

Typification of *Trifolium latinum* Sebast. (Fabaceae) and comparison with similar species

Duilio Iamónico*, Emanuela Giovi, Mauro Iberite & Giovanna Abbate

Sapienza Università di Roma, Dip. di Biologia Ambientale, Piazzale Aldo Moro 5, IT-00185 Roma, Italy (*corresponding author's e-mail: duilio.iamonico@uniroma1.it)

Received 16 June 2010, revised version received 28 Nov. 2010, accepted 2 Dec. 2010

Iamónico, D., Giovi, E., Iberite, M. & Abbate, G. 2011: Typification of *Trifolium latinum* Sebast. (Fabaceae) and comparison with similar species. — *Ann. Bot. Fennici* 48: 459–464.

Based on a plate from the protologue by Antonio Sebastiani and a specimen in RO, a lectotype and an epitype, respectively, for *Trifolium latinum* Sebast. are designated here.

Trifolium is one of the largest genera within the family Fabaceae. It includes approximately 255 species that are mainly distributed in temperate and subtropical regions of the world. The genus has three centres of diversity: one is located in the Mediterranean basin, the second in California and its surroundings, and the third in the highlands of eastern Africa (Zohary & Heller 1984, Ellison *et al.* 2006).

At present, more than 110 species are recorded in the Mediterranean area, representing seven out of the eight sections recognized in *Trifolium* (Zohary & Heller 1984). In Italy, 72 species in six sections are recorded (Zohary & Heller 1984, Conti *et al.* 2005, Conti *et al.* 2007, Iocchi *et al.* 2009).

Trifolium latinum Sebast., which is included in the sect. *Trifolium*, is an eastern-Mediterranean species (Pignatti 1982) distributed in Italy, Bulgaria, Greece and Turkey (Coombe 1968: 171, Greuter *et al.* 1989). In Italy, *T. latinum* has not been recorded for more than a century. The Italian localities can be considered disjunct within the distribution area, similar to some other eastern species present in the Lazio region, such as *Vicia sativa* subsp. *incisa* (Giovi *et al.* 2003a, 2003b).

The aim of this work was to provide the proper application of the name *T. latinum* and its delimitation in comparison with the morphologically similar species *T. echinatum* and *T. leucanthum*. This paper is based on an analysis of the relevant literature, and on the examination of the specimens kept in the Herbaria RO and FI.

Morphological analysis of the *exsiccata* of the three species in question, based on the 26 characters (5 qualitative and 21 quantitative; Table 1), was also performed.

Trifolium latinum Sebast.

Pl. Rom. 1: 7. 1813.

LECTOTYPE (here designated): pl. 1, fig. 2 in Sebastiani 1813: 15 (Fig. 1). — EPITYPE (here designated): Alla Macchia de' Mattei fuori la porta portese, VI (XIX sec.), Herb. E. Mauri, H.S. (Sebastiani), *Leg. E. Mauri, Rev. S. Belli 12775* (RO-Herbarium Romanum) (Fig. 2).

FURTHER ICONOGRAPHY: pl. 9, fig. 1 in Gibelli & Belli 1888 (Fig. 3); pl. 197 in Zohary & Heller 1984: 501.

In order to locate a possible lectotype, we checked the specimens collected by Sebastiani in RO and FI. All of the material comes from

a restricted area of the western sector of Rome that extends from a zone named Maglianella to a zone named Macchia Mattei (type locality). Only two of the specimens kept in RO can be ascribed to the Sebastiani collection, due to the abbreviation “H.S.” in authentic handwriting (meaning *Herbarium Sebastiani*). But because they both lack the year of collection, none of them can be unequivocally chosen as lectotype.

Sebastiani (1813) reported six illustrations (in four plates), one of which matches the protologue. That drawing is selected here as the lectotype of the name *Trifolium latinum*. Since the cited figure shows a fruiting plant, and in order to properly define the application of the name, we also selected one specimen as the epitype (Fig. 2).

Table 1. Characters measured in *Trifolium echinatum*, *T. latinum* and *T. leucanthum* (characters marked with an asterisk are qualitative).

