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CORUNDUM DEPOSITS FROM GEDRITITES OF KHAMMAM DISTRICT, ANDHRA PRADESH

PRECAMBRIAN meta-anorthosites in Tamil Nadu and gabbroid and ultrabasic rocks of Mysore contain corundum deposits. Corundum associates with sillimanite schists in Assam and similar rocks in Madhya Pradesh. The corundum, associated with gedritites at Lalapuram, Lakshmipuram and Sriramgiri in Wyra region of Khammam District (Andhra Pradesh) extends to a strike length of about 70 meters with a width of 30 meters. The corundum is being worked by individual prospectors on a very small scale. The gedritites, usually greyish white in colour are found in the hinges of NW plunging isoclinal anticlines exhibited by the Precambrian meta-gabbros and meta-anorthosites. The gedrite occurs as radiating crystals (Fig. 1) and have the following properties: $2V_\gamma = 82°–84°$, $D = 3·08$, refractive indices $\alpha = 1·628$, $\beta = 1·641$, $\gamma = 1·647$; cell parameters aA 18·55, bA 17·85, cA 5·30. The gedrite with 100 $Mg/Mg+Fe^{2+}+Fe^{3+}$ ratio of 84 indicates that the present amphibole is a magnesio-gedrite[3].

TABLE I

Chemical analyses of coloured corundums from Khammam District

	1	2	3	4
*SiO_2	0·72	0·69	0·80	0·58
Al_2O_3	96·85	97·65	97·72	97·80
†Traces in p.p.m.				
Cr	1750	840	570	88
Fe	4400	3000	2600	2400
Ti	750	400	400	400
Co	26	22	19	5
V	35	22	42	27
Ni	20	20	22	27
Mn	320	320	320	320
Cu	95	85	85	85
Mg	4200	2200	2000	2500
Ca	6500	6500	6000	7000
Mo	50	40	90	60
Ga	20	15	17	20

Ge, Cd—less than 10 and 15 p.p.m. respectively in all the samples.

1. Violet pink corundum from Lakshmipuram pit. 2. Pink corundum from Lalapuram pit. 3. Light pink corundum from Lalapuram pit. 4. White corundum from Lalapuram pit.

*SiO_2 and Al_2O_3—classical analysis.

†Quantitative trace elemental data determined on Jobin, $Yvon_{z-8}$; Large quartz—prism spectrograph at Hungarian Geological Institute using palladium as an internal standard.

Field observations indicate that the corundum in association with talc has confined to the shear zones (Fig. 2) parallel to the axial plane traces of the folds

FIG. 1. Radiating crystals of gedrite.

FIG. 2. Shear zones in gedrites.

in the gedrities. The corundums show fascinating colour variation from violet pink, pink, light pink to white. A few crystals are prismatic ranging upto 3 cm in length whereas others are flattened and wafer-like with a thickness of about 3 to 5 mm, characterised by hexagonal form. The chemical analysis of coloured corundums are listed in Table I. The higher the concentrations of Cr, Fe, Ti, and Co, the darker is the colour imparted to the corundums of the present investigation.

The gedrite relics in the talc confined to the shear zones suggest that talc is an alteration product from the gedrite along the shear zones as expressed by the following reaction :

Gedrite → Talc

$$3Mg_5Al_4Si_6O_{22}(OH)_2 \rightarrow 3Mg_3Si_4O_{10}(OH)_2 + 2MgO + 2SiO_2 + 2Al_2O_3$$

The liberated MgO and SiO_2 in the reaction have been fixed in chlorite, which occurs as a widespread accessory with talc, while the Al_2O_3 has crystallised into corundum. The association of corundum with tectonically emplaced gedritites along shear zones has the potentialities of being used as a criterion in geological prospecting of corundum in the Khammam region of Andhra Pradesh.

