

PROPOSAL FOR THE INCLUSION OF TWO ACTIVE RAISED BOGS IN THE ROSCI0116 MOLHAȘURILE CĂPĂȚÂNEI PROTECTED AREA OF COMMUNITY INTEREST

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Abstract: Oligotrophic peat bogs reach the southern boundary of their European distribution area in the Romanian Carpathians. They shelter boreal species considered glacial relicts, surviving from the Würmian III period. Such areas (habitats) conserving relict species have major phytohistorical importance. They provide insights into the history of forest vegetation in the region and past climatic conditions. Based on floristic, phytocoenological and phytogeographical data, we propose to include two active raised bogs, namely “Calul de Piatră” and “Izvorul văii Șoimului” in the ROSCI0116 Molhașurile Căpățânei site of community interest. The inclusion of the two bogs in the ROSCI0116 Molhașurile Căpățânei protected area will increase the peat bog surface in the Apuseni Mountains and will be beneficial for the conservation of the wetland habitats and their typical flora, both very vulnerable to natural and anthropogenic disturbances.

Key words: Apuseni Mountains, conservation, priority habitat, wetlands

Introduction

As a consequence of its geographical position, Romania is a country with high biological diversity, reflected both at ecosystem and species level. Among wetlands with permanent character, oligotrophic peat bogs are of particular importance, mainly because of their specific flora. Oligotrophic peat bogs reach the southern boundary of their European distribution area in the Romanian Carpathians. They shelter relict plant species such as *Andromeda polifolia*, *Carex pauciflora*, *Vaccinium microcarpum*, *Carex magellanica* and *Empetrum nigrum*, with high biogeographical value, typical for tundra, preserved since the last glaciation. The oligotrophic peat bogs of Romania, covering 1351 ha [7], need better protection and monitoring in order to assess their syndynamics.

The ROSCI0116 Molhașurile Căpățânei protected area of community interest is located in the Gilău-Muntele Mare Mountains [6], part of the western Romanian Carpathians (Apuseni Mountains), at the boundary between Cluj and Alba counties. It occupies 816 ha [13] of a larger peat bog area situated on the forested plateau of the Căpățâna Mountain, at around 1600 m altitude, one of the highest in Romania. The habitat types found here consist of active raised bogs (7110*), bog woodland (91D0*) and acidophilous *Picea* forests of the montane to alpine levels (*Vaccinio-Piceetea*) (9410) (*designates priority Natura 2000 habitat type) [13].

When the actual boundaries of the ROSCI0116 Molhașurile Căpățânei were drawn, two genuine active raised bogs, “Calul de Piatră” and “Izvorul văii Șoimului” [7], located at

approximately 1.5-1.8 km NE, were not included in the protected area. These peat bogs deserve legal protection as well, as they have high botanical, palynological and conservation value [4, 7].

“Calul de Piatră” active raised bog was first surveyed by Pop [7]. He observed the *Sphagnum* layer on the edges, with stunted spruce, the oligotrophic plant series (including *Andromeda polifolia*) and the raised part (*Sphagno-Eriophoretum*) with numerous erosion trenches and small pools populated by *Carex limosa*, *C. rostrata*, *C. magellanica* (?) and *Drosera intermedia*. A later survey was carried out by Coldea on September 2nd 1992, but the floristic data were not published.

“Izvorul văii Şoimului” active raised bog was initially surveyed in 1918 by Péterfi, who reported *Drosera intermedia*, and later by Pop, noting the resemblances in terms of landscape and flora to those found at “Calul de Piatră” [7]. The author found here as well *Carex limosa*, *C. magellanica*, *Drosera intermedia* and *D. rotundifolia*.

Material and Methods

Both peat bogs are located on a forested plateau, about 3.3-3.7 km NW in aerial line from the Căpăţâna Peak (1599 m) towards Piatra Groşilor Peak (1757 m), close to the Smidele and Stedea glades (Figs. 1-3).

“Calul de Piatră” (46°30'19"N-23°08'55"E) is a typical oligotrophic peat bog with the central part conspicuously convex (Fig. 2), where peat thickness reaches at least 5.6 m [4]. It is situated at 1640-1650 m altitude, has an elliptical shape (about 291×146 m), occupies about 3-3.5 ha and contains approximately 70,000 m³ of peat [4, 7]. The peat bog is completely hidden by the surrounding spruce forest, offering protection against human activities (e.g. grazing and tourism) [4].

