Formation of Buds in Leaves of *Atropa belladonna* L. in the in vitro Culture

The technique of tissue culture enables us to study the process of regeneration of whole plants from almost all parts of the plant body. Reports of the development of embryos and buds from single cells, tissues and organs have been numerous during the last few years[1]. However, the only examples of the in vitro formation of embryos and buds in leaves of flowering plants concern the pallisade cells of *Macleaya cordata, Nicotiana tabacum* and the epidermal cells of *Dendrophtoe falcata*[2–4].

Leaves (whole or cut into 2 transverse parts) of *Atropa belladonna* about 3 cm in length obtained from seedlings grown in vitro were used as the experimental material (Figure 1). They were inoculated on LINSMAIER and SKOOG medium[5] in 3 combinations: A) without kinetin and IAA; B) with IAA (2 mg/l); C) with kinetin (4 mg/l) and IAA (2 mg/l).

On A-medium no shoot buds were formed even after 10 weeks of culture. On B-medium only numerous roots arose from leaves. On C-medium 3–5 weeks after inoculation numerous buds developed from various points on the leaf surface (Figure 2). Root formation was almost completely inhibited. In cases where leaves were cut into parts, callus formation took place at the injured sites. Subsequently, numerous buds arose from the callus (Figure 3). When leafy shoots, developed from buds, were transferred to a fresh medium, they multiplied and produced many new shoots. When small stem segments (about 0.3 cm in length) of the leafy shoots were transplanted, they produced seedlings. However, rooting was suppressed and at the radicular end a bunch of buds appeared under the surface of the medium (Figure 4). When buds were transplanted on B-medium they developed seedlings which, at the radicular end, produced only roots.

Histological examinations of the leaves showed that the cells of the pallisade layer divided and either became directly organized into shoot buds without callusing or proliferated into callus, the cells of which subsequently differentiated into buds.

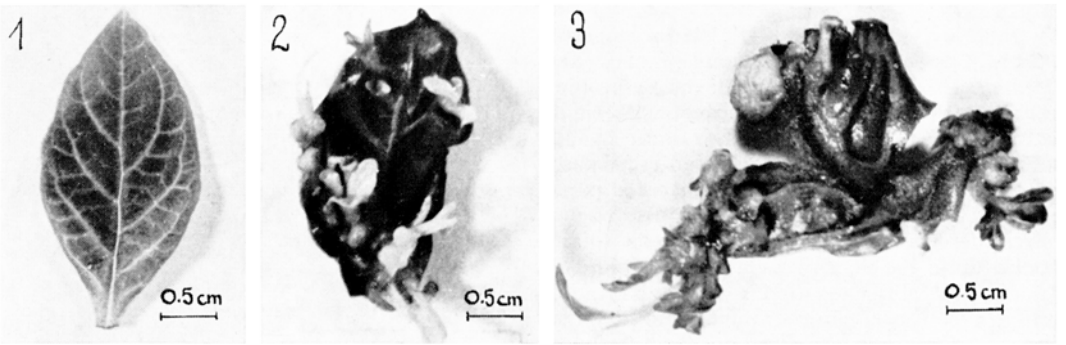

Fig. 1. A leaf at the time of inoculation.

Fig. 2. Shoots arising from a leaf.

Fig. 3. Shoots arising from a leaf callus; leaf was cut at the time of inoculation.

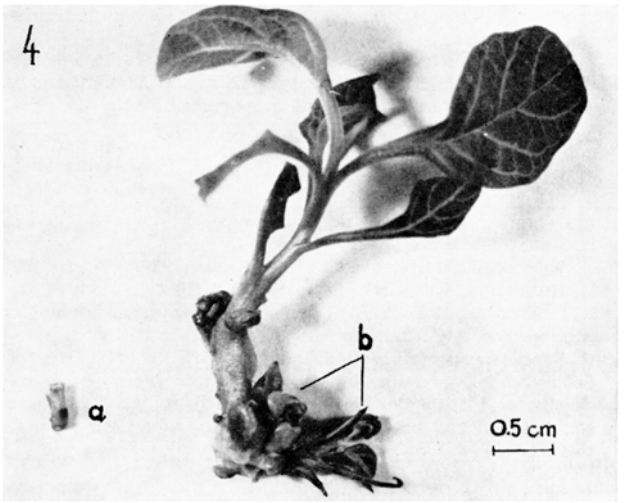

Fig. 4. A plantlet produced by a part of stem, a) of a leafy shoot after 6 weeks of culture; b) several buds at the radicular end.

Zusammenfassung. Blattmaterial von *Atropa belladonna* vermag unter geeigneten Bedingungen ganze Pflanzen zu regenerieren. Ausgangspunkt der Knospenbildung ist das Pallisadenparenchym.

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