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A Systematic Review On The Phytochemistry And Pharmacological Properties Of Dendrophthoe Falcata

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Abstract: The evergreen hemiparasitic plant Dendrophthoe falcata (Linn.f.), also referred to as "Vanda," is a member of the Loranthaceae family and grows on a variety of host plants. Being used historically to heal wounds, pulmonary TB, skin conditions, menstrual irregularities, ulcers, asthma, impotence, and paralysis, it has great ethnomedical significance. The phytoconstituents that give the plant its varied pharmacological characteristics include quercetin, quercitrin, rutin, gallic acid, beta-amyrin acetate, and beta-sitosterol. Its immunomodulatory, antioxidant, hepatoprotective, antidiabetic, antitumor, contraceptive, and wound-healing properties have all been documented in scientific investigations. This review highlights the traditional significance and therapeutic potential of Dendrophthoe falcata by summarizing the latest research on its pharmacognosy, phytochemistry, tissue culture, ethnobotany, and pharmacological activities.

Keywords: phytochemistry, pharmacology, anti-tumor, review, hemiparasitic plant, *Dendrophthoe falcata.*

INTRODUCTION

Medicinal plants have been an integral part of human civilization since ancient times, serving as primary tools to combat various diseases (1). India, often referred to as the **"**medicinal garden of the world**,"** is endowed with an enormous diversity of medicinal flora. In modern medicine, both synthetic drugs and plant-derived compounds are evaluated for their therapeutic efficacy, with medicinal plants remaining a valuable source of bioactive agents. According to a World Health Organization (WHO) survey, nearly 70–80% of the global population—particularly in developing countries—relies on traditional or herbal medicine for primary healthcare due to its affordability, safety, effectiveness, and easy availability. (2,3).

Among various medicinal plants of ethnobotanical relevance, *Dendrophthoe falcata* (L.f.) Ettingsh. emerges as a noteworthy hemiparasitic shrub of the family *Loranthaceae*. Commonly referred to as Indian mistletoe, this plant is indigenous to South and Southeast Asia, including India, Sri Lanka, Thailand, Indo-China, and Australia, and is known to parasitize over 300 host species. Its morphological traits—such as grey bark, thick opposite leaves, scarlet to orange-red flowers, and ovoid-oblong berries—aid in its identification across diverse ecological regions. Traditional medicinal systems have long utilized its bark and other parts for managing conditions such as wounds, menstrual irregularities, asthma, mania, and tuberculosis, and it has also been used as a substitute for betel nut. Phytochemical studies have revealed a rich profile of bioactive constituents, notably flavonoids like quercetin, kaempferol, and rutin, as well as tannins, β-sitosterol, stigmasterol, β-amyrin, and oleanolic acid, which may underlie its therapeutic potential. (4, 5, 6)

Dendrophthoe falcata is classified as a chlorophyllous, photosynthetic, obligate hemiparasite, tapping the xylem of host plants to obtain water and minerals while partially synthesizing its own assimilates. Excessive infestation of mistletoe on host branches can significantly reduce the host plant's growth and may eventually lead to its death. Globally, the genus *Dendrophthoe* comprises around 20 species, of which seven species are found in India. Due to its extensive parasitic activity and the damage it causes to economically important plants, D. falcata is also considered a potential pest. (7-10)

Given its wide distribution, rich phytochemical profile, and diverse pharmacological properties, *Dendrophthoe falcata* has garnered significant research interest in recent years. This review provides a comprehensive account of its morphology, tissue culture, phytochemistry, ethnomedicinal uses, and pharmacological activities, aiming to highlight its therapeutic potential and emerging applications. (11-19)

DESCRIPTION

Scientific Classification (20)

Domain	Eukaryote
Kingdom	Plantae
Subkingdom	Viridiplantae
Phylum	Tracheophyta
Subphylum	Euphyllophytina
Class	Magnoliopsida
Subclass	Rosidae
Superorder	Santalanae
Order	Santalales
Family	Loranthaceae
Genus	Dendrophthoe
Species	Falcata

Vernacular names (21-23)

Sanskrit	Vanda,Vrikshabhaksha, Vriksharuna
Hindi	Banda
Bengali	Baramanda
Marathi	Vanda
Gujrati	Vando
Telgu	Badanika, Jiddu
Tamil	Plavithil, Pulluri
Malayalam	Ithil
Uriya	Bridhongo

Fig 1: *Dendrophthoe falcata* inflorescence

Fig 2: *Dendrophthoe falcata* flower buds

GROWTH & DISTRIBUTION

Dendrophthoe falcata (L.f.) Ettingsh is a perennial, climbing, woody, parasitic plant that primarily grows on a wide variety of host trees. It thrives in tropical and subtropical regions and is commonly found in India, Sri Lanka, Thailand, China, Australia, Bangladesh, Malaysia, and Myanmar.

