

The typification of the Linnaean name *Papaver medium* (Papaveraceae) published in *Flora Anglica*

Duilio Iamónico

Garden of the Apennine Flora of Capracotta, 86082 Capracotta (Isernia), Italy

Corresponding author: d.iamonico@yahoo.it

This pdf constitutes the Version of Record published on 9th June 2022

Abstract: The typification of the Linnaean name *Papaver medium* is discussed. A Morison's illustration is designated as the lectotype, lacking specimen of original material. The identity of the type is widely discussed reaching to the conclusion that *P. medium* is a synonym of *P. dubium* subsp. *dubium*.

Keywords: Linnaean name; lectotypification; nomenclature; *Papaver dubium*.

Introduction

Papaver L. (Papaveroideae Eaton, Papaveraceae Juss.) is a genus traditionally comprising approximately 80 annual, biennial, and perennial herbs, distributed in central and south-western Asia, central and southern Europe, and northern Africa (Kadereit, 1988; Carolan *et al.*, 2006). The taxonomy of the genus is still debated. According to Carolan *et al.* (2006), *Papaver* would be monophyletic only if *Roemeria* Medik. is included in it. In fact, this latter genus forms a small group of taxa included in *Papaver* sect. *Argemonidium* Spach in the molecular analyses by Carolan *et al.* (2006) (see also Almousavi *et al.*, 2018). POWO (2022a) reported *Roemeria* as heterotypic synonym of *Papaver*, whereas most authors after Carolan *et al.* (2006) considered *Roemeria* as a separate genus (see for example Taia, 2009; Takhtajan, 2012; Karatashyan, 2013; Tavakkoli *et al.*, 2014; APGIV, 2016; Pezzetta, 2021; Banfi *et al.*, 2022). Recently, the new genus *Oreomecon* Banfi, Bartolucci, J.-M.Tison & Galasso was published by Banfi *et al.* (2022) to accommodate the European and Mediterranean members of *Papaver* sect. *Meconella* Spach following the phylogenetic results of Carolan *et al.* (2006).

Linnaeus published ten names in *Papaver*, all correctly typified, excepting for *P. medium* L. which is discussed in the present paper as part of the ongoing studies of some members belonging to the genus *Papaver* and the nomenclature of Linnaean names (see for example Del Guacchio & Iamónico, 2015; Iamónico, 2013, 2014, 2016, 2020; Iamónico & Peruzzi, 2012, 2014; Iamónico & Jarvis, 2012).

Material and methods

This research is based on the analysis of relevant literature (i.e. protologue of the name investigated and pre-Linnaean works therein cited, and primary Floras in which the studied names are listed) and examination of specimens preserved at the herbaria **LINN** and **MW** (acronyms follow Thiers, 2022 [continuous

update]). The articles cited throughout the text follow the *Shenzhen Code* (Turland *et al.*, 2018).

Typification

Papaver medium was validly published by Linnaeus (1754: 17) in his edition of *Flora Anglica*, where the name is validated by a mere reference to the species numbered "309-5" as reported in the third edition of Ray's *Synopsis Methodica Stirpium Britannicarum* (1724: 309 as "Papaver laciniato folio, capitulo longiore glabro"). In fact, according to the Art. 7.8 of ICN (Ex. 10) "A name of a new taxon validly published solely by reference to a previously and effectively published description or diagnosis ... is to be typified by an element selected from the entire context of the validating description or diagnosis, unless the validating author has definitely designated a different type ...". Therefore, the typification of the name *Papaver medium* must be undertaken from the context of Ray's publication, not to the collection of Linnaeus.

