



Article

The identity of *Bupleurum citrinum* Hochst. (Umbelliferae)

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Abstract

Described from Erzurum Province in eastern Turkey, the annual plant *Bupleurum citrinum* has not been included in modern Turkish floras. Examination of a single type specimen of this species in the University of Tübingen Herbarium showed that *B. citricum* belongs to *B. aleppicum*, a species widely distributed in Iran, Iraq, Syria and Turkey.

Keywords: *Bupleurum*, *Bupleurum citrinum*, Turkey, Umbelliferae

Introduction

Bupleurum citrinum Hochst., a rare and enigmatic species in the flora of Turkey, was not included in the latest summary of the Turkish vascular flora (Güner *et al.*, 2012). The species was described by Hochstetter (1845) from Erzurum Vilayet (Province), where, for almost two centuries, beginning with Tournefort (1656–1708), a huge amount of herbarium material has been collected. These herbarium specimens are stored mainly in G, P, W, LE and Turkish herbaria, including ANK, HUB and ISTE (Herbarium codes follow Thiers, 2016+). According to the data from these collections and publications on the Turkish flora, summarized in the database ASIUM (see Pimenov and Leonov, 2004) compiled in the Botanical Garden of Lomonosov Moscow State University, five *Bupleurum* species, excluding *B. citrinum*, are indicated for Erzurum Vilayet. They are *B. brachiatum* K.Koch ex Boiss., *B. croceum* Fenzl, *B. exaltatum* M.Bieb., *B. polyphyllum* Ledeb. and *B. schistosum* Woronow. None of these species correspond in their characteristics to the description of *B. citrinum*. The annual *B. brachiatum* with narrow stem leaves is the most similar to the latter, yet it differs sharply in the shape and size of its bracteoles.

Since its description *Bupleurum citrinum* has been mentioned in a few publications (Walpers, 1846; Tchihatscheff, 1860; Boissier, 1872; Wolff, 1910; Snogerup, 1972), sometimes without comment but with reproduction of the original description by Hochstetter (1845), as in the surveys by Walpers (1846) and Tchihatscheff (1860). Boissier (1872)



Fig. 1. Holotype of *Bupleurum citrinum* Hochst. (TUB)

suggested that the species belonged to the section *Glumacea* Boiss. ex H.Wolff and was followed in this matter by Wolff (1910). Only Snogerup (1972) noted the similarity of the

species description with that of *B. aleppicum* Boiss.. In his note to *B. aleppicum* he wrote: “from the description, *B. citrinum* Hochst. in Lorent, Wanderungen 337 (1845) described from Erzurum, may well be synonymous.” However, none of these botanists studied the original collection of Lorent, which is stored in the Herbarium of Tübingen University (TUB), established as holotype by Dr. C. Bräuchler, the Curator of TUB (see Global Plants on JSTOR). The author of the current paper visited the Tübingen Herbarium in August 2018 with the main goal of exploring this specimen.

A single type sheet, collected by Lorent from Erzurum in 1843–1844, is kept in TUB (Fig. 1). It contains only one plant with a branching stem, without roots and mature fruits. In addition to the plant, on the herbarium sheet there is a label containing the diagnosis of the species, written in clear handwriting by Hochstetter (Fig. 2):

Bupleurum citrinum Hochst.

Folia linearia versus apicem acuminatissima 5-7-nervia, umbellae triradiatae involucri triphylo pedunculos subaequante, involucri foliolis lanceolato-acuminatis 5 nerviis, involucello 5 phyllo, flosculos denos vel plures duplo superante, foliolis ovatis mucronato-acutis, citrinis, quinquenerviis et eleganter venosis.

Prope Erzerum legit Dr. Lorent.

