Typification of Eremostachys labiosa (Phlomoides labiosa, Lamiaceae) and its synonyms

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Abstract

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Phlomoides labiosa (based on *Eremostachys labiosa*) and its synonyms are typified from collections at LE and P. The history and dispersal of the little-known collections of Hieronymus Krause are discussed. The name of Alexander Petzholdt is added to the 19th century botanical collectors who worked in Central Asia.

Additional key words: Central Asia, lectotypes, nomenclature, Hieronymus Krause, Alexander Petzholdt

Introduction

In the course of preparing a taxonomic monograph of the genus *Phlomoides (Lamiaceae)* in Kyrgyzstan (Lazkov, in prep.), several names have to be typified to establish its taxonomic identity and correct synonymy. The original material, mostly from the 19th century, was found to be partly mislabelled and misinterpreted; relevant corrections (Lazkov 2006) led to rearrangements in the synonymy and description of a new species.

The taxonomy of *Phlomis* L. and allied genera has been a subject of controversy for a long time. Moench (1794) placed *P. tuberosa* L. in a new monotypic genus *Phlomoides* on the basis of its differences in the corolla shape and fruit structure, but this novelty received no recognition from contemporary botanists. Link (1829) was the only one who adopted the segregation of *Phlomis tuberosa,* but he coined his own generic name *Phlomidopsis* Link to accommodate its only species. The latter name has never been adopted since its original publication, but it was used at infrageneric ranks, interchangeable with *Phlomoides*.

The genus *Eremostachys* was established by Bunge (1830) as being presumably intermediate between *Moluccella* L. and *Phlomis,* for the species having an infundibular calyx. Bunge included four species in this genus, two transferred and two described as new. For several reasons, the typification of *Eremostachys* appeared to be difficult. The earliest but generally overlooked type designation was *Phlomis laciniata* L. (≡ *E. laciniata* (L.) Bunge ≡ *Phlomoides laciniata* (L.) Kamelin & Machmedov) by Pfeiffer (1874). Two more type designations were made subsequently, *E. phlomoides* Bunge (≡ *Paraeremostachys phlomoides* (Bunge) Adylov & al.) by Gladkova (1978) and Hedge (1990) and *Molucella tuberosa* Pall. (≡ *E. tuberosa* (Pall.) Bunge) by Machmedov (1990).

After Bunge (1830), the species of the Linnaean *Phlomis* were traditionally sorted into *Phlomis* and *Eremostachys* (e.g. Bentham 1832–36, Bunge 1873a, Briquet 1896, Popov 1940, Knorring 1954). Bentham (1832–36) placed *Phlomis tuberosa* in *P.* sect. *Phlomi-*

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dopsis Link ex Benth. Subsequently, Bunge (1873a) also recognised *P.* sect. *Phlomidopsis* and at the same time referred some similar species of his *Eremostachys* to *E.* sect. *Phlomoides* Bunge (nomenclaturally based on *E. phlomoides* Bunge, not on *Phlomoides* Moench). Since then, descriptions and keys distinguishing *Phlomis* and *Eremostachys* gave practically the same characters for both genera.

Popov (1940) and Knorring (1954) noticed the heterogeneity of *Phlomis,* some species of which were obviously closer to *Eremostachys*. Knorring (1954) suggested *Eremostachys* to be disassembled in favour of *Phlomis,* but these changes have been left unrealised.

The genus *Phlomoides* Moench was recently reinstated (Adylov & al. 1986; Adylov & Machmedov 1987) to accommodate species with the upper corolla lip not being laterally compressed and with tuberiform lateral roots. This genus was formed from the major part of *Phlomis* sect. *Phlomoides* and *Eremostachys* sect. *Phlomoides*. Only the species with the laterally compressed upper corolla lip remained in *Phlomis* s.str. The species left in *Eremostachys* are characterised by the upper corolla lip not being laterally compressed, a broadly infundibular calyx and a tuberiform main root, whereas the species formerly in *Eremostachys* with a tubular to campanulate calyx were placed into a new segregate genus *Paraeremostachys* Adylov & al. An outline of the system of *Phlomoides* was presented by Kamelin & Machmedov (1990), that of *Eremostachys* by Machmedov (1990) and that of *Paraeremostachys* by Adylov & al. (1986).

