

Review



Ethnobotanical, phytochemical and pharmacological evaluation of *Tilvaka (Viburnum nervosum D. Don)*: A narrative review.

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ABSTRACT:

Introduction: *Tilvaka (Viburnum nervosum D. Don.)* belongs to the family Caprifoliaceae. It is a deciduous shrub of Himalayan and the north-eastern regions of India. In classical texts, it is mentioned under *Shyamadi Gana* and *shat sodhana vriksha* (purifying trees), indicating its purgative property. It is an ingredient of formulations like *Arguvadi taila*, primarily indicated for *vata vyadhi* (Diseases due to vata imbalance), *pandu roga* (anemia) and *udara roga* (abdominal diseases), etc. The current review compiled the data on *Tilvaka* and evaluated its traditional claims in light of modern findings. **Methodology:** Data were collected and compiled from classical Ayurvedic texts, scientific literature, ethnobotanical data, and pharmacological reports from databases, including PubMed and Web of Science. Information on identification, traditional uses, phytoconstituents, and therapeutic intervention was analyzed. **Result:** *Tilvaka* is a medicinal shrub of the Himalayan region of India. It is also known by other names like *Telam*, *Thelka* and *Asara*. It has purgative action. In classical and folk medicine, different parts- bark, fruit, and the whole plant are used to treat various conditions like anemia and dysmenorrhea, etc. Phytochemical studies have confirmed its antioxidant, antimicrobial, and anti-cancerous activity due to the presence of compounds- terpenoids, triterpenoids and bergenin. **Discussion:** *Tilvaka* is a Himalayan medicinal plant that was confused with *Lodhra*, later identified as *Viburnum nervosum* by Thakur Balwant Singh. It is a mild *virechaka* (purgative) drug with ovate leaves and drupe fruit. In folklore, its fruit, root, and bark are used in anemia and GIT disorders and is key ingredients of formulations like *Tilvaka ghrita* and *Pippalayadi kshara*. Phytochemically, it contains terpenoids, glycosides, etc., responsible for possessing antimicrobial and antioxidant activities. **Conclusion:** *Tilvaka* is classical drug used in conditions like *Pandu*, *Krimi* and *Kustha*. It is an endangered species, requires complete Pharmacognosy and phytochemical profiling along with propagation and conservation techniques for future use.

KEYWORDS: Ayurveda, Antioxidant, Bergenin, Caprifoliaceae, Symplocos, *Lodhra*, narrative review

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1. INTRODUCTION

Tilvaka, known as *Viburnum nervosum* D. Don (syn. *Viburnum grandiflorum*). It is classified under family Caprifoliaceae. The *Viburnum* genus consists of 300 species, 17 of which, including *V. malluha*, *V. opulus*, and *V. corylifolium*, etc., is widely found in India. [1] *Tilvaka* is a deciduous shrub native to northeastern regions of the India. Traditionally, it is used to treat gastrointestinal, upper tract respiratory and menstrual disorders. In folklore medicine, the root is employed in decoction form to treat uterine problems, [2] and the fruit is act as a blood purifier. [3]

In *Brihatrayi* (*Charaka Samhita*, *Sushruta Samhita*, *Ashtanga Hridaya*). *Tilvaka* is classified as a *virechaka* (purgative) drug. It is indicated in diseases such as *grahani* (malabsorption), *vatavyadhi* (neuromuscular disorders), [4] *gulma* (abdominal masses), *Pittaja Abhishyanda* (inflammatory eye diseases), [5] chronic fevers, and metabolic disorders. This plant is known by names as *Telam* and *Timoi* in regions of India, Nepal, and Pakistan. [6]

The identification of *Tilvaka* has been a matter of concern among acharyas. The primary debate arises from *Tilvakalpa Adhyaya* of *Kalpasthan* of *Charak Samhita*, where *Lodhra* (*Symplocos racemosa* Roxb) is mentioned as a synonym of *Tilvaka*. [7] Such a reference is absent in earlier available classical texts which led to confusion. *Lodhra* is a *kashyaya*(astringent) drug possessing *vrana ropaka*(wound healing) and *raktastambhaka*(hemostatic) properties. *Tilvaka* is used as a detoxifying agent in various diseases. After that Thakur Balwant Singh cross-examined classical texts and the therapeutic properties of both plants and ultimately concluded *Viburnum nervosum* D. Don as the source of *Tilvaka*. [8] This identification has gained scholars' agreement, aligning well with both textual descriptions and observed properties and helped reestablish accuracy in ayurvedic botanical classification.

