

## DIRECT SOMATIC EMBRYOGENESIS IN *CATTLEYA TIGRINA* A. RICH.

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### REFERENCES

- AGILA A. Y. C., GUACHIZACA I., CELLA R. (2015). Combination of 2,4-D and stress improves indirect somatic embryogenesis in *Cattleya maxima* Lindl. *Plant Biosystems*, 149: 235-241.
- AMARAL T. L., JASMIM J. M., ARAÚJO J. S. P., THIÉBAUT J. T. L., COELHO F. C., FREITAS C. B. (2010). Fertilization of orchids with substrates of coconut fiber. *Ciência e Agrotecnologia*, 34: 11-19 (in Portuguese).
- ARRIGONI-BLANK M. F., SANTOS M. S., BLANK A. F., RABBANI A. R. C., SILVA-MANN R., SANTOS J. B., COSTA A. S., MENEZES T. S. A. (2016). Analysis of genetic diversity of *Laeliinae* (Orchidaceae) in the State of Sergipe using ISSR markers. *Genetics and Molecular Research*, 15: 1-9.
- CASTRO L. M., FILHO F. A. A. M., MENDES B. M. J. M., MIYATA L. Y. (2010). Somatic embryogenesis from the calli of sweet orange cultivars. *Ciência Rural*, 40: 1831-1834 (in Portuguese).
- CHANG C., CHANG W. C. (1998). Plant regeneration from callus culture of *Cymbidium ensifolium* var. *misericors*. *Plant Cell Reports*, 17: 251-255.
- CHEN J. T., CHANG W. C. (2004a). Induction of repetitive embryogenesis from seed-derived protocorms of *Phalaenopsis amabilis* var. *Formosa* Shimadzu. *In Vitro Cellular & Developmental Biology-Plant*, 40: 290-293.
- CHEN J. T., CHANG W. C. (2004b). TIBA affects the induction of direct somatic embryogenesis from leaf explants of *Oncidium*. *Plant Cell, Tissue and Organ Culture*, 79: 315-320.
- CHEN J. T., CHANG W. C. (2006). Direct somatic embryogenesis and plant regeneration from leaf explants of *Phalaenopsis amabilis*. *Biologia Plantarum*, 50: 169-173.
- CHEN J. T., HONG P. I. (2012). Cellular origin and development of secondary somatic embryos in *Oncidium* leaf cultures. *Biologia Plantarum*, 56: 215-220.
- FERREIRA D. F. (2011). Sisvar: a computer statistical analysis system. *Ciência e Agrotecnologia*, 35: 1039-1042 (in Portuguese).
- FERREIRA J. P., MARTINS J. P. R., PALAORO G. J., FIGUEIREDO D. D. C., SCHMILDT E. R., SCHMILDT O. (2012). *In vitro* growth of orchid at different concentrations of urea in substitution of ammonium nitrate. *Nucleus*, 9: 137-141 (in Portuguese).
- GALDIANO-JUNIOR R. F., MANTOVANI C., PIVETTA K. F. L., LEMOS E. G. M. (2012). *In vitro* growth and acclimatization of *Cattleya loddigesii* Lindley (Orchidaceae) with activated carbon under two luminous spectra. *Ciência Rural*, 42: 801-807 (in Portuguese).
- GUERRA P. G., TORRES A. C., TEIXEIRA J. B. (1999). Somatic embryogenesis and synthetic seeds. In: Torres A. C., Caldas L. S., Buso I. A. (Eds). *Tissue Culture and Genetic Transformation of Plants*. EMBRAPA: Brasília, 2: 533-568 (in Portuguese).
- GUERRA M. P., NODARI R. O. (2006). *Handbook of Biotechnology*. CCA/UFSC, Edição Da Steinmacher. Florianópolis, 41 pp. (in Portuguese).
- LEDO A. S., LAMEIRA A. O., MENEZES I. C. (2002). Somatic embryogenesis and regeneration of plants in Açai palm. Rio Branco: Embrapa Acre, *Boletim de Pesquisa*, 34: 22 (in Portuguese).
- LONE A. B., BARBOSA C. M., TAKAHASHI L. S. A., FARIA R. T. (2008). Acclimatization of *Cattleya* (Orchidaceae) on substrates alternative to tree fern fiber and sphagnum. *Maringá*, 30: 465-469 (in Portuguese).
- MACIEL A. L. R., RODRIGUES F. A., PASQUAL M., CARVALHO C. H. S. (2016). Large-scale, high-efficiency production of coffee somatic embryos. *Crop Breeding and Applied Biotechnology*, 16: 102-107.
- MAHENDRAN G., BAI V. N. (2016). Direct somatic embryogenesis of *Malaxis densiflora* (A. Rich.) Kuntze. *Journal of Genetic Engineering and Biotechnology*, 14: 77-81.
- MARUYAMA E., HOSOI Y., ISHII K. (2007). Somatic embryogenesis and plant regeneration in yakutanegoyou, *Pinus armandii* Franch. var. *amamiana* (Koidz.) Hatusima, an endemic and endangered species in Japan. *In Vitro Cellular & Developmental Biology-Plant*, 43: 28-34.
- MENEZES T. S. A., SANTOS T. C., ARRIGONI-BLANK M. F., BLANK A. F. (2012). Somatic embryogenesis of superior varieties of sugarcane (*Saccharum* spp.). *Revista Geintec*, 2: 32-41 (in Portuguese).
- MONTEIRO S. H. N. (2013). Orchidaceae. In: Prata A. P. N., Amaral M. C. E., Farias M. C. V., Alves M. V. (Eds). *Flora de Sergipe*. First edition, Aracaju: Gráfica e Editora Trifinfo Ltda: 431-490 (in Portuguese).
- MURASHIGE T., SKOOG F. (1962). A revised medium for rapid growth and bioassays with tobacco tissue cultures. *Physiologia Plantarum*, 15: 473-479.
- NAING A. H., CHUNG J. D., LIM K. B. (2011). Plant regeneration through indirect somatic embryogenesis in *Coelogyne cristata* orchid. *American Journal of Plant Sciences*, 2: 262-267.
- RECH A. R., ROSA Y. B. C. J., ROSA-JUNIOR E. J. (2011). Survey and ecological characteristics of Orchidaceae of the riparian forest of the Rio Dourados, Dourados-MS. *Revista Árvore*, 35: 717-724 (in Portuguese).