Among *Phlomis* and its three segregates *(Phlomoides, Paraeremostachys* and *Eremostachys)*, only *Phlomis* differs clearly from the others in its upper corolla lip being laterally compressed. The other three genera were distinguished through the character of root thickening and corolla shape. However, these differences are not clear-cut and the character states are connected by transitions (*Paraeremostachys* itself was described as intermediate between *Phlomoides* and *Eremostachys*).

Molecular phylogenetic studies of the whole *Phlomis* group have not been conducted yet, but some taxa were already sampled to draft general conclusions. *Phlomis* in its traditional circumscription was analysed by Mathiesen (2006), who uncovered two large monophyletic sister groups, *Phlomis* s.str. and *Phlomoides* (including both *Phlomis* sect. *Phlomoides* and *Eremostachys* sect. *Phlomoides*), based on the chloroplast *trnL* intron and the *trnL-trnF* intergenic spacer. In the recent molecular phylogenetic analysis of the subfamily *Lamioideae* by Scheen & al. (2010), the generic status of *Phlomoides* was confirmed and accepted. However, no representatives of *Eremostachys* s.str. and *Paraeremostachys* have been included in published phylogenies, and the question of separation of these segregates from *Phlomoides* thus remains unanswered.

The total number of species in *Phlomoides* s.str. is estimated to be c. 150 (Kamelin & Machmedov 1990; Lazkov, in prep.) and its distribution area extends from Central Europe to the Russian Far East. The major centres of diversity of *Phlomoides* are Central Asia, China and the Flora Iranica area (Afghanistan, Iran, W Pakistan, SW Turkmenistan, NE Iraq). *Phlomoides* sect. *Phlomoides* is best represented in China (42 species), with a hotspot in Yunnan and Sichuan (22 species) (Wu 1977). Only four widespread species of *P.* sect. *Phlomoides* are common between China and the former Soviet Central Asia (12 species being present in the latter). *Phlomoides* sect. *Filipendulina* is absent from China but species-rich (56) in Central Asia. In the Flora Iranica area, *P*. sect. *Filipendulina* (34 species) is dominating over *P*. sect. *Phlomoides* (5 species). Between this area and the former Soviet Central Asia, five species are common in *P.* sect. *Filipendulina,* whereas only one such species is found in *P.* sect. *Phlomoides*. In the total distribution area of *Phlomoides,* the species number of *P.* sect. *Phlomoides* decreases from east to west. *P.* sect. *Filipendulina,* in contrast, has a strikingly opposite tendency in its distribution, dominating in the westernmost part of the distribution area of the genus.

Eremostachys labiosa was originally assigned to *E.* sect. *Phlomoides* Bunge (Bunge 1873a). When the genus *Phlomoides* was resurrected, *P. labiosa* became the type of *P.* sect. *Filipendulina* Popov ex Kamelin & Machmedov, one of the two major subdivisions of *Phlomoides,* separated on the basis of fimbriate (versus not fimbriate or shortly fimbriate) appendages in all or at least the upper staminal filaments (Kamelin & Machmedov 1990). It is very widespread in Central Asia, being recorded from Afghanistan, Iran, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan and doubtfully from Pakistan (Rechinger 1982; Adylov & Machmedov 1987; Hedge 1990). This species is an important component of sparse vegetation on open gravelly slopes in arid mountain areas and on loess foothills, at 600–1600 m.

Phlomoides labiosa is easily recognised by its large whitish flowers with the pale yellow lower lip longer than the galea and usually incised leaves. It is highly variable in habit, leaf dissection and pubescence. This variability was formalised in descriptions of several taxa now treated as synonyms of *P. labiosa*.

Original material

Eremostachys labiosa was described in a contribution to the *Lamiaceae* of Iran (Bunge 1873a), but its original material comes from Russian Central Asia. As explained by Bunge, he found several new species of *Eremostachys,* "a beautiful genus related to *Phlomis*", in the collections of H. Krause from the vicinity of Tashkent [Toshkent], the present-day capital of Uzbekistan. Hieronymus Krause (*1847, date of death unknown) was an apothecary in Tashkent, who actively researched medical plants and their local use in "Russian Turkestan" (present-day Uzbekistan and Tajikistan) (Sorokina & Rhou 2004) and made significant botanical collections in the 1870s (Lip-

Fig. 1. Lectotype (the upper two larger plants) of *Eremostachys discolor* and *E. diversifolia*.

sky 1905). In anticipation of a forthcoming monographic treatment, when more material would be available, Bunge described his new taxa in a synoptic key to the species of *Eremostachys* then known. No further particulars about the original material were provided. In another publication, Bunge (1873b) mentioned that Krause's collection was from Alexander Petzholdt (1810–1889), Professor of Agriculture and Agrotechnology at the University of Dorpat at the time (present-day Tartu University, Estonia), who brought it with him from his last travels in Turkestan (probably in late 1871).

