

A morphological and anatomical study of *Lecokia cretica* (Apiaceae)

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Abstract: The family Apiaceae contains 47 monotypic genera in Turkey, one of them is the genus *Lecokia* DC. *Lecokia* is distributed from Syria, Cyprus to Iran. The species firstly collected from Crete by Joseph Pitton de Tournefort and named by Augustin Pyramus de Candolle in 1829. The local names of this species are Ayı baldıran, Eşek Baldıranı and seeds are used as antihypertensive in Turkey. *Lecokia cretica* (Lam.) DC. is a rhizomatous perennial herb, basal leaves 2-3-pinnate/ternate, segment elliptic, bracts and bracteoles linear, mericarp covered with forward-pointing hooks. *L. cretica* have prominent median and lateral ribs in the anatomy of mericarp. Intrajugal oil ducts are absent. There are 12-16 vittae which are localised close to the endocarp, the width of them is greater than the length. 10-14 oil ducts are on top of the sclerenchyma and 1-3 of them are beneath. Their width is a little greater than the length. The endosperm is concave and the hollow like a mushroom shape and endosperm contains numerous cluster crystals.

Key words: Apiaceae, *Lecokia*, anatomy, morphology, Turkey

Introduction

The family Apiaceae contains 47 monotypic genus in Turkey, one of them is the genus *Lecokia* DC. *Lecokia* is distributed from Syria, Cyprus to Iran and the genus is distributed in South, Southwest and Southeast part of Turkey (Stevens, 1972; Menemen, 2012) (Figure 1). The genus is different from *Trachydium* and *Prangos* in fruit covered with hooks and shape of leaves in the Flora of Turkey (Stevens, 1972). But, the results of phylogenetic analysis show that the genus *Lecokia* is distinct relative with the genus *Smyrniium*. Also the genera *Trachydium*, *Prangos*, *Smyrniium* and *Lecokia* are belonged in the tribe Smyrnieae (Katz-Downie et al., 1999).

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Figure 1. Distribution map of *Lecokia cretica* in Turkey.

Materials and methods

The study materials, ripe fruits of *Lecokia cretica* was collected from Ş.Urfa province (Turkey), ISTE number of specimen is 102744. The Distribution map of Turkish *Lecokia cretica* samples was taken from <http://bizimbitkiler.org.tr> website. First, mericarps were waited in warmish water, and then all transverse sections were cut by hand from the middle of the mericarps with a blade. The shape of transverse sections of mericarp was drawn schematically. The drawings were made using a Camera Lucida drawing tube attached to a Leitz Wetzlar microscope. Photographs were taken with Canon Power shot A640 and measurements of mericarps were made by program of KAMERAM[®]. Micromorphological photographs were taken by an Olympus BH-2 microscope.

Results and discussion

Description: Perennial herb, rhizome thick, horizontal with a few large tuberous roots. Stem c. 30 cm, ridged. Basal leaves 2-4-pinnate/ternate; upper stem leaves opposite, reduced; segment elliptic. Inflorescence little-branched; bracts and bracteoles linear, 3-9, small, up to 12 mm. Flower hermaphrodite; petals white. Fruit laterally compressed, oblong, covered with hooks: linear, mericarp covered with forward pointing hooks (Figure 2).

L. cretica have prominent median and lateral ribs in the anatomy of mericarps. 7-9 oil ducts are arranged on top of the sclerenchyma, however 12-16 dorsal vittae in a circle close to the endocarp and 4-6 commissural vittae are present. The endosperm is concave and the hollow resembles a mushroom and endosperm contains numerous cluster crystals and crystal sands (Table 1 and Figure 3).

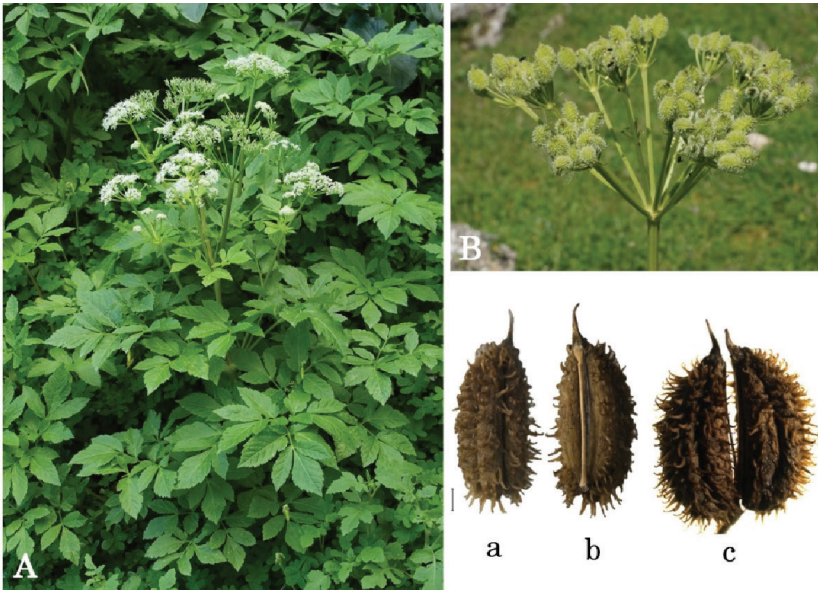


Figure 2. *Leokia cretica*. **A-** General view, **B-** fruits, **a-** mericarps of mature fruit in dorsal view, **b-** commissural view, **c-** lateral view. Scale bar= 2 mm.