Phytochemical studies reported that *Viburnum nervosum* has compounds, such as triterpenoids (butilinol, and oleanolic acid), sesquiterpenoids [9] and bioactive compound bergenin [10] responsible for their medicinal properties. This provides a reason for its utilization in folklore medicine.

In vitro studies have confirmed its antibacterial, [11] cytotoxic properties, [12] antifungal and antioxidant. [13] But still, there is not enough research on it. Further pharmacological and clinical experimentation is required to prove its traditional claims.

Even with botanical clarification and the plant's rich background, scientific evidence of *Tilvaka* is still limited. Its standardization, toxicological studies, mode of action and clinical effects are yet to be characterized. This lacuna reflects a need to bridge traditional knowledge with modern biomedical research

The present review undertakes a broad, interdisciplinary exploration of *Viburnum nervosum*. Data has been compiled from classical ayurvedic literature, ethnobotanical evidence, phytochemical analysis and available studies. This review highlights the therapeutic potential of *Tilvaka* by combining classical knowledge with available scientific evidence. The aim is to speed up the research into clinical applications. Finally, such an initiative can lead to the development of new formulations and the conservation of Himalayan flora.

2. MATERIAL AND METHODOLOGY

A detailed literature search was done to compile and evaluate the data available on *Viburnum nervosum* (*Tilvaka*) in classical texts and scientific literature. Classical texts like *Charak Samhita*, *Sushrut Samhita* and available *Nighantus*, The Wealth of India, and The Review of Indian Medicinal Plants, were reviewed to collect traditional knowledge and therapeutic effects. Electronic databases such as ScienceDirect, Scopus, Web of Science, Google Scholar, Ayushdhara, PubMed and NAMASTE (National Action for

Mechanized Sanitation Ecosystem) portals were searched for pharmacological research.

Keywords used for the database include “*Viburnum*,” “*Viburnum nervosum*,” “*Viburnum nervosum* and *Tilvaka*,” “*Tilvaka*,” “ethnobotany,” “folklore,” “phytochemical,” “*telam*,” “Caprifoliaceae,” “Himalayan flora,” “medicinal species of Himalaya,” and “traditional medicine.” A manual search of classical literature and ethnomedicinal records was also done to ensure thoroughness and capture the unreported data.

3. RESULTS

Vernacular Name: *Tilvaka* is known as *Shirpornajaya* in Hindi. [10] Locals of the Himalayan region identify *Tilvaka* by a various name, which reflects its widespread ethnobotanical importance. It is named as *Telam* and *Timoi* [14] in *Kumaon*, whereas *Tilen* and *Thelka* are the common names in Garhwal region of Uttarakhand. In Nepal, it is named *Asara*, *Anrola* in Punjab and *Amoch*, *Ghuz Mava*, *Chamiar*, and *Asos* in northern Pakistan. It is also called as *Talanaj*, *Taliani*, *Talkha*, and *Tillen* [15] in other parts of the Himalayan belt.

Synonyms: *Tilvaka* means the one having the property of oleation or lubrication. It is also known by other names that represent its morphological features and therapeutic property, like *tiritaka* (plant with thick bark), *brihatapatra* (plant with large leaves) and *Lodhra* (that pacifies *pitta* and *kapha doshas*). [16]

Tilvaka has also been consistently used as a synonym for *Lodhra* in major lexicons (*Dhanvantri Nighantu*, [17] *Bhavaprakasha Nighantu*, [18] *Kayideva Nighantu*, [19] and *Raja Nighantu*, [20] etc.)

Geographical Distribution: *Viburnum nervosum* grows in the Himalayan and northeastern region of the Indian subcontinent. It lies at a height of 1500–3300 meters. In India, it is found in Uttarakhand (Kharsali, Uttarkashi), Himachal Pradesh (Chamba and Rajgundha), Jammu & Kashmir, and

across Sikkim. It is also found in West Bengal and abundantly distributed throughout the northeastern states, including Arunachal Pradesh, Assam, Nagaland, Tripura and Mizoram. Worldwide, it is flourished well in Nepal and Pakistan, where it thrives in temperate to subalpine forests. [21]

Morphology: It is a deciduous shrub or small tree, reaching upto height of 5–6 meters. Fresh branches are covered with furfuraceous pubescence, while older branches are glabrous and large with elliptic lenticels.

