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What is the lectotype of the Linnaean name *Thymus pulegioides* (Lamiaceae)?

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Abstract: The protologue, original material and typification of the Linnaean name *Thymus pulegioides* (Lamiaceae) are discussed. The specimen Herb. Linnaeus No. 38.5 (LINN) has been regarded as the lectotype of *T. pulegioides*, and perfectly agrees with the protologue of this name, but appears not to have been effectively designated as such. Therefore, the lectotype must be Herb. Linnaeus No. 38.6 (LINN), which was effectively designated by Mártonfi in 1997.

Key words: Labiatae, Lamiaceae, lectotype, Linnaeus, nomenclature, taxonomy, *Thymus*, *Thymus pulegioides*

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Introduction

Thymus L. (Lamiaceae) includes c. 215 species occurring in the Old World north of the equator to southern Greenland and subarctic Eurasia, with the centre of diversity in the Mediterranean region (Morales 1989, 2002; Sostaric & al. 2012). The species are characterized by high levels of polymorphism attributed to their complex biology, including frequent hybridization even between distant taxa (Bartolucci 2010; Federici & al. 2013) and gynodioecy, that is the occurrence of both hermaphrodite and “female” plants in populations (Darwin 1877; Thompson 2002; Federici & al. 2013). This has resulted in a large number of names that were proposed in the genus over history, perplexed nomenclature, and numerous misidentifications of taxa (see, e.g., IPNI 2019+; Tropicos 2019+).

The name *Thymus pulegioides* L. is applied to a widespread species occurring across Europe eastward to 38°E. The western and northern boundaries of its range extend from southeastern Spain through the southern

British Isles, southern Norway and Sweden, and the Baltic states to western European Russia. The southern and eastern limits run across southern Spain (Sierra Nevada), southern France and northern Italy to the Balkans (including Albania, northern Greece, and southeastern Bulgaria), the Carpathian mountains, and western and northern Ukraine and central European Russia. The species grows as synanthropic in the vicinity of St. Petersburg (Russia) and in Finland, and has been introduced to North America and New Zealand (Schmidt & Knapp 1977; Morales & Gamarra 1988; Štěpánek & Tomšovic 2000; Morales 2002). *Thymus pulegioides* is well distinguished from other species by its general habit with absence of long, creeping, non-flowering branches; its 4-angular stems, hairy on the edges; and its clearly petiolate, ovate to oblong-lanceolate, obtuse leaves. Its infraspecific differentiation is, however, reputedly difficult and controversial, and needs a detailed revision (Jalas 1972; Schmidt & Knapp 1977; Mártonfi 1997; Bartolucci & al. 2013, 2018).

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Linnaeus published 12 names in *Thymus* (Linnaeus 1753, 1763, 1767a, 1767b, 1774), of which four are currently included in three other genera, i.e. *Clinopodium* L., *Pycnanthemum* Michx., and *Satureja* L. (Jarvis 2007; Ferrer-Gallego 2019; WCSP 2019+). The remaining eight Linnaean names include *T. cephalotos* L. (nom. rej. prop.; Ferrer-Gallego 2019), *T. mastichina* (L.) L., *T. piperella* L., *T. pulegioides*, *T. serpyllum* L., *T. villosus* L., *T. vulgaris* L., and *T. zygis* L., all of which are currently treated within *Thymus*. Correct type interpretations exist for seven of the above names (Morales 1986; Marhold & Mártonfi 1998; López & Morales 2011; Ferrer-Gallego 2019), while the nomenclatural type of *T. pulegioides* is still a source of controversy. In the exhaustive summarizing work on the Linnaean Plant Name Typification Project, Jarvis (2007) erroneously indicated the specimen Herb. Linnaeus No. 38.5 (LINN) as the lectotype of *T. pulegioides* designated by Ronniger (1944), and this viewpoint was subsequently adopted by modern monographers of *Thymus* (Bartolucci & al. 2013; Knyasev 2015; Nachychko & al. 2019a). In fact, Ronniger's (1944) publication contains no such effective designation of Herb. Linnaeus No. 38.5 as the lectotype of *T. pulegioides*. The present paper aims to contribute to the nomenclatural stability of the currently accepted name *T. pulegioides* through clarifying its typification. It is a part of the present authors' research on the nomenclature and taxonomy of the genus *Thymus* (Nachychko 2013, 2016; Nachychko & Honcharenko 2016; Nachychko & Sosnovsky 2018; Nachychko & al. 2019a, 2019b).

