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Ethnobotanically Important Beverages of India: A Mini-Review

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ABSTRACT

India has exceptional biological and cultural diversity, and many communities prepare beverages from plants and plant-derived ingredients. This mini-review provides an overview of selected plant-based beverages consumed in India, focusing on their botanical sources, plant parts used, preparation practices, and cultural significance. Information was compiled from ethnobotanical studies, scientific publications, literature on traditional foods and beverages, and relevant online sources, and was reviewed descriptively. For each beverage, the region, community, plant material and part, scientific name, processing method, and traditional use were extracted and tabulated. Seventy-four beverage entries were compiled and grouped into five categories: fermented, non-fermented plant-based, tea- and coffee-based, milk- and yogurt-based, and other culturally significant preparations. Fermented and distilled beverages account for 32 of the 74 entries (43.2%) and are predominantly grain-based, including beverages made from rice (*Oryza sativa*), finger millet (*Eleusine coracana*), and barley (*Hordeum vulgare*). Non-fermented examples include *Aam Panna*, *Kokum*, *Khus* and *Nannaari Sharbat*, *Buransh*, *Jal-Jeera*, and *Saunf Pani*. Tea and coffee preparations include *Masala Chai*, *Tulsi Tea*, regional teas such as Assam, Darjeeling, Nilgiri, and Kangra, and Indian filter coffee. Milk- and yogurt-based beverages include *Haldi Doodh*, *Kesar Milk*, and several types of lassi. Thandai and Bhang Lassi are examples of beverages with particular cultural associations. Traditional Indian beverages reflect the country's biocultural diversity and local knowledge of plant use and preparation. Their documentation would benefit from systematic reporting and reliable botanical identification. Traditional medicinal uses should be presented as ethnobotanical information and should not be interpreted as evidence of therapeutic efficacy without pharmacological or clinical support.



Introduction

India is one of the world's most biologically, climatically, and culturally diverse countries, and the diversity of its ethnic and local communities is reflected in a wide range of practices involving the use of natural resources (Bhawuk, 2011). Over generations, communities throughout the country have developed and transmitted extensive knowledge of the identification, collection, processing, and consumption of plants (Bhawuk, 2011). This knowledge extends beyond medicinal applications and encompasses the preparation of foods, spices, plant-derived products, and traditional beverages (Yumnam et al., 2024). Traditional plant-based beverages can thus be understood as part of the long-standing relationships between local communities and plant resources and as an important expression of India's biocultural heritage (Jain, 2007).

Traditional beverages consumed in India are highly diverse with respect to their ingredients, preparation methods, sensory characteristics, and cultural functions (Tamang, 2020). A broad range of plant parts, including roots, rhizomes, bark, leaves, flowers, fruits, seeds, and plant sap, may be used in their preparation (Tamang, 2020). While some beverages are prepared predominantly from a single plant species, others contain combinations of several plants, spices, or other plant-derived ingredients. For instance, beverages such as Nannaari Sharbat, Kokum Sharbat, Bel Sharbat, and Buransh are associated primarily with particular plant resources, whereas traditional teas and spiced beverages may involve mixtures of several botanical ingredients (Asrani et al., 2019). Regional climatic conditions, together with the availability and seasonal distribution of local plant resources, have also contributed to the development and persistence of this diversity across India (Barooah & Saikia, 2024).

Many traditional beverages are closely embedded in local foodways and social practices and may be consumed during festivals, religious ceremonies, particular seasons, and communal gatherings (Barooah & Saikia, 2024). Alongside non-fermented preparations, a diverse range of fermented beverages has also been documented among ethnic groups and rural communities in different parts of India (Barooah & Saikia, 2024).

Ethnobotanical studies from northeastern India, West Bengal, the Himalayan region, and other parts of the country have documented the use of various plant species and plant-derived substrates in the preparation of fermented beverages (Barooah & Saikia, 2024, Tamang, 2020). In some communities, the selection and processing of raw materials, as well as the preparation of fermentation starters, may reflect locally transmitted knowledge of plant resources and traditional processing practices. Collectively, these practices illustrate the close relationships among plant diversity, food-processing techniques, cultural traditions, and indigenous knowledge (Barooah & Saikia, 2024).

