

**ROOTING OF TWO *BORONIA SPECIES* AS INFLUENCED BY  $\alpha$ -NAPHTHALENE ACETIC ACID (NAA) AND 2-CHLOROETHYL PHOSPHONIC ACID (CEPA)**

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**REFERENCES**

- Abeles F. B. (1992). The role of ethylene in agriculture. *In*: Abeles F. B., Morgan P. W., Saltveit M. E. Jr (Eds.) Ethylene In Plant Biology, Academic Press: 264-296.
- Atta Aly M. A., Shehata N. G., Kobbia T. M. (1989). Effect of ethylene inhibitors, ethrel and auxins on the formation, growth, and development of adventitious root in tomato and squash cuttings. *Egyptian Journal of Horticulture*, 16: 45-57.
- Baraldi R., Bertazza G., Predieri S., Bregoli A. M., Cohen J. D. (1993). Uptake and metabolism of indole-3-butyric acid during the *in vitro* rooting phase in pear cultivars (*Pyrus communis*). *Acta Horticulturae*, 329: 289-291.
- Bartollini G., Fabbri A. (1988). Effects of cold storage and CEPA treatments on rooting of '140 Ruggeri' cuttings. *Acta Horticulturae*, 227: 257-259.
- Bollmark M., Eliasson L. (1986). Effects of exogenous cytokinins on root formation in pea cuttings. *Physiologia Plantarum*, 68: 662-666.
- Bollmark M., Eliasson L. (1990). Ethylene accelerates the breakdown of cytokinins and thereby stimulates rooting in Norway spruce hypocotyl cuttings. *Physiologia Plantarum*, 80: 534-540.
- Collett D. (1991). Models for Binary and Binomial Data. *In*: Collett D. (Ed.) *Modelling Binary Data*, Chapman & Hall/CRC: 43-92.
- Criley R. A., Parvin P. E. (1979). Promotive effects of auxin, ethephon, and daminozide on the rooting of *Protea neriifolia* cuttings. *Journal of the American Society of Horticultural Science*, 104: 592-596.
- Day J. S., Loveys B. R. (1998). Propagation from Cuttings of Two Woody Ornamental Australian Shrubs, *Boronia megastigma* Nees and *Hypocalymma angustifolium* Endl. *Australian Journal for Experimental Agriculture*, 38: 201-206.
- De Klerk G.-J., Van der Krieken W., De Jong J. C. (1999). Review: the formation of adventitious roots, new concepts, new possibilities. *In Vitro Cellular and Developmental Biology*, 35: 189-199.
- Dhua R. S., Mitra S. K., Sen S. K., Bose T. K. (1982). Effect of ethephon and IBA on rooting of guava. *Science and Culture*, 48: 444-445.
- Dutra L. F., Tonietto A., Kersten E. (1998). Effect of ethephon on plum (*Prunus salicina* Lindl) and of IBA on the rooting of cuttings. *Scientia Agricola*, 55: 296-304.
- Eklund L., Little C. H. A. (1998). Ethylene evolution, radial growth and carbohydrate concentrations in *Abies balsamea* shoots ringed with ethrel. *Tree Physiology*, 18: 383-391.
- Epstein E., Ackerman A. (1993). Transport and metabolism of indole-3-butyric acid in cuttings of *Leucadendron discolor*. *Plant Growth Regulation*, 12: 17-22.
- Epstein E., Sagee O. (1992). Effect of ethylene treatment on transport and metabolism of indole-3-butyric acid in citrus leaf midribs. *Plant Growth Regulation*, 11: 357-362.
- Epstein E., Zilkah S., Faingersh G., Rotebaum A. (1993). Transport and metabolism of indole-3-butyric acid in easy and difficult-to-root cuttings of sweet cherry (*Prunus avium* L.). *Acta Horticulturae*, 329: 292-295.
- Fabijan D., Taylor J. S., Reid D. M. (1981). Adventitious rooting in hypocotyls of sunflower (*Helianthus annuus*) seedlings. II. Action of gibberellins, cytokinins, auxins and ethylene. *Physiologia Plantarum*, 53: 589-597.
- Harbage J. F., Stimart D. P. (1996). Ethylene does not promote adventitious root initiation on apple microcuttings. *Journal of the American Society for Horticultural Science*, 121: 880-885.
- Harbage J. F., Stimart D. P., Auer C. (1998). pH affects indole-3-butyric acid uptake but not metabolism during the initiation phase of adventitious root induction in apple microcuttings. *Journal of the American Society*