Character no.	Character definition
1	stem hairiness (glabrous, pubescent, villous)*
2	smallest leaf petiole length (mm)
3	smallest leaf width (mm)
4	smallest leaf length (mm)
5	ratio 3/4
6	largest leaf petiole length (mm)
7	largest leaf width (mm)
8	largest leaf length (mm)
9	ratio 7/8
10	stipules total length (mm)
11	stipules adnate part length (mm)
12	stipules free portion length (mm)
13	ratio 10/11
14	ratio 10/12
15	ratio 11/12
16	flowering heads peduncle length (mm)
17	flowering heads diameter (mm)
18	flowering heads length (mm)
19	ratio 18/17
20	inflorescence branching (dichotomous, non-dichotomous)*
21	calyx length (mm)
22	calyx symmetry (actinomorphic, zygomorphic)*
23	calyx hairiness (glabrous, pubescent, villous)*
24	corolla length (mm)
25	ratio 22/19
26	fruiting calyx callosity (enlarged, non-enlarged)*

Trifolium latinum was first described from Rome (Lazio region, central Italy) in 1813 (“*in Sylvula prope Romam versus Mare vulgo dicta Macchia de’ Mattei*”; Sebastiani 1813). Subsequently, all the European floras in which *T. latinum* was quoted (e.g. De Candolle 1825, Diapoulis 1948, Coombe 1968: 171, Zohary & Davis 1970, Kozuharov 1976, Pignatti 1982) recognized it as a distinct species. Gibelli and Belli (1888) supposed *T. latinum* to be a hybrid between *T. echinatum* and *T. leucanthum* and wrote: “it is probably a hybrid [...] between *T. echinatum* and *T. leucanthum* [...] it resembles *T. leucanthum* as for the vegetative characters, and *T. echinatum* as for the characters of the flower” (originally in Italian, our translation). In particular, the authors noted an affinity with *T. leucanthum* regarding the stem hairiness and length of peduncles of the flowering heads, and with *T. echinatum* regarding the calyx structure. Moreover, they described the leaflets as “very long”, but in the subsequent discussion the length of the leaflets was considered intermediate between the putative parents.

Actually, in the literature *T. latinum* has been viewed as related both to *T. echinatum* and to *T. leucanthum*. Zohary and Heller (1984) included *T. latinum* and *T. echinatum* in the sect. *Trifolium* and distinguished the species at subsectional level in that they assigned *T. latinum* and *T. echinatum* to the subject. *Echinata*, and *T. leucanthum* to the subject. *Urceolata*, with the latter subsection differing from the former by having an urceolate calyx.

Trifolium echinatum was described by Bieberstein (1808) from *Caucasum*; according to the protologue, this species is characterized by an ascendent and villous stem, long and villous stipules, obovate leaflets, pedunculate and ovate flowering heads, and a zygomorphic and villous calyx. Also *T. leucanthum* was described by Bieberstein (1808), from *Tauriae meridionalis collibus siccis*; according to the protologue, it is characterized by an ascendent and villous stem, long stipules, obovate leaflets, pedunculate and globose flowering heads, and an actinomorphic and villous calyx.

According to the examined floras, *T. latinum* differs from the other two species by having the leaflets linear-lanceolate, from *T. leucanthum* by

having a zygomorphic calyx, and from *T. echinatum* by having linear teeth on the calyx.

Our analysis of the morphological features and qualitative characters allows to better separate *T. latinum* from the other two species. Six of the measured characters are of particular significance, as they clearly separate *T. latinum*; these are length, width, and length/width ratio of the smaller leaflets; and length, width, and length/width ratio of the largest leaflets (Fig. 4A–B). The remaining characters show a higher affinity between *T. latinum* and *T. leucanthum*. In fact, some characters (such as the diameter of the flowering heads; Fig. 4C) completely overlap, whereas *T. echinatum* is well separated.

As for the six qualitative characters, only the branching of the inflorescence is significative: all the specimens of *T. latinum* have a dichotomous inflorescence, while a significant percentage of the other plants (90%) have a non-dichotomous inflorescence. The hairiness of the calyx and of the stem are the same in *T. latinum* and *T. leucanthum* (villous), whereas *T. echinatum* has both the stem and the calyx glabrous or slightly pubescent.

