SCIENCE DU SOL n° 1986/1 - pp. 131-132 - PLAISIR-FRANCE

CALCRETES AND MINERALOGICAL SEQUENCES OF CARBONATES IN SOILS OF WESTERN FRANCE

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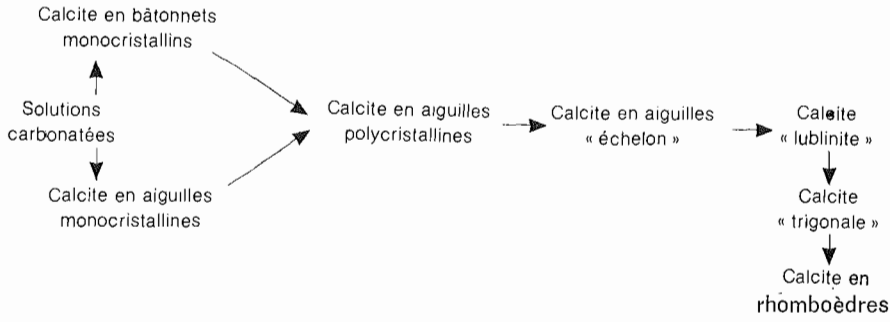
(Science du Sol n° 1984/1)

Calcretes are well developed in soils and weathered rocks of aridic areas according to vertical and lateral sequences which are known.

Their occurence also exits in calcareous areas of moist temperate climates such as western France. So, calcretes develop often in periglacial slope deposits, gravelous and calcareous which constitute good traps for supergene carbonates. Calcretes take place according to a similar scheme to this describe by Ruellan in Morocco. The less differenciated carbonatations are located at the surface of above and in depth downstream. The most differenciated appear at the surface downstream ; moreover, they develop only when the precedents are produced. The true sequences extend verticaly and lateraly along the slope.

The mineralogical schedule of the various carbonate horizons (Bca) shows that carbonatation is made with a complex mineralogy controled by calcite needles. In the A horizons, fibrous aragonite crystals appear near calcite rhomboedrons (fig. 6). Thus crystal associations agree with the various Bca horizons. Qualitatively and, it seems, quantitatively, they are arranged according to a mineralogical sequence where aragonite would be the first stage :

Other studies made on calcretes developed under calcareous pebbles show that crystallites are arranged according to a continuous sequence in which every morphological type succeeds to the anterior by successive crystalline growths and transformations.



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In fact, this sequence is still complex because observations graded during the year indicate in Winter the presence of amorphous calcium carbonate with "disordered" calcite and calcite, and in Summer, the presence of monohydrocalcite, aragonite and calcite.

Now, it has been proved by experimentation that these two mineralogical associations are in fact mineralogical sequences controled by specific organic substances present in the soils.

Two evolutive sequences would exist : they would be control by ecological factors and their mineralogical associations would be bound to kinetics of carbonate transformations.