

6th Balkan Botanical Congress, Rijeka (CRO), September 14-18, 2015

Excursion to the Northern Velebit National Park, September 16, 2015

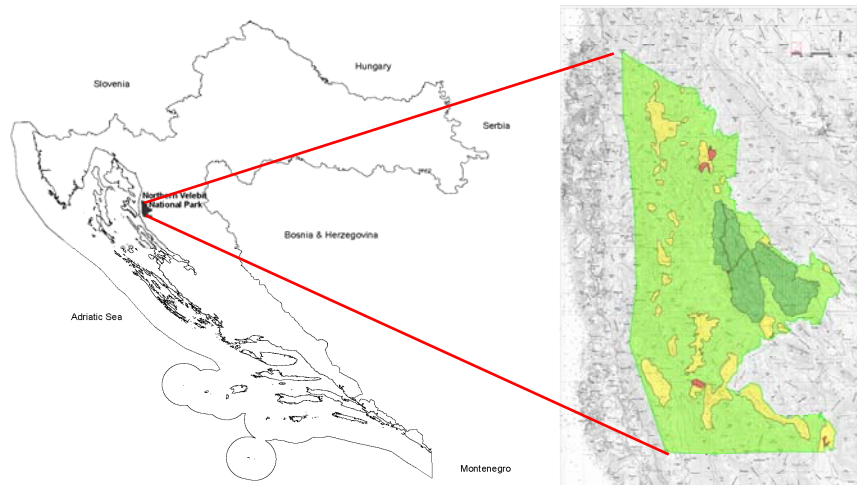


Fig. 1. Position of NP Northern Velebit

The Velebit Mt, a mountain range stretching alongside the Adriatic coast (Fig. 1), has a southwest facing foothill area that belongs to the Adriatic-Coastal, Mediterranean region, but the upper belts of the southwestern flanks and all the northwestern slopes belong to the Dinaric-Montane biogeographical region. With over 2,000 taxa of vascular plants and over 70 endemics, the Velebit Mt is one of the most important plant diversity centers in Croatia. With its total length of 145 km, the Velebit Mt is the longest Croatian mountain range. It is only 10–30 km wide with the highest peak (Vaganski vrh) of 1,757 m a. s. l. The range extends in a typical Dinaric direction from northwest to southeast and rises almost directly from the Adriatic Sea forming a wall-like appearance characteristic for the coastal Dinarides. Geologically it is dominated by Mesozoic limestone with only small patches of other rock types. Dividing the Adriatic coast from the inland area, the Velebit Mt has various climatic types, from sub-Mediterranean, subalpine to inland continental type. The yearly mean temperature on the Zavižan peak (1,594 m a. s. l.) is 3.5 °C, with an annual precipitation of 1,898 mm. The whole mountain is protected as “Nature Park” and within it there are two national parks: “Northern Velebit” and “Paklenica” (the latter in the Southern Velebit). Zavižan is a group of peaks in the Northern Velebit (Veliki Zavižan 1,677 m, Balinovac 1,601 m, Zavižanski Klek 1,620 m, Vučjak 1,645 m, Zalovačko bilo 1,630 m, Pivčevac 1,676 and Velika Kosa 1,620 m a.s.l.). An alpine house with a meteorological station (1,594 m) is situated in the central part, which was a starting point for field trips in the surroundings. Zavižan belongs to the belt of subalpine beech forests (*Saxifraga rotundifoliae*-Fagenion). However, as it used to be a summer grazing area for centuries, it is covered with extensive grasslands. The most widespread grassland community belongs to ass. *Festucetum bosniacae*. Open rocks and ridges have unique forms of vegetation with many local endemics.

One of the best ways to get insight into relief and vegetation of north Velebit is the walk along Premužićeva staza (Premužić Trail). The trail was laid out and constructed by the forestry engineer Ante Premužić, a passionate mountaineer and lover of Velebit. The construction of the trail began in 1930 and was finalized in 1933. Constructed using the drystone technique, the Premužić Trail is today considered a masterpiece of trail building. The route is laid out so as to provide the easiest possible access to the most rugged and inaccessible sections of Northern Velebit – Hajdučki i Rožanski kukovi. The 57 km route runs along the mountain ridge from Zavižan to Baške Oštarije in central Velebit.

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Main plant communities alongside Premužić Trail

Forest vegetation

Altimontane-subalpine beech forests (*Saxifraga rotundifoliae-Fagenion*) are the main zonal forest type in the belt between 1200-1500 m (Fig. 2). Inside this belt two associations can be recognized. The first one (*Ranunculo platanifolii-Fagetum*) has tree layer completely dominated by beech which trunks are usually curved in lower part due to long lasting snow bed and have very characteristic „J“ shape. Some of the plant species occurring in this forest type are *Ranunculus platanifolius*, *Prenanthes purpurea*, *Mycelis muralis*, *Paris quadrifolia*, *Saxifraga rotundifolia*, *Adenostyles alliaria*, *A. alpina*, *Polygonatum verticillatum*, *Calamintha grandifolia*, *Aremonia agrimonioides*, *Allium victorialis*, *Mercurialis perennis*, *Rubus saxatile* and many others.

Above this association, up to the *Pinus mugo* belt the last beech forest type in altitudinal gradient, *Polysticho lonchitis-Fagetum* (Fig. 3), is developed. It is physiognomically easily recognizable due to stunted, shrub-like form of beech. Some species differentiating this community from previous one are *Salix appedunculata*, *Pinus mugo*, *Sorbus chamaemespilus*, *Lonicera borbasiana* (*L. caerulea* subsp. *borbasiana*), *Ribes alpinum*, *Polystichum lonchitis* and others.



