Komoditas : Dendrobium
Tahun 2004-2008 (28judul)

Hui-Zhong Wang, Shang-Guo Feng, Jiang-Jie Lu, Nong-Nong Shi, Jun-Jun Liu, Phylogenetic study and molecular identification of 31 Dendrobium species using inter-simple sequence repeat (ISSR) markers, Scientia Horticulturae, Volume 122, Issue 3, 1 October 2009, Pages 440-447, ISSN 0304-4238, DOI: 10.1016/j.scienta.2009.06.005.
(http://www.sciencedirect.com/science/article/B6TC3-4WM68JV-4/2/9b533dd95c212db075651b0edd9b1f18)
Abstract:
The genetic diversity of the genus Dendrobium is not well known and the phylogenetic relationship of Dendrobium species are mainly determined by studies of the comparative vegetative anatomy and plant systematics. In the present study, we used the technique of inter-simple sequence repeats (ISSRs) to evaluate genetic diversity and phylogenetic relationship among 31 Dendrobium species from Yunnan region of China. In total, 2368 bands were amplified by 17 ISSR primers, resulting from 278 ISSR loci with 100% polymorphism at genus level. Thirty-one species were unequivocally distinguished based on ISSR fingerprinting. Species-specific ISSR markers were identified in nine of 31 tested Dendrobium species. Unweighted pair-group mean analysis (UPGMA) showed that 31 Dendrobium species were grouped into six clusters, indicating the genus was polyphyletic with several well-supported lineages. The high polymorphism and reliable amplification across species demonstrated the utility of ISSR marker for species diagnosis and genetic diversity study of the genus Dendrobium.
Keywords: Dendrobium; Genetic diversity; ISSR; Phylogenetic analysis

Z.H. Wang, L. Wang, Q.S. Ye, High frequency early flowering from in vitro seedlings of Dendrobium nobile, Scientia Horticulturae, Volume 122, Issue 2, 17 September 2009, Pages 328-331, ISSN 0304-4238, DOI: 10.1016/j.scienta.2009.05.018.
(http://www.sciencedirect.com/science/article/B6TC3-4WM68JV-2/2/921000e3af000989bbfebd811f895101)
Abstract:
Dendrobium nobile Lindl. is a popular temperate Chinese orchid commonly marketed as a traditional medicinal plant. Seedlings of Dendrobium nobile Lindl. produced floral buds (33.3-34.8%) precociously on a defined basal medium (1/2 MS) containing paclobutrazol (PP333) at 0.5 mg L-1 or thidiazuron (TDZ) at 0.1 mg L-1 within 4 months of culturing. The frequency of floral buds formation can be further increased to 95.6% by growing seedlings in a PN (PP333 0.3 mg L-1 + NAA 0.5 mg L-1)-containing medium followed by transfer onto 1/2 MS medium with PP333 and TDZ (PP333 + TDZ). However, flower developed was deformed under 25 [degree sign]C but it developed fully when grown in a lower temperature regime (23 [degree sign]C/18 [degree sign]C, light/dark) for 45 days. Under optimal condition, in vitro flowering was observed about 6 months after seed sowing.
Keywords: Dendrobium nobile Lindl.; In vitro flowering; Seedlings; Temperate orchid

Niramol Rangsayatorn, Micropropagation of Dendrobium draconis Rchb. f. from thin cross-section culture, Scientia Horticulturae, In Press, Corrected Proof, Available online 28 July 2009, ISSN 0304-4238, DOI: 10.1016/j.scienta.2009.06.037.
(http://www.sciencedirect.com/science/article/B6TC3-4WW16Y8-1/2/14a7551c0c29e748e56645d44c298971)
Abstract:

An efficient procedure is outlined for rapid and mass in vitro propagation of an orchid, Dendrobium draconis Rchb. f. through in vitro culture of thin cross-sections (TCSs) derived from young stems. The TCS explants were excised along the stem from the base to shoot tip of 6-month-old plantlets and cultured on Murashige and Skoog (MS) medium supplemented with 20 g/l sucrose and different concentrations of N6-benzyladenine (BA), kinetin (Kn) and 1-naphthaleneacetic acid (NAA), either individually or in combination. Protocorm-like bodies (PLBs) were directly induced from the TCS explants and completely developed into shoots within 6-7 weeks. The optimal growth regulators combination for maximal PLB development was 2 mg/l BA and 1.0 mg/l NAA, giving rise to 68% of responding explants with an average 11 PLBs per explant. Shoot development was best achieved on MS medium containing sucrose and coconut water. Plantlets, 6-8 cm height were transplanted into coconut husk peat with 92% survival rate in a nursery.
Keywords: Dendrobium draconis; In vitro propagation; Thin cross-section

Jun-Hui Wang, Jian-Ping Luo, Xue-Qiang Zha, Bao-Jun Feng, Comparison of antitumor activities of different polysaccharide fractions from the stems of Dendrobium nobile Lindl, Carbohydrate Polymers, In Press, Corrected Proof, Available online 24 July 2009, ISSN 0144-8617, DOI: 10.1016/j.carbpol.2009.07.032.
(http://www.sciencedirect.com/science/article/B6TFD-4WV77WX-5/2/62d52b5b588d6059c1477653f1e5f462)
Abstract:
The antitumor activities of extracted polysaccharide fractions from the stems of Dendrobium nobile Lindl were investigated. Polysaccharides were sequentially extracted from the stems of D. nobile to obtain three fractions, i.e. water extract fraction (DNP-W), 5% NaOH extract fraction (DNP-OH) and 5% HCl extract fraction (DNP-H). Further the DNP-W was isolated to give six sub-fractions (DNP-W1, DNP-W2, DNP-W3, DNP-W4, DNP-W5 and DNP-W6) by anion-exchange chromatography. The monosaccharide profile, protein content, uronic acid content, total carbohydrate content, viscosity and molecular weight of nine polysaccharide fractions were analyzed. Both the in vivo and in vitro antitumor activities of nine polysaccharide fractions were evaluated and compared. Results indicated that DNP-W1 and DNP-W3 exhibited high antitumor activities against Sarcoma 180 in vivo and HL-60 in vitro. The results suggested that DNP-W1 and DNP-W3 could be considered as an effective natural antitumor source.
Keywords: Dendrobium nobile Lindl; Polysaccharides; Antitumor activities

