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The geological-geomorphological setting and the pedostratigraphic analysis of the sediment at Isera La Torretta (TN)

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ABSTRACT - Author describes the results of the pedostratigraphic features concerning the site of Isera "La Torretta" (Trento). Considerations concerning morphogenetic processes are also included.

Key words: Trentino, Valle dell'Adige, Neolitic, Geomorphology, Pedostratigraphy
Parole chiave: Trentino, Valle dell'Adige, Neolitico, Geomorfologia, Pedostratigrafia

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1. A GEOLOGICAL-GEOMORPHOLOGICAL OUTLINE

"La Torretta" hill (246.9m a.s.l.) at Isera, near Rovereto (TN) stands about 70m above the Adige valley bottom, on the right side of the River Adige and is part of a wide terrace composed of sedimentary deposits and basaltic vulcanites of the Tertiary (Fig.1). In this stretch of land, the wide alluvial valley bottom of the River Adige develops in a NE-SW direction and is delimited by the calcareous ridge of Mount Stivo-Cima Verde to the West, and by Mount Zugna Torta (1257m a.s.l.), to the Est.

2. PEDOSTRATIGRAPHIC DESCRIPTION

The descriptions were made following SANESI (1977); the colours were codified according to the *Munsell Soil Color Chart*. The symbols used to define the horizons are in accordance with the criteria of the *Soil Taxonomy*. In the pedostratigraphic scheme (Fig.2), section 6 was included in section 7; the ratio between the US was observed but not the relative depths.

Section n°1 (E-W direction, North side)

- 1Bwb (US103) from -2.20 to -2.45m: sandy, 7.5YR4/4 (*brown*), minute skeleton, angular, sparse; fine lumpy aggregate, moderately evident; friable (humid), very low effervescent in diluted HCI, very fine pores common; small roots common; coating of 10 YR 2/2 colour (*very dark brown*) organic matters common. Clear-cut linear lower end.
- 2Cckb (US102) from -2.45 to -2.90 m: sandy, 10YR4/4 (*dark yellowish brown*), medium and course skeleton, angular and rounded, frequent, course subangular polyhedral structure, faintly evident, not very hard (dry), high effervescence in HCI, fine pores common; small roots common.

Section n°6 (N-S direction, West side):

- 1Ab (US41) from -2.30 to -2.60m: sandy, 10YR3/1 (*very dark grey*), abundant skeleton, mediocre and sometimes course. Clear, linear upper end common, minute and mediocre skel-

eton, rounded and angular, consisting in pebbles and basaltic clasts, fine lumpy structure, faintly evident; resistant (humid), faint effervescence in HCl, pores common, fine and medium; many fine herbaceous roots; clear cut irregular lower end with US42 that continues with a clear cut irregular end onto:

- 2Ab (top of US43) from -2.10 to -2.25 m: sandy, 10YR3/1 (*very dark grey*), frequent skeleton, rounded and angular, fine sub-angular polyhedral aggregate, faintly evident, friable (humid), faint effervescence in diluted HCl, fine and medium pores common; fine roots, many; clay coatings and organic substances common; gradual linear lower end with:
- 2Btb (bottom of US43): from -2.25 to -2.80m: sandy, 10YR3/3 (*dark brown*); scarce skeleton, rounded, fine sub-angular polyhedral aggregate, moderately evident; resistant (humid), no effervescence in diluted HCl, fine and medium pores common; many medium and fine roots, clay coatings and organic substance common, abrupt, linear lower end.

Section n° 7 (N-S, NNE-SSW direction, East side).

- 3Bwb (US103) from -3.35 to -3.55m: sandy, 7.5YR4/4 (*brown*), minute, sparse angular skeleton; fine sub-angular polyhedral aggregate, moderately evident, friable (humid), no effervescence in diluted HCl, very fine pores common, small roots common, coatings of organic matters common colour 10YR2/2 (*very dark brown*). Clear linear lower end.
- 4Bwb (top of US102) from -2.00 to -2.65m: sandy, 2.5YR4/4 (*dusky red*), medium and course skeleton, angular and rounded, frequent, medium sub-angular polyhedral structure, moderately evident, friable (humid), no effervescence in diluted HCl, fine pores common; small roots common. Linear, gradual lower end onto:
- 4Cckb (bottom of US102) from -2.65 to -3.20 m: sandy, 10YR4/4 (*dark yellowish brown*), medium and course skeleton, angular and rounded, frequent, course lamellar structure moderately evident, not very hard (dry), considerable effervescence in diluted HCl, fine pores common; small roots common.

