



## Petrography and geochemistry of Ga'ara sedimentary ironstones, Western Desert of Iraq



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### ABSTRACT

The ironstone lenses of Ga'ara area are enclosed within the uppermost part of the clastic succession of Permocarboneous Ga'ara Formation. This succession is composed mainly of sandstones (sometimes with pebbles), siltstones, and kaolinitic claystones. The ironstones are classified according to their lithology and texture into two types: massive and pisolitic–oolitic ironstones. The later is restricted to the southern rim of Ga'ara Depression. The enclosure of ironstone lenses within the fining upward cycle, predominance of colloform and pisolitic oolitic textures and the low Cu, Pb, Zn, and Mn contents are good evidences for the shallow sedimentary environment of deposition. There is no convincing evidence to suggest any serious role of lateritization process in the formation of the studied ironstones. The most probable source rocks that consist of plutonic metamorphic complexes of Arabian Shield were subjected to deep chemical weathering and erosion under humid and tropical climate. These products dominated by amorphous iron oxyhydroxides, kaolinite, and quartz were transported by rivers to be deposited in fluvial and lacustrine environments in Ga'ara area. Iron was carried as colloids and/or associated with clay fractions. The massive clayey ironstone and pisolitic oolitic ironstone were formed by the deposition of iron oxyhydroxide-bearing clays within small lakes associated with flood plain river overbanks; while the massive sandy ironstone was formed by the deposition of water laid detrital quartz grains cemented by goethite and hematite.

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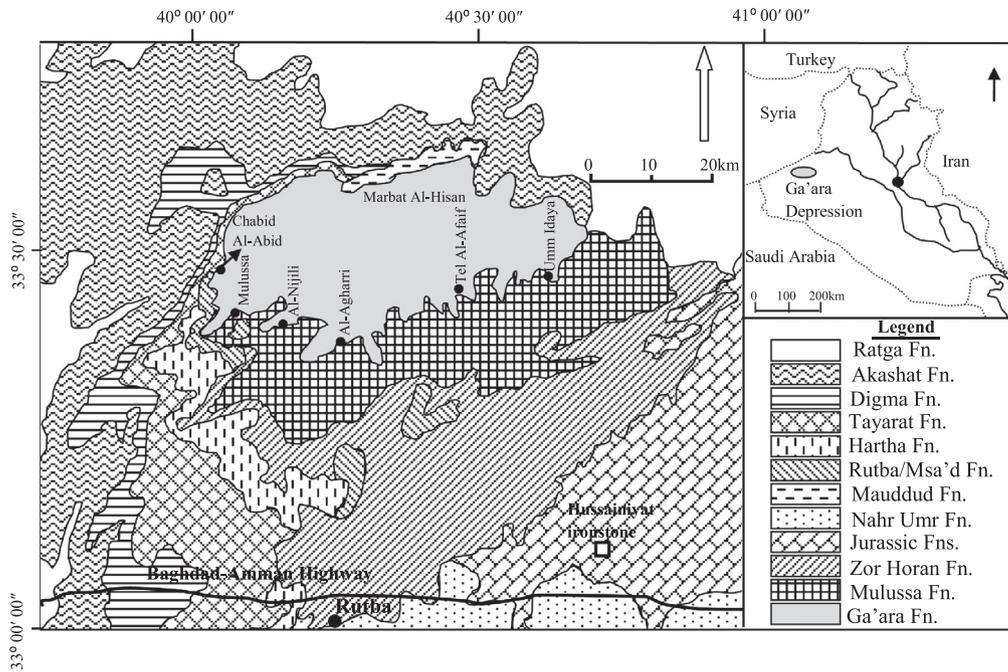


Fig. 1. Geologic and location map of the studied ironstones of Ga'ara Formation, Western Desert, Iraq.

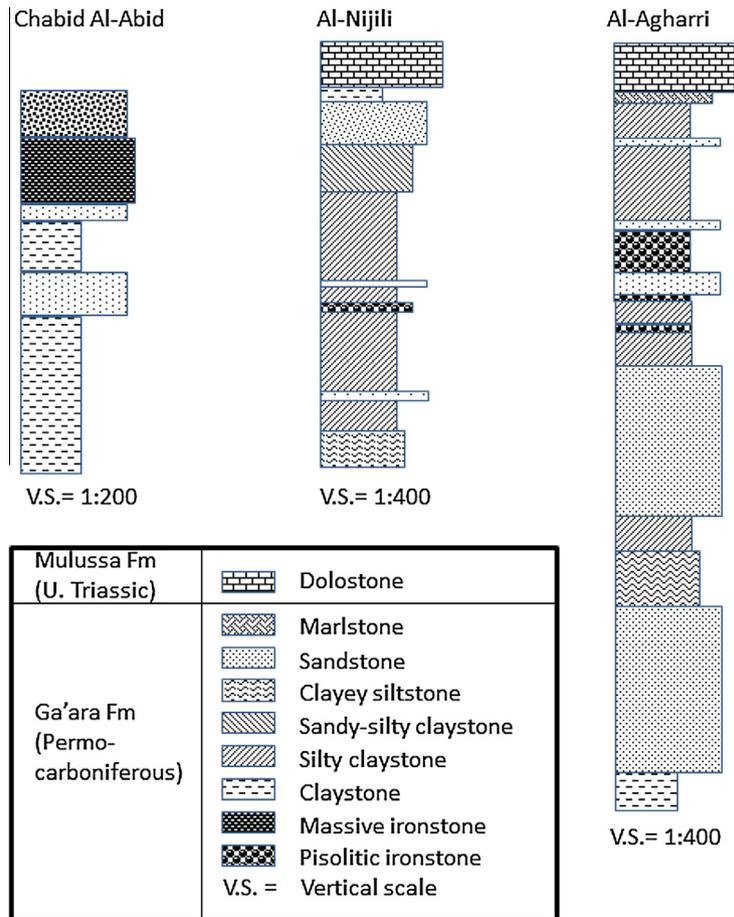


Fig. 2. Selected columnar sections of the upper part of Ga'ara Formation in Chabid Al-Abid at the western rim, and Al-Nijili and Al-Gharri at the southern rim of Ga'ara Depression.

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