Karstic phenomena of the BOUKADIR-Chlef. Geological, hydrogeological and mineralogical characterization

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Introduction

In **Algeria**, there are many karst areas: Tlemcen, Saida, the calcareous ridge of Djurdjura, Jijel... *(Fig.1)*
The region of **Boukadir** in the northern piedmont of Ouarsenis is the seat of surface and sub-surface karstic forms had witnesed a major collapse of the national road RN4 linking the wilaya of Algiers to Oran in 1988 *(Fig.2)* .

Map of karst areas of Algeria

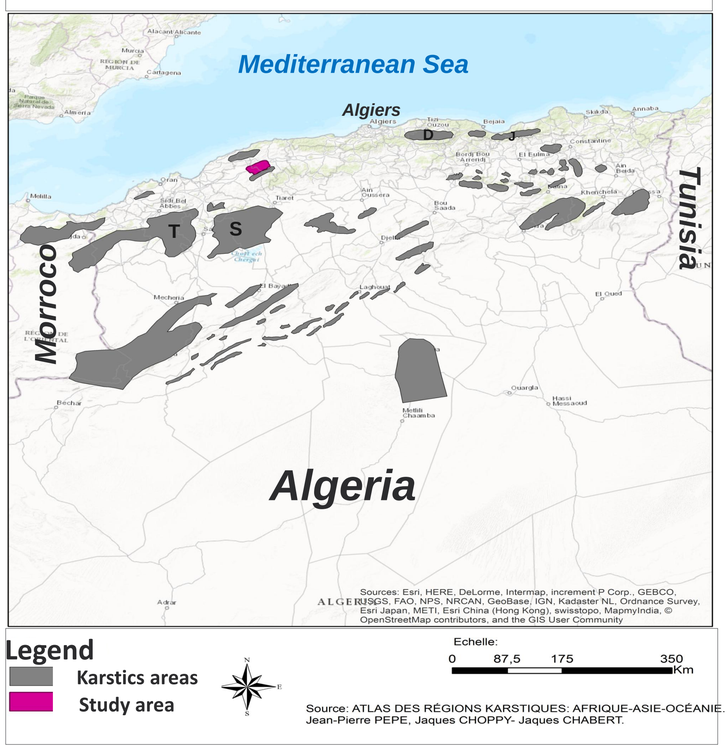

Fig. 1: Map of karst areas of Algeria.

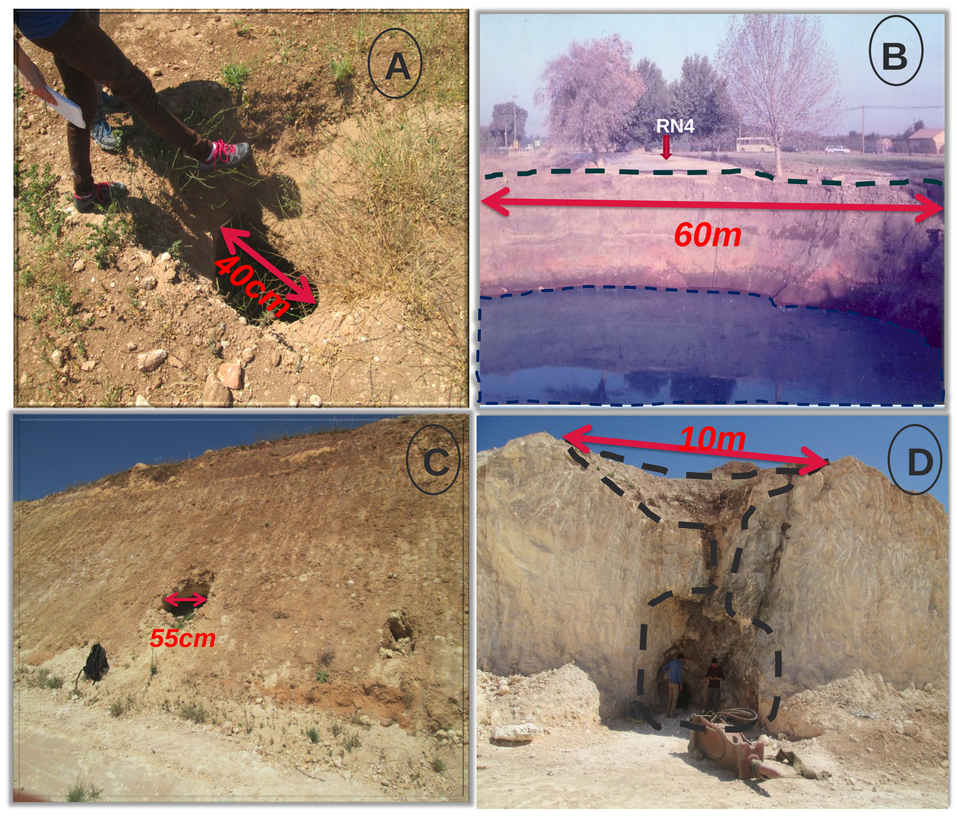

Fig.2: **A)** Sinkholes in study area; **B)** Sinkhole of the national road RN4 in 1988 ; **C)** Sinkhole in the quarry; **D)** Sinkhole near road.