Material and methods

This work is based on the analysis of the protologue of *Thymus pulegioides* (Linnaeus 1753: 592), one pre-Linnaean publication (Morison 1699) cited there, and the Linnaean herbarium collection at LINN (herbarium code according to Thiers 2019+). All herbarium material was retrieved from online databases (http://linnean-online.org/linnean_herbarium.html; <https://plants.jstor.org/>). Taxonomic literature was searched for possible type designations and taxonomic evaluations of original material. The articles cited in the text follow the *International Code of Nomenclature for algae, fungi, and plants* ("Code"; Turland & al. 2018).

Results and Discussion

Protologue and original material

Linnaeus (1753: 592), in the first edition of *Species plantarum*, described *Thymus pulegioides* from the south of France ("Habitat Monspelii"). The species diagnosis could be based on several elements that are associated with the protologue and/or cited there. One of them is the material that Linnaeus received from D. Sauvages.

Further, along with the short diagnosis and species description, Linnaeus cited as a synonym the following name used by Morison (1699: 404): "*Acinos Thymi folio & facie, floribus inexpansis*". In the publication of Morison (1699), the above name was supplemented with an illustration ("Section 11, Tab. 19, 6"), which is to be regarded as a part of the original material according to Art. 9.4(a) of the *Code*. However, detailed examination of this illustration clearly shows that the plant depicted is not *Thymus* but most likely *Clinopodium acinos* (L.) Kuntze (as seen from the general habit and a characteristic swollen calyx), and hence it is apparently at variance with the current application of the name *T. pulegioides*. There are two sheets in the Linnaean collection, which are associated with the protologue of *T. pulegioides* and are part of original material: "monsp. / 8", Herb. Linnaeus No. 38.5 (LINN! [image available at <http://linnean-online.org/153/> and <https://plants.jstor.org/stable/pdf/10.5555/al.ap.specimen.linn-hl38-5>]) and "*Satureja* / 8 / *thymoides*", Herb. Linnaeus No. 38.6 (LINN! image available at <http://linnean-online.org/154/> and <https://plants.jstor.org/stable/pdf/10.5555/al.ap.specimen.linn-hl38-6>)). As to lectotypification, these specimens are preferable to the above illustration according to Jarvis (2007).

In the second edition of *Species plantarum*, Linnaeus (1762: 31) transferred *Thymus pulegioides* to the genus *Cunila* L. ex Mill. and proposed for this taxon a legitimate replacement name *Cunila thymoides* L., because its original specific epithet was already taken for a different species, *Cunila pulegioides* (L.) L. (Jarvis 2007) published on the same page a few lines above. The original use of the name *T. pulegioides* was only revived by Ronniger (1924), whose detailed evaluation of the above two specimens from the Linnaean collection revealed several disagreements with the protologue (Ronniger 1924, 1944). According to Ronniger (1924), it was erroneous for Linnaeus (1753) to deduce the annual life habit of *T. pulegioides*. Following the viewpoint of Ronniger, we further speculate that Linnaeus most likely drew his conclusion from those two specimens (Herb. Linnaeus No. 38.5 and 38.6, LINN), both of which contain only generative shoots without any other elements indicative of the growth form (e.g. perennial plagiotropic skeletal axes) and as such can be mistaken for an annual plant. Although normally blooming after one or two years of vegetative growth, under favourable conditions *T. pulegioides* may produce flowers as soon as the first year, which could be one of the reasons for Linnaeus's conclusion noted above (Ronniger 1944). In addition, Ronniger (1924, 1944) mentioned the presence of a bunch of leaves at the top of the inflorescence in one of the two specimens at LINN, which is not indicated in the protologue. Such proliferation, resulting in the atypical open thyrse inflorescence as seen on the specimen Herb. Linnaeus No. 38.6, has no taxonomic value and occasionally occurs in various species of *Thymus* (including *T. pulegioides*), but is most frequent in interspecific hybrids whose parental

species have different growth habits—monopodial and sympodial (Schmidt 1980; Nachychko & Honcharenko 2016). Despite the above differences, both original specimens at LINN present a general suit of main diagnostic features of *T. pulegioides* and correspond to the current application of its name.

