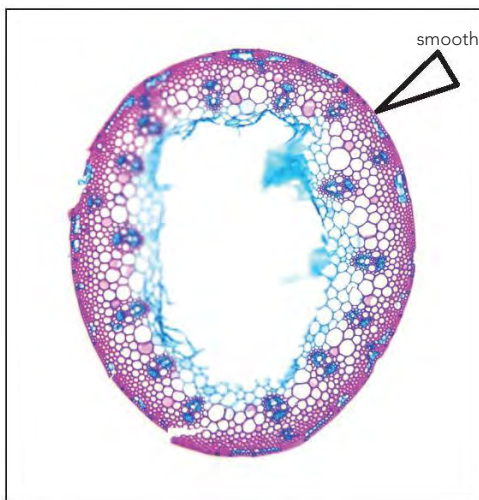


Presentation of anatomical features

The anatomical features of almost all known monocotyledons are presented on this website. Anatomical key features for the species described here have been defined by several authors. Cutler (1969) characterized the microscopic structure of culms of the Juncaceae with the genera *Juncus* and *Luzula*. Schenk 1886 described the stem structures and anatomical traits of water plants. Metcalf (1960) and Stern (2014) evaluated the anatomical features of the Orchidaceae, Thomlinson (1961) from Helobia with the families of Alismatales, Hydrocharidetalis, Scheuchzeriales and Potamogetonales, Grosser (1971) of the lignified Bambusae and Thomlinson 1961 those of the Palmae.

The list below contains examples of features of culms and leaves from herbaria. For the complete list of the features see Schweingruber and Berger, 2019.