In India, the species is widely distributed across various states, occurring in forests, plains, and hilly regions up to an altitude of approximately 900 meters. (23, 24, 25)

MORPHOLOGY

Macroscopic characters

The plant under study is a large, bushy, evergreen, glabrous branch parasite characterized by smooth grey bark. Its aerial branches are extensively branched, often jointed, and range from 2 mm to 2.5 cm in thickness. The stem surface is slightly rough with irregular fractures, and the fractured surface appears dark brown without any distinctive taste or odor.

Leaves are thick, coriaceous, simple, and arranged oppositely or sub-oppositely in a decussate pattern. They are ovate to oblanceolate in shape, measuring 7.5–18 cm in length and 2–10 cm in width, with flattened petioles on the upper side and rounded beneath. When young, the leaves are soft and leathery, becoming brittle upon drying. They have an entire margin, decurrent base, and acute apex, with a slightly astringent taste and a tea-like odor. (26)

Stem sections reveal thin, dark brown bark speckled with lighter lenticels, enclosing reddish-brown wood. Small twigs are 2 mm to 2.5 cm thick, and fractures are irregular, with no distinct taste or smell. (27)

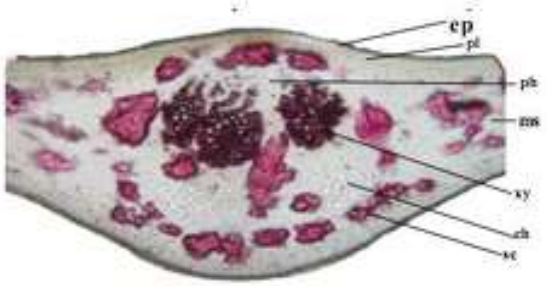
The roots of *Dendrophthoe falcata* are adventitious in nature, exhibiting a greyish-brown coloration externally and a yellowish-brown hue internally. Morphologically, they are slender, contorted, and knotty, often forming haustorial connections not only with host plants but occasionally even with the plant's own branches. These roots are typically unbranched, display irregular fractures when broken, and are devoid of any characteristic odor or taste, further distinguishing them from those of many other medicinal plants. (29)

Flowers are actinomorphic, bisexual, epigynous and occur in short, stout, axillary, unilateral racemes, often with two arising from a single axil. They measure 2.5–5 cm in length and are bright orange-red. The perianth consists of five tepals, free and strap-shaped distally, forming a sickle-shaped tube toward the base, with reflexed lobes at maturity. The perianth tube measures 40–55 mm in length, widening upward and enclosing five cushion-shaped nectaries. Stamens are five, epiphyllous, and appressed to the style in young flowers, with orange filaments and dark basifixed anthers. The ovary is inferior and unilocular, with a long style and capitate stigma. (27)

Fruits are smooth, ovoid to oblong pseudo-berries**,** measuring 3–8 mm in length and up to 3 mm in thickness**,** turning greenish-yellow when mature and brown upon drying**.** They are crowned by a persistent calyculus and contain a single, flask-shaped, elongated seed (5 mm × 2 mm) surrounded by a shiny, viscid film. The pericarp is fleshy with a sticky mesocarp. (27)

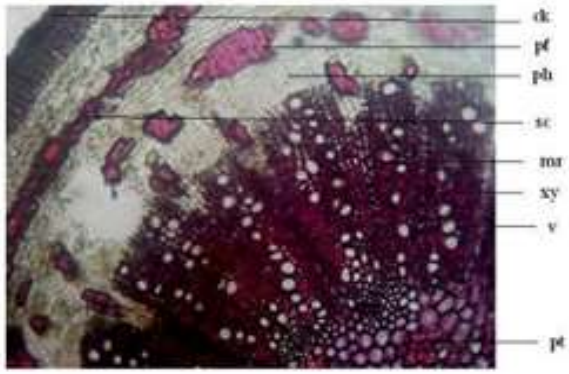
Microscopic characters

A transverse section of the leaf of *Dendrophthoe falcata* reveals a dorsiventral structure characterized by a thick cuticle and distinct upper and lower epidermal layers. These epidermal cells are squarish in shape with convex periclinal outer walls. The midrib is prominent, appearing shallowly convex on the adaxial (upper) side and broadly semicircular on the abaxial (lower) side, both surfaces being covered by a well-defined cuticle and radially arranged cell walls. The ground tissue is composed of compact, dilated, circular parenchyma cells, many of which contain dense tannin deposits. A single collateral vascular bundle is centrally located within the midrib, supporting the overall vascular architecture of the leaf. (30)



