

Reconstructing the prehistoric landscape of Sikourio and Elatia intra-mountain basins, Thessaly, Greece

Sotiris Valkaniotis¹, Antonis Manakos², George Toufexis³, Agathe Reingruber⁴

(1) Trikala, Greece, valkaniotis@yahoo.com

(2) Thessaloniki, Greece

(3) Diachronic Museum of Larissa, 41222 Larisa, Greece

(4) Free University of Berlin - Institute of Prehistoric Archaeology, 14492 Berlin, Germany

Extended Abstract

Mt Olympus (2919 m.a.s.l.) and Mt Ossa (1978 m.a.s.l.) form the northeastern boundaries of the Thessalian Plain in Central Greece, separating the plain from the Aegean Sea. At the lower slopes of Mt Olympus and Mt Ossa, a series of intra-mountain basins develop between the lower eastern Thessalian Plain and the main mountain blocks. The most prominent of these basins is Sikourio basin, separated from the Larisa plain by the Chassambali chain of hills. Sikourio basin is nowadays connected to another complex of smaller basins forming the Elateia basin. These intra-mountain basins probably were formed during the post-orogenic extension of Middle Tertiary (Caputo & Pavlides, 1993; Kiliyas, 1995). Today, Sikourio and Elateia basins are hydrologically connected to the Piniós river basin through the Kalamitsa drainage that flows towards northwest into the main Piniós river body. The river Xerias drains a large part of Mt Ossa and flows to the south towards the remnants of the lake Bara Toibasi in the southern part of Sikourio basin (Fig.1). Kalamitsa River and its smaller tributaries drain the largest part of Sikourio and Elateia basins, forming a steep gorge at Magoula Bounarbasi, near Kispelochori. Through small sinkholes around Bara Toibasi Lake, a result of karstification, lake water infiltrates and feeds the karstic aquifer developed inside the limestone formations. This karstic aquifer connects hydraulically both the surficial and the ground water of Sykourio basin with the springs that are found at the border of the bedrock formations of Chassambali hills and the East Thessalian alluvial aquifer, to the south of Sykourio basin.

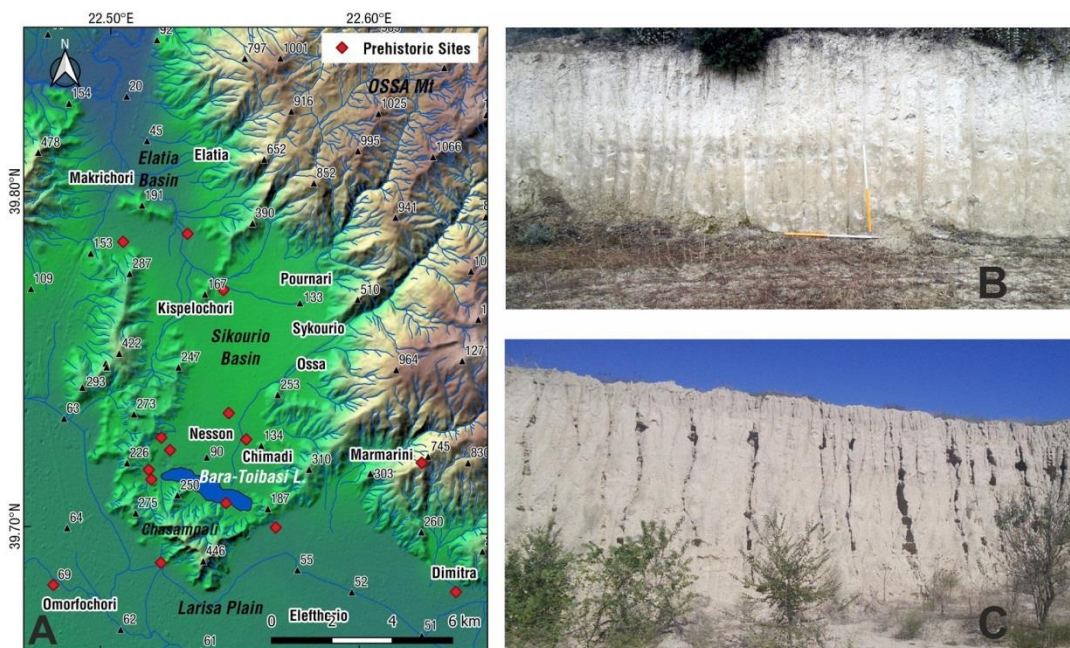


Figure 1. A) Overview map of Sikourio & Elateia basins. Prehistoric sites marked with red. Bara Toibasi Lake is shown with its extent from 1945, before recent irrigation & drainage modifications. B) Lacustrine sediments, northern part of Sikourio basin near Magoula Bounarbasi. C) Plio-Pleistocene lake sediments exposed at the abandoned quarries near Kalochori.