Ray (1724: 309) reported as synonyms of his Papaver no. 5 a citation from Morison (1680: 279 "Argemone capitulo longiore glabro, nobis") who provided an illustration (S. 3, T. 14, f. 11) which can be considered for the lectotypification of the Linnaean name *Papaver medium* (see Ex. 10 of the Art. 7.8 of ICN). Furthermore, Ray (1724: 309) stated "This [species] was sent me by Mr. Dent out of *Cambridgeshire* [a County of Eastern England]. Found also by Mr. Dale at *Bocking* [a city included in the County Essex, eastern England]". To note that previously Ray (1686: 856) also reported "*Argemone capitulo longiore glabro* ... in agro Cantabrigensi observavit & ad nos jeus capitula transmisit D. Pet. Dent ... & nuper etiam in vicina nostra invenit & ad nos attulit D. Sam. Dale ...". Peter Dent was an apothecary of Cambridge and friend of J. Ray, contributing to exploration of Cambridgeshire territory (Whittet & Newbold, 1977: 202).

Samuel Dale's collection still survives at the herbarium **BM** (see Iamónico 2020, 2021, and also HUH Index of botanists, 2013a). However, no Dale specimen was traced at **BM** neither in his own collection nor in the Adam Bubble's collection where some exsiccata are attributed to S. Dale (J. Hunnux and M. Carine, pers. comm.). Concerning Peter Dent's collection, no information is reported neither in *Taxonomic Literature* (Stafleu & Cowan, 1976) nor in *Harvard University Herbaria & Libraries* website (HUH Index of botanists, 2013b) and I was not able to trace any Dent's collection.

All things considered, Morison's illustration cited by Ray (1724: 309) appears to be the only extant original material for the Linnaean name *Papaver medium* and it is here designated as the lectotype.

Concerning the identity of *Papaver medium*, Morison's *Argemone capitulo longiore glabro* is identifiable as *P. dubium* L. according to the current concept (see e.g., Kadereit, 1993; Díaz González, 1986; Pignatti, 2017) by displaying the following morphological characters: annual plant, leaves pinnatifid, the upper cauline sessile (not amplexicaul); ratio length/width of the petal about 1; capsule glabrous, obovoid-cylindrical (more than twice as long wide) with 10-ribbed and disc with 6 rays. The identification at infraspecific rank is more difficult.

Papaver dubium is a species highly variable from the morphological point of view and several infraspecific taxa were described in the past (see e.g., POWO, 2022b). The recognition of these taxa is currently debated. For example (Table 1), POWO (2022b) accepted two subspecies, i.e. subsp. *dubium* and subsp. *stevenianum* (Mikheev) Kubaát & Ípoová, whereas other authors (e.g. Kadereit, 1993; Pignatti, 2017; Info Flora, 2022) accepted the subsp. *lecoquii* (Lamotte) Syme or *P. lecoquii* Lamotte (this taxon is not reported in POWO, 2022b). Díaz González (1986), in the treatment of *Papaver* for *Flora Iberica*, highlighted the phenotypic variability of *P. dubium* listing three varieties, i.e. var. *lecoquii* (Lamotte) Fedde, var. *minus* Lange, and var. *collinum* (Bogenh. ex Bisch.) Ducommun. Kadereit (1993: 299) recognized three subspecies, i.e. subsp. *dubium*, subsp. *lecoquii*, and subsp. *laevigatum* (M.Bieb.) Kadereit. Finally, Aghababian (2011), in the *Euro+Med PlantBase*, recognized the subsp. *confine* (Jord.) Hörandl, treated the taxa *laevigatum*, *lecoquii*, *minus*, and *stevenianum* as separate species, and synonymized *P. collinum* Bogenh. ex Bisch. with *P. dubium*. Note that POWO (2022b) accepted *P. confine* Jord., *P. minus*, and *P. laevigatum* M.Bieb. as separate species, whereas *P. collinum* was synonymized with *P. dubium*.

Table 1. Use of the names related to *Papaver dubium* in some important works; *Flora Iberica* (Díaz González, 1986), *Flora Europaea* 2nd ed. (Kadereit, 1993), *Euro+Med PlantBase* (Aghababian, 2011), *Flora d'Italia* 2nd ed. (Pignatti, 2017), online *Switzerland Flora* (Info Flora, 2022), and *Plant of the world online* (POWO, 2022b).