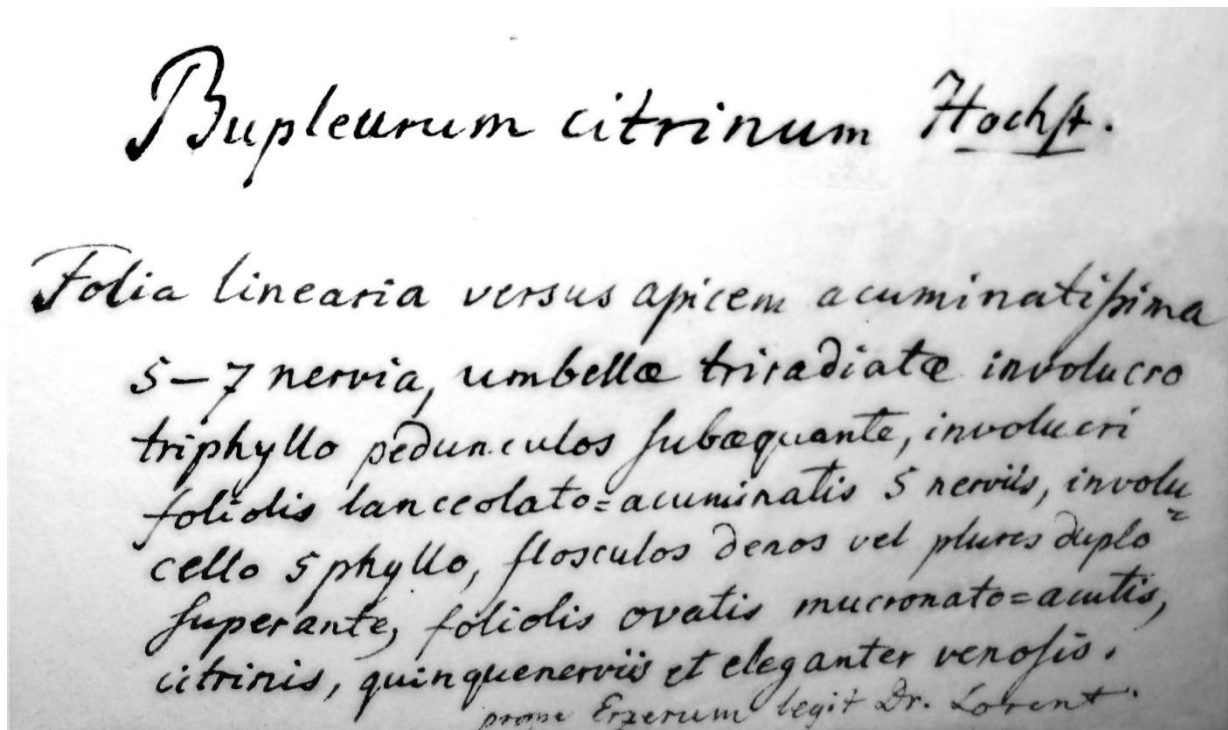


Fig. 2. Diagnosis of *Bupleurum citrinum* handwritten by C.Hochstetter (1845)

Broad coloured bracteoles are the most obvious characteristic of the species. Some species, such as *B. brachiatum* or *B. pulchellum* Boiss. & Heldr., which are similar in life form, linear stem leaves and general habit, differ greatly from *B. citrinum* in having smaller and firmer, lanceolate umbellate bracteoles with three prominent veins. I concluded that it is impossible to synonymize *B. citrinum* with any other species known in Erzurum and it is a novelty to the flora of Erzurum Vilayet.

A broader search among annual *Bupleurum* species of Turkey and neighbouring countries, however, allowed attribution of the plant from Erzurum known as *Bupleurum citrinum* to *B. aleppicum* (Fig. 3), as Snogerup (1972: 404) had suggested. *B. aleppicum* is widespread in northern Syria (described from Aleppo), Iraqi Kurdistan, western Iran and some provinces of Turkey, including the eastern Anatolian vilayets of Malatya, Elaziğ and Bingöl, but was never mentioned for Erzurum. In various European and Turkish herbaria there is a number of specimens that belong to the original material representing the species; one of them (treated here as an isoelectotype) is shown in Figure 3.