Leaves: Leaves are clustered at the tips. Stipules 2–5 mm long, caducous or absent. Leaf blades (7–18 × 4–11 cm) are ovate to broadly ovate, with a papery texture. The upper surface is glabrous and the lower surface is pubescent along the veins, while Venation is pinnate, anastomosing nears the margins. Leaf bases are cordate or rounded, margins irregularly serrate. Apex is acute.

Inflorescence and Flowers: Inflorescences are terminal, compound, umbel-like cymes, 5–15 cm in diameter. Primary node bears 5–7 whorled rays, with small glands. Bracts are greenish, ovate to elliptic, and accompanied by like bracteoles.

Flowers are aromatic, with short pedicels. The calyx is green with small, ovate lobes covered in stellate pubescence. The corolla is white or reddish, 5–7 mm in diameter, with a tube 3–4 mm long. Lobes are ovate, two times the length of the tube. Stamens are shorter, with 1 mm filaments and purple with broadly ovoid anthers. The style exceeds the calyx.

Fruit: The fruit is an ovoid drupe, 7–9 × 5–7 mm, glabrous. On maturing, it changes from yellow to red and eventually purplish-black. The base and apex are round. Each fruit contains compressed pyrenes with shallow dorsal and deep grooved ventral surfaces.

Phenology: Fruiting occurs from September to October, and flowering from April to June. [1][21][22]

Review in Ayurveda: *Tilvaka* holds a definite place in the *Brihatrayi*. It is classified under *Vamana-Virechana Dravyas* (emetics and purgatives), *Shodhana Vrikshas*(detoxifying trees), [23] *Pratisarniya Kshara Dravyas* (caustic substances used in cauterisation), *Madhyama Kshara Dravyas* (moderately potent alkalis), and the *Shyamadi Gana*. [24]

Tilvaka is a major ingredient in several classical preparations mentioned in *Brihatrayi*. These preparations include various

Taila (medicated oils), *Ghrita* (medicated ghee), *Churna* and *Agada* preparations, which shows its versatile roles in the management of diseases like *kustha* (diseases of the skin), *grahani* (malabsorption), *kasa* (cough), *vatavyadhi*, and *vidradhi* (abscesses), etc. The following part is the textual references, formulations, and therapeutic indications related to *Tilvaka* in the traditional Ayurvedic literature ([Table 1](#)).

Table 1: Classical formulations containing *Tilvaka* and their indications [25] [26] [27]

	Charaka Samhita	Sushruta Samhita	Ashtanga Hridaya
Formulation	<i>Arguvadi taila</i> <i>Gavakshyadi churna</i> <i>Pippalyadi kshar</i> <i>Tilvaka ghrita</i>	<i>Shivtrahar lepa</i> ; <i>Mahaausadhi ayaskriti</i> <i>Ksharagada</i> ; <i>Tilvaka ghrita</i> ; <i>Mahaasuashi</i> <i>agada</i> <i>Hare nukadi yoga</i> <i>Hikkahara leham</i>	<i>Pilu ghrita</i> <i>Gavakshyadi churna</i> <i>Tilvaka ghrita</i>
Indications	<i>Krimi</i> (worms); <i>Jvara</i> (Fever); <i>Udara</i> (abdominal diseases) <i>Vataj grahani</i> ; <i>Kshyaja kasa</i> (pulmonary tuberculosis) <i>Vata vyadhi</i> (disorders due to vata) <i>Hridya shoola</i> (chest pain)	<i>Vatavyadhi</i> disorders due to vata) <i>Bhagandara</i> (Fistula-in-ano); <i>Kustha</i> (Skin diseases); <i>Mahakustha</i> (Skin diseases) <i>Vatoudara</i> (Vata-induced abdominal disorder) <i>Pakwavidradhi</i> (Suppurated abscess) <i>Galaganda</i> (Thyroid enlargement (Goitre)) <i>Vataj Vridhi</i> ; <i>Pittaja abhishyanda</i> (Acute Purulent Conjunctivitis); <i>Hikka</i> (Hiccups) <i>Kasa</i> (cough); <i>Pandu</i> (Anaemia); <i>Sannipatika Gulma</i> ; <i>Pratishyaya</i> (Rhinitis)	<i>Vatapitta jvara</i> (Viral/ inflammatory fever); <i>Kshyaja kasa</i> (pulmonary tuberculosis); <i>Pittaja chardi</i> (Bilious Vomiting); <i>Nirama grahani</i> (non-inflammatory gastrointestinal dysfunction); <i>Mutraghata</i> (Obstructive urinary disorder); <i>Kaphaja Vidradhi</i> (Chronic abscess/Cold abscess); <i>Antra Vidradhi</i> (Intra-abdominal abscess); <i>Vataj Vridhi</i> ; <i>Pittaja Gulma</i> (inflammatory abdominal mass); <i>Vatoudara</i> (Vata-induced abdominal disorder); <i>Pittarakta</i> (Inflammatory skin disease); <i>Pratishyaay Vatak</i> (Dry rhinitis); <i>Galganda</i> (Thyroid enlargement (Goitre))