The hydrological conditions affected greatly the behaviour of human groups since prehistoric times. Permanent settlements were founded here already during the Neolithic Age – some of them forming in the course of many centuries (ca. 6000 calBC to ca. 4500 calBC) several meter high mounds (e.g. Nessonis II or Magoula Bounarbasi). Additionally, thanks to systematic surveys, a number of flat sites were detected, mainly in the area of the former lake Bara Toibasi (Fig. 1). Our working hypothesis is that these sites relate to the lake and were founded close to its former shores. We interpret Bara Toibasi Lake as a remnant of an older larger lake inside Sikourio basin. This lake is different from the ancient Lake Nessonis that extended in the Larisa plain south of Girtoni and from the Lake Karla south of Eleftherio (Gallis, 1992; Caputo et al. 1994, Reingruber et al. in print). Lacustrine (lake) sediments are exposed in large abandoned clay quarries around Bara Toibasi Lake, while in this study we document more outcrops to the northern part of Sikourio basin, with additional indications of probable extensive lacustrine sedimentation also in Elateia basin (Fig.1). These extensive

lacustrine sediments are indicators of a wider lake system that existed inside Sikourio and Elateia basins from Pliocene (?) up to Late Pleistocene-Holocene and are covered by recent alluvial sediments from the Xerias fan and secondary fans around the basin borders.

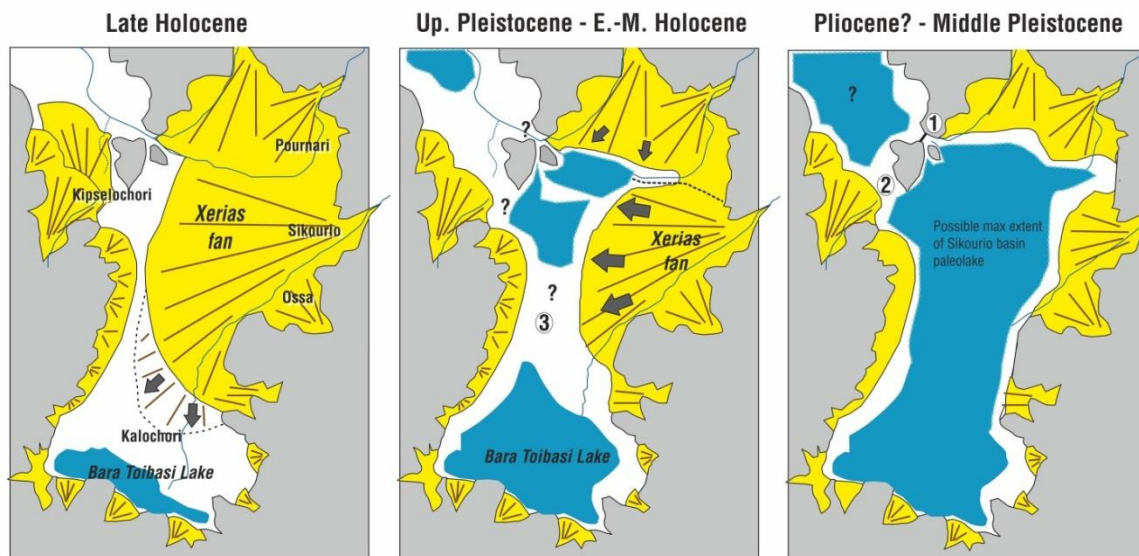


Figure 2. Proposed paleogeographic evolution of Sikourio basin and the proto-Sikourio lake system. The basin infill by the rapidly expanding Xerias fan, together with the fast draining through Bounarbasi (1) and Kipselochori (2) gorges, led to the confinement of Sikourio/Bara Toibasi Lake to the southernmost part of the basin. The westward expansion of Xerias fan closed the basin at the center (3) and created a hydrological divide between the northern and southern part.

Bara Toibasi Lake was previously considered as a product of hanging-wall subsidence of a proposed eastwards segment of Girtoni fault (Caputo 1990; Caputo et al., 1994). Using geological, geomorphological and archaeological observations, we propose the existence of a proto-Sikourio lake that covered Sikourio basin during Late Neogene - Quaternary. The draining of the lake was facilitated by a) the expansion of the Xerias fan that covered the central part of the basin and b) the lake outflow towards Elateia basin through Bounarbasi gorge and probably along Kipselochori area. Xerias fan expansion and lake draining led to the creation of Bara Toibasi Lake at the southern part of Sikourio that remains disconnected hydrologically with the northern part (Fig. 2). Sediment and water supply towards the northern part of proto-Sikourio lake/basin was probably affected by changes in the mountain catchments at Mt Ossa and identified large paleo-landslides that temporarily blocked drainage towards the lake/basin. Bounarbasi gorge opening and lake outflow is estimated to have taken place before the Mesolithic period and the beginning of the Holocene, probably around or shortly after the Last Glacial Maximum (LGM, ~24-16ka BP). Neolithic sites at the southern Sikourio basin are found around the estimated paleo-shoreline of Bara Toibasi. Draining through the karstic aquifers of Chassambali hills and a probable lower water supply through Xerias River led to the shrinkage of Bara Toibasi from the Neolithic era up to today. Conditions in Elateia basin are more complex; the Elateia basin complex includes a series of small closed connected intra-mountain basins that were cut through by Pinios River during Late Quaternary, as the Pinios River eroded through Olympus-Ossa mountain range and exited towards the Aegean Sea. While lacustrine sedimentation is present in Elateia basin, its previous connection with the Sikourio basin is under investigation.

Acknowledgements

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