Taxonomic summary

Bupleurum aleppicum Boiss. Ann. Sci. Nat. (sér. 3, Bot.) 1 (Pl. Aucher.): 148. 1844.

References: Boissier, 1872: 840; Post, 1896: 341; Wolff, 1910: 72; Nábělek, 1923: 120; Post, 1932: 511; Thiebaut, 1936: 141; Mouterde, 1970: 635, tab. 295, fig. 2; Snogerup, 1972: 404; Snogerup, 1987: 275, tab. 206; Heller & Heyn 1993: 17; Mozaffarian, 2007: 284; Güner & al., 2012: 52; Townsend, 2013: 143.

Type: Syria: Circa Aleppum [Alep], *Aucher-Eloy 3626* (lectotype G-BOIS!; designated here by Pimenov & Jacquemoud; isoelectotypes FI-W!, G! [G00367666, G00367667], G-DC!, K! [K000687173], MPU! [MPU019728], P! [P00752830, P00752831]).

= *Bupleurum citrinum* Hochst. in Lorent, *Wanderungen*: 337. 1845, **syn. nov.**

References: Walpers, 1846: 859; Tchihatcheff, 1860: 421; Boissier, 1872: 851, in nota; Wolff, 1910a: 171.

Type: Turkey: prope Erzerum [bei Erzerum], *Lorent* (holotype TUB! [TUB003111]).

= *Bupleurum speciosissimum* Rech.f., *Anz. Österr. Akad. Wiss. Math.-Naturwiss. Kl.* 89(11): 170. 1952.

References: Mozaffarian, 1983: 35.

Type: Iran: Luristan, Chamchid, 1500 m, 27.05.1940, *Koelz 15878* (lectotype W!, designated here by Pimenov; isoelectotype US [US00127170]).

Distribution: Iran (W: Kurdistan, Lorestan), Turkey (E Anatolia: Erzurum, Malatya, Elaziğ, Bitlis, Mardin), Iraq, Syria. Endemic to Southwestern and Mediterranean Asia.

