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**Towards a common humus form classification. A first European approach: few generic top soil references as functional units.**

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Abstract

1. A network of European humus researchers has been founded in 2003, and has compared the various individual systems towards a common classification of humus forms. 2. The first general principles of a common classification have been finalized. 3. Some critical remaining aspects were identified

1. In Europe as well as in North America a multitude of humus taxonomies exists starting

with early approaches in the late 19th century. Due to the variety of sites throughout Europe, different methodological approaches were used, thus resulting in different classification systems. The Canadian (Green et al. 1993) and French (Brêthes et al. 1998) classification systems are frequently used in an international context, but don't cover all site conditions of European forest ecosystems. Basic concepts of most national European classification systems are similar along general lines. Nevertheless there are differences in parameters used for description and classification of humus forms as well as in scaling these parameters. In 2003, 26 European specialists on humus forms met in Trento (Italy) and decided to set up a "European humus research group" in order to study the process of transformation of the top soil and to find some common rules of classification based on a morphogenetic description and diagnostic horizons, adapted to European ecological conditions. The group established three commissions named "Vocabulary", "Classification" and "Diffusion". These groups produced common references. This presentation illustrates the most important steps on this way. In July 2004, the commission Classification met in Vienna (Austria) and drafted a key to the main terrestrial humus forms based on response to environmental conditions and specific biological activities. This draft was presented in Freiburg (Germany) at EUROSIL 2004 (Jabiol et al. 2004) and modified at joint meeting in San Vito (Italy) in 2005 in a well developed taxonomic draft.

2. Protocols for assessment and sampling of ecto- and endorganic layers were set up as well as definitions of specific horizons and the their designation. Taking into account the Canadian (Green et al., 1993) and the French points of view (Brêthes and al. 1998), it has been possible to individuate four main humus forms (Mull, Moder, Mor and Amphi) and various subcategories. Assigning a strong discriminating power to the role of the pedofauna, which above all modifies the OH and A horizons characters and determines the evolution of the top soil in a given ecosystem, one can classify both the humus form and ecosystem functioning. Mull humus forms are developed due to the mixing activity mainly of anecic and endogeic earthworms. In unfavourable ecological conditions for earthworms, Moder humus forms are developed by the litter comminuting activity of microarthropods and enchytraeids. Amphi corresponds to the activity of both animal groups in different vertical niches and, finally, Mor humus forms are found in ecosystems in which soil animal abundance is very low. Some properties are considered as taxonomic differentiae for humus forms: the presence/absence and thickness of diagnostic horizon, type and size of horizons' structure, presence/quantity of roots, woody debris and rock. Finally, the latest version of the classification takes into account also the semi-terrestrial ecosystems mostly based on the Dutch system. Conceived as a dichotomised tree, the first bifurcation of the key separates peat from terrestrial forms. The descriptors for the diagnostic horizons have been conceived in harmony with the revision of FAO/WRB-draft (1998), and will be presented in Philadelphia by Broll et al. under the title "Topsoil characterization and classifications. New developments and chances for links to WRB".

3. In order to supplement the activities of the humus form group, and to facilitate the ongoing developments in a most transparent manner, , a web site has been established in Grenoble (France) in 2004: <http://humusresearchgroup.grenoble.cemagref.fr/>. The now 40 members of the group recruits from 10 European countries (Austria, Belgium, Czech Republic, France, Germany, Italy, Netherlands, Rumania, Sweden, Switzerland). The ongoing activities of the three Commissions are mainly focused to improve the definitions of the Amphi and Litho forms, as well as to more clearly define transitional cases, which have been found especially common in intensively managed ecosystems. The latter mainly concerns intergrades between Amphi – Moder, and Moder - Mor.

Brêthes, A., Brun, J.J., Jabiol, B., Ponge, J.F., Toutain, F., 1998.- Types of humus form in temperate forests. In : A sound reference for soils : the "Référentiel Pédologique". Association Française pour l'Etude du sol, INRA, Paris, pp. 266-282.

Green, R.N., Trowbridge, R.L., Klinka, K., Towards a taxonomic classification of humus forms. Forest Science 3, monograph 29. p 1-49.

Jabiol B., Zanella A., Englisch M., Hager H., Katzensteiner K., de Waals R., 2004 .- Towards an European Classification of Terrestrial Humus Forms. Congrès Eurosoil, Septembre 2004, Freiburg.

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