

OCHRADENUS ARABICUS (RESEDACEAE), A NEW RECORD FOR THE FLORA OF IRAN

S. Martín-Bravo & M. Amini Rad

Received 21 11 2009. Accepted for publication 03 03 2010

Martín-Bravo, S. & Amini Rad, M. 2010 06 30: *Ochradenus arabicus* (Resedaceae), a new record for the flora of Iran. –*Iran. J. Bot.* 16 (1): 84-86. Tehran.

The study of herbarium specimens of family *Resedaceae* from Iran (IRAN herbarium) resulted in the finding of a new species for the flora of Iran, *Ochradenus arabicus*. The specimens were collected in Chabahar (Sistan and Baluchestan province), in the SE part of the country. This new record constitutes an interesting disjunction for the range of this species, which was previously considered an endemic from the Arabian Peninsula. A brief description of this species and identification keys of the taxa of genus *Ochradenus* in Iran are provided, together with comments about their taxonomy and distribution.

Santiago Martín-Bravo (correspondence), Department of Molecular Biology and Biochemical Engineering, Pablo de Olavide University, ctra. de Utrera km 1, C.P. 41013, Sevilla, Spain (E-mail: smarbra@upo.es) - Mohammad Amini Rad, Department of Botany, Iranian Research Institute of Plant Protection, P.O. Box 1454, Tehran, Iran.

Key words. Arabian Peninsula, chorology, flora, Iran, new record, *Ochradenus*, *Resedaceae*.

گزارش *Ochradenus arabicus* از تیره *Resedaceae*. جدید برای ایران

سانتیاگو مارتین براو، دپارتمان زیست ملکولی و مهندسی بیوشیمی دانشگاه اولوید.

محمد امینی راد، مربی پژوهش مؤسسه تحقیقات گیاهپزشکی کشور.

در بررسی نمونه های هرباریومی متعلق به تیره *Resedaceae* در هرباریوم "IRAN"، نمونه ای از استان سیستان و بلوچستان (چابهار) مشاهده گردید که پس از مطالعه تحت *Ochradenus arabicus* تعیین نام گردید. این گونه بومی شبه جزیره عربستان می باشد و این گزارش گسستگی جالبی را برای محدوده این گونه تشکیل می دهد. صفات مورفولوژیکی این گونه و کلید شناسایی گونه های جنس *Ochradenus* در ایران آورده شده است. همچنین توضیحاتی راجع به این گونه و پراکنش آن نیز ارائه می شود.

Introduction

Ochradenus Del. is a small genus of about eight species of shrubs distributed in desert and arid regions of NE Africa and SW Asia, with a centre of diversity in the S Arabian Peninsula. Plants of *Ochradenus* are typically spinescent or intricately branching switch shrubs with deciduous leaves and frequently polygamous flowers with absent or ephemeral corolla. These features have been interpreted as adaptations to extremely xeric environments (Martín-Bravo *et al.* 2007). The taxonomy of the genus is complex and the number of species considered has varied depending on the different treatments proposed (2-9 species; Müller Argoviensis, 1857, 1868; Abdallah & de Wit, 1978; Miller, 1984; see Martín-Bravo *et al.*, 2007). The traditionally difficult taxonomy of the genus and the fact that its species frequently grow in scarcely explored or remote areas has brought about the description of new species until recent times (Abdallah

& de Wit 1978; Miller 1984; Thulin 1994a; Miller & Morris 2004; Knees *et al.* 2007). Only one species (*O. baccatus* Del.) is widespread across all the distribution of the genus, while most of the rest are restricted endemics in the S Arabian Peninsula and the horn of Africa (Miller 1984). Two species have been recorded in Iran to date, the widespread *O. baccatus* and *O. aucheri* Boiss. [including *O. ochradenii* (Boiss.) Abdallah], distributed from S Pakistan to SE Arabian Peninsula and represented by two subspecies in Iran (Abdallah *et al.* 1982; Miller 1984).

Materials and methods

Specimens of family *Resedaceae* from the IRAN Herbarium (Iranian Research Institute of Plant Protection, Tehran, Iran) were examined as part of taxonomical studies of *Resedaceae* in progress by the first author. Sheets were studied with a Nikon SMZ645 stereoscopic microscope. Identification of the material

