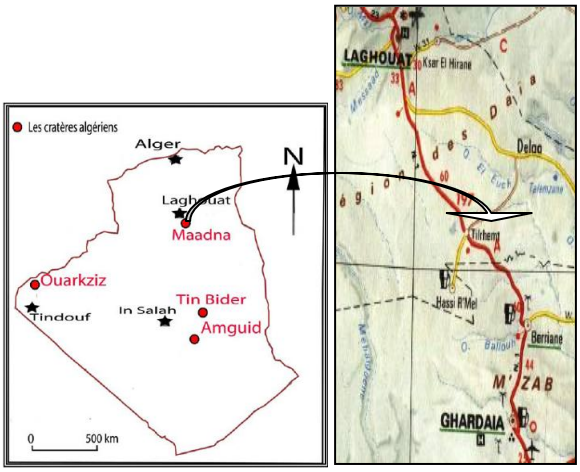
NEW STUDIES ABOUT THE MAADNA IMPACT CRATER (TALEMZANE, ALGERIA). D. Belhaï.[1], R. Sahoui[1] and D. Bertrand[2]. *[1]LGIP, FSTGAT, USTHB, BP 32 El Alia Algiers, Algeria. [1]dbelhai2001@yahoo.fr, [2]LMV, Univ. Blaise Pascal, 63000 Clermont, France*

Introduction: Algeria has four meteorite impact craters all located in the Saharan platform. These craters are Amguid and Maadna (Talemzane) which are simple type, the Ouarkziz and Tin Bider being complex type [1].

Crater Maadna from the name of the daïat el Maadna (meaning Maadna depression) and the Arabic word which also means depression of ore, is located 15 km from the well of Talemzane has taken the name of the crater. This relocation has baffled many researchers and visitors to the crater.



a b

Fig 1 has: (a) location of Algerian meteoritic craters and (b) that of Maadna

That is why we propose its local name (Maadna), which is located on the edge of wilayat of Ghardaia and Laghouat in the far southeast of the of Hassi Dellaa locality.

Mapping and structure: It has been the subject of several studies by geologists during the past century [2], [3], [4] and was declared the original impactites structure based on its circular shape and the presence of a different types of breccias in this proximity. They had described shock quartz with PDF planar structures.

In this present work, new map is realized that shows a different type of breccias which are confirmed. In the base of the lower type of breccia we found crystalline calcareous (marble) [5].

The MNT shows fractures which are organized on radial structures. The circular depression is also confirmed and we have applied gravimetric studies. Petrographic analysis and X-ray diffraction of samples collected on site which allowed us identify a number of criteria in favor of the meteoritic origin of this depression.

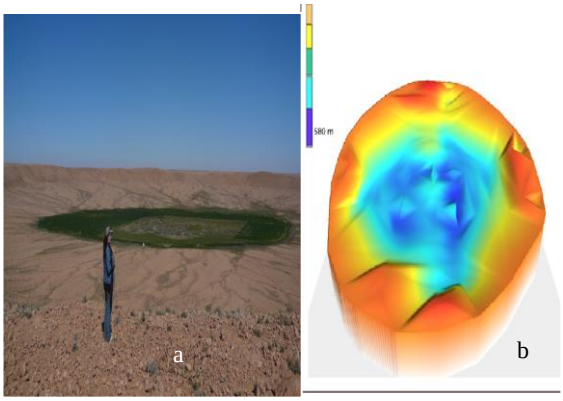


Fig. 2: Photograph of the Maadna crater (a) and numerical Model of the ground (MNT) of structure (b)

Among the criteria which justify character of impact meteoritic of Maadna, we can enumerate still the presence of particular minerals of aragonite (polymorphic high pressure and high temperature calcium carbonate) associated with the marble formed after metamorphism suffered by the layers of limestone, we detect also, magnetic elements and Zinc (minrecordite) by X-ray. The gravity anomaly throughout the area of the holes is performed for the first time, and the organization of the fracturing also characterized some of the crater formations.

Organization in radial structures of fractures: The counting of structures along several radial stations shows that they are distributed in almost homogeneous patterns between a unit of measurement and the measurement unit superior.

So we obtained a linear relationship expressing a self-similarity at different scales to a factor of 1.2. The radial deformation in the structure of Maadna follows the fractal law with a fractal dimension of 1.2.

Discussion and conclusion:

Maadna (Talemzane) depression is a true meteorite crater and the second simple type crater in Algeria (because its diameter is less than 2 km).

We discover for the first time metamorphic rocks (marble) and particular minerals (minrecordite and aragonite). Based on erosion rates that are between 0.001 mm and 0.5 mm in desert areas, age of the crater is estimated in the range from 203 000 years to 2 million years, which is consistent with the age of rocks

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Lambert in agreement with Karpoff [2], [6] suggested that the age of the formation of the crater of Talemzane (Maadna) takes place after the Pliocene and Lambert thinks that he formed between 0,5 and 3 million years. This age concords with our findings.

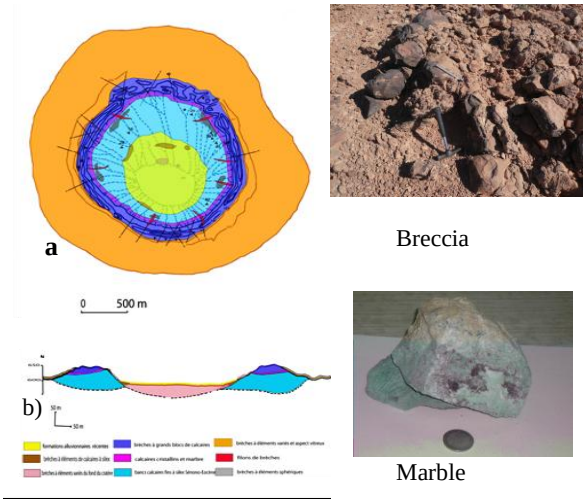

Fig. 3: a) Geologic map and
b) Geological cross section of Maadna

References: [1] Belhaï D., Merle.O., Vincent.P, Devouard B, Afalfiz. AH., 2006 : Etat des connaissances et mise au point sur les cratères météoritiques du Sahara algérien, des indicatres de pièges à hydrocarbures? *Bulletin du Service Géologique de 1 'Algérie. Vol. 1* 7, *n2, p. 95-112*. [2] Lambert P., Mc Hone J., Dîetz R., Houfani M., (1980): Impact and impact-like structures in Algeria. Part I: four bowl-shaped depressions: *Meteoritics, y. 15, p. 175-179.* [3] Belhai D., Hamoudi M. et Baker H., 1999: The meteritical cratere of Maadna (Saharan Algeria). *62 nd Annual Meeting Meteoritical Society 1999. Johannnesbourg (South Africa).* [4] Belhai D., Merle O., Vincent P., Devouard B. and Afalfiz A. (2005): Are the Complexe Algerian Meteorites Craters potentials Hydrocarbon traps. *36the Lunar and Planetary Sciences Conference (Houston Texas).* [5] Sahoui R. 2009: Etude géologique et structurale du cratère météoritique du cratère de Maadna. Essai de modélisation analogique. *Thèse Magister, FSTGAT, USTHB, Alger ; 160 p.* [6] Karpoff R. (1954) : un cratère de "météorite" à Talemzane dans le Sud Algérien. *C.R. Congrès Géol. International d'Alger, 1952. Sect. 13, Fas. 14, 233-241.*