

GYMNOSPERMOUS FOSSIL WOOD FROM SUDAN

HARI K. MAHESHWARI

Birbal Sahni Institute of Palaeobotany, Lucknow

A gymnospermous fossil wood from the *Continental intercalaire* of Wadi Sedina, Sudan is reported. The wood has a large pith, some of the pith cells having mineral inclusions. The pitting on the radial walls of the tracheids is uni-to biseriate; cross-field pits are not preserved. Xylem rays are uniseriate and homogenous.

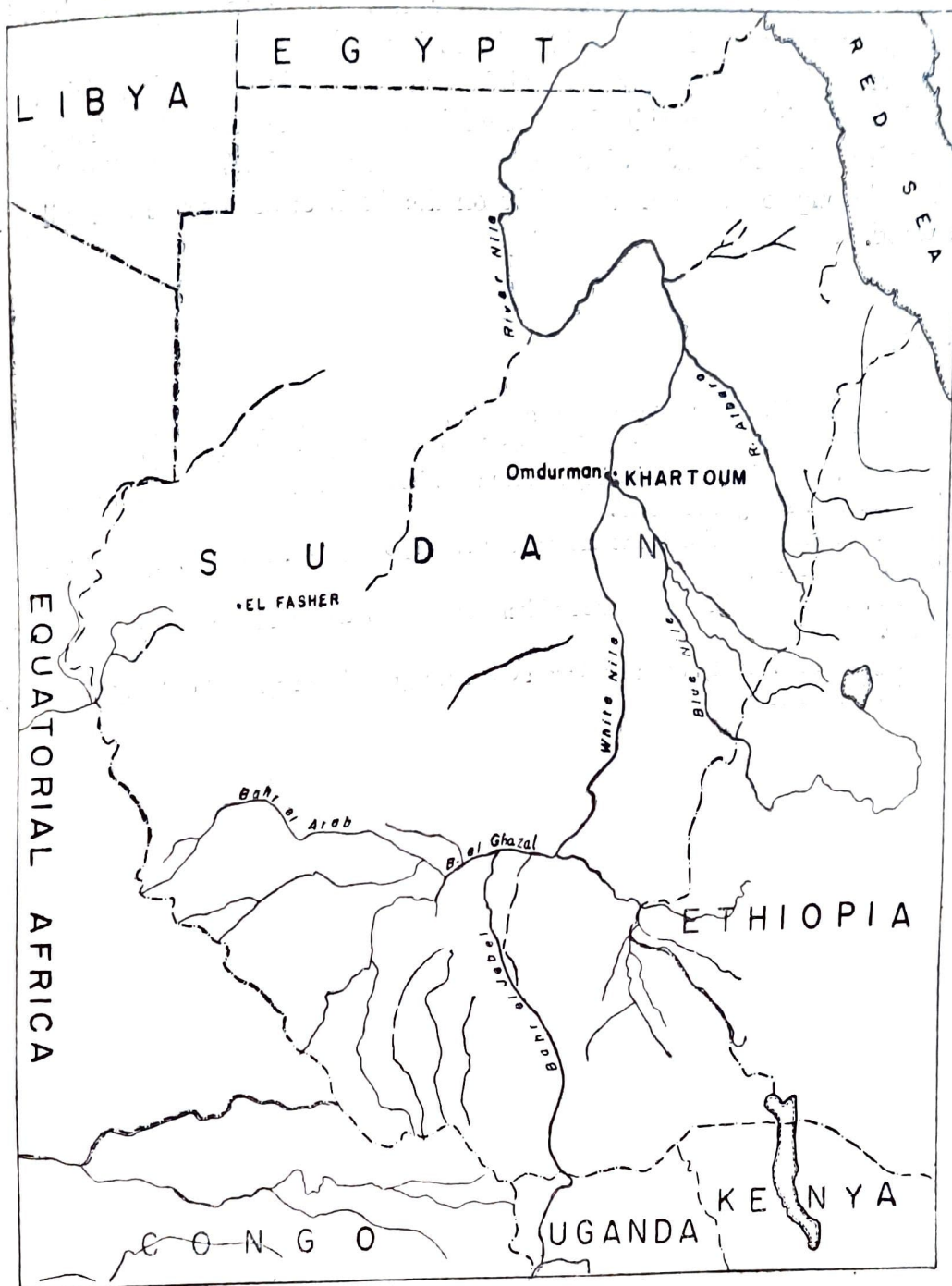
The fossiliferous succession of the Nubian sandstone in Sudan contains a quantity of silicified wood usually determined as *Dadoxylon*. Most are identified as coniferous. Information gathered from fossiliferous rocks, including plant remains shows that the formations represent a range from upper part of the Palaeozoic to the upper part of the Cretaceous (ANDREW, 1943; DELANY, 1952).

