

Phytocoenological studies of the rare communities of *Spiraea salicifolia* in Rhodopi Mts and their significance for vertebrate animals



SCIENTIFIC
CONFERENCE
KD 2020

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Introduction

The communities of *Spiraea salicifolia* are rare for Bulgaria and the information on their composition, structure and significance for vertebrates is rather limited. The general distribution of the species includes territories in Central and Eastern Europe, Asia and Northwest America. The only locality of *Spiraea salicifolia* in Bulgaria is in the Western Rhodopes (fig.1) along the left bank of Dospatska River, north of the town of Sarnitsa.

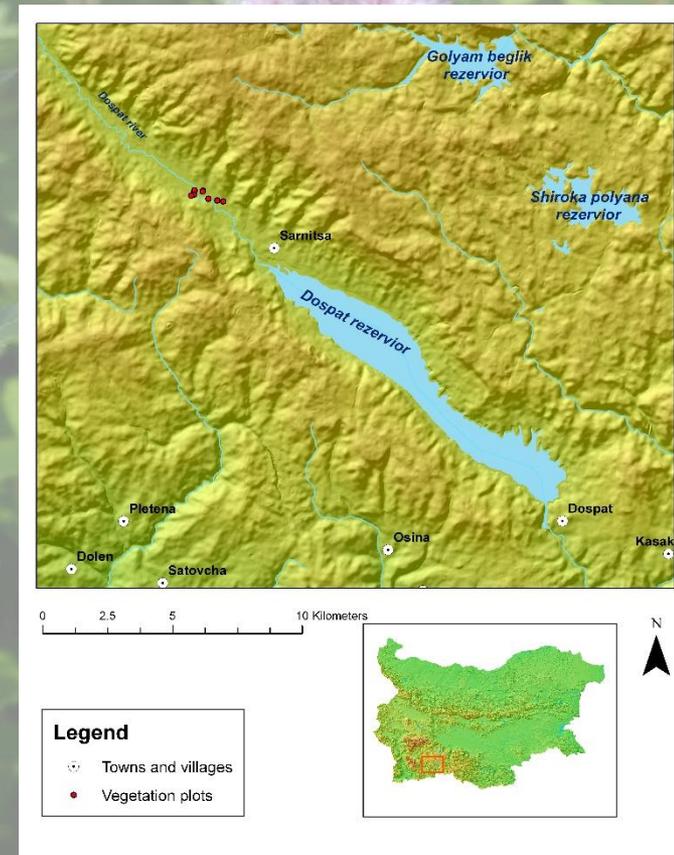
Spiraea salicifolia is a threatened plant, category "Critically endangered" according to the Red Data Book of the Republic of Bulgaria (Sopotlieva, 2015). It is included in Annex 3 of the Biological Diversity Act. Its communities are protected within the protected area "Chibutsite", belonging to the NATURA 2000 protected area "Western Rhodopes" under the Birds Directive.

Materials and Methods

Totally ten phytocoenological relevés were made in the communities during the vegetation seasons of 2019 and 2020. Field work and further analysis followed classical phytocoenological methodology. Ecological indicator values which characterize the ecological optimum of plant species along major environmental gradients were extracted and used as an effective way of characterization of the abiotic conditions of the studied vegetation. Biological (on the basis of Raunkiaer's life form) and chorological spectra were constructed in order to give any basic information on the origin and history of this vegetation.

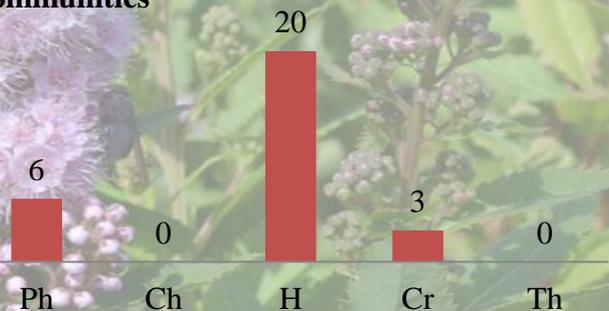
The presence of vertebrate species was registered both through direct observations and traces of their activity. The habitat was studied in terms of its potential as a resource - food base and shelters. Species diversity of vertebrates was studied by the transect method through Sherman live traps and camera traps.

