

# Typification and taxonomic characterization of *Thymus longicaulis* C. Presl (Lamiaceae)

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*Thymus longicaulis* C. Presl, described from Sicily by Carl Bořivoj Presl, is a critical Mediterranean species, often confused with other taxa belonging to *Thymus* sect. *Serpyllum*. In order to preserve the current application of this name, a lectotype is designated. We provide a detailed morphological description and information about its habitat, phenology, distribution and taxonomy.

## Introduction

*Thymus* is one of the most critical genera of the Euro-Mediterranean flora (Federici *et al.* 2013). According to Morales (2002), it includes 250 taxa distributed in Europe, northwest Africa, Ethiopia, Asia, and Greenland, but its centre of diversity is the Mediterranean region (Morales 1997). The high morphological variability in this genus has led to the description of more than one thousand species, with many nomenclatural and taxonomic synonyms, and most of those taxa need to be typified (Bartolucci & Peruzzi 2013, Bartolucci *et al.* 2013).

*Thymus longicaulis* C. Presl was first described by Carl Bořivoj Presl (1826) in “Flora Sicula” without specifying any collection locality but probably based on material collected by him during a trip in Sicily in 1817 (Sutorý 2006). According to Čelakovský (1883), in Presl’s her-

barium there was conserved a sample of *Thymus* collected by Presl in Sicily “*in collibus apricis ad Tauromenium Siciliae*”, and bearing the name *T. elongatus* Presl. Čelakovský (1883) reported that that herbarium specimen was identical to *T. dalmaticus* (Rchb. f.) Freyn and can be considered the original material for the name *T. longicaulis*. *Thymus elongatus* does not appear in Presl (1826), probably because Presl realized that that name already existed (Link 1822) and so he replaced it with *T. longicaulis*.

*Thymus longicaulis* was misinterpreted and often confused with other taxa belonging to *Thymus* sect. *Serpyllum*. Accordingly, in order to preserve the current application of that name it is necessary to designate a lectotype. This work is carried out within the project “Italian Loci Classici Census” (Domina *et al.* 2012), the aim of which is to provide data on the original material of the plants described from Italy (Domina &

Mazzola 2011, Iamonico *et al.* 2011, Scassellati *et al.* 2011, Di Pietro *et al.* 2012, Iamonico & Peruzzi 2012, Peruzzi & Carta 2012, Peruzzi *et al.* 2012, 2013, Bartolucci & Conti 2013, Bartolucci & Peruzzi 2013, Bartolucci *et al.* 2013).

## Material and methods

This study is based on analysis of relevant literature, field surveys and examination of herbarium specimens (including the original material) kept in APP, AQUI, B, BI, CAME, CAT, CLU, FI, GE, IS, JE, LEC, MNHM, MSNM, NAP, P, PAD, PAL, PI, PRC, RO, ROV, W, WU, ZA and private collections of S. Costalonga (Pordenone), G. Gestri (Prato), M. Iocchi (Rome), P. Lavezzo (Rome), A. Santangelo (Napoli), D. Uzunov (Cosenza) (*see* Appendix). Furthermore, in order to better determine the morphological traits of *T. longicaulis*, many samples were collected and examined fresh (deposited in APP).

## Results

### Typification

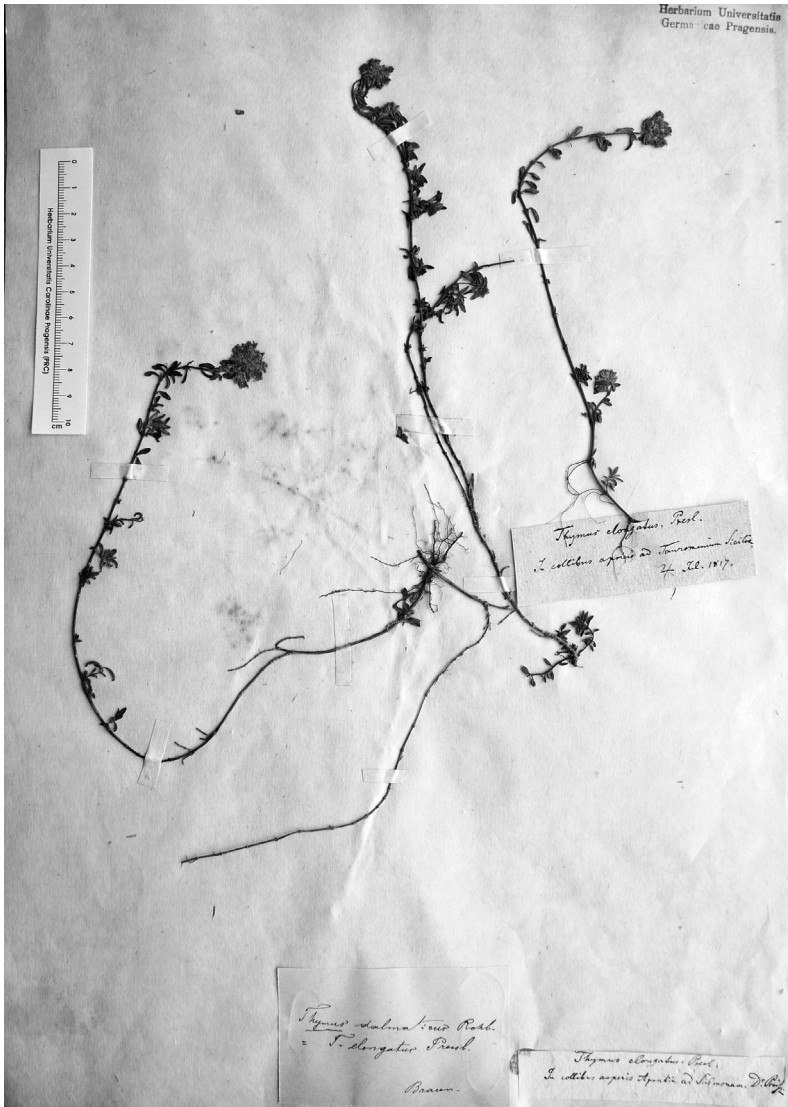
Despite the short original description, Presl (1826) provided some important information to correctly identify *Thymus longicaulis*: “*T. caulibus longissimis repentibus puberulis, foliis cuneiformi-oblongis obtusis glaberrimis integris, capitulis globosis, bracteis oblongis obtusis longitudine calycis pubescentis, dentibus calycinis ciliatis subulatis, antheris exsertis*”. This combination of characters does not occur in any other known species of *Thymus* from Sicily: *T. paronychioides* Čelak. and *T. spinulosus* Ten. (Bartolucci & Peruzzi 2013) belonging to *T. sect. Hypodromi* are characterized by elliptical-spathulate cauline leaves, ciliate at the base and more or less hairy on both sides, and by trullate bracts longer than calyx; *T. praecox* subsp. *parvulus* (Lojac.) Bartolucci, Peruzzi, N.G. Passal. (Bartolucci *et al.* 2013) belonging to *T. sect. Serpyllum* is characterized by short creeping branches, ovate to oblong-lanceolate leaves, which are coriaceous, with prominent