Certain plant-based beverages are also traditionally associated with nutritional, refreshing, digestive, or other customary uses in different Indian communities (Das et al., 2019). However, traditional use should not be interpreted as evidence of clinically established efficacy, and any therapeutic claims associated with these beverages should be evaluated in the context of available pharmacological and clinical evidence. At the same time, socioeconomic and cultural changes, increasing reliance on industrially produced foods and beverages, and reduced intergenerational transmission of orally maintained knowledge may contribute to the gradual loss of traditional knowledge related to beverage preparation and consumption (Das et al., 2019). Systematic documentation of such knowledge may therefore support the preservation of cultural and culinary heritage, facilitate the recognition of plant resources used by local communities, and provide a foundation for future investigations into the nutritional composition and bioactive constituents of these beverages.

Against this background, the present mini-review aims to characterize selected plant-based beverages documented in ethnobotanical and related literature from India, with particular emphasis on their botanical resources, scientific plant names, plant parts used, traditional preparation methods, and nutritional, customary, and cultural significance. By bringing together information from diverse regional and cultural contexts, this review provides an overview of the botanical and cultural diversity of traditional beverages associated with indigenous knowledge in India and highlights the continuing importance

of plant resources in shaping the country's beverage traditions.

Methods

Information on traditional, fermented, and plant-based beverages consumed in India was compiled from ethnobotanical studies, research articles, books and scholarly book chapters on traditional foods and beverages, and relevant online sources. The literature was reviewed with particular attention to beverages associated with ethnic and local communities in different regions of India, the botanical resources used in their preparation, traditional preparation and fermentation practices, and their reported nutritional, cultural, and customary significance.

For each beverage, the available information was extracted and organized according to the geographical region, ethnic or local community, beverage name, plant material or plant part used, scientific name of the plant species, preparation or fermentation method, and reported traditional use or cultural significance. Where available, information on the principal botanical ingredients and specific preparation practices was also recorded. The collected data were descriptively synthesized and compared, with particular emphasis on the geographical, botanical, and cultural diversity of traditional beverages documented across India. Given the descriptive nature and scope of this mini-review, the available evidence was not subjected to quantitative meta-analysis or formal statistical synthesis.

Results

The literature review identified a wide range of traditional and plant-based beverages consumed by communities across different regions of India. The documented beverages varied considerably in their botanical ingredients, preparation methods, fermentation practices, and cultural contexts. For clarity, the reported beverages were grouped into five broad categories: fermented beverages, non-fermented plant-based beverages, tea- and coffee-based beverages, milk- and yogurt-based beverages, and other culturally significant preparations.

Fermented beverages

Fermented beverages constituted a prominent category in the reviewed literature. They were prepared from a variety of plant-derived substrates, particularly cereals, pseudocereals, fruits, palm sap, and sugarcane. Cereal-based beverages included Chhang/Lugri (*Hordeum vulgare*), Chhang (*Triticum aestivum*), Lugri (*Oryza sativa*), Sura/Sur (*Eleusine coracana*), Jaan (*Oryza sativa*), Jaanr/Jaan (*Eleusine coracana*), Apong (*Oryza sativa*), Sujen (*Oryza sativa*), Kiad (*Oryza sativa*), Zutho (*Oryza sativa*), Chuwak/Chuak (*Oryza sativa*), Handia (*Oryza sativa*), Haria (*Oryza sativa*), Laopani/Haanj (*Oryza sativa*), Lugdi (*Oryza sativa*), Kodo ko Jaanr (*Eleusine coracana*), and Sekmai (*Oryza sativa*). Some preparations involved mixtures of cereal substrates, such as Mandia pej (*Eleusine coracana* + *Oryza sativa*) and Zawlaidi (*Oryza sativa* + *Eleusine coracana* + *Zea mays*). Other documented fermented beverages included Zu, prepared from various plant species; banana wine (*Musa* spp.); Mahua (*Madhuca* spp.); Feni prepared from cashew (*Anacardium occidentale*) or coconut (*Cocos nucifera*); Toddy/Tadi/Kallu and Kallu/Thaati Kallu associated with palms (*Arecaceae*); Arrack prepared from palm and other plant resources; Apo (*Oryza sativa*); Kallu (*Cocos nucifera*); and Gudamaba (*Saccharum officinarum*).

