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Orchid flora of the Muntele Mic (Caraş – Severin Country, Romania)

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***Abstract*:**

Milanovici, S.: ***Orchid flora of the Muntele Mic (Caraş – Severin Country, Romania). Biologica Nyssana, 7 (2), December 2016: 107-112.***

Muntele Mic Mountain, is located in the southeastern part of Romania and belongs to the Southern Carpathians. Although relatively small, Muntele Mic contains most characteristic mountain and high-mountain habitats. The field researches regarding the orchid's family in the Muntele Mic area, have been began in the summer of 2009. Thanks to easy access (asphalt road that goes to the tourist center of Muntele Mic), although it is classified as part of the European Natura 2000 network (ROSCI0126 Munţii Ţarcu), was supported strongly negative anthropogenic impact factors. Although considered a very anthropized, field research, it was concluded that there is growing 10 species of orchids, of which three: *Gymnadenia frivaldii* Hampe ex Griseb., *Dactylorhiza fuchsii* (Druce) Soó and *Dactylorhiza saccifera* (Brongn.) Soó), is not mentioned in the literature data.

Key words: orchids, conservation, threats, Muntele Mic, Romania

***Apstrakt*:**

Milanovici, S.: ***Flora orhideja planine Muntele Mic (Caraş – Severin Country, Romania). Biologica Nyssana, 7 (2), Decembar 2016: 107-112.***

Planina Muntele Mic, nalazi se u jugoistočnom delu Rumunije i pripada južnim Karpatima. Iako relativno male površine, Muntele Mic sadrži većinu karakterističnih planinskih i visokoplaninskih staništa. Sistematska terenska istraživanja porodice orhideja planine Muntele Mic, započeta su u proleće 2009 godine. Zahvaljujući lakom pristupu (asfaltni put koji ide do turističkog centra Muntele Mic), iako svrstan kao deo mreže Natura 2000 - ROSCI0126 Munţii Ţarcu, pod snažnim je udarom negativnih faktora antropogenog porekla. Iako se smatra veoma antropizovanim, terenskim istraživanjem, konstatovano je da ovde raste 10 vrsta orhideja, od čega se tri: *Gymnadenia frivaldii* Hampe ex Griseb., *Dactylorhiza fuchsii* (Druce) Soó i *Dactylorhiza saccifera* (Brongn.) Soó), ne pominju u stručnoj literaturi.

Ključne reči: orhideje, problemi zaštite, Muntele Mic, Rumunija

Introduction

Orchidaceae L. are the most diverse of all angiosperm families, with estimates of >25.000 species (Dressler, 1993; Mabberley, 1997; Cribb et al., 2003). Orchids comprise five subfamilies and approx. 870 genera, and are considered almost ubiquitous, occurring on all

vegetated continents and even some Antarctic islands (Dressler, 1981; Chase et al., 2003).

According to "Flora României" (vol. VII, Pauca et al., in Savulescu, 1972) there are 56 orchid species growing in Romania. In the last decades, some taxa, formerly classified as subspecies, became species *per se* (a typical example is several species of the *Epipactis* genus). In 2009 Ciocârlan mentions 58 orchid species recorded for the Romanian flora (Ciocârlan, 2009), while according to Sârbu this number reaches 60 (Sârbu et al., 2013). Three more species are to be added to the last figure mentioned: *Epipactis guegelii* Robatsch (Robatsch, 1996), *Epipactis persica* (Soó) Hausskn. ex Nannf. (Wucherpfennig, 2008) and *Epipactis greuteri* H. Baumann et Künkele (Ardelean, 2011). So far the total amount of orchid species recorded in Romania is 62. We do not regard this figure as final.

In his reference work Boşcaiu (1971) mentions 16 orchid species for the Muntele Mic area.

The geographical unity of Ţarcu Mountains, from who the Muntele Mic is part cover the North-Western Region of Meridional Carpathian Mountains.

The covered surface has the shape of a triangle with the cathetus towards the Timiş and Bistra Valleys and the hypotenuses formed by the two valleys, Râul Rece şi Râul Mare (Rogobete et al., 2007).

The relief modeling in Paleocene and Miocene continued in the Pliocene has cut down the Muntele Mic to the height of 1700-1800 m. The massif is placed between Bistra Mărului and the springs Sebeşul Mare, with slopes accentuated to Caransebeş Depression (Rogobete et al., 2007).