The collections of Krause were acquired by the Botanical Garden of the Russian Academy of Sciences at St Petersburg (herbarium LE) (Korshinsky 1899), although they were not directly listed among its accessions (Lipsky 1899). As evidence of possession, the specimens have curatorial labels from the Garden added in the 1870s and 1880s. It is uncertain whether Krause's collection was examined by Bunge in Dorpat or in St Petersburg; both options are possible. After comparing the *Eremostachys* collection of Krause kept in St Petersburg with that obtained by Bunge in Paris, as well as the descriptions of the new species published by Bunge, we conclude that Bunge examined the whole collection and then removed some small fragments (for example, single leaves) of representative taxa for his private collection. The main collection, passed onto the Russian Academy of Sciences, was left without Bunge's annotations and the names of new taxa appeared on Bunge's fragments only. The private botanical collections of Bunge were entirely sold to Ernest Saint-Charles Cosson (Lipschitz 1947) and subsequently acquired by the Muséum National d'Histoire Naturelle Paris (P). In spite of the lack of annotations, both parts of Krause's collection, at LE and at P, should be considered as having equal rights for typification. The evidence that Bunge examined the whole collection, not only its fragments, comes from descriptions of his new taxa, which give characters absent in the fragments but present in the complete plants.

In January 1960 Viktor Botschantzev, Curator of the Russian Central Asian phanerogam collections at St Petersburg (LE), conducted a special search for the original material of Bunge's *Eremostachys,* requesting photographs from P. The original material of *E. labiosa* at P is represented by a single specimen with a fragment of the top of a flowering stem, having a short inflorescence with two entire stem leaves beneath. The inflorescence leaves are very short, corresponding to the protologue ("folia subfloralia integerrima calycem subaequantia"), and the calyces obviously have a very poor pubescence of simple hairs ("pubes calycis homomorpha stellata"). The label is written in Bunge's hand and reads: "Inter Wernoje & Taschkend, coll. Petzholdt 1871." No separate collection of Petzholdt is known as having been acquired by LE or any other herbarium, but it seems likely that this specimen was not a mislabelled part of Krause's collections but a plant randomly collected by Petzholdt himself during his journey from Wernoje (nowadays Almaty, Kazakhstan) to Tashkent. No similar plant was found among Krause's specimens in Petersburg. Since there is no evidence that the specimen at P was the only one used by Bunge (other specimens from Krause were likely used), it cannot be accepted as the holotype and is thus selected here as the lectotype of *E. labiosa*.

Another new species, *Eremostachys discolor* Bunge, was described together with *E. labiosa* and said to differ from the latter in its incised leaves in the inflorescence (versus entire leaves in *E. discolor*) and in the presence of simple hairs on the calyx. These characters were shown to be very variable and *E. discolor* was placed into the synonymy of *E. labiosa* (Knorring 1954). The original material of *E. discolor* came also from Krause's collection.

Among Krause's specimens referable to *Phlomis labiosa,* as we understand it nowadays, is a sheet at LE that consists of three complete plants (Fig. 1). It has an original label in Krause's hand, with a precise locality in Russian ("Kuz-gulak") but without Bunge's identification; two more labels were added by the curators in St Petersburg, one in Eduard Regel's hand and another being a later copy in Constantin Winkler's hand. Both curatorial labels have the locality information in Latin, generalised to "pr[ope] Taschkent"; in both the collection date is corrupted (29.7.1871 in Regel's label, and 29.6.1871 in Winkler's label) because of misreading of the original Russian text, which gives the date in words ("June of the 2nd day"). The plants are taxonomically identical but differ in habit and pubescence, giving a hint that two gatherings were originally involved. Two larger plants have long and dissected floral leaves and a significant number of simple hairs on the calyces, corresponding with the original description of *Eremostachys discolor* Bunge. No original material of *E. discolor* could be traced in Paris by Botschantzev, but no evidence exists that the specimen at LE is the only one used by Bunge, especially because this specimen is not signed by him. The larger plants from the herbarium sheet at LE are selected as the lectotype of *E. discolor* here.

