Tissue culture in ornamentals: Factors and techniques in propagation, and its application

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Abbreviations		
Medium		
	MS	Murashige and Skoog
	1/2 MS	Half strength MS medium
	LM	Liquid media
	MS-LM	MS liquid medium
	mMS[1]	MS medium supplemented with 412.5 mg/L NH_4NO_3 and 950 mg/L KNO_3
	mMS[2]	MS medium supplemented with 100 mg/L $MgSO_4.7H_2O$, 100 mg/L NH_4NO_3, 30 mg/L Fe-EDTA, 1 mg/L thyamine
	mMS[3]	MS medium with the elimination of Cl^- and reduced NH_4^+ ions
	mMS[4]	MS medium with extra addition of 330 mg/L $CaCl_2{\cdot}6H_2O$, 13.9 mg/L $FeSO_4$, 20.65 mg/L $Na_2EDTA{\cdot}2H_2O$
	NN	Nitsch and Nitsch
	NDM	New Dogashima medium
	VW	Vacin and Went
	mVW	Ferric tartrate replaced by Na_2EDTA 37.3 mg/L and $FeSO_4{\cdot}7H_2O$ 27.8 mg/L
	uVW	Modified VW medium, modification is not specified
	B5	Gamborg medium
	WH	White medium
	WPM	Woody Plant Medium
	SH	Schenk & Hildebrandt medium
	TC	Teixeira Cymbidium medium
	TC1	Teixeira Cymbidium medium 1
	mHm	Modified Hyponex medium (6.5 N4.5 P–19K + 20N–20P–20K)
	SM	Simplified medium with 5 mL/L of Biofert Plus® NPK (08-09-09) fertilizer and 60 g/L 'Nanica' banana pulp
	MM	Basal medium of Mitra et al. (1976)
	KC	Knudson's C media
	mKC	Modified by $ZnSO_4.7H_2O$ (from 0.331 to 6.62 mg/L), H_3BO_3 (from 0.056 to 1.4 mg/L) and $MnSO_4.H_2O$ (from 7.5 to 15 mg/L)
	mNS	Modified nutrient solution of KC, replacement of the iron source by iron-EDTA of MS medium
	O753	Orchid Multiplication Medium, PHYTAMAX™
	P0931	Phytamax basal medium
	NP	Ichihashi New Phalaenopsis Medium
	CIM	Callus induction medium [half strength MS macro- and micronutrients, 250 mg/L peptone, 100 mg/L myo-inositol, 2 mg/L glycine, 0.5 mg/L nicotinic acid, 0.1 mg/L thiamine-HCl, 0.5 mg/L pyridoxin-HCl, 1 mg/L MES]
	CM	Chen medium
	DKW	Driver and Kuniyuki walnut (Driver and Kuniyuki 1984)
Carbon sources		
	suc.	Sucrose
	mal.	Maltose
	glu.	Glucose
	tre.	Trehalose
Solidifying agents		
	ag	Agar
	gg	Gellan gum
	pg	Phytagel
	gr	Gelrite
	bag	Bacto agar
	cg	Clarigel
	cn	Carrageenan
	pa	Phyto agar
Light		

	WF	White fluorescent
	PAR LED	Photosynthetically Active Radiation (blue; 430 nm 5%, 460 nm 10%; red, 610 nm 10%, 630 nm 35%, 660 nm 35%, 730 nm 5%)
Plant growth regulators (PGRs)		
Auxin	IAA	Indole-3-acetic-acid
	IBA	Indole-3-butyric acid
	NAA	1-Napthaleneacetic acid
	2,4-D	2, 4-Diclorophenoxiacetic acid
	Pic	Picloram (4-amino-3,5,6-trichloropicolinic acid), a synthetic auxin
Cytokinins	BAP	6-benzylaminopurine
	BA	6-benzyladenine
	KIN	Kinetin
	ZT	Zeatin
	TDZ	Thidiazuron (N-phenyl-N'-1,2,3-thiadiazol-5-yl urea)
	mT	meta-Topolin
	ZR	Zeatin riboside
Gibberellins	GA_3	gibberellic acid
Elicitor	Ch	Chitosan
	O-Ch	Oligomeric-Chitosan mixture
	P-Ch	Polymeric-Chitosan
	5-ALA	5-aminolevulinic acid
	NAG	*N*-acetylglucosamine
	SA	Salicylic acid
	L-phe	L-Phenylalanine
	HA9	Hyaluronic Acid with molecular weight 1.08x106 Da
	HA12	Hyaluronic Acid with molecular weight 1.2x106 Da
	JA	Jasmonic acid
	MeJA	Methyl jasmonate
	PG	P hloroglucinol
Carbocyclic sugar		
	MI	*myo*-inositol
	MeI	*meso*-inositol
Plant hormones		
	24-EpiB	Epin-Extra® (24-epibrassinolide)
	RE	Ribav-Extra®
	TRIA	Triacontanol
Lanthanoids		
	Nd	Neodymium nitrate

