

MICROPROPAGATION OF *MONSTERA DELICIOSA* LIEBM. ‘THAI CONSTELLATION’

Iyyakkannu Sivanesan^{1*}, Young Kyu Lee², Kyung Won Kang², and Han Yong Park³

¹Department of Bioresources and Food Science, Institute of Natural Science and Agriculture, Konkuk University, 1 Hwayang-dong, 05029 Gwangjin-gu, Seoul, Republic of Korea

²Babo Orchid Farm, Namyangju-si, Gyeonggi-do 472-831, Republic of Korea

³Department of Bioresources Engineering, Sejong University, 209 Neungdong-ro, Gwangjin-gu, 05006 Seoul, Republic of Korea

*Fax: + 8224503310, *E-mail: isivanesan@yahoo.com

REFERENCES

- ABDALLA N., EL-RAMADY H., SELIEM M. K., EL-MAHROUK M. E., TAHA N., BAYOUMI Y., SHALABY T. A., DOBRÁNSKÝ J. (2022). An academic and technical overview on plant micropropagation challenges. *Horticulturae*, 8: 677.
- ADEBOMOJO A. A., ABDULRAHAMAN A. A. (2020). Surface sterilization of *Ocimum* seeds and tissues with biosynthesized nanosilver and its effects on callus induction. *IOP Conference Series: Materials Science and Engineering*, 805: 012024.
- AHLAWAT J., SEHRAWAT A. R., CHOUDHARY R., YADAV S. K. (2020). Biologically synthesized silver nanoparticles eclipse fungal and bacterial contamination in micropropagation of *Capparis decidua* (Forsk.) Edgew, a substitute to toxic substances. *Indian Journal of Experimental Biology*, 58: 336-343.
- ALAWAADH A. A., DEWIR Y. H., ALWIHIBI M. S., ALDUBAI A. A., EL-HENDAWY S., NAIDOO Y. (2020). Micropropagation of lacy tree philodendron (*Philodendron bipinnatifidum* Schott ex Endl.) *HortScience*, 55: 294-299.
- AMENTE G., CHIMDESSA E. (2021). Control of browning in plant tissue culture: a review. *Journal of Scientific Agriculture*, 5: 67-71.
- BAO H. G., TUNG H. T., VAN H. T., BIEN L. T., KHAI H. D., MAI N. T., LUAN V. Q., CUONG D. M., NAM N. B., VAN THE VINH B., NHUT D. T. (2022). Copper nanoparticles enhanced surface disinfection, induction and maturation of somatic embryos in tuberous begonias (*Begonia × tuberhybrida* Voss) cultured *in vitro*. *Plant Cell, Tissue and Organ Culture*, 151: 385-399.
- CHAND H., PEARSON M., LOVELL P. H. (1999). Rapid vegetative multiplication in *Colocasia esculenta* (L.) Schott (taro). *Plant Cell, Tissue and Organ Culture*, 55: 223-226.
- CHANG H., CHAKRABARTY D., HAHN E., PAEK K. (2003). Micropropagation of calla lily (*Zantedeschia albomaculata*) via *in vitro* shoot tip proliferation. *In Vitro Cellular & Developmental Biology-Plant*, 39: 129-134.
- CHEN F. C., WANG C. Y., FANG J. Y. (2012). Micropropagation of self-heading *Philodendron* via direct shoot regeneration. *Scientia Horticulturae*, 141: 23-29.
- CHEN J., MCCONNELL D. B., HENNY R. J. (2004). Light induced coordinative changes in leaf variegation between mother plants and daughter plantlets of *Chlorophytum comosum* ‘Vittatum’. *Acta Horticulturae*, 659: 453-459.
- CHEN J., WEI X. (2018). Thidiazuron in micropropagation of aroid plants. In: Ahmad N., Faisal M. (Eds). *Thidiazuron: From Urea Derivative to Plant Growth Regulator*. Springer: 95-113.
- CHEN W. L., YEH D. M. (2007). Elimination of *in vitro* contamination, shoot multiplication, and *ex vitro* rooting of *Aglaonema*. *HortScience*, 42: 629-632.
- DEVASIA J., MUNISWAMY B., MISHRA M. K. (2020). Investigation of ZnO nanoparticles on *in vitro* cultures of coffee (*Coffea arabica* L.). *Journal of Nanoscience and Nanotechnology*, 16: 271-277.
- EL-MAHROUK M. E., DEWIR Y. H., NAIDOO Y. (2016). Micropropagation and genetic fidelity of the regenerants of *Aglaonema* ‘Valentine’ using randomly amplified polymorphic DNA. *HortScience*, 51: 398-402.
- FANG J. Y., HSU Y. R., CHEN F. C. (2013). Development of an efficient micropropagation procedure for *Aglaonema* ‘Lady Valentine’ through adventitious shoot induction and proliferation. *Plant Biotechnology*, 30: 423-431.
- FONNESBECH A., FONNESBECH M. (1980). *In vitro* propagation of *Monstera deliciosa* L. *HortScience*, 15: 740-741.
- HAN B. H., YAE B. W., GOO D. H., YU H. J. (2004). *In vitro* propagation of *Alocasia cadieri* Chantrier. *Journal of Plant Biotechnology*, 31: 61-65.
- HASSANEIN A. M. (2004). A study on factors affecting propagation of shade plant-*Syngonium podophyllum*. *Journal of Applied Horticulture*, 6: 30-34.
- IMEELDA M., WULANSARI A., POERBA Y. S. (2007). Micropropagation of iles-iles (*Amorphophallus muelleri* Blume). *Berita Biologi*, 8: 271-277.
- KALIMUTHU K., PRABAKARAN R. (2014). *In vitro* micropropagation of *Syngonium podophyllum*. *International Journal of Pure & Applied Bioscience*, 2: 88-92.
- KIM D. H., GOPAL J., SIVANESAN I. (2017). Nanomaterials in plant tissue culture: the disclosed and undisclosed. *RSC Advances*, 7: 36492-36505.
- KIM J., KANG S. W., PAK C. H., KIM M. S. (2012). Changes in leaf variegation and coloration of English ivy and polka dot plant under various indoor light intensities. *HortTechnology*, 22: 49-55.
- KUNISAKI J. T. (1980). *In vitro* propagation of *Anthurium andreanum* Lind. *HortScience*, 15: 508-509.
- MILLER L. R., MURASHIGE T. (1976). Tissue culture propagation of tropical foliage plants. *In Vitro*, 12: 797-813.
- MORADPOUR M., AZIZ M. A., ABDULLAH S. N. A. (2016). Establishment of *in vitro* culture of rubber (*Hevea brasiliensis*) from field-derived explants, effective role of silver nanoparticles in reducing contamination and browning. *Journal of Nanomedicine Nanotechnology*, 7: 375.