A key to the three species in question is as follows:

1. Stem glabrous or slightly pubescent; leaflets ovate, obovate or broadly lanceolate (3–14 × 7–25 mm); length of adnate part of stipules 3–8(–10) mm; diameter of the flowering heads (7–)8–12 mm; calyx slightly pubescent *T. echinatum*
1. Stem villous; leaflets ovate, broadly lanceolate or linear; adnate part of stipules and diameter of flowering heads longer; calyx villous 2
2. Leaflets lanceolate-linear (2–4 × 20–45 mm); branching of inflorescence dichotomous *T. latinum*
2. Leaflets obovate or broadly lanceolate (4–10 × 20–40 mm); branching of inflorescence usually non-dichotomous *T. leucanthum*

We can conclude that the examination of the Italian specimens of *T. latinum*, the most recent of which was collected in 1902, allows us to designate a lectotype and an epitype for the name. Based on the literature, we can say that the Italian specimens were never examined by any modern author, including the specialist M. Zohary (cf. Zohary & Heller 1984); all of those authors considered *T. latinum* to be related to *T. echinatum*. Based on our study, it seems that *T.*



Fig. 1. Lectotype of the name *Trifolium latinum* Sebast. (from Sebastiani 1813).

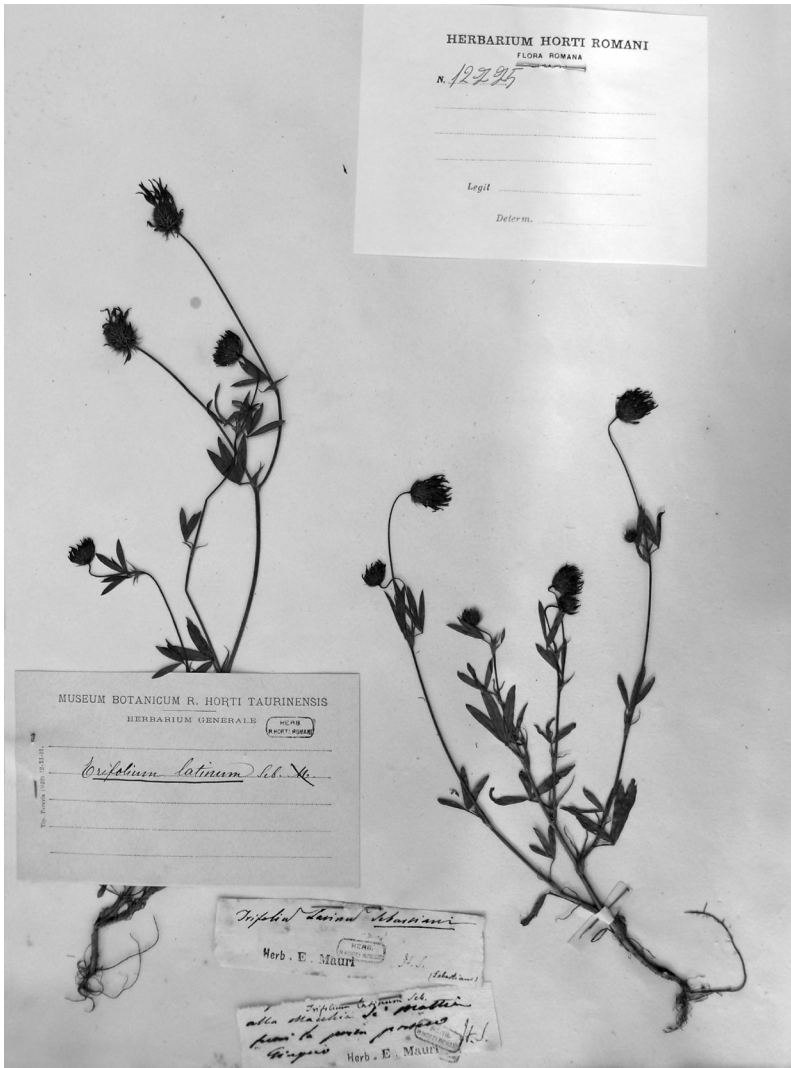


Fig. 2. Epitype (right-hand-side specimen) of the name *Trifolium latinum* Sebast. (RO-Herbarium Romanum, no. 12775).

latinum has more affinity with *T. leucanthum*. Further field investigations and molecular analyses of herbarium materials will be performed in order to verify the actual disappearance of the species from Italy, and to clarify its taxonomic identity.