Ying Wang, Jian-Ping Luo, Hu-Qi Wu, Hong Jin, Conversion of protocorm-like bodies of Dendrobium huoshanense to shoots: The role of polyamines in relation to the ratio of total cytokinins and indole-3-acetic acidindole-3-acetic acid, Journal of Plant Physiology, In Press, Corrected Proof, Available online 21 July 2009, ISSN 0176-1617, DOI: 10.1016/j.jplph.2009.06.008.
(http://www.sciencedirect.com/science/article/B7GJ7-4WTHB0V-1/2/6e60fd0877bdfe3c6ffdf76353625f93)
Abstract: Summary
In the present paper, a correlation between enhanced conversion of protocorm-like bodies (PLBs) of Dendrobium huoshanense to shoots by free polyamines (PAs) and changes in the levels of endogenous hormones is described. The endogenous levels of free spermidine (Spd) and putrescine (Put) increased during the conversion of PLBs to shoots. The exogenous addition of PAs, mainly Spd or Put at 2.0 mM, not only elevated the endogenous levels of PAs but also promoted the frequency of conversion of PLBs to shoots. As compared with control, the enhanced conversion of PLBs to shoots by exogenous PAs was accompanied by an increase in ratio of total cytokinins (CTKs) to indole-3-acetic acid (IAA), which was due to decrease in the endogenous level of IAA and increase in the endogenous level of total CTKs, including the levels of isopentenyladenine+isopentenyladenine 9-riboside and zeatin+zeatin riboside. Analysis of enzyme

activities showed that the increased endogenous level of total CTKs by PAs was related to the inhibition of CTK decomposition by CTK oxidase, while the decreased endogenous level of IAA was related to the promotion of IAA decomposition by IAA oxidase. Addition of PA biosynthetic inhibitors, involving [alpha]-difluoromethylornithine for Put and methylglyoxal(bis)-guanylhydrazone for Spd and Spm, decreased the conversion of PLBs to shoots, the ratio of total CTKs to IAA, and the levels of endogenous Put and Spd. This inhibition could be partly reversed by the application of exogenous Put or Spd.
Keywords: Dendrobium huoshanense; Endogenous hormones; Hormone-metabolizing enzymes; Polyamines; Protocorm-like bodies

Shivani Vyas, Satyakam Guha, Minakshi Bhattacharya, I. Usha Rao, Rapid regeneration of plants of Dendrobium lituiflorum Lindl. (Orchidaceae) by using banana extract, Scientia Horticulturae, Volume 121, Issue 1, 2 June 2009, Pages 32-37, ISSN 0304-4238, DOI: 10.1016/j.scienta.2009.01.012.
(http://www.sciencedirect.com/science/article/B6TC3-4VHS7T8-2/2/cb2d87ec03898dc9647581bee95e5515)
Abstract:
Effects of banana extract (BE) and 6-benzylaminopurine (BAP) were evaluated on asymbiotic seed germination and an early differentiation of protocorms and plant regeneration of Dendrobium lituiflorum Lindl. High percentage germination was achieved by culturing seeds on modified Knudson C medium supplemented with 10% (v/v) BE. Rapid regeneration was observed within 60 days of culture on 10% (v/v) BE supplemented KC medium where maximum percentage propagules showed development of leaves and root formation. Propagules on BAP supplemented KC medium showed no further development beyond one leaf stage. In another experiment, culture of shoots on 12.5% (v/v) BE supplemented KC medium led to multiplication, shoot elongation as well as vigorous rooting. Shoots cultured on 10 [mu]M BAP supplemented MS medium showed maximum multiplication but these were stunted. Plants with well expanded deep green leaves and elongated roots from BE media were first hardened in vitro followed by ex vitro hardening on cocopeat:perlite (9:1) in the greenhouse conditions and exhibited 90% survival. The study emphasizes the role of BE as a natural additive at different stages of development from seed germination to plant regeneration.
Keywords: Banana extract; Cytokinin; Plant regeneration

Ladawan Lerslerwong, Saichol Ketsa, Wouter G. van Doorn, Protein degradation and peptidase activity during petal senescence in Dendrobium cv. Khao Sanan, Postharvest Biology and Technology, Volume 52, Issue 1, April 2009, Pages 84-90, ISSN 0925-5214, DOI: 10.1016/j.postharvbio.2008.09.009.
(http://www.sciencedirect.com/science/article/B6TBJ-4V936KP-2/2/a25f1a70b5f24c47138b66140c936317)
Abstract:
During ethylene-induced petal senescence in Dendrobium cv. Khao Sanan flowers, the levels of water-insoluble protein in petals decreased but the levels of water-soluble proteins were not affected. Total peptidase activity in the petals increased from day 1 of ethylene treatment and showed a peak by day 4. Treatment of excised flowers with E-64, a specific inhibitor of cysteine peptidases, prior to ethylene exposure, almost doubled the time to visible petal senescence. Since the membrane-impermeable form was used, the results might suggest an effect on an extracellular peptidase. Treatment of the flowers with 1,10-phenanthrolin, a general metal chelator, also doubled the time to ethylene-induced visible petal senescence. This compound might have several effects other than on metallopeptidases. A partial cDNA encoding a cysteine peptidase gene (Den-Cys1) in senescent petals was identified. Its transcript abundance in petals showed a large increase, within one day of the onset of ethylene treatment. Treatment of the flowers with ethylene

also resulted in an increase in DenCys1 abundance, an increase in total peptidase activity, and a decrease of soluble protein, in the column (the organ consisting of fused anthers, filaments, stigma, and style). The results show that senescence, both in petals and the column, is accompanied by increased peptidase activity and degradation of water-insoluble protein. This is the first report to show that a specific inhibitor of cysteine peptidases delays the time to petal senescence.
Keywords: Column; Cysteine peptidase; Flower senescence; Orchid; Peptidase activity; Petal; Protein degradation

