

# Relationships between North Téra Birimian gondites and manganese mineralization (Liptako, West Niger)

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North Téra manganese mineralization is located in the Diagorou-Darbani Greenstone Belts, closely to the Téra-Ayorou pluton (Fig. 1). Rocks bearing Mn mineralization are mainly gondites, a type of granites containing spessartine garnet. The methodological approach implemented consisted of field study (Fig. 2) followed by a polarizing microscope analysis (Fig. 3).

North Téra gondites result of Birimian manganese-rich sediments metamorphism in amphibolite facies (Soumaila, 2000; Soumaila and Garba, 2006).

The macroscopic analysis of the concretions, combined with the microscopic observations, shows that manganese mineralization is the result of gondites alteration. The processes of supergene alteration of the latter (oxidation, hydrolysis and leaching of chemical elements), under conditions of PH = 7 to 9 and Eh = + 0.4 to + 0.6 V, lead to a residual deposit of Mn (up to 39.4% of Mn metal; Machens, 1961). This preliminary work shows that north Téra Mn deposits consist of manganese oxide concretions of pyrolusite type (Figs. 2C,D).

**Keywords:** Gondite, manganese, north Téra, supergene alteration, amphibolite facies.

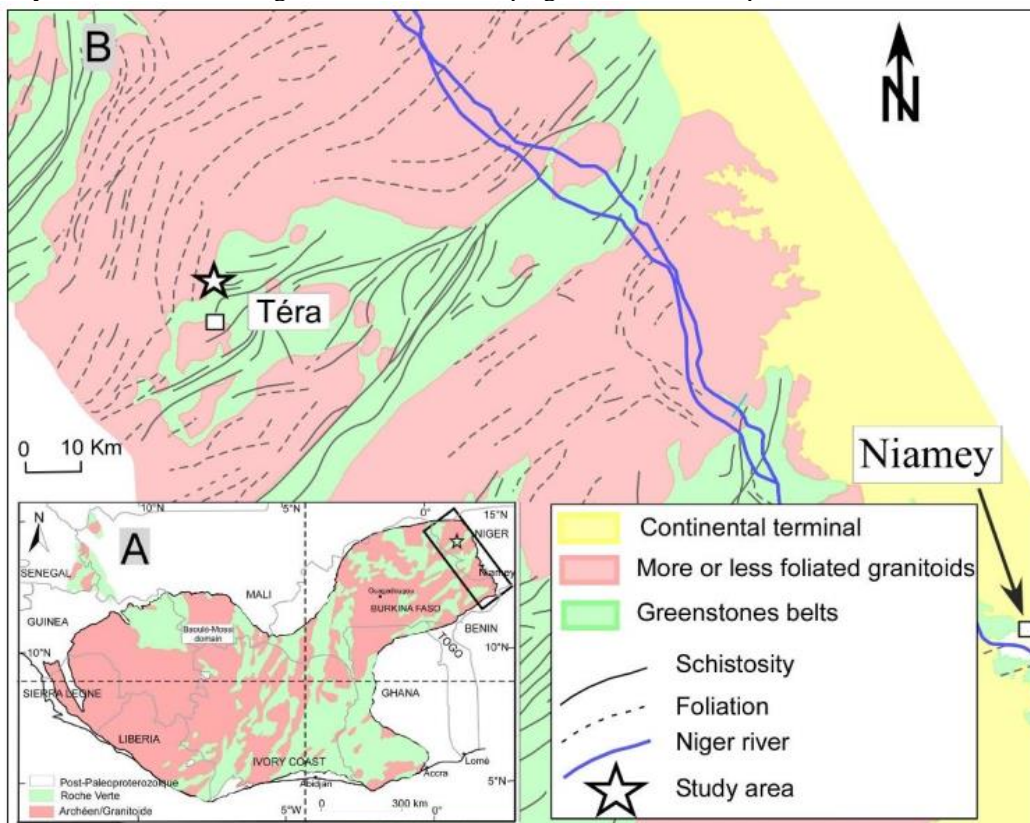


Figure 1: (A) - Liptako region of Niger in West African Craton context. (B) - Simplified geological map with the study area localization (Machens, 1967, modified).

