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PROPOSAL FOR THE NEW SERBIAN SOIL CLASSIFICATION

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At the XII Congress of Serbian Soil Science Society, held in Novi Sad in 2009 (Andrevlje on the mountain Fruška gora) some new elements of Serbian soil classification was done. This new version of soil classification has been brought considerably closer to our earlier suggested principles and division (ANTONOVIĆ M.G., PROTIĆ J.N., 1997, 1998) and to international soil classification, FAO (2006), WRB (2006) and USA classification in particular. Some changes in Yugoslav soil classification (ŠKORIĆ A., FILIPOVSKI G., ĆIRIĆ M., 1973, 1985) has been done especially in the new Macedonian version (FILIPOVSKI G. 2006) and also in Bosnia and Hercegovina (RESULOVIĆ H. et al., 2008).

Key words: Serbian soil classification, international soil classification, FAO and WRB, cambisols, luvisols, podzols (brunipodzols), planosols, gleysols, solonetz, solonchaks, histosols

INTRODUCTION

Long-term use of the Yugoslav soil classification (ŠKORIĆ A., FILIPOVSKI G., ĆIRIĆ M., 1973 and 1985) is deeply rooted in the soil cartography and the studies of Serbian soils. During investigations the researchers of the Institute of soil science observed some possible changes, especially in the lowest systematical units and decided to work on the new Serbian soil classification.

The work on soil classification is not only a hard and responsible job but also of critical importance. At the XII congress of Serbian soil science society (2009) and in the scientific paper (ANTONOVIC M.G. et al. 2010) were presented only the basic principles and the part of the new soil classification: entisols, fluvisols, mollisols, umbrisols, vertisols, anthroposols and technosols.

Now, we would like to continue with presentations of all great soil groups and lower systematical units: cambisols, luvisols, podzols (brunipodzols), planosols, gleysols, solonchaks, solonetz and histosols.

Our national classification consist on:

- Large soil group, or soil order is introduced instead of division and class. It is constituted of soils characterized by specific diagnostic horizons and diagnostic material (only for alluvial soil materials);
- Type is determined by diagnostic horizons;
- Subtype is determined by the processes which take place in the soil;
- Variety is the basis for geological substratum;
- Subvariety denotes strength (depth) of some horizons or soil materials;
- Form is related to soil texture;
- Phase applies to per cent of skeleton;

Large soil group defines specific group of diagnostic horizons and/or diagnostic materials which reflect dominant processes of soil formation.

Cambisols (from latin; cambio, to change) – Soils with at least the beginnings of horizon differentiation in the subsoil evident from changes in colour, clay content and structure.

Type: Eutric cambisol, Dystric cambisol, Terra rossa, Kalkokambisol

Luvisols (from latin, luere, to wash) – Soils that have higher clay content in the subsoil than in the topsoil as a result of pedogenetic processes, especially clay migration leading to an argic subsoil horizon.

Type: Luvisol

Podzols (from Russian, pod, underneath, and zola, ash) – soils with a spodic illuviation horizon under a subsurface horizon that has the appearance of ash and is covered by an organic layer.

Planosols (from Latin, planus, flat) – Soils with a light – coloured surface horizon that shows signs of periodical water stagnation and abruptly overlies a dense, slowly permeable subsoil with significantly more clay than the surface horizon.

Type: planosol (pseudogley)

Gleysols (from Russian, gley, mucky mass) – Gleysols are wetland soils that, unless drained, are saturated with groundwater for long enough periods to develop a characteristic gley colour pattern.

Type: Fluvial meadow soil (humofluvisol), Hydromorphic black soil (humogley), Swampygley soil (eugley)

Solonchaks (from Russian, sol, salt) – Soils that have a high concentration of soluble salts at some time in the year

Solonetz (from Russian, sol, salt) – Soils with a dense, strongly structured, clayey subsurface horizon that has a high proportion of adsorbed Na and/or Mg ions.

Histosols (from Greek, histos, tissue) – comprise soils formed in organic material.

Type: fibrisol, hemisol, saprisol

According to the new version of classification, soil type is characterized by the presence of diagnostic horizons. It has some other distinctive characteristic developed by secondary soil forming process and it is that characteristic which makes it different from another soil type from the same large group of soils. In other words, each soil type is distinctive for its specific vertical combination or vertical sequence of various characteristics in the soil profile.