lateral veins; *T. richardii* Pers. subsp. *nitidus* (Guss.) Jalas belonging to *T. sect. Serpyllum* is a sub-erect plant with woody stems lacking creeping branches, endemic to Marettimo Island. Furthermore, after a critical revision of several herbarium specimens from Sicily, we concluded that the previous records of *T. pulegioides* L. from this area (i.e., Conti *et al.* 2005, Giardina *et al.* 2007) are based on misidentifications and should be actually referred to *T. longicaulis* or to *T. praecox* subsp. *parvulus*. Hence, the original description by Presl (1826) perfectly fits to the current circumscription of *T. longicaulis*. A further confirmation comes from Čelakovský (1883) who identified *T. elongatus* C. Presl with *T. dalmaticus*, currently considered a morphotype with narrower leaves, and of no taxonomic value, under *T. longicaulis*.

We searched the original material of *T. longicaulis* in PR, PRC and BRNM, where Presl's herbarium is housed. We traced in PRC an herbarium sheet bearing three samples of *T. longicaulis* collected in two different localities: “*Thymus elongatus* Presl / *In collibus apricis ad Tauromenium Siciliae* / July 1817”, top right; “*Thymus elongatus* Presl / *In collibus apricis Aprutio ad Sulmona Dr. Preisz*”, middle and left. The sample collected in Sicily by Presl is selected here as a lectotype. Unfortunately, the sample has only a short stem of *Thymus*, not well preserved. Considering the taxonomic difficulties in the genus, we designate also an epitype to fix the application of the name and to avoid erroneous interpretations. The specimen selected as epitype, clearly referable to the systematic unit to which the name *T. longicaulis* is currently applied, was collected by Citarda in the north-eastern Sicily and is housed in PAL, duplicates are in FI, P and PAL.

### *Thymus longicaulis* C. Presl

Fl. Sicul.: XXXVII. 1826. — *T. striatus* var. *longicaulis* (C. Presl) Nyman, Consp. Fl. Eur.: 594. 1881. — *T. serpyllum* var. *longicaulis* (C. Presl) Bég. in Fiori & Paol., Fl. Italia 3: 66. 1903. — LECTOTYPE (designated here): [Sicily] “*Thymus elongatus* Presl, *In collibus apricis ad Tauromenium Siciliae*, VII/1817, Presl s.n. (PRC! Fig. 1, top right). — EPITYPE (designated here): [Sicily] “*Thymus glabratus* Hoff. et Link. fl.



**Fig. 1.** Lectotype of *Thymus longicaulis* C. Presl (PRC, top right specimen).

part. 1, p. 130. *In apricis montosis Mirto presso Longi, Majo, Citarda in Flora Sicula Exsiccata 691*" (PAL17864!; isoepitypes: FI!, P!, PAL17865!).

*T. serpyllum* a *vulgaris*  $\beta$  *dalmaticus* Rchb. f., *Icon. Fl. Germ. Helv.* 18: 37. 1858. — *T. serpyllum* subsp. *dalmaticus* (Rchb. f.) Nyman, *Consp. Fl. Eur.*: 594. 1881. — *T. dalmaticus* (Rchb. f.) Freyn, *Verh. Zool.-Bot. Ges. Wien* 27: 400. 1878. — *T. longicaulis* var. *dalmaticus* (Rchb. f.) Ronniger, *Feddes Repert.* 42: 387. 1924.

*T. brevicalyx* Strobl, *Oesterr. Bot. Z.* 33: 330. 1883. — *T. longicaulis* var. *brevicalyx* (Strobl.) Ronniger, *Feddes Repert.* 42: 388. 1924.

*T. exserens* auct. non Ehrh. ex Link; *Ten. Fl. Napol.*, vol. 5: 22. 1835, and *Syll. Pl. Fl. Neapol.*, App. IV: 30. 1835.

*T. glabratus* auct. non Hoffmanns. & Link; *Guss., Fl. Sicul. Syn.* 2(1): 840. 1844.

