

Abstract

CYTOMETRIC ploidy level screening was done in 120 populations of the *Juncus bufonius* group, mainly in central Europe. Two polyploid cytotypes, which are sometimes treated separately as *J. minutulus* and *J. bufonius* s. str., were detected and considered to be DNA tetraploids and hexaploids with 2C values of $1.18 \pm 2.8\%$ pg 2C DNA and $1.84 \pm 1.6\%$ pg 2C DNA, respectively. The correspondence between nuclear DNA content and the number of chromosomes was verified by chromosome counting, establishing that true polyploidy, as opposed to agmatoploidy, is behind the karyological variation. To assess the utility of supposedly diagnostic quantitative morphological characters, measurements of 6 floral and 3 vegetative quantitative characters (no less than 10 measurements per flower, 30 per plant) were obtained for 358 mature plants of known ploidy level from 49 localities. Principal component analysis did not show any separation of the ploidy levels. Canonical discriminant analysis indicated inner tepal length followed by mean capsule width and mean capsule length to be the most useful characters for identifying the ploidy levels; however, the estimated 10-fold cross-validation error rate of a simple k nearest neighbour classification analysis is 0.45. No novel distinction between the cytotypes was discovered. It is thus concluded that it is not possible to reliably tell apart *J. minutulus* and *J. bufonius* s. str. in both mixed or pure populations. Thus, *J. bufonius* in Europe is best treated as a variable species with two cytotypes that are almost inseparable using the quantitative morphological traits suggested by extant literature.

Key words: *Juncus*, *bufonius*, *minutulus*, taxonomy, cytometry, chromosomes, genome size, isozymes, discriminant analysis. . .