In December 1966, Mr. K. Sahni, the then FAO Forest Botanist, collected some pieces of fossil wood from Wadi Sedina, 6 km west of the town of Omdurman (Map. 1). Two pieces of fossil wood (Nos. 73 & 74) were sent to Birbal Sahni Institute of Palaeobotany for identification.

Both fossil logs are silicified and brown in colour. In specimen no. 73 the pith is represented by a cavity, the cells having disintegrated. Primary xylem is not preserved. The secondary xylem is compact, without growth rings and parenchyma. The radial pitting is rarely preserved, pits always being uniseriate.

Specimen no. 74 has pith and secondary xylem but primary xylem and cortical tissues are not preserved. The pith is large, 2.5 cm in diameter, parenchymatous and heterogeneous. The cells are isodiametric or oval, 55-92 μ in transverse diameter. In some of the cells the wall is upto 25 μ thick and the small lumen contains mineral inclusions. However, no concentric layering is seen in the walls as is usually found in sclerotic cells. Irregularly distributed in the pith are small canal-like openings bordered by 1-3 layers of small sized cells. As no radial section passing through one of these structures could be prepared, their exact nature remains doubtful. The pith is partitioned by irregularly arranged gaps, probably formed due to decomposition of tissue before or during preservation. Longitudinally the pith cells are 1½-2 times higher than broad and more or less rectangular. Distributed in between are 1-4 cells high rows of, 2-3 times broader than high, cells running towards the margin of the pith and probably continuous with the xylem rays.

In transverse section the tracheids are thickwalled, squarish, rectangular or polygonal with more or less circular lumen. There is no differentiation of spring wood and autumn wood. The tracheids measure 55-74 μ radially and 45-67 μ tangentially, double walls between the tracheids being 10-18 μ thick. Xylem parenchyma is absent. In tangential longitudinal section the xylem rays are uniseriate, homogeneous, 1-13 cells high, average height 3-4 cells; individual cells are 28-37 μ high and 18-28 μ broad. Very often the cell lumen is filled with a dark content. Tangential walls of the tracheids are smooth. Radial pitting is preserved only at few places. The pits are bordered, 18-26 μ in diameter, circular or very slightly flattened, usually uniseriate, rarely biseriate, in the latter case being more or less polygonal



and alternate. The pit pore is circular and usually delineated by mineral deposit. Crossfield pits are not preserved.

The specific identification of the present fossil wood is made difficult by the unsatisfactory preservation. The Djebel Dirra sandstones, 75 km east of El Fasher (in the Darfour) have yielded *Dadoxylon aegyptiacum* Unger (EDWARDS, 1926) which differs from the present fossil wood in having multiseriate radial pitting. The secondary xylem of the present wood compares with that of *D. leixirae* (BOUREAU, 1949) known from the Jurassic of Portugal and Morocco, but the latter is differentiated by the presence of resin parenchyma. *D. jurassicum* (BHARADWAJ, 1953) resembles in the absence of growth rings, and the presence of mostly uniseriate, rarely biseriate radial pitting and 1-11 cells high uniseriate xylem rays. However,

in *D. jurassicum* resin tracheids are present and the pith is small, with groups of sclerotic cells. *D. santalense* (SAH & JAIN, 1964), too, differs in having resin tracheids.

In Sudan, fossil gymnospermous wood is known to occur in association with *Weichselia reticulata* and *Frenelopsis hoheneggeri* in the Djebel Dirra Sandstones near El Fasher (EDWARDS, 1926). Though no leaf impressions have been reported from the Wadi Sedina beds, these most probably belong to *Continental intercalaire* on the basis of occurrence of fossil gymnospermous wood.

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