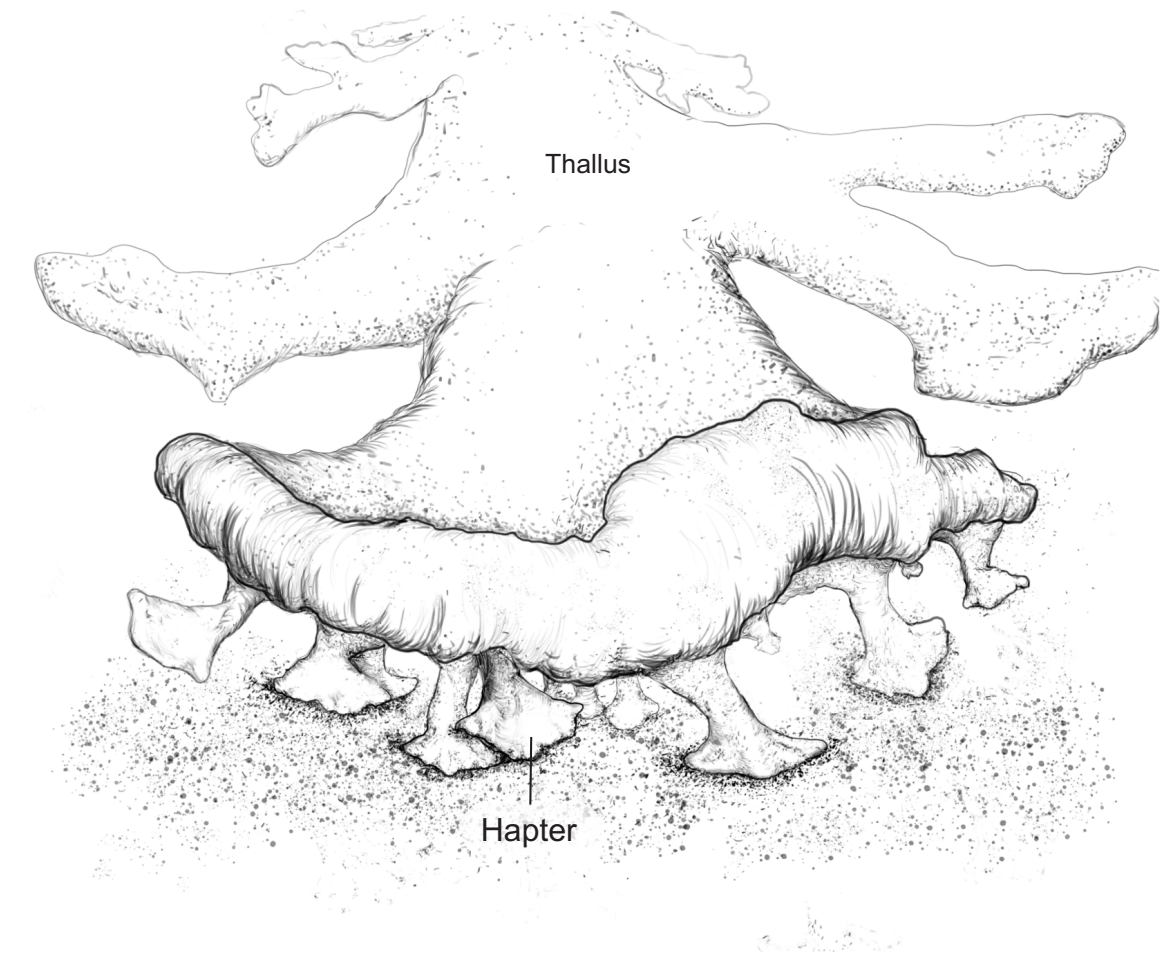
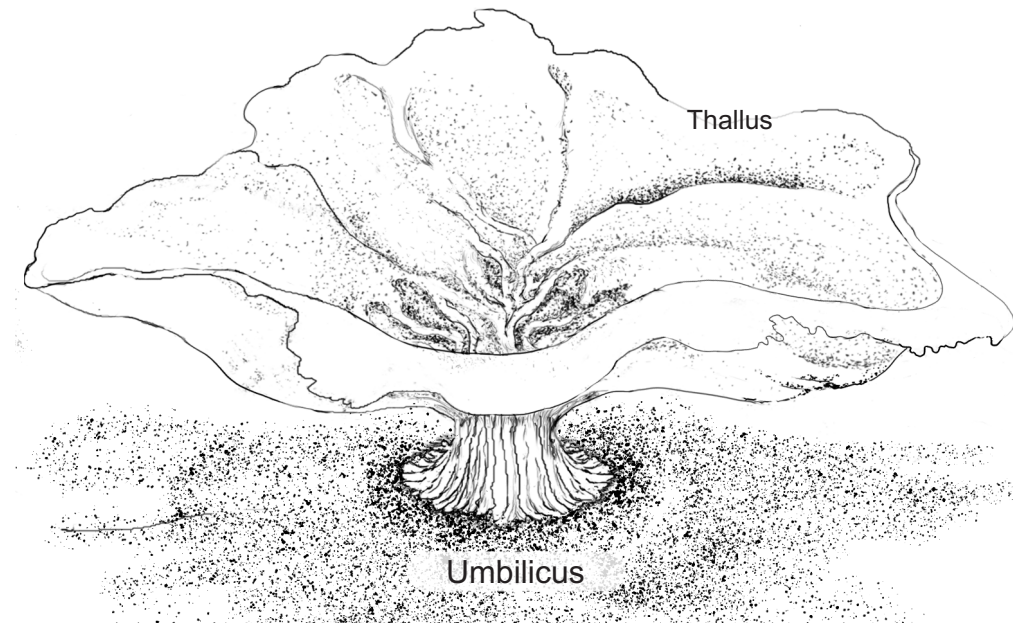
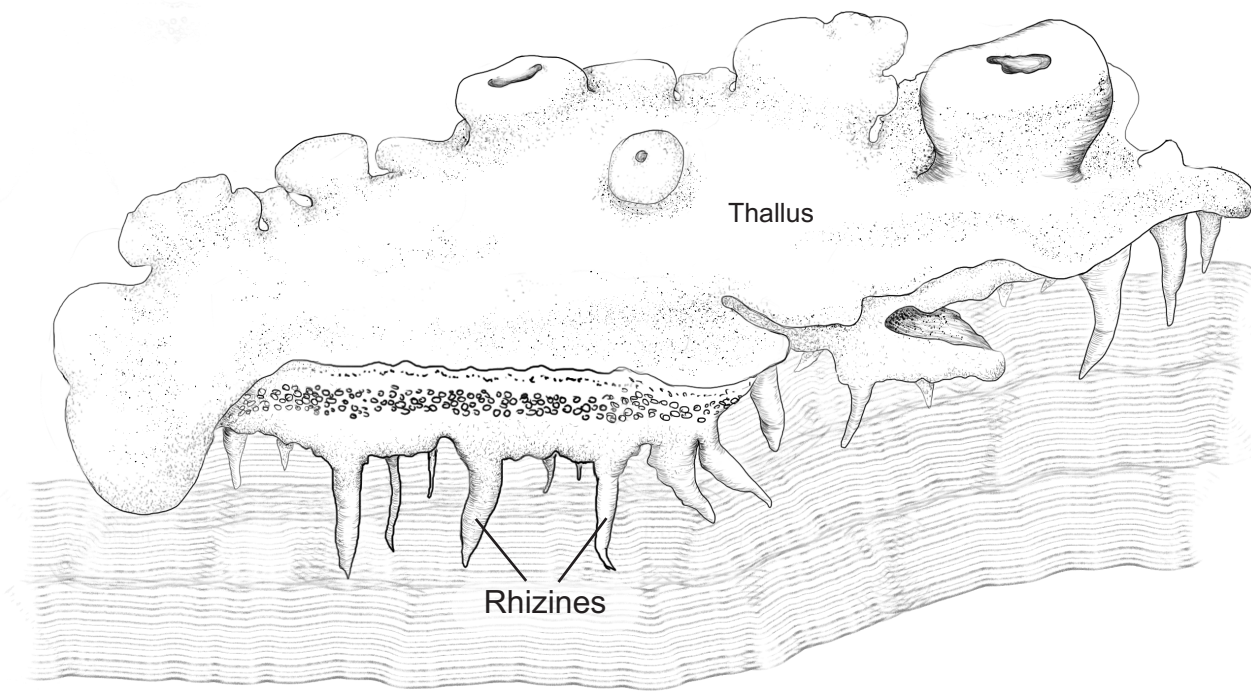


Rhizines: simple or branched thread-like or fasciculate structures developed from the lower surface of the lobes of foliose lichens

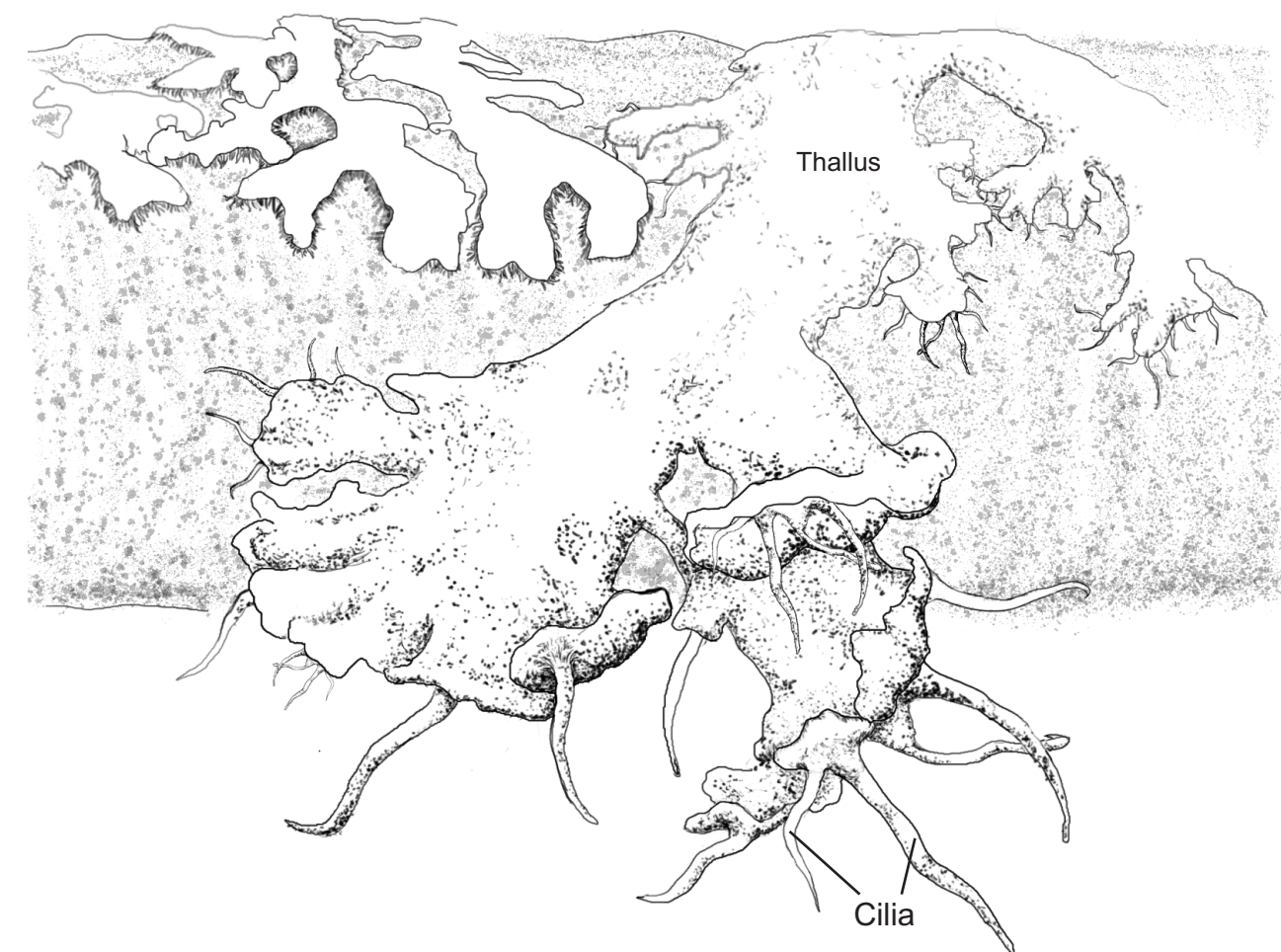