Data & Results

The understanding of these phenomena is inevitably linked by a good carecerization of this area, by doing an inventory of karstics forms (Fig. 3), analyze geology and hydrogeology, using different data such as a drilling boreholes and different logs (Fig.4 & 6) and of course, with a mineralogical study (Fig.7) based on a morphoscopic analysis of the thin sections and a diffractometric examination (DRX) of the samples collected around this locality to evaluate the dissolution capacity of the calcareous deposits.

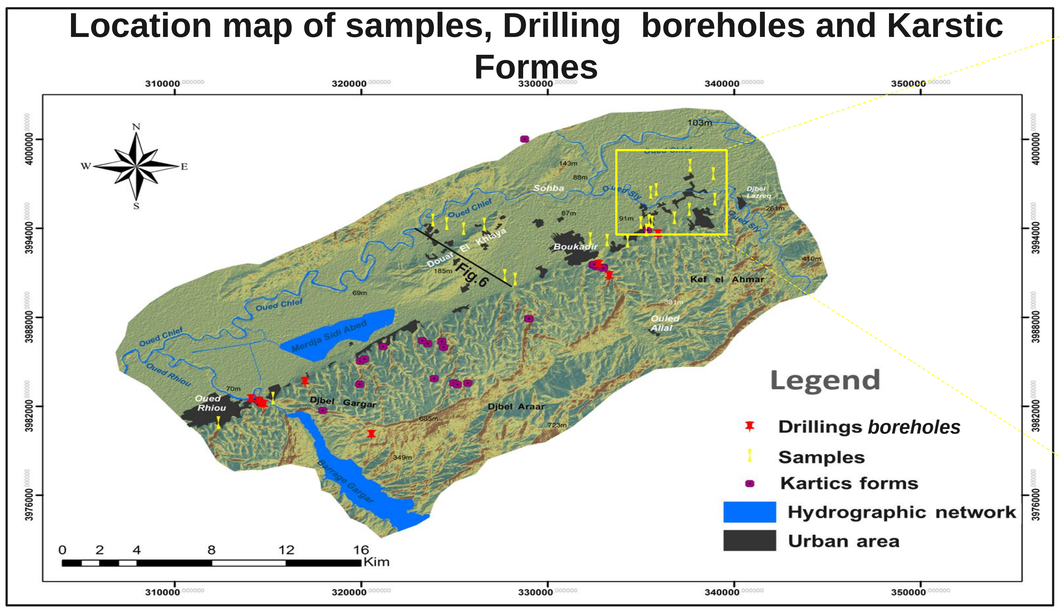

Fig.3: Location map of Samples, Drilling borholes and Karstic Forms.

