



The synopsis of the genus *Gagea* (Liliaceae) in Turkey

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Abstract

In this study, the synopsis of the genus *Gagea* taxa in Turkey is presented. According to Flora of Turkey, the genus has 26 taxa (25 species and one subspecies) in Turkey, however at the end of this study, the number has been increased to 29 species. It has been determined that *G. foliosa*, *G. fibrosa*, *G. granatellii*, *G. taurica*, and *G. tenera* do not actually occur in Turkey. It has been confirmed that *G. rigida*, *G. alexeenkoana*, *G. commutata*, and *G. chlorantha* occur in the country. Diagnostic keys are provided for both sections and species within the genus.

Introduction

The history of the genus *Gagea* Salisbury (1806: 555) is based on Pallas (1773). Since then, many researchers have contributed significantly to the development of knowledge on this genus (Schultes & Schultes 1829, Koch 1849, Boissier 1882, Pascher 1904, 1907, Terracciano 1904, 1905a, 1905b, 1906, Post 1932, Grossheim 1935, Stroh 1937, Uphof 1958–1960, Heyn & Dafni 1971, 1977, Davlianidze 1972, 1973, 1976, Heywood 1980, Dasgupta & Deb, 1983a, 1983b, 1986, Feinbrun-Dotham 1986, Townsend & Guest 1985, Wendelbo & Rechinger 1990, Levichev 1990a, 1990b, 1999a, 1999b, 2006, 2011, Peruzzi 2003, 2011, 2012a, Peterson *et al.* 2004, 2008, 2011, Zarrei *et al.* 2007, 2011a, 2011c, Peruzzi *et al.* 2008a, 2011b, Schnittler *et al.* 2009, 2013, Tison *et al.* 2013, Beisinova *et al.* 2015). In recent years, studies in the molecular systematics of the genus have provided many important phylogenetic data (Patterson & Givnish 2002, Peterson *et al.* 2004, 2008, 2009, 2010, Peruzzi 2008, 2012b, Peruzzi *et al.* 2008a, 2008b, 2011, Zarrei *et al.* 2009, 2011a, 2011b, 2012, Wörz *et al.* 2012, Tison *et al.* 2013).

Gagea is represented by approximately 280 (Peruzzi 2012a) to 300 species worldwide (Peterson *et al.* 2008, 2011, Zarrei *et al.* 2011a, 2011b, Tison *et al.* 2013, Kayıkçı *et al.* 2014, Tekşen & Karaman Erkul 2015). In Flora of Turkey, this genus included 25 species and one subspecies, two of which were considered endemic (Rix 1984). In recent years, the following species were described: *G. sivasica* Hamzaoğlu (2008: 261), *G. antakiensis* Kayıkçı *et al.* (2014: 252), *G. vanensis* Tekşen & Karaman (2015: 270). Thus, this genus has evaluated as 29 species, four of which are endemic (Hamzaoğlu *et al.* 2008, Kayıkçı *et al.* 2014, Tekşen & Karaman Erkul 2015).

Gagea includes 13 sections according to Levichev (1990a, 2011) and Peterson *et al.* (2008). According to Peruzzi (2003, 2012a), Peruzzi *et al.* (2008a, 2008b, 2012a), and Tison *et al.* (2013), it includes 15 sections, mainly separated by the morpho-anatomic and ontogenetic features of the basal and cauline leaves, peduncle, pedicels, tepals, and seeds. On the contrary, Zarrei *et al.* (2011b) divided the genus into only 7 sections. In this study, researchers have agreed on Peruzzi (2012a) sectional classification and species were evaluated under 9 sections and 30 species in Turkey. The taxa of the genus *Gagea* belong to the following sections and the number of species in Turkey: sect. *Anthericoides* Terracciano (1905a: 24) (one species), sect. *Bulbiferae* Levichev in Peterson *et al.* (2008: 448) (one species), sect. *Didymobulbos* (Koch 1849: 229) Boissier (1882: 203) (14 species), sect. *Gagea* (three species), sect. *Minimae* (Pascher 1907: 357) Davlianidze (1973: 62) (one species), sect. *Persicae* (Levichev 1990a: 230) Peruzzi (2012a: 24) (one species), sect. *Platyspermum* Boissier (1882: 204) (four species), sect. *Plecostigma* (Turczaninov 1844: 8) Pascher (1904: 116) (three species), and sect. *Stipitatae* (Pascher 1904: 118) Davlianidze (1972: 71) (two species).

The aim of the study is 1) to update the taxonomy and distribution of the genus *Gagea* in Turkey, 2) to provide diagnostic keys for species identification, and 3) to provide a contribution to the preparation of a monograph of the genus *Gagea*.