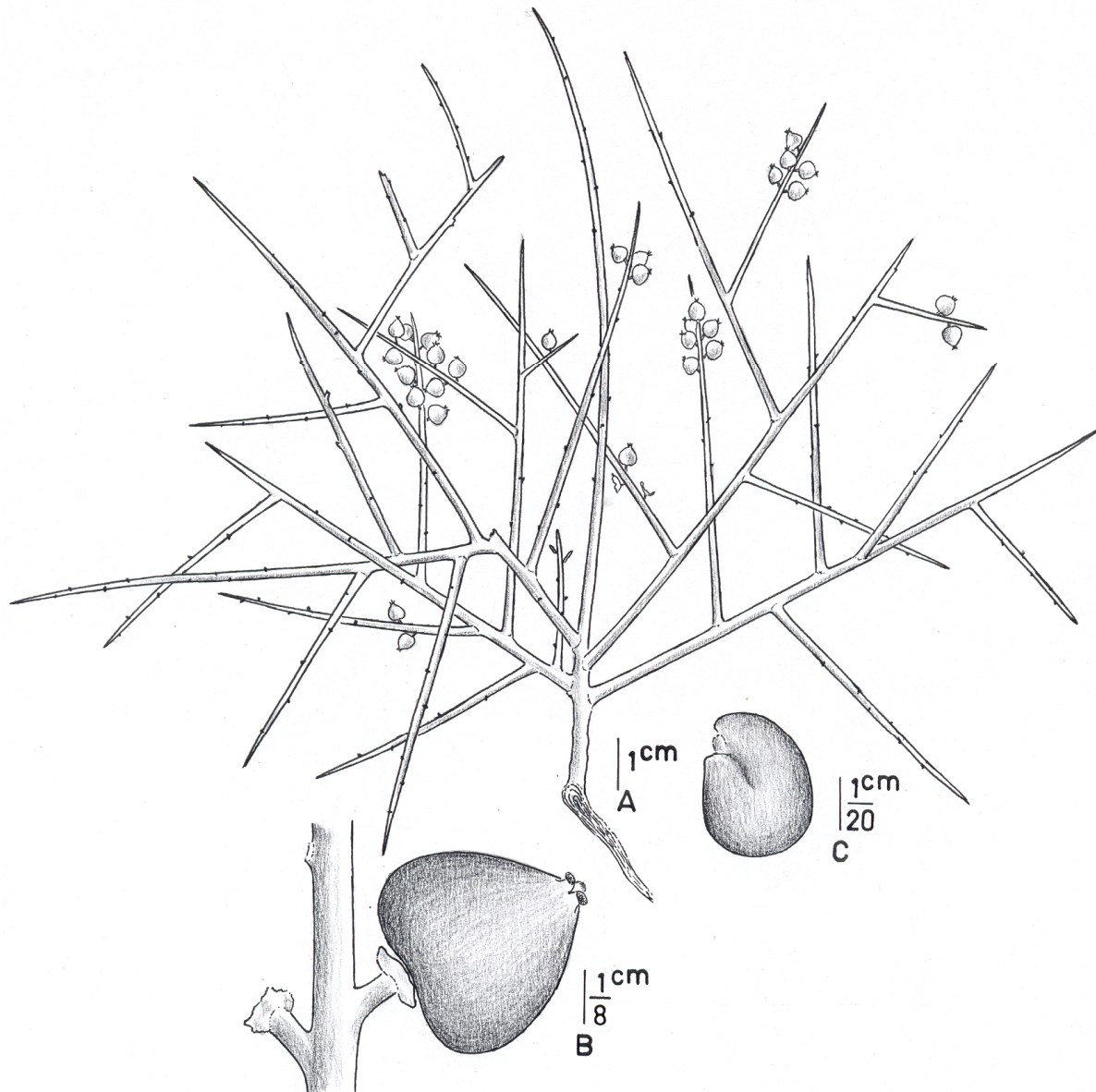


Fig. 1. *Ochradenus arabicus* (IRAN 35282). A) Habit; B) Fruit; C) Seed.

was achieved with the aid of different taxonomic works on the *Resedaceae*, with special focus on genus *Ochradenus* (Abdallah & de Wit 1978; Abdallah *et al.* 1982; Miller 1984, 1996; Nowroozi 1993).

Results and discussion

Ochradenus arabicus Chaudhary, Hillc. & A.G. Mill., Notes Roy. Bot. Gard. Edinburgh 41(3): 494 (1984). Iran: Baluchestan, Chabahar, 9 April 1949, Leg. Sharif (IRAN 35282; Fig. 1).

Description (modified from Miller 1984): Dioecious shrub, up to 50 (-100) cm. Branches glabrous, switch

(bearing leaves when young but becoming progressively aphyllous), intricately arranged, spinescent. Leaves linear, 15-25 mm x 0.5-1.8 mm. Sepals oblong-ovate, 0.5-1 mm. Petals absent or rarely 1-2 present, with linear limb. Disc single and reflexed, fleshy. Stamens 12-16. Capsules globose or ovoid-globose, 4-5.5 x 4-6 mm, papery, yellow or straw-coloured when ripe, usually densely arranged. Seeds reniform, 1.2-1.8 mm, smooth, glossy, blackish when ripe.

