

NEW CHOROLOGICAL DATA FROM OLTENIA (ROMANIA) FOR APHANES AUSTRALIS RYDB. AND MONTIA FONTANA L. SUBSP. CHONDROSPERMA (FENZL) WALTERS SPECIES

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ABSTRACT

In this paper we present the new chorological information from Oltenia (floristic province of Romania) for species Aphanes australis (Rosaceae) and Montia fontana subsp. chondrosperma (Portulacaceae), accompanied by some considerations from ecological and cenological points of view.

INTRODUCTION

Oltenia represents one of the most interesting provinces of Romania regarding the natural conditions and the flora and vegetation diversity. For some species from the Romanian flora and implicitly from Oltenia region, the taxonomy and chorological data are not clear yet.

Thus, the chorology of *Aphanes australis* and *Montia fontana* subsp. *chondrosperma* taxons from Romania is still little known.

In Red Lists of Romania, they are stated as endangered species – E (according to Dihoru & Dihoru 1994) or as rare species – R (Bo caiu, Coldea, Horeanu 1994; Oltean & al. 1994). In Red Book of vascular plants from Romania (Dihoru & Negrean 2009) *Aphanes australis* is considered to be seriously endangered species (CR), and *Montia fontana* subsp. *chondrosperma* is not placed in any zoological category, the latter one being considered during the last few years as very sporadic within Romanian flora.

These two species have been identified recently in Oltenia, in several localities of Gorj county.

MATERIAL AND METHOD

As a result of the trips in several area of Oltenia for studying the flora and the vegetation in all their stages, we identified *Aphanes australis* and *Montia fontana* subsp. *chondrosperma* taxons in several localities of Gorj county. The material collected from the fields was analysed according to the specialized literature from Romania and abroad.

The nomenclature follows that of the “Flora României” (S vulescu 1952-1976) and Flora Europaea (Tutin & al. 1964–1980) completed by several recent works.

The nomenclature of coronims is the one official in Romania. Herbarium abbreviation follows Holmgren & al. (1990).

For counties we use the abbreviations according to the current norms.

The resorts where the two analysed species was found are presented together with the GPS coordinates, were recorded with a Garmin GPS, and we used Lehrer & Lehrer (1990) for coordinates for mapping the distribution of these species in Romania.

RESULTS AND DISCUSSIONS

Aphanes australis Rydberg in N. L. Britton et al., N. Amer. Fl. 22: 380. 1908. (*Alchemilla microcarpa* auct., non Boiss. & Reuter; *Aphanes microcarpa* auct. roman., non (Boiss. & Reuter) Rothm., A. Nyárády 1957, Stud. Cerc. Biol. (Cluj): 285; Beldie 1977, Fl. Rom., Det. Il. Pl. Vasc., 1: 268; *A. inexpectata* W. Lippert Mitt. Bot. Staatsaml. München

20: 458 (1984); Ciocârlan 2000, Fl. Il. Rom., Pterid., Spermat., ed. 2: 320) (Rosaceae). – Fig. 1.



Fig.1. *Aphanes australis* Rydb. – habit (Foto V. Boruz)

Chorology: In the last few years we identified this species in the following localities: between Racovița (GJ) and Cerna (VL), on Cerna Gorges, on Cerna banks (at the border between Gorj and Vâlcea counties); in Gorj county: Cloani (45.06932 N, 22.79743 E, alt. 450 m; 45.06947 N, 23.79740 E, alt. 441 m), Baia de Fier (45.18279 N, 23.78789 E, alt. 564 m; 45.18263 N, 23.78778 E, alt. 561 m; 45.18247 N, 23.78782 E, alt. 568 m), Cernădia (45.18518 N, 23.71111 E, alt. 675 m; 45.18594 N, 23.71073 E, alt. 688 m), Polovragi (Poiana mănăstirii near Polovragi monastery; on Codrișor hill: 45.18042 N, 23.80823 E, alt. 607 m), Novaci (on Măgura hill: 45.18838 N, 23.71063 E, alt. 704 m; on Scăriștea hill: 45.19387 N, 23.67990 E, alt. 680 m; 45.19315 N, 23.68023 E, alt. 673 m; 45.19093 N, 23.68014 E, alt. 655 m; 45.19505 N, 23.68026 E, alt. 694 m; 45.19561 N, 23.68050 E, alt. 696 m; 45.20141 N, 23.68342 E, alt. 764 m; Plaiul Novacilor: 45.21559 N, 23.69755 E, alt. 951 m; in an empty area of meadow 45.21709 N, 23.69614 E, alt. 960 m; 45.21705 N, 23.69580 E, alt. 962 m; in the area Plai: 45.21875 N, 23.69716 E, alt. 957 m; 45.21723 N, 23.69881 E, alt. 962 m; 45.21703 N, 23.69931 E, alt. 950 m).

