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In Vitro Propagation of Tarragon[1]

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Abstract. **A combination of 1.0 mg/liter 6-benzylamino purine (BA) and 0.1 mg/liter naphthaleneacetic acid (NAA) with 3% sucrose produced the greatest number of shoots from sterile leaf pieces of tarrogon (*Artemesia dracunculus* L. var. *sativa*) placed on Linsmaier-Skoog (LS) medium. Plantlet regeneration also occurred with 0.2 mg/liter BA without auxin and with 2% sucrose.**

Artemesia dracunculis L. var *sativa,* commonly referred to as French tarragon by culinary herbalists, is a perennial herb. It is propagated by divisions since cutting propagation is usually unsatisfactory and viable seed are not produced. Well-grown plants can be divided every 3 years but this is not a rapid means of multiplication (1). In this study we investigated the possibility of rapid propagation of French tarragon by tissue culture.

The primary plant material was obtained from 3-year-old plants growing in the herb garden of the Landscape Garden Center of the University of Kentucky. Stem pieces 3-4 cm in length were collected, leaves excised, surface sterilized for 25 min in 0.5% sodium hypochlorite (10% Clorox) with a 5-min rinse in sterile deionized water, and transferred to sterile citric acid solution (150 mg/liter) for 5 min. Leaves were placed flat in tubes containing 10 ml of isolation medium. The isolation medium consisted of Murashige and Skoog inorganic salts and vitamins (3), 2% sucrose, 0.2 mg/liter BA, 0.05 mg/liter NAA and 0.7% agar; pH was adjusted to 5.7-5.8 before autoclaving. Tissues overtly free of microbial growth were transferred after seven days to tubes containing 15 ml of LS medium (2) with 170 mg/liter sodium monophosphate. The medium was supplemented with BA (0.2, 0.5, 1.0, 5.0, 10.0 mg/liter) and NAA (0.0 and 0.1 mg/liter) in 8 different combinations. Sucrose concentration was tried at both 2% and 3% for each hormone combination, resulting in 16 different media tested. Tubes were placed in a growth room at 25° ± 1° C and supplied with a 16-hr photoperiod from Cool White fluorescent lamps giving 1600 lux at the tops of the tubes.

Plantlet regeneration occurred on 2 different media. One medium was supplemented with 0.2 mg/liter BA and no auxin with 2% sucrose; the other medium was supplemented with 1.0 mg/liter BA and 0.1 mg/liter NAA with 3% sucrose. Tissues on the other 14 media had shown little or no response after 30 days in culture and were discarded.

Of the tissues that had begun regeneration on the 2 different media, the fastest growing isolates on each were maintained on their respective medium, the clumps of tissue subdivided into uniform segregates and transferred to 6 cm diameter x 11 cm jars containing 35 ml of their respective medium. Tissues were further subdivided at 30-day intervals, the shoots excised and counted. At the end of 150 days in culture, the isolate cultured with 0.2 mg/liter BA and 2% sucrose had produced a total of 5,784 shoots. The single isolate maintained on media supplemented with 1.0 mg/liter BA and 0.1 mg/liter NAA with 3% sucrose had produced a total of 9,676 shoots.

Callus formation in all cultures was minimal. Plantlets arose from the petiole region of the explants. The small amounts of callus produced from the distal portion of half-leaf explants did not give rise to plants. Shoot production resembled adventitious budding, as clumps of shoots that were subcultured did not arise from callus. Single shoots placed back into culture also formed plantlets.

Rootless shoots about 1 cm tall were placed into tubes containing 15 ml of White's medium (4) supplemented with 0.2 mg/liter indolebutyric acid. Roots were initiated within 14 days but plants were not removed from the culture tubes for 28 days to allow a greater amount of roots to form, all shoots forming roots. Rooted plants were washed free of medium, dipped in an aqueous Captan solution and planted in sterile soil. Half were placed under intermittant mist (3 sec each 3 min) for 5 days and then transferred to a bench shaded with 70% Saran shade cloth. The remaining plants were placed under the shade cloth immediately after planting. No losses occurred with either treatment.

The fastest growing isolates of French tarragon were selected and used for multiplication rates in this investigation. Results indicate that propagation *in vitro* would be an efficient way for rapid establishment of a desirable line for commercial or home garden use.

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