medium range periodicity between 900 and 400 mb surfaces over west coast of India. However, the eddy sensible heat transport is dominated by short range periodicity over west coast between 900 and 400 mb surface, whereas at Mangalore the medium range periodicity in eddy sensible heat transport is equally effective.

The long range periodicity has been observed in eddy sensible heat transport at Calcutta between 550 and 350 mb surface, in eddy latent heat transport at Agartala between 550 and 600 mb and at Port Blair between 400 and 550 mb surface and in eddy momentum transport between 500 and 650 mb as well as between 750 and 850 mb surface at Agartala and at 300 mb and 400 mb surfaces at Calcutta and at Madras between 400 and 550 mb surface as well as below 700 mb at Madras and Port Blair. Thus, long range periodicity is usually observed over the extreme north of the east coast of India in the middle and the upper troposphere in eddy sensible and latent heat transport and in the lower and middle troposphere in eddy momentum transport. However it is observed at Madras and Port Blair in the middle troposphere in eddy latent heat transport and in the lower and middle troposphere in the eddy momentum transport. The short and medium range periodicities are well distributed throughout the east coast in eddy transport of sensible and latent heat as well as momentum.

Finally, we conclude that short and medium range periodicities are present throughout the east and west coasts of India between 1000 and 300 mb surface with different fluxes. The long range periodicity is relatively infrequently observed in lower and upper troposphere.

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EPR SPECTROSCOPIC STUDIES OF CALCIC-PLAGIOCLASES FROM THE ARCHAEAN ANORTHOSITES OF HOLENARASIPUR, KARNATAKA CRATON, SOUTH INDIA

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THIS communication presents a study of the structural state of calcic-plagioclases from the terrestrial Archaean anorthosites of the Holenarasipur belt in Karnataka Craton, South India, by an electron paramagnetic resonance (EPR) spectroscopic study of Fe^{3+} ions substituting for Al^{3+} tetrahedral sites in the structure. The six-point Rb/Sr whole-rock isochron data provided by Kutty *et al.*[1] for the Holenarasipur anorthosites indicate that they are 3095 Ma old and are of Archaean age.

In the three representative EPR spectra of the 23 calcic-plagioclases studied from the 3095-Ma-old Archaean anorthosites, we observed the Fe^{3+} spectral component occupying the distorted tetrahedral sites, indicating the disordered structural state of plagioclases attained during the crystallization event, similar to that of lunar plagioclases. In the study of lunar plagioclase Weeks[2] not only observed the Fe^{3+} signal at $g = 4.27$ in the EPR spectrum but also recognized Ti^{3+} signal at $g = 1.98$. We have been able to ascribe the absence of Ti^{3+} spectral component in the plagioclase of Holenarasipur anorthosite to the presence of titanium in the tetravalent state based on the recognition of Ti^{3+} signal at $g = 1.998$ in the EPR spectrum of plagioclase heated to 650°C under reducing condition.

EPR spectra of Fe^{3+} ions in Ca-plagioclases

EPR first-derivative spectra were taken at 78 K on a Varian E-109 E-line X-band spectrometer at about 9.2 GHz. The phase-pure powder samples examined weighed about 30 mg. Three representative EPR spectra of the 23 plagioclase samples studied from the Archaean anorthosites of Holenarasipur are presented in figure 1 and are interpreted.