According to literature data, in Romania this species was identified in the following localities presented by counties (Fig. 2):

AR: Zarand Mountains, in collibus Debela Gora, 25.IX.1970, leg. I. Pop (as *Alchemilla arvensis*, det. G. Negrean [CL 593.286, rev. G. Negrean, 31.I.2004]; **VL:** between Sîntioara and Milostea [CLA 71.216] (Nyárády A. 1957: 285; Beldie & Váczy 1976: 40); **MH:** the Dubova Depression, 25.VI.1966, leg., det. G. Negrean, IX 1982, with the fungus *Sphaerotheca alchemillae* (Grev.) L. Junell [BUCM 71.216] (Dihoru & Negrean 2009: 61). **GJ:** Moi village - N 44°54'094 "and E 23°13'358" at heights of 244 m and Rugetu locality N 45°08'290 "and E 23°520'210" at heights of 531 m (Răduțoiu & Costache 2012).

Indexes mapping the network of 50 x 50 Km: GR 10/20 (Polovragi, Racovița), GR 10 (Baia de Fier, Cernădia), GR 00 (Novaci), GR 20 (Cerna Gorges), FQ 49 (Cloani) – new chorological data; ES 60 (Zarand Mountains – Conop locality), GR 20 (Milostea – Sîntioara), FQ 04 (Dubova), FQ 77 (Moi village), GR 20 (Rugetu locality) – data from literature.

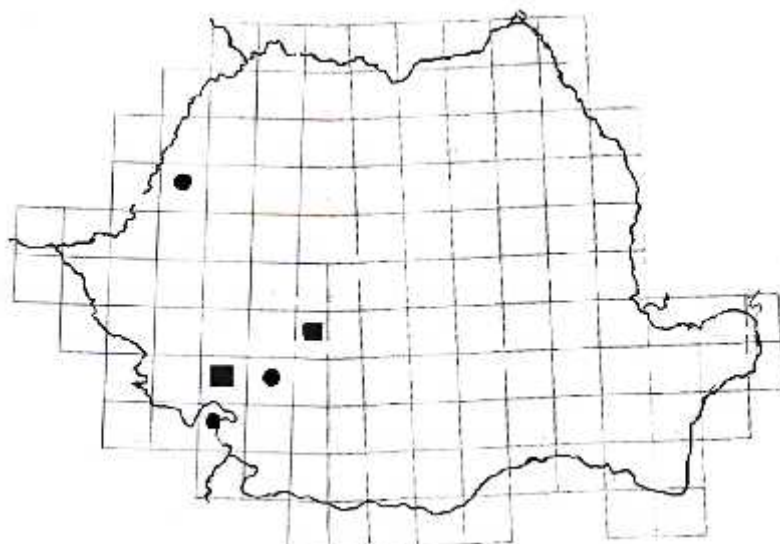


Fig. 2. Distribution of *Aphanes australis* Rydb. in Romania (original)

● chorological data from literature and herbarium
■ new chorological data – material examined

Ecology: It is a heliophilous, thermophil, acidophilous species, it grows on average dry soils and damp soils, with or without sandy texture, with a poor up to moderately rich content of nutritive substances, poor limestone, in the cultivated land, pastures, fallow land, roadside grass in places, meadows, and in empty areas within meadows. It is a rare species, found in the forests of oak to beech floor.

Coenology: At Baia de Fier, in open habitats, on a soil with or without sandy texture, at the roadsides and in a little meadow near the road between Baia de Fier and Polovragi, *Aphanes australis* was identified together with the following cohabitants species: *Bellis perennis*, *Poa pratensis*, *Achillea millefolium*, *Rumex acetosella*, *Plantago lanceolata*, *Taraxacum officinale*, *Capsella bursa-pastoris*, *Ranunculus bulbosus*, *Veronica arvensis*, *Trifolium repens*, *Carex hirta*, *Potentilla argentea*, *Scleranthus annuus* subsp. *polycarpus*, *Veronica persica*, *Fragaria vesca*, *Vicia villosa*, *Poa annua*, *Cerastium fontanum* subsp. *fontanum*, *Cruciata pedemontana*, *Erophila verna*, *Poa bulbosa* var. *vivipara*, *Geranium robertianum*, *Lotus corniculatus*, *Medicago lupulina*, *Potentilla reptans*, *Trifolium pratense*, *Prunella vulgaris*, *Sherardia arvensis*, *Cynodon dactylon*, *Cerastium glomeratum*, *Hieracium pilosella*, *Lamium purpureum*, *Stellaria media*.

