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Observation on the pollen morphology of 5 species of *Caragana* Fabr. plants in the alashan desert

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Key words : Pollen grain , Pollen morphology , *Caragana* Fabr. , Alashan desert

Introduction The Alashan desert is located in the Alashan highland of Inner Mongolia plateau . Many *Caragana* Fabr. species distributed in the desert and arid grasslands of the Alashan highland . They are very important for protection of the environment of the Alashan desert . Observation of the *Caragana* Fabr. pollen morphology from the plants in the Alashan desert can provide valuable information for some researches of how to use the desert plants .

Materials and methods The materials for the study were sampled in 2004~2005 . *Caragana* Fabr. Plants , integrated plants and pollen sample were uniformly gathered . Pollen sample was scattered on double sided pastern paper on carry matter desk equably and plating film by IB-5 hydronium spatter instrument . Sample are send into S-530 scan electron microscope , choose different magnify multiple and observe angle to go along observe and photograph for pollen sample . All datas of microspore surface characters are root in the average of 20 microspore(Wang Kaifa ,1983 ; Wan Tao ,1999) .

Results and analysis The abnormal pollen morphology of 5 species of *Caragana* Fabr. is $(24.34 \sim 32.11) \mu\text{m} \times (11.31 \sim 20.27) \mu\text{m}$ which is belong to minitype . Others are middle pollen types(*Caragana tibetica* Kom . $32.11 \mu\text{m} \times 20.27 \mu\text{m}$) which equator surface is long or exceed long sphericity , $P/E = 1.59 \sim 2.06$. The polar surface is 3-split or 3-crack rotundity . Bourgeon apparatus belong to 3 aperture channels type and the channel is thin and length to the two poles , channel edge is tidiness ; Inside aperture sink or not evidence ; Microspore surface is reticulation or aperture ornamentation , mesh or aperture is quite fleet and some assume perforation shape at polar section or channel edge . These are related with collectivity characters of Leguminosae Papilionatae *Caragana* Fabr. (Table 1) .

Table 1 Character of pollen morphology of Alashan desert *Caragana* Fabr. .

Species name	PA(μm)	EA(μm)	P/E	Shape	Germinators		Ornamentation
					Type	Trait	
<i>Caragana tibetica</i>	28.32~33.56	18.42~22.12	1.59	long sphericity	3aperture channels	Slightness and length to the two poles .	reticulation , mesh is fleet
<i>Caragana brachypoda</i>	27.18~31.05	12.94~14.91	2.06	exceed-long sphericity	3aperture channels	slightness and length to the two poles .	apertur , fleet , have perforation
<i>Caragana intermedia</i>	25.23~28.72	14.88~18.98	1.68	long sphericity	3aperture channels	slightness and length to the two poles .	apertur , fleet , symmetry
<i>Caragana stenophylla</i>	22.72~26.90	11.89~16.19	1.72	long sphericity	3aperture channels	Slightness and have film	apertur , fleet , asymmetry
<i>Caragana leucophloea</i>	21.55~26.32	9.56~13.66	2.15	exceed-long sphericity	3aperture channels	Narrow and inside aperture sink	apertur , small and fleet , no perforation

Conclusions *Caragana* Fabr. is belong to evolutionary species comparatively but not the furthest(not 3 aperture type) . Pollen morphology is outbalance part in collectivity character of plant , all characters of microspore accord with the genetic stability and diversity .

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