Diagenetic Crystallisation and banding of iron ore-minerals in Banded iron-formation, Orissa India

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The 'Horse-shoe' iron ore district of Orissa is the youngest of the three banded iron formation (BIF) of the Iron Ore Supergroup that occupies a part of Kendujhar and Sundergarh districts of Orissa and a smaller part of the southern part of Singbhum district, Bihar.

This BIF, forming the 'U' shaped (hence the name horse-shoe) hill range exhibits no sign of metamorphism, unlike its older counterparts. The rocks are variegated shale, BIF and ferruginous shales.

Being unmetamorphosed, the BIFs here are eminently suitable for sedimentological and diagenetic studies.

Hemalite, siderite, chart and less commonly magnetite are primary minerals and also are diagenetic. Stylolites are common along bedding (banding) along which diagenetic crystallisation and migration takes place and with lapse of time the bands thicken with slow death of the stylolite. Excellent features like 'cut & fill', vug filling, vein deformation, compactional thinning, pepper and salt texture, giant crystal formation etc. can be observed. Syndiagenetic giant crystals of siderite, partially/ fully, replaced by hematite, are commonplace along banding, all in the diagenetic milleu. Chert/quartz fills up a lot of space between bands.

Older BIF (Daitari IF BIF-2) shows carbonate facies towards stratigraphic depth only. In BIF-1 such evidence are yet to be found possibly because of obliteration of textures due to higher metamorphic grade.

Role of carbonates in BIFs should be considered to be much more important than better to realised.