



Short Paper

Adenocarpus ronaldii Essokne & Jury. sp. nov. (Leguminosae). A New Species From Morocco

RAFAA S. ESSOKNE¹, MOHAMED H. MAKHLOUF¹, STEPHEN L. JURY^{2*}

1. Department of Botany, University of Tripoli, National Herbarium of Libya. E-mail: rafa_essokne@yahoo.com. Mahklouf64@yahoo.com

2. School of Biological Sciences (Harborne Building), University of Reading, Whiteknights, Reading RG6 6AS, United Kingdom. E-mail: stephenjury21@btinternet.com

Corresponding author*. Rafea Essokne. Email. rafa_essokne@yahoo.com

ARTICLE INFO

Article history:

Received 22 Oct. 2017

Revised 22 Dec. 2017

Accepted 12 Jan. 2017

Adenocarpus ronaldii (Leguminosae) is proposed as a new species with a distribution restricted to the Middle Atlas in Morocco, Zaiane, Oulmes. Its morphological, biogeographical and ecological features are discussed, together with its relationship to, and differences from, the other species of *Adenocarpus* complicates (L.) Gay.

Keywords: Adenocarpus, Leguminosae, Morocco 'new species, taxonomy.

Introduction

The genus *Adenocarpus* DC. is centered in the western Mediterranean with ten species enumerated in *Flora iberica* [1]. Which dramatically increased the taxa previously recognised in Spain [2] by adding ten species and three subspecies. The account for Morocco [3] is old and was not significantly revised in the *Flora Practique de Maroc* [4]. The total area of distribution of *Adenocarpus* includes Macaronesia, northern, southwestern Europe, and more locally, Central and South Italy, Greece, West Turkey, Libya and Syria [5], and one species in Tropical Africa, *Adenocarpus mannii* Hook.f. A recent treatment for Morocco is given by Ouyahia et al. [4] in the *Flora Practique du Maroc*. However, this account simply follows that of Greuter, Burdet & Long [6] in Med-checklist, although they add a hybrid *A. × subdecorticans* Humbert & Maire (*A. decorticans* × *A. complicatus* var. *tazzekanus* Humbert & Maire. Unlike Castroviejo [7], this treatment ranks the *A. complicatus* complex of variation at the subspecies level. The new *Index Synonymique de la Flore d'Afrique du Nord* volume 4 account of *Adenocarpus* enumerates eight species, one with two subspecies, plus a hybrid [8] and maintains a traditional view. The genus was last fully revised by Gibbs [9], who recognized 14 species; two in the Canary Islands, seven in North Africa, four in the Mediterranean region of Europe, extending into the Atlantic region (Spain, Portugal, France), and one species in Tropical Africa, *Adenocarpus mannii* Hook.f. The major floristic inventory of the Mediterranean, Med-checklist [6], enumerated

a total of 11 species and six subspecies. Since then Castroviejo [1] has undertaken a revision of the genus for the Iberian Peninsula for his account in *Flora Iberica* [7] and added two further species. In addition, he raised some subspecies to species status. Furthermore, earlier Reading University fieldwork in Morocco suggested that the genus presently consists of ca. 25 species [10]. However, in this paper *Adenocarpus ronaldii* is recognised as a new species and accordingly described.

Materials and Methods

In order to revise and understand the variation in *Adenocarpus* in Morocco, field collections were made from the end of May until mid-June 2007. The specimens were collected by S.L. Jury & Rafea Essokne from natural habitats in Morocco, GPS readings for all the sites were recorded and the specimens were dried and transported to the University of Reading Herbarium. A small amount of leaves were reserved in Silica gel ready for morphological, phytochemical analysis and DNA extraction. Permission to collect and export the material was obtained through Professor Sherif Harouni (IAV-Agadir) and Professor Mohammed Fennane (RAB). Morphology was studied mainly on herbarium specimen material examined using light microscope. Flowers and leaflets from herbarium specimens were rehydrated in boiling water for about 5 min with two drops of detergent for the vegetative morphology of leaves, stipules, flowers and the glandular papillae on both the calyx and fruits, samples were obtained from herbarium specimens in RNG, NHM, and E.

Latin diagnosis

Adenocarpus ronaldii Essokne & Jury, sp. nov.

= *A. complicatus sensu* Greuter, Burdet & Long, *Med-Checklist*, 4: 4, Ma [Morocco only] (1989), *non* (L.) Gay.

Frutex ad 150 cm, caulibus subglabris; ramis multis cum pilis dense villosis, foliis trifoliolatis, foliolis obovatis 6—9 × 3.0—4.1 mm, superficiebus dense sericeis, infernis dense subglabris; petiolis 4—5 mm; inflorescentia recemosa; bracteis lanceolatis 2.2—3.0 mm, glandiferis papillis; bracteolis sublinearibus ad lanceolatas 2—3 mm, glandiferis papillis; calycibus 5—8 mm, glandiferis papillis, labiis superis triangularibus duo dentibus, 4.0—4.5 mm, infernis 5.0—5.7 mm; corollis luteis, vexillis late ovatis, 12—15 mm, alis 12—13(13.5) mm, carinis 13—13.2 mm; leguminibus 25—45 mm, glandiferis papillis; seminibus 5—8.