“Izvorul văii Şoimului” (46°30'20"N-23°09'14"E) is also a distinctive peat bog with the central part barely convex (Fig. 3). It is situated roughly at 280-290 m eastward from “Calul de Piatră”, at 1640 m altitude, has a more rounded (176×108 m) surface of about 1.5 ha and contains around 35,000 m³ of peat [7]. This peat bog is located close to a road and only partially surrounded by spruce forests. Vehicle tracks were noted at its southern margin, where the bog is exposed.

The relevé method of Braun-Blanquet [1] was employed for surveying “Calul de Piatră” and “Izvorul văii Şoimului” on sample areas of 2 m² (peat bogs) and 200 m² (spruce forest). The floristic composition of each association is based on one representative relevé.

Here we briefly characterize the two active raised bogs from floristic and phytocoenotic point of view, mention their phytogeographical characteristics and glacial relicts, and eventually provide scientific arguments for their inclusion in the ROSCI0116 Molhaşurile Căpăţânei protected area.

Results and Discussion

From a floristic and phytocoenotic point of view, the two peat bogs have the typical physiognomy of the oligotrophic bogs of the Apuseni Mountains i.e., with a convex central part and a marginal area surrounded by spruce. In the central area small mounds (*Bulten* in German) and small pools (*Schlenken* in German) are present here and there. The vegetation cover of these peat bogs differs according to these micro-formations in the peat sediment and the level of water table.

Around and inside the pools, where the water does not exceed 8-10 cm in depth, there are hygrophilous phytocoenoses of the association *Sphagno cuspidati-Caricetum limosae* Osvald

1923. We chose to assign this association to habitat 7110*, as the order which includes it, *Scheuchzerietalia palustris*, is included *pro parte* within this habitat [3]. The floristic composition of this association consists of *Carex limosa* 3.5, *Carex magellanica* +, *Eriophorum vaginatum* +, *Drosera rotundifolia* +, *Drosera intermedia* +, *Vaccinium microcarpum* +, *Andromeda polifolia* +, *Sphagnum cuspidatum* 4.5, *Sphagnum fuscum* + and *Polytrichum strictum* +.

The phytocoenoses of the association *Sphagnetum magellanici* Käster et Fläsner 1933 subass. *sphagnetosum fusci* Dierssen 1977 (habitat 7110*) occur on the small mounds of the peat bogs, where the peat deposit is less wet. The floristic composition of this syntaxon, typical of a subcontinental climate, consists of *Sphagnum fuscum* 4.5, *Sphagnum magellanicum* 2.3, *Empetrum nigrum* 2.3, *Vaccinium microcarpum* 1.2, *Vaccinium myrtillus* +, *Vaccinium vitis-idaea* +, *Calluna vulgaris* +, *Eriophorum vaginatum* 1.2 and *Polytrichum strictum* 1.2.

The phytocoenoses of the associations *Eriophoro vaginati-Sphagnetum recurvi* Heuck 1925 and *Sphagno-Caricetum rostratae* Steffen 1931 occur in the marginal areas of the bogs, where the peat layer is thinner (1-1.5 m) and the moisture varies throughout the year. The coenoses of the association *Eriophoro vaginati-Sphagnetum* (habitat 7110*) occupy the flat areas of the bogs, with moderate moisture. The floristic composition of this syntaxon is more diversified and consists of *Eriophorum vaginatum* 3.4, *Carex pauciflora* 1.2, *Carex echinata* 1.1, *Carex curta* +, *Carex rostrata* +, *Vaccinium microcarpum* 1.2, *Pedicularis limnogenia* 1.2, *Valeriana simplicifolia* +, *Deschampsia flexuosa* 1.2, *Polytrichum strictum* 1.2, *Sphagnum recurvum* 3.5, *Sphagnum magellanicum* 1.1. The marginal areas of the peat bogs, with large moisture fluctuations during the year, are populated by the coenoses of the association *Sphagno-Caricetum rostratae*. The floristic composition of this syntaxon consists of *Carex rostrata* 4.5, *Eriophorum vaginatum* 1.2, *Carex curta* 1.2, *Carex echinata* +, *Deschampsia caespitosa* +, *Agrostis canina* +, *Ranunculus repens* +, *Juncus effusus* +, *Caltha palustris* +, *Galium uliginosum* +, *Sphagnum recurvum* 3.5, *Polytrichum commune* 1.3.

