

GEOMORPHOLOGICAL AND PEDOLOGICAL ASPECTS OF EPIMETAMORPHIC BASIC INTRUSIVE ROCKS NEAR LAVRAS , MINAS GERAIS, BRAZIL

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Epimetamorphic basic intrusive rocks of Precambrian age associated with the Lavras Complex occur in the region of Lavras, Minas Gerais, Brazil (CAVALCANTE et al., 1979). This work deals with the morphological, chemical, physical and mineralogical characteristics of the soil cover that has developed upon these intrusive rocks.

According to CAVALCANTE et al. (1979), the "metabasics" of the area are represented by ophitic epimetamorphic gabbros consisting of labradorite in a matrix of augite. The rock has an ophitic texture, and the labradorite with albite twinning is sometimes saussuritized. Green uralite is seen at the edges of the augite, and the other accessory minerals are opaques, red biotite, apatite, and some quartz. The host rock is a leucocratic gneiss of the Lavras Complex.

The soil cover was studied in trenches two to three meters deep (Fig. 1). Pedological analysis has shown that at points 1 and 2 the soils have latosolic characteristics (ROCHA, 1982), that is, they comprise material with high porosity and permeability, with a Munsell color of dark reddish brown (2.5 YR 3/4); soil structure is typically microgranular and friable, with clay content more than 70%. The material is much weathered, predominantly positively charged as a result of the high content of gibbsite in the clay fraction; there is also some kaolinite. In the sand fraction, light minerals (70 to 80%) predominate, followed by heavy minerals (10 to 20%), and finally by magnetic minerals (5 to 10%).

At point 3 (Fig. 1), the soil is podzolic (CAMARGO et al., 1987), red in color (2,5 YR 4/8 - Munsell notation), with well-developed prismatic structure, with little porosity, and clay content less than 50%. The soil here is not as thick as at points 1 and 2 and has a C horizon at a depth of 1.5 m.

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Kaolinite predominates in the clay fraction, while illite and vermiculite also occur. In the sand fraction, light minerals predominate (90 to 95%) followed by heavy minerals (5 to 9%), with minor amounts of magnetic minerals.

The pedological cover over the gabbro is somewhat different from the weathered mantle developed upon the gneiss. Geomorphologically, the soils developed from the basic rock sustaining the top of the studied hill. Their high permeability, resulting from the microgranular structure, inhibits erosive processes because rain water penetrates vertically in the soils. On the other hand, the soils from the gneiss are more susceptible to erosion because they have low structural permeability, and are preferentially located in the portions of more accentuated relief in the study area.

The morphological, physical, chemical and mineralogical data reveal the existence of a direct geologic control on the characteristics of this soil cover, in disagreement with the general idea of a predominance of transport and reworking processes of alteration products in tropical soils, as advocated by OLLIER (1959) and QUEIROZ NETO (1976).

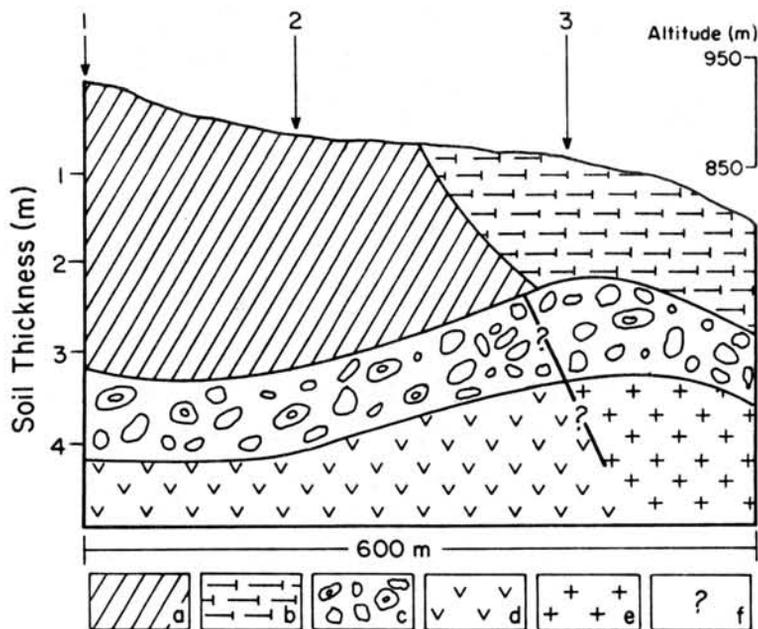


Figure 1 - Highly Schematic profile showing the relations between the pedological covers and the lithologies of the area. Legend: A - Latosolic cover; B - Podzolic cover; C - Weathered rock (C-horizon); D - Epimetamorphic gabbro; E - Leucocratic gneiss; F - Inferred geologic contact. Numbers refer to trenches studied.

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