Phyto and Pharmacological Review of 
Lindera communis

Mohamed Jihad El1, Rajasekaran .S2

1Department of Pharmacology, Research Scholar, Institute of Pharmaceutical Sciences and Research Centre, Bhagwant University, Sikar Road, Ajmer, Rajasthan, India-305004
2Department of Pharmacology, Institute of Pharmaceutical Sciences and Research Centre, Bhagwant University, Sikar Road, Ajmer, Rajasthan, India-305004

1Corresponding Author Email: jihadev[at]gmail.com
Mobile: +919946390450

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. Thamain chemical constituents, which were reported in Lindera communis, are α-pinene, β-pinene, apigenin, sabine, 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, flavonePhyto 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 (Hemst.) Rehder
- Benzoin formosanum (Hayata) Kamik.
- Lindera bodinieri 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
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 ellipsoid 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 sesquiterpenoids 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]

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

8) Phytochemical constituents of Lindera Communis [17]
<table>
<thead>
<tr>
<th>Phytoconstituents</th>
<th>Petroleum ether</th>
<th>Ethanol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alkaloids</td>
<td>Absence</td>
<td>Presence</td>
</tr>
<tr>
<td>Glycosides</td>
<td>Presence</td>
<td>Presence</td>
</tr>
<tr>
<td>Flavonoids</td>
<td>Absence</td>
<td>Presence</td>
</tr>
<tr>
<td>Carbohydrate</td>
<td>Presence</td>
<td>Presence</td>
</tr>
<tr>
<td>Steroids</td>
<td>Presence</td>
<td>Presence</td>
</tr>
<tr>
<td>SAPs</td>
<td>Presence</td>
<td>Presence</td>
</tr>
<tr>
<td>Tannins</td>
<td>Absence</td>
<td>Presence</td>
</tr>
</tbody>
</table>

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. akeosis*, *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 antioxidant 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.

References


[7] Gunral N., Kumbul D. D., Aylak F., Saygin M., Savik E. *Juniperus communis* Linn oil decreases oxidative stress and increases antioxidant enzymes in the heart of...
rats administered a diet rich in cholesterol. *Toxicology and Industrial Health.*


