

Ethnobotany and exploitation of medicinal plants in the Rhodope Mountains – is there a hazard for *Clinopodium dalmaticum*?

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Abstract

The present work summarises preliminary results of an ethnobotanical study in the Rhodope Mountains. The aim was to assess the traditional home use of medicinal plants for herbal tea by local people and to estimate the threats to the Balkan endemic *Clinopodium dalmaticum*. Semi-structured interviews with local informants from 15 localities in Central and Eastern Rhodope Mountains were performed in 2015 and 2018. As a result, the most used plant species were listed. The major source of plants was recorded as being gathered from the wild. The plants, known with the local names “wild mint” and “white mint”, were identified as *Clinopodium dalmaticum* from dried specimens presented by informants in Central Rhodopes. A frequent collection from wild populations of *C. dalmaticum* in Central Rhodope Mts. (Smoljan region) was revealed along with just a few cases of cultivation close to the studied sites.

Keywords

sustainable use, medicinal plants, plant collection, herbal tea, *Clinopodium dalmaticum*

Introduction

The Rhodopes are located in the southern part of Bulgaria and Northern Greece. The mild climate and the geomorphological history of the mountain contribute to its high biological diversity with numerous rare and endemic species (Petrova and Vladimirov 2010). Even though a process of depopulation of Bulgarian villages in recent decades is a fact, the Rhodopes remain the most inhabited mountain in Bulgaria (Mladenov and Ilieva 2012)

with diverse habitats (Assenov et al. 2016) and vivid traditions with rapid development of tourism (Lulcheva and Aleksandrov 2017). For this reason, urgent efforts for preservation of its bio-cultural diversity are necessary. The specific Bulgarian traditional knowledge about medicinal plants is still alive there.

Clinopodium dalmaticum (Benth.) Bräuchler and Heubl (syn. *Micromeria dalmatica* Benth.) is a Balkan endemic species occurring only in Bulgaria, Greece, Crete and Montenegro (Euro+Med PlantBase 2011). It is a perennial

used traditionally as a herb, there is a danger of its becoming a vulnerable medicinal plant as is the case of *Sideritis scardica* (Yordanova and Apostolova 2000).

Material and methods

Semi-structured interviews with 53 people (male and female, average age of 60) were performed. Thirty settlements in Eastern Rhodopes and in Smoljan region provisionally marked as Central Rhodopes were visited from June till September in 2014 and 2015. Informants were asked: 1) what plant species they use to prepare herbal tea; 2) to point the origin of the plants, wild or cultivated and 3) their exact local names. Data from audio records of the



interviews were transformed in Microsoft Excel tables. Descriptive statistics were used to determine relative frequencies of anecdotal reports expressed as a percentage.

Additionally, semi-structured interviews strictly focusing on the usage of *Clinopodium dalmaticum* were performed in 2018 with 59 people (male and female, average age of 41) in the Smoljan region provisionally marked as Central Rhodopes.

The plants known with the local names “Wild mint” and “White mint” were identified as *Clinopodium dalmaticum* by dried specimens presented by informants in Central Rhodopes (Fig. 2).

Results and discussion

Eastern Rhodopes

The most reported plants for herbal tea by people in Eastern Rhodopes were *Hypericum perforatum*, *Tillia* spp., *Matricaria chamomilla*, *Thymus* spp. and *Origanum vulgare* ssp. *hirtum* etc. (Fig. 3).

Central Rhodopes

In Central Rhodopes the most reported plants for herbal tea were *Origanum vulgare* ssp. *vulgare*, *Sambucus nigra*, *Thymus* spp., *Clinopodium dalmaticum*, *Hypericum perforatum* and *Sideritis scardica* etc (Fig 4).

Clinopodium dalmaticum appears to be popular amongst local people in the studied sites of Smoljan region, (Figs 4, 5, Table 1). It is known as “Mountain mint” or “White mint”. Even though *C. dalmaticum* is not listed in the Medicinal Plant Act of Bulgaria (2000), it is collected for herbal tea and as a medicinal plant (Table 1, Fig. 5). *C. dalmaticum* is actively collected from the wild. It is gaining popularity amongst plant collectors and even could be found on the market, but only few reports of its cultivation are recorded (4% of the informants reported cultivation). Many of the locals report a decrease in the wild resources (Table 1). The species is gaining popularity and it appears packed in large supermarkets.

The traditional knowledge about therapeutic effects according to the anecdotal reports is: calming and sedative, against stomach-ache, against cold, they use it as herbal tea and a spice (Fig. 5).

Table 1. Attitude to *Clinopodium dalmaticum* in Central Rhodopes.

