

## Anatomical and Histochemical Investigation of the Leaf of *Vitex agnus-castus* L.

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**Abstract :** Introduction: Nature has been the source of medicinal agents since the dawn of the human existence on Earth. Currently, millions of people, in the developing world, rely on medicinal plants for primary health care, income generation and lifespan improvement. In Greece, more than 5500 plant taxa are reported while about 250 of them are considered to be of great pharmaceutical importance. Among the plants used for medical purposes, *Vitex agnus-castus* L. (Verbenaceae) is known since ancient times. It is a small tree or shrub, widely distributed in the Mediterranean basin up to the Central Asia. It is also known as chaste tree or monks pepper. Theophrastus mentioned the shrub several times, as 'agnos' in his 'Enquiry into Plants'. Dioscorides mentioned the use of *V. agnus-castus* for the stimulation of lactation in nursing mothers and the treatment of several female disorders. The plant has important medicinal properties and a long tradition in folk medicine as an antimicrobial, diuretic, digestive and insecticidal agent. Materials and methods: Leaves were cleaned, detached, fixed, sectioned and investigated with light and Scanning Electron Microscopy (SEM). Histochemical tests were executed as well. Specific histochemical reagents (osmium tetroxide, H<sub>2</sub>SO<sub>4</sub>, vanillin/HCl, antimony trichloride, Wagner's reagent, Dittmar's reagent, potassium bichromate, nitroso reaction, ferric chloride and di methoxy benzaldehyde) were used for the sub cellular localization of secondary metabolites. Results: Light microscopical investigations of the elongated leaves of *V. agnus-castus* revealed three layers of palisade parenchyma, just below the single layered adaxial epidermis. The spongy parenchyma is rather loose. Adaxial epidermal cells are larger in magnitude, compared to those of the abaxial epidermis. Four different types of capitate, secreting trichomes, were localized among the abaxial epidermal cells. Stomata were observed at the abaxial epidermis as well. SEM revealed the interesting arrangement of trichomes. Histochemical treatment on fresh and plastic embedded tissue sections revealed the nature and the sites of secondary metabolites accumulation (flavonoids, steroids, terpenes). Acknowledgment: This work was supported by IKY - State Scholarship Foundation, Athens, Greece.

**Keywords :** *Vitex agnus-castus*, leaf anatomy, histochemical reagents, secondary metabolites

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