

## ROLE OF SEED WATER GAP STRUCTURE IN SEED GERMINATION OF *Ficus* SPECIES FROM SOUTH CHINA

V. Silva<sup>1,2</sup>, H. Chen<sup>2</sup>, N. Geekiyanage<sup>1,2</sup>, and U.M. Goodale<sup>2</sup>

<sup>1</sup>*Department of Plant Sciences, Faculty of Agriculture, Rajarata University of Sri Lanka, Anuradhapura, Sri Lanka.*

<sup>2</sup>*Plant Ecophysiology and Evolution Group, Guangxi Key Laboratory for Forest Ecology and Conservation, College of Forestry, Guangxi University, Daxuedonglu 100, Nanning 530005, Guangxi, People's Republic of China.*

Investigating the predictive power of seed functional traits to determine regeneration success could improve our understanding of the regeneration process and its response to future global changes. This study, using 16 *Ficus* species evaluated the predictive capacity of seed traits on seed germination success and the role of seed water gap structure during the imbibition phase of seed germination. A dye tracking experiment using seeds submerged in acid fuchsin for 20 min, followed by paraffin embedding, slicing and subsequent measurement of digital images showed that the water gap structure was the main water entry point for all species. The hilum region length and width measured by imbibing seeds for 12 h period at 25°C showed a diversity of changes from increases to decreases in its length. Seed coat thickness in the water gap structure area was different from the rest of the seed coat. Intra-specific differences between seed coat thickness was identified but without a correlation to seed germination or a differentiation between epiphytic versus terrestrial habit. Contrary to expectations, there was no correlation between the hilum length and width after 12 hours imbibition in water and the probability of germination. Correlations between all seed traits (water gap traits such as hilum length and width, and seed coat thickness in the water gap region, seed width, seed length, seed perimeter, seed area, seed coat thickness and seed moisture content) and germination success showed that germination rate was highly correlated with species' seed surface area ( $p > 0.0001$ ) followed by seed length ( $p > 0.01$ ) and seed width ( $p > 0.01$ ), indicating larger seeds has higher germination probability. The seed water gap structure mattered the most for germination along with the thickness of seed coat. This study provides novel insights into the role of the water gap structure and other seed characteristics in determining seed germination.

**Keywords:** Dye tracking, *Ficus* species, Imbibition phase, Seed water gap structure