CONCORSO PUBBLICO, PER ESAMI, A N. 1 POSTO DI CATEGORIA D, POSIZIONE ECONOMICA D1, AREA TECNICA, TECNICO-SCIENTIFICA ED ELABORAZIONE DATI, PER LE ESIGENZE DEL CENTRO DI RICERCA INTERDIPARTIMENTALE SULLA "EARTH CRITICAL ZONE" PER IL SUPPORTO ALLA GESTIONE DEL PAESAGGIO E DELL'AGROAMBIENTE (C.R.I.S.P.) DELL'UNIVERSITÀ DEGLI STUDI DI NAPOLI FEDERICO II (COD. RIF. 2015), INDETTO CON DECRETO DEL DIRETTORE GENERALE N. 468 DEL 09.07.2020.

QUESTI <u>ESTRATTI</u> ALLA PROVA ORALE DEL 7.10.2020 SUDDIVISI PER ARGOMENTO

A) PROCEDURE PER LA COSTRUZIONE E ALLESTIMENTO DI SISTEMI WEBGIS OPEN SOURCE PER IL SUOLO E PER IL PAESAGGIO AGRARIO, CHE INCLUDANO APPLICAZIONI QUALI GEOSERVER, QGIS ARCGIS, ECOGNITION, OLTRE ALLE APPLICAZIONI INFORMATICHE PIÙ DIFFUSE, CON PARTICOLARE RIFERIMENTO AI SOFTWARE APPLICATIVI DELLA SUITE MS OFFICE (WORD, EXCEL, POWERPOINT) E DEI SISTEMI OPERATIVI WINDOWS

Il candidato descriva le procedure geoinformatiche per l'allestimento di un WEBGIS per l'analisi dell'erosione del suolo

B) POTENZIALITÀ E LIMITI DEI SISTEMI GEOSPAZIALI WEB DI SUPPORTO ALLE DECISIONI PER IL SUOLO, PER IL PAESAGGIO AGRARIO E PER L'AGROAMBIENTE

Il candidato analizzi le problematiche sottese nell'adozione dei sistemi geospaziali web di supporto alle decisioni per la gestione dei sistemi agrari

C) IMPORTANZA DEL SUOLO, DELLE CONOSCENZE DI PEDOLOGIA APPLICATA E DELL'EARTH CRITICAL ZONE PER LA GESTIONE DELLE PROBLEMATICHE AGROAMBIENTALI

Il candidato descriva il ruolo del suolo nell'adattamento ai cambiamenti climatici

D) PROCESSAMENTO GIS ED ELABORAZIONE IMMAGINI DA SATELLITE

Il candidato descriva le procedure GIS per intersecare informazioni di carte tematiche differenti (in formato vettoriale e raster)

Per ordine del Presidente della Commissione
Il Segretario
F.to dott.ssa Claudia Chiantese

or more successive pedogenic processes, (ii) soil sediments, i.e., mainly colluvial deposits, originating from erosion of older soils, and containing micromorphological evidences of former soil formation, mostly as fragmented pedofeatures, and (iii) buried soils, i.e., soils, sometimes partly truncated, covered by a more recent geological body, mostly a sediment or colluvium. As almost all natural soils are more or less polygenetic, they will be treated here together in Section 2, whereas soil sediments and buried soils will be separately discussed in Section 3.

In the reviewed papers information on the profiles, their characteristics (field and laboratory analyses) and exact location is often absent even as their classification (Soil series in the Belgian Soil Classification System are identified by three major characteristics of the soil profile: soil texture, natural drainage class and degree of profile development) or (often National) classification systems are used. In order to harmonize terminology, where possible, the soil horizon symbols are indicated according to the FAO Guidelines (FAO, 2006); the soils are classified according to WRB 2015 (IUSS Working Group WRB, 2015).

Thin section sizes are not indicated in most of the reviewed papers. Based on our experience, it can be said that in case of relatively old research, petrographic size thin sections (48 × 28 mm) were the most used format, for more recent research also mammoth, semi-mammoth or quarter mammoth (respectively 180 × 120, 120 × 90 and 90 × 60 mm) thin sections were used.

Illustration of the discussed soils had to be restricted to thin sections still present in the collection of the Department of Geology at the Ghent University, and focus on less common typical features.

2. Soils along a transect from the coast to the Ardennes

2.1. Introduction

Almost all Belgian soils formed in the Quaternary and mainly Last Glacial (Weichselian) cover sediments, evolving from relatively sandy in the north to loessic materials in the centre and the south, where they are mixed with weathering products of the underlying sediments and rocks. Other, more specific parent materials are dune sands and Polder clays in the coastal area, Polder sediments in the estuary of the river Scheldt, alluvial materials in valleys where locally peaty soils formed and colluvial deposits associated to erosion on agricultural land (Fig. 1).