Cross-section

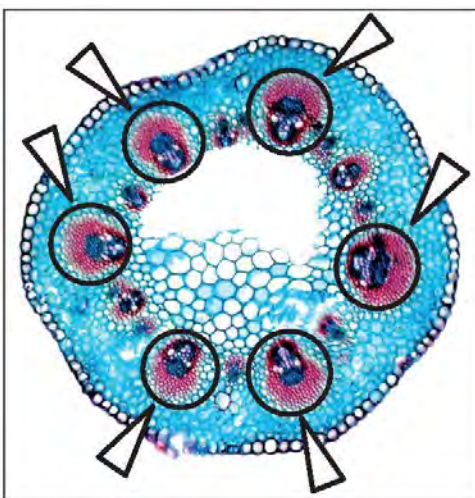


Cross-section round or oval

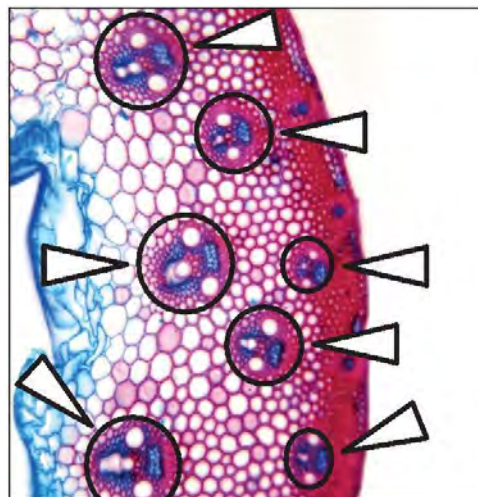


Cross-section triangular

Vascular bundles

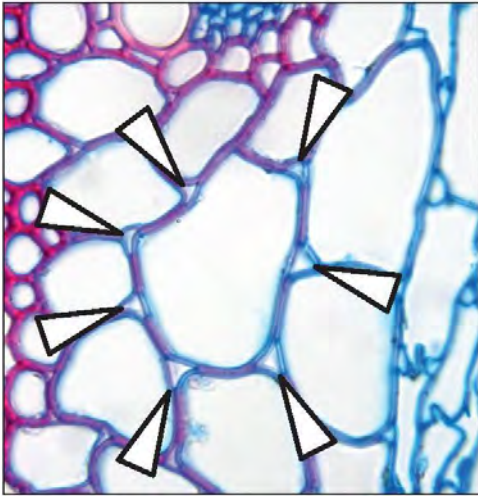


Vascular bundles in one row

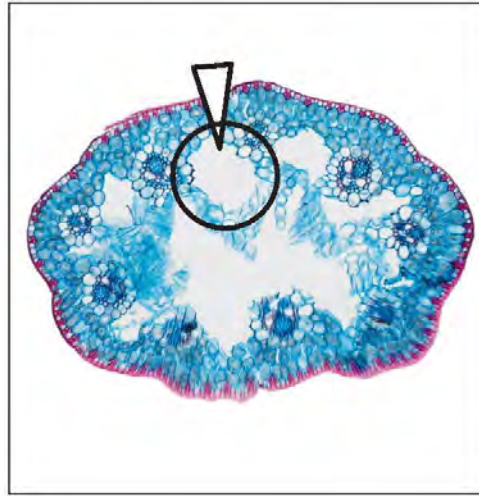


Vascular bundles in two rows

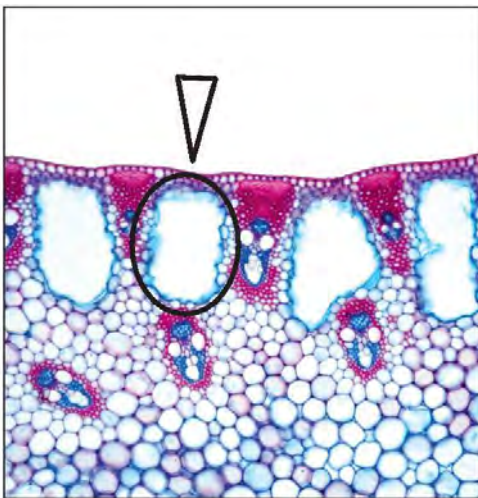
Intercellular cavities and aerenchyma



Small triangular or rectangular cavities

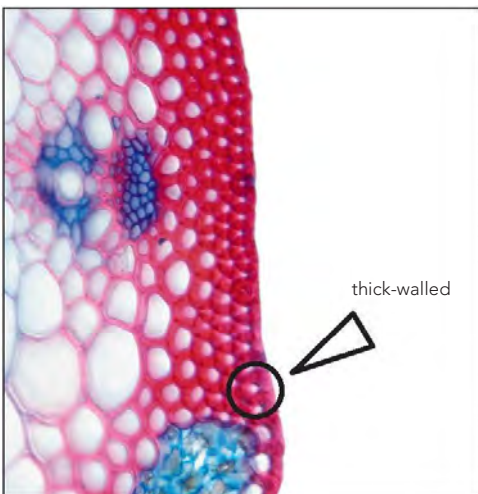


Large irregular cavities (aerenchyma)

