



Resolution of polyphyly in *Pueraria* (Leguminosae, Papilionoideae): The creation of two new genera, *Haymondia* and *Toxicopueraria*, the resurrection of *Neustanthus*, and a new combination in *Teyleria*

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Abstract

Recent molecular phylogenetic studies (Egan *et al.*, in prep.) have demonstrated widespread polyphyly within the genus *Pueraria*. A new classification is presented here that delineates monophyletic groups previously considered congeneric with *Pueraria*. This taxonomic treatment provides several new species combinations and a more natural circumscription of *Pueraria* by reinstating the genus *Neustanthus*, transferring one species to *Teyleria* and establishing two new genera: *Haymondia* and *Toxicopueraria*.

Key Words: classification, Fabaceae, Glycininae, Phaseoleae, taxonomy

Introduction

Pueraria de Candolle (1825: 97) belongs to the tribe Phaseoleae, subtribe Glycininae in the legume family (Leguminosae, Papilionoideae). The genus was first described to accommodate two species: *P. tuberosa* (Roxburgh ex Willdenow) de Candolle (1825: 97) and *P. wallichii* de Candolle (1825: 97). Since then, the genus has been expanded to include ca. 20 species native to southern, eastern, and Southeast Asia (geographical regions as ascribed by the United Nations statistical divisions). *Pueraria* includes two species that have been introduced widely outside their native ranges: kudzu, *P. montana* (Loureiro) Merrill var. *lobata* (Willdenow) Maesen & S.M.Almeida ex Sanjappa & Predeep (Sanjappa 1992: 288), is a notorious invasive species introduced from Asia to the United States in the 1800's, originally for fodder and soil erosion control; tropical kudzu, *P. phaseoloides* (Roxburgh) Benth (1865: 125) has been widely planted as a cover crop and used as a green manure pantropically. Various economic uses of *Pueraria* species have been documented since ancient times. References going as far back as 500 B.C. in Chinese literature (Keng, 1974) and 600 A.D. in Japanese literature (Shurtleff & Aoyagi, 1977) record uses in food, medicine, paper, clothing, cordage, and construction materials. More recently, van der Maesen (1985) summarized the importance of understanding the biodiversity in *Pueraria* when he said "Some species of *Pueraria* are important as fodder, green manure crops, or weeds; some produce edible tubers; some have medicinal or poisonous properties, but many are rare or only locally abundant and poorly collected."

Previous treatments have recognized the unnatural grouping that comprises *Pueraria*. In his unpublished dissertation and treatment of tribe Phaseoleae, Lackey (1977b) tentatively segregated his 20 recognized *Pueraria* species into four groups (A–D, Table 1) based on morphological characters and stated that his groups A–C should be retained within *Pueraria*. However, he also recognized that species in group C could potentially be removed from *Pueraria* and allied with his new genus *Neonotonia* J.A.Lackey (1977), erected for *Glycine wightii* (Graham ex Wight & Arnott) Verdcourt (1966: 35), an idea first proposed, twice, by Wight and Arnott (1834). Lackey also recognized that species in group B were distinct enough from group A to warrant the creation of a new genus. Lackey also suggested that group D should be excluded from *Pueraria* based on morphology (1977b) and, in particular, that *P. wallichii* was anomalous in the genus based on the presence of canavanine, a non-proteinogenic α -amino acid (Lackey, 1977a). In spite of all these recommendations, Lackey did not formally revise the genus according to his groupings.