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# TRANSVERSE CONNECTIONS BETWEEN CORTEX AND TRANSLOCATING MEDULLA IN LAMINARIA DIGITATA

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## SUMMARY

The translocating medulla is connected with the cortex in the cauloid by transverse filaments. The connection is a large pit with a cortical cell. The filaments are septate. The pit membrane and the thin septa are traversed by many plasmodesmata. Pits are also observed between cortical cells with a membrane and many plasmodesmata.

Long-distance translocation in *Laminaria* proceeds through the medulla, as was observed by autoradiography by SCHMITZ, LÜNING & WILLENBRINK (1972). The cortex and the meristoderm form a symplast by numerous pit connections, which were found in several species (SMITH 1939, BISALPUTRA 1966).

The connections between medulla and cortex are formed by transverse filaments (e.g. SMITH 1939). We investigated by electron microscopy how these transverse filaments were connected with the cortex in the cauloid. The cauloid was fixed in $KMnO_4$ after killing by freezing. It was embedded and cut as described by VAN WENT & TAMMES (1972).

It was observed that these filaments are connected through a pit with a cortical cell (*Plate 1*). The pit membrane has many plasmodesmata. The transverse filaments are septate, the septa are thin membranes, also with many plasmodesmata. These transverse filaments contain protoplasm and organelles. In the region of the connections with the cortex, pits with membranes and plasmodesmata were found between the cortical cells.

Thus symplastic connections exist in *Laminaria* between medulla and cortex of the cauloid.

## REFERENCES

BISALPUTRA, T. (1966): Electron microscopic study of the protoplasmatic continuity in certain brown algae. *Can. J. Bot.* **44**: 89–93.

SMITH, A. S. (1939): The comparative histology of some Laminariales. *Am. J. Bot.* **26**: 571–585.

SCHMITZ, K., K. LÜNING & J. WILLENBRINK (1972): $CO_2$ Fixierung und Stofftransport in bentischen Marinen Algen II. Zum Ferntransport $^{14}C$ markierten Assimilate bei Laminaria hyperborea und Laminaria saccharina. *Z. Pflanzenphysiol.* **67**: 418–429.

WENT, J. L. VAN & P. M. L. TAMMES (1972): Experimental fluid flow through plasmodesmata of Laminaria digitata. *Acta Bot. Neerl.* **21**: 321–326.

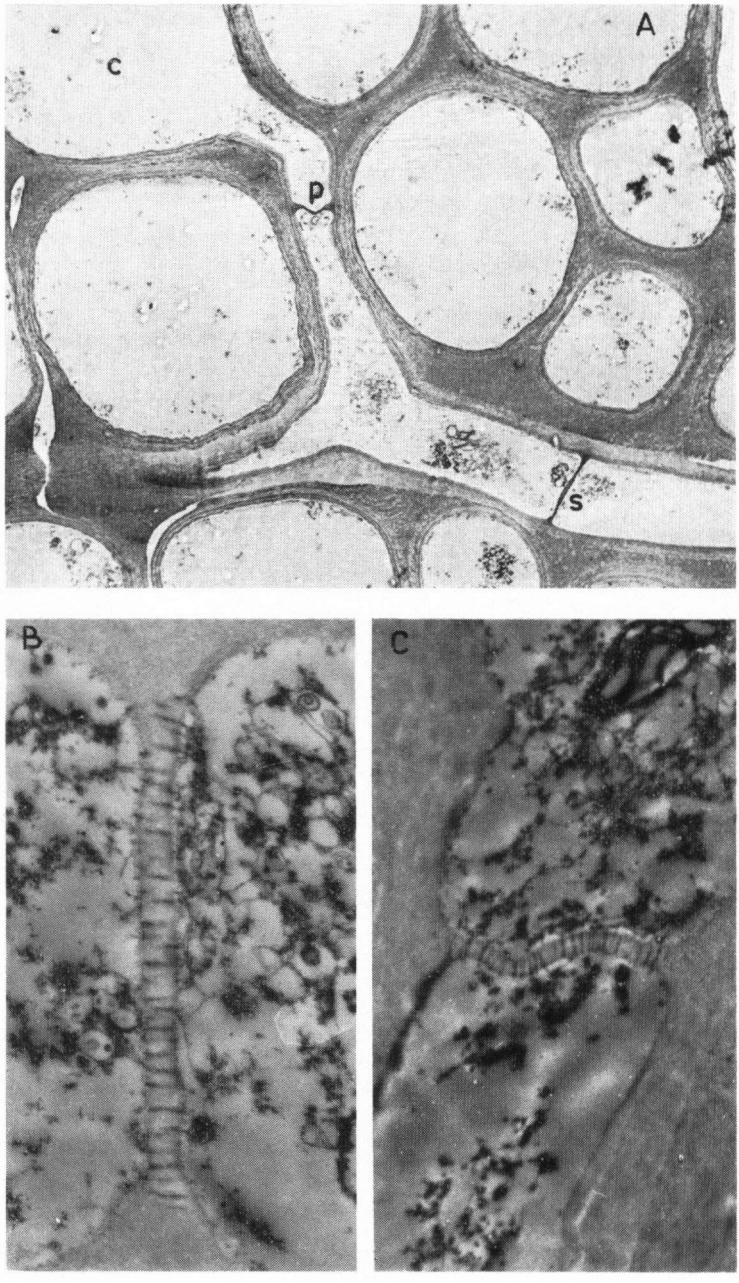


Plate 1.A. Transverse filament connected with the cortical cell c, with pit membrane p and septum s, cross section of cauloid × 1400. B. Enlargement of a pit membrane × 22800. C. Enlargement of a septum × 14000. Plasmodesmata visible in the membranes of B and C. Fixation in $KMnO_4$ after killing by freezing.