The Muntele Mic Massif is conformable to his epimetamorphic crystalline schist cover, with metagabbros and amphibolites recross by the pegmatites. The massif has in the eastern part granitoides with gneissic texture, in which we can distinguish quartiphere diorites, porphyries and magmatites, granodiorite (Rogobete et al., 2007).

The Sebeş River, with the spring in Muntele Mic is a Timiş affluent. The climate has a specified multi-stage: the average annual temperature is 5.5 ˚C at Cuntu and 8 ˚C in the Caransebeş Depression, the precipitations overstep 1.100 mm on the Muntele Mic and are 758 mm at Caransebeş (Rogobete et al., 2007).

At heights over 1600 m, on the leveling surfaces is carried with grasslands vegetation with *Festuca rubra*, *Festuca ovina* and *Nardus stricta*. The biggest surfaces are covered by forestry vegetation. Between 900 - 1600 m dominantes spruce fir (*Picea abies*) and a mixture of beech (*Fagus silvatica*) and fir (*Abies alba*) (Rogobete et al., 2007).

Over the last 10 years on the mountain roads and paths in the western part of the Southern

Fig. 1. Geographical position of the Muntele Mic investigated area (GoogleEarth map).

Carpathians, especially in the Muntele Mic - Ţarcu Mountains, the degradation has increased due to a new sport in Romania: mountain off road motorcycling and Enduromania contests (Urdea et al, 2009).

Material and methods

The field researches regarding the *Orchidaceae* L. family in the Muntele Mic Mountain area, the species inventory, the inventory, distribution, size and dynamics of populations as well as the acknowledgment of the threats with (direct and indirect) impact upon the orchid species and populations have been started with the year 2009 (**Fig. 1, 2b**).

The main bibliography related to the Muntele Mic Mountain, starting with the basic studies: Boşcaiu (1971) and Pauca et al., in Savulescu – "Flora R. S. România", Vol. XII, (1972). To understand the biology and ecology of terrestrial orchid species were used as basic works (Dressler, 1981, 1983; Rasmussen, 1995).

The determination of species has been made based on the data provided by "Flora of The S. R. Romania" Vol. XII (Pauca et al., in Savulescu, 1972) up to the species level and the nomenclature of taxa that were used has been harmonized to World Checklist of Monocotyledons Database (2003). There have been also used other specialty literary sources (Soó, 1973; Moore, 1980; Delforge, 2006; Ciocârlan, 2009) and specialty websites.

The area where researches were conducted covers only the zone of the alpine meadows, of spruce and beech forests, along the mixed ones, mesophyllic mountain meadows (especially those located in the upper part of the Craiu Valley) to an altitude minimum of some 600 m.

Results and discussion

The researches presented here regarding the orchid species comprised the area of Muntele Mic, from an altitude of 600 m to the top of the mountain. Although in his reference work Boşcaiu (1971) mentions 16 orchid species for the Muntele Mic zone, we have no field confirmation (in the researched zone above 600 m) of a number of seven species, namely: *Listera ovata* (L.) R.Br., *Platanthera chlorantha* (Custer) Rchb., *Anacamptis palustris* subsp. *elegans* (Heuff.) R.M.Bateman, Pridgeon & M.W.Chase, *Anacamptis coriophora* (L.) R.M.Bateman, Pridgeon & M.W.Chase, *Orchis mascula* subsp. *signifera* (Vest) Soó and *Anacamptis morio* (L.) R.M.Bateman, Pridgeon & M.W.Chase, *Neotinea ustulata* (L.) R.M.Bateman, Pridgeon & M.W.Chase). Instead, in the lower meadows area (Borlova zone) and beech forests, below 600 m, one can notice the presence of most of the species mentioned above.

We have observed the presence of three orchid species, not mentioned in the specialized literature (esp Boşcaiu, 1971) for the Muntele Mic zone, specifically *Leucorchis friwaldskiana* (Hampe) Fuss, *Dactylorhiza fuchsii* (Druce) Soó and *Dactylorhiza saccifera* (Brongn.) Soó.

In the following, a diagnosis is presented, for each species confirmed in field (Muntele Mic zone, above 600 m elevation):

The genus *Dactyloriza* Neck. ex Nevski.

Dactylorhiza cordigera (Fr.) Soó

Habitat: it springs individually or in groups of up to dozens of specimen on the eastern slope of the mountain, on wet meadows, on the banks of the torrents coming down from the mountain or in bogs, at an altitude between 1450 and 1600 m (**Fig. 2a**);
Status of population: population is relatively large and stabile. Following the multiannual countering, one can find at least 500 blooming specimen (mostly on the eastern slope of Muntele Mic);
Threats: over pasturing, leveling of the meadows for skiing tracks, off road motorcycling.

