Genetic diversity evaluation of Cumin (Cumin cyminum L.) based on phenotypic characteristics.

ABSTRACT

In order to assess the genetic diversity of cumin and determine the traits effective on seed yield and cumin- aldehyde, forty nine cumin ecotypes which they are sub-populations belonged to nine populations from different provinces of Iran were evaluated based on morphological and biochemical traits. Results indicated a significant variation for all the measured traits among and within populations derived from different provinces. Kerman and Esfahan populations showed the best performance based on the phenotypic data, while Yazd had almost the lowest levels of traits. Correlation analysis showed number of seed per umbel and umbel per plant had highest relationship with seed yield. Path analysis also demonstrated that number of umbel per plant and number of seed per umbel had the most direct effects on seed yield and were identified as the most effective factors on seed yield. Cumin aldehyde was mostly correlated by number of umbel per plant. The present study showed that different qualitative characteristics such as seeds with light color and without trichome and leaves without trichome, alternate and large pods of Petiole tend to produce high seed yield. Pattern analysis of different populations based on first two main principal components categorized the measured genotypes in to three groups: Pars, Northern_Khorasan, Golestan, Semnan and Yazd (Group1), Southern_Khorasan and Khorasan_Razavi (Group2) Kerman and Esfahan (Group3), which the third group are high yielding genotypes with different genetic background can be advised for cultivation and breeding programs. So the available genetic diversity among the Iranian cumin populations can be lead to produce high yielding population of cumin.

Keyword: Cumin; Genetic diversity; Phenotypic assay.