Typification

Jarvis (2007) regarded the publication of Ronniger (1944) as a place where the specimen Herb. Linnaeus No. 38.5 was effectively designated as a lectotype of *Thymus pulegioides*. In this publication in German, Ronniger discussed the original material and used the following phrase: “Die Originalpflanze liegt im Herbar Linné heute noch aufbewahrt” [The original plant is still preserved today in the Linnaean Herbarium]. Most likely, Jarvis (2007) following Art. 7.11 of the *Code* took Ronniger’s “Originalpflanze” for an equivalent of “type”, direct citation of which is sufficient for type designation in works published before 2001. In our opinion, however, Ronniger’s (1944) term “Originalpflanze” meant “original specimen” (i.e. one of the two mentioned here) and was not intended as an equivalent of the term “type” (typus). According to Art. 7.11 of the *Code* in its strict interpretation (see, e.g., Ex. 12), an equivalent of the term “type” must be one of its “linguistic equivalents” (in German: “Typus” or “Typ”), none of which was used by Ronniger (1944). Further, as Ronniger (1924, 1944) did not see the original specimens but only their photographs (as indicated by Ronniger himself), he failed to correctly associate the specimens with their provenances, likely due to a poor quality of those photographs. Namely, he referred to the specimen from the *locus classicus* (Montpellier) mentioned in the protologue (i.e. Herb. Linnaeus No. 38.5, containing a hardly legible note “monsp.” handwritten by Linnaeus) when describing, in fact, the other specimen (Herb. Linnaeus No. 38.6) with no indication of locality. Thus, even if one accepts the designation of Herb. Linnaeus No. 38.5 as a lectotype by Ronniger without the use of an appropriate term (similarly to Jarvis 2007), this action will run counter to Art. 7.11 of the *Code* and introduce evident confusion due to the lack of definite acceptance of the type as such by the typifying author. Therefore, the publication of Ronniger (1944) is not the place of effective designation of the lectotype of *T. pulegioides*.

Klokov (1954: 487) stated that the “Тип” [type] of *Thymus pulegioides* is “в Лондоне” [in London], which was a standard statement in the *Flora of the USSR* referring to the personal collection of Linnaeus at the Linnean Society of London (Sennikov & Melnikov 2018). However, Klokov did not indicate the respective specimen through direct citation, as is required by Art. 7.11 of the *Code*. A similar statement, “Тип: Франция (‘in Monspelii’)” [Type: France (‘in Monspelii’)], was given by Menitsky (1978: 201), who also failed to explicitly cite the specimen but referred to the statement of provenance

given in the protologue, which was a formally accepted type citation in the *Flora of the European part of USSR*. Thus, the statements by Klokov (1954) and Menitsky (1978) are too vague to be taken as a citation that could serve as a lectotypification.

Mártonfi (1997: 158) cited “LINN 38.6” as “lectotypus” of *Thymus pulegioides* with reference to Morales. In a note below (Mártonfi 1997: 178), he stated that the designation of this specimen as the lectotype was planned by Morales to be effected in a project’s forthcoming *Labiatae* typifications paper (although Morales [pers. comm. Jan 2020] stated that in 1996 he had informed the Linnaean Plant Name Typification Project at BM that Herb. Linnaeus No. 38.5 [LINN] should be the lectotype). However, this work, published in May 2001 (Jarvis & al. 2001), does not contain a lectotypification of *T. pulegioides*. Therefore, the specimen Herb. Linnaeus No. 38.6 (LINN) is to be regarded as the lectotype of *T. pulegioides*, effectively designated by Mártonfi (1997), who clearly indicated that specimen by direct citation including the term “lectotypus”, thereby fulfilling the requirements of Art. 7.11 of the *Code* for lectotype designation before 2001. This lectotype, in fact, lacks information about provenance and possesses an atypical inflorescence (see discussion above). However, it is identifiable with *T. pulegioides*, represents the diagnostic features of the species, and fits well with Art. 7.2 of the *Code*, which warns that “The nomenclatural type is not necessarily the most typical or representative element of a taxon.” On the other hand, the missing provenance on the specimen label and lack of mention of the atypical inflorescence in the protologue are not to be considered essential features rendering Herb. Linnaeus No. 38.6 “in serious conflict with the protologue”, which otherwise would justify the supersession of this lectotype according to Art. 9.19(c) of the *Code*. Therefore, according to Art. 9.19, Mártonfi (1997), who first designated Herb. Linnaeus No. 38.6 (LINN) as the lectotype of *T. pulegioides*, must be followed. This action will not affect the nomenclatural stability of *T. pulegioides* and the current taxonomic application of the name will remain unchanged.

Thymus pulegioides L., Sp. Pl. 2: 592. 1753 ≡ *Cunila thymoides* L., Sp. Pl., ed. 2, 1: 31. 1762. – Lectotype (designated by Mártonfi 1997: 158): Herb. Linnaeus No. 38.6 (LINN! [image available at <http://linnean-online.org/154/> and <https://plants.jstor.org/stable/pdf/10.5555/al.ap.specimen.linn-hl38-6>]).

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