

Short Communication

STIPULAR SPINE OF *CAPPARIS CARTILAGINEA* DECAISNE

D. Khan

Department of Botany, University of Karachi, Karachi-75270, Pakistan

Corresponding author's email: yousafzai\_khan\_doctor@gmail.com

Stipule (Latin stipula = straw, stalk, a term coined by Linnaeus refers to the outgrowth borne on either side (sometimes just one) of the base of the leaf stalk (petiole). A pair of stipules is considered part of the anatomy of leaf of a typical flowering plant – morphologically variable (CED, 1994). Phyu Phyu San and Yi Yi Han (2003) have studied morphological and anatomical characteristics of some species of Capparidaceae but anatomy of stipular spine has not been undertaken by them. To study stipular spine, the Twigs of *Capparis cartilaginea* Decaisne were collected from the plant growing in the rock fissures in coastal area of Paradise point, Karachi. The twigs were preserved in formalin. The anatomy of stipular spine was studied microscopically by preparing transverse sections of the materials.

The stipular spines of *Capparis cartilaginea* are two at each stem node on either side of leaf. They are hard, rigid, and orange brown in colour and curved and pointed at the apex and thicker at the base. One surface of the spine is concave. If the scheme of spine geometry of Gallenmüller *et al.* (2015) is followed (See Fig. 2 for explanation), the spines were c 0.6-0.7 cm in height. The vertex point (V) of the curvature lies around 0.3 - 0.35 cm above the spine base. The base of spine (L) is lesser than the height of the spine and width of the spine base (W) is somewhat smaller than the one-third of the L. These spines are considered to be a xerophytic character which also prevent herbivory due to their hardness and piercing shape.

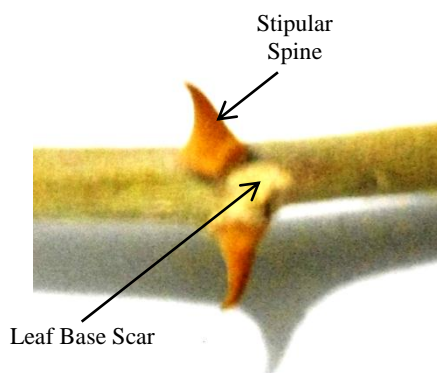


Fig. 1. Spiny stipule of *C. cartilaginea*.

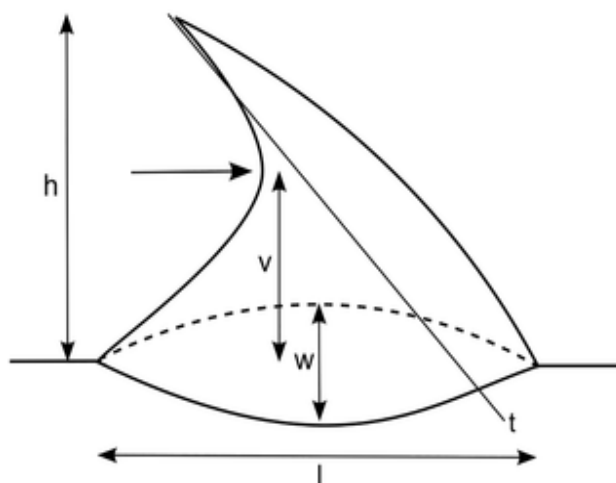


Fig. 2. Scheme of spine geometry:

Measured parameters are h (height), l (length of prickle base), w (maximum width of prickle base), v (distance of vertex from prickle base) and the angle between t (inner tangent) and the stem. After: Gallenmüller *et al.* (2015)