## Morphological description

(measurements refer to hermaphroditic plants only)

Loosely mat-forming perennial herbs, with long, not flowering, terminal creeping branches, rarely ending with an inflorescence. Flowering stems in rows, 4–10(16) cm, hairy on two opposite sides only (amphitrichous). Middle cauline leaves herbaceous, elliptical-lanceolate (2)6–12(13) mm long  $\times$  (1)2–4.5(6) mm wide, ciliate at base and glabrous on surface, covered by numerous sessile glands (oil dots) usually reddish, rarely

yellowish; central vein prominent, lateral veins obsolete. Inflorescence usually capitate, rarely elongated with basal verticillaster remote; bracts similar to cauline leaves. Calyx (2)2.5–3.6(4.5) mm long, greenish to reddish, tube campanulate, typically shorter than lips, covered by numerous sessile glands, glabrescent to more or less hairy; lower calyx teeth ciliate 1.2–2.5 mm long, upper calyx teeth 0.4–1.1 mm, glabrous to shortly ciliate. Flower pedicel pubescent usually with stipitate glandular hairs, rarely absent, bracteole linear. Corolla lilac to purple, (3.8)5–6.2 mm long.

### Habitat, phenology and distribution

*Thymus longicaulis* grows in woodland margins, clearings, pastures and stony meadows, indifferent to the substrate, from sea level to hilly-mountainous habitats up to above 1500 m a.s.l., rarely up to 1900–2300 m a.s.l. It flowers from April to June or July.

*Thymus longicaulis* occurs in the eastern Mediterranean region, in Sicily, Italian Peninsula, southern Austria on the Slovenian border, Balkan Peninsula, Turkey (in Europe) and Anatolia (Ronniger 1930, 1944, Guşuleac 1961, Jalas 1974, 1982, Markova 1989, Baden 1991, Bartolucci 2010). The previous records of *T. longicaulis* from the Alps (i.e., Aeschiman *et al.* 2004, Conti *et al.* 2005) and southeastern France (Jalas 1970, Dentant 2007) and the so-identified specimens studied by us coming from those areas and stored in AO, APP, FI, HBBS, MSNM, P, RO, ROV, and TSB are largely based on misidentifications and should actually be referred to other taxa belonging to *T. sect. Serpyllum* (i.e., *T. pulegioides* L., *T. oenipontanus* complex, *T. praecox* complex). *Thymus longicaulis* is also recorded from northern Spain (Morales & Gamarra 1988, Morales 2010) but the specimens seen, kept in MA, are characterized by flowering stems with an holotrichous or amphitrichous indumentum, middle cauline leaves lanceolate to elliptical, seldom spatulate showing prominent lateral veins evanescent towards the margins with a few sessile glands, calyx cylindrical-campanulate with a few sessile glands and flower pedicel without stipitate glandular hairs. These

populations seem to be better placed within the *T. praecox* complex but further studies with more complete sampling are needed to understand their taxonomic position.

### Discussion

*Thymus longicaulis* belongs to *T. sect. Serpyllum* subsect. *Pseudomarginati*. According to Jalas (1974, 1980, 1982) and Baden (1991), due to the high morphological variability, it can be subdivided in two subspecies and several varieties. Within *T. longicaulis* subsp. *longicaulis*, characterized by flowering stems hairy on two opposite sides (amphitrichous) or all round (holotrichous), middle cauline leaves herbaceous with lateral veins not prominent, upper calyx teeth 0.4–1.1 mm long, not pungent, there are four varieties recognized. Var. *longicaulis*, quoted from Sicily, Italian Peninsula, Balkan Peninsula, Turkey (in Europe) and Anatolia (Ronniger 1930, 1944, Guşuleac 1961, Jalas 1974, 1982, Baden 1991, Bartolucci 2010), is characterized by flowering stems hairy on two opposite sides only and by glabrous leaves; var. *subisophyllus* (Borbás) Jalas (= ?*T. moesiacus* Velen.) from the Italian Peninsula, Balkan Peninsula, Turkey (in Europe) and Anatolia (Jalas 1974, 1982, Hruška Dell'Uomo 1981, Baden 1991) is characterized by flowering stems hairy all round; var. *malyi* (Ronniger) Jalas (basionym *T. malyi* Ronniger) from Balkan Peninsula (Ronniger 1930, Jalas 1974) is characterized by flowering stems hairy all round and by hairy leaves; and var. *illyricus* (Ronniger) Jalas (basionym *T. illyricus* Ronniger) from the Italian Peninsula and Balkan Peninsula (Hruška & Šegulja 1970, Jalas 1974, Bartolucci 2010) is characterized by flowering stems hairy on two opposite sides and by hairy leaves.

Also within *T. longicaulis* subsp. *chaubardii* (Rchb. f.) Jalas (basionym *T. serpyllum* var. *chaubardii* Rchb. f.), which has flowering stems hairy all round (holotrichous) or on two opposite sides (amphitrichous), coriaceous leaves with prominent lateral veins, upper lip of calyx usually longer than lower teeth, upper calyx teeth pungent (0.5)0.8–1.2 mm long, several varieties are recognized. Var. *chaubardii*, quoted from



the southern Balkan Peninsula and extending to central Anatolia (Jalas 1980, 1982, Baden 1991) is characterized by flowering stems hairy on two opposite sides only; var. *alternatus* Jalas from Greece and Anatolia (Jalas 1980, 1982, Baden 1991) by flowering stems hairy on two opposite sides and by the calyx being shorter than lips; var. *antalyanus* (Klokov) Jalas (basonym *T. antalyanus* Klokov) from central and southern Anatolia (Jalas 1980, 1982) has flowering stems hairy on two opposite sides and a calyx tube as long as the lips; var. *ocheus* (Heldr. & Sart. ex Boiss.) Baden (basonym *T. ocheus* Heldr. & Sart. ex Boiss.), reported from Greece (Baden 1991), is characterized by leaves hairy on both sides; and var. *boeoticus* (Heinr. Braun) Ronniger (basonym *T. boeoticus* Heinr. Braun) from the Balkan Peninsula (Ronniger 1930, Baden 1991) has narrow leaves.