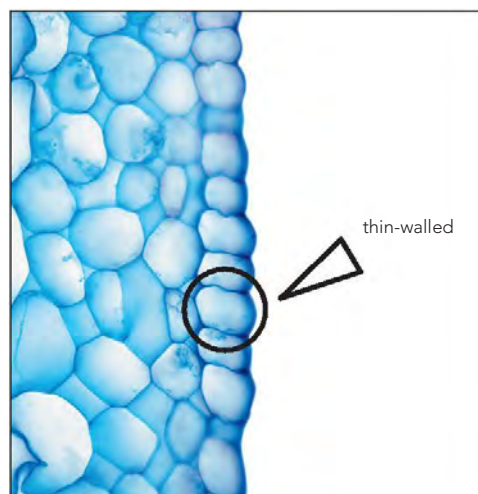


Large round, oval or rectangular cavities

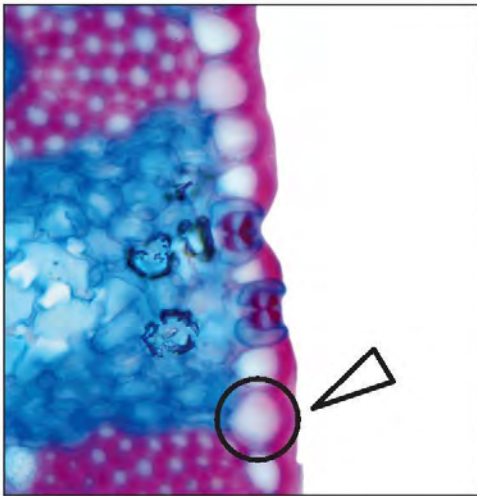
Epidermis



Epidermis thick-walled



Epidermis not thin-walled



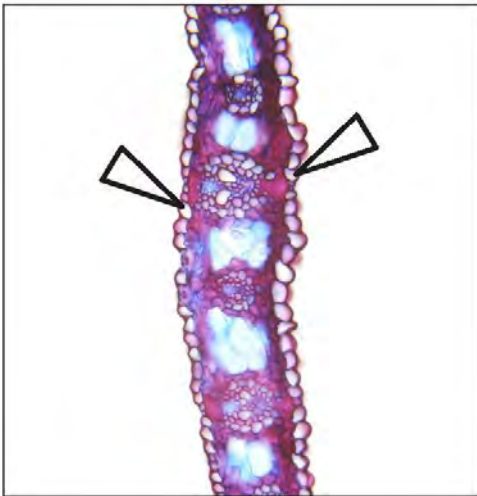
Epidermis lignified



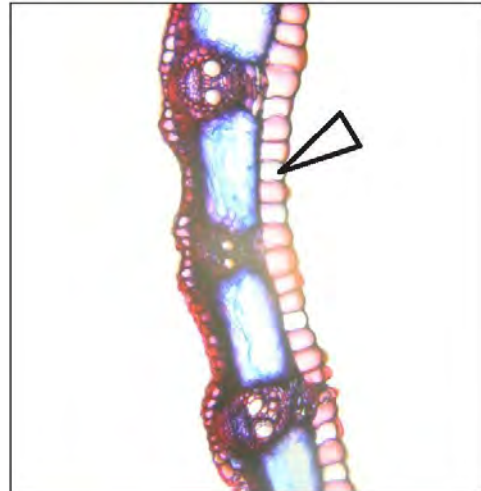
Epidermis with papillae

Leaf features

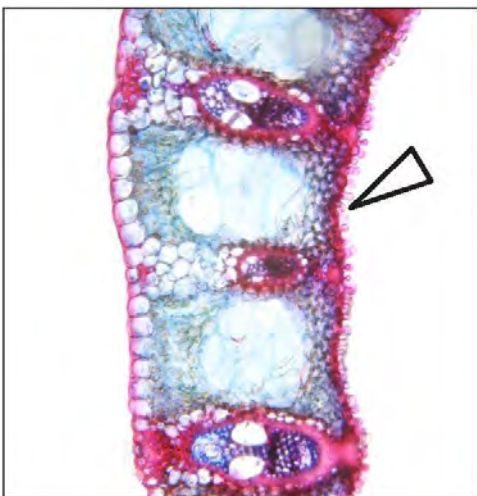
Epidermis



