

Microscopic observations of the ultrastructure of Kersting's groundnut (*Macrotyloma geocarpum* (Harms) Maréchal and Baudet) flowers

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Abstract

Kersting's groundnut belonging to *Fabaceae* family is a grain legume widely consumed in West Africa. Its genetic diversity is low and can be broadened through hybridization. The flowers are chasmogamous, and unfortunately floral biology is not well known. This study aims to understand the floral development stages of six cultivars of Kersting's groundnut and to analyse anthesis timing together with stigma receptivity and pollen dehiscence and viability by utilizing photonic microscope and eyes observation. To achieve this, seeds were firstly sowed on pots on experimental site of GBioS by using half di-allele design. For visual observation, one flower per plant were marked and observed every day in the morning at 6:30 pm and evening 5pm for development stages of the flowers. One flower per cultivar were observed per day in ten days in terms of pollen viability, stigma receptivity, and number of ovules per ovary through optical microscopic, at magnification of $\times 400$ and $\times 1000$. The results show five stages of flowers development namely immature bud stage; bud emergence; partially opened flower; anthesis and wilted flowers. From stage of bud initiation to bud emergence 5 (± 2) days were recorded, 3(± 1) days between bud emergence and partially opened flower, 2 (± 0.5) days between partially opened flower and anthesis; and 7 (± 2) days between anthesis and development of gynophore. Cultivars showed a difference in terms of numbers of sepals, petals and stamens and ovule per ovary. The stigma becomes receptive at the step of bud emergence and pollen viability occurs at the step of partially opened flower. The colour of anthers is yellow and stigma is green at the partially opened flower stage, showing that these organs are already mature at this stage. There is no significant difference between the pollen maturity and stigma receptivity time and stigma becomes receptive before anthesis. This shows that the appropriate time of emasculation for hybridization happens at stage of bud emergence.

Keywords: chasmogamous, stamen, sepal, petal, ovule, ovary, pollen, viability.