Ethnobotanical Use

Tilvaka is of great ethno botanical value in the Himalayan and sub-Himalayan region. In Muzaffarabad, different parts of the plants- bark, root, fruit, and leaves—are used for different diseases. Fruits are recommended for improving blood-related disorders in Himachal Pradesh and for digestive support in northern Pakistan. These uses highlight its importance in traditional medicine. Detailed ethno botanical uses are mentioned in [Table 2](#).

Chemical Constituents [9] [10] [13]

Preliminary phytochemical analysis of the *Viburnum nervosum* extract revealed the presence of various phytoconstituents, including flavonoids, triterpenoids and glycosides, etc. Data was collected from various sources like PubChem, IMPPAT database and related articles, summarized in [Table 3](#)

Research Studies Conducted

The plant has been explored for its antibacterial, antiplasmodial, anticancerous and antioxidant properties so far, summarised in [Table 4](#).

Table 2: Ethnobotanical uses of *Tilvaka*

S.no	Uses	Part used	Places where it is used	References
1.	Powder of whole plant is used to purify and produce blood.	Whole plant	Muzaffarabad, Pakistan	[2]
	Decoction of bark is used to treat Dysmenorrhea, asthma, threatened abortion, and haemorrhage.	Bark		
	Root decoction in the treatment of uterine diseases	Root		
	Leaf extract acts as a carminative.	Leaves		
2.	Raw fruit is used in Anaemia	Fruit	Talana – Bharhaur H. P	[28]
3.	Fruit is used in the treatment of stomach aches	Fruit	Northern Pakistan	[29]
4.	Root powder is used in Acute furunculosis	Root	Kashmir	[10]
5.	Menorrhagia, Metrorrhagia.	Bark	Traditional healers of the	[3]
	Blood purifier	Fruit	Jhelum valley	
6.	Perfume	Flowers	-	[1]
7.	Menorrhoea	Stem bark	Himalayan region	[30]

Table 3: Chemical compounds present in *Viburnum nervosum*

S.no	Class of compound	Chemical compound	Present in the plant part
1.	Triterpenes	Butilinol, Oleanolic Acid,	Whole plant
2.	Terpenoids	Ursolic Acid, B-Sitosterol	Whole plant
3.	Triterpenoids	Butilin, Butilinic Acid, Germanicol, A-Amyrin, Corosolic Acid	Whole plant
4.	Monoterpene	Myrecine, Linalool, P.Cymene	Root oil
5.	Sesquiterpenes	A-Elemene, A-Selinene, A-Elemol	Root oil
6.	Sesquiterpenoid	Globulol, Ledene, A-Eudesmol	Root oil
7.	Alcohol	Glaucyl Alcohol	Root oil
8.	Rose Ketones	A-Ionone	Root oil
9.	Tricyclic Sesquiterpenoid	Spathulenol	Root oil
10.	Olefinic Compound	Elemicin	Root oil
11.	Glycoside	Bergenin	Root

Table 4: Pharmacological activity reported on *Viburnum nervosum* (*Tilvaka*)