<i>Flora Iberica</i>	<i>Flora Europaea</i> 2nd ed.	<i>Euro+Med PlantBase</i>	<i>Flora d'Italia</i> 2nd ed.	<i>Switzerland Flora online</i>	<i>Plants of the world online</i>
<i>P. dubium</i>	<i>P. dubium</i> subsp. <i>dubium</i>	<i>P. dubium</i> subsp. <i>dubium</i>	<i>P. dubium</i>	-	<i>P. dubium</i> subsp. <i>dubium</i>
-	<i>P. dubium</i> subsp. <i>laevigatum</i>	<i>P. laevigatum</i>	-	-	<i>P. laevigatum</i>
<i>P. dubium</i> var. <i>collinum</i>	-	<i>Papaver dubium</i>	-	-	<i>P. dubium</i> subsp. <i>dubium</i>
-	-	<i>P. dubium</i> subsp. <i>confine</i>	-	-	<i>P. confine</i>
<i>P. dubium</i> var. <i>lecoquii</i>	<i>P. dubium</i> subsp. <i>lecoquii</i>	<i>P. lecoquii</i>	<i>P. lecoquii</i>	<i>P. dubium</i> subsp. <i>lecoquii</i>	-
<i>P. dubium</i> var. <i>minus</i>	-	<i>P. minus</i>	-	-	<i>P. minus</i>
-	-	<i>P. stevenianum</i>	-	-	<i>P. dubium</i> subsp. <i>stevenianum</i>

Because of the disagreement found in literature, I decided to consider all the above-mentioned taxa to try to identify Morison's illustration of *Argemone capitulo longiore glabro* (lectotype of the Linnaean *Papaver medium*):

- 1) *Papaver laevigatum*: this taxon includes "Plants with very sparse indumentum" according to Kadereit (1993: 299) whereas Morison's illustration shows the stem clearly pubescent (at least in the bottom half).
- 2) *Papaver minus*: Díaz González (1986: 411) distinguished this taxon by the leaves which are nearly entire. Leaves are pinnatifid in Morison's illustration.
- 3) *Papaver stevenianum* Mikheev: Mikheev (1993: 86–88), in the protologue, compared the new species with both *P. dubium* and *P. lecoquii* Lamotte, stating "Nostra species *P. dubio* ... et *P. lecoquio* affinis est, sed differt: ab illo latice flavo vel aurantiaco, antheris discum stigmaticum attingentibus, lobis disci in se tegentibus, seminibus cyaneis et fortasse characteribus aliis; ab hoc corolla phialiformi, petalis pallidioribus marginibus inter se tegentibus, antheris violaceis, seminibus majoribus cyaneis ..." (= Our species is related to *P. dubium* and to *P. lecoqui*, but differs from the first [*P. dubium*] for the yellow or orange latex, for the anthers that reach to stigmatic disc, for the lobes of disco that overlap each other, for the seeds bluish and maybe for further characters; from that [*P. lecoqui*] for the corolla saucer-like in shape, for the petals paler and that overlap each other, the anthers purplish, the seeds larger and bluish...). Unfortunately, since latex, seed, and anthers cannot be seen in Morison's illustration, most of the above mentioned characters cannot be verified. Only the shape of the corolla ("corolla phialiformi") and margin of the petals ("petalis ... marginibus inter se tegentibus") are visible in Morison's illustration. The term "phialiformi" used by Mikheev (1993) is not easy to interpret (it could be translated as "having a form like that of a saucer"), but fortunately the author provided a very good illustration (Fig. 1 in Mikheev, 1993) with two detailed views of one flower (frontal and lateral). On the basis of these corolla's views, flowers of Morison's *Argemone capitulo longiore glabro* is not phialiform but has a cross-like shape. Concerning the overlapping of the petals, they are not or slightly overlapped in Morison's illustration whereas in Mikheev's figure petals are clearly overlapped. Furthermore, on the basis of both Mikheev's figure, as well as personal observations on both specimens preserved at MW (see <https://plant.depo.msu.ru/module/itemsearchpublic>) collected in the Caucasus (which includes the *locus classicus*; see Mikheev, 1993: "Ciscaucasia, provincia Stavropoliensis, haud procul ab oppido Pjatigorsk ("Proval")" and pictures in Plantarium (2022) made in Caucasus, Crimea, and Ukraine, *P. stevenianum* displays a large triangular-ovate black spot or an oblong band from the base of the red petal. Morison's illustration (only two opened flowers occur) shows petals with a more or less blended grey and small basal spot.
- 4) *Papaver lecoquii*: according to Díaz González (1986: 411), Kadereit (1993: 299), and Pignatti (2017: 886), this taxon can be distinguish by its yellow latex (red when dry), whereas in *P. dubium* sensu stricto latex is white or cream (brown or black when dry). Unfortunately, this character cannot be verified by observing Morison's illustration. However, based on personal observations (but see also Pignatti, 2017: 886), *P. lecoquii* has leaves 2-pinnatifid, whereas in Morison's lectotype leaves are 1-pinnatisect;
- 5) *Papaver confine*: according to Kubát (1988), *Papaver confine* is a species similar to *P. dubium* and *P. lecoquii* from which differs by the capsule [(1.6–

