Iron deposits in China: Distribution, types and tectonic setting

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All types of iron deposits have been recognized in China, but Banded Iron Formations (BIFs), skarn, Kiruna, submarine volcanic-hosted and Ti–Fe–(V) oxide deposits are the most economically imporant. However, the high-grade iron ores are predominantly from skarn, Kiruna and submarine volcanic-hosted types although BIFs occupy 48% of total iron reserves in China. The special feature can be ascribed to prolonged interaction of the Central-Asian, the Circum-Pacific and the Tethys–Himalaya systems or absence of strict cratons due to multiple tectonism. BIFs are mainly distributed in the North China Craton (NCC), and Neoarchean (ca. 2.5 Ga) metamorphic rocks are the most important hosting rocks, which are primarily meta-volcanic rocks and minor meta-sedimentary rocks. The submarine volcanic-hosted iron deposits are widely distributed in orogenic belts, mostly located in western China, including Tianshan, Beishan, Altay, and western margin of Yangtze Craton (YC). They formed in a considerable age range, from Proterozoic to Mesozoic, but with more than 70% formed in Late Paleozoic, and mostly related to subduction settings. Ti–Fe–(V) oxide deposits are predominantly associated with ca. 260 Ma mafic-ultramafic layered intrusions in the Panxi region, central part of the Emeishan large igneous province and Mesoproterozoic (ca. 1.8 Ga) anorthosite complex in the Chengde region of NCC. The Panxi region is the most important V and Ti ore cluster in the world, and has been genetically attributed to mantle plume event. In ontrast, the Mesoproterozoic anorthosite complex have been considered to be related to rift event in NCC. The skarn iron deposits are widespread, concentrally the uplift areas at the margin of down-faulted basins of Eastern China. The hosting rocks are mainly Early Cretaceous intermediate-felsic intrusions, which lithospheric extension following subduction of paleo-Pacific plate. Comparably, the Kiruna iron deposits, commonly associated with dioritic subvolcanic intrusions, are present in the Cretaceous terrigenous volcanic basins in the northern margin of YC, and they were formed in the same tectonic setting with those skarn iron deposits in the eastern China.

Lipid biomarkers in the sediments of Lake El Junco and their possible sources

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Lipid biomarkers contained in suspended particles and sediments from Lake El Junco, Galápagos demonstrate for the first time that all three races of the alga *Botryococcus braunii* (A, B & L) have co-existed intermittently during the last 460 years. *Cis* and *trans* C_{25}-C_{31} *n*-alkadienes and a C_{29} triene indicated race A, a series of $C_{34}H_{58}$ botryococcenes indicated race B, and a $C_{40}H_{78}$ hydrocarbon, *trans, trans*-lycopadiene indicated race L (Zhang *et al*., 2007) .

Other biomarkers include C_{25} HBIs from diatoms, long-chain alkenols, diols and a triol, keto-ols, hydroxy acids and keto acids. Saturated and monounsaturated long chain diols from C_{30} to C_{36} had terminal hydroxyl groups and hydroxyl groups between the ω16 and ω20 positions. Vicinal diols with hydroxyl groups at ω9 and ω10 were likely from the floating fern *Azolla*. C_{30} to C_{36} keto-ols, mid-chain hydroxy and keto acids had mid-chain functional groups at similar positions to the diols, suggesting common origins. The predominance of ω20-hydroxy acids and diols, together with 20,21- dihydroxy-nonacosanoic acid is indicative of an *Azolla* source, while ω16 and ω18 hydroxy acids and diols imply a microalgal source.

Long chain (C_{30}–C_{36}) *n*-chloroalkanes and chloroalkenes have a chlorine atom at the terminal position. The *cis* and *trans* alkenyl chlorides have double bonds near the middle of the hydrocarbon chain. The lipid chain lengths and the positions of functional groups imply a structural relationship between chloroalkenes and some alkenols, diols and (or) hydroxy acids that most likely derive from algae.

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