The two oligotrophic bogs are surrounded by bog woodlands built up by spruce (*Picea abies*) coenoses. The boggy spruce forests in the area belong to the association *Sphagno magellanici-Piceetum* Zukrigl 1973 (habitat 91D0*). The floristic composition of this syntaxon consists of *Picea abies* 4.5, *Vaccinium myrtillus* 2.3, *Vaccinium vitis-idaea* 1.2, *Homogyne alpina* +, *Luzula sylvatica* 1.3, *Eriophorum vaginatum* 2.3, *Empetrum nigrum* +, *Huperzia selago* +, *Lycopodium clavatum* +, *Melampyrum sylvaticum* +, *Deschampsia flexuosa* 1.2, *Deschampsia caespitosa* +, *Sphagnum girgensohnii* 3.4, *Sphagnum magellanicum* 1.2, *Sphagnum rusowi* 1.2, *Polytrichum commune* 1.2, *Polytrichum strictum* +. These spruce phytocoenoses play an important role in the maintenance and syndinamic evolution of the peat bogs by reducing summer evapotranspiration through wind speed reduction and by keeping the precipitation water within the moss synusia.

The floristic composition of the five associations identified in the two peat bogs has several phytogeographical characteristics worth mentioning. One example is the composition of the associations *Sphagno-Caricetum limosae* and *Sphagnetum magellanici*, which shelter important boreal-arctic species, such as *Andromeda polifolia*, *Carex magellanica*, *Empetrum nigrum*, *Vaccinium microcarpum*, *Drosera rotundifolia*, *Drosera intermedia*, *Carex pauciflora* and *Carex limosa*. The species listed above are considered as glacial relicts of the Würmian III period [8, 10], and they emphasize the particular (topo)climatic conditions in the area and the ancientness of these species in the region. Another example is represented by the occurrence of species with an eastern

European distribution area, such as *Valeriana simplicifolia* and *Pedicularis limnogen*a, present in the association *Eriophoro vaginati-Sphagnetum*. These species give the phytocoenoses of the Apuseni Mountains a regional specificity with respect to those described in central and northern Europe [2, 5].

The extension of the ROSCI0116 Molhaşurile Căpăţanei protected area is of paramount importance, as several peat bogs in the Apuseni Mountains have been degraded (Damiş, Munţişoru, Dorna) [9] or have completely disappeared (Bălceşti, Călăţele) due to peat exploitation. The inclusion of both active raised bogs (total surface about 5 ha) in the ROSCI0116 Molhaşurile Căpăţanei protected area will partly compensate for the partial loss of peat bog area in the upper sector of the Someşul Rece river watershed. These bogs are located at higher altitudes (1300-1700 m) [9] as compared to their counterparts in the Someşul Cald river watershed, offering suitable conditions for maintaining glacial relicts. Moreover, oligotrophic peat bogs, as wetlands, are ecosystems considered to be particularly vulnerable to natural disturbance and human impact [11, 12] and therefore, through their adequate protection, the conservation of the flora and the habitats might be hopefully maintained. The forest area near the peat bogs must be preserved as well, as it is important to maintain the water table at an appropriate level in the moss layer and because the bog woodland itself is a Natura 2000 priority habitat (91D0*).

All these arguments call for the protection of the active raised bogs “Calul de Piatră” and “Izvorul văii Şoimului” by including them within the boundaries of the ROSCI0116 Molhaşurile Căpăţanei Site of Community Interest. Consequently, this initiative does not claim the distinction of a new protected area, but only the extension of the north-eastern limit of an existing protected area.