)2.0–2.3 times longer than wide vs. 2.4–3.3 times longer than wide in *P. dubium*] and latex (white vs. yellow in *P. lecoquii*). Concerning the ratio length/width of the fruit, Morison's illustration shows capsule about 2 times longer than wide. As regard *P. lecoquii*, the latex cannot be verified in Morison's illustration, but *P. lecoquii* has leaves 2-pinnatifid, whereas in Morison's lectotype leaves are 1-pinnatisect (see Pignatti, 2017: 886);

6) *Papaver collinum*: the protologue of this species (Borgenhard in Bischoff 1849: 4) reports the following diagnostic characters in comparison with *P. dubium*: "petala autem habet multo minora (ovario vix duplo longiora) miniata, stamina pauciora (circiter 15), stigmatis 5radiatis crenas sub anthesia margine incumbentes, nex disjunctas, et radios papillis longioribus vestitos" [= The petals are much smaller (slightly more than twice as long as the ovary) red coloured, with less stamens (approximately 15), sinus of the 5-lobed stigmatic disc incumbent on the margin, not separate and ray covered by longer papillae]. Eight years later Boreau (1857: 29) provided a more detailed description including the habit (erect, pubescent, and branched), shape of leaves (pinnatifid with oblong, dentate, and acute lobes) and petals (obovate), hairiness of sepals (pubescent) and fruit (glabrous), structure of the disc of the capsule (with 4–8 rays), and colour and surface of seeds (brown and finely reticulate). To note that Boreau (1857: 29) reported "*P. [Papaver] dubium*. L. sp. 726, *pro parte*", so highlighting the similarities with the Linnaean species. Fournier (1928: 26), by proposing *P. collinum* at subspecies rank of *P. dubium*, highlighted that Borgenhard's taxon differs from Linnaean's one by the colour of the latex (white), lobes of the stigmatic disc (which are longer than the width of the capsule), and stigmas (which are shorter than the stigmatic disc). More recently, Díaz González (1986: 411) distinguished this taxon by the hairs of peduncles which would be yellow to orange, whereas in *P. dubium* are usually white. Unfortunately, most of the characters above mentioned cannot be verified in Morison's illustration. However, on the basis of ratio petal/ovary length and ratio stigmatic disc length/capsule diameter, the lectotype of *P. medium* cannot be identified with the taxon *collinum* showing petals much longer than the ovary and stigmatic disc smaller than the width of the capsule.

All things considered, I here propose to synonymise the Linnaean names *Papaver medium* and *P. dubium*, the latter one having nomenclatural priority (date of publication 1754 vs. 1753) according to Art. 11.4 of ICN.

