Czech Journal of GENETICS AND PLANT BREEDING

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Czech J. Genet. Plant Breed.

Rastogi A., Mishra B.K., Singh S.P.:

Alkaloid diversity in relation to breeding for specifi c alkaloids in opium poppy (*Papaver somniferum* L.)

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Papaver somniferum is a chief source of diverse physiologically active alkaloids, required by the pharmaceutical industry. The present study describes the diversity of the alkaloid spectrum of 122 opium poppy accessions of Indian origin by means of a cluster analysis based on Mahalanobis generalised distances. The accessions could be grouped into 11 clusters according to their relationship between the contents of morphine, codeine, thebaine, narcotine and papaverine in raw opium. The diversity of the alkaloid spectrum of 11 clusters

reflected the very low correlations between the contents of the individual alkaloids across the 122 entries, found earlier. The clusters represented almost all possible combinations of the high content of an alkaloid with high or low content of another alkaloid. Although on average the morphine content exceeds the sum of the other four alkaloids, in one cluster the narcotine content (15.3%) was even higher than that of morphine (14.6%) and the content of the remaining alkaloids was also extremely high. The variation range among the clusters was for papaverine between 0.14% to 5.3%, while for morphine between 12.4% to 18.0%. The results indicate a large space for the breeding of opium poppy for individual alkaloids or particular combinations of alkaloids, as required by pharmaceutical industries.

Keywords:

alkaloids; clustering; multivariate; *Papaver somniferum*

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