On the hill near Cernădia, on an empty soil, easily wearable *Aphanes australis* (45.18518 N, 23.71111 E, alt. 675 m) cohabits with *Sherardia arvensis*, *Trifolium repens*, *Veronica arvensis*, *Teucrium chamaedrys*, *Cruciata pedemontana*, *Hieracium pilosella*, *Plantago lanceolata*, *Cynodon dactylon*, *Trifolium arvense*, *Scleranthus annuus* subsp. *polycarpus* etc. It was also identified in meadows, in a place dug by wild boars (45.18594 N, 23.71073 E, alt. 688 m), with variable humidity, with marshy spots, together with *Montia fontana* subsp. *chondrosperma*, *Potentilla reptans*, *Veronica serpyllifolia*, *Trifolium repens*, *Ranunculus sardous*.

On Măgura hill (Novaci) (45.18838 N, 23.71063 E, alt. 704 m), near a puddle with *Ranunculus tricophyllus*, on humid soil around the puddle, *Aphanes australis* was identified together with *Montia fontana* subsp. *chondrosperma*, *Trifolium repens*, *Veronica serpyllifolia*, *Carex hirta*, *Cardamine impatiens*, *Ranunculus repens*, *Eleocharis palustris*, *Veronica beccabunga*, *Potentilla reptans*, *Mentha aquatica*, *Juncus effusus*, *Glyceria notata*, *Poa annua*, *Alopecurus aequalis*.

On Codri or hill (Polovragi) *Aphanes australis* species was identified on the side of the meadow (45.18042 N, 23.80823 E, alt. 607 m), on a worn soil, near the road, together with *Potentilla argentea*, *Ajuga genevensis*, *Scleranthus perennis*, *S. annuus* subsp.

polycarpus, *Poa bulbosa* var. *vivipara*, *Plantago lanceolata*, *Hieracium pilosella*, *Cerastium fontanum* subsp. *fontanum*, *Ranunculus bulbosus*, *Carex pilulifera*, *Genista sagittalis*, *Achillea millefolium*, *Hypochaeris radicata*, *Sanguisorba minor*, *Erophila verna*, *Polygala vulgaris*, *Anagallis arvensis* etc.

On Sc rița hill (Novaci) *Aphanes australis* (Fig. 3) was identified on the meadow of *Festuca rubrae*-*Agrostietum capillaris* or in empty area of the meadow, together with *Medicago lupulina*, *Trifolium repens*, *Plantago lanceolata*, *Cerastium glomeratum*, *Rumex acetosella*, *Eryngium campestre*, *Hieracium pilosella*, *Veronica arvensis*, *V. officinalis*, *Hypochaeris radicata*, *Arenaria serpyllifolia*, *Leucanthemum vulgare*, *Potentilla reptans*, *Scleranthus annuus* subsp. *polycarpus*, *Lotus corniculatus*, *Achillea millefolium*, *Filago arvensis*, *Leontodon autumnalis* etc. It can also be seen in area dug by wild boars, with variable humidity together with *Montia fontana* subsp. *chondrosperma*.



Fig. 3. *Aphanes australis* with *Trifolium repens* in the meadow on Sc rița hill, Novaci (Foto V. Boruz)

At Novaci, on Plaiul Novacilor (near the petrol station) *Aphanes australis* species was identified on the side of the meadow, near the road, together with *Festuca rubra*, *Medicago lupulina*, *Thymus pulegioides*, *Trifolium repens*, *T. campestre*, *Achillea millefolium*, *Cerastium fontanum* subsp. *fontanum*, *Arenaria serpyllifolia*, *Rumex acetosella*, *Scleranthus perennis*, *Hieracium pilosella*, *Euphrasia stricta*, *Lotus corniculatus*, *Hypochaeris radicata*, *Cruciata pedemontana*, *Leontodon hispidus*, *Ranunculus bulbosus*, *Vulpia myuros*, *Hypericum humifusum*, *Sagina procumbens*, *Potentilla erecta*.