2.2. The coastal region

The coastal region consists of a narrow strip of sand dunes, protecting the low lying, clayey Polder from the sea.

2.2.1. Recent sand dunes

Soil formation in the stabilised sand dunes under forest was studied by Ampe (1999) and Ampe and Langohr (2003). Thirty-three profiles, mainly Arenosols, were studied micromorphologically (57 thin sections, 90 × 60 mm), focussing on the humus forms, the mineralogy (primary and secondary calcium carbonate) and the initial pedogenic processes such as podzolization and oxido-reduction. The subsoil of these AC profiles shows a coarse monic c/f related distribution pattern, the coarse material mainly consisting of well sorted rounded quartz grains (200–290 µm), and a few glauconite grains. In the subsurface layers, grains of micrite (120–290 µm) and shell fragments are observed (Fig. 2a and b). The A horizon has an enaulic c/f related distribution pattern in depressions, and a coarse monic one on slopes. Under deciduous vegetation an L-F-H + E horizon sequence containing rather fresh organic remains, is observed in thin sections; the L and F horizons of the very thin moder humus form are composed of loosely packed slightly to moderately decomposed organic remains. Under coniferous vegetation they are rather fresh (Fig. 2c). Roots are rare in the A horizon, and the occurrence of hyphae is very limited (Fig. 2d). Excrements of mites, enchytraied/collembola and isopoda/diplopoda/dipteral occur, but generally not altogether. Earthworms are almost absent, and therefore also a crumb microstructure is seldom observed. The microstructure is mainly single grain to intergrain micro-aggregate.

2.2.2. Polder soils

Soils of the Polder area formed on more or less thick layers of clayey material, overlying Holocene peat resting on a Last Glacial sandy substrate. The soil parent material is often quite complex as a result of historical flooding and human activities. Moreover, in large areas the peat layers were partially mined for combustion during the Roman Period and the Middle Ages. Only few profiles were studied applying micromorphological techniques in this area (Becze-Deák, 1993).

The cambic B horizon of a representative profile on Polder clay near Damme (Brugge) has a channel microstructure with a porosity of about 15%. The coarse material is composed mainly of angular to subangular grains of quartz with small quantities of calcite, even as shell fragments, and fresh glauconite; the fine material has a calcitic crystallitic b-fabric and the c/f related distribution pattern is close porphyric. Reddish brown dusty clay coatings and infillings, sometimes laminated, are observed in about 30% of the channels. They are considered as the result of human activity, related to soil management. Iron oxides hypocoatings surrounding few channels, and few impregnative iron oxide nodules, point to redox processes, evidencing a gley morphology. Sparitic calcite nodules of unknown origin are observed.

2.3. The sandy region in northern Flanders and Hainaut

In the north-eastern part of the country soils are mainly developed on sandy deposits of either Last Glacial age (Pleniglacial and Late Glacial cover sands) or Holocene age (human induced drift sands). The Pleniglacial cover sands are the sandy facies of the loess cover and may contain some silt (less than 10%) and some clay (less than 5%). The late Glacial cover sands, mainly resulting from the aeolian erosion/sedimentation of soils developed in the Pleniglacial sands, are sandier whereas the Holocene drift sands are mostly devoid of silt and clay. All these sediments contain variable additions of weathering products from the decomposition of the Cainozoic substrate.

The only micromorphological studies available on soils of this sandy region in Flanders deal with the so called “Flemish Valley” (Younes, 1966) and archaeological excavations in Gent (Pieters, 1986). Because of the incomplete, outdated descriptions in the study of the “Flemish Valley”, only a rough sketch can be given. In all profiles the coarse material is dominant and consists mainly of quartz with some rock fragments and varying quantities of glauconite. Even within the same profile the glauconite content can vary irregularly, pointing to a variable influence of the Cainozoic substrate. In the Ap horizon fine material consists mainly of a mixture of clay and fine organic material. In the B horizons fine, strongly oriented clay coatings and bridges are frequently observed on free grains of coarse material. In Podzols these coatings are covered by younger organic material. Iron oxide nodules are observed in all studied soils.

In a pedo-archaeological study in Gent, Pieters (1986) described in the sandy material a spodic horizon with a chitonic c/f related distribution pattern with monomorphic coatings in the upper part, and clay coatings in the lower part, till the underlying silty layer. The clay coatings are yellowish, non-laminated, and fit with the requirements for an argic horizon. In the upper part of this horizon dusty coatings occur, probably pointing to human activities. The illuviation band passes through Late Glacial stratified materials and crosses the fill of a man-made ditch.

de Roubaix (1966) described several soil profiles in the sandy area of the Province of Hainaut. The coarse material is throughout the profile dominated by quartz with some feldspars and glauconite grains. The fine material apart from that in the pedofeatures, is limited to interstitial greyish clay in some more clayey bands, resulting locally in a close porphyric c/f related distribution pattern, whereas the overall