens* Wall.ex G.Don | Apocynaceae | Kala Kuda | Pod, Leaves | T | Pods and leaves are commonly used to treat diseases such as diarrhea, dysentery, liver disorders, and bleeding piles. |
| *Holorrhena antidysentrica* (L.) Wall | Apocynaceae | Kuda | Leaves | T | Leaf juice is taken orally during stomachache and dysentery. |
| *Impatien dalzelli* Hook. f. & Thomson | Balsaminaceae | Terda | Leaves, seeds | H | Leaves juice is used for the treatment of *rheumatism, pain, fractures, and inflammation of the nails. Seed oil is used for skin disease and greyness of hair.* |
| *Iphigenia magnifica* Ansari & R.S.Rao | Colchicaceae | Ran lasani | Corm, Leaves | H | Corms paste with coconut oils is externally applied against snakebites and migraines. Leaves juice is useful for |

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| | | | | | curing ear problems. |
| *Iphigenia pallida* Baker | Colchicaceae | Grass lily | Corm, Leaves | H | Corms paste with coconut oils is externally applied against snakebites, migraines, and headache problems. |
| *Jasminum malbaricum Wight* | Oleaceae | Ran mogra | Flower | S | Flower juice is used as a blood purifier and used in the cosmetic and detergent industries. Flowers are used to make Gajara by tribes' communities. |
| *Ledebouria revoluta* (L.f.) Jessop | Asparagaceae | Indian Squill | Leaves | H | Leaves are used for making vegetables is useful during the pregnancy period in women and reduces the skin irritation problems. |
| *Leea indica* (Burm. f.) Merr. | Leeaceae | Karkani | Fruit, Leaves | S | Fleshy fruits with scanty edible pulp. leaf juice is effective against fever. |
| *Madhuca indica*`J.F. Gmel | Sapotaceae | Moh | Fruit | T | Fruit is used to cure skin diseases and urinary tract infections. Fruits and flowers are used for making wine by tribal communities. |
| *Mangifera indica* L. | Anacardiaceae | Amba | Fruit, Seed | T | Seed paste is useful to cure asthma and astringent. Ripen fruit is edible and unripe fruit used to preparation for muramba or pickle. |
| *Memecylon umbellatum* Burm. F. | Melastomataceae | Anjan | Fruit | T | Fruit is used to treat ailments like diabetes, and cough. |
| *Meyna laxiflora* Robyns | Rubiaceae | Aaliv | Fruit | T | Fruit is used for the treatment of inflammation, stomach pain, and gastrointestinal disorders. |
| *Murraya paniculata* L. | Rutaceae | Wild kadipatta | Leaves | S | Juice of tender leaves is taken orally to treat vomiting. and leaves are used in making curry as a spice. |
| *Ocimum tenuiflorum* L. | Lamiaceae | Ran Tulsi | Leaves | H | Leaves juice is taken orally to cure cough, asthma, and bronchitis. Leaves are very effective as blood purifiers and antioxidants. Leaves paste is externally applied to cure skin problems. |
| *Opuntia elatior* Mill. | Cactaceae | Nivdung | Fruit | S | Ripe fruits are eaten raw for various vitamins by tribal peoples. |
| *Oxalis corniculata* L. | Oxalidaceae | Ambushi | Leaves | H | *It is a good stimulates digestive fire, relieves abdominal pain; and treats cough and rheumatism* diseases. leaves used as vegetables. its use in the treatment of neurological disorders like depression. |
| *Pimpinella heyneana* (DC.) Benth. & Hook. f. | Apiaceae | Donger jira | Seeds, Roots | H | Roots are given to chew to cure cough, cold and sore. Seeds are used for curing *kidney stones, and respiratory infections.* |
| *Pinda concanansis* Dalzell) P.K. Mukh. & | Apiaceae | Pand | Seeds, flowers | H | *Flowers and leaves are consumed as vegetables for nutritional benefits and seeds* |