In our classification as well as in FAO and WRB classifications there are a lot of identical diagnostic horizons and diagnostic properties.

Examples of new classification are tabulated representing cambisols, luvisols, podzols (brunipodzols), planosols, gleysols, solonetz, solonchaks and histols).

Great soil group	Types	Subtypes	V a r i e t i e s	Subvarietes	Forms	Phase
CAMBISOLS	Eutric Cambisol	- haplic (typic) - leptic - leached - - hypocalcic - orthocalcic - luvic - vertic	- on loess and loess-like sediments - on calcareous alluvial sediments - on terciari and diluvial noncalcareous sediments - on noncalcareous colluvial and fluvio glacial sediments - on hard neutral, basic and ultrabasic rocks and their regolith - on pyroclastic sediments	- shallow, <20 cm - medium thick, 40-80cm - thick, 80-120 cm - very thick, >120 cm	- sandy - loamy - clayey	- slightly skeletal - medium skeletal - strongli skeletal
	Dystric cambisol	- dystric - leptic - humic - luvic - brunipodzolized - - podzolized	- on hard acid silicate rocks - on hard quartz rocks - on various noncalcareous water and glacial clastic sediments - on residual regolith and on pyroclastic sediments (tuffs)	- thin, <40 cm - medium thick, 40-70 cm - thick, >70 cm	- sandy - loamy - clayey	- slightly skeletal - medium skeletal - strongly skeletal
	Terra rossa (red soil)	- haplic - humic - luvic - ferric	- on hard limestones - on hard dolomites	- thin, <40 cm - medium thick, 40-70 cm - thick, >70 cm	- loamy - clayey	- slightly skeletal
	Brown soil on hard limestones And dolomites Kalkocambisol	- dystric - eutric - humic - luvic	- on hard limestones - on hard dolomites	- thin, <35 cm - medium thick, 35-50 cm	- loamy - clayey	- slightly skeletal

Great soil group	Types	Subtypes	V a r i e t i e s	Subvarietes	Forms	Phase
LUVISOLS	Luvisol	- dystric - eutric - stagnic - vertic - chromic	- on hard acid rocks and their residual regolith - on hard neutral and basic rocks and their residual regolith - on terciari and diluvial noncalcareous sediments - on colluvial and fluvio glacial non calcareous sediments - on tertiary and dilluvial calcareous sediments - on pyroclastic sediments - on two layers sediments		- sandy - loamy - clayey	
PODZOLS (Brunipodzols)	Podzol	- haplic (typic) - leptic - gleyic	- on hard quartz rocks - on hard acid metamorphic rocks - on hard acid volcanic rocks - on hard neutral volcanic rocks - on glacial and water sediments - on pyroclastic sediments		- sandy - loamy	- slightly skeletal - medium skeletal - strongly skeletal
PLANOSOLS	Planosol	-sedimorphic - dystric - eutric - cambic - luvic - vertisollic - vertic - gleyic	- According to the thickness of the solum to the impermeable horizon	- thin, <25cm - medium thick 25-50 cm - thick, 50-70 cm	- sandy - loamy	

Great soil group	Types	Subtypes	Varieties	Subvarieties	Forms	Phase
GLEYSOLS	Fluvial meadow soil	<ul style="list-style-type: none"> - calcaric - hypocalcic - eutric - salinized - alkalized - on buried soil - covered 	<ul style="list-style-type: none"> - calcareous alluvial deposits - noncalcareous alluvial deposits 	<ul style="list-style-type: none"> - thin, <40 cm - medium thick, 40-80 cm - thick, >80 cm <p>According to the depth of the gleyzation:</p> <ul style="list-style-type: none"> <150 cm - medium deeply gleyzed, 150-200 cm - deeply gleyzed, >200 cm 	<ul style="list-style-type: none"> - sandy - loamy - clayey 	
SOLONCHAK	Solonchak	<ul style="list-style-type: none"> - haplic (typic) - mollic - eutric - calcaric - orthocalcic - hypocalcic - vertic - gleyic - gypsic - gypsic 	<ul style="list-style-type: none"> - According to the salt composition: <ul style="list-style-type: none"> - According to the depth of the salic horizon: 	<ul style="list-style-type: none"> - sulfate - sulfate-soda - soda-chloride - soda-chloride-sulfate - sulfate-soda-chloride <ul style="list-style-type: none"> - salinized on the surface part of the soil, <30 cm - medium deeply salinized 30-80 cm - deeply salinized >80 cm 	<ul style="list-style-type: none"> - sandy - loamy - clayey 	