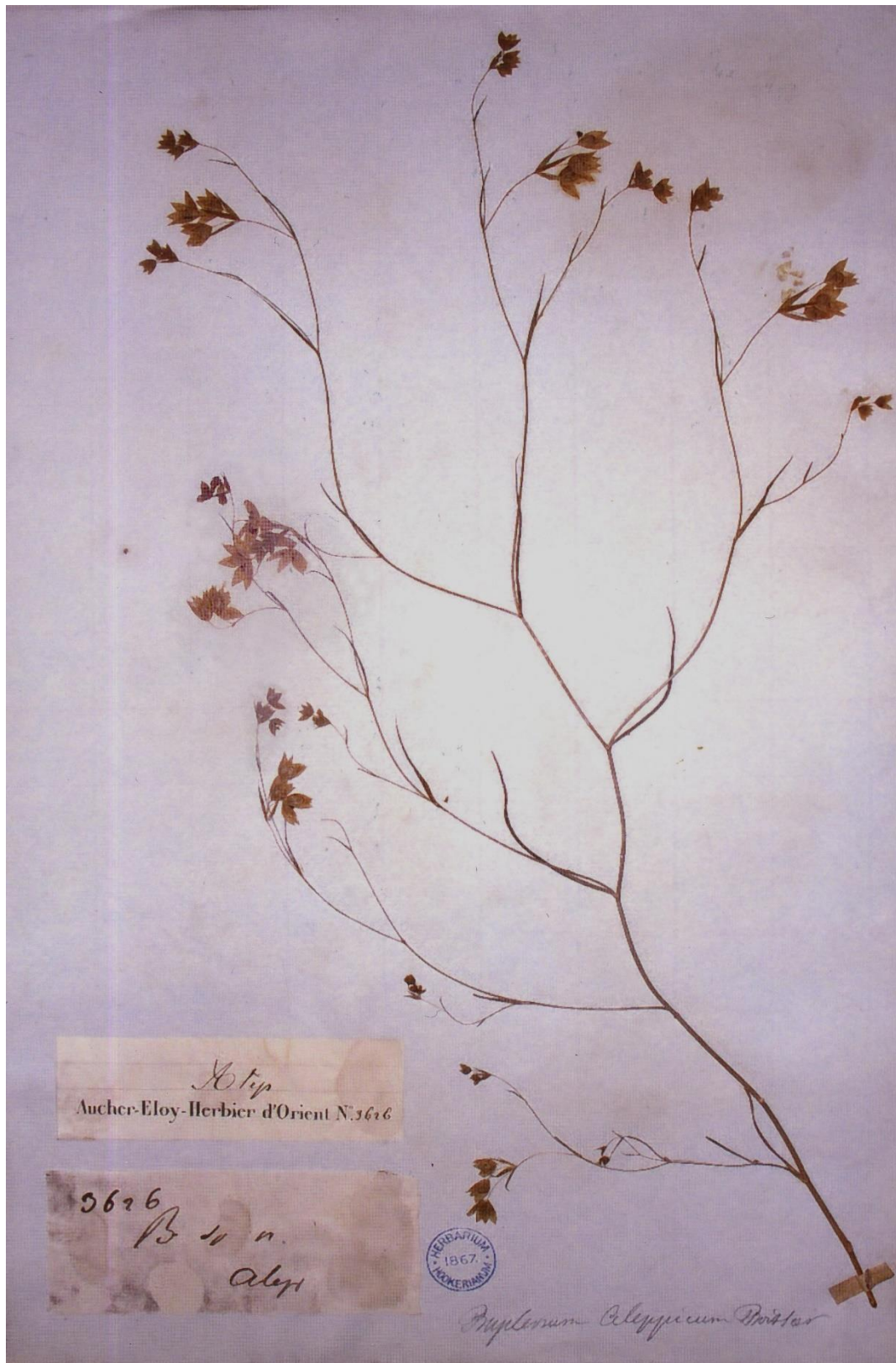


Fig. 3. Isolectotype of *Bupleurum aleppicum* Boiss. (K)

According to the treatment of the annual species of *Bupleurum* in the *Flora of Turkey* (Snogerup, 1972), the species belongs to the informal group B (annuals, leaves narrow, \pm linear, bracteoles broad). Group B includes 11 species (Nos. 8–18). Within the group, the species differ from each other mainly in the form and size of the bracteoles, number of rays in the umbel, number and consistency of bracteole veins. Using the key for determination of the species of the group B, the plant collected by Lorent in Erzurum and described by Hochstetter (1845) as *B. citrinum*, is easily determined as *B. aleppicum* in two steps. When comparing herbarium materials of the two species, no significant differences between them were observed, which makes it possible to confirm the Snogerup (1972: 404) opinion and place the name *B. citrinum* into synonymy of *B. aleppicum*, an earlier legitimate name.

It should be noted that the greatest diversity in annual species of *Bupleurum*, closely related to *B. aleppicum*, is observed in Turkey, which becomes obvious from comparison with other treatments by the same author, namely, with that in the *Flora Iranica* (Snogerup, 1987) and within Europe (Snogerup and Snogerup, 2001).

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References

- Boissier, P.E.** 1872. *Flora orientalis sive, enumeratio plantarum in Oriente a Graecia et Aegypto ad Indiae fines nusque observatae* 2. Genève, Basle & Lyon: H.Georg.
1995. JSTOR Global Plants. Available at <https://plants.jstor.org/> (accessed 31 Dec 2018).
- Güner, A., Aslan, S., Ekim, T., Vural, M. and Babaç, M.T.** 2012. (eds.). *Türkiye Bitkileri Listesi (Damarlı Bitkiler)*. Istanbul: Nezahat Gökyiğit Botanik Bahçesi ve Flora Araştırmaları Derneği Yayını.