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| Constance | | | | | *are used in spices.* |
| *Piper nigrum* L. | Piperaceae | Kali Miri | Seed | C | The dried seeds are taken orally for antioxidants, bronchitis, asthma, fever, cough, and *paralysis of the* tongue disease. |
| *Plumbago zeylanica* L. | Plumbaginaceae | Chitrak | Root | H | The powdered root is mixed with goat's milk and taken internally to cure rheumatoid arthritis and skin diseases. |
| *Rauwolfia serpentine* Benth. | Apocynaceae | Sarpa-gandha | Root | C | Roots are used to treat blood pressure, intestinal disorders, snakebite, and facial paralysis. |
| *Rubia cordifolia* L. | Rubiaceae | Manjistha | Root | C | Root paste is applied topically on the heel problems before going to bed. Roots are chewing to cure throat problems. |
| *Santalum album* L. | Santalaceae | Chandan | Bark | T | The bark is effective in the treatment of bronchitis and urinary tract. It is useful for making perfume and fragrance sticks. |
| *Scleichera oleosa* (Lour.) Oken | Sapindaceae | Kusum | Fruit, seeds | T | Fruits are edible; seeds are used against skin diseases. |
| *Sida acuta* Burm. f. | Malvaceae | Tea weed | Leaves | H | The paste of leaves is mixed with coconut oil and applied on the head regularly to kill dandruff and also strengthen hair. |
| *Sterculia foetida* L. | Malvaceae | Kukur | Seed | T | Seeds are eaten as roasted. Seeds are used to treat various ailments like rheumatism, and skin diseases. |
| *Syzygium cumini* (L.) Skeels. | Myrtaceae | Jambhul | Fruit | T | Fruits are edible and effective against diabetes and toothache disease. |
| *Tacca leontopetaloides* (L.) Kuntze | Taccaceae | Bat flower | Tuber | H | The tubers are edible for cooking. It is a traditional medicine *for eye problems, diarrhea, dysentery, sores,* burns, wasp stings, and ear pains. |
| *Tamarindus indica* L. | Caesalpinaceae | Chinch | Fruit | T | Dried fruits are taken orally to treat eye infections. |
| *Tectona grandis* L. | Verbanaceae | Sag | Bark | T | Bark powder is used in snakebite, Dysentery, eyes, swellings, and liver-related troubles. |
| *Terminalia arjuna* Roxb.Ex. Dc Wight & Arn. | Combretaceae | Arjun tree | Fruit, Bark | T | Fruit paste is applied topically on wounds. Bark powder is boiled with water and inhaled to cure headaches to kill worms in teeth. |
| *Terminalia bellirica* (Gaertn.) Roxb. | Combretaceae | Behda | Bark | T | Bark power is very effective in curing *Alzheimer's disease, inflammatory conditions, and digestion problems.* |
| *Terminalia chebula* Retz | Combretaceae | Hirda | Fruit | T | Powdered fruit is mixed with water or |

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| | | | | | cow's or goat's milk and taken internally for digestive problems, liver, and gastrointestinal problems. |
| *Tinospora cordifolia* (Wild) Miers | Menispermaceae | Gulvel | Whole plant | C | Stem and leaf extract is the best remedy for diabetes, acidity, jaundice, and liver diseases. Stem juice is used to boost the immune system of the body. |
| *Tribulus terrestris* L. | Zygophyllaceae | Sarata | Leaves | H | Leaves are used as vegetables and are effective against rheumatism and arthritis. |
| *Tricholepis amplexicaulis* C.B.Clarke | Asteraceae | Camel Thistle | Leaves | S | Leaves are used to make vegetables by tribes' communities due to the presence of a rich source of vitamins. |
| *Tylophora indica* (Burm. f.) Merr. | Asclepiadaceae | Arkaparni | Leaves, Root | C | Paste of leaf and root is mixed with an equal amount of root paste of *Rauvolfia serpentina* and applied externally on the spot of snakebite. Leaf juice alone is also taken internally to cure snakebite. |
| *Vigna khandalensis* (Sant.) Raghavan & Wadhwa | Fabaceae | Ran mug | Seed | H | Unripe seeds from legumes are cooked as vegetables and eaten raw for better nutritious content. |
| *Vitex negundo* L. | Verbanaceae | Nirgudi | Leaves | S | leaf juice with cow's urine is given to women and fresh leaf juice with sugar is helpful in fever. Leaves paste is externally applied to reduce the pain of arthritis and rheumatism. |
| *Woodfordia fruticose* L. Kurz | Lytharaceae | Dhayati | Flower | S | The flower is used during women's pregnancy for reduced pain. |
| *Zizyphus jujube* Mill. | Rhamnaceae | Bor | Fruit, bark | T | Fruit and bark are useful for improving digestion, cough, and mouth cleaners. |

Legends:
H: Herb, S: Shrub, T: Tree, C: Climber

Most dominant families: - Apocynaceae (5 species), Fabaceae, and Asparagaceae (4 species), and the remaining families viz. Asteraceae, Rubiaceae, Rutaceae, Asteraceae, Apiaceae, Acanthaceae, Araceae, Asclapidaceae, Colchicaceae, and Combretaceae (3 Species); (Figure 3 & 4).