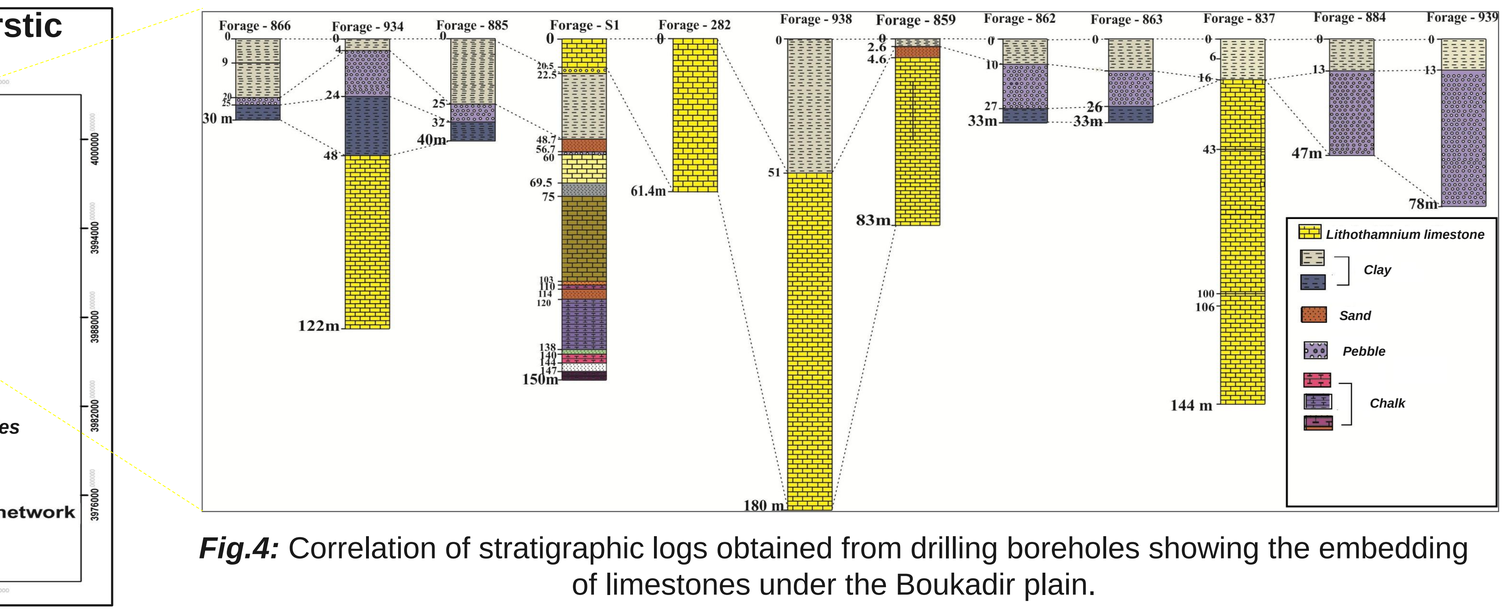

Fig.4: Correlation of stratigraphic logs obtained from drilling boreholes showing the embedding of limestones under the Boukadir plain.

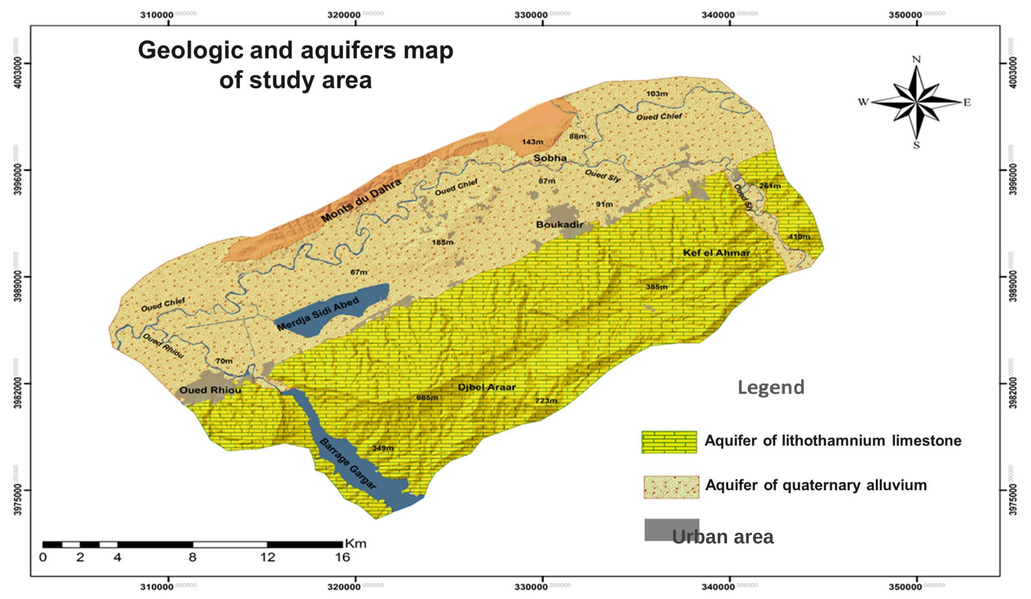

Fig.5: *Geologic and* Aquifers map of study area.

