

Fig. 1. Dry weight, rubber, protein and total carbohydrate per plant. Complete nutrient (Compt.) and minus micro-nutrient element (-Mic. Nut.) treatments given for light (L) and dark (D) cultures

Although no leaf symptoms which could be attributed to a mineral deficiency were noted, a lack of micro-nutrient elements produced shorter plants. The dry weights of the dark-grown plants varied little over the duration of the experiment; but those in light increased, as expected. The results indicated that the rubber content per plant was greater for seedlings in light than in the dark and that the relative effect of light intensity on rubber content was greater than that of nutrient status. The total dry weight, carbohydrate and protein contents of the plants deprived of micronutrient elements were lower than those of plants supplied with complete nutrient (Fig. 1). The amount of rubber per plant, deprived of micronutrient elements, was also for the light-grown plants lower than for the complete nutrient plants (Fig. 1). In general, plants supplied with nutrient treatments (3) (minus phosphorus) and

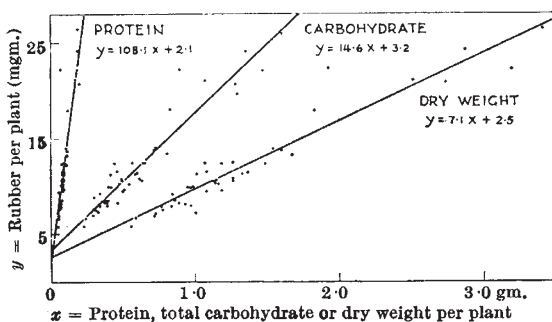


Fig. 2. Variation of rubber with protein content ($r = 0.901$, $P < 0.001$), total carbohydrate content ($r = 0.956$, $P < 0.001$) and dry weight per plant ($r = 0.960$, $P < 0.001$), irrespective of mineral status, light intensity or sampling dates

(4) (water only) showed similar variations to those of treatments (1) (complete) and (2) (minus micro-nutrients), respectively, and values for these treatments are not shown in Fig. 1.

The dry weight per plant and the amounts of carbohydrate and protein per seedling bore close relationships to the amount of rubber present (Fig. 2). The positive correlation between rubber and each of these variables held for both light- and dark-grown plants. However, the correlation obtained in respect of total carbohydrates, for the dark-grown plants, was almost entirely accounted for by the crude fibre fraction, whereas the hydrolysable carbohydrates showed a negative correlation to rubber, but this was not significant. The results presented in Fig. 2 do not permit any conclusion other than that the production of rubber is closely allied to the growth of the plant; whether rubber is a food reserve or a waste by-product of growth processes still remains to be resolved.

Fuller details of these investigations will be communicated to the *Journal of the Rubber Research Institute of Malaya*.

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Preservation of *Nitrosomonas*

In a communication under this title in *Nature* of April 13, Mr. K. Gundersen concludes that preservation under paraffin oil seems to be more promising than any other method used. He was evidently not aware that I mentioned in an article in *Nature* of February 12, 1955, the use of mineral oil for the maintenance of crude and pure cultures of nitrifying bacteria and briefly discussed the results of my experiments in a paper in the annual report of the Experimental and Research Station, Cheshunt, for 1954. Mr. Gundersen did not obtain the results he expected from this method because he did not give his cultures a chance to develop, but put them under paraffin oil immediately after inoculation. My cultures, which were only partly purified, were fully developed and showed peak reactions for nitrite and nitrate, respectively, before they were covered with paraffin oil. They were then kept at room temperature in a cupboard for from three to seven months. Subcultures made after these times developed into fully active cultures; however, the speed of their development differed, probably depending on the strains and the impurities present.

I also isolated, as can be seen from the above-mentioned report, a pure culture of *Nitrosomonas*. This culture was lost owing to circumstances described in the report.

When the Research Station moved to Littlehampton, I had to discontinue the work on nitrifying organisms, and am now engaged on microbiological research of a different type.

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