

# COMPARISON OF PEDUNCLE VASCULAR TISSUE OF WILD PERENNIAL *HELIANTHUS* SPECIES

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## INTRODUCTION AND OBJECTIVES

Variations in peduncle vascular system characteristics among wild perennial *Helianthus* species could indicate their different conductivity capacity which is reflected in differences in seed yield potential. Taking into account the importance of the functional vascular network of peduncle, its close correlation with sunflower seed yield potential, and the importance of wild species in breeding programmes, we made a comparative analysis of peduncle vascular tissues of 19 wild perennial *Helianthus* species.

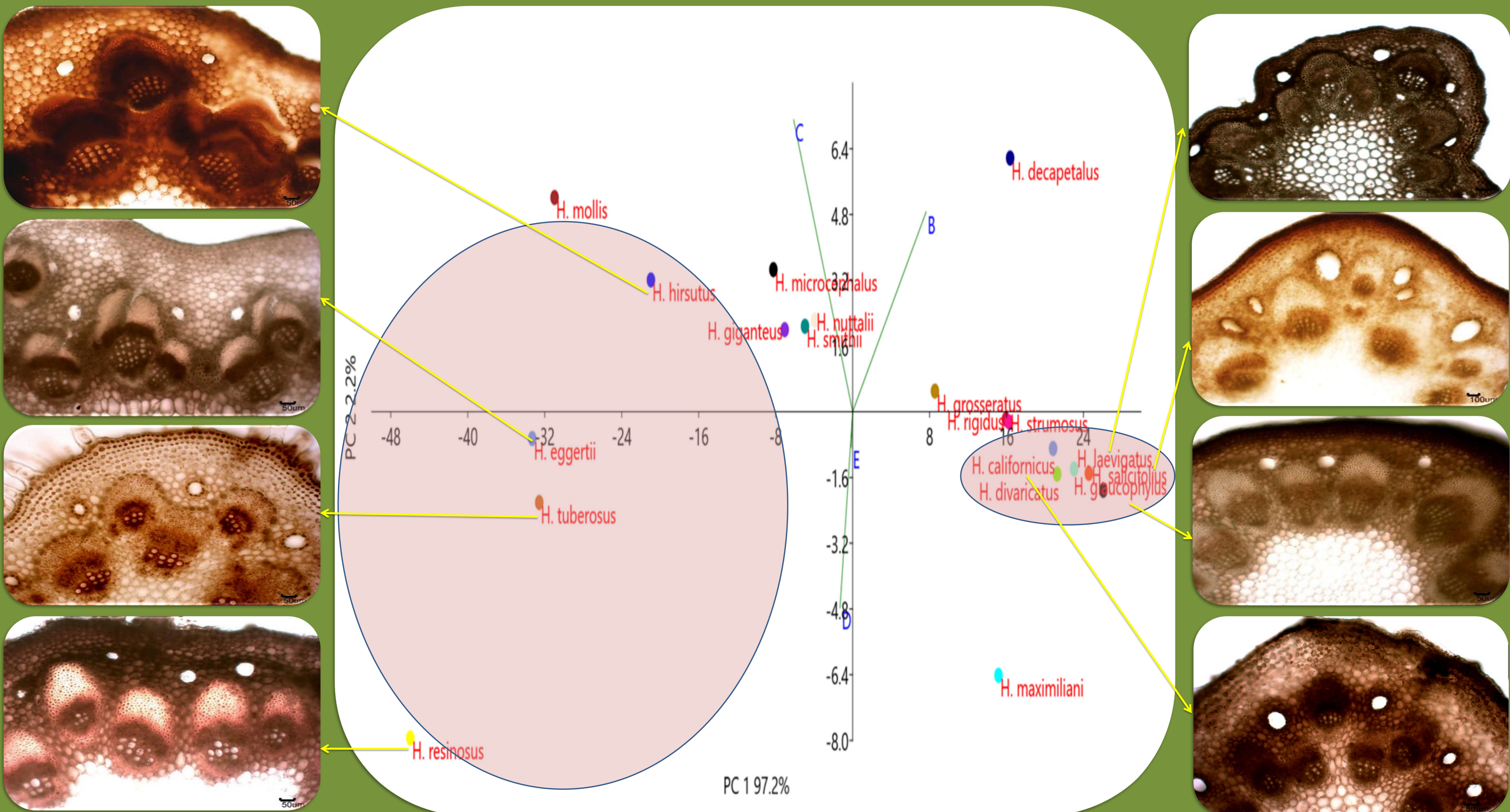
## RESULTS:

Our study showed that the number of vascular bundles was not always in a positive correlation with the length of peduncle, size of the peduncle cross section and the size of the vascular bundles. Multivariate Discriminant Analysis showed that species *H. eggertii*, *H. resinosus*, *H. hirsutus*, and *H. mollis* had remarkably higher cross-section area of vascular bundles as well as size of lumen and number of vessels than other analysed species.

## METHOD / DESIGN:

For anatomical observation, five plants of each species were randomly selected and cross sections were obtained from the middle part of peduncle, using cryotechnic procedure. Measurements of vascular tissues' features were performed using light microscopy.

In the species *H. tuberosus*, we noticed large vascular bundles with well developed xylem composed of a slightly smaller number of vessels of the wider lumen. In addition to the more developed xylem, species *H. eggertii*, *H. resinosus*, *H. hirsutus*, and *H. tuberosus* had the most developed phloem and sclerenchyma tissues. Also, Principal Componentes Analysis showed that in these species, although in a small percentage, the most frequent presence of vessels with the widest lumen (300-500  $\mu\text{m}^2$  and 500-1000  $\mu\text{m}^2$ ) was observed. On the other hand, species *H. salicifolius*, *H. glaucophyllus*, *H. laevigatus* and *H. divaricatus* were positioned in the negative zone of the graph with significantly narrower lumen of vessels.



## CONCLUSIONS:

Understanding the peduncle vascular characteristics is of a fundamental importance for improvement of cultivated sunflower seed yield. Wild species with larger vascular bundles, a higher number of vessels and its wider lumen could indicate a higher conductivity capacity of the peduncle.

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