

# Preliminary data on the ecological features of the communities of *Satureja pilosa* from Central Balkan Mts.

Ina Lazarova<sup>1</sup>, Kalina Pachedjieva<sup>1</sup>, Georgi Kunev<sup>2</sup>, Gabriela Petrova<sup>2</sup>

<sup>1</sup>Sofia University "St. Kliment Ohridski", Faculty of Biology, Dep. of Ecology and environmental protection

<sup>2</sup>Sofia University "St. Kliment Ohridski", Faculty of Biology, Dep. of Botany

## Introduction

*Satureja pilosa* is a Balkan endemic species which forms open petrophytic communities with fragmented distribution on the territory of Bulgaria.

Although the species has been an object of phytochemical and taxonomic investigations, the information on the ecology, phytosociology and syntaxonomy of its communities is limited. The aim of this study is to reveal the floristic composition, structure and main ecological features of the communities of *Satureja pilosa* distributed in Central Balkan Mts.

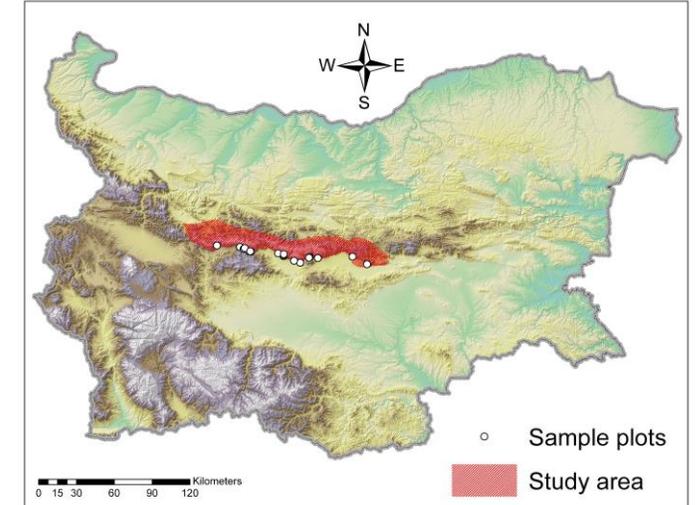
## Methods

In the summer of 2020 almost all potential habitats in the lower parts along the southern macro-slope of Central Balkan Mts were visited. Totally 27 phytocoenological relevés were made in rocky outcrops with high abundance of *Satureja pilosa*. Field work and further analysis followed the principals and methodology of Braun-Blanquet. Biological and chorological spectra (based on Raunkiaer's life forms and geographical range of species, respectively) were constructed in support to a preliminary syntaxonomical decision.

In order to reveal the main ecological features of the studied communities an analysis of the Ellenberg-type ecological indicator values was applied. These values are expressed on ordinal scales along major environmental gradients (*light, temperature, moisture, continentality, pH and nutrients*). They were calculated per each plot as an effective way of bioindication.

## Results

The communities of *Satureja pilosa* are xerophytic with open vegetation structure. They occupy steep and sunny slopes on acidic substrates that in Central Balkan Mts. originate mainly from granite. Their vegetation density is relatively low and the distribution patterns of the plants are mosaic.

