



The giant monazites occurrences in Manangotry (Madagascar)

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Several occurrences of giant monazites have been known since the 50's in the Anosyan mountains close to Fort-Dauphin, at the extrem south of Madagascar. Individual crystals, few centimeters big are present in museum or individual collections, but no descriptions of the geology of the deposits have ever been published. We are currently studying an occurrence situated along the trail that lead to the Manangotry pass. The largest crystals are 1 to 3 cm long, with tabular morphology with the (100) face being the most developed. In thin section, the crystals occasionally displays polysynthetic twinning. Despite their high Th content, the crystals are not metamict, as shown by X-ray diffraction and optical properties. In some other occurrences monazite crystals can be as big as 20 cm.

The outcropping conditions are very bad. The mineralization occurs in an altered granite, and is made of a 10-30 cm thick layer of massive pale yellow apatite, above a 5-10 cm biotite layer which contains the monazite crystals. The mineralogy is rather simple, with only biotite, apatite, ilmenite, and some zircons.

Monazite crystals are Th rich (up to 20% ThO₂) but some monazite crystals in massive apatite are almost Th-free. Apatite is Fluorapatite with a significant Cl content. Biotite are also F-rich, and enriched in Ba and Ti. In the massive apatite, monazite fills cracks and clivages, indicating that REE were transported by fluids. Petrographic evidences suggest that several episodes of fluid infiltration occurred during the geological history. The U-Th-Pb electron probe dating indicate a "pan african" age in agreement with previous results.

The mineralogical association monazite-apatite-biotite-ilmenite is rather unusual and

studies are still in progress to decipher the origin of those occurrences