X.-Q. Zha, J.-P. Luo, P. Wei, Identification and classification of Dendrobium candidum species by fingerprint technology with capillary electrophoresis, South African Journal of Botany, Volume 75, Issue 2, April 2009, Pages 276-282, ISSN 0254-6299, DOI: 10.1016/j.sajb.2009.02.002.
(http://www.sciencedirect.com/science/article/B7XN9-4VT17YF-1/2/40bfa89f40a9fd554d6cb58dd1dd2168)
Abstract:
A capillary electrophoresis fingerprint method was established to evaluate the quality of Dendrobium candidum. The method of sample preparation and the electrophoresis condition were optimized to obtain highly sensitive and specific capillary electropherogram. The analysis was performed on a fused-silica capillary (65 cm x 75 [micro sign]m i.d). The detection wavelength was 195 nm and a voltage of 20 kV was applied. The background electrolyte was a 40 mmol/L sodium borate solution (5% methanol, v/v) adjusted to pH 9.5 with 0.1 mmol/L NaOH solution. Medicinal materials were extracted by ethanol reflux for 2 h. The capillary electrophoresis fingerprints of 69-sample of Dendrobium candidum species from 10 different areas showed 15 characteristic peaks which could be applied to identification of this species. The coefficients were from 0.854 to 0.963 between standard fingerprint and each sample. The quantitative data of the fingerprints were analyzed by principal component analysis (PCO), UPGMA cluster analysis and the results showed that samples from different regions could be divided into three groups. Moreover, a rapid and convenient discriminant function was established to classify the Dendrobium candidum plants. The data revealed that the coincidence rate of all samples attached 100% by this discriminant model. The method is reliable and could be used to control the quality of medicinal plants including Dendrobium candidum species in the future.
Keywords: Capillary electrophoresis; Dendrobium candidum; Discriminant analysis; Fingerprint; Similarity analysis

Jin Xiaohua, Chen Singchi, Luo Yibo, Taxonomic revision of Dendrobium moniliforme complex (Orchidaceae), Scientia Horticulturae, Volume 120, Issue 1, 3 March 2009, Pages 143-145, ISSN 0304-4238, DOI: 10.1016/j.scienta.2008.10.002.
(http://www.sciencedirect.com/science/article/B6TC3-4V1D7TM-1/2/1a4388d6a0042d6537059c2ac1f8ec78)
Abstract:
Taxonomic revision of Dendrobium moniliforme complex is presented. D. moniliforme complex is characterized by the even slim stems, bracts with brownish zone, semi-spherical anther cap and the hairy disc of lip. Dendrobium tosaense, Dendrobium officinale and Dendrobium guangxiense were excluded by having membranous bracts lacking brownish zone, anther cap conical and bifid. Two species are recognized in this complex, i.e., D. moniliforme and Dendrobium wilsonii. D. wilsonii differs from D. moniliforme by having elliptic leaves about 1.3-2 cm wide, dorsal sepal 3.0-4.0 cm long, 0.6-0.9 cm wide, petals elliptic to oblong, 3.0-4.0 cm long, 1.0-1.5 cm wide, lip elliptic to ovate-lanceolate, 2.6-3 cm long, 1.2-1.5 cm wide.
Keywords: Dendrobium candidum; Dendrobium hennanense; Dendrobium houshanense; Dendrobium moniliforme; Dendrobium wilsonii; Taxonomic revision

You-Min Yap, Chiang-Shiong Loh, Bee-Lian Ong, Regulation of flower development in Dendrobium crumenatum by changes in carbohydrate contents, water status and cell wall metabolism, Scientia Horticulturae, Volume 119, Issue 1, 10 December 2008, Pages 59-66, ISSN 0304-4238, DOI: 10.1016/j.scienta.2008.06.029.
(http://www.sciencedirect.com/science/article/B6TC3-4T4J1FT-2/2/93cf0c718b96e5d4e8cdd893de7e4c08)
Abstract:
The involvement of carbohydrates, water potential, cell wall components and cell wall-based enzymes in regulating flower development in Dendrobium crumenatum was investigated. Plants were subjected to cold treatment to release floral buds from dormancy, and the various parameters were investigated from young floral bud stage till flower senescence. Development of floral buds was accompanied by progressive decrease in concentrations of fructans and starch. Upon full flower opening, concentration of soluble sugars was maximum, accompanied by a more negative water potential. High pectin methylesterase activity was observed during early bud development and decreased thereafter. Significant increase in activities of [beta]-galactosidase, [beta]-mannosidase and [beta]-xylosidase was also observed during floral bud development. The cell walls of sepals and petals were modified extensively during floral bud and flower development, as observed by changes in the amounts of celluloses, hemicelluloses and total pectin. Pectin solubilisation was also observed to commence during early floral bud development. These results indicated that carbohydrate hydrolysis, osmotic changes and cell wall dissolution that began early in young floral buds, all regulated flower development in this sympodial orchid. Possible applications of the findings in the horticultural industry are discussed.
Keywords: Orchid; Flower development; Carbohydrates; Osmolality; Cell wall composition; Cell wall hydrolases

