

## Pharmacognosy of *Prunus laurocerasus* Linn-A Homoeopathic Drug

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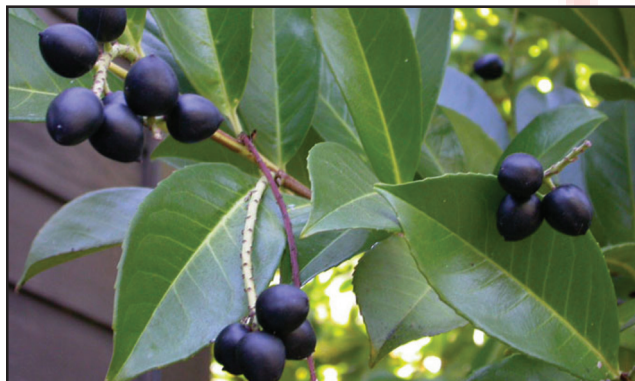
### Abstract

*Prunus laurocerasus* L., a shrub belonging to family Rosaceae, is a well known drug in homoeopathy. Leaves are used as an antispasmodic, in heart diseases, for relief in nausea and as an ingredient in eye lotions.

The leaves are coriaceous, dark green above and pale beneath, shortly petiolate; epidermal cells have distinctly thick, curved to wavy and sinuate sides; hypostomatic with anomocytic and anisocytic types of stomata. The mesophyll and midvein ground tissue possess characteristic sphaeraphidal idioblasts. Typical aerenchyma is present in ground tissue of leaf midvein and petiole. A layer of endodermis encloses the median arcuate vascular bundle of midvein and petiole.

### Introduction

*Prunus laurocerasus* L., (Syn. *Cerasus laurocerasus* Lowel. & *Laurocerasus officinalis* M. Roem.) popularly known as cherry laurel in English, Laurier-cerise in French and Kirschchlor beer in German, is a shrub belonging to family Rosaceae. It is



*Prunus laurocerasus* Linn.

indigenous to Turkey and South East Europe and cultivated in temperate gardens. The leaves are used as an antispasmodic, in heart diseases, nausea and as an ingredient in eye lotions. *Laurocerasus* was proved and introduced in 1828 by Jorg.Hartlaub and Nenning; and also mentioned by Hering, Allen, Clarke, Hamilton and H.P.I.<sup>1,2,3,4</sup>

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The leaves are reported to possess a cyanogenetic glycoside prulaurasin or DL-mandelonitrile-D-glucoside.<sup>5</sup>

A review of literature reveals no pharmacognostic standards recorded for the drug. In view of the importance of the drug in homoeopathy, pharmacognostic studies have been carried out and presented.

### Material and Methods

The leaf material of *Prunus laurocerasus* Linn. was supplied by Survey of Medicinal Plants and Collection Unit, Udhagamandalam, Tamilnadu. The leaves were fixed in F.A.A. (formaldehyde-acetic acid-alcohol), processed for microtomy (paraffin method), stained and permanent slides prepared following Johansen<sup>6</sup>. The epidermal peels were obtained by gently scraping and peeling with razor blade. The powder microscopy was undertaken by boiling the powdered drug in distilled water, stained in safranin and mounted with glycerine. Photomicrography was done with Olympus CH-2 trinocular microscope.

### Results and Observations

#### Morphology

Leaves coriaceous and glossy, shortly petiolate; lamina 12 to 17 cm long and 4 to 5 cm broad, oblong

lanceolate to oblong-obovate, the apex acuminate and recurved; with 2 or 3 glandular dots near the base on lower side; margin serrate; upper surface dark green and lower pale.

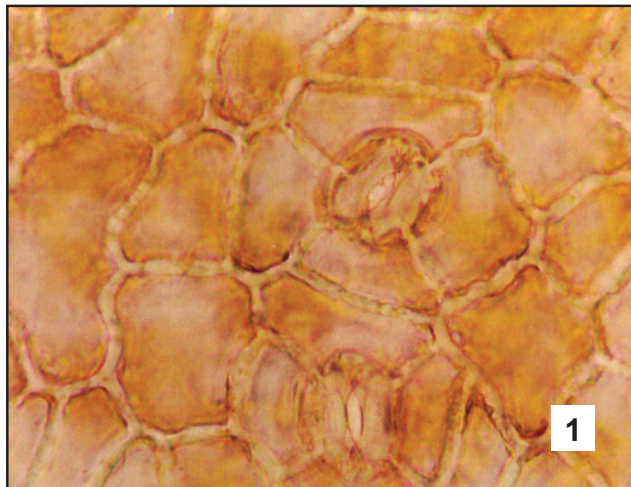
### Leaf – Surface

Epidermal cells on abaxial surface polygonal, anisodiametric to isodiametric, sides thick, few pitted, curved to wavy; 3560 per sq. mm. Costal cells linear.

