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Study on the pollen morphologies and seed setting rate of *Hemarthria compressa*

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Key words: *Hemarthria compressa*, pollen, viability, germination, seed setting rate

Introduction Whipgrass (*Hemarthria compressa*) is one of the popular grass for hay production in southwest China (Yang, 2004), but the low seed setting rate hindered its further popularizing. The research objective was to determine whether the pollen characteristics influence seed setting.

Materials and methods Inflorescent whipgrass was the material which collected in the field of Sichuan Agricultural University, Ya'an, Sichuan province, China (38°08' N, 103°14' E) in July to Aug. 2006. The fresh inflorescences were fixed with F.A.A. chemical. The Pollen morphological and germinational features were observed by KYKY1000-B scanner, the vitality was detected by method of iodine-iodide kalium.

Results The pollen grains of whipgrass are mostly spherical, rarely spheroidal, mostly circular or subcircular in polar and equatorial view (Figure 1). From the top of the inflorescence to bottom, the pollen viability tended to decline (Figure 2). The average pollen viability of flowers is 29.96%. Germination rate of pollens in first and fifth hour were 47.11% and 67.44% respectively. The elongate of the pollen tubes was 14.1 μm/h in first hour, and 1.3-3.9 μm/h in fifth hour. The self-pollination was observed that pollen tubes entered into papillate with the tip dilating or branching off (Figure 3). And even if there's no monstrosity, the pollen tube was just twisting on the surface of stigma (Figure 4). The natural seed setting rate was 1.17%.

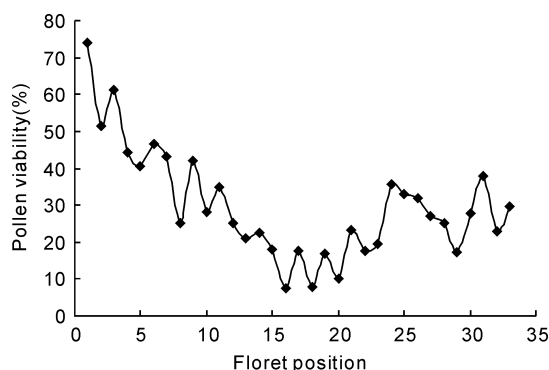


Figure 2 The pollen viability of different floret position of whipgrass.

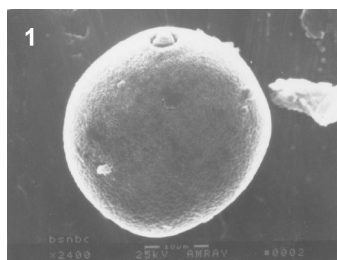


Figure 1 Pollen's equatorial view of whipgrass.

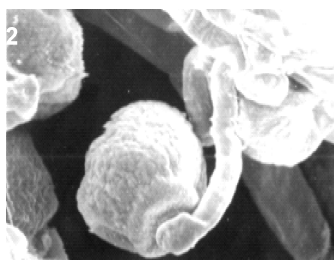


Figure 2 Pollen tubes entering into papillate with tip branching off.



Figure 3 Pollen tubes was twisting on the surface of stigma after germination.

Conclusions Self-incompatibility of whipgrass was caused by the abnormal phenomenon on pollen tubes such as tip inflation, bursting, and twisting on the surface of stigma. As the pollen has a natural vitality and germination rate, it's not the leading factor to low nature seed setting rate. There need farther research to find out the reasons.

Reference

Yang C.H., Zhang X.Q., Li X.L. 2004. *Hemarthria* germplasm resources and breeding[J]. *Acta Prataculturae Sinica*, 13(2):7-12.