- for Horticultural Science, 23: 6-10.
- Hausman J. F. (1993). Changes in peroxidase activity, auxin level and ethylene production during root formation by poplar shoots raised *in vitro*. *Plant Growth Regulation*, 13: 263-268.
- Hore J. K., Sen S. K. (1994 a). Interaction of non-auxinic compounds with NAA in the regeneration of roots in stem cuttings of water apple (*Syzygium javanica* L.). *Journal of Tropical Agriculture*, 32: 80-82.
- Hore J. K., Sen S. L. (1994 b). Effect of non-auxinic compounds and IBA on root formation in stem cuttings of roseapple (*Syzygium jambos* Alston). *Crop Research*, 7: 44-48.
- Hore J. K., Sen S. L. (1994 c). Root formation in air-layers of pomegranate with NAA and auxin synergists. *Annual Agricultural Research*, 15: 310-314.
- Inoue Y., Yamaoka K., Kimura K., Sawai K., Arai T. (1998). Effects of low pH on the induction of root hair formation in young lettuce (*Lactuca sativa* L. cv. *Grand Rapids*) seedlings. *Journal of Plant Research*, 113: 39-44.
- Jusaitis M. (1986). Rooting of intact mung bean hypocotyl stimulated by auxin, ACC and low temperature. *Hort Science*, 21: 1024-1025.
- Kang B. G., Park W. J., Nam M. H., Hertel R. (1991). Ethylene-induced increase of sensitivity to auxin in *Ranunculus* petioles and its implications regarding ethylene action on adaptation. *In: Karssen C. M., Van Loan L. C., Vreugdenhil D. (Eds.). Progress in Plant Growth Regulation*, 13: 248-253.
- Krishnamoorthy H. N. (1970). Promotion of rooting in mung bean hypocotyl cuttings with ethrel, an ethylene releasing compound. *Plant and Cell Physiology*, 11: 979-982.
- Linkins A. E., Lewis L. N., Palmer R. L. (1972). Hormonally induced changes in the stem and petiole anatomy and cellulase enzyme patterns in *Phaseolus vulgaris* L. *Plant Physiology*, 52: 554-560.
- Liu J., Mukherjee I., Reid D. M. (1990). Adventitious rooting in hypocotyls of sunflower (*Helianthus annuus*). *Physiologia Plantarum*, 78: 268-276.
- Liu J. H., Mukherjee I., Reid D. M. (1993). Stimulation of adventitious rooting in sunflower (*Helianthus annuus*) by low pH: possible role of auxin. *Canadian Journal of Botany*, 71: 1645-1650.
- Mitra S. K., Bose T. K. (1991). Metabolic changes during adventitious root formation in ethrel and IBA treated cuttings of litchi. *The Indian Journal of Horticulture*, 48: 105-107.
- Moe R., Andersen A. S. (1988). Stock plant environment and subsequent adventitious rooting. *In: Davis T. D., Haissig B. E., Sankhla N. (Eds.) Adventitious Root Formation in Cuttings*, Dioscorides Press: 214-234.
- Morgan P. W., Gausman H. W. (1966). Effects of ethylene on auxin transport. *Plant Physiology*, 41: 45-52.
- Mudge K. W. (1988). Effect of ethylene on rooting. *In: Davis T. D., Haissig B. E., Sankhla N. (Eds.) Adventitious Root Formation in Cuttings*, Dioscorides Press: 150-161.
- Nanda K. K., Anand V. K. (1970). Seasonal changes in auxin effects on rooting of stem cuttings of *Populus nigra* and its relationship with mobilization of starch. *Physiologia Plantarum*, 23: 99-107.
- Pal M. (1994). Enhancing the efficiency of auxins for promotion of rooting in stem cuttings of *Populus robusta*. *Indian Journal of Forestry*, 17: 348-350.
- Sadhu M. K., Bose S. (1980). Effect of ethylene on rooting of cuttings and air layers of mango (*Mangifera indica*), guava (*Psidium guajava*) and waterapple (*Syzygium javanica*). *The Indian Journal of Horticulture*, 37: 335-337.
- Sadhu M. K., Sanghamitra B. (1980). Effects of ethylene on rooting of cuttings and air layers of mango, guava and waterapple. *The Indian Journal of Horticulture*, 37: 335-337.
- Sen S. K., De R. K., Bandyopadhyay A. (1990). Effect of preconditioning stock plant and exogenous application of growth regulators on rooting of semi-hard wood cuttings of aonla (*Emblica officinalis* Gaertn.). *Advances in Plant Science*, 3: 195-199.
- Sharma J., Ollerenshaw P. J. (1989). Better results for *Boronia* cuttings. *Australian Horticulture*, April: 32-35.
- Sun W. Q., Bassuk N. L. (1993). Auxin-induced ethylene synthesis during rooting and inhibition of budbreak of 'Royalty' rose cuttings. *Journal of the American Society for Horticultural Science*, 118: 638-643.
- Swanson B. T. (1974). Ethrel as an aid in rooting. *International Plant Propagator's Society Proceedings*, 24: 351-361.