At the current state of knowledge we accept the taxonomic treatment proposed by Jalas (1974, 1980, 1982) and Baden (1991), but after a preliminary study of *T. longicaulis* subsp. *chaubardii* original material and several other herbarium specimens coming from Balkan Peninsula (FI, JE, NAP, PAL, RO, W, WU) it seems that the species rank for this taxon would be more appropriate. Also other taxa, such as *T. moesiacus* and *T. illyricus* (*T. longicaulis* var. *illyricus*; incl. *T. malyi*), appear to be substantially distinct from *T. longicaulis* s. *stricto*. A critical taxonomic revision is necessary.

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#### Appendix. Specimens of *Thymus longicaulis* C. Presl subsp. *longicaulis* var. *longicaulis* studied

**ITALY: Friuli-Venezia Giulia:** In sylvis prope Tergestem, Austria, 10.V.1889, *Engelhardt* V. (MNHN, P); Opicina [...] bei Triest, 9.V.1895, *Engelhardt* V. (P, 2 sheets); Opicina presso Trieste, Carso, 12.III.1950, *Sallich* (RO); Trieste, *Mayer* (NAP); Doberdò (Italia, prov. di Gorizia), Colle Nabregom, 30.IV.1983, *Poldini* L. (P); Trieste, IV.1911, *Marchesetti* (PI). **Emilia Romagna:** Colline di Faenza, IV.1864, s. coll. (PAL). **Tuscany:** M. Falterona, Passo della Calla, La Burraia, 23.V.1952, *R. Corradi*, *R. Bavazzano*, *A. Contardo* (BI); Monteferrato sopra Prato, 14.V.1865, *F. Curentice* (FI 4940-9); Le Macinaie, 25.IV.1983, *B. Lanza et al.* (MSNM); a Camaioni, 24.IV.2005, *G. Gestri* (Herb. Gestri); sopra Faltognano, 1.V.2009, *G. Gestri* (Herb. Gestri); Macchia di Camaioni, 18.IV.2009, *G. Gestri* (Herb. Gestri); Pietramarina, 24.IV.2008, *G. Gestri* (Herb. Gestri); *ibidem*, 25.IV.2010, *G. Gestri* (Herb. Gestri); Vinacciano, 13.IV.2009, *G. Gestri* (Herb. Gestri); Casentino, s.d., s. coll. (BI); Montalbano, 24.IV.09, *G. Gestri* (Herb. Gestri); Montalbano, 12.IV.09, *G. Gestri* (Herb. Gestri); Vinci (Firenze), 25.IV.2010, *G. Gestri* (Herb. Gestri); Monsummano Alto (Prato), 30.IV.2010, *G. Gestri* (Herb. Gestri). **Umbria:** Monte Cucco, 8.VI.1985, *Anzalone* (RO); Pian Perduto, 17.VI.1995, *S. Ballelli* (CAME). **Marche:** sotto Colle Veticchiaro, 14.VI.1981, *S. Ballelli* (CAME); dalla Il casermetta al Valico di Cima Fonteguidone, 5.VII.1997, *S. Ballelli* (CAME); dopo Passo il Chino salendo a Macera della Morte, 23.VI.2011, *F. Bartolucci et al.* (APP); Monte Ceresa, *D. Tinti et F. Ventrone* (APP); M. Comunitore, 14.VI.2007, *F. Conti* (APP). **Lazio:** Valle Stracciaro, 25.V.1993, *F. Conti* (APP); Pizzo di Sevo, 4.VII.2011, *S. Ballelli et Allegrezza* (CAME); M. Terminillo al P. di Rosce, 23.VI.1980, *Anzalone* B. (RO); Rom, Albanenberge bei Frascati, *K. Ronniger* (P); Montenero, V.2008, *F. Bartolucci* (APP); Montagna della Duchessa, 28.VI.2008, *F. Bartolucci* (APP, 3 sheets); M. Navagna, 29.V.2007, *F. Bartolucci* (APP); M. Antuni, 14.IV.2006, *F. Bartolucci* (APP); lungo la statale che costeggia il fiume Salto, 19.V.2007, *F. Bartolucci* (APP, 12 sheets); sopra Marcellina, 29.V.1970, *B. Anzalone* (AQUI); castagneto a S. Polo, 29.V.1970, *B. Anzalone* (AQUI); tra Subiaco e Jenne, s. coll. (AQUI); loc. Piscicarello di Jenne, 26.V.2005, *F. Bartolucci* (APP); M. Gennaro, 2.IV.2005, *F. Bartolucci* (APP); Monte Soratte, 23.IV.1989, *Micali M. Consuelo* (LEC); nei pressi di Calcata, 17.IV.2006, *F. Bartolucci* (APP); M. Palanzana, 4.VI.1999, *F. Bartolucci* (APP); M. Altino, 18.V.1996, *Anzalone* (RO); Barbarano, 29.IV.1995, *Anzalone* (RO); bosco di Bassiano, 21.V.1991, *Anzalone* (RO); Anguillara Sabazia, 2.V.1971, *Anzalone* (RO); boschi di M. Raschio, V.1953, *Anzalone*

