

Phyto and Pharmacological Review of *Lindera communis*

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Abstract: *Lindera* is a genus of about 80–100 species of flowering plants in the family Lauraceae, mostly native to eastern Asia but with three species in eastern North America. The species are shrubs and small trees. Traditionally the plant is being potentially used as anti-diarrhoeal, anti-inflammatory, astringent, and antiseptic and in the treatment of various abdominal disorders. The main chemical constituents, which were reported in *Lindera communis*, are α -pinene, β -pinene, apigenin, sabinene, β -sitosterol, campesterol, limonene, flavone, and many others. This review includes the last 20 years journals and various books update on this plant, representing its pharmacological activity and health benefits against various diseases.

Keywords: *Lindera communis*, Lauraceae, flavone Phyto and pharmacological

1. Introduction

Plants have been used as primary sources of disease treatments from ancient times and till to date a number of species have been reported to possess various pharmacological activities [1–3]. From ancient time herbs had been used by all cultures of the world including India that has one of the oldest, richest, and most diverse cultures [4]. Advances in clinical research and quality control showed a greater value of herbal medicine in the treatment and overcome from many diseases [5]. *Juniperus* genus is a well-known source of cedar wood oil which is widely distributed in the North hemisphere and it is used in folk medicine [6, 7] *Lindera communis* is an evergreen shrub or small tree, usually growing 3-4 metres tall. The bole can be 25cm in diameter. The small tree is harvested from the wild for local use as a food, medicine and source of oils. It has been widely used as herbal medicine from ancient time.

1) Synonym

- *Beilschmiedia parvifolia* Lecomte
- *Benzoin commune* (Hemsl.) Rehder
- *Benzoin formosanum* (Hayata) Kamik.
- *Lindera bodinieri* H. Lév.

- *Lindera formosana* Hayata
- *Lindera glauca nitidula* Lecomte
- *Lindera paxiana* H. Winkl.
- *Lindera sterrophylla* C. K. Allen
- *Lindera yunnanensis* H. Lév.
- *Litsea cavaleriei* H. Lév.
- *Litsea esquirolii* H. Lév.

2) Scientific classification and Binomial Name

Lindera communis hemsl

- Kingdom: Plantae
- Division: Magnoliophyta
- Class: Magnoliopsida
- Order: Laurales
- Family: *Lauraceae*

3) Common names

- spicewood
- spicebush
- Benjamin bush

4) Parts of *Lindera communis*



Figure: Leaves



Figure: Fruit



Figure: Seed



Figure: Flower

5) Description

Tree to 10 m, 0.3 m dbh. Branchlets reddish or blackish brown with dense golden or black pubescence. Leaves deciduous, alternate, 5–10 × 2–3.5 cm, oblong to oblanceolate, thick, papery, upper surface greenish brown and glabrous, lower surface with yellowish brown tomentum, four to six lateral veins on each side of the midrib, margins entire, apex caudate to acuminate; petiole 0.5–0.6 cm long, pubescent below. Inflorescence clusters axillary, with five to six flowers and four bracts. Flowers yellowish green, tepals six, slightly pubescent outside; staminate flowers with nine fertile stamens; pistillate flowers smaller, with nine staminodes. Fruit ellipsoidal to globose, deep red, 0.8 × 0.5 cm. Flowering April, fruiting October to November (Taiwan). Liao 1996b. The leaves are occasionally used as a condiment. The dried, powdered leaves and twigs are added to rice bouillon for flavour. Edible oil is obtained from the seed [8]

6) Chemical Constituent's

Eudesmane sesquiterpenes and Germacrane sesquiterpenes isolated from *Lindera* plants mainly include lindenane, eudesmane, germacrane, and guaiane. In all, 99 sesquiterpenoids have been isolated and structurally characterized from *Lindera* plants [9] Aporphines, one of the characteristic constituents produced by plants belonging to the *Lauraceae* family, include majority of alkaloids and exhibit significant pharmacological actions. [10] GC/MS analysis along with 1D and 2D NMR techniques were used to

identify various essential oils from *Lindera* plants. Eighteen compounds have been characterized from the essential oil of *L. communis* fruits, with bis (2-hydroxyethyl) lauramide (43.53 %) and n-carpic acid (35.28 %) being the predominant compounds. This essential oil exhibits obvious antifungal and antibacterial properties. Forty compounds have been characterized from the essential oil of *L. neesiana* fruit, with Z-citral (15.08 %), E-citral (11.89 %), eucalyptol (8.75 %), citronellal (6.72 %), apinene (6.63 %), and b-pinene (5.61 %) being the major compounds. [11] Niwa et al. isolated Butanolides from *L. Communis* [12]

7) Traditional uses of *Lindera communis* plant [13, 14]

Parts	uses
Leaves	Respiratory affections, diabetes, Asthma, gonorrhoea, arthritis,
Fruit	Carminative, urinary antiseptic, diuretic, emmenagogue, sudorific, digestive, and Anti-inflammatory.
Seed	Used as antiseptic, stimulant, disinfectant.
Aerial	Used for acute and chronic cystitis, leucorrhoea, and amenorrhoea.
Flower	Abdominal disorders and skin affections.