Yegao Chen, Ying Liu, Jinhe Jiang, Yan Zhang, Benlin Yin, Dendronone, a new phenanthrenequinone from Dendrobium cariniferum, Food Chemistry, Volume 111, Issue 1, 1 November 2008, Pages 11-12, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2008.03.017.
(http://www.sciencedirect.com/science/article/B6T6R-4S33NBT-B/2/5d7ca7edae65f00aa74ffc5ffe9fd9e9)
Abstract:
The stems of several Dendrobium species of the Orchidaceae, used as health foods and nutrients, are rich sources of aromatics, such as bibenzyls, phenanthrenes, fluorenones and simple aromatic acids and esters with antitumour, antioxidant and antimutagenic activities. From the chloroform extract of the whole plant of Dendrobium cariniferum, a new phenanthrenequinone, dendronone, was isolated. Its structure was identified as 5-hydroxy-7-methoxy-9,10-dihydro-1,4-phenanthrenequinone, based on extensive spectroscopic studies, including HRESIMS, EIMS, 1H NMR, 13C NMR, DEPT, H-H COSY, HSQC, HMBC and NOESY spectra. In this paper, we described the isolation procedure and the structural elucidation of this new compound, as well as the detection of gigantol and batatasin III by co-chromatography with authentic standards.
Keywords: Dendrobium cariniferum; Orchidaceae; Phenanthrenequinone; Dendronone; 5-Hydroxy-7-methoxy-9,10-dihydro-1,4-phenanthrenequinone

Yegao Chen, Yupeng Li, Chen Qing, Yanli Zhang, Liqin Wang, Ying Liu, 1,4,5-Trihydroxy-7-methoxy-9H-fluoren-9-one, a new cytotoxic compound from Dendrobium chrysotoxum, Food Chemistry, Volume 108, Issue 3, 1 June 2008, Pages 973-976, ISSN 0308-8146, DOI: 10.1016/j.foodchem.2007.12.007.
(http://www.sciencedirect.com/science/article/B6T6R-4RBYG2H-4/2/f3aa54293feaa94296f1079a92e23142)
Abstract:

A new compound, 1,4,5-trihydroxy-7-methoxy-9H-fluoren-9-one, has been isolated together with two known fluorenones, dendroflorin and denchrysan A, from the whole plant of Dendrobium chrysotoxum, a plant of Dendrobium genus, used as a health-food. The structure of the fluorenones has been determined on the basis of spectroscopic studies. The isolated compounds were evaluated in vitro for their inhibitory ability against the growth of human leukaemia cell lines K562 and HL-60, human lung adenocarcinoma A549, human hepatoma BEL-7402 and human stomach cancer SGC-7901. All three fluorenones displayed selective cytotoxicity against BEL-7402 with IC50 values of 1.49, 0.97 and 1.38 [mu]g/ml, respectively.
Keywords: Dendrobium chrysotoxum; Orchidaceae; Fluorenones; 1,4,5-Trihydroxy-7-methoxy-9H-fluoren-9-one; Cytotoxicity

Yegao Chen, Jiangtao Li, Liqin Wang, Ying Liu, Aromatic compounds from Dendrobium aphyllum, Biochemical Systematics and Ecology, Volume 36, Issues 5-6, May-June 2008, Pages 458-460, ISSN 0305-1978, DOI: 10.1016/j.bse.2007.11.004.
(http://www.sciencedirect.com/science/article/B6T4R-4RFD09T-2/2/d61a750f009a2715335285fcb5b3aa27)
Keywords: Dendrobium aphyllum; Orchidaceae; Aromatics; Biphenanthrene; Bibenzyl; Chemotaxonomy

Patchra Limpanavech, Subhalai Chaiyasuta, Ranitha Vongpromek, Rath Pichyangkura, Chumpol Khunwasi, Supachitra Chadchawan, Pongtharin Lotrakul, Reungwit Bunjongrat, Anchalee Chaidee, Thapana Bangyeekhun, Chitosan effects on floral production, gene expression, and anatomical changes in the Dendrobium orchid, Scientia Horticulturae, Volume 116, Issue 1, 10 March 2008, Pages 65-72, ISSN 0304-4238, DOI: 10.1016/j.scienta.2007.10.034.
(http://www.sciencedirect.com/science/article/B6TC3-4RVMWMC-1/2/c2f5b1c5334857f379e98518d6b94458)
Abstract:
Six types of chitosan molecules, P-70, O-70, P-80, O-80, P-90, and O-90, were used to determine the effects on Dendrobium `Eiskul' floral production. According to analysis of variance (ANOVA) followed by Duncan's multiple range test (DMRT), chitosan O-80 at all concentrations tested, 1, 10, 50, and 100 ppm could induce early flowering and increase the accumulative inflorescence number during the 68 weeks of the experimental period, when compared to the non-chitosan-treated controls. Therefore, chitosan O-80 was selected for further investigation of chitosan effects on the Dendrobium orchid. With the foliar anatomical study, chloroplasts in the young leaves of the plants treated with chitosan O-80 at 10 and 50 ppm were found to be significantly larger than those of the non-chitosan-treated ones. Enlarged chloroplasts were also detected in the old leaves treated with 50 ppm chitosan O-80. Differential display showed that the ycf2 gene (accession no. DQ268736) in chloroplasts was affected after 24 h of chitosan O-80 treatment. The reduction of ycf2 gene expression was detected in the young leaves after 12-48 h of chitosan O-80 application using the reverse transcription-polymerase chain reaction (RT-PCR) method. This indicated that chloroplast was one of the target sites for chitosan action in Dendrobium. Moreover, chitosan O-80 also significantly increased the number of vascular bundles containing silica cells in both old and young leaves, suggesting chitosan effects on silica metabolism and/or silica uptake in orchids.
Keywords: Chitosan; Flowering; Orchid; Dendrobium; Chloroplast; Vascular bundle; Silica