(RO); Macchia Grossa al lago di Vico, VIII.1957, *Anzalone* (RO); Lago di Vico: pendici del M. Venere-M. Fogliano, 13.VI.1985, *Anzalone* (RO); Soriano nel Cimino, VII–VIII.1957, *Anzalone* (RO); Castelli romani, 21.V.1964, *Anzalone* (RO); presso Frascati, III.1983, *Pigantti* (RO); Rocca Priora, 15.V.1955, *Anzalone* (RO); S. Cesareo salendo verso Rocca Priora, 24.V.1963, *Anzalone* (RO); Pian della Faggeta, 25.V.1983, *Anzalone* (RO); M. Semprevisa, 7.VI.1965, *Anzalone* (RO); Monti della Duchessa, VI.1946, *Anzalone* (RO); Valle del Vivaro, 8.V.1948, *Anzalone* (RO); Canale Monterano, 8.V.1988, *Anzalone* (RO); da Pian della Faggeta a M. Erdigheta, V.1982, *Anzalone* (RO); M. Cavo, 7.V.1981, *Anzalone* (RO); Anguillara (Roma): presso casa Paoletti, 25.IV.1980, *Anzalone* (RO 2 sheets); Monte Gennaro, 10.IV.1885, *Macchiati* (FI); M. Gennaro-M. Morra, 30.IV.1977, *Anzalone* (RO); da Castel Madama ai Piani di Arcinazzo, 6.VI.1976, *Anzalone* (RO); via Subiaco-Jenne presso S. Giovanni, 17.V.1968, *Anzalone* (RO); bosco di S. Polo, 29.V.1970, *Anzalone* (RO); Monte Morra, 29.V.1970, *Anzalone* (RO); castagneto a S. Polo M. Morra, 29.V.1970, *Anzalone* (RO); Rocca Priora, 14.V.1972, *Anzalone* (RO); Lenola, 3.VI.1960, *Di Ponzio* (RO); Monte Frainelli presso Colle di Tora, 11.VI.1901, *A. Pappi* (RO); lecceta rada di Monte Altino, 30.VI.1970, *E. Nardi et C. Ricceri* (FI); poco sopra i Campi di Annibale, 11.V.1952, *A. Chiarugi* (FI); *ibidem*, 11.V.1955, *A. Chiarugi et C. Negri* (FI); salita a Monte Spaccato, 4.V.1906, *s. coll.* (FI); sul Monte Catillo, 16.IV.1904, *L. Vaccari* (FI); Poggi della Palanzana, 21.IV.1885, *Macchiati* (FI); al Monte Cave, 27.VI.1906, *L. Vaccari* (FI); Velletri, Colle Potrone, 10.IV.1936, *L. Senni* (FI); Velletri, V.1886, *Biondi* (FI); Supino, 26.VI.1989, *s. coll.* (AQUI, 2 sheets). **Abruzzo**: in collibus apricis Aprutio ad Sulmona, *s.d.*, *Dr. Preisz* (PRC); Villa S. Nicola, 5.V.1979, *B. Germani* (AQUI); Prati del Sirente, 24.V.2006, *F. Bartolucci* (APP, 10 sheets); strada che da Rocca di Mezzo sale ai Piani di Pezza, 5.VI.2004, *F. Bartolucci* (APP, 2 sheets); loc. Le Coppe sopra Cesacastina, 12.VII.2005, *F. Bartolucci* (APP); Torricella Sicura, 1.X.1916, *Sciarra* (NAP); Terranera, 12.VI.2010, *F. Bartolucci* (APP); uscita dell'autostrada A24 "Tornimparte", 15.V.2012, *F. Bartolucci et F. Conti* (APP); Collepodrasi, 15.V.2012, *F. Bartolucci et al.* (APP); Bosco Martese, *s.d.*, *Zodda* (BI); Cortino a Rocca Roseto, *s.d.*, *s. coll.* (BI); Lago di Campotosto, 23.V.1999, *F. Conti et D. Tinti* (APP); *ibidem*, 21.VI.2000, *D. Tinti* (APP); Pizzo Marcello, *D. Tinti* (APP); presso Villa Grande, 29.IV.2007, *F. Conti* (APP); da campo di Giove verso Cansano, 29.V.2006, *D. Di Santo* (APP); le Felciare (Tornimparte), 19.V.2000, *F. Conti, A. Manzi* (APP); M. Mezzana, 27.V.2009, *F. Conti* (APP); Serra Lunga, *F. Bartolucci et N. Ranalli* (APP). **Molise**: Alta valle Biferno, *s.d.*, *s. coll.* (IS); San Polo Matese, *s.d.*, *P. Fortini* (IS); Monte di Mezzo nel Sannio, 20.VII.1824 (1) e 1.VII.1846 (2), *s. coll.* (NAP, 2 sheets); dalle Forme verso Pizzone, 27.V.1993, *F. Conti* (APP, 2 sheets); *ibidem*, 1240 m, 28.V.1993, *F. Conti* (APP); Le Forme, 27.V.1992, *F. Conti* (APP); tra Pizzone e Casone del Medico, 26.V.1992, *F. Conti* (APP). **Campania**: M. S. Angelo presso Castellammare di Stabia, VI.1903, *M. Guadagno* (PI); S. Maria a Castello presso Positano, 25.V.1913, *M. Guadagno* (PI); Acqua Fredda, 15.V.1911, *M. Guadagno* (PI); Valle dei Mulini presso Gragnano, 1911, *M. Guadagno* (PI); Tovere presso Amalfi, 20.IV.1912, *M. Guadagno* (PI); presso Ravello, 27.VI.1909, *M. Guadagno* (PI); M. Faito Castellammare, VI.1903, *M. Guadagno* (PI); Monte S. Angelo di Castellammare, all'Acquasanta, *s.d.*, *M. Guadagno* (PI); M. Sirino, 22.VI.1995, *R. Galesi* (CAT, 5 sheets); in ditone Neapol., Caserta [...], 14.IV.1898, *Haussknecht* (JE); Costa Petrelli (Alburni), 3.VII.1980, *s. coll.* (NAP); Sirino, 1963, *s. coll.* (NAP); base del Sirino, 1200 m, 21.VII.1972, *s. coll.* (NAP); tra Quisiana e M. Faito, 15.VI.1968, *s. coll.* (NAP); Calore (M. Picentini), *s.d.*, *s. coll.* (NAP); V. Colla (M. Picentini), *s.d.*, *s. coll.* (NAP); M. Cervialto, *s.d.*, *s. coll.* (NAP); Monte Vergine, VII.1850, *Pasquale* (RO, FI); Campo Rotondo, (Caserta), pascoli, 1150, 30.V.2007, *F. Tardella* (CAME); M. Mortale, 1400, 30.V.2007, *F. Lupino et S. Peccenini* (GE); Vetta del Monte Ianara, 1575, 30.V.2007, *F. Lupino et S. Peccenini* (GE); *ibidem*, *A. Croce et S. Strumia* (Herb. Santengelo); *ibidem*, *F. Tardella* (CAME); loc. Campo Braca pr. Lago del Matese, 30.V.2007, *E. Del Vico* (APP); *ibidem*, *S. Costalonga* (Herb. Costalonga); *ibidem*, *M. Iocchi* (Herb. Iocchi); *ibidem*, *D. Uzunov* (Herb. Uzunov); *ibidem*, *E. Bronzo* (Herb. Santengelo); *ibidem*, *A. Santangelo* (Herb. Santengelo); *ibidem*, *L. Bernardo* (CLU); La Palazzina, 30.V.2007, *P. Lavezzo* (Herb. Lavezzo, 2 sheets); Vallecupa, (Caserta), 30.V.2007, *G. Salerno* (Herb. Salerno); faggeta sotto Monte Soglio, 30.V.2007, *A. Croce et S. Strumia* (Herb. Santengelo); Mortale versante sud, 30.V.2007, *A. Croce et S. Strumia* (Herb. Santengelo); *ibidem*, *F. Lupino et S. Peccenini* (GE); Monte Cappello, 30.V.2007, *A. Santangelo* (Herb. Santengelo); Mortale versante nord, 30.V.2007, *A. Croce et S. Strumia* (Herb. Santengelo, 2 sheets); Campo Rotondo, 30.V.2007, *L. Gubellini* (PESA); M. S. Angelo a Tre Pizzi, 21.VI.2008, *L. Cancellieri et G. Salerno* (APP, 3 sheets); M. Faito di Castellammare, 3.VI.2008, *F. Bartolucci* (APP, 6 sheets); sopra Passo Chiunzi, 4.VI.2008, *F. Bartolucci* (APP, 3 sheets); Torr. Peglio, 30.V.1955, *s. coll.* (FI); Sassano, 27.VI.2001, *A. Musacchio* (CLU, cod. 10442); M. Motola, *s.d.*, *E. Del Vico* (APP); in aridis montis Cerreto supra Ravello, 30.V.1910, *C. Lacaïta* (FI, NAP, RO); Monte S. Angelo di Castellammare, *s.d.*, *G. Avellino* (FI); In montibus Stabianum, *s.d.*, *G. Avellino* (FI); Agerola all'acqua Fredda, 15.V.1911, *M. Guadagno* (FI); Avellino, V.1888, *G.B. Milani* (FI); Monti di Formicola, 4.IV.1912, *Grande* (NAP); Monte Vergine, 15.V.1909, *Grande* (NAP); Monte Stella nel Cilento, 10.V.1912, *Grande* (NAP); Monti di Castellammare, VI.1906, *Cavara* (NAP); Monte San Costanzo, 12.IV.1908, *Grande* (NAP); Monte Cerreto, 7.VI.1908, *Grande* (NAP); M. Sant'Angelo a Tre Pizzi, 31.V.1908, *Grande* (NAP); Monti di Gragnano, 24.V.1908, *Grande* (NAP); Bagnoli, VI.1916, *N. Terracciano* (NAP, 2 sheets); Monte Ruscello, VI.1905, *N. Terracciano* (NAP); supra Ravello, 30.V.1910, *C. Lacaïta* (RO); Monti della Cava, 23.V.1832, *s. coll.* (NAP, 2 sheets); Monte della Stella 1, Gneligeno 2, *s.d.*, *Tenore* (NAP); Valle di Orsolone presso Napoli, 10.V.1848, *s. coll.* (NAP); Valle di Orsolone presso Napoli, *s.d.*, *Gussone* (NAP); Cilento, Laurino al Piano del Mercato, 1.VI.1826, *s. coll.* (NAP); Salita di Monte Vergine, 21.V.1846, *s. coll.* (NAP); Monte Taburno, 1826, *s. coll.*