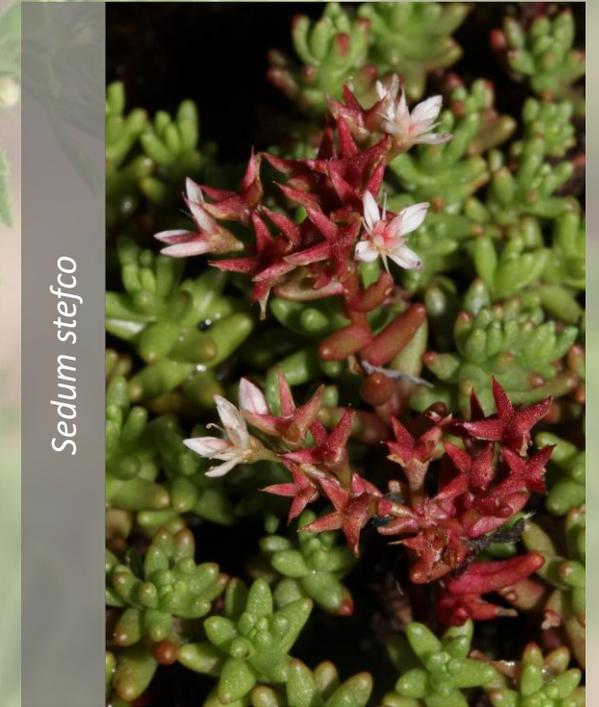


## Species composition and vegetation structure

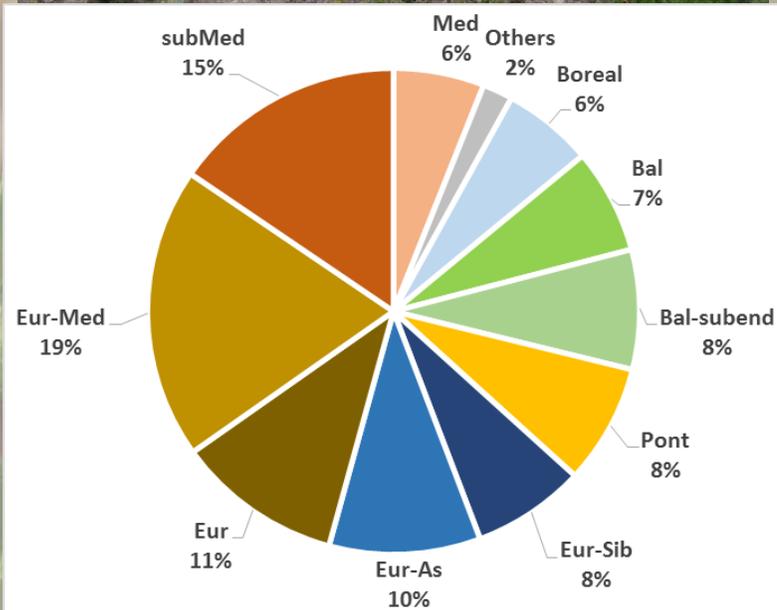
Totally 200 vascular plant species and subspecies and 15 bryophyte taxa take part in the floristic composition of *Satureja pilosa* communities. Species with high frequency are *Logfia arvensis*, *Koeleria macrantha*, *Phleum phleoides*, the Balkan endemics and subendemics *Galium rigidifolium*, *Campanula lingulata*, *Achillea crithmifolia* and others. Most of the constituents cover about 1-5% of the examined sites except *Satureja pilosa*, *Logfia arvensis*, *Sedum annum*, *Scleranthus perrenis* in certain plots.