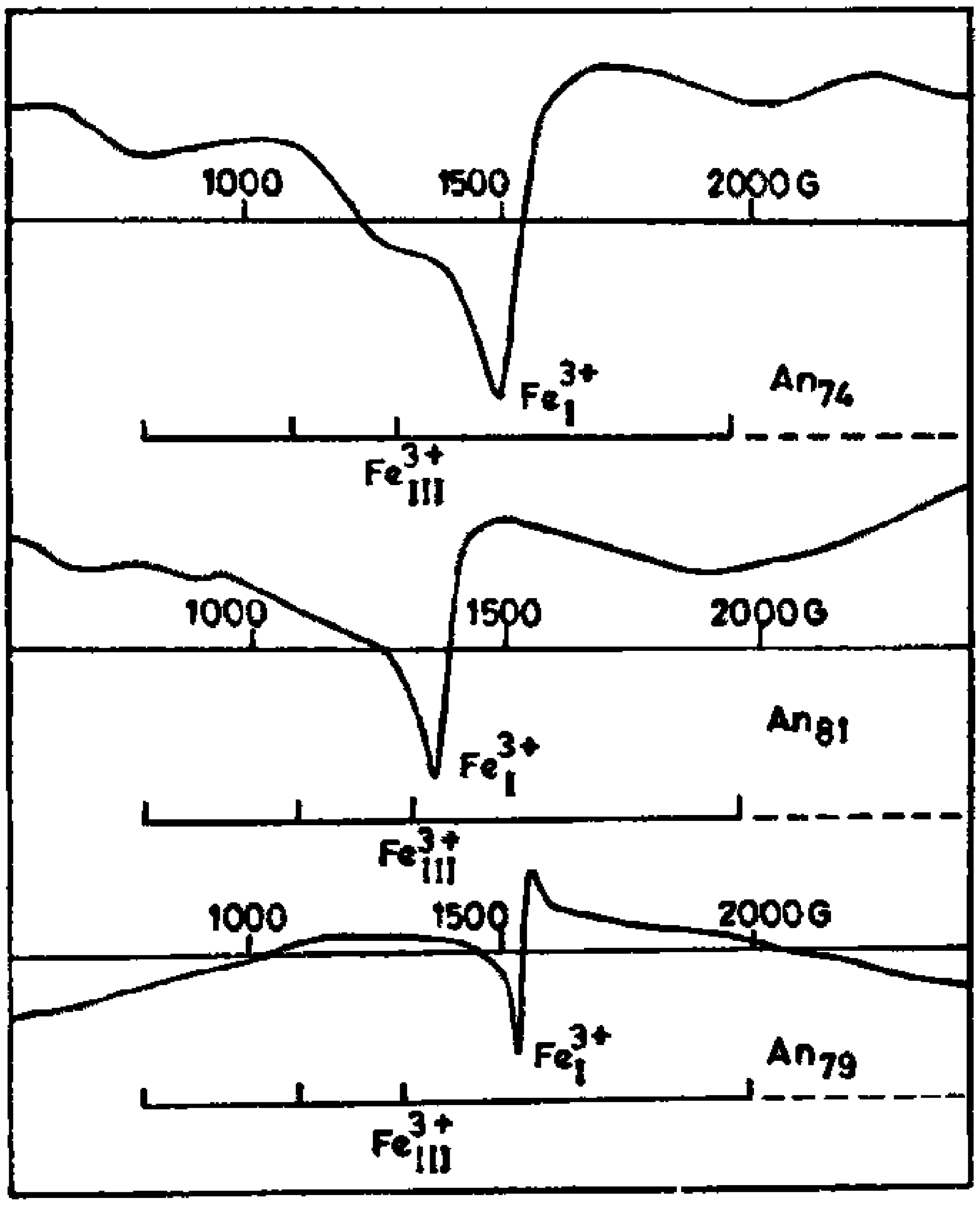

Figure 1. Typical EPR spectra for Fe^{3+} in plagioclases from Holenarasipur anorthosites (February, 9.2 GHz; temperature, 78 K).

EPR studies of Lesnov *et al.*[3] on calcic-plagioclases and of Hofmeister and Rossman[4] show that the number of sites for Fe^{3+} ions depends on structural state rather than on plagioclase chemistry. The linear correspondence of EPR double-integrated intensities with optical peak areas shows that all Fe^{3+} ions are tetrahedrally co-ordinated in both calcic-plagioclases and disordered K-feldspars. As the Fe^{3+} ions enter the plagioclase structure substituting for the Al^{3+} ions, Fe^{3+} follows Al^{3+} as regards the Al–Si distribution among the tetrahedral sites. Based on this it has been possible to use EPR of Fe^{3+} for investigating order–disorder relations in calcic-plagioclases. The different types of Fe^{3+} sites existing in plagioclases are found to be related to the structural state. This was established[3] by a study of 150 calcic-plagioclases from the gabbro-anorthosite suite of rocks. The three different types are: Fe^{3+}(I) with effective g-factor near 4.3; Fe^{3+}(II) with $g_1 = 4.5$, $g_2 = 3.84$ and $g_3 = 3.65$; Fe^{3+}(III) with $g_1 = 6.88$, $g_2 = 5.04$, $g_3 = 3.69$, $g_4 = 3.48$ and $g_5 = 2.2$.

