

VASCULAR BUNDLES IN GENUS Lotus L.
SUBGENUS Deflectostylus Callen SEEDS
(FABACEAE - FABOIDEAE)

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ABSTRACT

The purpose of this paper was to study the seed vascular bundles into subgenus Deflectostylus, its systematics value.

Seeds from sixteen species and three varieties have been surveyed.

Microscopic observations were made on seed coats with the interior of the hilar area exposed. After that, the following characters were obtained: there is not post-chalazal vascular bundle; every species have showed pre-chalazal vascular bundle; two recurrent vascular bundles developed along the length of the hilum were found in L. denticulatus, L. huaistratus, L. micranthus, L. purshianus, L. subpinnatus and L. wrangelianus seeds. These species can be distinguished from another subgenus Deflectostylus species studied.

Vascular system have showed to be stable at the species level.

Introduction

In Faboideae seeds we can find the most internal testa layer, parenchymatous tissue carrying the raphe v.b. or pre-chalazal v.b. between the hilum and the chalaza: it is at the basal end of the seed. Following this trajectory, the antiraphe v.b. or post-chalazal v.b. is carried on the opposite side of the seed from the base to the hilum. Sometimes there are two r.v.b. which connect with the raphe v.b. at its entry to the seed. In longitudinal section view the r.v.b. are found below the tracheid bar and these do not extend beyond the hilum. In transectional view these v.b. are found side by side below the tracheid bar.

By other way, every v.b. may be singles or they may give off branches to the sides of the seed.

Corner (1951) reported: there are much variation in vascular supply in the Faboideae but the variation may be systematic with generic or tribal value.

Abbreviations

r.v.b. recurrent v.b.
v.b. vascular bundle

Materials and Methods

Seed samples were obtained from C.Gunn, USDA, National Seed Herbarium (BARC-East), Beltsville, MD; G.White, USDA, Plant Introduction Program (PI), Beltsville, MD; Ann Pinzl, Herbarium Nevada State Museum, Capitol Complex (NSMC), Carson City, NV, USA; L.Arnou, Department of Biology, Univ. of Utah, Salt Lake City (UT), USA; R.Corrall, Biology Dept. New Mexico State University (NMC), Las Cruces, NM, USA; D.Sitha, Herbarium Santa Barbara Botanic Garden (SBBG), Mission Canyon Road, CA, USA; G.Levin, Herbarium San Diego (SD) Natural History Museum, CA, USA; D.Meyer, Department of Food and Agriculture (CDA), Sacramento, CA, USA; John Strother, University Herbarium Department of Botany (UC), Berkeley, CA, USA; N.Morin, Herbarium Missouri Botanical Garden (MO), St.Louis, MO, USA; W.Grant, Genetics Lab. McDonald Campus of McGill University, Ste Anne de Bellevue (B), Quebec, Canada; M.Muñoz Schick, Museo Nacional de Historia Natural (MNHN), Santiago, Chile; A.Torres, Herbario de la Facultad de Ciencias Naturales, Museo de La Plata (LP), Argentina.

Seed coats have been got from softened seeds in water boiling during 2-5 minutes.

Episperms colorless and stained with safranin with the interior of the hilar area exposed were mounted on slides

Results

I have found the following:

- . There is not post-chalazal v.b.
- . Every species have showed pre-chalazal v.b.
- . The vascular bundles are unbranched.
- . The vascular system have showed to be not variable into each species studied.

Table 1. Recurrent vascular bundles in Lotus subgenus Deflectostylus seeds.

species	characters	r.v.b. developed	r.v.b. no developed
<i>L. argyraeus</i> Greene			+
<i>L. denticulatus</i> (Drew) Greene		+	
<i>L. grandiflorus</i> (Benth.) Greene			+
<i>L. greenei</i> Ottley, in Kearney & Peebles			+
<i>L. humistratus</i> Greene		+	
<i>L. mearnsii</i> (Britton) Greene			+
<i>L. micranthus</i> Benth		+	
<i>L. oroboides</i> (HBK) Ottley ex Kearney & Peebles			+
<i>L. purshianus</i> (Benth) Clements & Clements		+	
<i>L. rigidus</i> (Benth) Greene			+
<i>L. salsuginosus</i> Greene			+
<i>L. salsuginosus</i> var. <i>brevivexillus</i> Ottley			+
<i>L. strigosus</i> var. <i>hirtellus</i> (Greene) Ottley			+
<i>L. strigosus</i> var. <i>tomentellus</i> (Greene) Isely			+
<i>L. subpinnatus</i> Lagasca		+	
<i>L. utahensis</i> Ottley			+
<i>L. wrangelianus</i> Fischer & Meyer		+	
<i>L. wrightii</i> (A.Gray) Greene			+

Discussion

On the basis of style-stigma feature Ottley (1944) proposed the sections Simpeteria Ottley and Microlotus Benth to the subgenus Acmispon Raf.

Later, Callen (1959) by character obtuse angle of attachment of the style to the ovary proposed a new subgenus named Deflectostylus, because the names Acmispon Microlotus and Anisolotus were not suitable, so, the species of Ottley's subgenus Acmispon falls into it.

Now, I have found in seed of species studied that on the basis of r.v.b. character there are two groups placed under subgenus Deflectostylus (table 1); the species included in these groups are the same that Ottley (1944) had separated in Microlotus and Simpeteria sections, except to L. salsuginosus and L.s. var. brevivexillus.

Conclusions

Lotus denticulatus, L. humistratus, L. micranthus, L. purshianus, L. subpinnatus and L. wrangelianus form a group closely related; these species can be distinguished from another subgenus Deflectostylus species studied.

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