SPECIMENS EXAMINED. — **Italy. Lazio, Roma (RO-Herbarium Romanum):** Macchia de' Mattei, Herb. E. Mauri, 31.V.1828, *Leg. E. Mauri, Rev. S. Belli 1894 12777*. Macchia Mattei, Herb. P. Sanguinetti, V.1829, *Leg. P. Sanguinetti, Rev. S. Belli 12781*. Macchia Mattei, Herb. P. Sanguinetti, VI.1830, *Leg. P. Sanguinetti, Rev. S. Belli 12780*. M.a Mattei, VI.1831, Herb. E. Mauri, *Leg. E. Mauri, Rev. S. Belli 12778*. Macchia Mattei, V.1847, Herb. P. Sanguinetti,

Leg. P. Sanguinetti, Rev. D. Belli 1894 12779. In sylvula de Mattei non comune, solum inveni erga la Maglianella in laxua, 27.V.1858, Herb. H. Rolli, *Leg. E. Rolli, Rev. S. Belli 12782*. In Sylvula de Mattei non comune, solum inveni erga la Magliana in laxua, 27.V.1858, Herb. H. Rolli, *Leg. E. Rolli, Rev. S. Belli 12783*. Colline a destra del fosso di Acqua fredda, sulla sinistra della via andando a Civitavecchia, 12.VI.1888, A. Terracciano 12766. Macchia Mattei, 14.VI.1888, *Leg. A. Terracciano, Rev. G. Lusina 12765*. Maglianella, 30.V.1889, *Leg. A. Terracciano, Rev. G. Lusina 12774*. Via Aurelia, riva sinistra dell'Acquafredda, boschetti, 28.V.1890, Herb. L. Salomonsohn, *Leg. L. Salomonsohn, Rev. G. Lusina 12767, 12768*. Via Aurelia, Acquafredda, boschetti, 31.V.1894, Herb. L. Salomonsohn, *Leg. L. Salomonsohn, Rev. G. Lusina 12770. Ibidem 12771*. Via Aurelia, Acqua fredda, boschetti, 4.VII.1894, Herb. L. Salomonsohn,

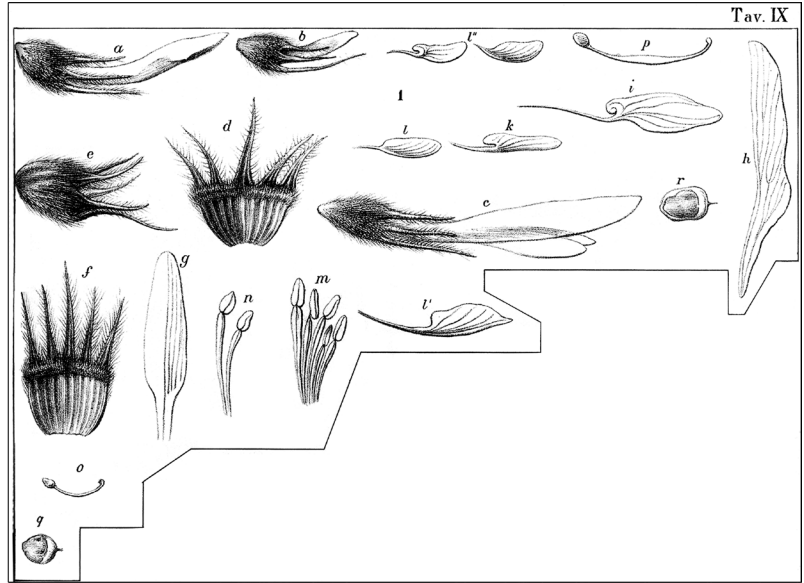


Fig. 3. *Trifolium latinum* Sebast. (from Gibelli & Belli 1888, pl. 9, fig. 1). — **a–c:** Flower. — **d–f:** Open calyx. — **e:** Fruiting calyx. — **g and h:** Flag. — **i–k:** Wing. — **l:** Keel. — **m and n:** Stamen. — **o and p:** Pistil. — **q and r:** Pod.