South Section:

- Ab (top US103) from -3.60 to -3.90m, sandy, 10YR4/3 (*brown*), undulated clear upper end represents the surface setting on which the archaeological deposit stands. Minute, angular, sparse skeleton, mainly basaltic, presence of concotto (about 2%), fine lumpy aggregate, moderated, weak effervescence in diluted HCl, very fine pores common; small roots common; coatings common with organic matters 10YR2/2 (*very dark brown*), not very humid, gradual, linear end onto:
- Bwcb (top US103) from -3.90 to -4.60m, sandy, 7.5YR4/4 (*brown*), minute and medium skeleton, sub-angular, sparse; fine sub-angular polyhedral aggregate, moderately evident, friable (humid), weak effervescence in diluted HCl, very fine pores common, small roots common, coatings common with organic matters in colour 10YR2/2 (*very dark brown*). Clear linear lower end marked by a *stone line*, onto:
- Bwcb (top US103) from -3.90 to -4.60m, sandy, 7.5YR4/4 (*brown*), minute and medium skeleton, sub-angular, common, fine sub-angular polyhedral aggregate, moderately evident, friable (humid), no effervescence in diluted HCl, very fine pores common, very small roots common.

3. MORPHOGENETIC PROCESSES

The Neolithic-Eneolithic sequence (Pedrotti, 1996), develops in a narrow depression on the southern slope of "La Torretta" Hill (Fig.2). On the basaltic substratum, sloping towards South at 30°, lies a heterogeneous glacial deposit with abundant carbonatic fracture, subsequently re-elaborated by gravity processes. At the top of this the stratum changes and is characterised by a reddish sandy horizon, leached by the carbonates without accumulations of alluvial clay. The evolution of the forest ground is interrupted by erosion followed by colluvial phases, mainly sandy and is also enriched with iron oxides. The anthropic impact is probably the main cause of the degradation of the slope, documented in the lower paleo-peat-bog as far back as the Early Atlantic (Calderoni *et al*, 1996). The succession is interrupted by the levelled surface relative to the first phase of anthropic settlement in the Late Neolithic (Isera 1, 4500-4300 BC). When the terrace was abandoned, the colluvial sandy organic deposits and other anthropogenic material probably from further uphill restored the slope. The evolution of this ground with a high concentration of alluvial clay confirms the deposition hiatus between the later phase of the Late Neolithic (Isera 2, 4200-3800 BC) and the following Tardoneolithic phase of terracing.

The series is cut off uphill by another terrace and is obliterated downhill by artificial ma-

terials, clino-layered, moderately gradual, delimited by "stone lines" and abrupt changes of texture. The reconstruction phase of the Tardoneolithic (Isera 3 and 4, 3800-3600/3600-3500 BC) is followed by the Eneolithic one (Isera 5, 3300-2700/2400 BC) with dwelling levels referring to various supporting structures. The overall geopedological evaluation of the deposit proves that the Neolithic occupation of the site "La Torretta" came about in a dryer climate than at present on a slope that is predominantly covered by vegetation, correlated to a general phase of bio-stasis relative to the *Optimum* climatic of the Holocene, already found in other contemporaneous sites of Northern Italy (Cremaschi, 1990; Coltorti & Dal Rì, 1985)