- SALDANHA C. W., MARTINS-CORDER M. P. (2012). *In vitro* germination and embryogenic competence acquisition of *Euterpe edulis* Martius immature zygotic embryos. *Crop Breeding and Applied Biotechnology*, 12: 171-178.
- STEFANELLO S., SILVEIRA E. V., OLIVEIRA L. K., BESSON J. C. F., DUTRA G. M. N. (2009). Efficiency of substrates for acclimatization of *Miltonia flavescens* Lindl. plants propagated *in vitro*. *Revista em Agronegócios e Meio Ambiente*, 2: 467-476 (in Portuguese).
- SOARES J. D. R., PASQUAL M., RODRIGUES F. A., VILLA F., ARAÚJO A. G. (2011). Sources of silicon in orchid micropropagation of the group *Cattleya*. *Acta Scientiarum Agronomy*, 33: 503-507 (in Portuguese).
- ULISSES C., PEREIRA J. A. F., SILVA S. S., ARRUDA E., MORAIS M. (2016). Induction and histology of primary and secondary somatic embryos of the hybrid *Phalaenopsis* classic spotted pink (Orchidaceae). *Acta Biológica Colombiana*, 21: 571-578 (in Portuguese).
- YAMAKAMI J. K., FARIA R. T., ASSIS A. M., REGO-OLIVEIRA L. V. (2006). Substrates for *Cattleya* (Orchidaceae) cultivation to substitute the tree fern fiber. *Maringá*, 28: 523-526 (in Portuguese).