Map of the region of distribution of *Spiraea salicifolia* communities



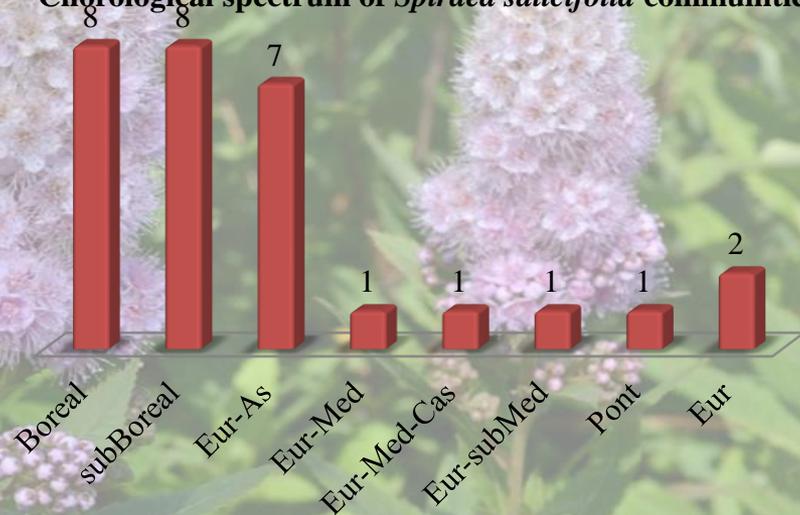
Results and Discussion

Biological spectrum of *Spiraea salicifolia* communities

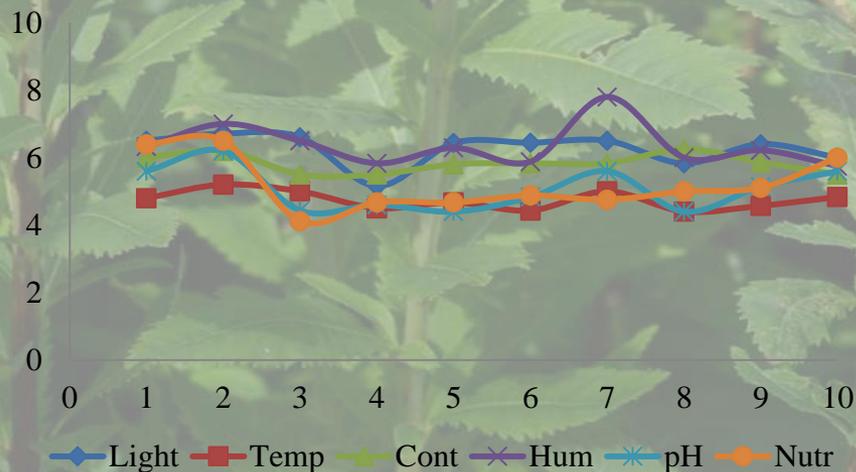


The boreal and sub-Boreal floristic elements prevail in relation to the relic origin of these communities in glaciation times. The high percentage of the European element (including Euro-Asian and Euro-(sub)Mediterranean) shows the origin and distribution centers of most plants in the composition of this vegetation to the north of the Balkan Peninsula.

Chorological spectrum of *Spiraea salicifolia* communities



Ecological structure of *Spiraea salicifolia* communities



Most vascular plants in the communities of *Spiraea salicifolia* prefer open and sunny habitats in the temperate zone and/or in the low mountains on moderately rich soils. They are cool-resistant and can tolerate low temperatures during the colder months. This vegetation is composed of neutro- and slightly acidophilous species such as *Deschampsia caespitosa*, *Potentilla erecta*, *Rumex acetosella*, with an intermediary character between the suboceanic and the subcontinental. This habitat is composed of typical hygrophyte species which do not tolerate water deficiencies and develop on very well irrigated soils and floodplains.

In the communities of *Spiraea salicifolia* the bank vole (*Myodes glareolus*) which is characteristic for the studied region was captured. There are data that climate change could lead to an increase of the calamities in this species, causing damage to plant communities as well as an increased risk of hantavirus in humans to whom they are carriers. The Balkan wall lizard (*Podarcis taurica*) was also registered in the habitat by direct observation. The species is found in Bulgaria mainly up to 500 m above sea level, but in the present study it was registered at 1220 m above sea level, which gives a reason to consider the species as a potential indicator for climate change



Spiraea salicifolia – individual (below) and habitat (above)



Podarcis tauricus – an observed species in the studied habitat



Myodes glareolus trapped in *Spiraea salicifolia* habitat



Acknowledgements: This work has been carried out in the framework of the National Science Program "Environmental Protection and Reduction of Risks of Adverse Events and Natural Disasters", approved by the Resolution of the Council of Ministers № 577/17.08.2018 and supported by the Ministry of Education and Science (MES) of Bulgaria (Agreement № ДО-230/06-12-2018).