Lower and upper cells of equal size and shape

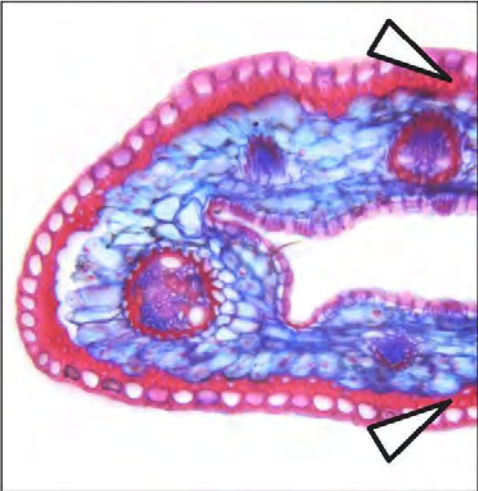


Upper cells larger than lower

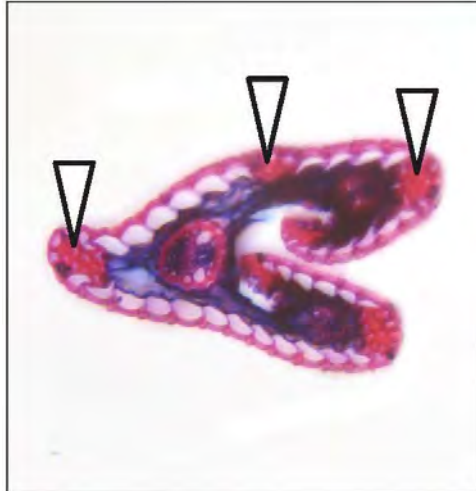


Epidermis with papillae

Peripheral sclerenchymatic cells

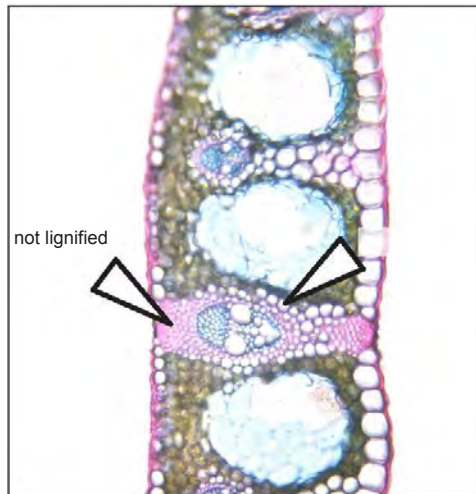
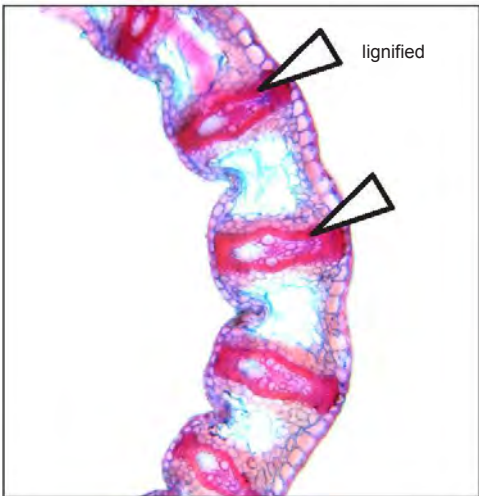


Continuous peripheral sclerenchymatic belt



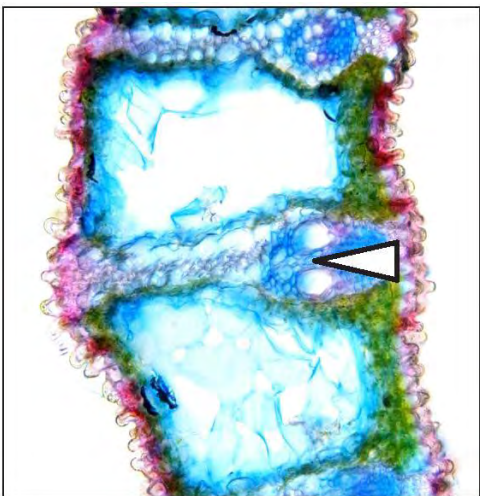
Sclerenchymatic cells selectively distributed