Wagner A. Vendrame, V.S. Carvalho, J.M.M. Dias, In vitro germination and seedling development of cryopreserved Dendrobium hybrid mature seeds, Scientia Horticulturae, Volume 114, Issue 3, 1 November 2007, Pages 188-193, ISSN 0304-4238, DOI: 10.1016/j.scienta.2007.06.006.
(http://www.sciencedirect.com/science/article/B6TC3-4P6MC37-6/2/78b5dbee944a61aa7ae81519d4fd8bc9)
Abstract:

In vitro germination and seedling development from Dendrobium Swartz. hybrid `Sena Red', `Mini WRL', `Jaquelyn Thomas', and `BFC Pink' seeds cryopreserved through vitrification (PVS2) were evaluated. Germination percentages after cryopreservation (LN) were variable among different controls and treatments, despite the initial high seed viability for all hybrids. Seeds exposed to PVS2 at ice temperature from 1 to 3 h prior to LN exhibited significantly higher germination than seeds exposed to PVS2 at room temperature for the same time periods. No significant differences in germination percentages were observed for time exposure to PVS2 at 1, 2 or 3 h for `Sena Red', `Mini WRL', and `BFC Pink'. Seeds of `Jaquelyn Thomas' exposed to 1 h prior to LN showed higher germination percentage than for exposure to 2 or 3 h. The combination of a pre-cooling treatment (ice) with a dehydration treatment (PVS2) for a period of time of 1-3 h was essential to allow proper germination of cryopreserved seeds. Although variability in seed germination among different hybrids and treatments was observed, germination was above 50% of the controls and all germinated seeds developed into normal seedlings with healthy shoot and root formation. No abnormalities, nutritional deficiencies, or diseases were observed in developed seedlings and no significant differences were observed for seedling growth and development from germinated seeds among the different hybrids. Seedlings transplanted to pots acclimatized well and developed into normal plants within 6-8 months in greenhouse. Transplanted seedlings exhibited 100% survival for all hybrids.
Keywords: Orchids; Cryopreservation; Vitrification; Orchidaceae

Xue-Qiang Zha, Jian-Ping Luo, Shui-Zhong Luo, Shao-Tong Jiang, Structure identification of a new immunostimulating polysaccharide from the stems of Dendrobium huoshanense, Carbohydrate Polymers, Volume 69, Issue 1, 1 May 2007, Pages 86-93, ISSN 0144-8617, DOI: 10.1016/j.carbpol.2006.09.005.
(http://www.sciencedirect.com/science/article/B6TFD-4M936M2-1/2/18397f77c2a882c3dae03dc0f5d1933b)
Abstract:
The water-soluble polysaccharide HPS, obtained from the stems of Dendrobium huoshanense by hot-water (50-60 [degree sign]C) extraction and ethanol precipitation, was fractionated by DEAE-Cellulose anion-exchange and gel filtration chromatography including Sephacryl S-200 and Sephadex G-75/G-100, giving one polysaccharide fraction of HPS-1B23 which was investigated by chemical techniques and NMR spectroscopy. This polysaccharide fraction consists of glucose, mannose and galactose in the ratio of 31:10:8. On the basis of periodate oxidation-smith degradation, methylation analysis and partial acid hydrolysis, the repeating unit of HPS-1B23 was established: Pharmaceutical experiments showed that the polysaccharide of HPS-1B23 possessed potent stimulating functions on IFN-[gamma] and TNF-[alpha] production in the culture medium of splenocytes and macrophages, respectively.
Keywords: Dendrobium huoshanense; Polysaccharide; Structure; Splenocytes; Macrophages; Cytokine

Narisa Uthaichay, Saichol Ketsa, Wouter G. van Doorn, 1-MCP pretreatment prevents bud and flower abscission in Dendrobium orchids, Postharvest Biology and Technology, Volume 43, Issue 3, March 2007, Pages 374-380, ISSN 0925-5214, DOI: 10.1016/j.postharvbio.2006.09.015.
(http://www.sciencedirect.com/science/article/B6TBJ-4MR1K3P-1/2/d614b302bbcaa3298b7442272021896b)
Abstract:
Dendrobium orchid inflorescences were treated for 4 h at 25 [degree sign]C with or without 100-500 nl/l 1-MCP and were then placed in water at 25 [degree sign]C to follow abscission. In controls, depending on the experiment, 20-80% of the floral buds and 0-20% of the open flowers abscised within 1 week. The 1-MCP pretreatment largely prevented this abscission. If flowers were exposed to 1.0 [mu]l/l ethylene for 3 days, all floral buds and all open flowers abscised within the 3

days of treatment. 1-MCP treatment just prior to ethylene treatment largely prevented the ethylene effect. Treatment with STS was as effective as treatment with 1-MCP. Dendrobium inflorescences are usually shipped by air in cardboard boxes lined with plastic film. The stem ends are placed in plastic tubes filled with water. After shipment and placement in water, a considerable percentage of the buds, and some flowers, abscise. This is probably due to elevated ethylene concentrations inside the boxes. Treatment of the inflorescences with 100-500 nl/l 1-MCP prior to simulated air transport largely prevented abscission during vase life. 1-MCP treatment inhibited ethylene production of the inflorescences by lowering both ACC synthase in open flowers and ACC oxidase activity in floral buds.
Keywords: Dendrobium; Abscission; ACC content; ACC synthase activity; ACC to ethylene conversion; 1-MCP; Orchid; Vase life