(NAP); Monti di Castellammare all'Acquasanta, 19.V.1847, *s. coll.* (NAP, 2 sheets); M. di Castellammare Faito, 19.V.1847, *s. coll.* (NAP); Caserta, 1.V.1850, *s. coll.* (NAP); Monte Vergine alla salita, 21.V.1856, *s. coll.* (NAP); Salerno, *s.d.*, *s. coll.* (NAP); Monte Vergine, 15–20.V.1986, *Tammaro* (AQUI); Monte Faito, 15–20.V.1986, *Tammaro* (AQUI); Taburno, *s.d.*, *s. coll.* (FI); M. Faito, 5.VI.1982, *Brullo et Signorello* (CAT); bosco sotto M. S. Angelo, 6.VI.1982, *Brullo et Signorello* (CAT); Vallo della Lucania, 19.VI.1917, *M. Guadagno* (PI); Monte Vergine, 26.VI.1897, *M. Guadagno* (PI); *ibidem*, VI.1903, *M. Guadagno* (PI); M. Terminio, VI.1905, *M. Guadagno* (PI). **Apulia:** Coppo l'Arena, 08.V.2009, *F. Bartolucci* (APP, 5 sheets); Monte Sacro, 31.V.1893, *U. Martelli* (FI); da S. Marco a S. Nicandro, 11.V.1893, *U. Martelli* (FI); Gargano, 4.VI.1952, *Corti* (BI); Gargano, 26.V.2011, *F. Bartolucci et F. Conti* (APP). **Basilicata:** Monte Caramola, 20.V.1994, *S. Mastropiero* (APP); Moliterno, 18.VI.1994, *R. Galesi* (CAT); C.da Ottorino, 2.V.2004, *F. Bartolucci* (APP, 3 sheets); Dolomiti Lucane, *F. Bartolucci* (APP, 2 sheets); Piano Ruggio, 26.VI.1991, *L. Bernardo et G. Cesca* (CLU); Alpe di Latronico, 30.VI.1907, *Cavara* (NAP); in Lucania, *s.d.*, *Crocchi* (PAL); Basilicata, *s.d.*, *Barbazita* (NAP); Balvano, 1843, *Barbazita* (NAP); Pizzuto di S. Michele, *s.d.*, *Ter-racciano* (NAP); Basilicata, *s.d.*, *s. coll.* (NAP); Piano del Caprio, 19.VI.1927, *Gavioli O.* (FI); Montis La Rocca, 24.V.1938, *Gavioli O.* (FI); Montis Cinciumelli, 22.V.1923, *Gavioli O.* (FI); Potenza, V.1927, *Gavioli O.* (FI); Potenza, V.1910, *Gavioli O.* (FI); Potenza a Cinciumelli, 22.V.1923, *Gavioli O.* (FI); Serra della Criva, 17.V.1923, *Gavioli O.* (FI); Alpe di Latronico, 30.VI.1907, *s. coll.* (PI). **Calabria:** Lorica, 31.V.1988, *s. coll.* (NAP); Tirivolo, 6.VII.1993, *P. Alfano* (CLU); C.da Viperaro, 7.VI.2008, *F. Bartolucci* (APP, 7 sheets); ca. 2 km W-SW of Camigliatello Silano, 11.VI.1997, Partecipanti VIII Iter Mediterraneum (CLU); Monte Cocuzzo, 20.V.1993, *S. Oliveti, E. Tucci* (CLU); Monte Curcio, versante SW, 11.VII.1995, *L. Bernardo, N. Passalacqua* (CLU); Valle Piana, 24.V.1997, *L. Bernardo et al.* (CLU); Monte Mula, 22.VII.1991, *L. Bernardo et al.* (CLU); M. Manfrana, 10.VII.1996, *L. Bernardo, N. Passalacqua* (CLU); Pollinello, VI.1994, *L. Bernardo* (CLU); Vallone Marcellino Serra, 25.VI.1997, *L. Bernardo et al.* (CLU); Monte Altare, 20.VI.1984, *L. Bernardo* (CLU); Afforcata, 10.VII.1996, *L. Bernardo et al.* (CLU); Foresta Luta, 25.V.1975, *G. Cesca* (CLU); Vallone Cecita, 28.VII.1992, *L. Bernardo et al.* (CLU); Timpa della Saitta, 26.V.1994, *L. Bernardo, S. De Marco* (CLU); Cozzo del Morto, 23.V.1987, *M. Codogno et al.* (CLU); Monte Mula, 14.VII.1994, *L. Bernardo, G. Cesca* (CLU); Sferracavallo, 22.VII.1991, *L. Bernardo et al.* (CLU); Monte Cocuzzo, 4.VIII.1993, *S. Oliveti, E. Tucci* (CLU); Gambarie, 28.VI.1958, *L. Tamanini* (ROV); Aspromonte, 14.VI.1981, *Brullo* (CAT); Fabrizia, 7.VII.1980, *Brullo et Signorello* (CAT); Colle Spada, 5.VII.1980, *Brullo et Signorello* (CAT); Serra S. Bruno, 5.VII.1980, *Brullo et Signorello* (CAT); Mongiana, 29.V.1980, *Brullo et Signorello* (CAT); Mangiatorella, 28.V.1980, *Brullo et Signorello* (CAT); Piano della Lacina, 29.V.1999, *D. Gargaro* (CLU); Fagnano Castello, 22.V.1982, *L. Panza* (CLU); Fondo dei Torni, 30.IV.1983, *s. coll.