ep-epidermis,pl-palisade,ph-phloem,ms-mesophyll,xy-xylem,ch-cholemchyma, sc- stone cells

The transverse section of the stem of *Dendrophthoe falcata* exhibits a nearly circular outline enveloped by a thick cuticle. The epidermis consists of squarish to barrel-shaped cells with convex outer periclinal walls and is occasionally interrupted by lenticels. A single layer of papillate epidermal cells is present beneath the cuticle. The cortex is notably wide, homocellular, and parenchymatous, measuring approximately 12 cell layers in thickness (around 400 µm), with many cells containing tannin bodies. The central stele forms a broad, hollow cylinder composed of discrete vascular bundles, each separated by parenchymatous ground tissue. Scattered among the cortical and vascular regions are small clusters of sclereids, contributing to the structural support of the stem. (30)



ck-cork,pf-pericyclic fibers,ph-phloem,sc-stone cells,mr-medullary rays,xyxylem,v-vessels,pt-piths

PHYTOCHEMISTRY

Dendrophthoe falcata is a hemi-parasitic plant renowned for its rich reservoir of bioactive compounds, which are distributed throughout its leaves, stems, roots, and fruits. The leaves are particularly abundant in flavonoids such as quercetin and quercetrin, along with tannins like gallic acid and chebulinic acid—compounds known for their potent antioxidant and anti-inflammatory activities. The bark contains significant quantities of (+)-catechin and leucocyanidin, with quercetrin identified as the major constituent in plants parasitizing *Vitex negundo*. Notably, cardiac glycosides, including strospeside, odoroside F, and neritaloside, have been isolated from leaves collected from *Nerium oleander* hosts.

The young shoots of the stem are rich in approximately 10% tannins and also yield compounds such as β-amyrin O-acetate, oleanolic acid and its methyl ester acetate, β-sitosterol, and stigmasterol—all of which are associated with anti-ulcer, hepatoprotective, and anticancer activities. Fractionation of alcoholic stem extracts using hexane, chloroform, and methanol solvents has led to the isolation of β-amyrin acetate, along with a novel triterpene ($C_{33}H_{54}O_4$, m.p. 219–220 °C, $[\alpha]_D$ +56°, IR 1735 cm^{-1}), in addition to β-sitosterol, stigmasterol, and oleanolic acid.

Extensive chromatographic investigations of the plant's fruits have resulted in the identification of three novel oleanane-type triterpenes: 3β-acetoxy-1β-(2-hydroxy-2-propoxy)-11α-hydroxy-olean-12-ene, 3β-acetoxy-11α-ethoxy-1β-hydroxy-olean-12-ene, and 3β-acetoxy-1β-hydroxy-11α-methoxy-olean-12-ene. Alongside these, nine known compounds were also identified, including kaempferol-3-O-α-L-rhamnopyranoside, quercetin-3-O-α-L-rhamnopyranoside, and gallic acid. Structural elucidation of these molecules was accomplished using 1D/2D NMR and HR-ESI-MS techniques. Among them, kaempferol-3-O-α-L-rhamnopyranoside demonstrated notable biological activity by binding to estrogen receptors, showing a higher affinity for ERβ. Collectively, these phytochemical discoveries highlight the remarkable chemical diversity of *D. falcata* and emphasize its relevance in chemotaxonomy and pharmacological research. (26, 37)

PHARMACOLOGY STUDIES

Hepatoprotective activity

Studies have demonstrated that both ethanol and aqueous extracts of *Dendrophthoe falcata* exhibit significant hepatoprotective effects. Treatment with these extracts resulted in a marked reduction in serum biomarkers, including AST, ALT, alkaline phosphatase, and total bilirubin levels, while simultaneously increasing total protein and albumin levels. Histopathological examination of liver tissues from the ethanolic extract-treated group revealed only mild microfatty changes and a dense aggregation of lymphoid cells, indicating minimal necrosis or degeneration. The hepatoprotective activity is attributed to the presence of phenolic compounds and flavonoids in the ethanolic leaf extract, which likely exert their effects by mitigating oxidative stress and enhancing the liver's antioxidant defense system. (38)