This species was described in the last taxonomic revision of the genus (Miller 1984). It has previously

been reported from Saudi Arabia, Yemen, Oman and United Arab Emirates, where it grows in limestone rocky ground and sandy arid places from 0 to 2000 metres above sea level (Miller, 1984, 1996). It can be readily distinguished from other species of the genus, including those recorded from Iran, mainly by its papery globose or ovoid-globose fruit and by its smooth, glossy seeds (Fig. 1). The studied specimens were collected near Chabahar, in the Sistan and Baluchestan province, in the SE part of Iran. They had been previously identified as *O. baccatus* by Rechinger in Flora Iranica (Abdallah & al. 1982; specimen with number 493-E, page 3). This population is separated by the Gulf of Oman (c. 300 km) from the nearest known conspecific populations in NE Oman. Therefore this new record implies an interesting disjunction and a considerable increase in the range of this species, previously believed to be an endemic from the Central and Southern Arabian Peninsula. The Arabian Peninsula and SE Iran are considered part of the Saharo-Sindian floristic region (e.g. Wickens 1998; Al-Nafie 2008), which helps to explain this pattern of disjunction, also found in other plant species (Thulin 1994b).

Identification keys for the species of *Ochradenus* in Iran (modified from Miller 1984)

1. Fruit oblong-ovoid to ellipsoid, at least 1.5 as long as broad; fruit pedicels ≥ 2 mm; stamens 17-80 [*O. aucheri* Boiss. (SE Arabian Peninsula, Iran, S Pakistan)]²
 - Fruit globose or ovoid-globose, less than 1.5 as long as broad; fruit pedicels 0-1.5 mm; stamens 10-18³
2. Disc with a conspicuous raised collar around stamens; stamens 17-30
 - O. aucheri* subsp. *rechingeri* A.G. Mill. [S Iran, S Pakistan]
 - Disc more or less flat; stamens 17-25
 - O. aucheri* subsp. *ochradenii* (Boiss.) A.G. Mill. [C, N Iran] [= *O. ochradenii* (Boiss.) Abdallah]
3. Ripe fruit baccate, white or reddish when dry; seeds with minutely papillose testa; shrub with frequently struggling habit
 - O. baccatus* Del. [NE Africa, SW Asia]
 - Ripe fruit papery, yellow or straw-coloured; seeds with smooth, glossy testa; shrub with spinescent habit
 - O. arabicus* Chaudhary, Hillc. & A.G. Mill. [C, S Arabian Peninsula, SE Iran]

Acknowledgements

The authors thank Mr. M. Mehranfard for drawing the specimen and the funding of the Spanish Ministry of Science and Technology and the Andalusian

Government through projects CGL2009-09972 and P06-RMM-4128, respectively.

References

- Abdallah, M. S. & de Wit, H. C. D. 1978: The Resedaceae: a taxonomical revision of the family (Final instalment). -Meded. Landbouwhoogeschool Wageningen, 78.
- Abdallah, M. S., de Wit, H. C. D. & Rechinger, K. H. 1982: Resedaceae in Rechinger, K.H. (ed.), Flora Iranica, no. 149. -Akademische Druck, Graz.
- Al-Nafie, A. 2008. Phytogeography of Saudi Arabia. - Saudi J. Biol. Sci. 15: 159-176.
- Knees, S. G., Laser, S., Miller, A. G. & Patzelt, A. 2007: A new species of Barleria (Acanthaceae) from Oman. -Edinburgh J. Bot. 64: 107-112.
- Martín-Bravo, S., Meimberg, H., Luceño, M., Märkl, W., Valcárcel, V., Bräuchler, C., Vargas, P. & Heubl, G. 2007: Molecular systematics and biogeography of Resedaceae based on ITS and *trnL-F* sequences. -Molec. Phylogenet. Evol. 44:1105-1120.
- Miller, A. G. 1984: A revision of Ochradenus. -Notes Roy. Bot. Gard. Edinburgh 41: 491-594.
- Miller, A. G. 1996: Resedaceae in Miller, A. G., Cope, T. A. (eds.) Flora of the Arabian Peninsula and Socotra vol. 1: 448-460. -Edinburgh University Press, Edinburgh.
- Miller, A. G. & Morris, M. 2004: Ethnoflora of the Socotra Archipelago. -Royal Botanic Garden, Edinburgh.
- Müller Argoviensis, J. 1857: Monographie de la famille des Résédacées. -Zürcher and Furrer, Zürich.
- Müller Argoviensis, J. 1868: Resedaceae in de Candolle, A. P. (ed.), Prodromus Systematis Naturalis Regni Vegetabilis vol. 16 (2): 548-589. -Victor Masson, Paris.
- Nowroozi, M. 1993. Resedaceae in Assadi, M., Maassoumi, A. A., Khatamsaz, M. & Mozaffarian, V. (eds.) Flora of Iran, no. 9. -Research Institute of Forests and Rangelands.
- Thulin, M. 1994a: A new species of Ochradenus (Resedaceae) from southern Arabia. -Nord. J. Bot. 14: 383-384.
- Thulin, M. 1994b: Aspects of disjunct distributions and endemism in the arid parts of the horn of Africa, particularly Somalia. pp. 1105-1119 in Seyani, J. H., Chikuni, A. C. (eds.). -Proceedings of the XIIIth Plenary Meeting AETFAT 2, Malawi.
- Wickens, G. E. 1998: Ecophysiology of economic plants in arid and semi-arid lands. -Springer-Verlag, Berlin.