

# Note on the unusually high concentration of Rubidium in a lithium mica from Govindpal area of Bastar District

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## Abstract

During preliminary investigations of lithium mica from Govindpal area of Bastar District, a variety very rich in  $\text{Rb}_2\text{O}$  (6.98%) was noted and is being reported here for the first time. It is colourless with fair relief. Extn. angle  $6^\circ$ ;  $2V$   $42^\circ \pm 1^\circ$ . The high rubidium content is attributed to extreme differentiation of the host rock and extensive diadochic relationship of rubidium with potassium.

## Introduction

In the present communication, the author records the presence of a lithium mica with a high concentration of rubidium ( $\text{Rb}_2\text{O}$ , 6.98%) from Govindpal area (lat.  $18^\circ 42' \text{N}$ , long.  $81^\circ 54' 40'' \text{E}$ ) of Bastar District.

This lithium mica is confined to pegmatite offshoots, where it is associated with mostly quartz and small grains of cassiterite. It is not found in the main pegmatite intrusion which contains only normal lepidolite.

## Mineralogy and Chemistry of Lithium Mica

The lithium mica is light grey in colour. It occurs in tabular radiating crystals. Under the microscope it is colourless, with fair relief and shows second and third order interference colours. Maximum extinction angle on cleavage traces is  $6^\circ$ .  $2V$  is  $42^\circ \pm 1^\circ$ .

The chemical analysis has been presented in the following Table.

TABLE I  
CHEMICAL ANALYSIS OF LITHIUM MICA  
Specimen No. G.O.F.—1

$\text{SiO}_2$	...	45.82
$\text{Al}_2\text{O}_3$	...	29.56
$\text{Fe}_2\text{O}_3$	...	1.60
$\text{FeO}$	...	1.15
$\text{MnO}$	...	1.86
$\text{MgO}$	...	0.11
F	...	2.55
$\text{Na}_2\text{O}$	...	1.55
$\text{K}_2\text{O}$	...	5.10
$\text{Li}_2\text{O}$	...	1.06
$\text{Rb}_2\text{O}$	...	6.98
$\text{Cs}_2\text{O}$	...	0.11
$\text{CaO}$	...	0.50
$\text{H}_2\text{O}^-$	...	0.17
$\text{H}_2\text{O}^+$	...	1.90

Analyst: B. P. Gupta

## Discussion

The first chemical analysis of a lepidolite from Bastar District was given by Dutta Roy *et al.* in 1951. The rubidium percentage was not estimated by them, though spectroscopic examination revealed a fair amount of rubidium.

Rubidium in lepidolite may exceed several per cent (Heier and Adams, 1964). Useful Rb-bearing lepidolites range from about 1.0 to 4.6%  $\text{Rb}_2\text{O}$  (Fairbridge, 1972). The lithium mica has also been analysed for its rubidium content by many other workers including Arhens & Gorfinkle (1951), but the author is yet to come across a recorded occurrence of lithium mica with such a high content of rubidium. As compared to the average of 26 analyses of lepidolite (Heinrich *et al.*, 1953) the  $\text{Rb}_2\text{O}$ ,  $\text{Na}_2\text{O}$  and  $\text{MnO}$  percentages are much higher, whereas the  $\text{Li}_2\text{O}$  and F percentages are lower. The light grey colour of lithium mica has been attributed to low Mn/Fe ratio.

The pegmatites of Govindpal area have been emplaced in the metabasic sills intrusive into the Bengpals. The Palim granite in the neighbourhood which is a non-foliated biotite granite appears to be responsible for the pegmatitic activity and subsequent pneumatolytic deposition of lepidolite (Ramaswamy, *et al.*, 1976). The formation of incipient zones containing lepidolite fluorite, and cleavelandite near to the quartz cores in pegmatites has been attributed to the effects of pneumatolysis (Deshpande *et al.*, 1976).

Rb content in mica increases with increasing 'differentiation' of the host rock and is at a maximum in the late stage pegmatite K-minerals. This is supported by the confinement of rubidium-rich lithium mica of the area in pegmatite offshoots. Mainly because of larger ionic size, Rb is enriched in low temperature K-minerals and in fractional crystallization it is concentrated in the residual liquid. When a rock system undergoes differentiation, Rb is expected to be concentrated relative to K in the 'felsic' fractions (Heier and Billings, 1970).

The lithium mica or rubidium muscovite occurs exclusively in late stage residual magma and usually crystallizes in granite pegmatite. It has also been reported from high temperature veins of granite pegmatite associated with tin mineralization (Deer *et al.*, 1967).

The results obtained from the calculation of structural formula of the analysis on the basis of 24 (O, OH, F) suggest it to be lithian mica with low Si (6.658 atoms) and Li (0.578 atoms). The x-ray studies, which are in progress, will also be taken into consideration to determine the exact position of the mineral amongst light micas. In this connection observation of Heier and Billings (op. cit.) that 'maximum Rb concentration are found in muscovites of pegmatites which grade into lepidolites' is important.

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## On the occurrence of *Terminalia* wood fossil from Coimbatore District, Tamil Nadu

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### Abstract

The note records the occurrence of *Terminalia* wood fossils in a sub-recent alluvial deposit on the northern bank of river Noyil in Coimbatore District, Tamil Nadu.

### Introduction

Remains of fossilised wood have been observed in the course of hydrogeological survey, in a narrow elongate patch of sub-recent alluvium, on the northern bank of river Noyil (Lat. 11°6'20"N; Long. 77°16'20"E) northwest of Mangalam village, at an altitude of 313 metres above mean sea level and about 0.55 metre below ground level (see Map). The fossil wood pieces are disposed horizontally in the sandy alluvium five to eight metres in thickness. The horizontal disposition of the fossil wood pieces suggests that they were transported.

The fossil wood has been identified by Birbal Sahni Institute of Palaeobotany, Lucknow, to be the genus *Terminalia*. *Terminalia* genus are Angiosperms of the family *Combretaceae*—the common *Terminalias* being *Terminalia chebula* Retz., *Terminalia bellirica* Roxb., and *Terminalia paniculata* Roth. *Terminalia* are known from Cuddalore series, which are considered to be of Mio-Pliocene age. The *Terminalia* fossils collected and examined from Mangalam are sub-recent and are preserved by normal silicification. The fossils studied by the Physical Research Laboratory, Ahmedabad, indicated that there is no carbonaceous matter left over, due to the total replacement of the same by silica.

Soil samples, collected between levels (i) 30–40 cm, (ii) 40–50 cm, (iii) 50–55 cm, and (iv) 55–60 cm, below the ground level revealed that they are poor in pollen content. Though the fossilised tree is identified as *Terminalia*, pollen of any *Terminalia* or other *Combretaceae* were not found in the samples. The *Terminalia*