Antinociceptive activity

The antinociceptive potential of the ethanolic bark extract of *Dendrophthoe falcata* (DFEE) has been evaluated using various experimental models of pain in rodents, including the formalin-induced nociception model, hot plate test (thermal stimulation), acetic acid-induced writhing test, p-benzoquinone-induced abdominal constriction test, and Haffner's tail clip method. Pre-treatment with DFEE at doses of 200 and 400 mg/kg body weight exhibited significant antinociceptive activity ($p < 0.05$) across all models when compared with the control group. Flavonoids and related phenolics may underlie this effect by inhibiting cyclooxygenase/lipoxygenase pathways and NF-κB activation, thereby reducing prostaglandins, leukotrienes, nitric oxide, and pro-inflammatory cytokines (e.g., TNFα, IL-1β); some also modulate central targets such as opioid receptors and TRPV1 channels, supporting both peripheral and central analgesia. (39)

Contraceptive activity

The methanolic extract of the stem of *Dendrophthoe falcata* has been investigated for its potential antifertility effects in adult, proven fertile male rats. The extract was administered orally at doses of 50, 100, and 200 mg/rat/day over a period of 60 days, with lonidamine used as the standard reference drug. On the 61st day, key reproductive organs—including the testes, epididymides, seminal vesicles, and ventral prostate—were excised and weighed to assess any morphological or functional alterations. In addition, critical reproductive parameters such as sperm motility, sperm density, and serum testosterone levels were evaluated.

The study demonstrated a significant, dose-dependent decline in both sperm motility and density across all treated groups, accompanied by a substantial reduction in serum testosterone levels. Histopathological examination of the testes revealed marked degenerative changes within the seminiferous tubules, with spermatogenesis arrested at the round spermatid stage. These observations suggest that the methanolic stem extract of *D. falcata* exerts a notable antifertility effect, likely mediated through disruption of spermatogenic progression and suppression of androgen biosynthesis. (40)

Diuretic and antilithiatic activity

The diuretic and antilithiatic activities of aqueous and alcoholic extracts of *Dendrophthoe falcata* have been systematically evaluated in experimental models. Oral administration of the aqueous extract at a dose of 4 g/kg in rats produced a significant increase in urine output, along with enhanced excretion of electrolytes, including sodium (Na^+), potassium (K^+), and chloride (Cl^-). These effects were found to be comparable to those produced by standard diuretic agents such as frusemide (4 mg/kg) and hydrochlorothiazide (10 mg/kg), indicating the extract's promising diuretic potential.

In a zinc disc-induced urolithiasis model, where rats developed magnesium ammonium phosphate stones following 1% ethylene glycol administration in drinking water for four weeks, both prophylactic and curative treatments with *D. falcata* extracts (4 g/kg, p.o.) resulted in a significant reduction in stone weight. The alcoholic extract, in particular, demonstrated superior efficacy in reducing calculi burden when compared to the aqueous extract. These findings suggest that *D. falcata* possesses notable antilithiatic properties, likely attributable to its ability to modulate urinary chemistry and inhibit crystal aggregation. (41)

Neurobehavioral toxicity

The ethanolic extract of the aerial parts of *Dendrophthoe falcata* was administered to rats at 250, 475, and 950 mg/kg body weight/day for four weeks. At the study's end, animals were evaluated using a functional observational battery (FOB) and open-field motor activity testing. The extract produced a decrease in arousal levels and a dose-dependent increase in the number of urine spots; however, no serious deficits were detected in the broader panel of behavioral or functional endpoints. Overall, the data suggest that hydroalcoholic extracts of *D. falcata* are relatively free from marked neurobehavioral toxicity and appear safe to use at the tested dose range. (42)

Anthelmintic activity

The anthelmintic activity of *Dendrophthoe falcata* leaf extracts was investigated to scientifically substantiate its traditional use in parasitic infections. Leaves were authenticated and subjected to solvent extraction using various polar and non-polar solvents, and the resulting dried extracts were evaluated for their efficacy against *Pheretima posthuma* (earthworm model). The anthelmintic potential was assessed by measuring the time to paralysis and death, using albendazole as the standard reference drug. Among the tested extracts, both ethyl acetate and methanolic extracts exhibited significant anthelmintic activity, with results comparable to those of albendazole.

