Towards an European Classification of Terrestrial Humus Forms

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causes: ecological factors and forest stands

biological activities

morphology of humus forms

descriptions
interpretations
classifications
modelisation

variability in time
variability in space

consequences: nutrients cycles, C storage...

sylviculture, sustainable management ...

HUMAN BEING
propo...sition of an European Classification whose aim is not to take the place of national systems
beginning of a common reflexion: an european group, Italia 2004
An harmonization seems to be possible instead of great differences in the lower levels or in the building of classifications because people are interested in several countries because essential basic concepts are similar
classification has to be built from morphological features which reflect specific biological activities.

humus forms are indicator and the result of biological activity.
second concept:

humus forms are dynamic systems in space and time
Space sequences (field observation)
Site conditions are heterogeneous

Time sequences (interpretation)
Modification of site conditions or of the stand
Ex.: forest chronosequence: phases A-B-C-D
An harmonization seems to be possible

because people are interested in several countries

because basic concepts are similar

because national classifications have the same upper level with mull, moder, mor, even if these names have not exactly the same definitions
For ex. : comparison of moder between 5 national classifications

<table>
<thead>
<tr>
<th>FRANCE/ Italie</th>
<th>GERMANY</th>
<th>AUSTRIA</th>
<th>NL</th>
</tr>
</thead>
<tbody>
<tr>
<td>no crumb structure (intermixed OM), no sharp transition 0H/A, (OH present)</td>
<td>H present : Obh/Ah, or Ouh/Ah (Obh friable struct., or loose and structureless), and no Okh horizon nor Osh</td>
<td>no crumb structure with A&gt;2cm, gradual transition</td>
<td>calcicModer</td>
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<tr>
<td>Hémimoder</td>
<td>OH absent</td>
<td></td>
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<tr>
<td>Mullartiger Moder</td>
<td>Mull-like Moder</td>
<td>Xeromullmoder</td>
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<tr>
<td>Obh &lt;0,5 cm, discontinuous</td>
<td>Ahb present, F zoogenous, H&lt;0,5 cm</td>
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</tr>
<tr>
<td>Eumoder</td>
<td>OH&lt;1 cm, sometimes discontinuous</td>
<td>typischer Moder</td>
<td>typcal Moder characteristics ??</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Obh continuous, &gt; 0,5 cm</td>
<td></td>
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<tr>
<td>Dysmoder</td>
<td>OH &lt;4cm</td>
<td>Rhizomoder</td>
<td>Rhizomoder</td>
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<tr>
<td></td>
<td></td>
<td>O with roots (Ouh)</td>
<td>O with roots (Fwf, Hwf)</td>
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</table>
3- propositions 1/

working subgroups

today ———> first approximation
definition of main O and A horizons

Consequence of the first concept: classification has to be built from morphological features which reflect specific biological activities.

For example:

- **EPIGEIC WORMS**
  - and/or arthropods
  - and/or enchytreids
  - not zoogenous:
  - felt or roots:

  - **OHz**
  - **Ohm, OHnoz**
  - **OHr**

- **ANEIC/ENDOGEIC WORMS**: **Az**
  - **Ajz, Aze**

- **not biogenous**: **Ae**
3- propositions 3/

concept of main humus forms

main types are based on presence or absence of main diagnostic horizons
### Actors of Biodegradation, Horizons, and Humus Forms

#### First Level:

<table>
<thead>
<tr>
<th><strong>OH</strong> from</th>
<th><strong>MULL</strong></th>
<th><strong>MODER</strong></th>
<th><strong>MOR</strong></th>
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</tbody>
</table>

#### Second Level:

- **Epigeic Worms** and/or arthropods and/or enchytreids (OHz)
- **Not Zoogenous** (OHm)
- **Anecic/endogeic Worms** (Az)
- **Epigeic Worms** and/or arthropods and/or enchytreids (Ajz, Aze)
- **No Biogenous** (Ae)
3- propositions 5/

**actors of biodegradation, horizons and humus forms**

<table>
<thead>
<tr>
<th>FIRST LEVEL</th>
<th>MULL</th>
<th>MODER</th>
<th>MOR</th>
<th>&quot;AMPHI&quot;</th>
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<tbody>
<tr>
<td><strong>Second level</strong></td>
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<tr>
<td><strong>OH from</strong></td>
<td></td>
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<tr>
<td>Epigeic worms and/or arthropods</td>
<td>OHZ</td>
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<tr>
<td>and/or enchytreids</td>
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<tr>
<td>Not zoogenous</td>
<td>OHm</td>
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<tr>
<td><strong>A from</strong></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Anecic/endogeic worms</td>
<td>Az</td>
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<td></td>
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<td>No biogenous</td>
<td>Ae</td>
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</tbody>
</table>
3- propositions 6/

very active mull

MULL

MODER

typical moder
MOR

AMPHI-form

typical Mor

OL
OF
OH

Ae

OHz

Az
evolutionary lines of four main humus forms
4- a second common level of taxonomy?

based on morphological features?
on chemical characteristics?
5- prospects

a new "humus meeting" next year
to discuss and to focus research projects
towards
- precision of biological functionning, characters and and recognition of diagnostic horizons
- are humus forms in great elevation a new "well" with transitions with the four others main forms ?
- is it possible to propose a common second level of classification ?
- at which level to take into account humic humus forms and chemical characteristics?
- proposition for hydro or xeric forms : can each main form present hydro or xeric conditions ?
- is it possible to define great type of "time sequences" in different site conditions ?