Wagner de Melo Ferreira, Gilberto Barbante Kerbauy, Jane Elizabeth Kraus, Rosete Pescador, Rogerio Mamoru Suzuki, Thidiazuron influences the endogenous levels of cytokinins and IAA during the flowering of isolated shoots of Dendrobium, Journal of Plant Physiology, Volume 163, Issue 11, 1 November 2006, Pages 1126-1134, ISSN 0176-1617, DOI: 10.1016/j.jplph.2005.07.012.
(http://www.sciencedirect.com/science/article/B7GJ7-4HDG93S-5/2/7b248ecc70b7cf66b4e98967e4f06e8d)
Abstract: Summary
This study reports the effects of thidiazuron (TDZ) on the endogenous levels of indoleacetic acid (IAA), zeatin, zeatin riboside ([9R]Z), isopentenyladenine and isopentenyladenosine ([9R]iP) as well as structural changes in the apical meristem of Dendrobium Second Love shoots during flower induction and initial development in vitro. The results revealed that the presence of 1.8 [mu]M TDZ had a profound effect on the endogenous cytokinins (CKs) and IAA levels of the explants, when compared to those grown on a TDZ-free medium. A significant increase in CKs (especially [9R]iP and [9R]Z) and IAA in the first samples (taken at day 5) grown on TDZ-enriched medium was associated with flower induction, while a second increase in the level of these hormones after 25 d of culture was related to flower development. The histological changes detected in the shoot apical meristem of explants grown in the presence of 1.8 [mu]M TDZ during 30 d of culture are also described. Based on these findings, it is suggested that both auxin and CKs seem to be involved with the floral transition of Dendrobium Second Love in vitro. However, a possible direct effect of TDZ on flower formation is not discarded.
Keywords: Auxin; Cytokinins; Dendrobium; Flowering; Orchid

Y. Khentry, A. Paradornuwat, S. Tantiwiwat, S. Phansiri, N. Thaveechai, Incidence of Cymbidium mosaic virus and Odontoglossum ringspot virus in Dendrobium spp. in Thailand, Crop Protection, Volume 25, Issue 9, September 2006, Pages 926-932, ISSN 0261-2194, DOI: 10.1016/j.cropro.2005.12.002.
(http://www.sciencedirect.com/science/article/B6T5T-4J3WG5V-2/2/a3fd32c6408c54b0e8edd2d0b0cf22f4)
Abstract:
Dendrobium is the most popular cut flower and potted plant for the Thai orchid industry and several viruses have been reported to negatively impact upon their growth and yield. This study was carried out to confirm viral infection and identify the viruses infecting Dendrobium spp. in Thailand. Dendrobium orchids propagated through cutting of pseudobulbs, and grown in tissue culture were screened for Cymbidium mosaic virus (CymMV) and Odontoglossum ringspot virus (ORSV) with indirect enzyme-linked immunosorbent assay (ELISA). CymMV and ORSV were detected in 65.4% and 0% of the 280 tested plants, respectively. Among the 29 cultivars of tissue cultured cut flower and 19 cultivars of potted Dendrobium, CymMV infection rates were 18.6% and 8.7%, respectively. No CymMV or ORSV were found in 21 species of in vitro seed cultured

seedlings of Thai native Dendrobium. The data indicated that CymMV is a prevalent virus in vegetatively propagated Dendrobium but not in in vitro seed cultured seedlings in Thailand. Plant material must be tested for the presence of viruses before being used for mass production by tissue culture, and sanitation during propagation of orchid plants and harvesting of flowers is essential in order to prevent the virus from spreading.
Keywords: Cymbidium mosaic virus (CymMV); Odontoglossum ringspot virus (ORSV); Dendrobium; ELISA

Li Yang, Zhengtao Wang, Luoshan Xu, Phenols and a triterpene from Dendrobium aurantiacum var. denneanum (Orchidaceae), Biochemical Systematics and Ecology, Volume 34, Issue 8, August 2006, Pages 658-660, ISSN 0305-1978, DOI: 10.1016/j.bse.2006.03.003.
(http://www.sciencedirect.com/science/article/B6T4R-4K07G25-1/2/123a1db2804b12118d057a14ccbc80e6)
Keywords: Dendrobium aurantiacum var. denneanum; Orchidaceae; Phenols; Triterpene; Bibenzyl; Fluorenone; Chemotaxonomy

K.P. Martin, Joseph Madassery, Rapid in vitro propagation of Dendrobium hybrids through direct shoot formation from foliar explants, and protocorm-like bodies, Scientia Horticulturae, Volume 108, Issue 1, 16 March 2006, Pages 95-99, ISSN 0304-4238, DOI: 10.1016/j.scienta.2005.10.006.
(http://www.sciencedirect.com/science/article/B6TC3-4J616TH-1/2/94c3ff3d95b2869f352a8b534c0f2bfc)
Abstract:
In vitro propagation protocol for Dendrobium hybrids Sonia 17 and 28, two highly priced commercial cut flower cultivars through direct organogenesis from in vitro derived foliar explants was established. Rapid clonal propagation was achieved by subsequent induction of protocorm-like bodies (PLBs) and its conversion to shoots. No significant differences were observed in the induction of direct shoots, shoot multiplication, PLBs formation and subsequent shoot development and rooting of shoots between the two cultivars. Leaf explants from flower stalk node derived shoots cultured on half-strength Murashige and Skoog (MS) medium supplemented with 44.4 [mu]M N6-benzyladenine (BA) developed more than seven shoots per explant. The isolated shoots transferred onto the same medium induced more than eight PLBs from the base within 60 days, which upon transferral to fresh medium having the same level of BA facilitated rapid proliferation. More than 200 PLBs were yielded from fifth subculture. Half-strength MS medium containing 6.97 [mu]M kinetin (Kn) facilitated conversion of more than 90% PLBs to shoots. PLBs exhibited proliferation without decline up to the 15th subculture. Half-strength MS medium with 2 g l-1 activated charcoal was the best for in vitro rooting. Plantlets of the hybrids exhibited more than 80% ex vitro establishment.
Keywords: PLB conversion; Orchids; Shoot multiplication