Non-fermented plant-based beverages

The reviewed literature also documented a diverse group of non-fermented plant-based beverages. Fruit- and plant-based preparations included Aam Panna (*Mangifera indica*), Nimbu Pani/Shikanjami (*Citrus* spp.), Kokum Sharbat (*Garcinia indica*), Khus Sharbat (*Chrysopogon zizanioides*), Nannaari Sharbat (*Hemidesmus indicus*), Phalsa Sharbat (*Grewia asiatica*), Karela Juice (*Momordica charantia*), Ganne ka Ras (*Saccharum officinarum*), Nariyal Pani/Karṛikku (*Cocos nucifera*), and Buransh (*Rhododendron* spp.). Other preparations included Pudina Sharbat (*Mentha* spp.), Saunf Pani (*Foeniculum vulgare*), Jal-Jeera (*Cuminum cyminum*), Panakam (*Citrus* spp. + *Saccharum officinarum*), Tanka Torani (*Oryza sativa*), Ookali (*Coriandrum sativum*), Sakar-Loung Pani (*Syzygium aromaticum*), Khas Khas Drink (*Papaver somniferum*), Gaajar ka Doodh (*Daucus*

carota), Badam Milk/Badam Doodh (*Prunus dulcis*), Kesar Milk (*Crocus sativus*), Haldi Doodh (*Curcuma longa*), and Rose Milk (*Rosa* spp.).

Tea- and coffee-based beverages

Tea- and coffee-based beverages represented another important group. Masala Chai was reported as a preparation based on *Camellia sinensis* and commonly combined with spices such as *Elettaria cardamomum*, *Zingiber officinale*, *Syzygium aromaticum*, *Cinnamomum* spp., and *Piper nigrum*. Regionally recognized tea types included Assam Tea (*Camellia sinensis* var. *assamica*), Darjeeling Tea (*Camellia sinensis*), Nilgiri Tea (*Camellia sinensis*), and Kangra Tea (*Camellia sinensis*). Other plant-based tea preparations included Tulsi Tea (*Ocimum tenuiflorum*), Ginger Tea (*Zingiber officinale*), Tejpatra Tea (*Cinnamomum tamala*), Elaichi Tea (*Elettaria cardamomum*), and Lemon Tea (*Citrus* spp.). Indian Filter Coffee was also documented and was associated with species of the genus *Coffea*.

Milk- and yogurt-based beverages

Milk- and yogurt-based beverages incorporated a range of fruits, spices, aromatic plants, and other botanical ingredients. Reported examples included Mango Lassi (*Mangifera indica*) and Sweet Lassi containing *Crocus sativus*, *Elettaria cardamomum*, and various fruit species. Other lassi formulations were reported to contain *Zingiber officinale*, *Mentha* spp., *Rosa* spp., *Elettaria cardamomum*, *Mangifera indica*, *Allium sativum*, and *Cuminum cyminum*. Namkeen Lassi was associated with ingredients such as *Cuminum cyminum*, *Piper* spp., and *Mentha* spp.

Other culturally significant beverages

Several other beverages of cultural importance were also identified in the reviewed literature. Thandai may contain a mixture of plant ingredients and is traditionally associated with particular cultural and festive contexts. Bhang Lassi incorporates *Cannabis* spp., whereas Sulaimani Chai is prepared from *Camellia sinensis* with various spices. Other reported preparations included Bel Sharbat (*Aegle marmelos*) and Pan Juice (*Piper betle*).

Overall, the reviewed literature demonstrates considerable diversity in the plant resources incorporated into traditional Indian beverages, encompassing cereals, fruits, spices, aromatic plants, medicinally used plants, palm-derived materials, and other botanical resources. The preparation techniques likewise ranged from simple extraction, infusion, and mixing to fermentation and, in some cases, distillation. This diversity reflects the influence of regional plant availability, locally developed food-processing practices, and the transmission of traditional knowledge among communities. Detailed information on the documented beverages, their botanical sources, and the plant materials used is presented in Table 1.

Discussion

This mini-review demonstrate substantial diversity in the traditional and plant-based beverages documented across India, particularly in terms of botanical resources, processing techniques, and cultural contexts. This diversity is consistent with the country's pronounced climatic, ecological, and cultural heterogeneity and with differences in the availability of locally accessible plant resources. Cereal grains, particularly rice (*Oryza sativa*), finger millet (*Eleusine coracana*), and barley (*Hordeum vulgare*), are prominent raw materials in fermented beverages documented from the Himalayan and northeastern regions of India (Jha et al., 2019). In contrast, fruits, roots, leaves, flowers, and spices contribute to a wide range of non-fermented preparations, including Nannaari Sharbat, Kokum Sharbat, Phalsa Sharbat, Khus Sharbat, Buransh, and various herbal infusions (Poswal et al., 2019). The distribution of these resources suggests that beverage traditions have been shaped not only by the nutritional or sensory properties of plants but also by their local availability, seasonality, climatic suitability, and incorporation into established food traditions (Jain, 2007, Tamang, 2020).

