

# Density-shifts of Membranous Organelles in Synchronous *Chlorella sorokiniana* Dependent on Nitrogen Starvation

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## Summary

Membranous compounds of *Chlorella sorokiniana* were separated and identified on sucrose gradients by the method already used for higher plants. The inhibition of plasmalemma  $Mg^{2+}/K^{+}$  ATPase by  $Na_3VO_4$  was confirmed as a tool for plasmalemma (PL) identification. Dependent on the length of N-starvation all identified membranes shifted to lower densities and the protein/lipid ratio dropped from 0.300 to 0.057. The most obvious shift was observed for mitochondria. Refeeding with  $NO_3^-$  results in an increase in the density which finally reaches that of the control. These results are discussed in view of a mobilization of membrane proteins.

*Key words:* *Chlorella* – isopycnic centrifugation – nitrogen starvation – membranes.

## Introduction

The method of isopycnic sucrose gradient centrifugation was used for the separation of membranes from higher plants (review by Quail, 1979). This well known technique was transferred to Desmidiaceae by Stabenau (1978).

In this paper we report a successful use of this method to demonstrate reversible density shifts of membranes from *Chlorella* organelles caused by both nitrogen starvation and recovery from nitrogen deficiency by feeding nitrate.

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# The Effect of $NO_2$ -Fumigation on Aseptically Grown Spruce Seedlings

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## Summary

Spruce seedlings were cultivated aseptically, in gastight containers in which the shoot and root areas were separated. Fumigation with 500 ppb  $NO_2$  (11 weeks) increased the nitrate content, the metabolic activities of the nitrate assimilating enzymes and glutamine synthetase only in the shoot. In the roots the nitrate reductase activity was reduced (50%) while glutamine synthetase activity remained unchanged. No effect of the fumigation was observed on the growth of lateral roots. The data are discussed with regard to detoxification of  $NO_2$  via the nitrate assimilating pathway in the shoot. It seemed as if the enzymes of nitrate reduction were under substrate limitation in the shoot of spruce seedlings.