At Clo ani, *Aphanes australis* was identified in open spaces, together with *Festuca rupicola*, *Plantago lanceolata*, *Trifolium repens*, *Teucrium chamaedrys*, *Medicago minima*, *Festuca valesiaca*, *Eryngium campestre*, *Veronica arvensis*, *Achillea millefolium*, *Scleranthus annuus*, *Potentilla argentea*, *Hieracium pilosella*, *Anthemis austriaca*, *Trifolium arvense*, *Erodium cicutarium*, *Sherardia arvensis*, *Rumex acetosella*, *Lotus corniculatus*, *Trifolium campestre*.

The spread of this species is currently little known, it may be more spread, but it was not noticed.

It was identified for the first time by Nyárády (1957) in Vâlcea county (between the localities Milostea and Sl tioara), Dihoru & R duțoiu (2006) from Sl tioara, and by R duțoiu & Costache (2012) from Moi village (GJ county) and Rugetu (VL county). Thus, by accumulating new information, bring additions to the knowledge chorology *Aphanes australis* species in Romanian flora, at the known data further upon coronime for Oltenia,

namely: Cloani (GJ county), Cerna Gorges, on Cerna banks (at the borderline between Gorj and Valcea counties), and in the localities Polovragi, Baia de Fier, Cernădia, Novaci (Gorj county).

Montia fontana L. subsp. **chondrosperma** (Fenzl) Walters 1953, *Watsonia*, 3(1): 4, Fig. 4.

(*M. fontana* L. var. *chondrosperma* Fenzl 1843, in Ledeb., *Fl. Ross.* 2: 152; *M. verna* Neck. 1766, *Delic. Fl. Gallo-Belg.* 1: 70, nom. illeg., quoad descr.; *M. minor* C.C. Gmel. 1805, *Fl. Bad.* 1: 301, nom. illeg., quoad descr.).



Fig. 4. *Montia fontana* L. subsp. *chondrosperma* (Fenzl) Walters – habit (Foto V. Boruz)

Chorology: Borza (1947) mentioned this plant from Transilvania, Oltenia, Muntenia. Subsequently, it was mentioned from Banat, too (Bujoreanu & al. 1959). Recently, after gathering more chorological data, according to Dihoru & Răduțoiu (2005) the species is known from AG, AR, BN, CJ, CS, DJ, GJ counties (Dumbrava forest, nord and west Peștișani), MH, MM, SB, TM, VL. We identified it in Gorj county in the last few years, in the following localities (Fig. 5): on the meadow from Codrișor hill, around Polovragi (45.18359 N, 23.80553 E, alt. 631 m), on the meadow of Racovița (45.17637 N, 23.82797 E, alt. 612 m) and on Măgura hills (Cernădia: 45.17637 N, 23.82797 E, alt. 612 m; 45.18838 N, 23.71063 E, alt. 704 m) and Scărița - Novaci (45.20141 N, 23.68342 E, alt. 764 m) in small damp depressions, placed that were dug by wild boars.

Indexes mapping the network of 50 x 50 Km (according to Lehrer & Lehrer 1990) for the material identified in Gorj county: GR 10/20 (Polovragi, Racovița), GR 10 (Cernădia), GR 00 (Novaci).

Ecology: *Montia fontana* subsp. *chondrosperma* grown up the hilly region to the floor beech, on acid soils, in small depressions or in places dug by wild boars, where the water makes puddles for a variable period of time (flooded temporarily). During this period the plants develops fast.

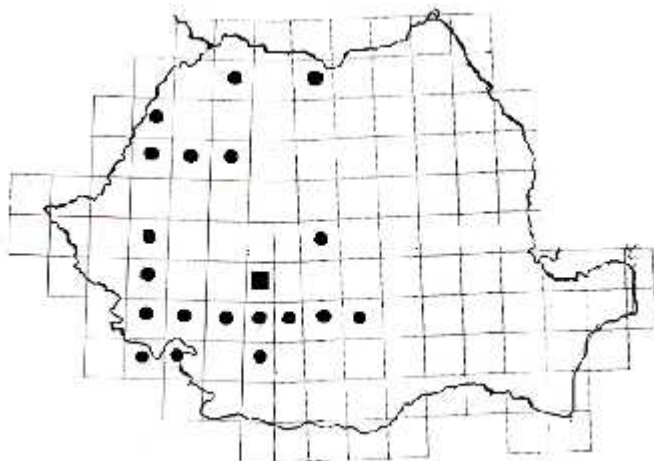


Fig. 5. Distribution of *Montia fontana* L. subsp. *chondrosperma* (Fenzl) Walters in Romania (original)

● chorological data from literature and herbarium
■ new chorological data – material examined

Coenology: On Codri or hill (Polovragi), on an area of the meadow dug by wild boars, of about 50 m², *Montia fontana* subsp. *chondrosperma* developed as hanks, almost monodominant, alternating in few parts with *Carex hirta*, *Veronica officinalis*, *Cynodon dactylon* and hanks of *Juncus effusus*.