Papaver dubium L., Sp. Pl. 2: 1196. 1753 var. ***dubium***. – TYPE (lectotype designated by Jafri & Qaiser, 1974: 15) Herb. Linn. 669.7 (**LINN!**). — An image of the lectotype is available at <https://www.nhm.ac.uk/resources/research-curation/projects/clifford-herbarium/lqimages/BM000647540.JPG>

= *Papaver medium* L., Fl. Angl.: 14. 1754 – TYPE (lectotype designated here): Type: [Icon] *Argemone capitalo longiore glabro* in Morison (1680: 279, S. 3, T. 14, f. 11). — An image of the lectotype is available at [https://bibdigital.rjb.csic.es/viewer/14341/?offset=#page=676&viewer=picture&o=bookmark&n=0&q=\).](https://bibdigital.rjb.csic.es/viewer/14341/?offset=#page=676&viewer=picture&o=bookmark&n=0&q=).)

Acknowledgements

Thanks are due to J. Hunnux and M. Carine (Herbarium **BM**) for the useful discussion about Dale's and Ray's collections. I also thank E. Del Guacchio (Univeristy of Naples Federico II) for the help in translation of some Latin phrases.

References

- Aghababian, M. 2011. Papaveroideae. – In: Euro+Med Plantbase - the information resource for Euro-Mediterranean plant diversity. [accessed 03 March 2022]. Available at:
<http://ww2.bgbm.org/EuroPlusMed/PTaxonDetail.asp?NameId=93316&PTRefFk=7500000>
- Aghababian, M. & Raimondo, F.M. 2011. Typification of the name *Papaver hybridum* L. (Papaveraceae). *Taxon* 60(5): 1475–1476.
- Almousavi, U.M.N., Alwan, A.A. & Naghavi, M.R. 2018. Molecular study in some species of family Papaveraceae and Fumariaceae in Iraq and Iran by used matK gene and ITS4/5. *Journal of Biology Agricuture and Health* 8(16): 88–98.
- APGIV 2016. An update of the Angiosperm Phylogeny Group classification for the orders and families of flowering plants: APG IV. *Botanical Journal of Linnean Society* 181: 1–20.
- Banfi, E., Bartolucci, F., Tison, J.-M. & Galasso, G. 2022. A new genus for *Papaver* sect. Meconella and new combinations in *Roemeria* (Papaveraceae) in Europe and the Mediterranean area. *Natural History Sciences* 9(1): 67–72.
- Bischoff, G.W. 1849. *Delectus seminum in horto botanico Heidelbergensi collectorum anno 1849*. Leiden.
- Bureau, A. 1857. *Flore du centre de la France et du bassin de la Loire, ou, Description des plantes qui croissent spontanément, ou qui sont cultivées en grand dans les départements arrosés par la Loire et ses affluents, avec l'analyse des genres et des espèces* 1. Paris: Librairie Encyclopedique De Roret.
- Carolan, J.C., Hook, I.L., Chase, M.W., Kadereit, J.W. & Hodkinson, T.R. 2006. Phylogenetics of *Papaver* and Related Genera Based on DNA Sequences from ITS Nuclear Ribosomal DNA and Plastid *trnL* Intron and *trnL-F* Intergenic Spacers. *Annals of Botany* 98: 141–155.
<http://doi.org/10.1093/aob/mcl079>
- Del Guacchio, E. & Iamónico, D. 2015. Typifications of the Linnaean names *Carduus eriophorus*, *Carduus eriophorus* var. *spurius*, and *Chnicus ferox* (Asteraceae). *Phytotaxa* 238(2): 196–200.
<http://dx.doi.org/10.11646/phytotaxa.238.2.8>
- Díaz González, T.E. 1986. *Papaver* L. In: Castroviejo, S., Laínz, M., López Gonzáles, G., Montserrat, P., Muñoz Garmendia, F., Paiva, J., Villar, L. (eds.), *Flora Iberica* 1: 407–417. Madrid: Real Jardín Botánico, CSIC.
- Fournier, P. 1928. *Flore complète de la plaine française*. Paris: Paul Lechevalier.