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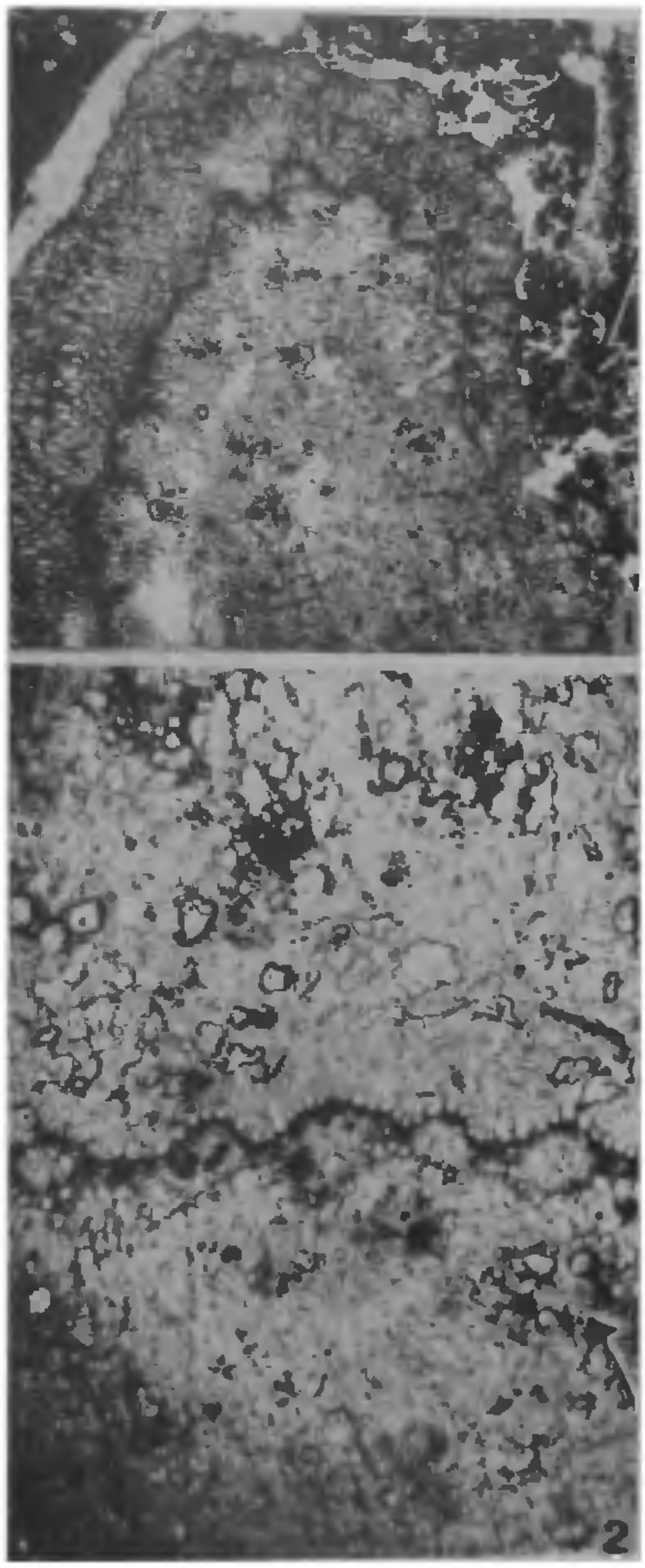
A FOSSIL AXIS (XYRIDACEAE) FROM MOHGAONKALAN

The fossiliferous chert, collected from the Deccan Intertrappean exposures of Mohgaonkalan, M.P., India, on breaking exposed an axis, a part of the leaf sheath, a bud and roots.

The axis is 1·2 to 2 cm in diameter and 2·5 cms in length. The cortex and the central cylinder are aerenchymatous with irregularly placed typical monocotyledonous vascular bundles (Fig. 2). The bundle sheath is two layered, the outer parenchymatous and inner fibrous. Two metaxylem vessels having scalariform thickening lie one on each lateral side of the bundle. The protoxylem vessels lie towards the centre and the phloem towards the periphery but above the xylem parenchyma which lies in between the metaxylem vessels. The cortex is separated from the central cylinder by a layer of large cells, which have characteristic 'U'-shaped thickening on their inner walls, known as endodermoid layer[3] (Figs. 1 and 2). It is followed by 3 6 cells thick sclerenchymatous beaded zone, which imbeds vascular bundles at regular intervals, the sclerotic cylinder[8] (Fig. 2). endodermoid layer and the sclerotic zone are hitherto known from fossil monocots : Cannace Cyclanthaceae[2], Heliconiaceae[6], Musaceae[1] Nymphaeceae[4].



Figs. 1–2. Fig. 1. T.S. axis showing cortex, central zone and roots (Arrow). × 6. Fig. 2. T.S. of axis magnified to show endodermoid layer, sclerotic zone and vascular bundle (Arrow). × 45.

Transverse section of the axis shows a part of leaf sheath and a number of roots which are present around the part of the axis (Fig. 1). In l.s. a root and a bud are seen to originate opposite to each other from the