Table 1. Traditional and plant-based beverages of India and their botanical resources

Region	Cultural Group	Traditional Beverage	Plant Resource/Raw Material	Scientific Name	Plant Part Used	Processing Type	Traditional Use/Cultural Significance	Source
Ladakh	Bhoto	Chhang/Lugri	Barley	<i>Hordeum vulgare</i>	Grain	Alcoholic fermentation	Traditionally associated with joint pain and arthritis	(Angmo & Bhalla, 2014, Targais et al., 2012)
Himachal Pradesh	Lahaul & Spiti/Kinnaur	Chhang	Wheat	<i>Triticum aestivum</i>	Grain	Alcoholic fermentation	Traditionally consumed in cold weather	(Kanwar et al., 2011).
Himachal Pradesh	Kinnaur	Lugri	Rice	<i>Oryza sativa</i>	Grain	Alcoholic fermentation	Traditionally consumed in cold weather	(Savitri & Bhalla, 2007)
Himachal Pradesh	Kullu/Kangra/Mandi	Sura/Sur	Finger millet	<i>Eleusine coracana</i>	Grain	Alcoholic fermentation	Traditional beverage; reported as a source of B-group vitamins	(Joshi et al., 2015, Thakur et al., 2004)
Uttarakhand	Bhotiya	Jaan	Rice	<i>Oryza sativa</i>	Grain	Alcoholic fermentation	Reported traditional use for fever, dysentery, respiratory complaints, and gastric ailments	(Sekar & Mariappan, 2007); Kishor et al., 2015)
Sikkim/Darjeeling	Various tribal groups	Jaanr/Jaan	Finger millet	<i>Eleusine coracana</i>	Grain	Alcoholic fermentation	Traditionally consumed in cold weather	(Sekar & Mariappan, 2007, Tamang et al., 2016)
Arunachal Pradesh	Monpa/Apatani/Nishi	Apong	Rice	<i>Oryza sativa</i>	Grain	Alcoholic fermentation	Traditional beverage, particularly associated with cold weather	(Chetia & Borgohain, 2020, Tiwari & Mahanta, 2007)
Assam	Mishing	Apong	Rice	<i>Oryza sativa</i>	Grain	Alcoholic fermentation	Traditional beverage with cultural significance	(Tiwari & Mahanta, 2007)
Assam	Deori	Sujen	Rice	<i>Oryza sativa</i>	Grain	Alcoholic fermentation	Traditional beverage of the Deori community	(Deori et al., 2007)
Manipur	Naga	Banana wine	Banana	<i>Musa</i> spp.	Fruit	Alcoholic fermentation	Traditional alcoholic beverage	(Devi & Kumar, 2012)
Meghalaya	Pnar/Jaintia/Khasis	Kiad	Red rice	<i>Oryza sativa</i>	Grain	Fermentation	Traditional fermented beverage	(Samati & Begum, 2007)
Nagaland	Angami/Naga	Zutho	Rice	<i>Oryza sativa</i>	Grain	Alcoholic fermentation	Traditional beverage of Naga communities	(Teramoto et al., 2002)
Tripura	Kalai/Jamatia/Debbarma	Chuwak/Chuak	Rice	<i>Oryza sativa</i>	Grain	Alcoholic fermentation	Traditionally consumed in cold weather	(Ghosh et al., 2016)
Northeastern India	Various communities	Handia	Rice	<i>Oryza sativa</i>	Grain	Alcoholic fermentation	Traditional and culturally important fermented beverage	(Tamang et al., 2016)