- Galasso, G., & 50 other authors. 2018. An updated checklist of the vascular flora alien to Italy. *Plant Biosystems* 152(3): 556–592.
- HUH Index of botanists 2013a-onwards. *Index of botanists, Harvard University Herbaria & Libraries*. [accessed 03 March 2022]. Available at: https://kiki.huh.harvard.edu/databases/botanist_search.php?mode=details&id=47839
- HUH Index of botanists 2013b-onwards. *Index of botanists, Harvard University Herbaria & Libraries*. [accessed 10 February 2022]. Available at: https://kiki.huh.harvard.edu/databases/botanist_index.html
- Iamónico, D. 2013. Lectotypification of the Linnaean name *Senecio doria* L. (Asteraceae). *Annales Botanici Fennici* 50(1): 71–72. <http://dx.doi.org/10.5735/085.050.0111>
- Iamónico, D. 2014. Lectotypification of Linnaean names in the genus *Achyranthes* L. (Amaranthaceae). *Taxon* 63: 405–407. <http://dx.doi.org/10.12705/632.2>
- Iamónico, D. 2016. Nomenclatural notes on four Linnaean names in *Arenaria* (Caryophyllaceae). *Taxon* 65(3): 610–616. <http://dx.doi.org/10.12705/653>
- Iamónico, D. 2020. Typification of two Linnaean names in *Atriplex* (Amaranthaceae sensu APGIV) referred to ancient *Flora Anglica* by Hudson and Linnaeus. *British & Irish Botany* 2(3): 202–206. <https://doi.org/10.33928/bib.2020.02.202>
- Iamónico, D. 2021. Typification of the Linnaean name *Atriplex maritima* (Chenopodiaceae) revisited. *British & Irish Botany* 3(3): 373–378. <https://doi.org/10.33928/bib.2020.02.202>
- Iamónico, D. & Jarvis, C.E. 2012. Lectotypification of two Linnaean names in *Chenopodium* L. (Amaranthaceae). *Taxon* 61(3): 864–865.
- Iamónico, D. & Peruzzi L. 2012. Lectotypification of the Linnaean name *Acanthus spinosus* (Acanthaceae). *Phytotaxa* 62: 11–12.
- Iamónico, D. & Peruzzi L. 2014. Typification of Linnaean names in Malvaceae for the Italian Flora. *Taxon* 63(1): 161–166. <http://dx.doi.org/10.12705/631.11>
- Info Flora 2022. Il centro nazionale dei dati e delle informazioni sulla flora svizzera. *Papaver dubium* L. [accessed 03 March 2022]. Available at: <https://www.infoflora.ch/it/flora/papaver-dubium.html>
- Jafri, S.M.H. & Qaiser, M. 1974: *Papaver* L. In: Nasir, E., Ali, S.I. (eds.), *Flora of West Pakistan* 61, 26–30. Ferozsons Press, Rawalpindi.
- Kadereit, J.W. 1988. Sectional affinities and geographical distribution in the genus *Papaver* L. (Papaveraceae). *Beiträge zur Biologie der Pflanzen* 63: 139–156.
- Kadereit, J.W. 1993. *Papaver* L. In: Tutin, T.G., Burges, N.A., Chater, A.O., Edmonson, J.R., Heywood, V.H., Moore, D.M., Valentine, D.H., Walters, S.M. & Webb, D.A., (eds.), *Flora Europaea* 2nd ed., 1: 297–301. Cambridge: Cambridge University Press.
- Karatashyan, N.G. 2013. New plant species for Ijevan Floristic Region (Armenia). *Proceedings of the Yerevan State University* 1: 44–46.