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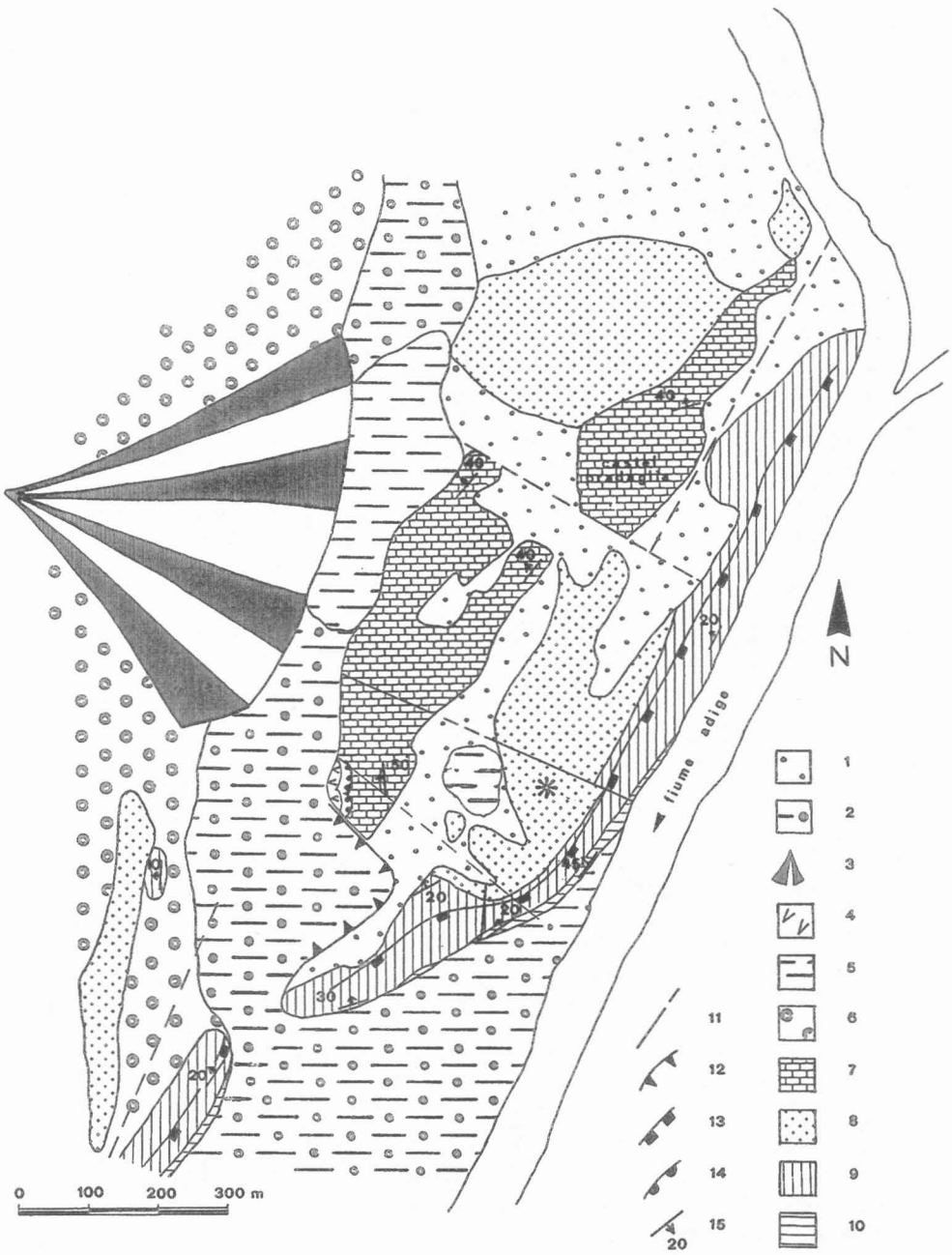

Fig. 1 - Geological-geomorphological map. 1) Silt and colluvial deposits. 2) Alluvial deposits (Holocene) 3) Deposit of the alluvial cone. 4) Accumulation of blocks and debris from landslides. 5)Lacustrine and swamp deposits. 6) Morainal deposits. 7) Nago limestone (Middle-Upper Eocene). 8) Basaltic vulcanites (Lower-Middle Eocene). 9) Limestones of the Lower-Middle Eocene (Chiusole limestone, Malcesine limestone). 10) Scaglia Rossa (Upper Cretaceous). 11) Faults. 12) Erosion escarpment. 13) Edge of a terrace. 14) Niche of a landslide. 15) Positions.

