Croscat Volcano may have been the last volcanic eruption in Spain 13,000 years ago

July 23 2012

The volcanic region of La Garrotxa, with some forty volcanic cones and some twenty lava flows, is considered to be the best conserved region in the Iberian Peninsula. It is also the youngest volcanic area. Although the approximate age of some of these volcanic constructions is known, one of the main problems when studying volcanoes is to pinpoint the chronology of each of their eruptions. Several geochronological studies have been conducted, but existing data is scarce and imprecise. With regard to the chronology of the Croscat Volcano, considered one of the most recent volcanic constructions, the latest dating was obtained with the technique of thermoluminescence conducted in the 1980s.

A group of scientists from the Universitat Autònoma de Barcelona, the University of Girona and the Catalan Institute of Human Palaeoecology and Social Evolution (IPHES), together with researchers from the Garrotxa Volcanoes Natural Park and the environmental sector firms Axial Geologia i Medi Ambient and Tosca, developed a programme to locate chronologically the final moment of volcanic eruptions in the region.

Researchers recently published the first results in an article in the journal *Geologica Acta*. The first volcano they worked on was the Croscat Volcano. Soil dating was carried out using the C-14 dating method - very precise and easy to conduct in many laboratories - with the organic material found on the surface of the earth right before the moment of eruption.

"The general idea is based on the hypothesis that if scientists could date the palaeosoil found right below the lava clay ejected by the volcano, they would have the dating of the moment before the eruption" explains Maria Saña, researcher at the UAB Department of Prehistory.

Scientists perforated the clay found in the region of Pla del Torn, a few metres to the northeast of the volcanic cone. Two tests were carried out, at 12 and 15 metres deep, which reached the base of the clay layer and the surface of the palaeosoil.

Pollinic analysis was conducted with the samples obtained from the surface of this pre-volcano level. This aided scientists in learning about the vegetation of the area in the moment before the Croscat Volcano erupted. Several 14C analyses were later made to determine the organic material contained in the samples.

The palynological analysis of the soil at the time of eruption, conducted by IPHES, revealed that the landscape of La Garrotxa was quite open, with Mediterranean meadows and steppes cotaining gramineae, asteraceae and artemisia. Oaks and holm oaks were also discovered, which indicates that temperatures were mild, a symptom of the beginning of the thawing period following the last Ice Age. The presence of riverside trees (elms, alders and willows), as well as aquatic herbs and plants (cyperaceae, bulrush, alisma, etc.) are proof that during that period there was also an increase in rainfalls.

Dating has shown that the age of the upper part of the soil dates back approximately between 13,270 and 13,040 years and that immediately after that moment the eruption of the Croscat Volcano took place.

Provided by Universitat Autonoma de Barcelona