

고사리 산업화를 위한 인공종자 개발 및 생산

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Synthetic Seed Development and Production for Industrialization of Eastern Bracken

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Ferns have been consumed as food in many countries for centuries. As rich sources of protein, fiber, minerals, vitamins, essential amino acids, and fatty acids, ferns provide important nutrients to humans. Eastern bracken (*Pteridium aquilinum* var. *latiusculum* (Desv.) Underw. ex A. Heller) is the most popular edible fern in South Korea where, additionally, it has long been used as an edible wild leaf vegetable. Recently, the production of eastern brackens in South Korea (2018) has reached 14,032 tons, for an annual revenue of 83.5 billion won, and even more eastern brackens are marketed if imports are taken into account as well. Most of the common ferns can be propagated using spores. However, fern farmers cultivate seedlings through traditional propagation methods, such as root pruning or rhizome division. These propagation methods exhibit limitations in forming roots and growing-points and are labor intensive. Quality seedlings of eastern bracken can be obtained through spore propagation, but the spores are fine and difficult to handle in the field. In addition, it would require appropriate environmental control. The production of synthetic seeds using encapsulation technology is easy to establish and it can be used to achieve high productivity at low cost. Synthetic seeds contain explants embedded into a seed foam, and they overcome the limitations of micropropagation and offer the possibility of using plug seedlings. Synthetic seed matrix, such as sodium alginate, has the advantages of low cost, low toxicity, and gel stability. The present study aimed to develop and produce synthetic seeds for the commercial exploitation of eastern bracken. Furthermore, we verified spore germination and the extent of gametophyte and sporophyte development achieved with our new synthetic seeds, whose production was intended to solve current problems with the handling, storage, and transportation of eastern bracken.

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