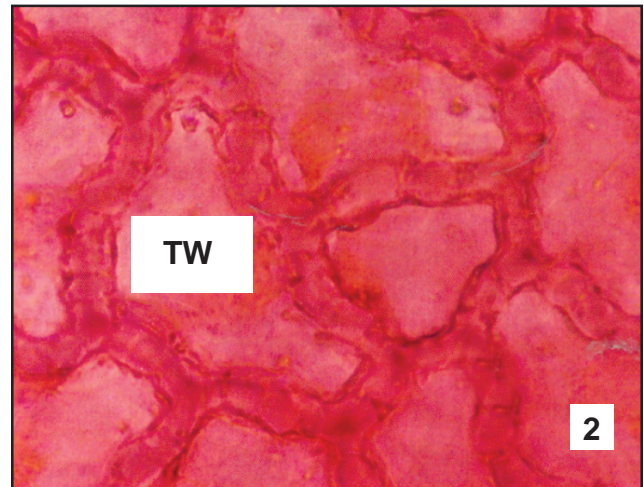
### Transection

Slightly ridged towards adaxial and prominently on abaxial. In shape oval to shield-like, 877-934  $\mu\text{m}$  thick vertically and 707-736  $\mu\text{m}$  thick laterally. Lamina wings 259-281  $\mu\text{m}$  thick (Fig. 1.3; Fig. 2.2).

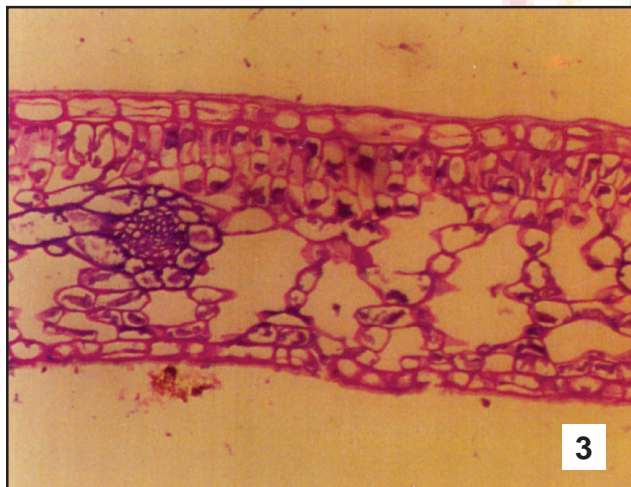
Epidermis 1-layered, cells adaxially larger, barrel shaped to tabular and oval, walls slightly thick; abaxially smaller, interrupted by sunken stomata (Fig. 1.3).



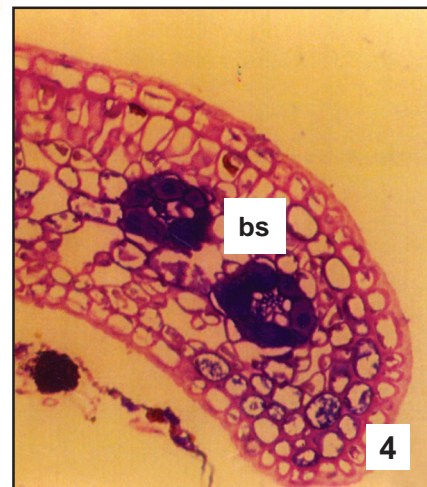
Abaxial epidermic (Surface view) x 517



Adaxial epidermic (Surface view) x 608



T.S. of leaf lamina x 121



T.S. of leaf at margin x 139

Abbreviations : Tw - Thick Walled epidermis, bs - bundle sheath

Fig. 1

Stomata anomocytic, a few anisocytic, 420 per sq. mm. Stomatal index : 10.55. Stomatal dimensions 30-41  $\mu\text{m}$  (35) long and 24-33  $\mu\text{m}$  (28) wide. Trichomes absent. Cells on adaxial surface similar but wavy to sinuate, contents scanty. 1720 per sq. mm. palisade ratio 4.75 – 5.5. Stomata and trichomes absent. Epidermal cells on petiole polygonal, anisodiametric to isodiametric, sides thick, straight to curved, surface striated. Distribution: transversely oriented; stomata and trichomes absent (fig. 1.1,2)

Mesophyll of 2-3 layered palisade consisting of cylindrical to tabular cells 24-49  $\mu\text{m}$  long and 8-22  $\mu\text{m}$  wide, with dense contents. Spongy parenchyma extensive with a reticulum of loosely interconnected cells, interspersed with sphaeraphidal idioblasts (Fig. 1.3,4).

Ground tissue at midvein consists of collenchyma as a group of cells on adaxial and as 1-2 layers on



abaxial side; cells lamellar. Parenchyma is scanty towards adaxial, cells polygonal to spherical, 14-44 µm in diameter along with sphaeraphidal cells in between. Abaxially 6-8 layered, cells 16-58 µm in diameter, often with sphaeraphidal idioblasts. The parenchyma on lateral sides of midvein is typically aerenchymatous (Fig. 2.2).

The vascular tissue is of a single arcuate bundle enclosed by a layer of endodermis (Fig.2.2). Minor veins also surrounded by a bundle sheath (Fig. 1.4). Vascular bundle 378–410 µm wide laterally and 497-518 µm long vertically, endarch, collateral and open with a pith at center. The vessels/tracheids in L.S. reveal scalariform, reticulate and helical thickenings. Phloem is external and scanty.