Region	Cultural Group	Traditional Beverage	Plant Resource/Raw Material	Scientific Name	Plant Part Used	Processing Type	Traditional Use/Cultural Significance	Source
Northeastern India	Various communities	Haria	Rice	<i>Oryza sativa</i>	Grain	Alcoholic fermentation	Traditional fermented beverage	(Tamang et al., 2016)
Northeastern India	Various communities	Laopani/Ha anj	Rice	<i>Oryza sativa</i>	Grain	Fermentation	Traditional alcoholic beverage	(Tamang et al., 2016)
Northeastern India	Various communities	Lugdi	Rice	<i>Oryza sativa</i>	Grain	Fermentation	Traditional fermented beverage	(Tamang et al., 2016)
Northeastern India	Various communities	Kodo ko Jaanr	Finger millet	<i>Eleusine coracana</i>	Grain	Alcoholic fermentation	Traditional beverage of mountainous regions	(Tamang et al., 2016)
Northeastern India	Various communities	Mandia Pej	Finger millet and rice	<i>Eleusine coracana</i> + <i>Oryza sativa</i>	Grain/ flour	Fermentation	Traditional fermented beverage	(Tamang et al., 2016)
Northeastern India	Various communities	Sekmai	Glutinous rice	<i>Oryza sativa</i>	Grain	Alcoholic fermentation	Traditional ethnic beverage	(Tamang et al., 2016)
Northeastern India	Various communities	Zawlaidi	Rice, finger millet, and maize	<i>Oryza sativa</i> + <i>Eleusine coracana</i> + <i>Zea mays</i>	Grain	Fermentation	Traditional cereal-based beverage	(Tamang et al., 2016)
Northeastern India	Various communities	Zu	Regional cereals/ plants	Various plant species	Various parts	Fermentation	Traditional ethnic beverage	(Tamang et al., 2016)
Central India	Tribal communities	Mahua	Mahua	<i>Madhuca</i> spp.	Flowers	Fermentation/distillation	Traditional alcoholic beverage with cultural significance	(GotRum, 2026)
Goa	Local communities	Feni	Cashew	<i>Anacardium occidentale</i>	Fruit/ pseudofruit	Fermentation and distillation	Characteristic traditional beverage of Goa	(GotRum, 2026)
Goa	Local communities	Feni	Coconut	<i>Cocos nucifera</i>	Sap	Fermentation and distillation	Traditional coconut-based beverage	(GotRum, 2026)
Kerala/ Tamil Nadu	Local communities	Toddy/Tadi /Kallu	Palm sap	Arecaceae	Inflorescence sap	Natural fermentation	Traditional beverage prepared from palm sap	(Pushpan gadan et al., 2012).
Kerala	Local communities	Kallu/Thaati Kallu	Palm	Arecaceae	Sap	Fermentation	Traditional palm beverage	(Pushpan gadan et al., 2012).
India	Various communities	Arrack	Palms and other plant resources	Arecaceae and other plants	Sap/plant-derived substrates	Fermentation and distillation	Traditional alcoholic beverage	(Pushpan gadan et al., 2012).
India	Local communities	Apo	Rice	<i>Oryza sativa</i>	Grain	Fermentation	Traditional fermented beverage	(GotRum, 2026)

Region	Cultural Group	Traditional Beverage	Plant Resource/Raw Material	Scientific Name	Plant Part Used	Processing Type	Traditional Use/Cultural Significance	Source
India	Local communities	Kallu	Coconut	<i>Cocos nucifera</i>	Sap	Fermentation	Traditional beverage prepared from coconut sap	(GotRum, 2026)
India	Local communities	Gudamaba	Sugarcane	<i>Saccharum officinarum</i>	Stem/sap	Fermentation	Traditional sugarcane-based beverage	(GotRum, 2026)
India	Various communities	Aam Panna	Mango	<i>Mangifera indica</i>	Unripe fruit	Extraction/dilution	Traditional beverage, particularly consumed during hot weather	(Pushpan gadan et al., 2012, TasteAtlas, 2026)
India	Various communities	Nimbu Pani/Shikanjami	Lemon/citrus	<i>Citrus</i> spp.	Fruit	Extraction/dilution	Traditional refreshing beverage	(Pushpan gadan et al., 2012, TasteAtlas, 2026)
India	Various communities	Kokum Sharbat	Kokum	<i>Garcinia indica</i>	Fruit	Extraction/syrup preparation	Traditional fruit-based beverage	(GotRum, 2026)
India	Various communities	Khus Sharbat	Vetiver	<i>Chrysopogon zizanioides</i>	Root	Extraction/syrup preparation	Traditional aromatic beverage	(GotRum, 2026)
India	Various communities	Nannaari Sharbat	Indian sarsaparilla	<i>Hemidesmus indicus</i>	Root	Extraction/syrup preparation	Traditional herbal beverage	(GotRum, 2026)
India	Various communities	Phalsa Sharbat	Phalsa	<i>Grewia asiatica</i>	Fruit	Extraction/syrup preparation	Traditional fruit-based beverage	(GotRum, 2026)
India	Various communities	Karela Juice	Bitter melon	<i>Momordica charantia</i>	Fruit	Juicing	Traditional plant-based beverage	(GotRum, 2026)
India	Various communities	Ganne ka Ras	Sugarcane	<i>Saccharum officinarum</i>	Stem	Juicing	Traditional sugarcane beverage	(GotRum, 2026)
India	Various communities	Nariyal Pani/Karōikkū	Coconut	<i>Cocos nucifera</i>	Coconut water	Direct consumption	Traditional/natural beverage	(GotRum, 2026)
India	Various communities	Buransh	Rhododendron	<i>Rhododendron</i> spp.	Flower	Extraction/syrup preparation	Traditional beverage of Himalayan regions	(GotRum, 2026)
India	Various communities	Pudina Sharbat	Mint	<i>Mentha</i> spp.	Leaves	Extraction/syrup preparation	Traditional herbal beverage	(GotRum, 2026)
India	Various communities	Saunf Pani	Fennel	<i>Foeniculum vulgare</i>	Fruits/seeds	Soaking/extraction	Traditional spiced beverage	(GotRum, 2026)
India	Various communities	Jal-Jeera	Cumin and spices	<i>Cuminum cyminum</i> and other species	Seeds/fruits	Soaking/blending	Traditional spiced beverage	(Pushpan gadan et al., 2012, TasteAtlas, 2026)

