Origin of Grooving in the Alkaline rocks at the Itatiaia Massif, Rio de Janeiro, Brazil

[1]PIRES, F.R.M. AND [2]MIANO, S.C.; [1]Degeo/UFRJ, Rio de Janeiro, RJ, Brazil; [2]Programa de Geoquímica/UFF, Níterói, RJ, Brazil.

The spectacular landscape at Itatiaia massif, particularly in the Agulhas Negras peak and Prateleiras range, which presents breathtaking sensation in the visitors brings an intriguing aspect related to the origin of the grooves. Several investigators have paid attention to that microgeomorphic feature. Grooves constitutes numerous, vertical and parallel microchannels or flutes ("caneluras"), about 5 cm wide by 3-4 cm deep separated by sharp cusps built in surface of the unweathered alkaline rocks. Frequently the surface of the naked rock is almost totally grooved. Apparently the grooves form at the Horton "belt of no erosion", being completely absent in the lower domains of the Itatiaia Complex. Some blocks and boulders accumulated in hillslopes show the grooves in different angular disposition, diverting from the original and vertical position.

A careful analysis on the position of the grooves in the in situ exposures of alkaline rocks revealed that they are restricted to the east-west faces of the mountain hillslopes, being completely absent on the north-south faces of the rocks. As the Agulhas Negras peak system is aligned along the northwest-southeast direction the grooves are fully exposed, but wherever north-south faces can be seen, smooth surfaces are depicted. Nevertheless, what does control this pattern? A conspicuous, close spaced, east-west fracture system, which crosscuts the whole massif apparently, is the correct answer to that question.