

# THE GRANUM OF PHASEOLUS VULGARIS CHLOROPLAST

by

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## INTRODUCTION

The ultra structure of the chloroplast in higher plants revealed by evidences from recent electron microscopic studies has been discussed by some investigators, e.g. ( Granick, 1955 and Rabinowitsch, 1957 ). The general feature of these energy transducers is that they are lamellated 70 — 200 Å thick, either running through the whole chloroplast or forming cylindrical stacks (grana) perhaps 2 μ thick suspended in the stroma ( Rabinowitsch, 1957 ).

In the present note is presented a micrograph of the granum of *Phaseolus vulgaris* chloroplast and a description of the ultrastructure of the granum. A chloroplast from the middle parenchymatous tissue of the developing green immature seed coat was examined. The material has been fixed in 1% Os O<sub>4</sub> for 15 minutes and embedded in araldite. Ultra thin sections (300 Å) were made. The granum was examined under a high magnification of the electron microscope (×150,000).

## THE GRANUM ULTRASTRUCTURE

Fig. 1 shows a granum in cross section. The granum is 6600 Å in diameter and 4000 Å in height. It is composed of 10 fine lamellae. Each lamella is 130—200 Å thick. The lamellae in *Phaseolus vulgaris* granum are thicker than those of *Zea mays* (Vatter, 1955), where the lamella thickness amounts to 100 Å. The intergranular lamellae are dark coloured, interpreted as richer in lipoids which take up more Os O<sub>4</sub> than proteins. The interlaminar material contains less lipoids, and is thus light coloured. The interlaminar material has an average thickness of 130 Å. It shows

uniseriately arranged fine capillaries which have not been noticed in the fine and clear illustrations of the granum in *Zea mays* by Vatter (1955) or by Mercer ( in Whittingham, 1963 ).

*REFERENCES*

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