- Kubát, K. 1988. *Papaver* L. In: Hejný, S., Slavík, B., Chrtek, J., Tomšovic, P., Kovanda, M. (eds), *Květena České socialistické republiky* 1, 482–492, Academia, Praha.
- Linnaeus, C. 1754. *Flora Anglica*. Upsaliae: Laur. Magnus Hojer, Reg. Acad. Typogr.
- Mikheev, A.D. 1993. The synopsis of the species of the family Papaveraceae from the Caucasian flora. *Botanicheskii Zhurnal (St. Petersburg)* 78(5): 115–124 [in Russian]. (Михеев А.Д. Обзор видов семейства Papaveraceae флоры Кавказа).
- Morison, R. 1680. *Plantarum Historiae Universalis Oxoniensis*, 2. Oxonii: ex Theathro Sheldoniano.
- Pezzetta, A. 2021. Papaveraceae of Italian flora: regional distribution and phytogeographic considerations. *Annales, Series Historia Naturalis* 30(2): 245–264.
- Pignatti, S. 2017. *Flora d'Italia* 2nd ed., 1. Milano: Edagricole.
- Plantarium 2022. Плантиум. Растения и лишайники России и сопредельных стран: открытый онлайн атлас и определитель растений. *Papaver stevenianum* Mikheev. [accessed 08 March 2022]. Available at: <https://www.plantarium.ru/lang/en/page/view/item/26872/part/1.html>
- POWO 2022a. *Roemeria* Medik. – Plants of the World Online. [accessed 03 March 2022]. Available at: <http://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:31714-1>
- POWO 2022b. *Papaver dubium* L. – Plants of the World Online. [accessed 03 March 2022]. Available at: <https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:673488-1>
- Ray, J. 1686. *Historia plantarum: species hactenus editas aliasque insuper multas noviter inventas & descriptas complectens*, 1. Londini: Mariae Clark.
- Ray, J. 1724. *Synopsis Methodica Stirpium Britannicarum*, 3th ed. Londini: Impensis Gulielmi & Joannis Innys Regiae Societatis Typographorum.
- Stafleu, F.A. & Cowan, R.S. 1976. *Taxonomic literature(A–G)*, ed. 2, 1. Bonn: Scheltema & Holtema.
- Taia, W.K. 2009. Review article of the Papaveraceae Adans. and status of the Egyptian and Saudi genera. *JKAU Science* 21(1): 145–159.
- Takhtajan, A.L. (ed.) 2012. *Konspektus Flora Kavkaza*, 3(2). Petersburg: Editio Universitatis Petropolitanae.
- Tavakkoli, Z., Assadi, M. & Zeraatkar, A. 2014. A revision of the genus *Roemeria* in Iran. *Rostaniha* 15(2): 146–152.
- Thiers, B. 2022 [continuously update]. *Index Herbariorum: A global directory of public herbaria and associated staff*. New York Botanical Garden's Virtual Herbarium. [accessed 10 February 2022]. Available at: <http://sweetgum.nybg.org/ih/>.

Turland, N.J., Wiersema, J.H., Barrie, F.R., Greuter, W., Hawksworth, D.L., Herendeen, P.S., Knapp, S., Kusber, W.-H., Li, D.-Z., Marhold, K., May, T.W., McNeill, J., Monro, A.M., Prado, J., Price, M.J. & Smith, G.F. (eds.) 2018. International Code of Nomenclature for algae, fungi, and plants (Shenzhen Code). adopted by the Nineteenth International Botanical Congress, Shenzhen, China, July 2017. *Regnum Vegetabile* 159: 1–254.

Whittet, T.D. & Newbold, M. 1977. Some eminent Cambridge apothecaries. *Transaction of the British Society for the History of Pharmacy* 1: 195–212.

Copyright retained by author(s). Published by BSBI under the terms of the [Creative Commons Attribution 4.0 International Public License](#).

ISSN: 2632-4970

<https://doi.org/10.33928/bib.2022.04.157>