Table 1. Features of MericarpS of *Lecokia cretica* in Transverse Section

Part of mericarp	Features
Shape & colour	rounded, brown at maturity, ribs prominent
Size (length x width)	6.23-7.20 x 5.3-6.10 mm
Surface	bullate squamae at main ribs
Epidermis	cells flattened periclinally, cuticle c. 1 μ m thick
Mesocarp	of 5 rows of sclerenchymatous cells, not flattened periclinally
Endocarp	single cell layer
Vascular bundles	dispersed
Oil ducts	present, around ribs
Vittae	a single circle in the mesocarp
Commissural vittae	4-6 and size 0.11 x 0.07-0.37 x 0.06 μ m
Dorsal vittae	ca. 12-16, 0.34 x 0.08-0.11 x 0.07 μ m
Crystals	cluster crystals and crystal sands dispersed in endosperm
Endosperm	concave at the commissural side
Commissure	very narrow

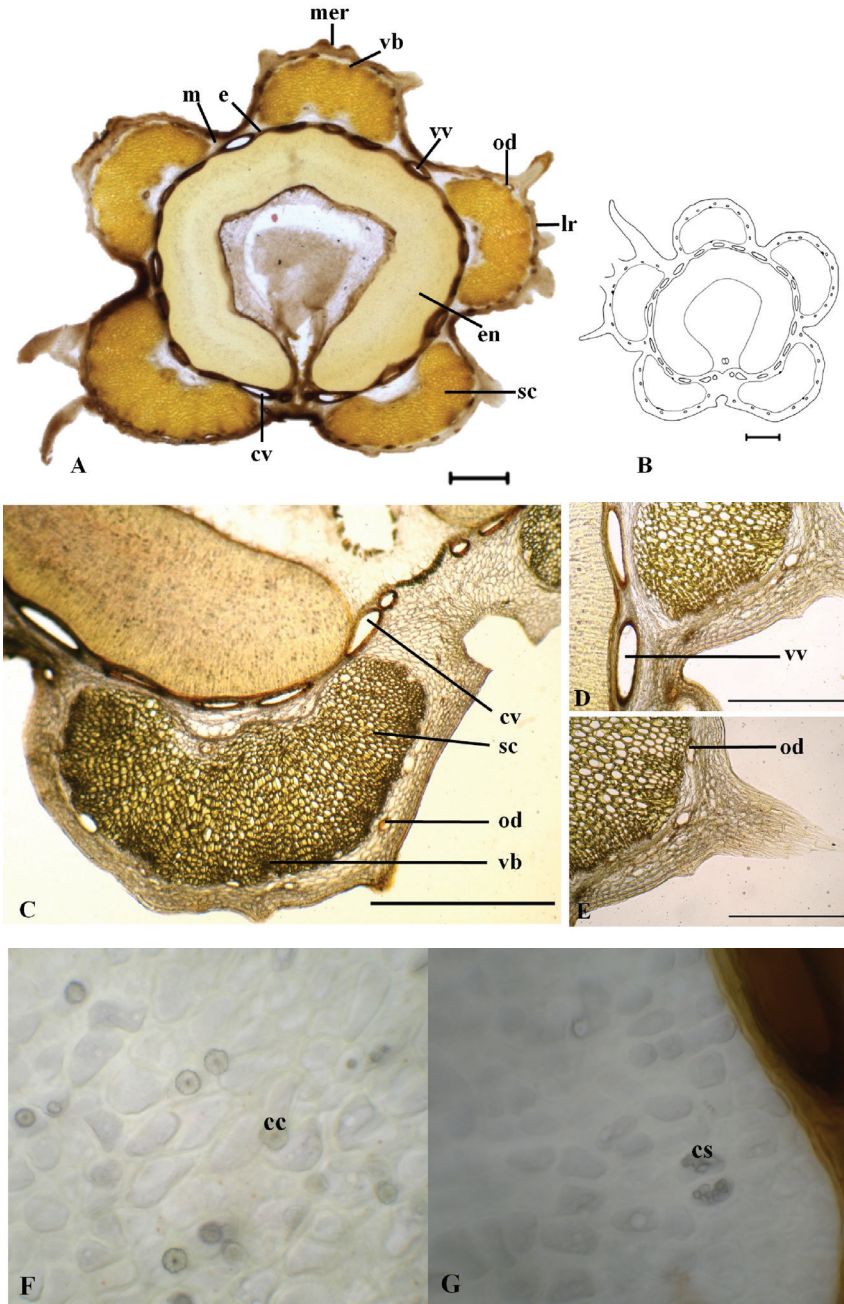


Figure 3. Transverse section of mericarp. A- diagrammatic of fruit structure, B- mericarp, C- valcular vittae in endocarp, D- lateral rib, E- marginal rib and commissural structure,

F- commissural view, G- cluster crystal in endosperm, H- crystal sand in endosperm. Scale bar: A, B, E= 1 mm, C, D, F= 0,5 mm.

Abbreviations: cc- cluster crystal, cs- crystal sand, cv- commissural vittae, e- endocarp, en- endosperm, lr- lateral rib, m- mesocarp, mer- median rib, od- oil duct, s- seed, sc- sclerenchyma, vd- vascular bundle, vv- vallecular vittae.

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