DEVELOPMENT AND GERMINATION OF SOMATIC EMBRYOS ON SUGAR-FREE WHEAT STARCH MEDIUM IN CARROT (*Daucus carota* L. cv. Nantes Duke)

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In the commercial application of artificial seed technology, highly efficient and simple germination method of somatic embryos (SE) is required. Recently, we detected the release of hydrolytic enzymes from SE of eggplant cultivated on sugar-free wheat starch medium (Toldi et al., 1994). In order to understand better physiological events during the process of germination of SE, in this study, the effects of exogenous starch as stored source of energy were analysed by carrot model system. Fine embryogenic cell suspension cultures were developed from sections of carrot hypocotyls (*Daucus carota* cv. Nantes Duke), according to the method of Sorvari et. al. (1994). Three fractions (250-355μm ; 350-500μm and 500μm>) of SE were separated from two-weeks old embryogenic suspension cultures produced in hormone-free liquid culture medium. Sugar-free and sugar-containing wheat starch semi-solid Murashige-Skoog (1962) media were prepared following the method of Fári (1990). The cultivation of the somatic embryos were carried out in Petri dishes using paper filter supporter posed on the medium surface. The cultures were placed in culture room for four weeks at 22-23 °C, and illuminated with fluorescent light for 16 hours or they were kept in darkness. The total fresh weight of SEs & germinated plantlets were measured. All treatments were repeated three times. On sugar-free wheat starch culture medium the development, germination and partial conversion of the early-cotyledon stage SE (500 μm>) were recorded in darkness, meanwhile the smallest ones (250-500μm, early-torpedo and torpedo stage) were not able to grow at all. Under light conditions, however, the conversion of the early-cotyledon stage SE germinated better in sugar-free wheat starch medium. On the contrary, on sugar-containing wheat starch medium all type of the SE showed good development and they germinated well and finally converted into plantlets. Significant differences were not observed in this experiment in relation to fresh weights of the germinated SE kept in darkness or under light conditions. Our experiment demonstrated firstly that the hydrolytic degradation pathway of the starch is occurring undoubtedly in the SE of carrot, from the early-cotyledon stage. The process is probably due to the amylases, which are expressing as products of the LEA (late-embryo-abundant) gene-class. The amylases are known as conservatively regulated hydrolytic enzymes of the higher plants, activating in the mature zygotic embryos during the germination.