Great soil group	Types	Subtypes	Varieties	Subvarieties	Forms	Phase
SOLONETZ	Solonetz	<ul style="list-style-type: none"> - haplic (typic) - calcaric - noncalcaric - calcic - humic - leached - luvic - gleyic - solodic - stagnic - salic - salinized - nonsalinized 	<ul style="list-style-type: none"> - According to the salt composition: <ul style="list-style-type: none"> According to the thickness of the A or A + E: 	<ul style="list-style-type: none"> - sulfate - chloride - soda - chloride-soda - soda-sulfate - soda-chloride - chloride-sulfate - sulfate-chloride <ul style="list-style-type: none"> - thin, <7 cm - medium thick, 7-15 cm - thick >15 cm 		
HISTOSOLS	Fibrisol hemisol sapsisol	<ul style="list-style-type: none"> - haplic (typic) - eutric - dystic - hemic - sapric - cumulic - covered 			<ul style="list-style-type: none"> - sandy - loamy - clayey 	

CONCLUSIONS

At the XII Congress of Serbian Soil Science Society, held in Novi Sad in 2009 (Andrevlje on the Mountain Fruška gora) some new elements of Serbian soil classification was done. This new version of soil classification has been brought considerably closer to our earlier suggested principles and division (ANTONOVIC M.G., PROTIĆ J.N., 1997, 1998) and to international soil classification, FAO (2006), WRB (2006) and USA classification in particular. Some changes in Yugoslav soil classification (ŠKORIĆ A., FILIPOVSKI G., ĆIRIĆ M., (1973, 1985) has been done especially in the new Macedonian version (FILIPOVSKI G. 2006) and also in Bosnia and Hercegovina (Resulović H. et al., 2008).

The first part of new Serbian soil classification with great soil group of entisols, fluvisols, molisols, vertisols, anthroposols was presented at XII congress of Serbian soil science society and publishing paper (ANTONOVIC M.G. et al. (2010).

The second part of classification was done in this paper presented the great soil group and lower systematics units for cambisols, luvisols, podzols (bruni podzols), planosols, gleysols, solonetz, solonchaks and hystosols.

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PREDLOG NOVE SRPSKE KLASIFIKACIJE ZEMLJIŠTA

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I z v o d

Na XII Kongresu srpskog društva za proučavanje zemljišta, održanom u Novom Sadu 2009. godine (Andrevlje na Fruškoj gori) saopšteni su neki novi elementi Srpske klasifikacije zemljišta. Nova verzija klasifikacije bliska je međunarodnoj klasifikaciji FAO (2006), WRB (2006) i našim ranijim principima i sugerisanim podelama (ANTONOVIC M.G., PROTIĆ J.N., 1997, 1998).

Promene u ranijoj Jugoslovenskoj klasifikaciji zemljišta (ŠKORIĆ A., FILIPOVSKI G., ĆIRIĆ M. 1973, 1985) posebno su zapažene u novoj verziji Makedonske klasifikacije (FILIPOVSKI G., 2006), kao i u klasifikaciji Bosne i Hercegovine (RESULOVIĆ H. et al., 2008).

Prvi deo nove Srpske klasifikacije zemljišta koji se odnosi na velike grupe zemljišta: entisole, fluvisole, molisole, vertisole, antroposole i tehnosole, prikazan je na XII Kongresu srpskog društva za proučavanje zemljišta, kao i u publikovanom radu ANTONOVIC M.G., et al. (2010).

Drugi deo klasifikacije obrađen je u ovom radu izlaganjem velikih grupa zemljišta i nižih sistematskih jedinica za kambisole, luvisole, podzole (brunipodzole), planosole, glejsole, solonece, solončake i histosole.

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