

A global survey of genus *Lotus* (Loteae-Fabaceae)

[ARNOLDO SANTOS](#)*

Unidad de Botánica-Instituto Canario de Investigaciones Agrarias (ICIA). Jardín de Aclimatación de La Orotava, Calle Retama 2, 38400 Puerto de la Cruz (Tenerife). Canary Islands- Spain.

* Corresponding author

[click here for Spanish version](#)

Lotus (Fabaceae: Loteae) is a moderate size genus comprising 125 – 180 spp. (Sokoloff and Lock, 2005). It includes herbs, suffrutices, and small shrubs; some of the species have ornamental values (i.e., specially the *Rhyncholotus* group from Canary Islands), others have broad use as forage (i.e., particularly the *L. corniculatus* –birdstrefoil-complex, *L. pedunculatus* –bigtrefoil- and *L. tenuis*), and others are used as cosmetics. The tribe Loteae is closely related to Sesbanieae and Robineae. The genus is composed of several subgenera, although their boundaries are not clearly understood and additional taxonomic research is needed at supra-generic level. For instance, the latest edition of Flora Europaea does not recognize any subgenus and divide the genus into six sections (i.e., *Lotus*, *Erythrolotus*, *Krokeria*, *Lotea*, *Pedrosia* and *Quadrifolium*). In addition, Flora Europaea considers *Dorycnium* as a distinct genus. This taxonomic treatment is also followed by Flora Iberica. *Lotus* is mostly confined to the northern hemisphere with a few species in southern one (South America, Africa and Australia). Flora Europea distinguishes over 30 species in Europe, and the genus also occurs in North Africa and the Atlantic archipelagos of Azores, Madeira, Salvajes, Canaries and Cape Verde Macaronesian Islands. Over 20 species are endemic to these islands. Few species of the genus occur in East Africa, although some of them are found on high altitudes areas of the Somalia-Masai massif. The Arabia peninsula, Sokotra, and South Africa have a very limited number of species. This pattern is also found in the New World, where there are few species on North America, Central America, and/or South America. *Hosackia*, a genus previously placed within *Lotus*, has over 11 species in SW Canada, W USA, Mexico and Guatemala, although most of them are in California areas. Among them, *Lotus corniculatus* and relatives have been the subject of intensive research because their value as cash-crops. A main limitation for the agriculture exploitation of these species concerns the presence of cyanogenic compounds, and several research programs are under development at different countries to explore and increase its use. Nucleotide sequences of the ITS region of the nuclear ribosomal DNA have been used to obtain phylogenetic reconstructions. These molecular phylogenies have included species from North America (Allan and Porter, 2000) and from the Atlantic Islands (Allan *et al.*, 2004). A recent taxonomic study by Sandral *et al.* (2006) concerned *Lotus* section *Pedrosia*, this study included all of the Macaronesian species, a selection of the North-western African ones and two species with a Mediterranean distribution, *Lotus arenarius* and *L. creticus*. Recent taxonomic research has relied mostly on flower, leaves and stipules traits and has been recently published by Kramina (2006). This recent study has helped to clarify taxonomic boundaries within the *L. angustissimus* complex, a taxon mostly found in Eurasia. Types of

indumentum have been tacked in account by Mader and Podlech (1989) to differentiate marrocan species. Molecular systematic and morphological taxonomy research is currently been undertaken by Graeme Sandral (Australia), Botanical Gardens Orotava and Viera y Clavijo at Canary Is., and Isidro Ojeda (Vancouver, Canada). Several projects are trying to get commercial cultivar(s) that will help to reduce soil water recharge and salinity problems (Graeme Sandral and collaborators, Australia). Other projects are under development at Uruguay, Chile and Argentine trying to get a better use of *Lotus* spp. as forage plants including nitrogen fixation capacity.

References

- ALLAN G.J. and PORTER J.M. 2000. Tribal delimitation and phylogenetic relationships of Loteae and Coronilleae (Faboideae: Fabaceae) with special reference to *Lotus*: evidence from nuclear ribosomal ITS sequences. *American Journal of Botany*, **87**, 1871-1881.
- ALLAN G.J., FRANCISCO-ORTEGA J., SANTOS-GUERRA A., BOERNER E. and ZIMMER E.A. 2004. Molecular phylogenetic evidence for the geographic origin and classification of Canary Island *Lotus* (Fabaceae: Loteae). *Molecular Phylogenetics and Evolution*, **32**, 123-138.
- KRAMINA T.E. 2006. A contribution to the taxonomic revision of the *Lotus angustissimus*-complex (Leguminosae, Loteae). *Wulfenia*, **13**, 57-92.
- MADER U. and PODLECH D. 1989. Revision der marokkanischen Arten von *Lotus* L. subgen. *Pedrosia* (R. Lowe) Brand (Leguminosae).- *Mitt. Bot. Staatssamml. München.*, **28**, 513-567.
- SANDRAL G., REMIZOWA M.V. and SOKOLOFF D.D. 2006. A taxonomy survey of *Lotus* section *Pedrosia* (Leguminosae, Loteae). *Wulfenia*, **13**, 97-192.
- SOKOLOFF D.D. and LOCK J.M. 2005. Loteae. **In** LEWIS G., SCHRIRE B., MACKINDER B. and LOCK M. (Eds.). *Legumes of the world*. BATH Press: United Kingdom. pp. 455-466.