- Heller, D. & C.C. Heyn** 1993. *Conspectus florum Orientalis*. An annotated catalogue of the flora of the Middle East 7. Jerusalem: The Israel Academy of Sciences and Humanities.
- Hochstetter, C.F.F.** 1845. *Bupleurum citrinum* Hochst. In: Lorent, J.A. *Wanderungen im Morgenlande während den Jahren 1842–1843*. Mannheim: Verlag Loeffler.
- Lorent, J.A.**, 1845. *Wanderungen im Morgenlande während den Jahren 1842–1843*. Mannheim: Verlag Loeffler.
- Mouterde, P.** 1970. *Nouvelle flora du Liban et de la Syrie 2*. Beyrouth: Imprimerie catholique.
- Mozaffarian, V.** 1983. The family of Umbelliferae in Iran. Keys and distribution. Tehran: Research Institute of Forests and Rangelands.
- Mozaffarian, V.** 2007. No 54: Umbelliferae. In: Assadi, M., Khatamsaz, M. and Maassoumi, A.A. (eds.). *Flora of Iran*. Tehran: Research Institute of Forests and Rangelands. (In Farsi)
- Nábělek, F.** 1923. Umbelliferae. In: *Iter turcico-persicum*. Pars I. *Plantae collectarum enumeratio (Ranunculaceae–Dipsacaceae)*. Spisy Přír. Fak. Masarykovy Univ. 35: 118–230.
- Pimenov, M.G. and M.V. Leonov** 2004. The Asian Umbelliferae biodiversity database (ASIUM) with particular reference to South-West Asian taxa. *Turkish J. Bot.* 28: 139–145.
- Post, G.E.** 1896. *Flora of Syria, Palestine, and Sinai*. Bayrouth: Syrian Protestant College.
- Post, G.E.** 1932. *Flora of Syria, Palestine and Sinai*, 2nd ed. (Revised by J.E. Dinsmore) 1. Bayrouth: American University Bayrouth.
- Snogerup, S.** 1972. *Bupleurum* (annual species). In: Davis, P.H. (ed.) *Flora of Turkey and the East Aegean Islands 4*: 393–415. Edinburgh: Edinburgh University Press.
- Snogerup, S.** 1987. *Bupleurum* (species annuae). In: Rechinger, K.H. (ed.). *Flora Iranica* 162: 269–297. Graz: Akademische Druck- und Verlagsanstalt.
- Snogerup, S. and Snogerup, B.** 2001. *Bupleurum* L. (Umbelliferae) in Europe 1. The annuals, B. Sect. *Bupleurum* and Sect. *Aristata*. *Willdenowia* 32: 205–308.
- Tchihatscheff, P.A.** 1860. *Asie Mineure. Description physique, statistique et archéologique de cette contrée. Troisième partie. Botanique 1*. Paris: Gide et Baudry.
- Thiebaut, J.** 1936. *Flora Libano-Syrienne 1*. La Caire. *Mem. Inst. Égypte, Cairo*, 31: ixxiv, 1–174.
- Thiers, B.** 2016+. *Index Herbariorum: a global directory of public herbaria and associated staff*. New York Botanical Garden. <http://sweetgum.nybg.org/ih/> [accessed January 2019].
- Townsend, C.C.** 2013. Apiaceae (Umbelliferae) pp. 108–284 In: Ghazanfar, S.A. and Edmondson, J.R. (eds.), *Flora of Iraq 5(2): Lythraceae to Campanulaceae*. Kew: Royal Botanic Gardens.
- Walpers, W.G.** 1846. *Repertorium botanices systematicae 5*. Lipsiae [Leipzig]: sumtibus

Friderici Hofmeister.

Wolff, H. 1910. Umbelliferae-Apioideae-*Bupleurum*, *Trinia* et reliquae Ammineae heteroclitae. In: Engler, A. (ed.). Die Pflanzenreich 43 (IV, 228). Berlin: Wilhelm Engelmann.