S. no	Pharmacological activity	Study design and model/ strain used	Form/type of drug/ extract	Results
1.	Anti-bacterial study [11] [13]	In vitro study Bacterial strain used -Staphylococcus aureus, Bacillus subtilis, Salmonella typhi, Pseudomonas aeruginosa, Klebsiella pneumoniae, Proteus vulgaris, Citrobacter freundii, and	Petroleum ether, chloroform, ethanol, and methanol extracts of leaves Standard drug: ciprofloxacin and erythromycin	Ethanol and methanol extracts of <i>Viburnum nervosum</i> exhibited significant antibacterial activity against all the strains used, while the Chloroform extract of leaves of <i>Viburnum nervosum</i> showed activity against P. vulgaris and C. freundii at a dose of 10 mg/ml.

Streptococcus pneumoniae			
	In vitro study	Essential oil and root extract (methanol, ethanol, methanol: water, ethanol: water)	The essential oil of <i>Viburnum nervosum</i> exhibited the strongest antibacterial effect against <i>Bacillus subtilis</i> and the weakest against <i>Pasteurella multocida</i> .
	Bacterial stain used: <i>Bacillus subtilis</i> , <i>Pasteurella multocida</i> , <i>Staphylococcus aureus</i> , <i>Escherichia coli</i>	Control drug: Rifampicin 30 µg/ dish	
2.	Anti-cancerous study [12]	In vitro study Green synthesis of AgNPs was performed using <i>Viburnum nervosum</i> leaf extract and tested in vitro on MCF-7 and A431 cancer cell lines.	Silver Nanoparticles (AgNPs) extracted from leaves of <i>Viburnum nervosum</i> Doxorubicin-loaded AgNPs for testing drug delivery efficiency
			The synthesized AgNPs were spherical (12–17 nm), showed an absorbance peak of 445 nm, and were capped by <i>Viburnum nervosum</i> biomolecules; they possessed biocompatibility with MCF-7 and A431 cells, and doxorubicin-loaded AgNPs enhanced drug bioavailability over the free drug.
3.	Antioxidant activity [13]	In vitro study DPPH (2,2-Diphenyl-1-picrylhydrazyl) Radical Scavenging Assay. Dose: 0.5 -15.5 µg/mL	Essential oil and 4 extract (methanol, ethanol, methanol: water, ethanol: water) from the root Positive control: synthetic antioxidant and BHT
			Essential oil of <i>Viburnum nervosum</i> showed free radical scavenging activity, followed by Methanolic and Ethanolic extracts.
4.	Anti-fungal study [13]	In vitro study Four strains: <i>Aspergillus niger</i> , <i>Rizopus solani</i> , <i>Fusarium solani</i> , and <i>A. flavus</i> Standard drug (Flumequinene)	Essential oil from the root Control drug: Fluconazole 25 µg/dish
			Essential oil also demonstrated significant antifungal activity against <i>Aspergillus niger</i> and <i>Rhizoctonia solani</i> .
5.	Anti-plasmodial activity [9]	In vitro study Chloroquine-sensitive (CQS) strain- <i>P. falciparum</i> NF54	3 µM of the compounds Butilinol, Oleanolic Acid, Ursolic Acid, and Betulin
			CQS strain of <i>P. falciparum</i> NF54 with Ursolic acid, concentrations ranging from 2 to 8 µM, resulted in a partial inhibitory effect at 4 µM and stronger at 8 µM

4. DISCUSSION

Tilvaka is a relatively lesser-known medicinal plant described in classical Ayurveda, predominantly distributed in the Himalayan region of the Indian subcontinent. Its botanical identification has historically been controversial due to its confusion with *Lodhra* (*Symplocos racemosa* Roxb.). This ambiguity was later resolved by Thakur Balwant Singh, who critically examined classical textual descriptions along with

ethnobotanical evidence and proposed *Viburnum nervosum* D. Don. as the authentic botanical source of *Tilvaka*.

Pharmacodynamically, *Lodhra* is predominantly *kashaya rasa* (astringent) and exhibits *rakta-stambhaka* (hemostatic) action, whereas *Tilvaka* is described as a mild *virechaka* (purgative) drug. Morphologically, *Tilvaka* is characterized by ovate, papery leaves, cymose inflorescence, and drupe-type fruits, which help in distinguishing it from *Lodhra*.

