

Occurrence of the Cap carbonates related deposits on the eastern edge of West African Craton (SE Man Shield, Firgoun area): implication for the Neoproterozoic glaciations

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Neoproterozoic glacial deposits are systematically followed by enigmatic carbonates deposits well identified on several continents including Africa (Font, 2005). These carbonates deposits commonly called Cap carbonates are regarded as important keys for understanding the Neoproterozoic glacial events.

At least three glacial episodes are known during the Neoproterozoic (Hoffmann et al., 2004; Font, 2005): the Sturtian (750-700 Ma), the Marinoan (635 Ma) and the Gaskiers (580 Ma) glaciations. The Sturtian and the Marinoan are Early and Late Cryogenian glacial deposits, respectively, whereas the Gaskiers correspond to the Ediacaran glacial deposits.

The West African basins (Taoudenni, Voltas and Gourma) contain Late Cryogenian glacial deposits overlaid by carbonates that have been assimilated to postglacial carbonates (Trompette, 1973; Affaton 1990; Miningou et al., 2017).

The Firgoun area deposits, located on the eastern edge of the West African Craton area (Fig. 1), are assumed to be the equivalent to the basal deposits of the Ydouban Group (Gourma Basin).

In Firgoun area, the uppermost deposits include matrix-supported diamictites, cherts and carbonates. The occurrence of diamictite deposits, interbedded into the marine quartzitic sandstones beds and the presence of more or less recrystallized limestones and silexites could be considered as parts of the well-known Neoproterozoic Triad.

Two kinds of carbonate rocks lithofacies have been observed: unmetamorphosed brown dolomitic limestones and white marbles. The dolomitic limestones exhibit a cavernous appearance probably due to a post-depositional dissolution phenomenon (Fig. 2a). Marbles are massive deformed rocks (metacarbonates), with a milky white to pinkish appearance (Fig. 2b).

Keywords: Cap carbonates, Diamictites, Neoproterozoic, glacial deposits, Firgoun

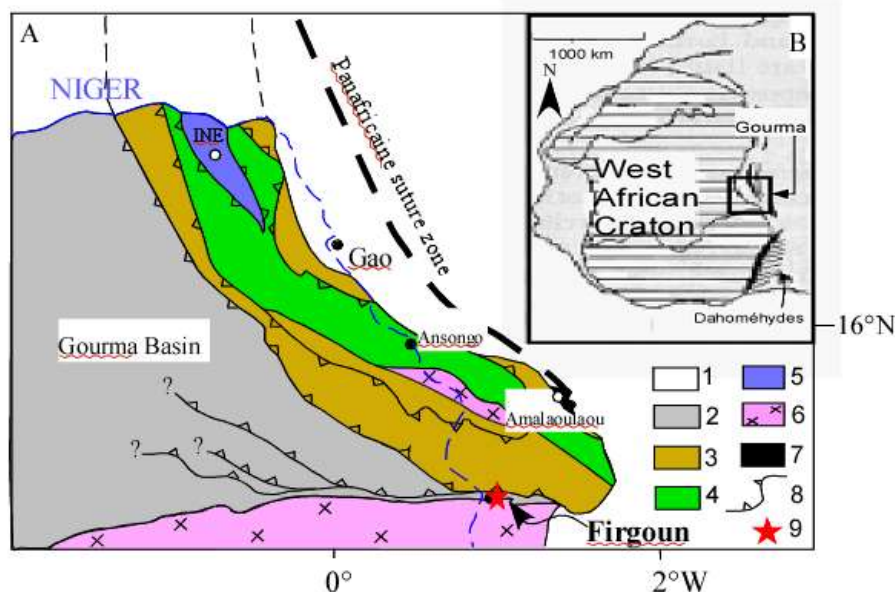


Fig.1. (A) Geological sketch map locating the Firgoun area into the southeastern of the Gourma Basin (from Cabyl et al., 2008). (B) Location of the Gourma Basin on the eastern border of the West African Craton (from Attoh and Nude, 2008). 1. Phanerozoic; 2. Gourma basin; 3. External nappes; 4. Internal nappes with HP-LT; 5.

UHP metamorphism (INE: Inedem); 6. Paleoproterozoic rocks of the WAC and Bourré Inlier; 7. Mafic-ultramafic massifs; 8. Major thrust; 9. Study area.

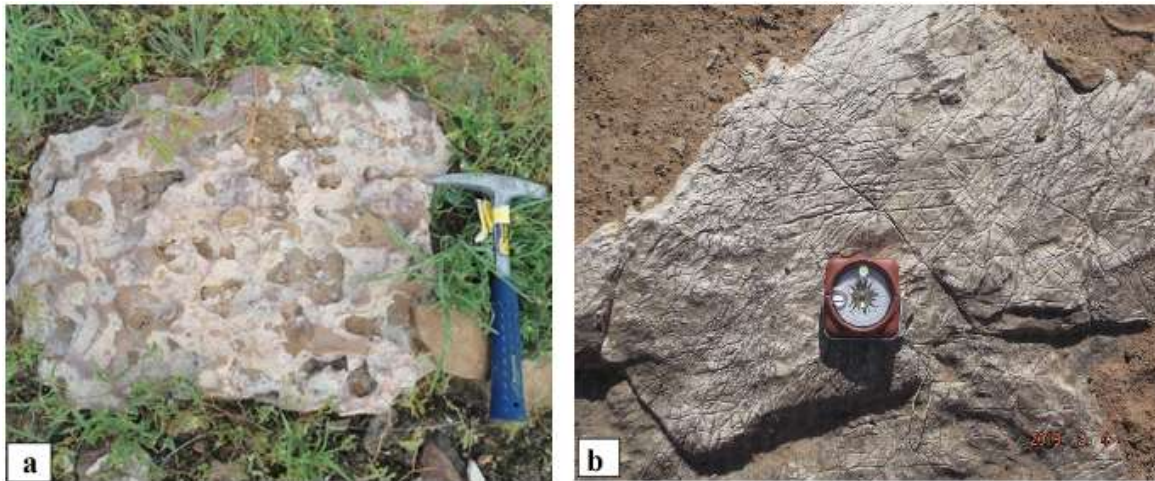


Fig. 2. Carbonates deposits observed in Firgoun area (a) Brown dolomitic limestones exhibiting a cavernous appearance, followed by quartzitic sandstones sequences which include diamictite deposits, (b) White marbles with a milky white to pinkish appearance. These marbles display many fractures.

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