8) Phytochemical constituents of *Lindera Communis* [17]

Phytoconstituents	Petroleum ether	Ethanol
Alkaloids	Absence	Presence
Glycosides	Presence	Presence
Flavonoids	Absence	Presence
Carbohydrate.	Presence	Presence
Steroids	Presence	Presence
Saponins	Presence	Presence
Tannin	Absence	Presence

9) Pharmacological Activities

Anticancer, anti-inflammatory and antiviral Activity

The sesquiterpenes in *L. Communis*, which some exhibit anticancer, anti-inflammatory, and antiviral properties. [9]

Antihypertensive activity

Alkaloids isolated from *Lindera communis*. Aporphines, one of the characteristic constituents produced by plants belonging to the Lauraceae family, include majority of alkaloids and exhibit significant pharmacological actions. [10]

Anticancer Activity

Butanolides isolated from *Lindera* plants, mainly *L. glauca*, *L. akoensis*, *L. obtusiloba*, *L. benzoin*, and *L. communis*. Most butanolides have anticancer properties, whereas some have antibacterial properties. [15]

Cardiotonic activity

flavone molecule from *lindera* were fused with one or two p-methene units. These compounds exert cytotoxic effects and inhibit the release of LDH from BSO-treated H9c2 cardiac myocytes [16]

Anti-Microbial Activity

This Essential oil in *lindera communis* exhibits antimicrobial activity against *Staphylococcus aureus* and *Candida albicans* at doses that are non-cytotoxic to human keratinocytes, [11]

Hepatoprotective Activity

The ethanolic leaf extracts of *Lindera communis* for hepatoprotective activity using paracetamol (2g/kg) and D-galactosamine (400mg/kg) induced models. Acute toxicity study and preliminary Phytochemical screening were also studied to evaluate the toxicity. No toxicity profile was observed in rats after oral administration of the ethanolic leaf extract at the dose of 5g/kg body weight. The different dose of 200 mg/kg and 400 mg/kg administered with the extract of *Lindera communis* there was significant ($P < 0.001$) reduction in biochemical parameters with respect to control. Phytochemical screening of the plant extract revealed the presence of tannins, alkaloids, flavonoids and saponins, and terpenoids. It can be concluded that the hepatoprotective activity elucidated by *Lindera communis* could be mainly due to the presences of high value of phenolic class of compounds as the major content in the plants. [17]

Anti-Hypertension activity

Lindera communis show obvious cardiovascular effects, Extracts of *L. communis* were investigated for their effects on systolic blood pressure, cardiac function, and plasma noradrenaline levels in spontaneously hypertensive rats

(SHRs). Treatment with an extract of 10 g roots in 20 ml water for 30 weeks showed antihypertensive effect and increased cardiac function in SHRs. [18]

Anti – platelet activity

It was proved, inhibiting platelet aggregation and anti-oxidative stress effect [18]

Anti-inflammatory activity

Inflammation is a central feature of many pathological conditions and is mediated by various soluble factors and cellular signaling events. Previous studies have shown that extracts and constituents of *Lindera* plants show remarkable anti-inflammatory effects. Aqueous and alcohol extracts of *L. communis* roots at a dose 20 g/kg (raw material) antagonized ear swelling induced by an inflammatory agent. Oral administration of 50, 100, and 200 mg/kg of total alkaloids from *Radix Linderae* (TARL) to CIA rats for 20 days alleviated disease severity in a dose-dependent manner. TARL (100 and 200 mg/kg) also decreased serum level of IgG anti-CII and inhibited delayed-type hypersensitivity, as assessed by its effect on collagen II-induced ear swelling in mice. [19]

2. Conclusion

The extensive literature survey revealed that *Lindera communis*. is an important medicinal plant due to its traditional uses to treat diseases and presence of many active chemical constituents which are responsible for various medicinal and pharmacological properties. Further evaluation needs to be carried out on *Lindera communis* in order to confirm its medicinal uses and development of formulations containing this plant for their practical clinical applications, which can be used for the welfare of mankind.

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