

## **GEOLOGIC, STRUCTURAL AND PETROGRAPHIC ASPECTS OF A MAGMATIC- HYDROTHERMAL IRON DEPOSIT, EASTERN OF PALEOZOIC PARNAÍBA BASIN, PIAUI, BRAZIL**

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**ABSTRACT:** The knowledge about iron deposits in Phanerozoic sedimentary basins, such as Parnaíba Basin, Amazonas and Paraná basins was restricted to Ironstone sedimentary deposits that generally exhibit a mineralogy dominated by hematite in oolitic and pisolitic textures with low iron content. In Parnaíba Basin these deposits have iron oxyhydroxides compositions with oolitic and non-oolitic texture occurring intergrated with Silurian sandstones and siltstones from Pimenteiras Formation. Its best exposure has been found in the northern region of Tocantins state, between the cities of Paraíso do Norte and Guaraí. Two lithofacies containing hematite were identified: one with oolitic texture and another without oolitic texture. The first one has hematite and goethite has an association with a shallow and agitated coastal environment, meanwhile the second one, non-oolitic, would have deposited in deeper and calmer waters. Other significant iron occurrences composed by massive magnetite partially martitized have been recently identified, capping and/or cutting Devonian sandstones from the Cabeças Formation, in the eastern border of the Parnaíba Basin, in the county of Piripiri and nearby areas. The occurrences are present in a variety of ways, ranging from roughly tabular fragmentary bodies to massive centimeter size angular blocks of massive magnetite, associated with diabases of the Sardinha Formation, of Cretaceous age, supporting small hills. The tabular iron occurrences exhibit centimetric size, angular to subangular fragments of massive magnetite, fine granulation, surrounded by a finer-grained matrix of limonite composition, which resemble to bodies of autoclastic breccias little transported (talus deposits). The limonitic matrix shows flow structures and cavernous-like textures, similar to the gas/volatile escape structures found in iron deposits of magmatic-hydrothermal origin, such as the Cenozoic iron deposit in Chile, the El Laco, which may indicate proximity to a magmatic or hydrothermal feeding zone. On the other hand, iron occurrences of magmatic and/or hydrothermal origin type IOA (Iron Oxide-Apatite), also known as Kiruna type, have been found in the east basement of the Basin associated with a bimodal volcanism (550Ma). Thus, the presence of these iron occurrences closely associated with a basic magmatism (Cretaceous Sardinha Formation) together with important of iron occurrences of magmatic and/or hydrothermal origin, in the east basement of the Basin, allow the characterization of different magmatic and/or hydrothermal iron events associated to the basic magmatic rocks in the vicinity of the Sobral- Pedro II Lineament.

**KEYWORDS:** IRON DEPOSIT; MAGMATIC-HYDROTHERMAL ORIGIN; PARNAIBA BASIN.