On the meadow near Racovița, on a humid soil, the species *Montia fontana* subsp. *chondrosperma* was identified together with cohabitants species *Potentilla reptans*, *Medicago lupulina*, *Trifolium repens*, *Poa annua*, *Lysimachia nummularia*, *Carex hirta*, *C. pallescens*, *Agrostis stolonifera* etc.



Fig. 6. *Montia fontana* L. subsp. *chondrosperma* (Fenzl) Walters alongside *Aphanes australis* Rydb. on a surface dug by wild boars – M gura hill, Cern dia (Foto V. Boruz)

On the meadow from M gura hill, around Cern dia, on an area dug by wild boars, *Montia fontana* subsp. *chondrosperma* (Fig. 6) was identified as hanks together with few plants of *Aphanes australis* etc.

On Sc rița hill (Novaci), on a surface of about 100 m², dug by wild boars, *Montia fontana* subsp. *chondrosperma* grows together with only few plants of *Aphanes australis*,

Juncus effusus, *J. conglomeratus*, *Potentilla reptans*, *Trifolium repens*, *Carex hirta*, *Veronica serpyllifolia*, *Agrostis stolonifera*, *Ranunculus sardous*, *Cynodon dactylon*, *Poa annua*, *Cerastium glomeratum*, *Rumex acetosella*.

CONCLUSIONS

The paper represents a modest contribution to the understanding and completing the chorology, ecology and coenology data for the two analysed species. This data is based on the specialized literature, collections, as well as on the personal observations during our field expeditions, the chorological information are also included in a map.

BIBLIOGRAPHY

1. **Beldie, Al.**, 1977 – *Flora României. Determinator ilustrat al plantelor vasculare*, 1412 pag., Acad. Rep. Soc. România, Bucure ti.
2. **Borza, Al.**, 1947 – *Conspectus Florae Romaniae regionumque affinium*. Fasc. 1, 160 pag., Editio Institutii Botanici Universitatis Clujensis, Cluj Napoca.
3. **Bo caiu, N., Coldea, G., Horeanu, C.**, 1994 – *Lista Ro ie a plantelor vasculare disp rute, periclitare, vulnerabile i rare din flora României*, Ocrot. nat. med. înconj. t. 38, nr. 1, p. 45-56, Bucure ti.
4. **Britton, N.L., Brown, H.A.**, 1913 – *An Illustrated Flora of the Northern United States Canada and the British Possessions*, 2735 pp., New York, Charles Scribner'Sons.
5. **Bujorean, G., Grigore, S., Oprin, C., Popescu, P.C., Popescu, V.**, 1959 – *Montia verna Neck. in flora Banatului (contribuție la flora Republicii Populare Române)*, Stud. Cerc. – ti. Agric. (Timi oara), 6(3-4): 91-95. Bucure ti.
6. **Ciocârlan, V.**, 2000 – *Flora ilustrat a României. Pteridophyta et Spermatophyta*, 1139 pag., Edit. Ceres, Bucure ti.
7. **Ciocârlan, V.**, 2009 – *Flora ilustrat a României. Pteridophyta et Spermatophyta*, 1041 pag., Edit. Ceres, Bucure ti.
8. **Dihoru, G., Dihoru, Alexandrina**, 1994 – *Plante rare, periclitare i endemice în flora României – Lista Ro ie*, Acta Botanica Horti Bucurestiensis 1993-1994, Bucure ti.
9. **Dihoru, G., Negrean, G.**, 2009 – *Cartea ro ie a plantelor vasculare din România*, 630 pag., Edit. Academiei Române, Bucure ti.
10. **Dihoru, G., R duțoiu, D.**, 2005 – *Montia fontana L. (Portulacaceae) în flora României*, Lucr. ti. Anul XLVII – Vol. 1(48): 639-644, Univ. de Științe Agricole și Medicin Veterinar "Ion Ionescu de la Brad" Ia i, Seria Horticultur , Edit. "Ion Ionescu de la Brad", Ia i.
11. **Dihoru, G., R duțoiu, D.**, 2006 – *Aphanes microcarpa s.l. in Romania*, Croatian Symposium on Agriculture, Opatia, Croația, 40: 769-770.
12. **Frost-Olsen, P.**, 1998 – *Aphanes* in Castroviejo, S. (coord.), *Flora Ibérica* Vol. VI: 357-369, Real Jardín Botánico, CSIC. Madrid.
13. **Fröhner, S.**, 1990 – *Aphanes* L. Pp. 242-248. In: Hegi G. (ed.) *Illustrierte Flora von Mitteleuropa*, ed. 2, 4/2B, Berlin & Hamburg.
14. **Grițescu, G.**, 1952 – Fam. 26 *Portulacaceae* Rchb. In T. S vulescu (Ed.), *Flora Republicii Populare Române*, 1: 614-616, Edit. Acad. R.P.R. Bucure ti.
15. **Holmgren, Patricia K., Holmgren, N.H., Barnett, L.C.**, 1990 – *Index Herbariorum*, Part I: The Herbaria of the World, 8th Ed. Regnum Veg. 120: 1-693.
16. **Kurtto, A., Fröhner, S., Lampinen, R. (eds.)**, 2007 – *Atlas Florae Europaeae. Distribution of Vascular Plants in Europe. 14. Rosaceae (Alchemilla and Aphanes)*, 200 pag., The Committee for Mapping the Flora of Europe & Societas Biologica Fennica Vanamo, Helsinki.
17. **Lehrer, A.Z., Lehrer, Maria**, 1990 – *Cartografierea faunei i florei României (coordonate arealografice)*. 290 pp., Edit. Ceres, Bucure ti.

