



Stratigraphic and sedimentological study of relevant lahar deposits of La Lumbre ravine, Colima volcano (Mexico): preliminary results.

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Volcán de Colima is the most active volcano of Mexico with more than fifty eruptions documented in the last four centuries. The great amount of pyroclastic material deposited in the volcano slopes represents a perfect source for an intense lahar activity. Despite the intense volcanic activity with production of explosive eruptions and pyroclastic flows, lahars are greatly the most dangerous phenomena at Volcán de Colima. Pyroclastic flows did not reach long distances, generally less than 5 km from the crater. In contrast, lahars travel long distances, up to 10 km, causing damage to infrastructure and being able to affect populated areas. For this reason in the last 100 years more than 350 people died for lahars in the Colima Volcanic Complex and only 8 lost their lives for pyroclastic flows in 1913 plinian eruption.

“La Lumbre” ravine is a very important morphological feature in the western-southwestern sector of the volcano, there, it gathers the main drainage system and collects water from “El Playon”, a wide intra-caldera basin delimited by the Volcán de Colima to the south and the “Paleofuego” caldera rim to the north. This ravine produced huge lahars such as the 1906 lahar which killed almost 325 people, or the lahars associated with the great 1913 eruption, other associated with the 1990-91 volcanic crisis, and is still very active, continuously remobilizing the 1998-99 pyroclastic flow deposits. In 2002 near the confluence between “La Lumbre” and “El Zarco” Ravine, a house was destroyed fortunately with no danger for people.

In order to perform future accurate lahar numerical simulation and obtain reliable hazard study along this ravine, is very important to reconstruct the complex stratigraphy and understand which of such important deposits is related with the 1906, 1913 or 1991 eruptive crisis. For this reason we are performing a detailed stratigraphic study of the lahars sequence. We selected the best outcrops at different distances from the crater. In each site we obtained vertical granulometric sections in order to point out the presence of granulometric structures. Each unit was studied in order to obtain the total granulometric distribution at different depths, and of each sample we performed component analysis and clast shape study.

Preliminary results point out the presence of almost three important lahar units that can be well followed along the ravine. All the studied deposits are related with no-cohesive lahars. The important thickness, the very coarse granulometry and the presence of abundant juvenile clasts, suggest that they are related with important volcanic crisis.