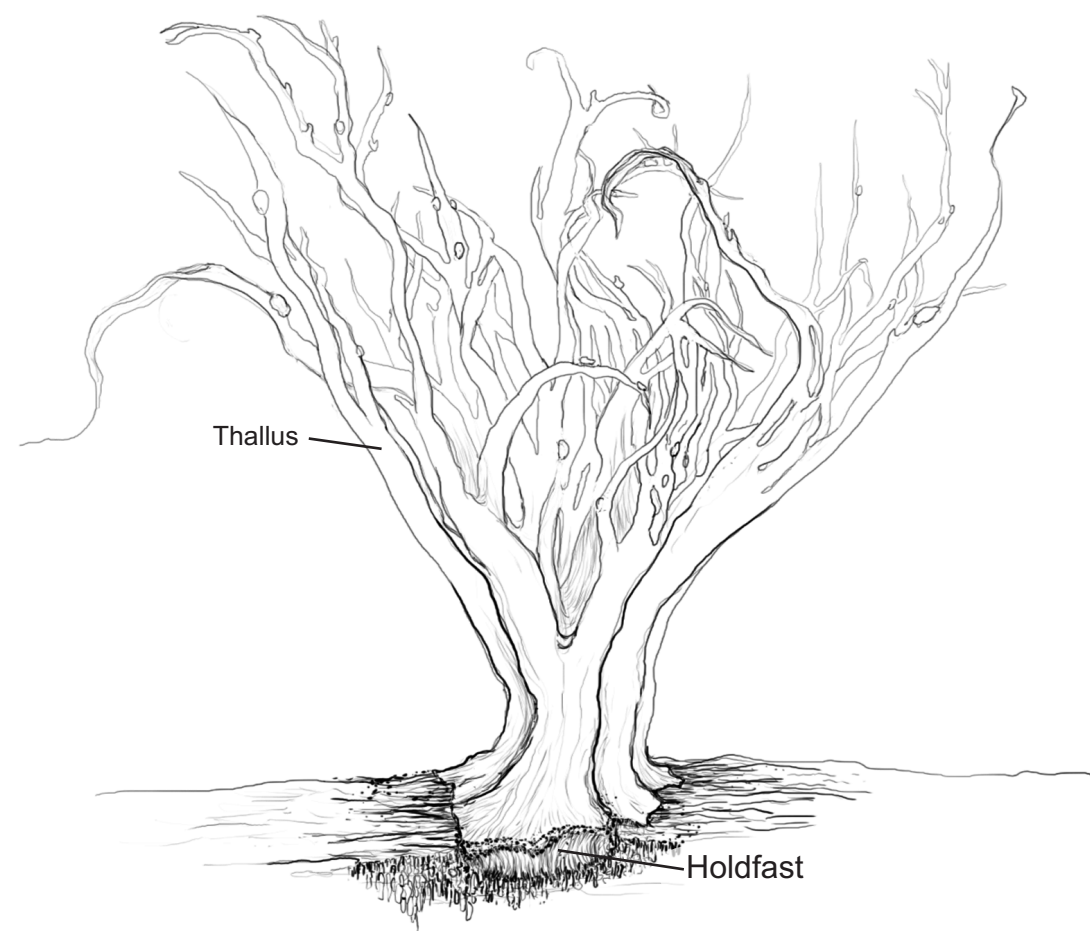
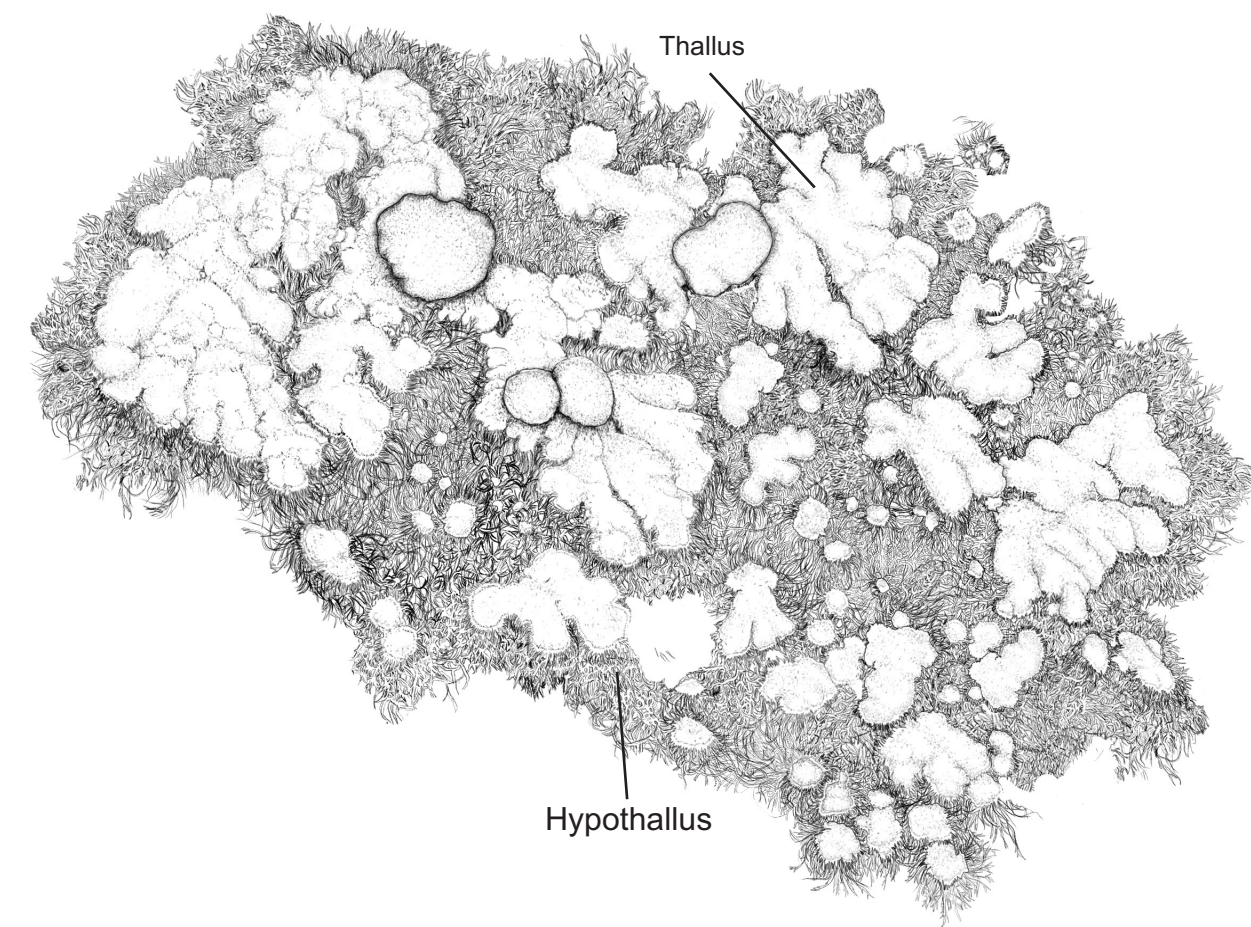
Umbilicus : an organ of attachment in the centre of the lower surface of an orbicular thallus.

Hapter: a suction pad like organ of attachment formed at the points of contact of closely appressed foliose lichens with the substrate



Attachment Structures

Most lichens are attached to their substrate by the lower surface in order to expose the maximum upper surface area to the sunlight. The organ of attachment will vary with the habit of the lichen so that bushy fruticose lichens may be attached by a holdfast whereas foliose lichens with overlapping lobes usually are attached by root-like rhizines. The main types of attachment are illustrated here and examples of the variation between species is shown on the following plates.



Hypothallus: a thick layer of felted fungal hyphae attaching the lower surface of the thallus to the substrate which projects beyond the margins of the thallus.

Holdfast: an expanded sometimes disc-like structure that attaches the thallus to the substrate of fruticose lichens.

Cilia (pl): eyelash-like outgrowths from the margins or surface of the thallus.