Martin Skipper, Kim B. Pedersen, Louise B. Johansen, Signe Frederiksen, Vivian F. Irish, Bo B. Johansen, Identification and quantification of expression levels of three FRUITFULL-like MADS-box genes from the orchid Dendrobium thyrsiflorum (Reichb. f.), Plant Science, Volume 169, Issue 3, September 2005, Pages 579-586, ISSN 0168-9452, DOI: 10.1016/j.plantsci.2005.04.011.
(http://www.sciencedirect.com/science/article/B6TBH-4G7DYNH-4/2/3a3536c71937bb87f45cbcf38105c2db)
Abstract: Summary
Orchids serve as useful model plants for the discovery and study of genes involved in novel processes in floral development because of their highly modified flowers. In this study three different FRUITFULL (FUL)-like MADS-box genes, DthyrFL1, -2, and -3 have been isolated from the orchid Dendrobium thyrsiflorum. Sequence alignment indicates that the entire sequence of exon 6 is missing in DthyrFL3 and that a frame shift could explain the missing FUL-like motif found

in the sequence of both DthyrFL1 and -2. Phylogenetic analysis of the APETALA1/FRUITFULL lineage shows that FUL-like sequences from monocots all fall within one major clade and that subsequent gene duplication within this group is specific to monocots. At least two major duplication events have occurred: one before the split of the Poaceae and another within the Poaceae. Quantitative real-time RT-PCR analysis of the DthyrFL genes shows that they are expressed at different levels during inflorescence development but also transcribed in ovules and at very low levels in roots and leaves. These results suggest that the three FUL-like members are involved in floral development in D. thyrsiflorum.
Keywords: Flower development; MADS-box genes; FRUITFULL-like; Real-time RT-PCR; Orchids; Dendrobium

Fumi Tatsuzawa, Tomohisa Yukawa, Koichi Shinoda, Norio Saito, Acylated anthocyanins in the flowers of genus Dendrobium section Phalaenanthe (Orchidaceae), Biochemical Systematics and Ecology, Volume 33, Issue 6, June 2005, Pages 625-629, ISSN 0305-1978, DOI: 10.1016/j.bse.2004.11.007.
(http://www.sciencedirect.com/science/article/B6T4R-4FC3RPY-8/2/05f54a241c215473750eee95ce5ca7eb)
Keywords: Dendrobium species; Section Phalaenanthe; Orchidaceae; Acylated cyanidin 3,7,3'-triglucoside; Malonic, p-Hydroxybenzoic and sinapic acids; Malonylglucoside

Guang-Nong Zhang, Ling-Yan Zhong, S.W. Annie Bligh, Ying-Li Guo, Chao-Feng Zhang, Mian Zhang, Zheng-Tao Wang, Luo-Shan Xu, Bi-bicyclic and bi-tricyclic compounds from Dendrobium thyrsiflorum, Phytochemistry, Volume 66, Issue 10, May 2005, Pages 1113-1120, ISSN 0031-9422, DOI: 10.1016/j.phytochem.2005.04.001.
(http://www.sciencedirect.com/science/article/B6TH7-4G7GFP4-1/2/3af821b9baccc237d0bcbde60fa2f20e)
Abstract:
One bi-bicyclic and two bi-tricyclic derivatives of coumarin-benzofuran, phenanthrene-phenanthrene and phenanthrene-phenanthraquinone, along with seven known compounds, were isolated from stems of Dendrobium thyrsiflorum Rchb.f. (Orchidaceae). On the basis of chemical, NMR (1H, 13C, HMQC, HMBC and NOESY) and mass spectrometry data, their structures were elucidated as denthyrsin [3-(5',6'-dimethoxybenzofuran-2'-yl)-6,7-dimethoxy-2H-chromen-2-one; 1], denthyrsinol (4,5'-dimethoxy-[1,1']biphenanthrenyl-2,5,4',7'-tetraol; 2), and denthyrsinone (7,4',7'-trihydroxy-2,2',8'-trimethoxy-[5,1']biphenanthrenyl-1,4-dione; 3). Compounds 1-3 and denthyrsinin (1,5,7-trimethoxyphenanthrene-2,6-diol; 4) showed significant cytotoxic activities against Hela (13.5, 9.3, 9.9 and 2.7 [mu]M, respectively), K-562 (0.45, 1.6, 6.0 and 2.3 [mu]M, respectively) and MCF-7 (18.1, not tested, 3.5 and 4.8 [mu]M, respectively) cell lines.
Keywords: Dendrobium thyrsiflorum; Orchidaceae; Denthyrsin; Denthyrsinol; Denthyrsinone; Cytotoxic activity