- MURASHIGE T., SKOOG F. (1962). A revised medium for rapid growth and bioassays with tobacco tissue cultures. *Physiologia Plantarum*, 15: 473-497.
- PALOMEQUE N. M. C., BERTOLINI V., DONJUAN L. I. (2021). *In vitro* establishment: *Monstera acuminata* Koch and *Monstera deliciosa* Liebm. *Trends in Horticulture*, 4: 13-21.
- PARK H. Y., KIM K. S., AK G., ZENGİN G., CZIÁKY Z., JEKŐ J., ADAIKALAM K., SONG K., KIM D. H., SIVANESAN I. (2021). Establishment of a rapid micropropagation system for *Kaempferia parviflora* Wall. ex Baker: phytochemical analysis of leaf extracts and evaluation of biological activities. *Plants*, 10, Article 698.
- POURHASSAN A., KAVIANI B., KULUS D., MILER N., NEGAHDAR N. (2023). A complete micropropagation protocol for black-leaved *Zamioculcas zamiifolia* (Lodd.) Engl. 'Dowon'. *Horticulturae*, 9: 422.
- PROSANTA P., MAINAK C., INDRAJIT K., SAGNIK H., AVRATANU D., KANTI H. P. (2015). *In vitro* antioxidant activity and total phenolic content of *Monstera deliciosa*. *International Journal of Pharmacognosy and Phytochemical Research*, 7: 416-419.
- SAMA A. E., HUGHES H. G., ABBAS M. S., SHAHBA M. A. (2012). An efficient *in vitro* propagation protocol of cocoyam [*Xanthosoma sagittifolium* (L.) Schott]. *The Scientific World Journal*, Vol. 2012, Article ID 346595.
- SIVANESAN I., MUTHU M., GOPAL J., TASNEEM S., KIM D. H., OH J. W. (2021). A fumigation-based surface sterilization approach for plant tissue culture. *International Journal of Environmental Research and Public Health*, 18: 2282.
- SONG K., KANG H., JANVIER U., KIM D. H., SIVANESAN I. (2021). Micropropagation and *in vitro* flowering of *Turbinicarpus valdezianus* (H. Moeller) Glass & R. C. Foster and *Turbinicarpus valdezianus* Var. *albiflorus* (Pazout) M. Zachar, Stanik, Lux & Drab. *Propagation of Ornamental Plants*, 21: 19-26.
- STANLY C., BHATT A., SULAIMAN B., KENG C. L. (2012). Micropropagation of *Homalomena pineodora* Sulaiman & Boyce (Araceae): a new species from Malaysia. *Horticultura Brasileira*, 30: 39-43.
- TUNG H. T., BAO H. G., CUONG D. M., NGAN H. T., HIEN V. T., LUAN V. Q., VINH B. V., PHUONG H. T., NAM N. B., TRIEU L. N., TRUONG N. K. (2021). Silver nanoparticles as the sterilant in large-scale micropropagation of chrysanthemum. *In Vitro Cellular & Developmental Biology-Plant*, 57: 897-906.
- ZANCA S. S., ZAFFARI G. R. (2013). *In vitro* micropagation of *Monstera obliqua* Miq. *Plant Cell Culture & Micropropagation*, 9: 24-29 (in Portuguese).
- ZHANG S., JIANG R., ZHOU H. (2004). Study on rapid propagation of *Aglaonema commutatum* cv. 'Golden Jewelry'. *Chinese Agricultural Science Bulletin*, 20: 39-40.