Dactylorhiza fuchsii (Druce) Soó

Habitat: sporadic and very rare; it had been found in a small number of specimens on the upper part of Valea Craiu, at the confluence of Craiu and Cuntu streams, at the edge of the forest, 610 m in altitude;
Status of population: population comprises some 20 specimens;
Threats: deforestation along removal of timber logs and their storage along the road;
Observation: newly found species for the Muntele Mic zone.

Dactylorhiza maculata (L.) Soó

Habitat: sporadic and very rare; it had been found in a small number of specimens in the mesophyllic meadow at the confluence of Craiu and Cuntu streams, 610 m in altitude (**Fig. 2c**);
Status of population: population comprises some 20 specimens;
Threats: deforestation along removal of timber logs and their storage along the road.

Dactylorhiza viridis (L.) R.M.Bateman, Pridgeon & M.W.Chase (syn. *Coeloglossum viride* (L.) Hartm.)

Habitat: very rare; a number of 5 specimens had been found, on shadowy rocks (northern exposure), on the eastern slope of the mountain; altitude: 1600 m;

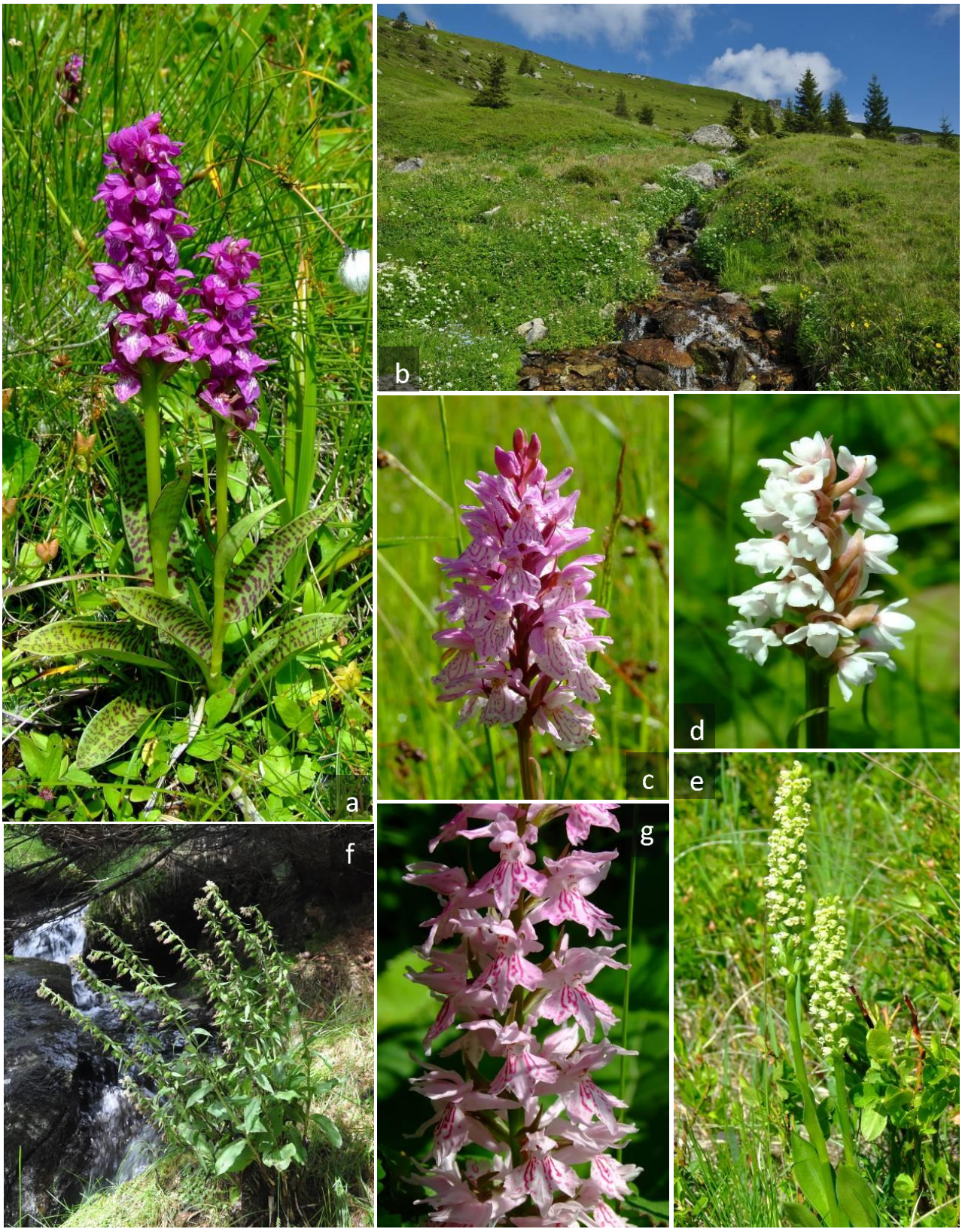

Fig. 2: a) *Dactylorhiza cordigera* (Fr.) Soó (photo: 18.06.2009); b) Muntele Mic – general view (photo: 05.06.2015); c) *Dactylorhiza maculata* (L.) Soó (photo: 18.06.2009); d) *Gymnadenia frivaldii* Hampe ex Griseb. (photo: 18.06.2009); e) *Pseudorchis albida* (L.) Á. Löve & D. Löve (photo: 18.06.2009); f) *Epipactis helleborine* (L.) Crantz (photo: 20.08.2015); g) *Dactylorhiza saccifera* (Brongn.) Soó (photo: 18.06.2009).

Status of population: the population is relatively numerous, concentrated on a very small surface and comprises some 200 bloomy specimens;
Threats: extremely threatened by over pasture, the more so as closely to its habitat a sheepfold was installed 2 years ago; the species is also threatened by off road motorcycling.
Observation: newly found species for the Muntele Mic zone.

The genus *Pseudorchis* Ség.

Pseudorchis albida (L.) Á. Löve & D. Löve

Habitat: a very small number of specimens were found on the eastern slope, 1400 m altitude (**Fig. 2e**);
Status of population: very rare; a total of six bloomy specimens, in different locations and different years;
Threats: extremely threatened by over pasture, the more so as closely to its habitat a sheepfold was installed 2 years ago; the species is also threatened by off road motorcycling.

The genus *Epipactis* Zinn

Epipactis helleborine (L.) Crantz

