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IVth AIGeo Young Geomorphologists' Stage "High mountain landscape and climate change". Analysis of the deglaciation history in an Italy-Switzerland cross-border area: the Val Viola (Upper Valtellina-Poschiavo Valley)

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The stage, financially supported by AIGeo, by Swiss Geomorphological Society (SGmG), by Dep. of Theoretical and Applied Sciences of Insubria University and by Dep. Earth Sciences of Milan University, was addressed to Young Geomorphologists (YGms) and the main topic of the IV[th] edition was to investigate the deglaciation history of the Val Viola Pass (VVP), This area is located at the border between Italy (Upper Valtellina) and Switzerland (Poschiavo Valley). The position of the study area favoured the participation of Swiss YGms, thus permitting a fruitful exchange of ideas on this specific research topic. The fieldtrip took place between the 29[th] and 31[st] July 2016. On 1[st] August a workshop was organized in Bormio (Upper Valtellina) to compare data collected on the field by the different working groups and to plan further data elaborations and a second round of field campaign (organized in September and October 2016), for refining and widening our dataset. According to the specific sub-aims of the stage, different methodologies were applied in the field by YGms; the participants were subdivided into groups and supervised by senior researchers. The first activity regarded the design of a detailed geomorphological map of the study area (Figure 1a). During the field survey and the drawing up of a legend to be applied for landforms representation, the comparison between Italian (ISPRA, 1994; 2007) and Swiss legend systems was fundamental. A preliminary version of the geomorphological map, covering a surface of 3,7 kmq and a range of altitudes comprised between 2300 and 3300 m a.s.l., at a finer scale respect to previous ones (Pozzi et al., 1990), is ready. The second focus was the large Paradisin rock glacier (Figure 2a) located on the Swiss side of the VVP, which was investigated by means of electrical resistivity tomography

(ERT) (Figure 2b). This activity led to the elaboration of two ERT profiles allowing the prospecting of the deep structure and stratigraphy. Moreover, on both the rock glacier debris and on many exposed rocky surfaces all around the VVP, Schmidt hammer measurements (Figure 2c) were carried out and elaborated in order to establish the surface weathering degree and subsequent exposure-age dating, which is a chronological proxy-data for deglaciation age. Direction of glacial palaeoflow indicators (*striae*) were also measured in the VVP area. Moreover, six soil profiles (Figure 1b), developed after the deglaciation, were described in the field, laboratory analyses on collected samples are in progress and two Peat bog deposits were dated with AMS radiocarbon dating. During the different phases, to accurately interpret field results, data on climate variations were collected from Swiss and Italian meteorological stations and analyzed to observe climatic conditions of the VVP. Information about the glaciers history were sought from glaciers inventories, glaciological surveys, historical maps and aerial photos. Interdisciplinary approaches, involving difference skills can be considered important in the framework of the evolution of high mountain environment in response to climate change.

Figure 1 - Geomorphological mapping performed using symbols deriving from the comparison between Italian and Swiss legend systems (a) and soil profiles description (b) carried out during the stage.

Figure 2 - The Paradisin rock glacier (a), on the Swiss side of the Val Viola (Poschiavo Valley) that has been investigated by means of electrical resistivity tomography (ERT) (b) and Schmidt hammer (c) methods.

REFERENCES

Pozzi, R., Bollettinari, G., Clerici, A., 1990. Studio geomorfologico e geologico applicato dell'Alta Valtellina: alto bacino dell'Adda con chiusura a Tirano. Quaderni AEM, Milano, 151 pp.

ISPRA, 1994. Geomorphological Map of Italy 1:50.000 - Survey Guidelines. Quaderni Serie III, 4. (Available online at: http://www.isprambiente.gov.it/it/pubblicazioni/periodici-tecnici/i-quaderni-serie-iii-del-sgi/carta-geomorfologica-d2019italia-1-50-000-guida-al).

ISPRA, 2007. Geomorphological Map of Italy 1:50.000 - mapping representation Guidelines, Quaderni Serie III, 10 (Available online at: http://www.isprambiente.gov.it/it/pubblicazioni/periodici-tecnici/i-quaderni-serie-iii-del-sgi/carta-geomorfologica-ditalia-1-50-000-guida-alla).