## Petiole

### Transection

Oblong-ovate and shield-like, 2122–2207 µm long vertically and 1754-1840 µm wide laterally. Epidermis is 1-layered; collenchyma hypodermal, 3-5 layered, cells polygonal to spherical, lamellar or angular with a few sphaeraphidal cells in between. Parenchyma is 6-10 layered, mostly towards abaxial, cells 14-57 µm in diameter, with a few sphaeraphidal idioblasts in between. Aerenchymatous cortex on adaxial beneath the collenchyma as a reticulum. Endodermis encloses the central vascular bundle (Fig. 2.1).

Vascular tissue is in the form of an arc-shaped bundle, vertically 918–961 µm thick and laterally 810–842 µm thick, endarch. Xylem cells arranged in radial rows, a few in groups with xylem parenchyma in



T.S. of petiole x 48  
Fig. 2.1



T.S. of leaf at midvein x 129  
Fig : 2.2

Abbreviations : Ae -Aerenchymatous tissue, bs - bundle sheath

between. Tracheary cells are similar to those found in the leaf. Phloem abundant, consisting of phloem parenchyma and phloem fibers (Fig. 2.1).

### Powder Microscopy

Fragments of leaf dark with chloroplasts and tannins. Pieces of epidermis of abaxial surface with stomata. Prismatic crystals and sphaeraphides are seen. Pieces of adaxial epidermis with thick walls. Fragments of tracheary tissue with helical and scalariform thickenings. Pieces of ground tissue with dense contents and sphaeraphides.

### Organoleptic characters

Colour : Dark green  
Touch : Coarse  
Taste : Acrid, slightly bitter  
Odour : No characteristic

## Discussion

*Prunus laurocerasus* L. is a shrub belonging to the family Rosaceae. In homoeopathy, the leaves are used as an antispasmodic, in heart diseases, nausea and in eye lotions.

### Leaf

The epidermal cells in surface are thick walled (Fig. 1.1,2), curved and 1720 per sq. mm on adaxial side while wavy to sinuate and 3560 per sq. mm on abaxial. Lower epidermis was reported papillose in *Prunus*<sup>7</sup>, but presently it is observed to be smooth. The stomatal index is 10.55 and palisade ratio is 4.75 – 5.5.

Metcalf and Chalk reported stalked capitate

glands in *Prunus*. However, presently hairs have been found to be absent in *P.laurocerasus* studied. They have also reported the presence of glandular spots or nectaries<sup>8</sup> near the base of the leaves in *P.laurocerasus*, which is presently confirmed.

In transection, leaf at midvein is ridged slightly on adaxial and prominently on abaxial(Fig. 2.2). Epidermis is 1-layered with larger cells on the adaxial. Lower epidermis is interrupted by sunken stomata (Fig.1.3).

The palisade is 2-3 layered with dense contents as also reported<sup>7</sup>. The spongy parenchyma is extensive, made of loosely interconnected cells with sphaeraphidal idioblasts (Fig. 1.3). Collenchyma occurs as a group of cells in adaxial ridge and is 1-2 layered towards abaxial side. Parenchyma is 6-8 layered and interspersed with sphaeraphidal idioblasts. Typically midvein possesses aerenchyma tissue on either sides of vascular bundle (Fig. 2.2).

The vascular bundle at center is arcuate, endarch, conjoint, collateral, open and surrounded by a layer of endodermis. The minor vein bundles have sheath around them (Fig.1.4) as reported earlier<sup>7</sup>.

### Petiole

In T.S. oblong-ovate or shield-like, 1.75–2.2 mm in diameter (Fig. 2.1). Cortex is 6-10 layered towards abaxial and interspersed with sphaeraphidal idioblasts (Fig.1) as reported(Metcalfe and Chalk, 1950). Adaxially aerenchymatous tissue is present beneath collenchyma (fig. 2.1). A layer of endodermis encloses the central vascular bundle. An arc shaped vascular

bundle, as reported<sup>7</sup>, is presently confirmed.

### Acknowledgements

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### References

1. Allen,T.E.. The Encyclopedia of Pure Materia Medica Rep.Ed. 1982 B. Jain Publishers, New Delhi. Vol.VII,27
2. Clarke,J.H. A Dictionary of Practical Materia Medica. Rep.Ed. 1984 Jain Publishing Co.New Delhi. Vol.II, 256.
3. Hamilton,E. The Flora Homoeopathica. Rep.Ed. 1982. B. Jain Publishers, New Delhi.
4. Hering,C. The Guiding Symptoms. Rep.Ed. 1988. B.Jain Publishers, New Delhi.Vol.VII,27.
5. Trease,G.E. and W.C.Evans. Pharmacognosy. 11<sup>th</sup> Ed. 1978. Bailliere Tindall, London.
6. Johansen,D.A. Plant Microtechnique. 1940. Mc Graw Hill Book Co. New York.
7. Metcalfe, C.R. and Chalk,L. Anatomy of the Dicotyledons. 1950. Clarendon Press, Oxford. Vols. 1&2.
8. Anon. Homoeopathic Pharmacopoeia of India, 1983 Ministry of Health, Government of India. Vol. IV,72.