

The study of seed morphological trait and testa characteristic for Korean *Vicia* species

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ABSTRACT

In order to evaluate the taxonomical relevance of seeds morphological characteristics, a macro- and micro-morphological study was conducted on seeds of Korean *Vicia* (Fabacea). We collected 19 taxa of genus *Vicia* distributed in Korea and introduced one taxa from USDA. The morphological characteristic and testa texture of seeds were investigated using a Stereo-microscope (SM) and Scanning Electron Microscope (SEM). Most of *Vicia* seeds were found spherical or oblong and some seeds were oval and subglose. The largest seed was *V. chosenensis* ($4.3 \times 3.6 \times 2.6$ mm), and the smallest was *V. tetrasperma* ($1.7 \times 1.7 \times 1.5$ mm). *V. chosenensis* and *V. hirsuta* were separated from other *Vicia* species by having a shiny in seed finish. In hilum shape, 14 species have linear and *V. sepium* was distinguished by having a circumlinear. In testa texture, they developed papillae, only *V. hirsuta* has lophate in level type. Deposition of the sheet-like debris between the papillae was observed in *V. chosenensis*, *V. cracca*, and *V. unijuga*. Polymorphism information content (PIC) values of the 13 qualitative morphological characters (QMC) were in the range of 0.0950 to 0.8863 with an average of 0.4611. PIC value of seed shape, seed colour, hilum colour were 0.7403, 0.8177, 0.883 respectively. Cluster analysis based on QMC detected three main clades. *V. cracca*, *V. amurensis*, *V. amoena* were involved in Group 1 and *V. unijuga* f. *minor*, *V. unijuga*, *V. unijuga* f. *angustifolia*, *V. sepium*, *V. hirticalycina*, *V. hirsuta*, *V. linearifolia*, *V. chosenensis*, *V. pseudorobus*, *V. venosa* var. *cuspidata* were involved in Group 2. *V. nipponica*, *V. japonica*, *V. villosa*, *V. dasicarpa*, *V. bungei*, *V. angustifolia*, *V. tetrasperma* were clustered in Group 3. Our research suggests that morphological characteristic and testa texture of seeds could be used as definers for the identification of genus *Vicia*.

Keywords: *Vicia*, seed morphological characteristic, seed testa texture, SEM

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