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Geomorphic impacts of active tectonics on a river course, the case of Klissoura gorge, central Greece.

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The delicate balance of the natural processes within the river systems can be easily tipped making them very sensitive to changes occurring on the earth surface. Fluvial systems are therefore profoundly influenced by endogenic processes such as active tectonics as well as global sea level fluctuations following the climatic variations during the Quaternary.
This study deals with the geomorphological evolution of the broader area of the abandoned gorge of Klissoura which is located in central Greece. This 130 m deep and roughly 3 km long gorge is a characteristic example of an old drainage course preserved on the footwall blocks of two normal faults which confine both outlets of the deeply incised valley. The gorge has formed by a river that once had a N-S flow direction discharging into the Gulf of Patras. Acheloos River and the much smaller Ermitza Remma Stream are the two recent primary watercourses which drain the area close to the abandoned gorge. Both the dimensions and morphological characteristics of the abandoned deep valley indicate that the gorge has formed by a large river with high discharge in order to incise into the limestone bedrock.
In order to investigate the tectonic constrains and determine the geomorphic and climatic processes that compelled the lower reaches of Acheloos River to abandon the gorge and find an outlet following its present course a GIS based analysis at a scale of 1:50.000 was applied in the drainage basin of Acheloos River. Additionally, to reconstruct the palaeolandscape and the earth surface processes, a detailed morphometric and geomorphic analysis of the abandoned gorge was also performed at a scale of 1:5.000 coupled with field observations and stratigraphic analysis of the deposits outcropping on the valley sides within the gorge as well as on both outlets.
The geomorphic analysis led to the conclusion that the primary course of the gorge abandonment and diversion and reverse of the drainage is the uplift of the footwall of the active Trichonis normal fault to the North.