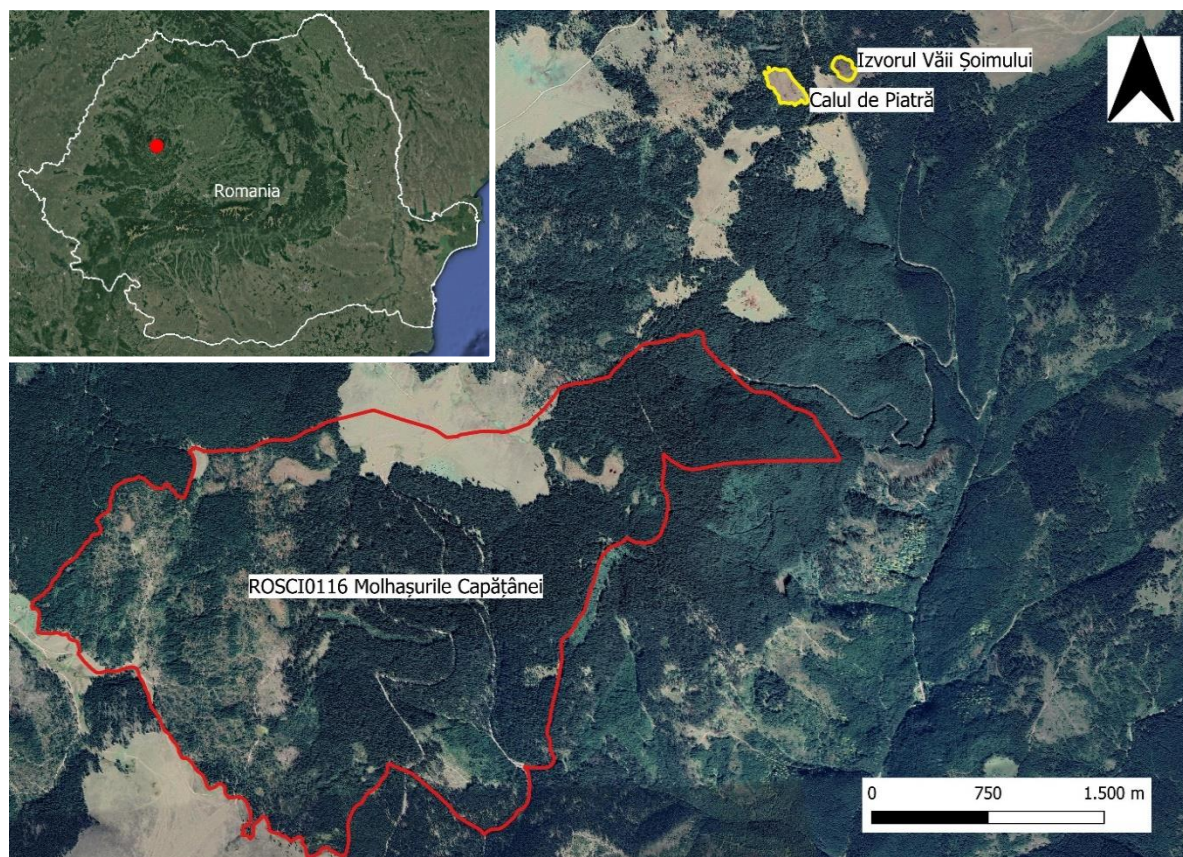


Fig. 1: Location of ROSCI0116 Molhaşurile Căpăţanei, “Calul de Piatră” and “Izvorul văii Şoimului” active raised bogs



Fig. 2: “Calul de Piatră” active raised bog



Fig. 3: “Izvorul văii Şoimului” active raised bog

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PROPUNERE PENTRU INCLUDEREA A DOUĂ MLAȘTINI OLIGOTROFE ÎN ARIA PROTEJATĂ DE INTERES COMUNITAR ROSCI0116 MOLHAȘURILE CĂPĂȚÂNEI

(Rezumat)

Mlaștinile oligotrofe în care supraviețuiesc unele specii boreale, considerate relictate glaciare din perioada Würmian III, se află la limita lor sudică în România (*Andromeda polifolia*, *Carex magellanica*, *C. pauciflora*, *Empetrum nigrum*, *Vaccinium microcarpum*). Astfel de stațiuni (habitate) conservatoare de specii relictate au o importanță fitoistorică majoră. Ele permit elucidarea istoricului vegetației forestiere din regiune și condițiile climatice din trecut. În contribuția de față se propune includerea tinoavelor "Calul de Piatră" și "Izvorul văii Șoimului" în situl de interes comunitar ROSCI0116 Molhașurile Căpățânei (Munții Apuseni), pe baza argumentelor floristice, fitocenologice și fitogeografice. Fitocenozele identificate în cele două mlaștini oligotrofe aparțin la cinci asociații, după cum urmează: *Sphagno cuspidati-Caricetum limosae* Osvald 1923, *Sphagnetum magellanici* Käster et Fläsner 1933 subass. *sphagnetosum fusci* Dierssen 1977, *Eriophoro vaginati-Sphagnetum recurvi* Heuck 1925, *Sphagno-Caricetum rostratae* Steffen 1931 și *Sphagno magellanici-Piceetum* Zukrigl 1973. Includerea celor două tinoave în ROSCI0116 Molhașurile Căpățânei va crește suprafața protejată de mlaștini oligotrofe din Munții Apuseni, fiind benefică pentru conservarea habitatelor umede și flora acestora, ambele foarte vulnerabile la perturbările naturale și antropice.