Region	Cultural Group	Traditional Beverage	Plant Resource/Raw Material	Scientific Name	Plant Part Used	Processing Type	Traditional Use/Cultural Significance	Source
India	Various communities	Panakam	Citrus and sugarcane	<i>Citrus</i> spp. + <i>Saccharum officinarum</i>	Fruit/sugarcane-derived sweetener	Blending/dilution	Traditional beverage	(GotRum, 2026)
India	Various communities	Tanka Torani	Rice	<i>Oryza sativa</i>	Rice/rice water	Fermentation/processing	Traditional rice-based beverage	(GotRum, 2026)
India	Various communities	Ookali	Coriander	<i>Coriandrum sativum</i>	Seeds	Extraction	Traditional herbal beverage	(GotRum, 2026)
India	Various communities	Sakar-Loung Pani	Clove	<i>Syzygium aromaticum</i>	Flower buds	Soaking/extraction	Traditional spiced beverage	(GotRum, 2026)
India	Various communities	Khas Khas Drink	Poppy	<i>Papaver somniferum</i>	Seeds	Soaking/extraction	Traditional beverage	(GotRum, 2026)
India	Various communities	Gaajar ka Doodh	Carrot	<i>Daucus carota</i>	Root	Grinding/blending with milk	Traditional milk-based beverage	(GotRum, 2026)
India	Various communities	Badam Milk/Badam Doodh	Almond	<i>Prunus dulcis</i>	Kernel	Grinding/blending with milk	Traditional nutritional beverage	(TasteAtlas, 2026)
India	Various communities	Kesar Milk	Saffron	<i>Crocus sativus</i>	Stigma	Infusion/blending with milk	Traditional aromatic beverage	(GotRum, 2026)
India	Various communities	Haldi Doodh	Turmeric	<i>Curcuma longa</i>	Rhizome	Cooking/blending with milk	Traditional spiced beverage	(Pushpanagan et al., 2012, TasteAtlas, 2026)
India	Various communities	Rose Milk	Rose	<i>Rosa</i> spp.	Flowers	Syrup preparation/blending with milk	Traditional aromatic beverage	(GotRum, 2026)
India	Various communities	Masala Chai	Tea and spices	<i>Camellia sinensis</i> + <i>Elettaria cardamomum</i> , <i>Zingiber officinale</i> , <i>Syzygium aromaticum</i> , <i>Cinnamomum</i> spp., <i>Piper nigrum</i>	Leaves, seeds, rhizomes, flower buds, bark, and fruits	Infusion	Widespread traditional and cultural beverage	(Pushpanagan et al., 2012, TasteAtlas, 2026)
Assam	Regional communities	Assam Tea	Tea	<i>Camellia sinensis</i> var. <i>assamica</i>	Leaves	Processing and infusion	Traditional/regional tea product	(TasteAtlas, 2026)
Darjeeling	Regional communities	Darjeeling Tea	Tea	<i>Camellia sinensis</i>	Leaves	Processing and infusion	Traditional/regional tea product	(GotRum, 2026)

