

SANDY PODZOLIZED SOILS FROM « LANDES DE GASCOGNE, FRANCE » REPARTITION AND MAIN CHARACTERISTICS

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In the "Landes de Gascogne" (France) the forest grows on soils which are essentially podzolized and/or hydromorphic soils. The soils are formed in a sedimentary mantle of coarse, quartzose sands with a slight microrelief consisting of low ridges and shallow troughs.

The microrelief governs positions of the watertable with reference to soil profiles and the pathways of soil development are strongly affected by the position of the watertable with reference to the soil surface.

A study of two typical toposequences in the "Landes du Médoc" was performed previously (RIGHI, 1977). It gave the main properties and explained the pedogenesis of the soils of the so called "Lande humide" where the watertable is at shallow depths. Later, the soil survey of the "Landes de Gascogne" revealed an other type of landscape called "Lande sèche" and some transition areas. The purpose of this study was to compare some results obtained in the "Landes du Médoc" to those obtained in two toposequences in the new areas.

One of these sequences is typical for a transition area. It include a small continental sand dune (lande sèche) and a swampy area (lande humide) (fig. 1).

In the previous studies of the soils of the "Landes", a great importance was given to the spodic B horizons but properties of the A₁ horizons are also subjected to quick and important lateral variations.

Characteristics of the surface horizons are different in the "lande sèche" and in the "lande humide". In the "lande sèche" organic matter has a high C/N ratio and is mainly constituted with non-transformed plant remains and humin (Table I and IV). Accumulation of lipids was also observed (Table II and IV). Al and Fe have been leached out of these horizons (fig. 2 and 3). In the surface horizons of the "lande humide", C/N ratio is lower, pyrophosphate extractable organic matter is more abundant and lipids ratio is lower. Leaching out of Fe and Al is less pronounced.

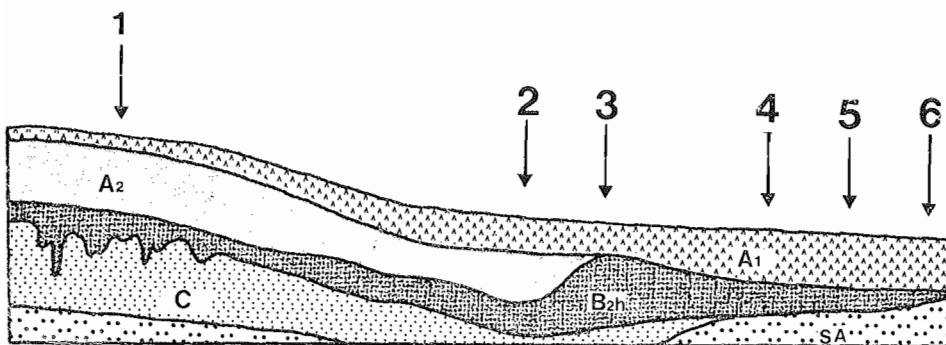


Figure 1 : SYM toposequence from "Lande sèche" to "Lande humide".

1, 2, 3... Location of studied soils.

S.A. Argillic sand.

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Table I : Fractionation of organic matter of the soils of the SYM sequence.
 (1) p. cent of 105°C dry soil.
 (2) p. cent of total carbon (CT).
 MOF : non-transformed plant remains.

| Profils | Horizons | C.T. (1) | C ext. (2) | A.H. (2) | A.F. (2) | AF/AH | MOF (2) | Humine (2) | C/N |
|---------|--------------------------------|-------------|---------------|-------------|-------------|-------|------------|---------------|-----|
| 1 SYM | A ₁ | 2,1 | 17,9 | 15,9 | 2,0 | 0,1 | 53,5 | 28,6 | 58 |
| | B _{2h} | 1,3 | 87,7 | 66,3 | 21,4 | 0,3 | n.d. | n.d. | 29 |
| 2 SYM | A ₁ | 3,6 | 10,2 | 8,9 | 1,3 | 0,1 | 57,8 | 32,0 | 49 |
| | B _{2h} | 0,5 | 80,9 | 52,7 | 28,2 | 0,5 | n.d. | n.d. | 29 |
| 3 SYM | A ₁ | 0,8 | 16,7 | 11,8 | 4,9 | 0,4 | 46,2 | 37,5 | 30 |
| | Bh ₁ | 2,9 | 76,9 | 64,3 | 12,6 | 0,2 | n.d. | n.d. | 26 |
| | Bh ₂ | 1,9 | 83,0 | 62,0 | 21,0 | 0,3 | n.d. | n.d. | 26 |
| | Bh/C | 0,7 | 73,9 | 37,9 | 36,0 | 0,9 | n.d. | n.d. | 30 |
| 4 SYM | A ₁ | 1,8 | 35,9 | 27,7 | 8,2 | 0,3 | 39,7 | 24,4 | 30 |
| | Bh | 1,5 | 79,5 | 43,7 | 35,8 | 0,8 | n.d. | n.d. | 24 |
| | II Bh/C | 0,8 | 68,8 | 22,7 | 46,1 | 2,0 | n.d. | n.d. | 22 |
| 5 SYM | A ₁ | 1,3 | 44,0 | 27,8 | 16,2 | 0,6 | 24,8 | 31,2 | 34 |
| | A ₁ /A ₂ | 0,4 | 48,2 | 34,0 | 14,2 | 0,4 | n.d. | n.d. | 22 |
| | II Bh | 0,6 | 46,7 | 27,5 | 19,2 | 0,7 | 25,0 | 27,4 | 16 |
| | II Bh/C | 0,3 | 25,3 | 5,1 | 20,2 | 4,0 | n.d. | n.d. | 17 |
| 6 SYM | A ₁₁ | 2,4 | 33,3 | 25,4 | 7,9 | 0,3 | 40,4 | 26,3 | 24 |
| | A ₁₂ | 1,4 | 40,3 | 25,6 | 14,7 | 0,6 | n.d. | n.d. | 26 |
| | A/Cg | 1,0 | 59,1 | 29,9 | 29,2 | 1,0 | 21,4 | 19,5 | 23 |
| | II Cg | 0,7 | 52,8 | 13,6 | 39,2 | 2,9 | n.d. | n.d. | 22 |

Table II : Lipids contents in A₁ horizons of the soils of the SYM sequence.

| Echantillons | C des liquides mg/kg de sol | C lipides % C total |
|-----------------------|--------------------------------|---------------------|
| 1 SYM A ₁ | 7 090 | 34 |
| 2 SYM A ₁ | 7 500 | 21 |
| 3 SYM A ₁ | 2 240 | 27 |
| 4 SYM A ₁ | 3 280 | 19 |
| 5 SYM A ₁ | 2 450 | 19 |
| 6 SYM A ₁₁ | 4 200 | 18 |