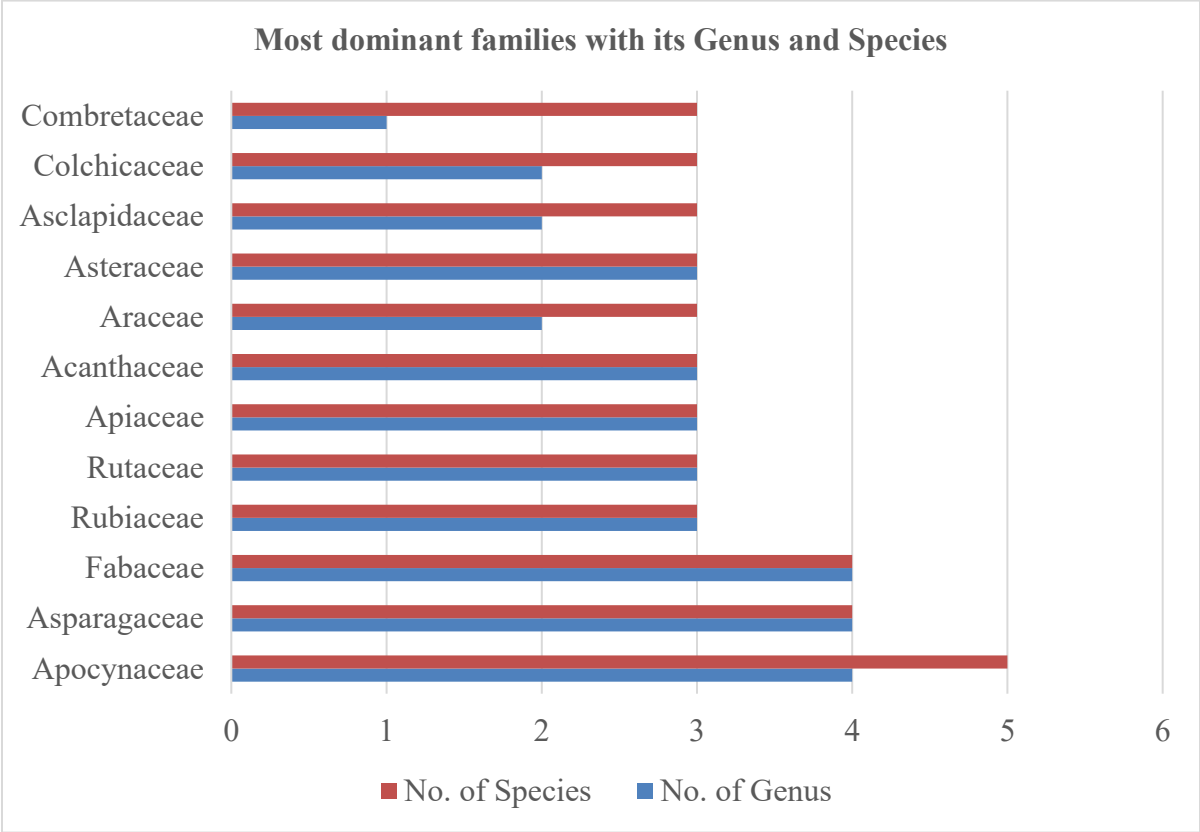


**Figure 3** Most dominant families with its number of genus and species.

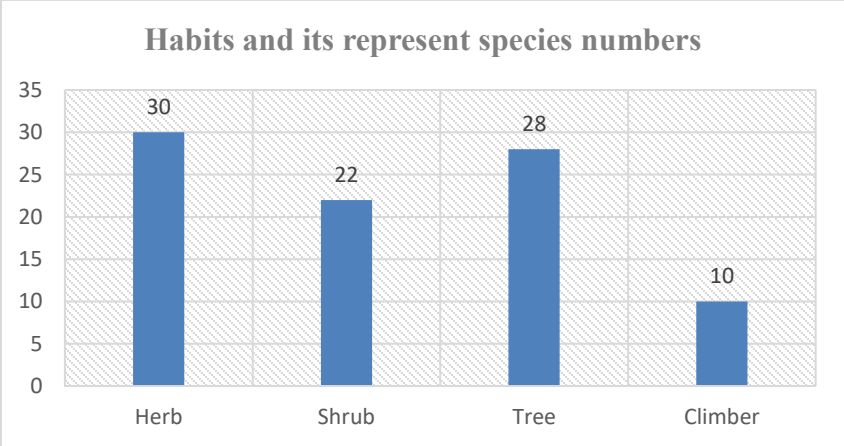


**Figure 4** Different habits with species number.

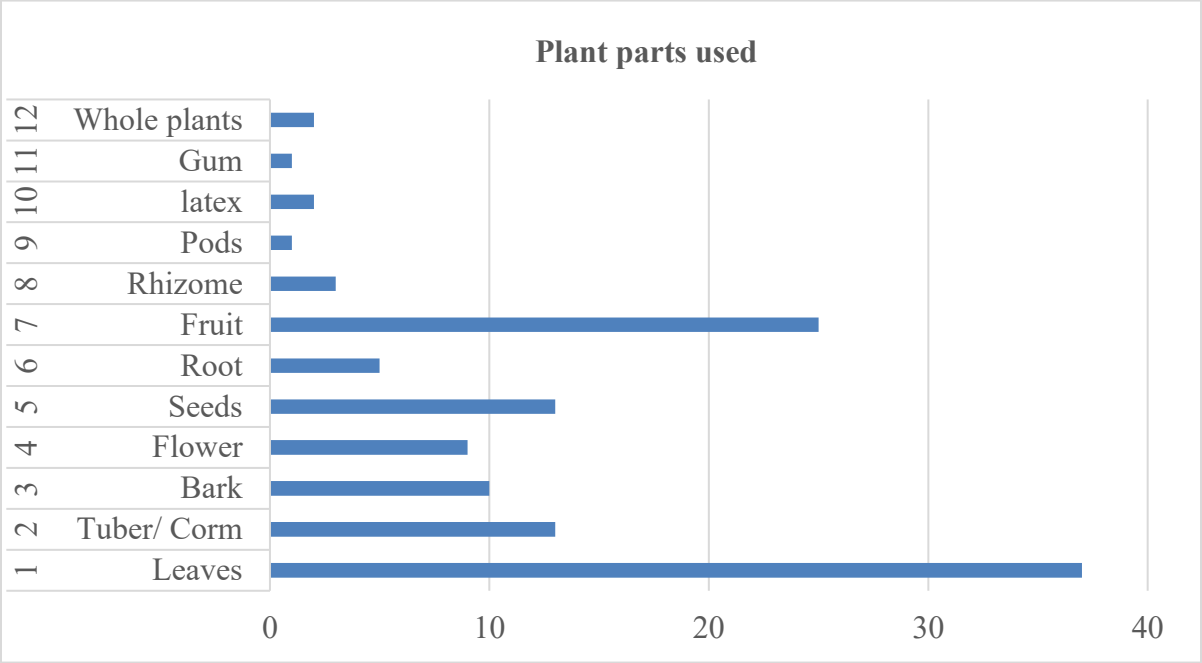


**Figure 5** Plant parts used and their species number

Figure 5 The utilization of different plants and their parts, the Leaves (37) were most frequently used for the treatment of various diseases, followed by fruit (25), tuber and Seeds (13), bark (10), flower (9), root (5), rhizome (3), latex and whole plant (2) and pods and gum (1).

Data from (Figure 6) 51 different ailments were cured by using ethnomedicinal plants. Tribals are using various ethnomedicinal plants to cure some critical diseases such as eye disease, gum and teeth problems, jaundice and dysentery, diabetes, kidney disease, rheumatism and arthritis, piles and fistula, earaches, swelling, cough, bronchitis, and colds, asthma, burns and wounds, respiratory disease, stomach pain, liver disorder, blood pressure, paralysis, skin disease, joint pain, heels problem, women pregnancy problem, Sore, throat problem, inflammation, hairs problem, hernia, gastrointestinal problems, vitamins, nutritional benefits, immune booster, migraine and headache, fever, neurological disease, urinary problem, snakebites, and Abdominal pain, etc. During the survey, we recorded that the maximum plants were used to cure skin disease (15), followed by rheumatism and arthritis (13), Cough, bronchitis, and colds (12), Burns and wounds (10), Jaundice and Dysentry (9), Snakebites and insecticide (9), inflammation (9), Vitamin and Nutritional benefits (9), Piles and fistula (8), Stomach pain (7) and Asthama (7).