Region	Cultural Group	Traditional Beverage	Plant Resource/Raw Material	Scientific Name	Plant Part Used	Processing Type	Traditional Use/Cultural Significance	Source
Nilgiri	Regional communities	Nilgiri Tea	Tea	<i>Camellia sinensis</i>	Leaves	Processing and infusion	Traditional/regional tea product	(GotRum, 2026)
Kangra	Regional communities	Kangra Tea	Tea	<i>Camellia sinensis</i>	Leaves	Processing and infusion	Traditional/regional tea product	(TasteAtlas, 2026)
India	Various communities	Tulsi Tea	Holy basil	<i>Ocimum tenuiflorum</i>	Leaves	Infusion	Traditional herbal beverage	(GotRum, 2026)
India	Various communities	Ginger Tea	Ginger	<i>Zingiber officinale</i>	Rhizome	Infusion	Traditional herbal beverage	(GotRum, 2026)
India	Various communities	Tejpatta Tea	Indian bay leaf	<i>Cinnamomum tamala</i>	Leaves	Infusion	Traditional herbal/spiced beverage	(GotRum, 2026)
India	Various communities	Elaichi Tea	Cardamom	<i>Elettaria cardamomum</i>	Seeds/capsules	Infusion	Traditional spiced beverage	(GotRum, 2026)
India	Various communities	Lemon Tea	Lemon/citrus	<i>Citrus</i> spp.	Fruit	Infusion/addition of fruit extract	Traditional beverage	(GotRum, 2026)
India	Various communities	Indian Filter Coffee	Coffee	<i>Coffea</i> spp.	Seeds	Roasting and brewing	Traditional/regional beverage	(TasteAtlas, 2026)
India	Various communities	Mango Lassi	Mango	<i>Mangifera indica</i>	Fruit	Blending with fermented dairy	Traditional dairy-based beverage	(TasteAtlas, 2026)
India	Various communities	Sweet Lassi	Saffron, cardamom, and fruits	<i>Crocus sativus</i> , <i>Elettaria cardamomum</i> , and fruit species	Stigmas, seeds, and fruits	Blending with fermented dairy	Traditional dairy-based beverage	(TasteAtlas, 2026)
India	Various communities	Lassi	Ginger, mint, rose, cardamom, mango, garlic, cumin, and other plants	<i>Zingiber officinale</i> , <i>Mentha</i> spp., <i>Rosa</i> spp., <i>Elettaria cardamomum</i> , <i>Mangifera indica</i> , <i>Allium sativum</i> , <i>Cuminum cyminum</i>	Various plant parts	Blending with fermented dairy	Traditional dairy beverage with regional variation	(TasteAtlas, 2026)
India	Various communities	Namkeen Lassi	Cumin, pepper, and mint	<i>Cuminum cyminum</i> , <i>Piper</i> spp., <i>Mentha</i> spp.	Seeds, fruits, and leaves	Blending with fermented dairy	Traditional savory beverage	(TasteAtlas, 2026)
India	Various communities	Thandai	Herbs, spices, and nuts	Multiple plant species	Various parts	Grinding and blending	Traditional festive and cultural beverage	(Pushpanagan et al., 2012, TasteAtlas, 2026)
India	Various communities	Bhang Lassi	Cannabis	<i>Cannabis</i> spp.	Leaves/flowers	Blending with fermented dairy	Traditional beverage	(TasteAtlas, 2026)

Region	Cultural Group	Traditional Beverage	Plant Resource/Raw Material	Scientific Name	Plant Part Used	Processing Type	Traditional Use/Cultural Significance	Source
India	Various communities	Sulaimani Chai	Tea and spices	<i>Camellia sinensis</i> and spices	Leaves and various spice parts	Infusion	Traditional regional beverage	(TasteAtlas, 2026)
India	Various communities	Bel Sharbat	Bael	<i>Aegle marmelos</i>	Fruit	Extraction/syrup preparation	Traditional fruit-based beverage	(TasteAtlas, 2026)
India	Various communities	Pan Juice	Betel leaf	<i>Piper betle</i>	Leaf	Extraction/blending	Traditional plant-based beverage	(GotRum, 2026)

Fermented beverages represented an important component of the documented diversity and illustrate the significance of traditional fermentation practices in several Indian communities. Beverages such as Chhang, Jaanr, Apong, Handia, Haria, and Zutho demonstrate the use of fermentation to transform locally available plant-based substrates into culturally recognized beverages. In some traditions, the preparation and repeated use of defined starter materials, such as Phab and Murcha, reflect locally developed knowledge concerning the initiation and maintenance of fermentation processes (Kumari et al., 2016). Differences in substrates, starter preparations, fermentation conditions, and processing practices may contribute to variation in the physicochemical, sensory, and microbiological characteristics of the resulting beverages (Tamang et al., 2016, Yumnam et al., 2024). Importantly, these fermentation practices are often embedded within broader systems of food preparation, social interaction, and cultural transmission rather than functioning solely as technical methods of beverage production. Their documentation may therefore contribute to a better understanding of the relationships between plant resources, traditional food technologies, and biocultural heritage (Asrani et al., 2019, Barooah & Saikia, 2024).