A single dwarf plant in the lower right corner of this sheet has short and entire floral leaves and few simple hairs on the calyces. This corresponds with the original description of *Eremostachys labiosa* and is possibly part of the original material of this name, left unannotated by Bunge in St Petersburg. A duplicate of this "dwarf" gathering with a curatorial label in Regel's hand was located in the herbarium of the Royal Botanic Garden Edinburgh (E 00397248; Hedge, pers. comm.).

The story continued when Regel (1880) revised many groups of Central Asian plants based on collections kept at the Imperial Botanical Garden in St Petersburg (now the Komarov Botanical Institute, LE), including *Eremostachys*. In the absence of Bunge's identifications, Regel overlooked the earlier names available for these plants and described *Eremostachys labiosa* anew as *E.*

diversifolia Regel. He included in his new species part of the material used by Bunge for *E. labiosa* and *E. discolor,* but without any evidence that all the material or the holotypes of these names were included, as specified in Art. 52.2 of the International Code of Botanical Nomenclature (McNeill & al. 2006). *E. diversifolia* is therefore not a superfluous name, but it is practical to typify it by the lectotype of *E. discolor*.

Within *Eremostachys diversifolia,* Regel established two varieties, *E. diversifolia* var. *subvillosa* Regel [herbarium name "var. *subhirsuta*"] and *E. diversifolia* var. *canescens* Regel, neither of which included the type of the species name as provided in Art. 26.2. However, one of these varieties, *E. diversifolia* var. *subvillosa,* included the holotype (the only specimen used) of the earlier legitimate varietal name, *E. tournefortii* var. *macrocalyx* Herder, and was therefore illegitimate as being superfluous. Herder was the first who recognised *Phlomoides labiosa* under any validly published name, but his material was unavailable to Bunge, who regretted this very much (Bunge 1873a). The characters used by Regel to separate his varieties were essentially the same that Bunge employed for his species.

Another variety of Regel, *Eremostachys diversifolia* var. *canescens,* was based mostly on the early collections of Olga Fedtschenko, made on the first expedition of her husband, the famous geographer and entomologist Alexei Fedtschenko, to Russian Turkestan. It is also conspecific with *Phlomoides labiosa*.

Two more later names are referable to the synonymy of *Phlomoides labiosa: Eremostachys napuligera* Franch. was already synonymised with *P. labiosa* by Knorring (1954) but accepted as a separate species by Adylov & al. (1987) and Czerepanov (1995). *E. dielsii* Bornm. was added to the synonymy of *P. labiosa* by Hedge (1967, 1990). The placement of *E. stocksii* Boiss., one more name once having been considered a synonym of *P. labiosa* (Hedge 1967), is doubtful (Hedge 1990).

Nomenclatural conclusions

Phlomoides labiosa (Bunge) Adylov & al. in Adylov, Consp. Fl. Asiae Mediae 9: 92. 1987 ≡ *Eremostachys labiosa* Bunge in Mém. Acad. Imp. Sci. Saint Pétersbourg, Sér. 7, 21(1): 79. 1873. – Lectotype (designated here): Kazakhstan / Uzbekistan, "Inter Wernoje [Almaty] & Taschkend [Toshkent]", 1871, *A. Petzholdt* (P 00686204; photo at LE!)

= *Eremostachys tournefortii* Jaub. & Spach var. *macrocalyx* Herder in Bull. Soc. Imp. Naturalistes Moscou 41(2): 390. 1868 ≡ *Eremostachys diversifolia* Regel var. *subvillosa* Regel in Trudy Imp. S.-Peterburgsk. Bot. Sada 6(2): 382. 1880, nom. illeg. – Holotype: Kazakhstan, "Tschemkent" [Shymkent], *N. Sewerzow* (LE!)

= *Eremostachys discolor* Bunge in Mém. Acad. Imp. Sci. Saint Pétersbourg, Sér. 7, 21(1): 79. 1873. – Lectotype (designated here): Uzbekistan, "prope Taschkent" [= in vicinity of Tashkent, Toshkent], "Kuz-gulak" [Tuz-Bulaq], [abundant], 2.6.1871, *H. Krause* (LE [the upper two larger plants]!)

= *Eremostachys diversifolia* Regel in Trudy Imp. S.-Peterburgsk. Bot. Sada 6(2): 380. 1880. – Lectotype (designated here): as for *Eremostachys discolor* Bunge

= *Eremostachys diversifolia* Regel var. *canescens* Regel in Trudy Imp. S.-Peterburgsk. Bot. Sada 6(2): 382. 1880. – Lectotype (designated here): Uzbekistan, "prope pagum Daul, in Kokania (valle Zeravschan)" [= Samarqand Region: Daul], 24.6.1869, *O. Fedtschenko* (LE!)