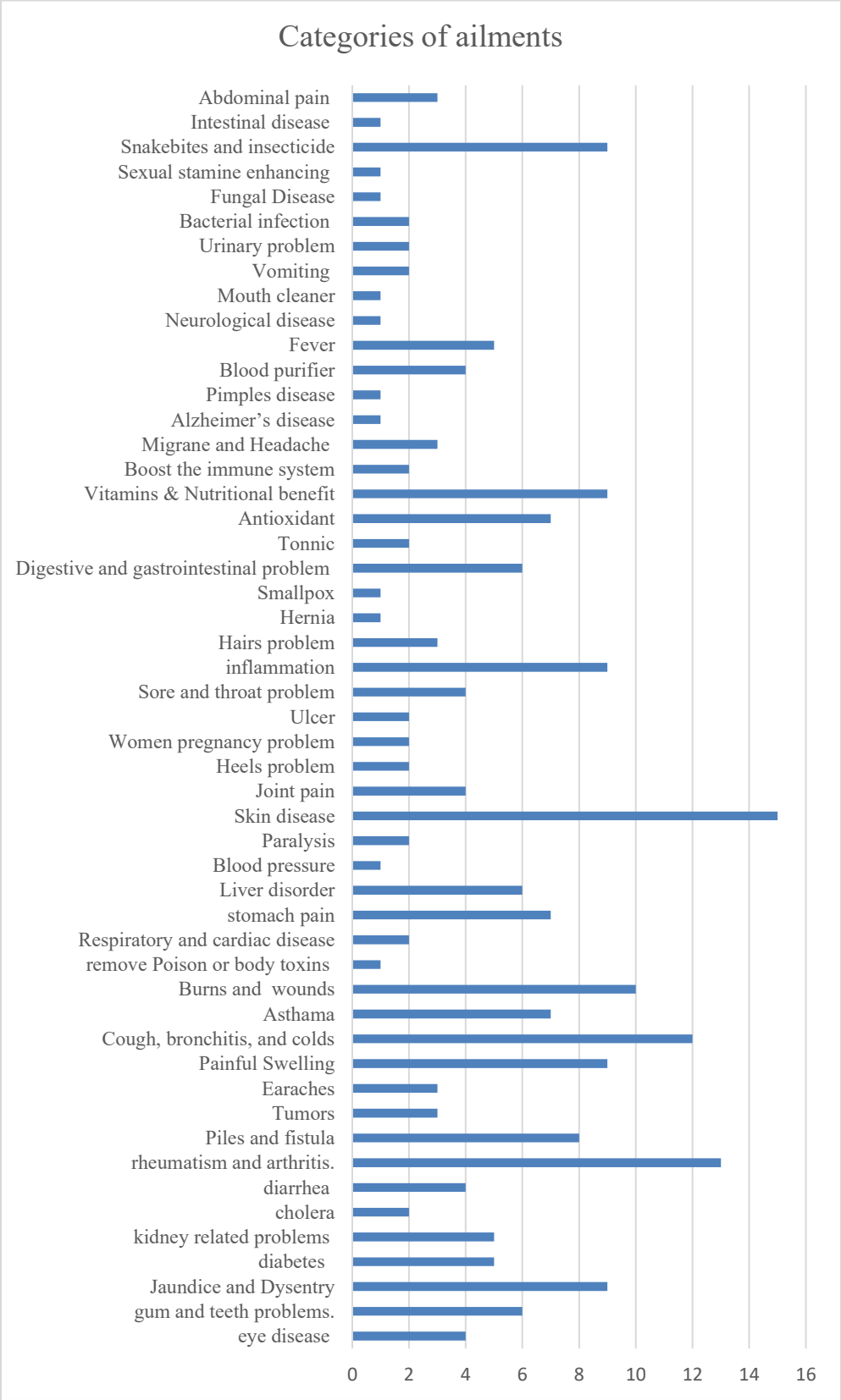


**Figure 6** No. of Plants used against various ailments


**Photoplate 1** A: *Butea monosperma* (Lam.) Kuntze, B: *Ensete superbum* (Roxb.) Cheesman, C: *Strobilanthes callosa* Nees, D: *Habenaria grandifloriformis* Blatt. & McCann, E: *Helicteres isora* L.