Preliminary phytochemical screening of these active extracts confirmed the presence of tannins, flavonoids, and terpenoids—classes of compounds well-documented for their anthelmintic mechanisms. These bioactive constituents are believed to exert their effects by binding to structural proteins in the worm's cuticle, disrupting energy metabolism, or interfering with neurotransmission, ultimately leading to paralysis and death. These findings highlight the potential of *D. falcata* leaf extracts as a natural source of anthelmintic agents. (43)

Cytotoxic and immunomodulatory activity

An extract prepared from a *Loranthus* species (syn. *Dendrophthoe falcata*) parasitizing *Mangifera indica* has been reported to exhibit notable cytotoxic and tumor-reducing properties. In Balb/c mice, administration of the extract increased the total white blood cell (WBC) count and polymorphonuclear leukocytes, indicating stimulation of innate immune responses. Moreover, treated animals showed an enhancement of antibody-forming cells and a rise in antibody titers, demonstrating potentiation of humoral immunity. Collectively, these findings suggest that the extract exerts a dual action—direct antitumor (cytotoxic) effects alongside broad **i**mmunostimulatory activity. (44)

Anti-tumor activity

The anti-tumor efficacy of an aqueous leaf extract of *Dendrophthoe falcata*, collected from *Shorea robusta* hosts, was investigated using a 7,12-dimethylbenz[a]anthracene (DMBA)-induced mammary tumor model in female Wistar albino rats. Fifty-day-old rats (weighing 100–150 g) received a single oral dose of DMBA (50 mg/kg) to initiate tumor formation. Tumor development was monitored by manual palpation, and tumor volumes were estimated using plasticine models for comparison. After 12 weeks, rats bearing mammary tumors ranging from 2 to 6 g in weight were randomly divided into four groups (n = 6 per group) for a three-week treatment phase.

The groups included (1) a control group receiving 0.3% w/v sodium carboxymethylcellulose (NaCMC), (2) a treatment group administered aqueous extract of *D. falcata* at a dose of 400 mg/kg, and (3) a standard group treated with tamoxifen (50 µg/day). This experimental design aimed to compare the therapeutic effect of the plant extract with that of a clinically established anti-estrogenic agent. Tumor regression and related parameters were monitored throughout the treatment period to evaluate the anti-cancer potential of *D. falcata*.

The aqueous extract demonstrated **a** 24.93% reduction in tumor size, which was lower compared to tamoxifen, which achieved a 62.87% reduction. Histopathological examination of tumor tissues revealed sheets of poorly differentiated adenocarcinoma cells, but treated groups showed partial tumor regression and reduced cellular density. These findings suggest that *D. falcata* possesses anti-tumor properties, though with lower efficacy than tamoxifen. (45)

Wound healing, antimicrobial, and in vivo antioxidant activity

The ethanolic extract of the aerial parts of *Dendrophthoe falcata* has been extensively studied for its wound-healing efficacy using both excision and incision wound models in rats. The treatment resulted in significant enhancement of wound contraction, increased tensile strength of the healed tissue, and elevated levels of hydroxyproline and hexosamine—biochemical markers indicative of increased collagen synthesis and extracellular matrix remodeling, key processes in tissue regeneration and repair.

Beyond its wound-healing properties, the extract's petroleum ether, chloroform, and ethanol fractions demonstrated broad-spectrum antimicrobial activity. These fractions effectively inhibited the growth of a wide range of Gram-positive and Gram-negative bacterial strains, including *Staphylococcus aureus*, *Staphylococcus pyogenes*, *Staphylococcus epidermidis*, *Micrococcus luteus*, *Bacillus subtilis*, *Bacillus cereus*, *Klebsiella pneumoniae*, *Enterobacter aerogenes*, *Pseudomonas aeruginosa*, *Serratia marcescens*, *Escherichia coli*, and *Salmonella typhi*. Additionally, notable antifungal activity was observed against both dimorphic fungi (*Candida albicans*, *Candida tropicalis*) and systemic fungi (*Aspergillus fumigatus*, *Aspergillus niger*), indicating a broad antimicrobial spectrum.