= *Eremostachys napuligera* Franch. in Ann. Sci. Nat., Bot., ser. 6, 18: 237. 1884 ≡ *Phlomoides napuligera* (Franch.) Adylov & al. in Adylov, Consp. Fl. Asiae Mediae 9: 93. 1987. – Holotype: Uzbekistan, "Boukharie: Tengi-Charam" [= Qashqadaryo Region: Dehqonobod?], 23.4.1881, *G. Capus 109* (P 00686222)

= *Eremostachys dielsii* Bornm. in Bot. Jahrb. Syst. 66: 240. 1934. – Syntypes: Afghanistan, "Dar-Ul-Aman, Hügel, 2000 m (Juli 1927, Nr. 24); alter Friedhof (26.6.1928, Nr. 98)", *C. Manger* (B, destroyed).

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References

Adylov T. A., Kamelin R. V. & Machmedov A. M. 1986: Zametki o semeistve *Lamiaceae* 1 [Notes on *Lamiaceae* 1]. – Novosti Sist. Vyssh. Rast. **23:** 110–114.

Adylov T. A. & Machmedov A. M. 1987: *Phlomoides* Moench. – Pp. 82–107 in: Adylov T. A. (ed.), Conspectus florae Asiae Mediae **9.** – Tashkent: Izdatel'stvo Akademii Nauk SSSR.

Bentham G. 1832–36: *Labiatarum* genera et species: or, a description of the genera and species of plants of the order *Labiatae;* with their general history, characters, affinities, and geographical distribution. – London: James Ridgway & Sons.

Briquet J. 1896: *Eremostachys* Bunge, *Phlomis* L. – Pp. 246–249 in: Engler A. & Prantl K. (ed.), Die natürlichen Pflanzenfamilien nebst ihren Gattungen und wichtigeren Arten insbesondere den Nutzpflanzen **IV(3a, 134).** – Leipzig: Wilhelm Engelmann.

Bunge A. 1830: *Eremostachys* Bunge. – Pp. 414–416 in: Ledebour C. F., Meyer C. A. & Bunge A., Flora altaica **2.** – Berlin: G. Reimer.

Bunge A. 1873a: *Labiatae* persicae. – Mém. Acad. Imp. Sci. Saint Pétersbourg, Sér. 7, **21(1):** 1–84.

Bunge A. 1873b: *Hypogomphia,* eine neue Labiatengattung aus Taschkend. – Bull. Acad. Imp. Sci. Saint-Pétersbourg **18:** 28–30.

Czerepanov S. K. 1995: Vascular plants of Russia and adjacent states (the former USSR). – Cambridge: Cambridge University.

Gladkova V. N. 1978: *Phlomis.* – Pp. 154–156 in: Fedorov A. A. (ed.), Flora evropeiskoi chasti SSSR [Flora partis Europaeae URSS] **3.** – Leningrad: Nauka.

Hedge I. C. 1967: Studies in the flora of Afghanistan VI. – Notes Roy. Bot. Gard. Edinburgh **27:** 149–173.

Hedge I. C. 1990: *Eremostachys*. – Pp. 137–147 in: Ali S. I. & Nasir Y. J. (ed.), Flora of Pakistan **192.** – Karachi: University of Karachi.

Kamelin R. V. & Machmedov A. M. 1990: Sistema roda *Phlomoides (Lamiaceae)* [The system of the genus *Phlomoides (Lamiaceae)*]. – Bot. Zhurn. (Moscow & Leningrad) **75:** 241–250.

Knorring O. E. 1954: *Eremostachys* Bge, *Phlomis* L. – Pp. 1–108 in: Schischkin B. K. (ed.), Flora SSSR **21.** Moskow: Izdatel'stvo Akademii Nauk SSSR.

Korshinsky S. I. 1899: Uchastie Botanicheskogo Sada v issledovanii rastitelnosti Rossii i drugikh stran [The participation of the Botanical Garden in explorations of the vegetation of Russia and other countries]. – Pp. 194–205 in: Fischer von Waldheim A. A. (ed.), Istoricheskii ocherk Imperatorskogo S.-Peterburgskogo Botanicheskogo Sada za poslednee 25-letie ego s 1873 po 1898 g [The history of the Imperial Botanical Garden in St Petersburg in its latest 25 years from 1873 until 1898]. – St Petersburg: Herold.