**Photoplate 2** A: *Gloriosa superba* L. B: *Pinda concanensis* (Dalzell) P.K.Mukh. & Constance, C: *Rotheca serrata* (L.) Steane & Mabb., E: *Iphigenia magnifica* Ansari & R.S.Rao

## 4. DISCUSSION

Traditional phytotherapy is an art of herbal practiced by a few older people (medicine healers) whose empirical knowledge is respected by everyone in the village. The signs and symptoms of many common diseases and illnesses are well known to them, and they have claimed to use locally accessible plant medications to heal or alleviate the symptoms of these illnesses (Upadhyay et al., 2007). The local traditional healers used different ethnomedicinal plants in their medicinal practices. They commonly used medicinal plants to treat a more significant number of diseases and preference easy availability in surrounding areas.

The tribal healers in the Naneghat and Daryaghat regions generally utilized are *Vitex negundo, Ocimum gratissimum, Azadirachta indica, Adhatoda vasica, Madhuka indica, Terminalia arjuna, Terminalia bellerica, Asparagus racemosus, Curculago orchioides, Curcuma aromatica, Amorphophallus paeoniifolius, Cholophytum borivilianum, Iphigenia magnifica, Piper nigrum, Phyllanthus emblica, Ocimum sanctum, Murraya panikulata, Atalantia racemosa, Ficus benghalensis,* and *Santalum album*. The edible wild plants are *Mangifera indica, Phyllanthus emblica, Tamarandus indica, Syzygium cumini, Carissa carandas, Meyna laxiflora, Psidium guajava, Atalantia racemosa, Elaeagnus latifolia Butea monosperma, Ensete superbum, Strobilanthes callosa, Habenaria grandifloriformis* and *Helicteres isora* (Photoplate 1).

Some wild medicinal important edible vegetables used by local tribes in their daily meal for their immunity booster are listed as *Trocholepis amplexicaulis, Carthamus oxyacanthus, Glossocardia bosvallia, Capparis zeylanica, Caralluma adsendens, Momordica dioica, Abelmoschus ficulneus, Ensete superbum, Tribulus terrestris Gloriosa superba Pinda concanensis, Rotheca serrata* and *Iphigenia magnifica* (Photoplate 2). Traditional healers are using these plants to cure diseases related to skin problems, colds, fever, coughs, headache, diarrhea, fertility problems, toothache, stomach ache, wounds, diabetes, rheumatism, asthma, dysentery, smallpox, bone fractures, earache, hair loss and poison (snake, scorpion, and insect) bites, etc. (Figure 6).

## 5. CONCLUSION

Naneghat and Daryaghat in Junnar tehsil is a treasure of biodiversity and endemism. These tribal communities are good herbal healers due to their having ethnomedical knowledge. The traditional practices of local tribal communities still depend on wild medicinal plants. Modernization affected younger generations tends to lack of interest in ethnomedicinal practices is the primary cause to decrease traditional knowledge. To prevent the extinction of traditional knowledge and healing practices, it is necessary to document evidential records. The forests of Naneghat and Daryaghat are underexplored regions with significant ethnomedicinal plants that require further research and documentation of their traditional uses by tribal communities.

More efforts should be made by the government, other policy making organizations, and NGOs to conserve traditional knowledge of ethnomedicinal plants, to raise awareness among tribal communities and the younger generation. The present study concludes the significance of a large number of ethnomedicinal plants used against various diseases by forest dwellers in remote areas could be helpful to discover new drug for pharmaceutical industries. This is a little endeavor to preserve the ethnomedicinal knowledge and the traditional practices of these tribes in the Naneghat and Daryaghat regions in Junnar tehsil.

**Author Contributions**

VDM surveyed the study area seasonally from January 2022 to September 2024 and interviewed local tribal healers. PPS and SJD have prepared the initial draft of the manuscript. PPS and ANC have identified ethnomedicinal plants and acquired information was cross-checked with available literature. Later along with SMK and SJD, ANC finalized the manuscript, interpreted and presented data after analysis to present form.

**Ethical approval**

The ethical guidelines for plants & plant materials are followed in the study for sample collection & identification (Maharashtra State Biodiversity Board, Letter no. MSBB/Desk-5/Research/995/24-25).

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**Informed consent**

Not applicable.

**Conflicts of interests:**

The authors declare that there are no conflicts of interests.

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**Data and materials availability**

All data associated with this study are present in the paper.

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