Ravindra B. Malabadi, Gangadhar S. Mulgund, Nataraja Kallappa, Micropropagation of Dendrobium nobile from shoot tip sections, Journal of Plant Physiology, Volume 162, Issue 4, 22 April 2005, Pages 473-478, ISSN 0176-1617, DOI: 10.1016/j.jplph.2004.09.008.
(http://www.sciencedirect.com/science/article/B7GJ7-4F9MTD1-3/2/86ce22012537cf54fbdca4fb6561e2e1)
Abstract: Summary
Successful shoot regeneration of Dendrobium nobile was achieved using thin shoot tip sections and triacontanol (TRIA) for the first time. Protocorm-like bodies (PLBs) or proliferating shoot buds were observed when thin shoot tip sections were cultured on the basal medium of Mitra et al. (Indian J. Exp. Biol. 14 (1976) 350) supplemented with 4.0 [mu]g L-1 TRIA. The highest percentage of explants (93%) produced PLBs or proliferating shoot buds (21) at 4.0 [mu]g L-1

TRIA-supplemented basal medium. All the newly formed PLBs or proliferating shoot buds survived and ultimately produced healthy shoots with 2-3 leaves. Shoots produced roots when cultured on basal medium supplemented with 2.0 [mu]g L-1 TRIA. The well-rooted shoots were transferred to pots containing charcoal chips, coconut husk and broken tiles (2:2:1), and a 92% survival rate was achieved. This work reveals that TRIA can be used as an effective growth regulator in the micropropagation and conservation of D. nobile.
Keywords: Conservation; Dendrobium nobile; Micropropagation

Katia Oliveira Campos, Gilberto Barbante Kerbauy, Thermoperiodic effect on flowering and endogenous hormonal status in Dendrobium (Orchidaceae), Journal of Plant Physiology, Volume 161, Issue 12, 13 December 2004, Pages 1385-1387, ISSN 0176-1617, DOI: 10.1016/j.jplph.2004.07.008.
(http://www.sciencedirect.com/science/article/B7GJ7-4DN13JR-1/2/4435ebb1603527c746f139e3c381fb57)
Abstract: Summary
Two year-old cloned plants of Dendrobium Second Love were submitted to 25 [degree sign]C (light) and 10 [degree sign]C (dark) under a 12 h photoperiod (60 [mu]mol m-1 s-1) for 30 days. The endogenous levels of IAA, ABA, and the cytokinins Z, [9R]Z, iP, and [9R]iP were measured 15, 22, and 30 days after the start of the thermoperiodic treatment in lateral buds and leaves. The endogenous levels of IAA and cytokinins, especially the zeatin-derived forms, increased significantly in buds after 15 days of treatment. On the other hand, the amount of ABA decreased progressively and significantly throughout the treatment. The treatment conspicuously accelerated flower-bud development. The found correlation suggests that hormones are involved in the signal transduction pathway of thermoperiodic flowering control.
Keywords: Flowering; Orchid; Hormones; Temperature

C. C. Tsai, C. I. Peng, S. C. Huang, P. L. Huang, C. H. Chou, Determination of the genetic relationship of Dendrobium species (Orchidaceae) in Taiwan based on the sequence of the internal transcribed spacer of ribosomal DNA, Scientia Horticulturae, Volume 101, Issue 3, 10 September 2004, Pages 315-325, ISSN 0304-4238, DOI: 10.1016/j.scienta.2003.11.004.
(http://www.sciencedirect.com/science/article/B6TC3-4BG3TD9-2/2/ba97c5c31dd38c0855a883bb3a925d8f)
Abstract:
The genetic relationship of 12 Dendrobium species in Taiwan was determined based on sequence analysis of the internal transcribed spacer (ITS) region of ribosomal DNA. Aligned sequences of the complete ITS region obtained from the 12 taxa and two outgroups resulted in 684 characters. Genetic distances and a phylogenetic tree were constructed, and four main clusters were generated among the 12 Dendrobium species. From the results, Dendrobium linawianum, Dendrobium moniliforme, Dendrobium tosaense, Dendrobium leptoclandum, and Dendrobium falconeri are grouped with Dendrobium aurantiacum; Dendrobium chameleon is grouped with Dendrobium miyakei; and Dendrobium crumenatum is grouped with Dendrobium equitans. In addition, Dendrobium furcatopedicellatum and Dendrobium somai are grouped together but are separated from other Dendrobium species. In the present study, results also support Epigeneium nakaharai not being placed in the genus Dendrobium. In addition, it may be preferable to place D. furcatopedicellatum and D. somai in a genus different from Dendrobium.
Keywords: Dendrobium; Phylogeny; rDNA; ITS; PCR; Hybrid

G. V. S. Saiprasad, P. Raghuveer, S. Khetarpal, R. Chandra, Effect of various polyamines on production of protocorm-like bodies in orchid--Dendrobium `Sonia', Scientia Horticulturae, Volume 100, Issues 1-4, 19 March 2004, Pages 161-168, ISSN 0304-4238, DOI: 10.1016/j.scienta.2003.08.017.

(http://www.sciencedirect.com/science/article/B6TC3-49Y41DS-1/2/bc2cd40c0358b88e53caa50f06006043)

Abstract:
Polyamines, putrescine, spermidine and spermine all at three concentrations viz., 0.2, 0.4 and 1.0 mM were tested, by supplementing to MS basal+4.44 [mu]m BAP medium. The explant used was fractionated plb. Ethylene and methane was measured at 20 and 40 days after inoculation (DAI). Among various polyamines tested, maximum number of plb's (protocorm-like bodies) were produced in putrescine 0.4 mM treatment. Increase (1.0 mM) or decrease (0.2 mM) in concentration caused a decrease in the production of plb's. All spermidine and spermine treatments resulted in the production of less number of plb's than control. No ethylene evolution was observed in any of the polyamine treatments. However, methane evolution was observed in all the polyamine treatments. The absolute amounts, of methane evolved could not be related to the observed plb's production response. However, when the evolution of methane was more than 1 nmol per gram FW h-1, poor plb's production was observed.

Keywords: Somatic embryogenesis; Regeneration; Putrescine; Spermidine; Spermine; Methane