TIGRAOU STRUCTURE: A POSSIBLE NEW IMPACT CRATER IN NORTHWESTERN ALGERIA. M. C. Chabou. Department of Earth Sciences, Ferhat Abbas University, Setif, Algeria. charaf.chabou@hotmail.com .

Introduction: Tigraou crater is located in northwestern Algeria, at about 485 km WSW of Algiers and 135 km WSW of Oran, near the Algerian-Moroccan border. The structure was first described by Kock (1901) [1] who interpreted this crater to be of volcanic origin. Sadran (1958) [2] noted the lack of volcanic products associated with this crater and described it as a "crypto-explosion" structure. Although the presence of volcanic craters in northwestern Algeria is common [2], the Tigraou crater was investigated in this work of possible impact origin because of its unusual characteristic described in the literature as a unique cryptovolcanic structure in northern Algeria. Such ambiguous descriptions (cryptoexplosion) are usually an indication of possible impact structure [3].

Observations: The nearly circular crater of Tigraou has a diameter of about 1 km (Figures 1 and 2) and is emplaced in Early Jurassic limestones. The southwestern rim of the crater rises 75 m above the crater floor whereas the northern and eastern rims of the crater are eroded. The flat center of the actual crater floor is filled by eolian deposits. The target rocks can be observed along the southern and southwestern rim of the crater which are mostly formed by limestones. In many places at the top of the southwestern rim, the limestone stratas become nearly vertical and we can see an overturned limestone beds at the top of the front of a quarry located in the southern rim of the crater (Figure 3). Breccia outcrops were observed along the rim near the crater floor. They consist of monomict (Figure 4) and polymict breccias mainly composed of angular limestone clasts. Even closer to the crater floor occurs an outcrop of melt breccia (figure 5). They consist of limestone fragments, frequently surrounded by brownish flow-banded glass (cored inclusions), in a matrix of flow glassy materials. Quartz grains are common in the matrix, with possible occurrence of silica glass as fluidal inclusions. Preliminary examination of thin sections of this melt breccia has shown a remarkable texture of quartz, shown in Figure 6.

Conclusion: The morphology of the Tigraou crater (raised rim, overturned strata at the rim crest), the occurrence of monomict and polymict breccias, and the discovery of an outcrop of a melt breccia with possible shock-metamorphic effects indicate that the Tigraou crater seemingly is a good candidate for a simple impact crater. Further work is in progress with the aim to confirm the impact origin of this promising structure.

References: [1] Kock A. B. (1901). *Bull. Soc. Geog. Archeol., 21*, 99–101. [2] Sadran G. (1958). *Bull. Serv. Carte Géol. Algérie, 18*, 533 p. [3] French B. M. (1999). *Traces of Catastrophes. LPI Contribution n° 954*, 120 p.

Figure 1: Google Earth satellite image of the Tigraou crater

Figure 2: Panoramic view of the Tigraou crater. The elevated soutwestern rim is visible at left.

Figure 3: Overturned strata in the southern side of the rim of the Tigraou crater

Figure 4: Monomict breccia of limestone composition from the Tigraou crater

Figure 5: Melt breccia from the Tigraou crater. This sample displays a limestone clast surrounded by a rim of brownish glass.

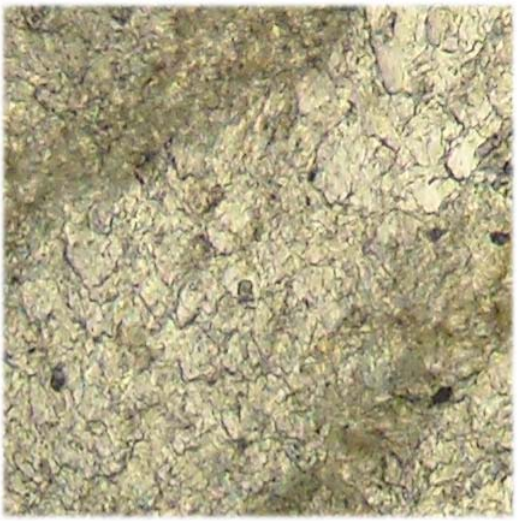

Figure 6: Remarkable texture in quartz within a melt breccia sample from the Tigraou crater.