*Sempervivum leucanthum*



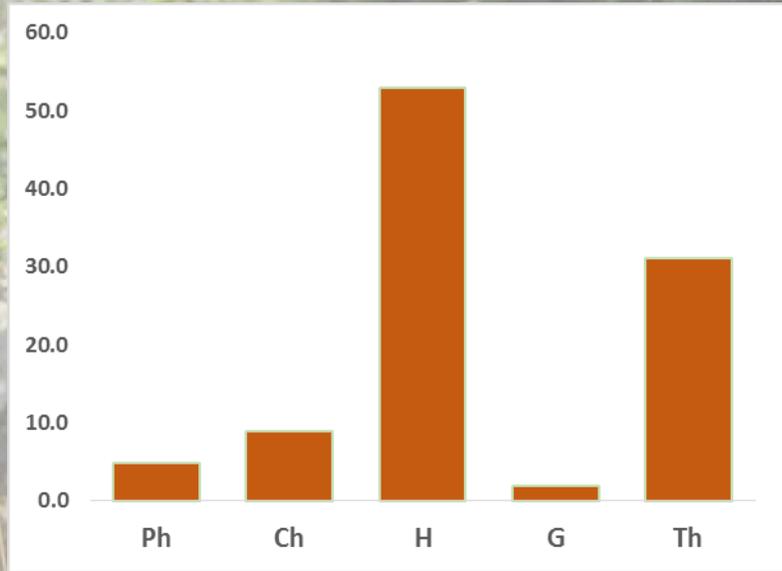
*Sedum stefco*



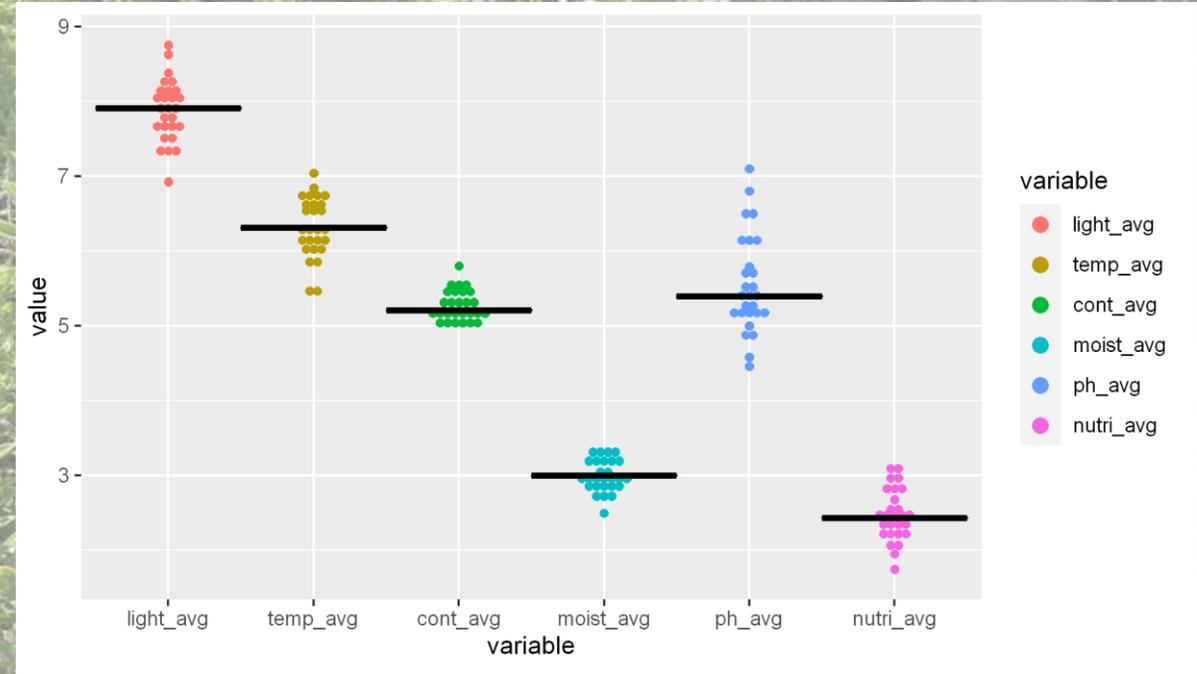
## Chorological and biological spectra

The chorological spectrum of the studied vegetation shows complex phytogeographical origin and floristic relations. The highest participation is that of the Euro-Mediterranean and sub-Mediterranean (including steno-Mediterranean) species and high share of the Balkan endemics and sub-endemics

The biological spectrum is the character for the temperate latitudes with the high proportion of hemicryptophytes. The high percentage of therophytes and rather low percentage of geophytes is due to the arid conditions and shallow or lack of soil substrate. Chamaephytes which are usually related to soil erosion are almost 1/10 of the plants in this vegetation



The analysis with the Ellenberg-type ecological indicator values of species shows that the vascular plants within this vegetation prefer warm climate and very dry habitats exposed to high solar radiation. This vegetation is composed of neutro- and slightly acidophilous species with an intermediary character between the suboceanic and the subcontinental. Concerning the nutrients availability in the soil these communities develop on very poor substrates



On the basis of the presented analysis we could suggest the syntaxonomical affiliation of *Satureja pilosa* communities to a new Balkan alliance of acidophilous coenoses in dry and nutrients-poor conditions within the xerophilous open steppic grasslands on shallow rocky calcareous and siliceous substrates of Central and southeastern Europe:

- Class *Festuco-Brometea* Br.-Bl. et Tx. ex Soó 1947
- Order *Stipo pulcherrimae-Festucetalia pallentis* Pop 1968
- Alliance *Saturejon pilosae* all. nov
- Association *Campanulo lingulatae-Saturejetum pilosae* ass. nova

**Acknowledgements:** The research is carried out under the project: "Ecological and floristic structure of the communities of *Satureja pilosa* sensu lato in Central Balkan Mts." financed by Scientific research fund of Sofia University – Contract №80.10-146/23.04.2020