Figure 1, which shows three typical EPR spectra of powdered calcic-plagioclases from Holenarasipur, also shows the relative intensities, linewidths and g-values of the three different Fe^{3+} sites. The characteristic features of these EPR spectra are described.

The EPR spectrum of specimen An_{74}, exhibits signals representative of site Fe^{3+}(III), displaying broad linewidth and lower signal intensity compared to signals of sites Fe^{3+}(I) and Fe^{3+}(II). This type of spectrum is observed only in one specimen.

The EPR spectrum of specimen An_{81} shows broad linewidth and very low intensity for Fe^{3+}(III) in contrast to Fe^{3+}(I). This can be attributed to Fe^{3+} occupying distorted tetrahedral sites converging into a complex site in calcic-plagioclase structure.

The EPR spectrum of specimen An_{79} actually comprises a sum of a complex Fe^{3+}(I). This complex set Fe^{3+}(I) is indicative of increasing disorder of the Fe^{3+} surroundings, as interpreted by Lesnov *et al.*[3] Their detailed investigations show how Fe^{3+} ions substituting for Al^{3+} in various sites in calcic-plagioclases cause variations in their structural state.

It can be inferred that EPR spectroscopic studies of plagioclases from the Archaean anorthosites of Holenarasipur reflect their disordered structural states due to Fe^{3+} ions occupying the distorted tetrahedral sites in the structure.

EPR spectrum of Ti^{3+} in plagioclase

In the EPR spectrum of lunar plagioclases, unlike those from the plagioclases of terrestrial Archaean Holenarasipur anorthosites, Weeks[2] observed not only the Fe^{3+} signal at $g = 4.27$ but also recognized the spectral component due to Ti^{3+} at $g = 1.98$.

In order to account for the absence of Ti^{3+} spectral component in the plagioclases of Holenarasipur anorthosites, EPR spectra of terrestrial plagioclase samples (i) unheated, (ii) heated under oxidizing condition, and (iii) heated under reducing condition were examined (figure 2). The Ti^{3+} spectral component shows up only in the plagioclase heated under reducing condition. The absence of Ti^{3+} spectral component in the unheated sample and in the sample heated under oxidizing condition can be ascribed to the presence of titanium in the tetravalent state in plagioclase.

The absence of Ti^{3+} spectral component in the terrestrial Archaean anorthosites of Holenarasipur indicates that the plagioclase crystals were formed under oxidizing conditions, unlike those of lunar plagioclases, which must have crystallized under reducing conditions.