Fig. 2. Altimontane-subalpine beech forest (*Ranunculo platanifolii-Fagetum*)



Fig. 3. Subalpine beech forest (*Polysticho lonchitis-Fagetum*)

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Very specific spruce forest (*Hyperico grisebachii-Piceetum*) with broken and open canopy (Fig. 4) is developed on steep limestone blocks of almost inaccessible tops, ridges and cracks above 1400 m, where conditions are too harsh for beech. This forest type is characterized by presence of many species of open habitats, rock crevices and alpine grasslands. The differentiating species in relation to other spruce phytocenoses are *Salix appendiculata*, *Sambucus racemosa*, *Juniperus communis* subsp. *nana*, *Achillea clavinae*, *Gentiana lutea* subsp. *symphyandra*, *Hypericum richeri* subsp. *grisebachii*, *Festuca bosniaca*. Some other common species are *Clematis alpina*, *Lonicera borbasiana*, *Calamagrostis varia*, *Cirsium erisithales*, *Carex ornithopoda*, *Carduus acanthoides*, *Carlina acaulis* subsp. *caulescens*, *Asplenium fissum*, *Melampyrum velebiticum* and others.



Fig. 4. Spruce forest on steep limestone blocks (*Hyperico grisebachii-Piceetum*)

The second type of spruce forests (*Laserpitio krapfii-Piceetum*) grows on slightly lower altitudes than the previous one (1100-1500 m). It is developed on steep, north-facing, cold and hardly accessible slopes descending from rocky tops towards sinkholes, pits and dolinas (Fig. 5). Some of the plant species occurring there are *Petasites albus*, *Knautia drymeia*, *Symphytum tuberosum*, *Laserpitium krapfii*, *Valeriana montana*, *Geranium sylvaticum*, *Trollius europaeus*, *Festuca altissima* and others.



Fig. 5. Spruce forest in dolina (*Laserpitio krapfii-Piceetum*)

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The upper boundary of forest vegetation is formed of mountain pine shrubberies (*Hyperico grisebachii-Pinetum mugii*). The community is developed mainly above 1400 m a. s. l. The floristic composition of the community contains many boreal plants, whose distribution in this area is related to consequences of glaciation. Some of most abundant species are *Salix appendiculata*, *Lonicera borbasiana*, *Sorbus chamaemespilus*, *Rosa pendulina*, *Ribes alpinum*, *Juniperus communis* subsp. *nana*, *Vaccinium myrtillus*, *V. vitis-idaea*, *Lycopodium annotinum*, *Clematis alpina*, *Adenostyles alpina*, *Valeriana montana*, *Hypericum richeri* subsp. *grisebachii*, *Solidago virgaurea* subsp. *minuta* and others.



Fig. 5. Stand of mountain pine (*Hyperico grisebachii-Pinetum mugii*)

Vegetation of rocks

Rock fissures and crevices of carbonate rocks have very rich and specific flora rich in endemic species (Fig. 6). Several plant communities were described and they belong to the order *Potentilletalia caulescentis* inside the class *Asplenieta trichomanis*. Due to richness in endemic species this vegetation is phytogeographically the most specific and the main reason of uniqueness of Velebit's flora. Some of the species that can be found in these habitats are *Campanula waldsteiniana*, *Micromeria croatica*, *Aquilegia kitaibelii*, *Cardaminopsis croatica*, *Arenaria gracilis*, *Arabis scopoliana*, *Alchemilla velebitica*, *Primula kitaibeliana*, *Dianthus integer*, *Seseli malyi*, *Asplenium fissum*, *Heliosperma pusillum*, *Silene hayekiana*, *Edraianthus graminifolius*, *Kerneria saxatilis*, *Cystopteris fragilis*, *C. regia*, *Achillea clavenae*, *Leontopodium alpinum* and many others.



Fig. 6. *Campanula waldsteiniana*, endemic species of rock crevices

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Grassland vegetation

Grasslands are important and prominent part of landscape in Northern Velebit (Fig 7). However, they are of seminatural origin and are consequence of several thousand years of extensive sheep breeding. They have rich flora and are substantial part of biodiversity. Nowadays they are undergoing process of succession toward shrub and forest vegetation due to abandonment of traditional land use. Several grassland communities can be distinguished, but in the area, the most widespread and prominent are grasslands of Bosnian fescue (*Festucetum bosniacae*) which grow on relatively deeper soils and positions more or less sheltered from strong winds (Fig. 7). Some of plant species found here are *Dianthus velebiticus*, *Silene saxifraga*, *Scabiosa lucida*, *Dianthus bebius* (*D. petraeus*), *Pimpinella alpestris*, *Scorzonera purpurea* subsp. *rosea*, *Centaurea haynaldii*, *Senecio doronicum*, *Campanula glomerata*, *Phyteuma orbiculare*, *Rhinanthus aristatus*, *Anthyllis vulneraria* subsp. *alpestris*, *Acinos alpinus*, *Bromus erectus*, *Trifolium montanum*, *Hippocrepis comosa*, *Carex humilis* and other. *Genista radiata*, *Juniperus communis* subsp. *nana* and *Ligusticum lucidum* are indicators of succession and can be very abundant changing floristic composition.

On the other hand, on shallow soils and wind exposed positions grasslands of narrow-leaf moor grass are developed (*Sesleria juncifoliae*-*Caricetum humilis*). Beside *Sesleria interrupta* and *Carex humilis* here grow *Genista sericea*, *Inula hirta*, *Satureja subspicata*, *Globularia cordifolia*, *Plantago argentea*, *Pedicularis hoermaniana*, *Biscutella laevigata*, *Oxytropis dinarica* subsp. *velebitica* and others. *Arctostaphylos uva-ursi* and *Juniperus communis* subsp. *nana* are indicators of succession.



Fig. 7. Grassland of Bosnian fescue (*Festucetum bosniacae*)