



The Deep Valleys in Northern Italy

A. Bini (1), P. Haeuselmann (2) and M. Felber (3)

(1) University of Milano, Milano, Italy, (2) Institute for Speology and Karst Research, 2301 La Chaux-de-Fonds, Switzerland, (3) Felber Consulting, 6834 Morbio Inferiore, Switzerland (alfredo.bini@unimi.it)

The deep valleys in Northern Italy are extraordinary geomorphic features: (1) they extend from inner alpine areas to the edge of the Po Plain, (2) they are very deep with bedrock surfaces many hundreds of meters below sea-level, (3) they are of complex multi-channel confluence/diffluence, bifurcation-type geometry (e.g. Lago di Como/Lago di Lecco, Lago di Lugano), and (4) they are, in geomorphic terms, compared to canyons and fjords.

Seismic investigations demonstrate their fluvial origin and stratigraphically they are related to erosive events of the Messinian or even before. In addition, recent studies demonstrate that at least parts (e.g. Lago di Lecco) is tectonically controlled by pre-Messinian graben tectonics. Stratigraphic proof of the age relationships is from dated cave sediments in the Lago di Como area where burial dates based on cosmogenic $^{10}\text{Be}/^{26}\text{Al}$ nuclide compositions indicate Middle Pliocene age for the cave filling. The main valley, therefore, must be older.