Familiar with <i>C. dalmaticum</i>	Positive 78%	Negative 22%	Neutral 0%
Collect <i>C. dalmaticum</i> from the wild populations	Collect 56%	Do not collect 40%	Buy from collectors 4%
Locals estimate populations as decreasing	Positive 34%	Negative 34%	Neutral 32%



Figure 2. Dried plant material of *Clinopodium dalmaticum* known by the informants as “Wild mint” or “White mint”.

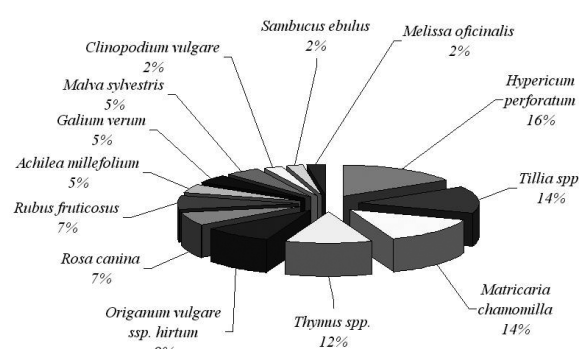


Figure 3. Plant species used for herbal tea in Eastern Rhodopes (% of anecdotal reports).

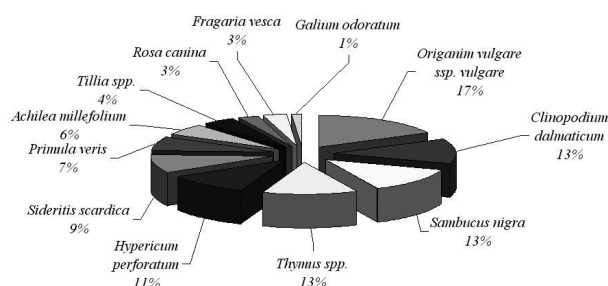


Figure 4. Plant species used for herbal tea in Central Rhodopes (% of anecdotal reports).

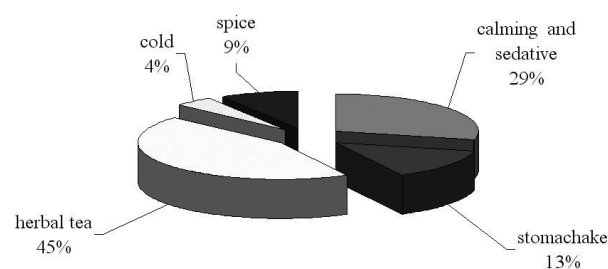


Figure 5. Traditional knowledge about therapeutic effects of *Clinopodium dalmaticum* (% of anecdotal reports).

Conclusion

Clinopodium dalmaticum is collected as a medicinal and aromatic plant and is used as a sedative and against gastric disorders. It is actively collected from its wild populations, including for trading, which is a hazard for them which can result as a “danger to its existence”. There is an incre-

asing necessity for monitoring its natural localities. Cultivation of this species must also be initiated with regard to the sustainable use of this medicinal plant with restricted distribution. There is a good existing practice with the similar case for *Sideritis scardica* (Evstatieva and Popova 1998, Evstatieva 2009, Kozuharova 2009, Evstatieva and Alipieva 2011).

