



A new *Crocus* L. (Iridaceae) species from SE Turkey, based on morphological and molecular data

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Abstract

Crocus musagecitii is described as a new species. Diagnostic morphological characters, a full description and detailed illustrations are provided on the basis of the type specimen and wild specimens. Morphologically, *C. musagecitii* is close to *Crocus biflorus* subsp. *pseudonubigena*. *Crocus musagecitii* differs from *C. biflorus* subsp. *pseudonubigena* by the lack of stripes or narrow purplish tongue on outside of outer tepals, wider tepals, and homogenously yellow anthers. In order to clarify the phylogenetic position of this species within the *Crocus adamii* species complex, we sequenced the internal transcribed spacer region (ITS: ITS1 + 5.8SrdDNA + ITS2) and 5' external transcribed spacer (ETS) of the nuclear ribosomal DNA (rDNA). A phylogenetic tree obtained by Bayesian phylogenetic inference is given. Phylogenetic analyses revealed that the new taxon is close to *C. munzurensis*. *Crocus musagecitii* differs from its phylogenetically closest relative *C. munzurensis* by the corm tunics (*C. musagecitii*: coriaceous; *C. munzurensis*: membranous), the number of leaves (*C. musagecitii*: up to 8; *C. munzurensis*: up to 4) and non-hairy leaf margins.

Key words: ETS, ITS region, morphology, single-copy gene regions, taxonomy

Introduction

Crocus Linnaeus (1753: 36) was known to cover about 90 species (Mathew 1982, Mathew 1984, Petersen *et al.* 2008). However, since the last revision of the genus (Mathew 1982), over 50 new species were described (e.g. Erol *et al.* 2011, 2012, 2014a, 2014b, Peruzzi & Carta 2011, Harpke *et al.* 2014, 2015, Kerndorff *et al.* 2013a, 2013b, 2013c, Randelovic *et al.* 2012, Yüzbaşıoğlu & Varol 2004, Yüzbaşıoğlu *et al.* 2015) suggesting that the number of species is much higher. Taxonomically the genus is currently complicated, as e.g. many of the newly described taxa are not assigned to any series. Moreover, recent phylogenetic analyses proved several units within the genus *Crocus* to be para- or polyphyletic even at infraspecific level like in the case *C. biflorus* Miller (1768: 4) and its 23 subspecies (see Mathew 1982). In phylogenetic trees taxa of *C. biflorus* sensu Mathew were found in distinct clades intermingled with taxa on species rank sometimes even from different series (Petersen *et al.* 2008, Harpke *et al.* 2013). A clade comprising different *C. biflorus* subspecies sensu Mathew (1982) is very homogenous and is sister to another large clade comprising *C. ser. Aleppici* Mathew (1982: 103), *ser. Flavi* Mathew (1982: 94), *ser. Speciosi* Mathew (1982: 109), *ser. Reticulati* Mathew (1982: 61) and other former *C. biflorus* subspecies sensu Mathew (Harpke *et al.* 2013). This clade comprises 19 taxa (Kerndorff *et al.* 2013c), four of them are former *C. biflorus* subspecies. To arrive at a systematic treatment of *Crocus* that reflects natural relationships among taxa a new circumscription of this clade on series level is in preparation by H. Kerndorff (see also Kerndorff *et al.* 2013c). Here we will refer to it as *Crocus adamii* Gay (1811: 319) species complex.

The taxa of the *Crocus adamii* species complex are characterized by toothless basal tunic rings [with the exception of *C. aeri*us Herbert (1847: 288), lacking rings], silvery bract and bracteole (in some taxa they turn brown with aging), glabrous throat, trifurcate style and vernal flowers. Within the *Crocus adamii* species complex several well-defined species groups can be identified, such as *Crocus pseudonubigena* group—comprising three different species characterized by blackish anthers- or the *Crocus munzurensis* group.