* (CLU); La Sila, 29.V.2.VI.1955, *Anzalone* (RO); lago Arvo, 9.V.1950, *Sarfatti et Corradi* (RO, 2 sheets); Trapidò, 6.V.1950, *Sarfatti et Corradi* (RO); Tirivolo, 20.VI.1950, *Sarfatti et Corradi* (BI, RO); Difesa Spina, 11.VII.1951, *Sarfatti et Contardo* (BI, FI, RO); salita al Macchione, 15.VII.1951, *Negri et al.* (BI, FI, RO); Camigliatello, 10-12-15-16.VII.1951, *Sarfatti et Contardo* (RO); salita al Monte Carlomagno, 14.VI.1950, *Sarfatti et Corradi* (BI, FI, RO); Camigliatello, 25.VI.1950, *Sarfatti et Corradi* (RO); Cuturelli, 11.V.1950, *Sarfatti et Corradi* (BI, FI, RO); San Giovanni in Fiore, 11.V.1950, *Sarfatti et Corradi* (BI, FI, RO); Neto di Femara, 22.VI.1950, *Sarfatti et Corradi* (FI, RO); presso il Lago Ampollino, 19.VI.1960, *M. Paolu* (RO); prope Palma, 20.V.1877, *Arcangeli* (RO, FI); bivio di Garga, 31.V.1955, *Chiarugi et al.* (RO, FI); contrada Gianberga, *s.d.*, *Chiarugi et al.* (RO, FI); M. Basilico, 2.VI.1955, *Chiarugi et al.* (RO, FI); Valico di Pietra Spada, 1.VI.1955, *Chiarugi et al.* (RO, FI); Serra San Bruno, 25.V.1884, *Zwierlein* (RO, FI); *ibidem*, 15.VI.1884, *Zwierlein* (RO, FI); Monte Cocuzza, 10.VI.1899, *Fiori* (RO, FI); Giffone di Calabria, VII.1850, *Pasquale* (RO, FI); Fiumara di S. Andrea Calabria, 9.V.1824, *s. coll.* (NAP); Monte Pecoraro, 5.VII.1980, *Brullo et Signorello* (CAT); Cosenza, 21.IV.1918, *M. Guadagno* (PI); Sila di Savelli, 1-2.VII.1917, *M. Guadagno* (PI, 2 sheets); *ibidem*, V-1917, *M. Guadagno* (PI); Colline a Francavilla Marittima, 15.IV.1917, *M. Guadagno* (PI); Cozzo Pellegrino, 26.VI.1917, *M. Guadagno* (PI); Sila di Savelli, 27.VII.1918, *M. Guadagno* (PI, 2 sheets); in tutta la Sila, *s.d.*, *s. coll.* (FI); tra Cotronei e il Lago Ampollino, 27.IV.1990, *Banfi* (MSNM, 2 sheets); Contrada Viperaro, 07.VI.2008, *G. Galasso* (MSNM, 2 sheets); Belvedere di Malvento sul versante sud di Timpona Capanna, 3.VII.1991, *L. Bernardo* (CLU); prope San Giovanni in Fiore, 11.VI.1933, *Bornmuller J.* (P); Castrovillari, VII.1877, *Huter, Porta et Rigo* (P). **Sicily:** In collibus apricis ad Tauromenium Siciliae, VIII/1817, Presl (PRC); Monti della Noara, V-VI, *G. Gussone* (NAP); *ibidem*, VI, *G. Gussone* (NAP, 4 sheets); Monte Bonavita alla Noara, VI, *G. Gussone* (NAP); *ibidem*, 11.VI, *G. Gussone* (NAP); Messina, V-VI, *Alexander* (NAP); Messina al Campo, *s.d.*, *Prestandrea* (NAP); Messina, *s.d.*, *Prestandrea* (NAP, 2 sheets); Sicilia, *s.d.*, *Todaro* (PAL); Mirto presso Longi, V, *Citarda* 691 (FI, P, PAL, PAL); Russomanno // Messina, V.1852, *s. coll.* (PAL); sopra Messina, 9.VI.1832, *s. coll.* (PAL); Piano dei Campi, *s.d.*, [...] (PAL); Messina, *s.d.*, *s. coll.* (PAL); prope Longi, *s.d.*, *s. coll.* (PAL, 2 sheets); *ibidem*, *s.d.*, *Bivona* (FI); Valdemone, VI.1894, *Citarda et Riccobono* (PAL); B. di Valdemone, V.1855, *Todaro* (PAL); Valdemone, *s.d.*, *s. coll.* (PAL); Noara, V, *s. coll.* (PAL); Monte Scuderi, *s.d.*, *s. coll.* (PAL); M. di Cammarata, VII, *Lojacono* (PAL); Tortorici, *s.d.*, *Todaro* (RO); Monte Trefinaite, 29.VI.2001, *R. Galesi* (CAT); Contrada Acquasanta Flascia, 13.VI.1974, *Brullo et Grillo* (CAT); M. Polverello, 31.V.1981, *Brullo* (CAT); Malabotta, 31.V.1981, *Brullo* (CAT); Monte Salvatesta, *s.d.*, *Nicotra* (FI); *ibidem*, VI, *s. coll.* (RO); Monti di Valdemone, *s.d.*, *Todaro* (FI); Portella di Materio sopra S. Marco, *s.d.*, *Todaro* (FI); Valdemone, 1882, *Todaro* (P); Mandanici, V, *Nicoltra* (RO); montis Dinnammare, *s.d.*, *Nicotra* (P). **CROATIA:** Dalmatia, *s.d.*, *s. coll.* (MSNM); San Martino Lussinpiccolo, 16.X.1922, *Lusina G.* (RO); *ibidem*, 12.X.1920, *Lusina G.* (RO); *ibidem*, 11.