The ethnobotanical uses of *Tilvaka* across Himalayan and sub-Himalayan communities also support its broad therapeutic relevance. Its bark, root, fruit, leaves, and whole plant are traditionally used for anemia, dysmenorrhea, uterine disorders, stomach ache, menorrhagia, metrorrhagia, blood purification, and acute furunculosis (Table 2). These traditional applications indicate that *Tilvaka* was not restricted only to purgation but was also used in disorders involving blood, digestion, inflammation, and reproductive health.

An integrative interpretation of the available ethnobotanical, phytochemical, and pharmacological data suggests that *Tilvaka* (*Viburnum nervosum* D. Don.) holds a unique position among classical *Virechaka Dravyas*, with potential systemic therapeutic implications beyond its traditionally described purgative action. Its classical use in *Pandu*, *Grahani*, *Udara Roga*, *Kustha*, *Jvara*, and *Vatavyadhi* is supported by its presence in several classical formulations such as *Tilvaka Ghrita*, *Pippalyadi Kshara*, and *Arguvadi Taila* (Table 1).

Phytochemically, *Viburnum nervosum* contains triterpenes, terpenoids, triterpenoids, monoterpenes, sesquiterpenes, sesquiterpenoids, alcohols, rose ketones, and glycosides such as bergenin (Table 3). The presence of oleanolic acid, ursolic acid, betulinic acid, β -sitosterol, and bergenin provides a pharmacological basis for its reported antioxidant, antimicrobial, anti-inflammatory, and possible hepatoprotective actions. These constituents may partly explain its traditional indications in *Pandu*, *Grahani*, *Udara Roga*, and inflammatory conditions.

The available pharmacological evidence further strengthens this traditional rationale. Reported studies have demonstrated antibacterial, antioxidant, antifungal, antiplasmodial, and anticancer-related activities of *Viburnum nervosum* extracts and isolated compounds (Table 4). The antibacterial activity may support its traditional use in

gastrointestinal and infectious conditions, while antioxidant activity may explain its use in chronic inflammatory and metabolic disorders.

However, the available evidence remains largely preclinical. Most pharmacological studies are limited to in vitro models, and there is a lack of in vivo validation, toxicity profiling, dose standardization, and clinical trials (Table 4). Therefore, although classical formulations and ethno botanical claims suggest wide therapeutic potential (Table 1 and Table 2), these claims cannot yet be considered clinically established.

Another important concern is botanical authentication. The historical confusion between *Tilvaka* and *Lodhra* (*Symplocos racemosa*) necessitates strict pharmacognostical, macroscopic, microscopic, and phytochemical standardization. Without such standardization, substitution or adulteration may compromise both efficacy and safety. Hence, future studies should focus on authenticated raw material, marker-based standardization using compounds such as bergenin and triterpenoids (Table 3), and disease-specific pharmacological and clinical validation.

Overall, *Tilvaka* represents a promising but underexplored Ayurvedic medicinal plant. Its classical indications (Table 1), ethno botanical applications (Table 2), phytochemical diversity (Table 3), and preliminary pharmacological activities (Table 4) together justify further systematic research, conservation, and evidence-based therapeutic development.

Strength:

This review compiled the available data on *Tilvaka*, an underrated medicinal plant of classical Ayurveda, highlighting its therapeutic efficacy, its purgative action and ethno botanical importance. It also addressed the controversy over *Tilvaka's* identification and the importance of conservation by identifying the plant as a near-endangered species.

Limitation:

This review is limited by gaps in existing data, including unestablished *raspanchaka*, phytochemical and Pharmacognosy profile, propagation techniques and quality control parameters. These limitations show the broader use of *Tilvaka* being underexplored in modern medicine. Addressing these gaps through systematic studies, propagation and conservation techniques are essential to validate the traditional claims and safe use in daily practice.

5. CONCLUSION

Tilvaka (*Viburnum nervosum* D. Don.) is a classical ayurvedic medicinal plant useful in multiple conditions- *Vata vyadhi*, *Pandu*, *Krimi*, *Udara roga* and *Kustha*, etc. It is an endangered species found in the Himalayan region of India. It should be explored pharmacognostically, phytochemically and therapeutically so that it can be brought into mainstream medicine. Different strategies should be employed for its propagation and conservation for its future use.

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