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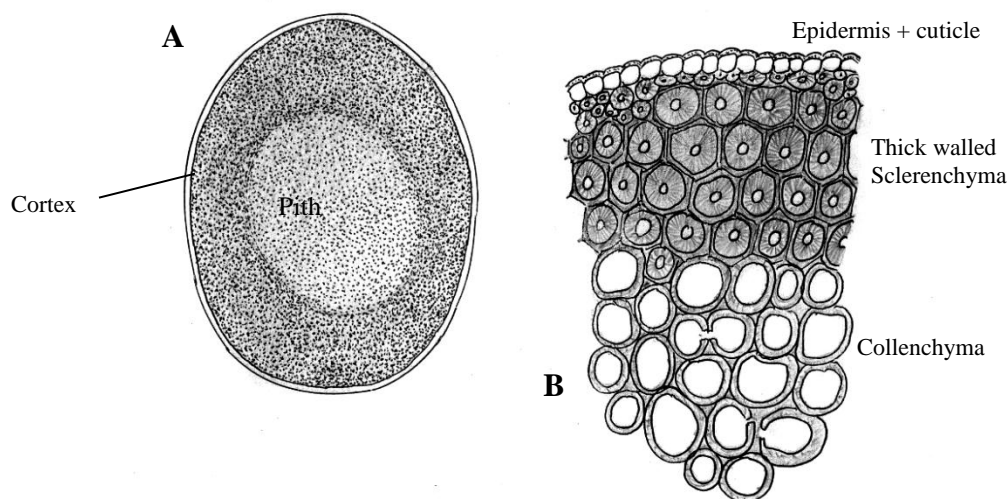


Fig. 2. Stipular Spine. A, TS (diagrammatic) cut near the apex of the spine; B, TS (cellular) near the base of the spine.

The T.S. of the spine near the apex was oval and almost round in the basal region. The spines were covered with thick cuticle. Epidermal cells were more or less squarish in outline in transverse section. Anticlinal walls were straight or slightly curved. Epidermis is followed by hard sclerenchymatous zone of brown colouration, the upper cells of which were smaller in size. The cells were thick lignified leaving only small unthickened part in the mid of the cells and devoid of any intercellular spaces. The pith region was made up of collenchyma of thick walled cells with little spaces between the cells.

The spine of *C. cartilaginea* had no vascular supply in them and nor any vascular termination of the vascular bundle. The spines of the *C. spinosa* have also been reported, quite earlier, to contain neither vascular bundles nor termination of bundles (Lothelier, 1983). The stipular spines of *C. cartilaginea* are, therefore, exogenous in structure. Unlike them, thorns are known to be endogenous in origin. Monod and Schmitt (1968) presented anatomy of thorns of *Acacia drepanolopium* and *A. seyal fistula* by means of transverse sections, containing cortical collenchyma and a band of the Sclerenchyma in contact with numerous small vascular bundles.

## REFERENCES

- CED (Concise English Dictionary. (1994). Wordsworth Editions Ltd. (ISBN – 1-85326-328- 1).
- Gallemüller, F.A., A. Feus, K. Fiedler and T. Speck. (2015). Rose prickles and Asparagus spines – Different hook structures attachment devices in climbing plants. (<http://doi.org/10.1371/journal.pone.0143850>)
- Lothelier, Épines, Thèse, Paris. (1893). pp. 35 and 46. Seen in Solereder, 1908).
- Metcalfe, C.R. and L. Chalk. (1979). Anatomy of the Dicotyledons Second Edition. Vol. I. Systematic Anatomy of Leaf and Stem, with a brief history of the subject. Clarendon Press, Oxford. Viii + 276.
- Monod, T. and C. Schmitt. (1968). Contribution á létude des pseudo-gallies formicales chezquelques Acacias africains. *Bull. Inst. Fond. Afr. Noire, A*. 30:m 353-1027 (seen in Metcalfe and Chalk, 1979).
- Phyu Phyu San and Yi Yi Han. (2003). A study on morphological and anatomical characteristics of some species of the Family Capparidaceae. Pp. 491-517. ([www.forestdepartment.gov.mm](http://www.forestdepartment.gov.mm))
- Solereder, H. (1908). Systematic Anatomy of Dicotyledons: A Handbook for Laboratories of Pure and Applied Botany. Translated by L.A. Boodle and F.E. Fritsch and Reviewed by D.H. Scott. Vol. II. Monochlamydae, Addenda, concluding remarks. Oxford, Clarendon Press.

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