IV.1920, *Lusina G.* (RO); *ibidem*, 3.VI.1919, *Lusina G.* (RO); pr. Veglia nel Quarnero, 12.IV.1915, *Lusina G.* (RO); nell'Is. di Lussino nel Quarneo, *s.d.*, *Lusina G.* (RO); pr. Lussingrande, 3.IV.1937, *Lusina G.* (RO); M. Laccia, 20.V.1944, *Lusina G.* (RO); Pola, *s.d.*, *Pichler T.* (P, WU, 2 sheets); ad agrorum margines prope Polam, V.1881, *Pichler T.* (P, 2 sheets); prope Pola, 2–170 m. s. m., IV.V.1898, *Untchj K.* (P); pr. Torretto ad Spalato, V.1870, *Pichler T.* (P); [...] Pola, V.1881, *Pichler T.* (P, 2 sheets); Pola [...], *s. coll.* (P); Pola [...], 3.V.1890, [...] (P); Dalmatia, *Visiani* (NAP); Šibenik, 26.IV.1994, *Milović M.* (ZA); Hrv. Primorje Skrljevo, 3.V.1951, *Horvat I.* (ZA); Mrkan, otočić kod Cavtata pašnjak, 22.III.1979, *Hećimović S.* (ZA); Gravosa: in Weingarten bei Malfi, 50 m, 16.IV.1897, *Baenitz C.* (P, 2 sheets); Is. di Unie nel Carnaro, incolti pr. paese, 20 m. s. m., 25.V.1934 *Lusina G.* (RO). **MONTENEGRO**: an der Strasse von Cattaro nach Cetinje, 6.V.1896, *Kraus O.* (P). **ALBANIA**: Peshkopi, 2.IV.1922, *s. coll.* (P). **GREECE**: jugo Baldenes m. Olycika distr. Janina, 17.VI.1896, *A. Baldacci* (P, 2 sheets).

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