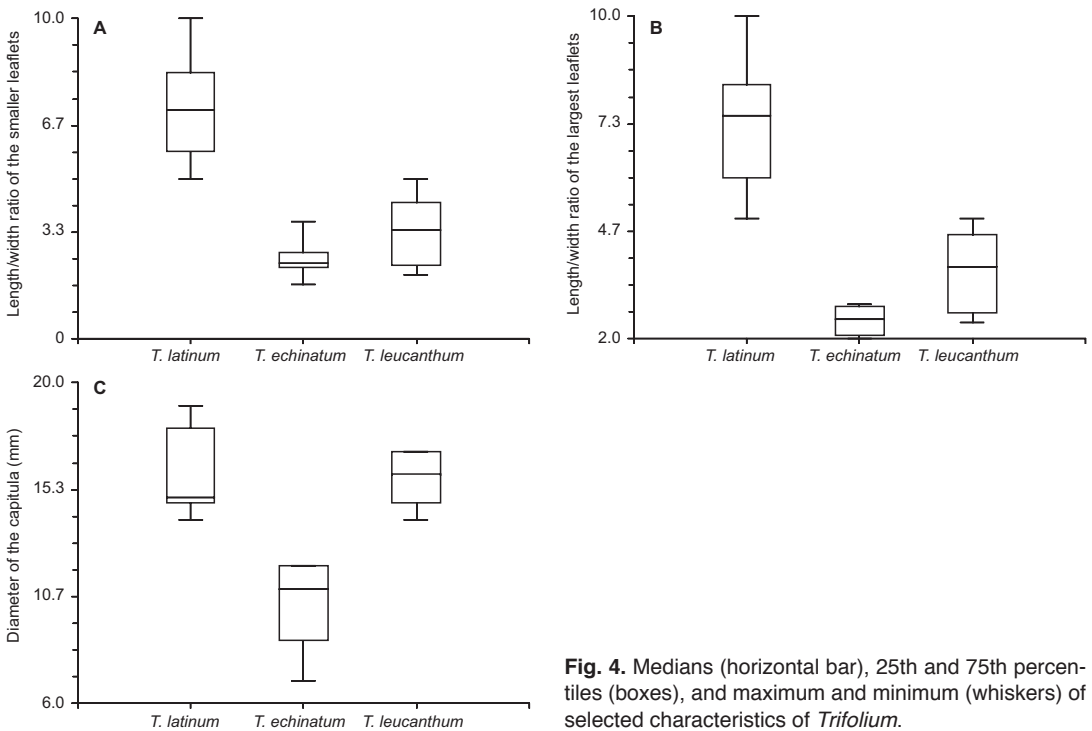


Fig. 4. Medians (horizontal bar), 25th and 75th percentiles (boxes), and maximum and minimum (whiskers) of selected characteristics of *Trifolium*.

Leg. L. Salomonsohn, Rev. G. Lusina 12764. Via Aurelia, Acquafredda, al solito posto, già boschetti, ora campo di grano (con molto *Rubus* e moltissima *Pteris aquilina*), 10.VII.1900, Herb. *L. Salomonsohn, Leg. L. Salomonsohn, Rev. G. Lusina 12769.* Rom Maglianella Weide, VI.1902, Herb. Honig, *Leg. B. Honig, Rev. G. Lusina 12772. Ibidem*

17773. Via Aurelia, riva sinistra dell'Acquafredda, prato al piè della collina, 19.VI.1902, Herb. *L. Salomonsohn, Leg. L. Salomonsohn, Rev. G. Lusina 12763.* **Lazio, ROMA (RO-Herbarium Cesatianum):** M.a Mattei, VI.1831, *Leg. E. Mauri, Rev. S. Belli. Sine loc., XIX sec., Ex Fl. Romana Prodr. 252. Tab. VI f. 1., d. Exc.mus Medici-Spada. Macchia*

de' Mattei lungo la strada, VI (XIX sec.), Herb. E. Mauri, H.S. (Sebastiani), *Leg. E. Mauri, Rev. S. Belli 12776*. Alla Macchia de' Mattei fuori la porta portese, VI (XIX sec.), Herb. E. Mauri, H.S. (Sebastiani), *Leg. E. Mauri, Rev. S. Belli 12775*. **Lazio, Roma (FI):** *Sine loc.*, III.1856, da *Sanguinetti s.n.* In sylvia dicta de' Mattei extra Porta Portese haud frequens et hinc inde in laxua erga la Magliana, 27.V.1858, da *Rolli s.n.* Via Aurelia (Ten. di Brava in Butswald an Acquafredda) Roma, I.VI.1888, *sine coll. & n.* Macchia Mattei, *sine die* (XIX sec.), *sine coll. & n.*

Acknowledgements

Thanks are due to Directors and Curators of all quoted Herbaria for their support during our visits or loan of specimens/ photograph. We are also grateful to Dr. Marco Iocchi (Roma) for the information provided.

