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## **The impact of molecular markers on species recognition**

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Molecular marker methods are contributing vast amounts of new data for the determination of genetic and phylogenetic relationships in taxonomy. In these studies, species delimitation usually is not an issue. In comparisons of many species, one or a few specimens are selected to represent the species; in population analyses, sampling takes place within species boundaries.

Species delimitations are more or less arbitrary taxonomic decisions. The concept that members of one species form a gene pool of interfertile individuals and are reproductively isolated from other such gene pools is rarely applicable in plants, and such a concept is irrelevant for asexually propagating taxa. In practice, species delimitation always depends on a set of correlated diagnostic characters, by which members of a species can be recognised. However, such characters are few, and with an increasing demand for an objective, simple and reliable method of plant identification, the scarcity of truly diagnostic characters becomes evident.

Here, I discuss a few molecular approaches to the identification of diagnostic characters and suggest how these might be standardised. Problems with the identification of agamospermic microspecies as clonal lines in multiclonal populations are analysed in some detail. Occasional mutations in clonal lines can be detected. The basic problem concerns facultative agamospermy. Even very rare sexual events in otherwise clonally reproducing groups can generate a large number of recombinant genotypes. In agamosperm populations, in which sexual events are too rare to be detected, the allele distribution, at least among different genotypes (i.e., excluding identical copies) can approach those of panmictic sexual populations.