Lazkov G. A. 2006: Zametki o rode *Phlomoides* Moench *(Lamiaceae)* [Notes on the genus *Phlomoides* Moench *(Lamiaceae)*]. – Novosti Sist. Vyssh. Rast. **38:** 205–214.

Link H. F. 1829: Handbuch zur Erkennung der nutzbarsten und am häufigsten vorkommenden Gewächse **2.** – Berlin: S. J. Joseephy.

Lipschitz S. J. 1947: Russkie botaniki. Biografo-bibliograficheskii slovar' [Botanicorum rossicorum lexicon biographo-bibliographicum] **1.** – Moscow: Editio Societatis Naturae Curiosorum Mosquensi.

Lipsky V. H. 1899: Alfavitnyi ukazatel' vsekh kollekcii, postupivshikh v Gerbarij Imperatorskogo Botanicheskogo Sada [An alphabetical list of all collections acquired to the Herbarium of the Imperial Botanical Garden (1823–1898)]. – Pp. 57–160 in: Fischer von Waldheim A. A. (ed.), Istoricheskii ocherk Imperatorskogo S.-Peterburgskogo Botanicheskogo Sada za poslednee 25-letie ego s 1873 po 1898 g [The history of the Imperial Botanical Garden in St Petersburg in its latest 25 years from 1873 until 1898]. – St Petersburg: Herold.

Lipsky V. H. 1905: Flora Srednej Azii, t.e. Russkogo Turkestana i khanstv Bukhary i Khivy. Botanicheskie kollekcii iz Srednej Azii [Flora of Middle Asia, i.e. Russian Turkestan and Khanates of Bukhara and Khiva. Botanical collections from Middle Asia]. – Trudy Tiflissk. Bot. Sada **7:** 339–841.

Machmedov A. M. 1990: The system of *Eremostachys* Bunge. – Bot. Zhurn. (Moscow & Leningrad) **27:** 135–137.

Mathiesen C. 2006: Phylogeny and biogeography of the lamioid mint genus *Phlomis* L. – University of Oslo, Ph.D. thesis.

McNeill J., Barrie F. R., Burdet H. M., Demoulin V., Hawksworth D. L., Marhold K., Nicolson D. H., Prado J., Silva P. C., Skog J. E., Wiersema J. H. & Turland N. J. (ed.) 2006: International Code of Botanical Nomenclature (Vienna Code) adopted by the Seventeenth International Botanical Congress Vienna, Austria, July 2005. – Regnum Veg. **146.**

Moench C. 1794: Methodus plantas horti botanici et agri Marburgensis, a staminum situ describendi. – Marburg: Officina nova libraria academiae.

Pfeiffer L. 1874: Nomenclator botanicus **1(2).** – Kassel: T. Fischer.

Popov M. G. 1940: Opyt monografii roda *Eremostachys* Bge. [An attempt of a monograph of the genus *Eremostachys* Bunge]. – Byull. Moskovsk. Obshch. Isp. Prir., Otd. Biol., ser. 2, **19:** 1–166.

Rechinger K. H. 1982: *Eremostachys*, *Phlomis*. – Pp. 256–317 in: Rechinger K. H. (ed.), Flora iranica **150.** – Graz: Akademische Druck- u. Verlagsanstalt.

Regel E. 1880: Descriptiones plantarum novarum et minus cognitarum VII. – Trudy Imp. S.-Peterburgsk. Bot. Sada **6(2):** 289–403.

Scheen A.-C., Bendiksby M., Ryding O., Mathiesen C., Albert V. A. & Lindqvist C. 2010: Molecular phylogenetics, character evolution, and suprageneric classification of *Lamioideae (Lamiaceae)*. – Ann. Missouri Bot. Gard. **97:** 191–217. [CrossRef]

Sorokina M. J. & Rhou I. V. 2004: Doktor Hieronymus Krause und die Volksmedizin im russischen Turkestan in der zweiten Hälfte des 19. Jahrhunderts. – Pp. 101–112 in: Kästner I. & Pfrepper R. (ed.), Wissenschaftsbeziehungen in Medizin und Naturwissenschaften zwischen Deutschland und dem Russischen Reich im 18. und 19. Jahrhundert. – Aachen: Shaker.

Wu C.-Y. 1977: *Phlomis* Linn. – Pp. 428–478, 594–601 in: Wu C.-Y. & Li H.-W. (ed.), Flora Reipublicae Popularis Sinicae **65(2).** – Beijing: Science Press.