**A phylogenetic analysis of gynodioecy and its correlates in the flowering plants**

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Gynodioecy, a breeding system where plants are female or hermaphroditic, has been hypothesized to facilitate the evolution of dioecy, a breeding system where plants are male or female. Despite the importance of gynodioecy, a database of gynodioecious species has not yet been assembled. This has limited our ability to test whether the evolution of gynodioecy and dioecy are correlated and to identify traits associated with gynodioecy. We assembled a database of gynodioecious species, and used it determine the frequency and distribution of gynodioecy across the angiosperms. We also tested whether gynodioecy is associated with dioecy, or with traits previously associated with gynodioecy: an herbaceous growth form, and a temperate zone distribution. We found that fewer than 1% of species were gynodioecious, but gynodioecious species occur in 81 of 428 families. Compared to previous studies that surveyed breeding systems within local floras, we found fewer gynodioecious species, but more families that contained gynodioecious species. These 81 families were more likely to also contain dioecious species, herbaceous species, and species with a temperate zone distribution. Although our results supported the hypothesis that dioecy evolves via gynodioecy, we also found that gynodioecy was associated with different morphological and ecological traits than dioecy. This suggests that different conditions select for the evolution of gynodioecy versus dioecy.