RESPONSE OF ABIES ALBA EMBRYONAL-SUSPENSOR MASS TO VARIOUS
CARBOHYDRATE TREATMENTS

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Cultures of Abies alba embryonal-suspensor mass (EMS) were screened for their response to various sucrose concentrations ranging from 1%-6% (w/v) and various carbohydrate sources in equimolar concentrations, i.e. glucose, fructose, galactose, sucrose, and soluble starch.

Nutritional factors and sequential relationships of growth regulators control the course of embryogenesis (1). In order to stimulate maturation processes in various stages of somatic embryogenesis a sequence of culture steps was applied. The proliferation medium (2) was modified by gradual omission of BA and subsequent addition of ABA in combination with a higher concentration of the respective carbohydrates. These medium variants influenced the structure of the EMS markedly. The microscopic examination of acetocarmine stained EMS revealed great differences concerning size and development stages of the somatic embryos (SE) in the different carbohydrate treatments. While fructose was unable to promote any SE maturation, glucose, sucrose and galactose so far promoted early stages. SE development from early globular stage to precotyledonary (torpedo) stage was observed only on media with soluble starch or lactose. In contrast to the results with soluble starch, the lactose treatment led to more synchronized maturation, comparable to the zygotic embryogenesis. There is evidence that lactose has a morphogenic effect on the somatic embryogenesis of Abies alba.

REFERENCES

1. Gupta, P.K., and Durzan, D.J., 1986, Somatic polyembryogenesis from callus of mature sugar pine embryos. *Bio/Technology* 4:643-645
2. Schuller, A., Reuther, G, and Geier, T., 1989, Somatic embryogenesis from seed explants of Abies alba. *Plant Cell, Tissue and Organ Culture* 17:53-58