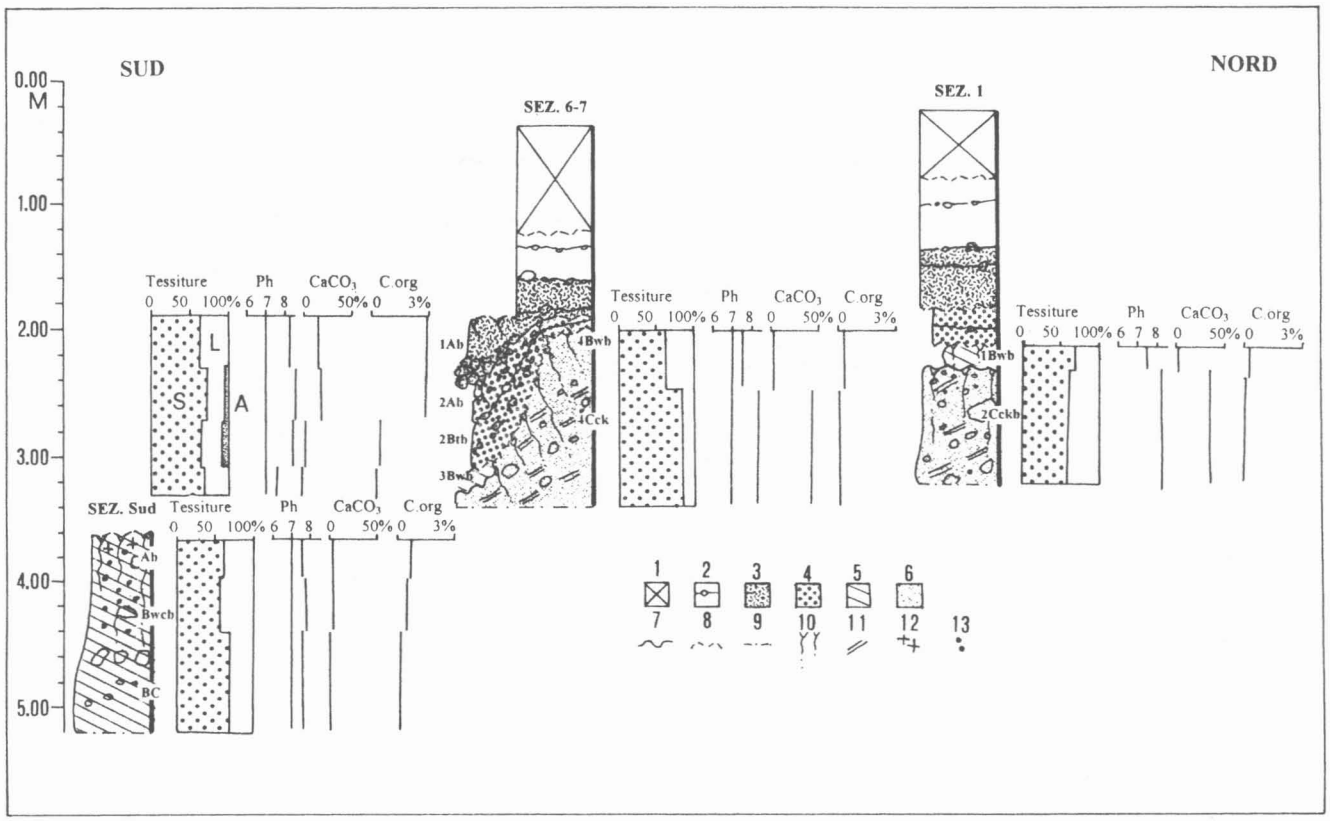

Fig. 2 - Pedostratigraphic outline of surveyed sections. 1) Reworked deposit. 2) Eneolithic sequence (Isera 5, 3300-2700/2400 BC). 3) Tardoneolithic sequence (Isera 3 and 4, 3800-3600/3600-3500 BC). 4) Late Neolithic sequence (Isera 1 and 2, 4500-4300/4200-3800 BC). 5) Colluvial unit. 6) Substrata with ground change on top. 7) Erosion surface. 8) Interface arrangement. 9) Limits of depth of the sections. 10) Pedogenesis. 11) CaCO3Lens. 12) Charcoal. 13) Concotto.