English description

Shrub up to 150 cm, stem subglabrous; with many branches, with densely villous hairs, leaves trifoliolate, leaflets obovate, 6—9(10) × 3—4.1 mm, upper surfaces with densely sericeous hairs, lower surfaces subglabrous; petioles 4—5 mm; inflorescence racemose; bracts lanceolate, 2.2—3.0 mm, with glandular papillae; bracteoles sublinear to lanceolate 2—3 mm, with glandular papillae; calyces 5—8 mm, with glandular papillae, upper lips

with two triangular teeth 4.0—4.5 mm, lower lips 5.0—5.7 mm; corollas yellow, standard broadly ovate, 12—15 mm, wings 12—13(13.5) mm, keels 13—13.2 mm; legumes 25—45 mm, with glandular papillae, seeds 5—8.

Type: Morocco, Middle Atlas, Zaiane, Oulmes, 15.5 km from Oulmès and 76.5 km from Khemisset, 33° 28' 50" N, 6° 07' 17" W, 930 m, 5.7.2007, *S.L. Jury & R. Shkwa 20890* (Holotype: RNG !; Isotypes: BM !, RAB !, PAL !).

Distribution: This species is endemic to Oulmès in the Middle Atlas, Morocco. (Figure 2).

Selected specimen examined: MOROCCO: Oulmès: Oakwoods of El-Harcha, 1050 m, 16.5.1969, *Paunero, Galiano, Gibbs & Valdés 1857-69* (E); Meknès, prope lacum Tatchas dictum, 32°56' N 5°18' W, 1500 m, 3.6.1985, *Blanche, Casas, Molero, Montserrat & Romo 20* (E, RNG).



Figure 1. *A.ronaldii* Essokne & Jury, sp. nov.



Figure 2. *A. ronaldii* Essokne & Jury, sp.nov. Middle Atlas, Zaiane, Oulmès, 15.5 km from Oulmes and 76.5 km from Khemisset. 33° 28'50'' N, 6° 07'17'' W alt. 930 m

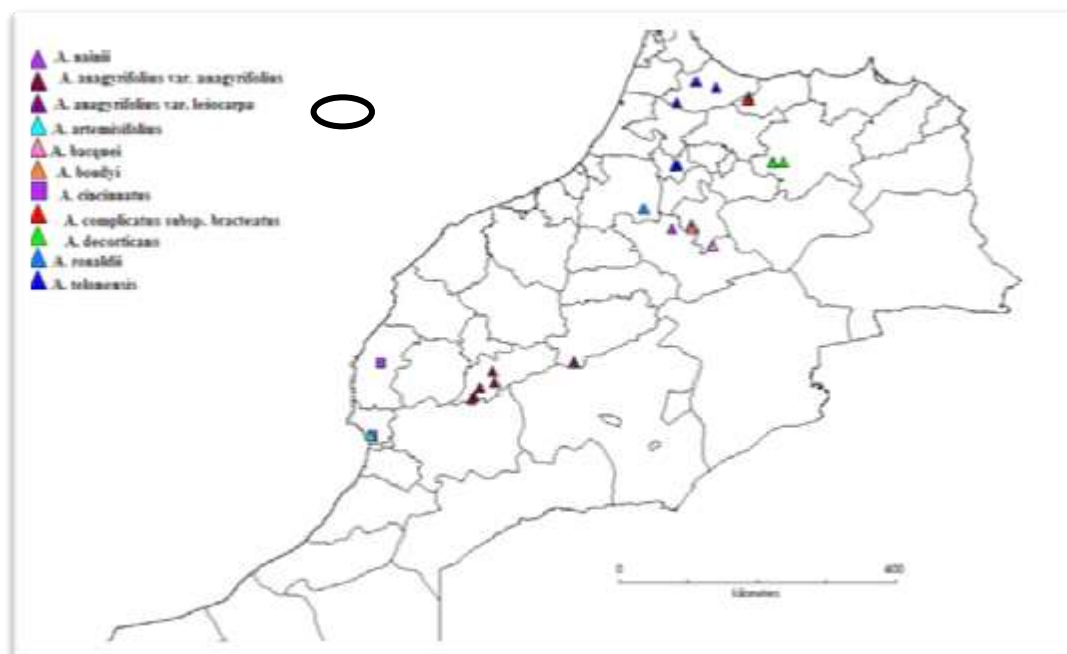


Figure 3. Map showing distribution of the genus *Adenocarpus* in Morocco.

Results and Discussion

On the basis of the herbarium specimens, phytochemical analysis and the phylogeny of this taxon, it does not belong to the European *complicatus* complex. Therefore, this taxon must be considered a separate species endemic to the Middle Atlas region. According to

our observations and in accordance with the previous revisions [7, 9], *A. ronaldii* (Fig 1&3) can be distinguished from *A. complicatus* by several features: *A. complicatus* has leaflets whose lower surface is sparsely to densely hairy and the upper surface glabrous or hairy, while *A. ronaldii* has leaflets always densely hairy on the upper surface and subglabrous on the lower. Similarly, the calyx in *A. complicatus* is only sometimes with glandular papillae, the bracts and bracteoles always without glandular papillae, whereas in *A. ronaldii* the calyx is always densely covered with glandular papillae, the bracts and bracteoles always with glandular papillae. Both species have a legume without glandular tubercles.

Etymology: This species is dedicated to Mr Ronald Rutherford who has worked tirelessly for 40 years at the University of Reading, both in the Herbarium (RNG) and the Harris Garden. He has helped me considerably by finding and helping translate much botanical literature.

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