TRANSLOCATION OF FERROCYANIDE IN THE SIEVE-TUBES OF PALMLEAFLETS

by

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In 1933 the author published an article on the bleeding of palm trees. One of the facts observed was the transport of a solution of ferrocyanide by the sieve-tubes of the bleeding stalk of an inflorescence. However, it was still a problem if this could be induced if conditions were more natural, the bleeding stalk being severely bruised and not in normal condition.

Further experiments were therefore made by putting leaflets of the coconut-palm in an 1% aqueous solution of ferrocyanide. A fresh cut was made before the leaflets were inserted. After 10 to 15 minutes slices were cut out of the midribs at different levels and put into alcohol to which a few drops of ferrichloride had been added. The ferrichloride causes a deposit of prussian blue to develop in all places where ferrocyanide is present.

In many cases the ferrocyanide was transported by the water-vessels and an intense blue colour was observed in them and also in the sieve-tubes. However, this was not always the case as sometimes the vessels had been clogged by the airbubbles sucked in after cutting. In these cases a blue colour could often be observed in the sieve-tubes, at the same time being absent in the xylem vessels.

In an experiment made by placing parts of leaflets upright or upside down in the ferrocyanide solution showed that transport of the ferrocyanide in the sieve-tubes was possible in both directions.

These experiments were especially successful during dry weather and a transport covering a distance of 5 to 10 cm could be observed in some cases. The slices were cut out at 5 cm interspaces. During the rainy season in Macassar, after days of very heavy showers and no sunshine a number of leaves were cut and kept in the solution. Transport was not observed neither in the xylem vessels, nor in the sieve tubes.

In concluding from the facts observed, it is most probable that the transport of ferrocyanide in sieve-tubes is the result of sucking forces of the living tissue. When the water vessels are clogged by airbubbles, the water is sometimes sucked in by the phloem and with this water traces of ferrocyanide also enter the sieve-tubes and are transported, so that they can be traced at higher levels. This will explain the fact that in cases of saturation no transport is possible and that if transport occurs it can be observed in both directions.

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LITERATURE

P. M. L. TAMMES, 1933. Observations on the bleeding of Palm trees. Rec. des Trav. Bot. Néerl. Vol XXX.