Trifolium pratense L.

Red Clover Blossom

Trifolii Flos

Fabaceae

The blossoms of red clover are commonly used in Western herbalism as a blood purifier, an action thought to promote endogenous eliminative processes. For the past 130 years, it has been a primary ingredient in various herbal compounds for the treatment of cancer. In more recent years, it has been studied and sold for its putative ability to relieve menopausal symptoms, presumably due to its content of phytoestrogens. Ideally, blossoms (with attached sepals) should be traded alone; however, in commercial trade, the leaf and stem are often included.

A. Leaf

Surface view: Upper and lower epidermis are similar, except cells on upper surface are rounded to polygonal, while those on the lower surface have wavy anticlinal walls; anomocytic stomata approximately 20 µm long occur on both surfaces; small, three-celled covering trichomes, with a large spherical basal cell, a very small thick-walled second cell, and a long (up to 900 µm), extremely thick-walled acute terminal cell that frequently has a highly narrowed lumen; glandular trichomes occur primarily along veins on the lower surface; they are uniseriate with a short stalk and elongated multicellular head up to 150 µm long; vascular bundles include fibers and are accompanied by a sheath of very small calcium oxalate prism crystals, each ~10 µm long.

Transverse section: Bifacial; palisade cells in one to three irregular rows; compact, spongy mesophyll contains calcium oxalate prisms as crystal sheaths along the fibers at the veins.

B. Flower

Calyx: Tube is densely covered with appressed, uniseriate, three-celled covering trichomes; very long covering trichomes occur on the apices of the considerably elongated calyx teeth; trichome cell walls are heavily thickened with slightly warty cuticle; glandular trichomes are frequent on the tubular region of the calyx; calcium oxalate prism crystals, ~8–10 µm long, occur as a sheath along the veins and in the intercostal regions.

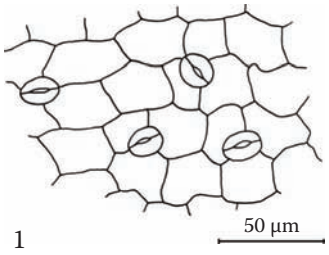
Corolla: Papillose epidermal cells with wavy anticlinal walls and a striated cuticle; calcium oxalate prism crystals may cover large areas; trichomes are absent.

Pollen: Elliptical, triangular, or subspherical grains, ~40 µm long, tricolpate, with a finely warty exine.

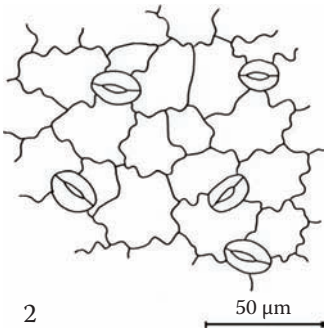
C. Stem

Transverse section: Overall outline shows ridges along the surface; interior to the epidermis is a small ring of collenchyma; inside each ridge lies a large vascular bundle with a huge fiber cap outside the phloem; between vascular bundles is a ring of thickened parenchyma; pith of parenchyma cells.

Powder: Fragments of the calyx with covering trichomes and calcium oxalate prisms; pollen grains; leaf fragments with bases of covering trichomes and veins with calcium oxalate prism sheaths; fragments of the hairless pink corolla; fiber bundles from the stem with calcium oxalate prism sheath.



1



2