References

- Ancev M (1989) Genus *Micromeria*. In: Velchev V (Ed.) Flora of PR Bulgaria (Vol. 9). BAS Publ. House, Sofia, 356–362. [in Bulgarian]
- Aneva I, Zhelev P, Nikolova M, Evtimov I (2016) *Micromeria dalmatica* Benth. – one of the valuable medicinal plants with restricted distribution. Fifth International Scientific and Practical Internet Conference Medicinal Herbs: from Past Experience to New Technologies, 27–29.12.2016, Poltava.
- Assenov A, Borisova B, Dimitrov P (2016) Habitat diversity: a key category in landscape analysis for spatial planning in mountain conditions (a case study of the Banite municipality, Bulgaria). Proceedings of the 17th International Symposium on Landscape Ecology, Nitra, 38–44.
- Bukvicki D, Stojkovic D, Sokovic M, Nikolic M, Vannini L, Montanari C, Marin PD (2015) Potential application of *Micromeria dalmatica* essential oil as a protective agent in a food system. LWT-Food Science and Technology 63(1): 262–267. <https://doi.org/10.1016/j.lwt.2015.03.053>
- Dimitrov D, Pavlova D (2011) In: Biserkov V (ed.) Red Data Book of the Republic of Bulgaria; Volume 3 – Natural habitats. <http://e-ecodb.bas.bg/rdb/en/vol3/12H3.html>
- Euro+Med PlantBase (2011) Euro+Med PlantBase. <http://ww2.bgbm.org/euroPlusMed/PTaxonDetail.asp?NameId=36285&PTRef-Fk=8000000>
- Evstatieva L (2009) The role of the collection “ex situ” in the protection of threatened medicinal plants. Plant, fungal and habitat diversity investigation and conservation Proceedings of IV Balkan Botanical Congress Sofia, 20–26 June 2006: 687–689.
- Evstatieva L, Alipieva K (2011) Conservation and sustainable use of threatened medicinal plant *Sideritis scardica* in Bulgaria. In: 1st International Symposium on Medicinal, Aromatic and Nutraceutical Plants from Mountainous Areas (MAP-Mountain 2011) 955: 89–92. <https://doi.org/10.17660/ActaHortic.2012.955.10>
- Evstatieva L, Popova I (1998) Factors, affecting germination and seedling development of *Sideritis scardica* Griseb. and *S. syriaca* L. In: Proceedings of an international jubilee conference marking the 70th anniversary of the Forest Research Institute, Sofia, Bulgaria, 6–7 October 1998. Volume 1, 371–376.
- Karousou R, Hanlidou E, Lazari D (2012) Essential oils of *Micromeria dalmatica* Benth., a Balkan endemic species of section *Pseudomelissa*. Chemistry & Biodiversity 9(12): 2775–2783. <https://doi.org/10.1002/cbdv.201200121>
- Kostadinova E, Alipieva K, Stefova M, Stafilov T, Antonova D, Evstatieva L, Bankova V (2007) Chemical composition of the essential oils of three *Micromeria* species growing in Macedonia and Bulgaria. Macedonian Journal of Chemistry and Chemical Engineering 26(1): 3–7.
- Kozuharova E (2009) New ex situ collection of rare and threatened medicinal plants in the Pirin Mts. (Bulgaria). Ekoloji 18(72): 32–44. <https://doi.org/10.5053/ekoloji.2009.725>
- Lulcheva I, Aleksandrov K (2017) Research on the supply and consumer demand for rural tourism in Eastern Rhodopes. Scientific Papers: Management, Economic Engineering in Agriculture & Rural Development 17(4).
- Marin PD, Grayer RJ, Veitch NC, Kite GC, Harborne JB (2001) Acacetin glycosides as taxonomic markers in *Calamintha* and *Micromeria*. Phytochem 58: 943–947. [https://doi.org/10.1016/S0031-9422\(01\)00352-1](https://doi.org/10.1016/S0031-9422(01)00352-1)
- Medicinal Plants Act (2002) Promulgated, SG No. 29/7.04.2000, Amended, SG No. 23/1.03.2002, 91/25.09.2002.
- Mincheva I, Kozuharova E, Rastrelli L (2016) Ethnobotany and exploitation potential of *Oreganum vulgare* L. in the Rhodopes, Bulgaria PharmacologyOnline 3: 168–173.
- Mladenov C, Ilieva M (2012) The depopulation of the Bulgarian villages. Bulletin of Geography. Socio-economic series 17(17): 99–107. <https://doi.org/10.2478/v10089-012-0010-8>
- Nikolova M, Aneva I, Berkov S (2016) GC-MS metabolic profiling and free radical scavenging activity of *Micromeria dalmatica*. Biologica Nyssana 7(2): 159–165.
- Nikolova M, Aneva I, Zhelev P, Dimitrova M (2017) Flavonoid compounds and antioxidant activity of Bulgarian species of micromeria. Annuaire de l'Université de Sofia “St. Kliment Ohridski” Faculte de Biologie 102: 7–13.
- Petrova A, Vladimirov V (Eds) (2009) Red List of Bulgarian vascular plants. Phytologia Balcanica 15(1): 63–94.
- Petrova A, Vladimirov V (2010) Balkan endemics in the Bulgarian flora. Phytologia Balcanica 16(2): 293–311.
- Radulović NS, Blagojević PD (2012) Volatile secondary metabolites of *Micromeria dalmatica* Benth. (Lamiaceae): biosynthetic and chemotaxonomical aspects. Chem. Biodivers 9: 1303–1319. <https://doi.org/10.1002/cbdv.201100429>
- Slavkovska V, Couladis M, Bojovic S, Tzakou O, Pavlovic M, Lakusic B, Jancic R (2005) Essential oil and its systematic significance in species of *Micromeria* Benth from Serbia and Montenegro. Plant Systematics and Evolution 255(1–2): 1–15. <https://doi.org/10.1007/s00606-005-0303-y>
- Tomas-Barberan FA, Gil MI, Marin PD, Tomas-Lorente F (1991) Flavonoids from some Yugoslavian *Micromeria* species: Chemotaxonomical aspects. Biochemical Systematics and Ecology 19: 697–698. [https://doi.org/10.1016/0305-1978\(91\)90088-H](https://doi.org/10.1016/0305-1978(91)90088-H)
- Yordanova M, Apostolova I (2000) Estimation of the status of representative populations of *Sideritis scardica* Griseb. in the Rhodope Mts. Phytologia Balcanica 6(1): 43–57.