

**TYOLOGICAL INVESTIGATIONS OF VEGETATION AND
SOIL AS A BASIS FOR LAND CLASSIFICATION AND
EVALUATION***

**TIPOLOŠKA ISTRAŽIVANJA VEGETACIJE I TALA KAO OSNOVA
ZA KLASIFIKACIJU I VREDNOVANJE KOPNENIH EKOSUSTAVA
(LAND)**

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Comparative typological investigations of vegetation and soil carried out in Croatia the last twenty years, brought us to the following conception:

1) between pedologic-systematical and phytocenological units there are regular relations and

2) phytocenological units, the ecology of which has been sufficiently studied, can be a sure indicator for the fundamental qualities of locality and therefore can serve as a basis for practical land classification.

The purpose of this short report is not to point out all the laws we have found during comparative pedo-phytocenological investigations in our country, and which are of no interest regarding the specificity of our pedological and phytocenological conditions. I would like to illustrate with some examples the relation of pedologic-systematical and phytocenological units of our forests and to expose their significance for the method of land classification and evaluation.

The investigations are carried out on the areas under natural vegetation; the plant associations are conceived in conformity to the phytocenological school Braun-Blanquet, and the soil type in conformity to the old Russian pedologic school.

* Reprinted from: Transactions of the International Congress of Soil Science, Amsterdam 1950, Volume II.

Djelo velikog znanstvenika objavljujemo jer je ono i danas osnova za izradu suvremenih karata kopnenih ekosustava (LAND-a). - Uredništvo

The mixed forests of *Quercus sessiliflora* and *Carpinus betulus* cover important surfaces of lower regions of continental Croatia and appertain, according to our phytocenologist Prof. I. Horvat, to bound *Fagion silvaticae* i.e. to the very expressive association *Querceto-Carpinetum*. Besides the *Carpinus betulus* and *Quercus sessiliflora* that most constantly appear in these forests, for this association are also characteristic: *Prunus avium*, *Acer campestre*, *Acer platanoides*, *Corylus avellana*, *Lonicera caprifolium*, *Acer tataricum*, *Evonymus europaea*, *Stellaria holostea*, *Gallium verum*, *Crocus vernus*, *Epimedium alpinum*, *Melampyrum nemorosum*, *Helleborus atrorubens*, *Ranunculus auricomus* and *Helleborus dumetorum*. With respect to considerable differences of the floristic composition, Prof. Horvat divided this association into three sub-associations:

1. *Querceto-Carpinetum croaticum erythronietosum* with differential species *Erythronium dens canis*, *Listera ovata*, *Gentiana asclepiadea*, *Majanthemum bifolium*, *Melampyrum pratense*, *Pteridium aquilinum*, *Luzula pilosa* etc.

2. *Querceto-Carpinetum caricetosum pilosae*, a sub-association in which is dominant *Carex pilosa*, and more seldom the species *Carex glauca*.

3. *Querceto-Carpinetum croaticum staphyletosum*, with specific species *Staphylea pinnata*, further *Hacquetia epipactis*, *Scilla bifolia*, *Helleborus atrorubens*, *Carex digitata*, *Tamus communis* et al.

The typological soil investigations in different regions of Croatia where these soils often appear in direct proximity, brought very interesting conceptions that:

1. all soils of the sub-association *Querceto-Carpinetum croaticum erythronietosum* belong to the group of moderate podsolized soils, of which the degree of base saturation (V) of the adsorbing complex in the eluvial horizon varies between 35—60 %;

2. the soils of the sub-association *Querceto-Carpinetum caricetosum pilosae* appertain to the group of weakly podsolized soils of which the degree of base saturation of the adsorbing complex in the eluvial horizon is greater than 60 %;

3. the soils of the sub-association *Querceto-Carpinetum staphyletosum* are from the brown i.e. yellowish-grey eluviated carbonate types, which contain calcium carbonate at least in one horizon.

Wherever appear these sub-associations in Croatia they always cover the same types, i.e. subtypes of soils.

The evaluation and classification of localities of these forests founded exclusively on the domination of overstocked stands consequently could not be successfully done because *Quercus sessiliflora* and *Carpinus betulus* in all these forests, the soils of which are essentially different, represent the dominant overwood. Only the differentiating into sub-associations, established upon studies of understocked stands, can discover all the variety in the value of the land of these apparently rather homogeneous forests.

Besides the sub-associations mentioned considerable surfaces in Croatia are also under the association *Querceto-Castanetum croaticum* HORVAT, in which the most important species are *Quercus sessiliflora* and *Castanea sativa*, and from lower storey *Vaccinium myrtillus*, *Cattuna vulgaris*, *Genista germanica*, *Genista tinctoria*, *Cytisus supinus*, *Cytisus nigricans* etc. and the moss species *Polytrichum attenuatum*, *Hypnum cupressi-formae* and *Leucobryum glaucum*.

The pedological investigations have led to the conclusion that all soils of the association *Querceto-Castanetum croaticum* constantly belong to the group of intensely podsolized soils of which the degree of the base saturation (V) of the adsorbing complex in the eluvial horizon is lower than 35 %•

Pedologic-systematical, as well as phytocenological units usually represent stages of development that are products either of recent pedogenetic or phytocenological processes or of geologically involved changes. In any case they are the reflexes of general genetic conditions, which exist in single parts of our pedosphere. The close connection between the pedological and phytocenological units allows us to use the conceptions of this reciprocal relation between soil types and vegetation as a basis for land classification and evaluation.

It is evident from the examples here exposed that for the land evaluation and hence for their classification it is not enough only to pay attention to the mean tree culture, but primarily to the understocked stands, which are characteristic for different types (associations and sub-associations) and which often much more, evidently indicate differences of ecological properties and of land value than the overstocked vegetation.

The comparative pedo-typological and phytocenological investigations show us the natural way of the development of soil and of vegetation cover and reveal their phase of life. When the relation between pedological and phytocenological units will be sufficiently investigated the typological

mapping of vegetation shall be a great methodic help to the land classification and evaluation.

If land classification also includes the execution of the specific plans for purposeful use of land, as some authors point out (GRAHM *et al.*), then the classification based upon the phytocenologic-pedological characteristics deserves the greatest attention. It comprehends many natural land characteristics in all their complexity, that could hardly find a simpler and unanimous expression.

RESUME

Les recherches comparees typologiques de la vegetation et du sol, fait en Croatie les derniers vingt annees ont fait connaitre: 1° qu'entre les units pedo-systematiques et phytocenologiques existent les relations de loi et 2° que les units phytocenologiques dont l'ecologie est suffisamment etudie, peuvent etre revelatrices des proprietes naturelles de la localite et par consequent peuvent servir de base pour une classification pratique et evaluation du terrain. L'auteur donne une documentation en exemples pour la signification pratique de ces constatations.

LITERATURE

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Primljeno - Received:
10. 4. 2003.