18. **Lippert, W.**, 1984 – *Zur Kenntniss des Aphanes microcarpa-Komplexes*, Mitt. Bot. Stadtssaml., München 20: 451-464.
19. **Nyárády, A.**, 1957 – *Aphanes microcarpa (Boiss. et Reut.) Rothm. o specie nou pentru flora României din fam. Rosaceae*, Stud. Cerc. Biol., Cluj 8: 285-289.
20. **Oltean, M., Negrean, G., Popescu, A., Roman, N., Dihoru, G., Sanda, V., Mihăilescu, Simona**, 1994 – *Lista Roșie a plantelor superioare din România*. In: Oltean M. (coord.) Studii, sinteze, documentații de ecologie, Acad. Română, Institutul de Biologie, Nr. 1: 1-52.
21. **Paiva, J., Villanueva, E.**, 1990 – *Montia* L. in Castroviejo, S. & al. (Ed.), *Flora Ibérica. Plantas vasculares de la Península Ibérica e Islas Baleares*, Vol. II, Platanaceae-Plumbaginaceae (partim), Real Jardín Botánico, CSIC. Madrid.
22. **Răduțoiu, D., Costache, I.**, 2012 – *Areal Limits in the Romanian Territory: Aphanes australis Rydberg 1908*, Muzeul Olteniei Craiova, Oltenia. Studii și comunicări. Științele Naturii, Tom. 28, No. 2: 17-20.
23. **Rothmaler, W.**, 1935 – *Systematische Vorarbeiten zu einer Monographie der Gattung Alchemilla (L.) Scop. emend. II. Die systematische Gliederung der Gattung. III. Notizen über das subgenus Aphanes (L.)*, Feddes Repert. Spec. Nov. Regni Veg., Berlin-Dahlem 38: 33-43.
24. **Săvulescu, T. (ed.)**, 1952-1976 – *Flora României (Flora Romaniae)*, Edit. Academiei Române, Vol. 1-13.
25. **Sârbu, I., Ștefan, N., Oprea, A.**, 2013 – *Plante vasculare din România. Determinator ilustrat de teren*, 1320 pp., Edit. Victor B Victor.
26. **Tutin, T.G., Heywood, V.H., Burges, N.A., Moore, D.M., Valentine, D.H., Walters, S.M., Webb, D.A. (ed.)**, 1964–1980 – *Flora Europaea*, Vol. 1-5, Cambridge: Cambridge University Press.
27. **Walters, S.M.**, 1949 – *Aphanes microcarpa (Boiss. et Reut.) Rothm. in Britain*, Watsonia, Arbroath 1: 163 - 169.
28. **Walters, S.M.**, 1968 – *Aphanes* L. in T.G. Tutin & al. (eds.), *Flora Europaea*, 2: 64, At the University Press, Cambridge.