LAVA FLOW TYPES AND THEIR CORRELATION WITH THE MASS MOVEMENT EVENTS OF THE SERRA GERAL GROUP IN SERRANA REGION, SC

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ABSTRACT: The Serra Geral Group, component of Paraná-Etendeka Igneous Province, is a thick sequence of lava flows which presents great exposures at Santa Catarina state. In Serrana area, their exposures are composed by basaltic lava flows and acidic volcanic rocks. The lava flows are classified as rubbly pahoehoe and simple or compound pahoehoe according to the morphological parameters and preserved features and occur predominantly in outcrops along the roads and quarries of the area. The distinction between the lava flows types is mainly made by surface features and internal zonation. The simple pahoehoe lava flows present upper crust with uniform vesicles, dense core and lower crust with elongated vesicles. Occasionally it is possible to identify small flow lobes, featuring compound pahoehoe. Features like vesicles sheets and cylinders sheets are also found. Meanwhile, the rubbly pahoehoe flows show a brecciated upper crust, dense core and lower crust with elongated vesicles like the pahoehoe type. It is well known that lithologic composition of the lava flows and their structural control represent geological features that associated with other geomorphological and climate-hydrological features – besides the anthropic influence –, may ensure instability and the consequent deflagration of mass movements. Therefore, the mapping of lava flow types in the area and the pointing of the mass movement events recently occurred allows the correlation between the different morphologies of the lava flows and the occurrence of landslides and rock falls. Profiles were developed along the roads of the entire analyzed area, with the objective of identifying the types of lava flows and their structural characteristics, as well as visits to points of occurrence of mass movement events. It has been observed that the landslides often occur among the contacts of the lava flows, with the same morphology or not, with the predominance of sliding in the contact between rubbly pahoehoe flows or along the contact between these and the overlapping acid rocks. Moreover, the rock falls are mostly associated with irregular fracturing in dense cores. Another important point is that the orientation of the contact plans between the flows is not taken into account when opening the roads. The relationship between the contact planes and the orientation of the road is important in determining the stability of the slope. In cases where this relationship can facilitate sliding, the retaining structures must be carried out together with the construction of the road. It was also found that this procedure is not performed. The survey of these data enables the elaboration of a lava flow type map for the region and the correlation between the flows structure and the occurrence of mass movements.

KEYWORDS: SERRA GERAL GROUP, LAVA FLOW TYPES, MASS MOVEMENTS