The extract also exhibited potent in vivo antioxidant activity. It significantly inhibited lipid peroxidation and enhanced the activity of key antioxidant enzymes such as reduced glutathione (GSH), superoxide dismutase (SOD), and catalase. These effects are largely attributed to the presence of phenolic compounds, which possess strong radical-scavenging properties. Owing to their redox potential, these compounds function as reducing agents, hydrogen donors, singlet oxygen quenchers, and metal chelators.

The synergistic interplay between the extract's antimicrobial, antioxidant, and tissue-regenerative properties likely underpins its overall wound-healing efficacy, making *D. falcata* a promising candidate for phytotherapeutic applications in wound management. (46, 47)

Antifertility effect

The traditionally recognized antifertility potential of *Dendrophthoe falcata* (L.f.) Ettingsh. (family: *Loranthaceae*) has been scientifically validated through studies conducted on the female reproductive system of adult Wistar rats. Oral administration of a hydroalcoholic extract derived from the aerial parts of the plant demonstrated significant antifertility activity, as reported by Sarvani Manthri et al. (2011). The extract was found to be well-tolerated at the effective doses employed, with an LD_{50} value estimated at 4.55 g/kg body weight, indicating a favorable safety profile.

These findings highlight the plant's potential as a natural contraceptive agent. However, further investigations are necessary to elucidate the precise mechanism of action, assess the reversibility of its effects, and evaluate its long-term safety for potential therapeutic use. (48)

Antioxidant and anticancer activity

The hydroalcoholic extract of *Dendrophthoe falcata* (L.f.) Ettingsh. (Loranthaceae), referred to as HEDF, has been evaluated for its chemopreventive potential against 7,12-dimethylbenz[a]anthracene (DMBA)-induced mammary carcinoma in female Wistar rats. DMBA administration led to significant alterations in hepatic marker enzymes, characterized by decreased levels of alanine aminotransferase (ALT) and aspartate aminotransferase (AST), along with elevated levels of alkaline phosphatase (ALP), acid phosphatase, and 5′-nucleotidase—biochemical indicators associated with hepatic dysfunction and tumor progression.

Treatment with HEDF effectively restored these enzyme levels toward normal, indicating hepatoprotective and systemic stabilizing effects. In addition, a significant reduction in breast tumor weight was observed in the DMBA + HEDF-treated group compared to the untreated cancer group. These findings suggest that HEDF exhibits both antioxidant and anticancer properties, contributing to its protective effect against DMBA-induced breast carcinogenesis.

The observed antioxidant activity is likely attributed to the rich presence of phenolic and flavonoid constituents in the extract, which are known to mitigate oxidative stress, protect against DNA damage, and inhibit tumor initiation and progression. Collectively, the data support the potential therapeutic value of *D. falcata* in cancer chemoprevention. (49)

Antihyperlipidemic activity

Hyperlipidemia was experimentally induced in rats through the administration of a high-fat diet (HFD) for 42 days, leading to a marked increase in serum levels of total cholesterol (TC), triglycerides (TG), low-density lipoprotein (LDL), and very low-density lipoprotein (VLDL), alongside a significant reduction in high-density lipoprotein (HDL) levels, compared to normal control animals. Treatment with the ethanolic leaf extract of *Dendrophthoe falcata* (70% ethanol, 300 mg/kg, p.o.) resulted in a statistically significant reduction ($p < 0.01$) in serum TC, TG, LDL, and VLDL concentrations, accompanied by a notable elevation in HDL levels.

These findings underscore the hypolipidemic potential of *D. falcata*, suggesting its efficacy in ameliorating diet-induced dyslipidemia. The lipid-lowering effects are likely mediated through the extract's antioxidant properties and its ability to modulate lipid metabolism pathways, potentially involving the regulation of hepatic enzymes and lipoprotein synthesis. This positions *D. falcata* as a promising candidate for managing hyperlipidemia and associated cardiovascular risk factors. (50)

Antidiabetic activity

Diabetes was experimentally induced in rats by administering alloxan (70 mg/kg), which caused a marked rise in blood glucose levels. Treatment with *D. falcata* leaf ethanolic extract (70% ethanol, 300 mg/kg, p.o.) significantly ($p < 0.01$) lowered elevated blood glucose levels compared with diabetic control rats. These findings indicate the extract's potential as an antidiabetic agent, possibly via enhancement of insulin secretion and reduction of oxidative stress. (51)