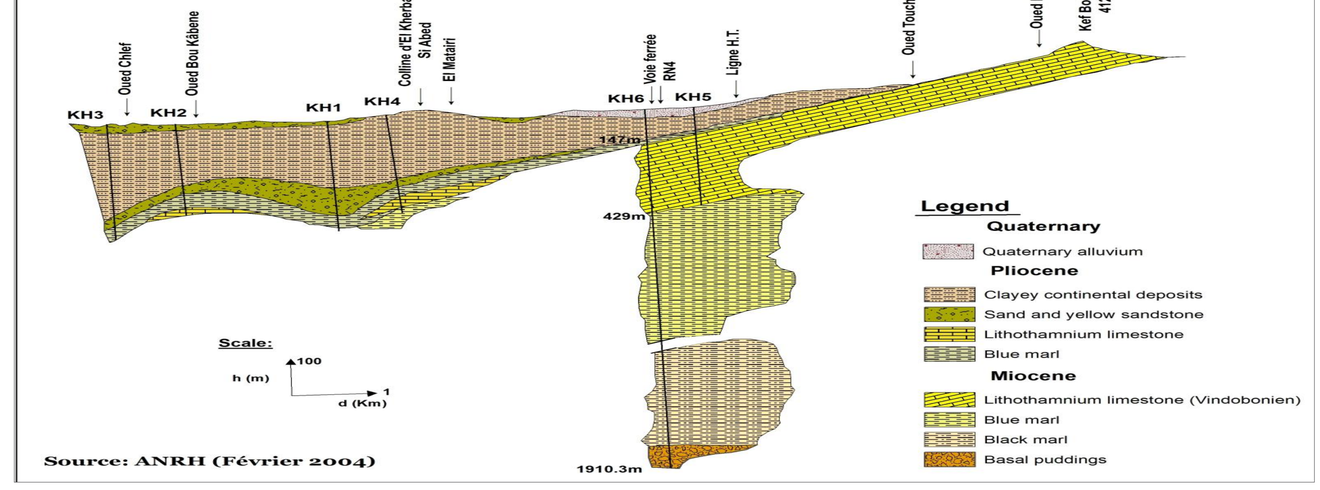

Fig.6: Geological cross section of Boukadir obtained through drilling boreholes.

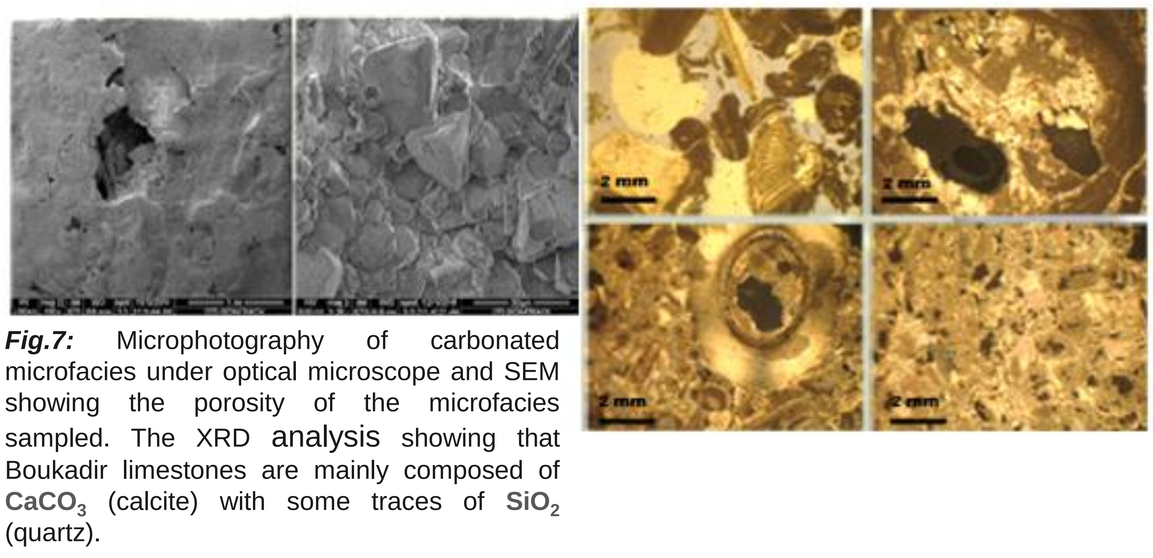

Fig.7: Microphotography of carbonated microfacies under optical microscope and SEM showing the porosity of the microfacies sampled. The XRD analysis showing that Boukadir limestones are mainly composed of $CaCO_3$ (calcite) with some traces of SiO_2 (quartz).

Conclusion

Considering the geological data (the drillings boreholes, stratigraphic logs, the correlation of drillings boreholes) (Fig.4) and the geological cross sections (Fig.6) combined to the hydrogeological parmeters (Geologic and Aquifers maps (Fig.5)) as well as the petrographic characteristics (porous limestone, high concentration of $CaCO_3$) (Fig.7) and also the inventory of the karstic phenomena (Fig.3) let's say that Boukadir is a vulnerable area to karstics hazards.