Girders

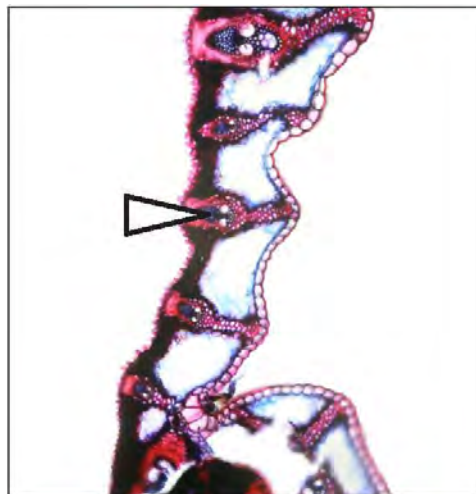


Girders not lignified

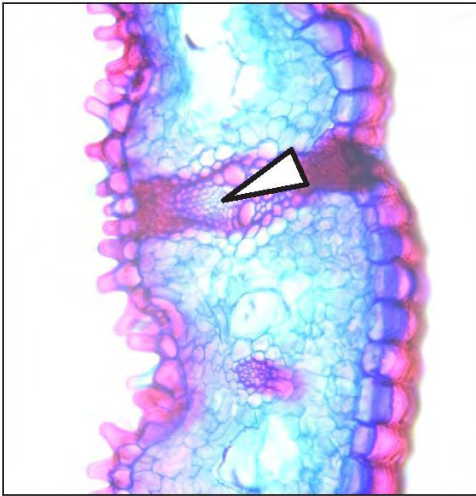
Vascular bundles



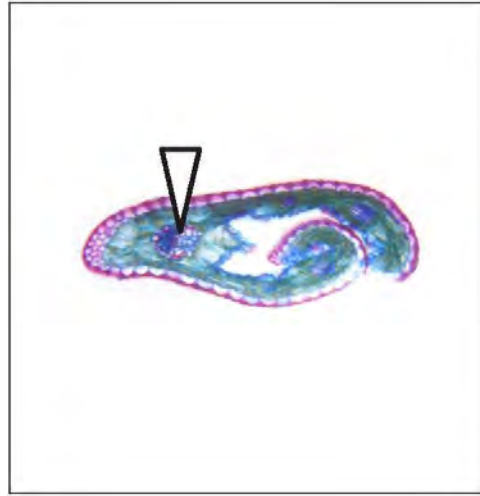
Vascular bundles near the upper side of the leaf



Vascular bundles near the lower side of the leaf

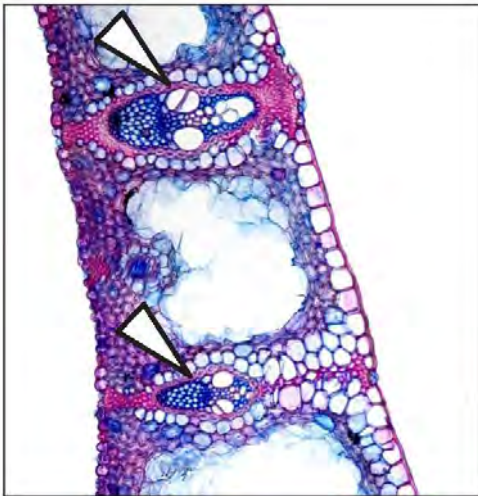


Vascular bundles in the middle between the upper and lower side of the leaf

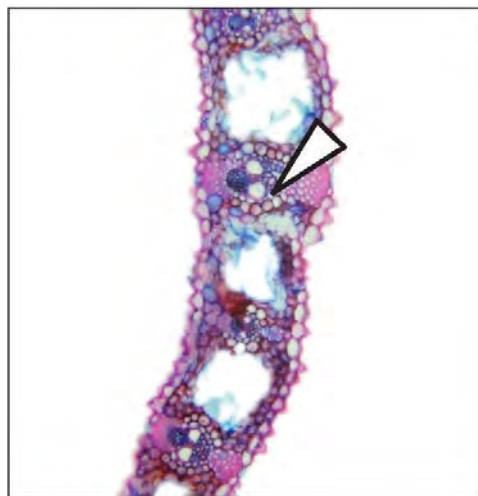


Vascular bundle not integrated in a girder

Sheath around the vascular bundles



Sheath lignified



Sheath not lignified