

## Controls on Gold, Rare Metals, Rare Earth Elements deposits in the Hoggar, Tuareg Shield (southern Algeria)

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The Hoggar is composed of well preserved and largely reworked Archean (3200 to 2500 Ma) and Paleoproterozoic terranes (2000 Ma) as well as juvenile Pan-African terranes (750-550 Ma) (Liégeois et al., 2003). During the last 50 years of exploration and prospecting, the ORGM (National Bureau of Mining and Geology of Algeria) has discovered many thousands of various minerals occurrences where the overwhelming majority are without economic importance.

We will depict only mineral deposits which are valuable, beginning by the more eldest to the recent.

1- BIF: the banded iron formations with gold traces are embedded in granulitic Archean formations of In Ouzzal and Gour Emellalen regions (western Hoggar) (Ouzegane, 1987)

2- The Paleoskarns outcrop at Alouki and Tekhamalt regions (In Ouzzal, western Hoggar) and are hosted in the archean granulitic greenstone belt. They are mainly constituted by Be-Musgravite, pyrochlore, scheelite and monazite (Boumaza, 2008)

3- The REE bearing carbonatites and metacarbonatites (2000 Ma) are only found at the margins of the granulitic Archean craton (block) of In Ouzzal (western Hoggar). They are associated with alkaline rocks and are located only in the In Ouzzal Archean block, more frequently at its margins. They consist of dykes and lenses and are constituted mainly by calcite, dolomite, clinopyroxene, amphibole, biotite K-feldspar, titanite, allanite, fluorite, magnetite garnet, bastnaesite, apatite, monazite and britholite. They are poor in HREE and relatively rich in LREE (Ouzegane, 1987; Ouzegane et al., 2003; Cherbal and Aissa, 2012; Cherbal et al., 2016)

4- The Hoggar gold deposits are linked to the translithospheric faults trending 2°30', 4°13', 7°30' and 8°30' (excepted the 4°13' and 4°50' faults where the gold occurrences are successively poor and very poor) (Aissa et al., 2002; Marignac et al. 2016; Aissa and Marignac 2017). The richest gold deposits are of orogenic type, and located in metacraton margins which undergone granulitization

5 - The Rare Metals (Sn, W, Nb, Ta, Be, Li) with economic importance are also located at the metacraton margins or deeply faulted metacraton. They are linked to the more evolved late Panafrican granites ore pegmatites.

Thus, all the valuable ore deposits are situated on the margins of craton or metacraton (Archean to Paleoproterozoic), whereas those located in the juvenile terranes (Neoproterozoic to Cambrian) are very poor.