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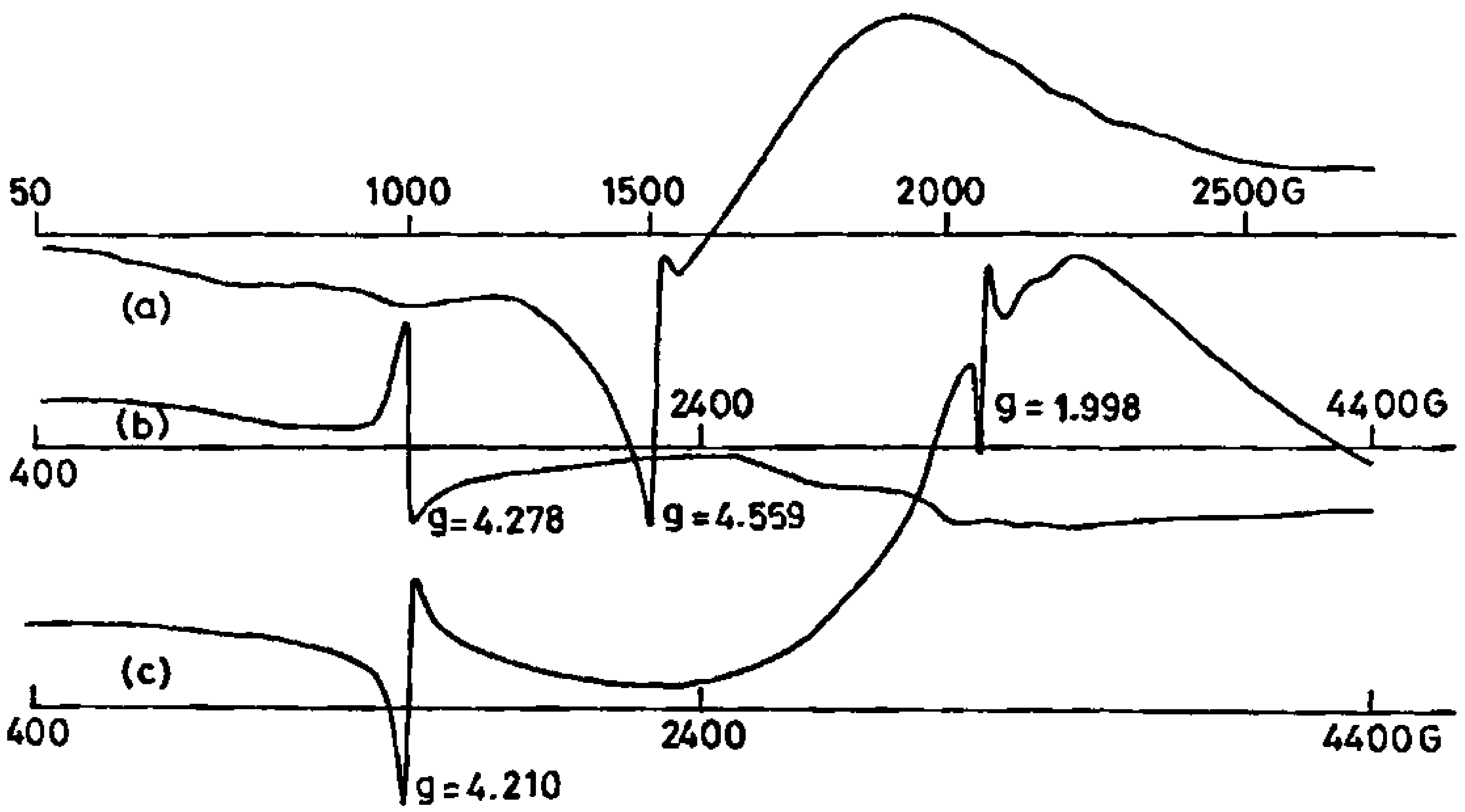

Figure 2. EPR spectra of a plagioclase from Holenarasipur (frequency, 9.2 GHz; temperature 78 K. (a) Untreated sample, (b) Oxidized at 650°C, (c) reduced at 650°C.

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A NEW SPECIES OF *SCYTALIDIUM* FROM INDIA

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DURING our studies on litter decomposition of *Tectona grandis* in the forests of Madhya Pradesh a new species of *Scytalidium* was isolated.

On microscopic examination and comparison, the present fungus was found to be distinct from the three known species of *Scytalidium* in having bigger conidia[1,2]. Therefore the fungus is described here as a new species of *Scytalidium* from India. The specific epithet of this collection has been given after the name of host plant.

Scytalidium tectonae sp. nov. Soni, Jamaluddin and Rajak

Colonies effuse, dark, blackish brown to black; hyphae mid- to dark-brown, smooth, 5.0–7.5-μm thick; conidiogenous cells fragmented and forming arthroconidia; integrated, intercalary conidia of two types—hyaline, thin-walled, cylindrical or oblong, unicellular to bicelled, in chains, 5.0–17.5 × 3.75–5.0 μm in size; thick-walled, oblong, broader, doliform or broadly ellipsoidal, 0- to 3-septate, 7.5–20.0 × 3.75–7.5 μm in size (figure 1).

Coloniae effusae, fuscae ad aterae; cellulae conidigenae fragmentae et formantes arthroconidia; conidia integra, intercelaria, bityporum; conidia determinata, cylindrica, doliiformia, oblonga vel ellipsoida, hyalina, tenuitunicata, unicellularis ad bicellularis, in catenis 5.0–17.5 × 3.75–5.0 μm, conidia crassitunicata, oblongata, doliformia vel late ellipsoida 0–3-septata, 7.5–20.0 × 3.75–7.5 μm.

Culture has been deposited at CMI, Kew, under accession no. IMI 283013 and also in the Regional Forest Research Centre, Jabalpur, India.