Formulation studies—tablet binder

The mucilage derived from *Dendrophthoe falcata* was evaluated as a natural tablet binder in paracetamol tablet formulations. Tablets were prepared using the wet granulation technique with varying concentrations of the mucilage (2%, 4%, 6%, and 8% w/w). The tablets were compressed to a hardness range of 6.6–6.9 kg/cm² and assessed for standard quality parameters. Results indicated friability between 0.53% and 0.98%, disintegration times ranging from 10 to 17 minutes, and over 90% drug dissolution within 70 minutes. Among all formulations, tablets containing 6% w/w mucilage exhibited the most optimal characteristics, suggesting that *D. falcata* mucilage is a promising natural binder for the preparation of uncoated tablet dosage forms. (52)

Therapeutic uses based on ethnobotanical studies

Ethnobotanical studies reveal that the medicinal properties of *Dendrophthoe falcata* vary significantly depending on its host plant. For instance, when parasitizing *Calotropis gigantea*, the plant is traditionally used to enhance cognitive function, whereas specimens growing on *Tamarindus indica* are valued for treating impotence. In the state of Bihar, India, *D. falcata* growing on the *Shorea robusta* (Sal tree) is employed in the treatment of paralysis, reflecting the influence of host-specific phytochemical variation.

The sweet-tasting fruit of *D. falcata* is edible and holds considerable therapeutic significance. Across various traditional medical systems, the whole plant is used as an aphrodisiac, astringent, narcotic, and diuretic, as well as in the treatment of asthma, ulcers, wounds, and pulmonary tuberculosis. Leaf paste is commonly applied for skin diseases and is also ingested for its abortifacient properties. In certain indigenous practices, a combination of *D. falcata* leaf paste with *Urtica dioica* (locally known as Sisnu) is used to treat bone fractures.

Bark juice or decoction is administered for managing menstrual disorders and asthma, while bark paste is topically applied to boils to extract pus and is also used in setting dislocated bones. The fruit is not only consumed as food but also applied as a paste for fractures and other ailments. Notably, the plant's nectar attracts birds such as the hair-crested drongo and sunbirds, indicating its ecological as well as ethnomedical relevance.

In Ayurvedic medicine, *D. falcata* is recognized as a valuable therapeutic agent. It is recommended as a diuretic for urinary tract disorders and renal calculi and is also prescribed for conditions such as diarrhea, dysentery, epilepsy, cardiac disorders, blood imbalances, convulsions, and other nervine dysfunctions. It plays a key role in treating menstrual irregularities, wounds, and hemorrhagic conditions, and in preventing miscarriage and abortion. When parasitizing *Ficus fistula*, the plant is believed to support fetal development during pregnancy. Ayurvedic formulations utilize *D. falcata* to maintain the equilibrium of the three doshas—*vata*, *pitta*, and *kapha*—particularly emphasizing its role in preventing abortion during the third month of gestation. (53)

CONCLUSION

In this review, we have consolidated the existing knowledge on the pharmacognosy, phytochemistry, ethnomedicinal applications, and pharmacological activities of *Dendrophthoe falcata*. A comprehensive survey of the literature reveals that *D. falcata* is a hemi-parasitic plant of the family *Loranthaceae*, also referred to as *Loranthus falcatus* Linn. f. The species is native to several regions across South and Southeast Asia, including India, Sri Lanka, Thailand, Indo-China, and Australia.

Phytochemical investigations have identified a wide array of bioactive compounds within the plant, including carbohydrates, alkaloids (notably in the leaves), phytosterols, fixed oils, phenolic compounds, gallic acid, ellagic acid, triterpenes, and flavonoids such as quercetin, quercitrin, and rutin. Additional constituents such as chebulinic acid, β-amyrin acetate, β-sitosterol, and stigmasterol further contribute to the plant's therapeutic versatility. Pharmacological studies have demonstrated significant activities across multiple domains, including wound healing, anti-ulcer, anti-asthmatic, neuroprotective (e.g., in paralysis), dermatological, hepatoprotective, immunomodulatory, antitumor, and gynecological (e.g., in menstrual disorders) applications.

Given its broad pharmacological spectrum and ethnomedical significance, *D. falcata* represents a promising candidate for further pharmacological investigation. Rigorous in vivo studies, mechanism-based research, and clinical evaluations are essential to fully validate and harness its therapeutic potential in modern medicine.

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