References

- Conti, F., Abbate, G., Alessandrini, A. & Blasi, C. (eds.) 2005: *An annotated checklist of the Italian vascular flora*. — Palombi & Partner, Roma.
- Conti, F., Alessandrini, A., Bacchetta, G., Banfi, E., Barberis, G., Bartolucci, F., Bernardo, L., Bonacquisti, S., Bouvet, D., Bovio, M., Brusa, G., Del Guacchio, E., Foggi, B., Frattini, S., Galasso, G., Gallo, L., Gangale, C., Gottschlich, G., Grünanger, P., Gubellini, L., Iiriti, G., Lucarini, D., Marchetti, D., Moraldo, B., Peruzzi, L., Poldini, L., Prosser, F., Raffaelli, M., Santangelo, A., Scassellati, E., Scortegagna, S., Selvi, F., Soldano, A., Tinti, D., Ubaldi, D., Uzunov, D. & Vidali, M. 2007: Integrazioni alla checklist della flora vascolare italiana. — *Natura Vicentina* 10: 5–74.
- Coombe, D. E. 1968: *Trifolium* L. — In: Tutin, T. G., Heywood, V. H., Burges, N. A., Moore, D. M., Valentine, D. H., Walters, S. M. & Webb, D. A. (eds.), *Flora Europaea*, vol. 2: 157–172. Cambridge University Press, Cambridge.
- De Candolle, A. P. 1825: *Prodromus systemati naturalis regni vegetabilis sive enumeratio contracta ordinum, generum specierumque plantarum huc usque cognitarum, juxta methodi naturalis normas digesta* 2. — Sumptibus Sociorum Treuttel & Würz, Parisiis.
- Diapoulis, H. A. 1948: [*Synopsis Florae Graecae*, Tomos B(1)]. — Athenai. [In Greek].
- Ellison, N. W., Liston, A., Steiner, J. J., Williams, W. M. & Taylor, N. L. 2006: Molecular phylogenetics of the clover genus (*Trifolium* — Leguminosae). — *Molecular Phylogenetics and Evolution* 39: 688–705.
- Gibelli, G. & Belli, S. 1888: *Rivista critica e descrittiva delle specie di Trifolium italiane e affini comprese nella sez. Lagopus Koch*. — Ermanno Loescher, Torino.
- Giovi, E., Abbate, G. & Iberite, M. 2003a: Demographic, phytogeographic and state-of-habitat study on eight red-listed taxa of central-southern Italian vascular flora: early data. — In: De Iongh, H. H., Bánki, O. S., Bergmans, W. & van der Werff ten Bosch, M. J. (eds.), *The harmonisation of Red Lists for threatened species in Europe*: 205–216. Bakhuijs Publishers, Leiden.
- Giovi, E., Bassani, R., Bonacquisti, S. & Abbate, G. 2003b: *Vicia sativa* L. subsp. *incisa* (M. Bieb.) Arcangeli nel Comprensorio dei Colli Albani: enigma corologico o evidenza storica? *Documenta Albana*. — *Musei Civici di Albano (Albano Laziale — Rm)* II serie 25: 7–13.
- Greuter, W., Burdet, H. & Long, G. 1989: *Med-checklist 4. Pteridophyta, Gymnospermae, Dicotyledones (Lauraceae–Rhamnaceae)*. — Conservatoire et Jardin botaniques de la Ville de Genève, Genève.
- Iocchi, M., Allori, A. & Piras, P. 2009: Notula 1599. *Trifolium cernuum* Brot. Notulae alla checklist della flora vascolare italiana: 8. — *Informatore Botanico Italiano* 41: 352.
- Kozuharov, S. I. 1976: *Trifolium* L. — In: Jordanov, D. (ed.), *Flora Reipublicae Popularis Bulgaricae* 6: 327–441. Bulgarian Academy of Sciences, Sofia. [In Bulgarian].
- Pignatti, S. 1982: *Flora d'Italia* 1. — Edagricole, Bologna.
- Sebastiani, A. 1813: *Romanarum Plantarum fasciculus primus*. — Typis de Romanis, Romae.
- Zohary, M. & Davis, P. H. 1970: *Flora of Turkey*, vol. 3. — Edinburgh University Press, Edinburgh.
- Zohary, M. & Heller, D. 1984: *The genus Trifolium*. — The Israel Academy of Sciences and Humanities, Jerusalem.