Habitat: a relatively large population of some 200 specimens was found in a small spruce forest, near a torrent, on the border of the alpine meadows. It is interesting that in the lower areas, although the habitat is friendlier to this species, not a single specimen had been identified (**Fig. 2f**);
Status of population: relative large population, comprising some 200 specimens (some 1200 m altitude); the entire population is concentrated on some 100 sq m;
Threats: pasturing on forest ground (closely to its habitat a sheepfold was installed 2 years ago) and technical improvements for a skiing track.

Conclusion

Muntele Mic Mountain is located in the southeastern part of Romania and belongs to the Southern Carpathians. Although relatively small, Muntele Mic contains most characteristic mountain and high-mountain habitats (**Fig. 2b**).

The field researches regarding the orchid family in the Muntele Mic area have been began in the summer of 2009.

Thanks to easy access (asphalt road that goes to the tourist center of Muntele Mic), although it is classified as part of the European Natura 2000 network, was supported strongly negative anthropogenic impact factors. Although considered a very anthropized, field research, it was concluded that there is growing 10 species of orchids, of which three: *Gymnadenia frivaldii*, *Dactylorhiza fuchsii* and *Dactylorhiza saccifera*, are not mentioned in the literature data.

The *Dactylorhiza cordigera* species, according to multiannual monitoring, presents the largest population (at least 500 bloomy specimens, most of them on the east slope of Muntele Mic). The rarest species are: *Pseudorchis albida*, *Gymnadenia conopsea* (!?), *Dactylorhiza viridis*, *Dactylorhiza fuchsii* and *Dactylorhiza maculata*, as the number of specimen for each of these is up to 20.

Considering the easy access up the mountain (asphalted road to Muntele Mic resort) the existing habitats are subject to an extremely severe negative anthropic impact. The greatest threats to the species and their habitat come from leveling of the meadows for skiing tracks and adjacent infrastructure, unfortunately highly aggressive and irreversible (including the south western part) It follows the over pasturing, as on Muntele Mic there are at least three sheepfolds. Another threat comes from the illegal off road motorcycling races (mentioned also by U r d e a et al., 2009).

The research on orchid flora on Muntele Mic monitoring of its populations will go on.

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