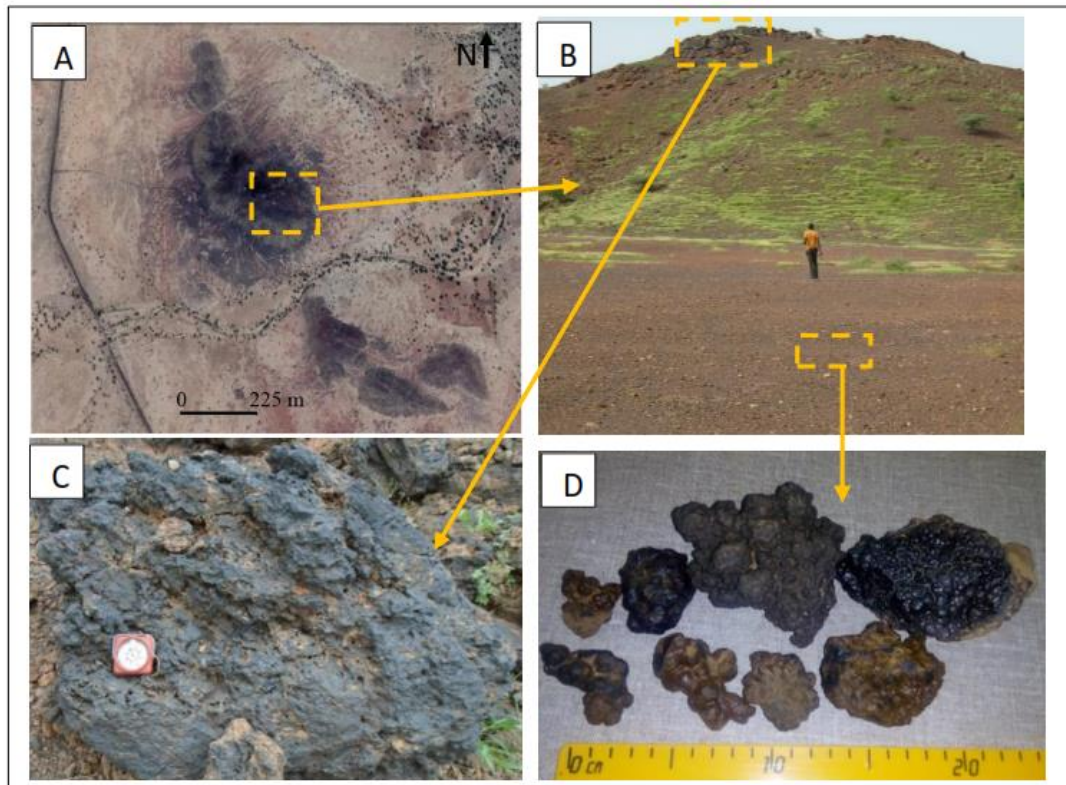


Figure 2: Northern Téra manganese deposits: **A)** Google Earth image of the study area; **B)** Main hill of Mn; **C)** and **D)** Manganese concretions.

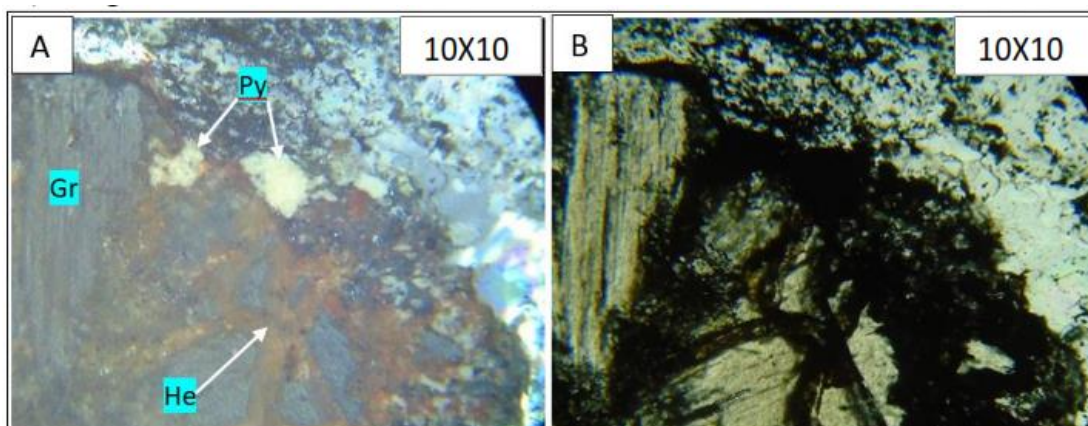


Figure 3: Metallogenic analyses of garnets (Gr) in altered gondites. **A)** image in reflected light and **B)** in transmitted light microscopy. Manganese oxide with pyrolusite (Py) and iron hematite oxide (He).

### References

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