Poster

An analysis of morphological variation of *Atractylodes* in eastern Asia

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Introduction. *Atractylodes macrocephala*, baizhu, is an herb in traditional Chinese medicine, which has less frequently used substitutes, such as *A. lancea*, *A. chinensis*, *A. japonica*, and *A. ovata*, known in Chinese as cangzhu. The previous taxonomic works on the genus *Atractylodes* were based almost entirely on differences in size and shape of leaves. The reproductive structures were believed to be rather uniform and did not provide many useful distinctions, except *A. macrocephala*. It was hoped that this analysis would provide an insight into some of the species problems of *Atractylodes*.

Objectives. To analyze the phenetic relationships among the different morphological entities of five *Atractylodes* species, *A. lancea, A. chinensis, A. koreana, A. ovata*, and *A. japonica* from throughout eastern Asia. Particular attention has been given to determining if the morphological variation among the previously distinguished taxa warrants recognition at the rank of species.

Methods. Ten morphological characters were selected for analyses included those most frequently utilized in keys and diagnoses. Morphological variation was assessed using univariate statistics (mean, maximum, minimum) and multivariate analysis (PCA).

Results. As expected, a lack of phenetic coherence was evident in multivariate analysis and some a priori taxa (*A. lancea* and *A. chinensis*; *A. japonica* and *A. ovata*) were virtually inseparable in a PCA projection. In addition, the delimitations *A. ovata* of *A. lancea* complex were clarified using these diagnostic characters. Shiba et al (2006) recoginized hybrids between *A. lancea* and *A. chinensis*. This study, however, suggests that *A. koreana* is a hybrid between *A. chinensis* and *A. ovata*.

Conclusion. The results indicated that *Atractylodes* should be recognized as several polymorphic species. Previously recognized taxa, *A. chinensis* and *A. japonica* were not supported to warrant the designation of any taxonomic rank. The observed pattern of variation may be environmentally induced and suggests that the species may exhibit environmental plasticity.

Keywords: *Atractylodes*, phenetics, identification, hybrid, morphometics

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