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A study of the inner tepal micromorphology in the tribe Rumiceae Dum. (Polygonaceae) and its systematic significance

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In order to assess systematic relationships between taxa in the tribe Rumiceae as well as to further understand between their tepal cell structures and pollination syndromes, a detailed scanning electron microscopy (SEM) study of inner tepal surface was conducted. Based upon the types of inner tepal cells, 4 genera representing 56 species of Rumiceae can be divided into three groups: Group 1, mostly long rectangular cells with a sinuate anticlinal walls - in *Oxyria* Hill., *Rheum* L. sect. *Rheum* and *Rumex* sections *Rumex* L., *Acetosella* Meisn., *Platypodium* Willk.; Group 2, long rectangular cells (size is similar with Group 1) with straight anticlinal walls - in *Rheum* sect. *Deserticolae* Maxim., *Rumex* sect. *Acetosa* Campd.; Group 3, short rectangular or close to square cells with straight/slightly undulate anticlinal walls - in *Emex* Campd., *Rheum* sect. *Monticolae* Maxim. Cuticular striations are mostly longitudinal or sometimes irregularly arranged, but do not appear to have less systematic value than the cell shape. It is interesting to note that the genus *Oxyria* have lots of wart-like verrucae throughout the tepal surface, which is quite similar with the upper part of tepal cells in *Rumex* sect. *Platypodium*. Thus it can be presumed that phylogenetically these two taxa can be closely related each other or they may have evolved independently as a parallism. The cuticular striations seem to be not strong significance concerning the pollination mechanism, but appear to afford extra strength to the cell walls. In conclusion, these tepal characters in Rumiceae can be useful in improving for the infrageneric classification, but less for the intergeneric level.

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The pollen morphology of the genus *Fagopyrum* Mill. (Polygonaceae)

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The pollen of 12 species including 2 subspecies (ca. 40 specimens) in the genus *Fagopyrum* Mill. was investigated by light microscopy and scanning electron microscopy (SEM). The pollen grains of studied taxa are monad, 3-colporate with mostly reticulate exine ornamentation. The shape of pollen grains is mostly prolate or often subprolate/prolate-spheroidal [$P/E = (1.12-1.33-1.73)$]. The size of pollen is $P = 25-72 \mu\text{m}$, $E = 17-46 \mu\text{m}$. The colpi are mostly wide, rarely narrow, with/without granules. The exine ornamentation is variable both in shape (angular, non-angular, more or less rugulate) and size. The pollen dimorphism has been shown in six species which were known to be heterostylous plants. Dimorphism of pollen size and exine ornamentation in relation to distyly in all taxa is well correlated and is significantly different. The pollen grains from short-styled (thrum) flowers are larger than those from long-styled (pin) flowers. The ratios of thrum to pin pollen size vary from 1.03 to 1.60. The pollen grains of the thrum-type have much larger lumina than those of the pin-type. In conclusion, the palynological characters of *Fagopyrum* can be useful for evaluating the infrageneric classification in some degree. The examination of the geographical variation in more additional material as well as the application of the new SEM methods (e.g., broken pollen grains by freezing to check the endoaperture characters), which are in progress, will give more promising palynological data.