The reviewed beverages also demonstrate considerable variation in the ways plant materials are processed. Depending on the beverage, plant resources may be subjected to extraction, soaking,

infusion, juicing, grinding, blending, fermentation, or distillation. Such variation reflects the adaptation of processing techniques to the physical characteristics of the raw materials and to locally established preparation practices. In fermented beverages, differences in substrate composition and fermentation procedures may also influence the resulting microbial communities and metabolite profiles, highlighting the potential value of integrating ethnobotanical documentation with microbiological and food-science approaches (beverages (Tamang et al., 2016, Yumnam et al., 2024). However, the available literature is uneven in its reporting of botanical identification, plant parts used, starter composition, fermentation duration, and other processing parameters, which limits direct comparison among beverage traditions.

Beyond their dietary role, many traditional beverages are associated with seasonal practices, social gatherings, festivals, religious observances, and other forms of cultural expression. These associations indicate that beverages may function as culturally meaningful products through which knowledge concerning plants, preparation techniques, and customary practices is transmitted across generations. From this perspective, traditional beverages represent more than individual food products; they form part of locally adapted food systems and broader biocultural traditions. Nevertheless, claims concerning nutritional, medicinal, or health-related properties should be interpreted cautiously because

traditional use does not, in itself, establish biological efficacy or clinical effectiveness.

Overall, the diversity documented in this review underscores the close relationship between botanical resources, food-processing practices, and cultural knowledge in India. At the same time, the uneven geographical and ethnographic coverage of the available literature suggests that the documented diversity may represent only part of the knowledge maintained by local and traditional communities, particularly where practices continue to be transmitted primarily through oral traditions. Further ethnobotanical documentation, together with standardized reporting of botanical identity, plant parts, preparation procedures, fermentation conditions, and starter materials, would improve the comparability and reproducibility of studies in this field. Such interdisciplinary documentation could also provide a stronger foundation for future investigations into the nutritional composition, microbiological characteristics, and potentially bioactive constituents of traditional Indian beverages, without conflating traditional use with scientifically established therapeutic efficacy.

Conclusion

The present mini-review highlights the considerable botanical, technological, and cultural diversity of traditional and plant-based beverages documented across India. These beverages represent an important component of local food systems and biocultural heritage, encompassing a wide range of plant resources, preparation techniques, and fermentation practices that have been transmitted through generations. Although nutritional, cooling, digestive, and other traditional therapeutic uses have been reported for some of these beverages, such uses should be interpreted within the context of traditional knowledge and should not be considered evidence of established therapeutic efficacy in the absence of adequate experimental and clinical evidence.

Ongoing changes in lifestyle, food industrialization, and declining intergenerational transmission of orally maintained knowledge may contribute to the gradual erosion of some traditional beverage practices and the associated botanical knowledge. Continued ethnobotanical documentation is

therefore important for recording plant species, plant parts, preparation methods, fermentation practices, and traditional starter cultures before such knowledge is further diminished.

Future research should integrate systematic ethnobotanical documentation with standardized botanical identification and scientific evaluation of nutritional composition, bioactive constituents, microbial characteristics, fermentation processes, and food safety. Such an interdisciplinary approach could strengthen the connection between traditional beverage knowledge and contemporary food, microbiological, nutritional, and biological sciences while preserving a clear distinction between traditionally reported uses and effects supported by experimental or clinical evidence.

Declarations Conflict of Interest

The authors declare no conflicts of interest.

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Consent for Publications

The authors certify that that this work in its final form has been thoroughly reviewed and approved for publication.

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Ethical Considerations

Not applicable. This letter does not report new studies involving human participants, animal subjects, or patient data.

AI Use Disclosure

The authors declare that AI tools were not used to generate or develop the scientific content of this manuscript. AI was used solely for English language editing, grammar correction, and improving sentence clarity and readability. The authors take full responsibility for the final content.

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