	CCC	Chlorocholine chloride (CCC: (2-chloroethyl) trimethyl-ammonium chloride)
	MES	4-morpholineethanesulfonic acid
	NAg	Nano-silve
	2iP	6-(γ,γ-dimethylallylamino)purine
	ac	Activatedd charcoal
	HYPONeX	liquid, N:P:K=6:3:3

Misc.

Thi	Thiamine	Bio	Biotin	AS	Adenine sulphate
L-gl	L–glutamine	Nia	Niacin	CA	Citric acid
Pt	Peptone	PHCl	Pyridoxine HCl	L-arg	L-arginine
p–ABC	*p*–aminobenzoic acid	gly	Glycine	6P	6-(4-hydroxy-3-methylbut-2- enylamino) purine
T–HCl	Thiamine HCl	Chl	Casein hydrolysate	CPPU	N-(2-chloro4-pyridl)-N′-phenylurea
cw	Coconut water	pyr	Pyridoxine	Tt	Tryptone
BH	Banana homogenate	NA	Nicotinic acid	Spe	Spermin, a Polyamines
PH	Potato homogenate	pac	Paclobutrazol	Orn	Ornithyne, a Polyamines
TH	tomato homogenate	glu	Glutamine	wks	Weeks
Pu	Putrescine, a Polyamines	AA	Ascorbic acid		

Table S1. Effective plant growth regulators and other factors for the in vitro culture in ornamentals.

Plant species	Media	Carbon source	Solidifying agent	Media supplements	Effective concentration and combinations	Temperature	Light / dark cycle	Culture period	Target of regeneration	Ref
Cymbidium orchid										
Cymbidium Twilight Moon "Day Light"	TC	2% suc.	0.8% bag	–	1-2 mg/L 2,4-D or 1 mg/L TDZ	25 °C	16 h/ 8 h	–	Embryogenic callus	da Silva 2014a
Cymbidium aloifolium	MS	3% suc.	0.8% ag	100 mg/L MI	5 mg/L NAA	25±1 °C	–	8 wks	Rhizomes	Nayak et al. 1998
C. aloifolium	MS	3% suc.	0.8% ag	100 mg/L MI	1 mg/L BA + 0.1 mg/L NAA	25±1 °C	–	8 wks	Shoot/rhizome	Nayak et al. 2002
C. aloifolium Sw.	MS	3% suc.	0.8% ag	100 mg/L MI	14 µM ZR (PLBs); 9.8 µM IBA (root)	25±1 °C	–	10 wks	PLBs and root induction	
Cymbidium "Memoria Amelia Earhart"	1/2 MS	–	0.7% ag	0.15% ac	10^{6}% 24-EpiB; 11.6 µM KIN + 2.9 µM IAA	22±2 °C	16 h/ 8 h	6 wks	PLBs	Lukatkin et al. 2019
	MS	–	0.7% ag	0.15% ac	10^{4}%-10^{5}% 24-EpiB; 0.5 µM KIN + 2.9 µM IAA	22±2 °C	16 h/ 8 h	6 wks	Shoot organogenesis	
	MS	–	0.7% ag	0.15% ac	10^{4}% RE; 4.4 µM or 13.3 µM BA; 109 µM TDZ + 2.9 µM IAA	22±2 °C	16 h/ 8 h	6 wks	Shoot organogenesis	
Cymbidium Waltz "Idol"	mMS[1]	2% suc.	0.2% pg	–	0.1 mg/L HA9	25±2 °C	16 h/ 8 h	40 days	PLBs proliferation	Kaewjampa et al. 2012
C. insigne	mMS[1]	2% suc.	0.2% pg	–	0.1 mg/L CS	–	16 h/ 8 h	8 wks	PLBs proliferation	Nahar et al. 2013
C. faberi Rolfe	1/2 MS	3% suc.	0.68% ag	2 g/L ac + 0.5 g/L Chl	0.5, 1, 2 mg/L NAA	25±2 °C	12 h/ 12 h	30 days	PLB organogenesis and proliferation	Tao et al. 2011
	1/2 MS	3% suc.	0.68% ag	3 g/L ac + 0.5 g/L Chl	1 mg/L TDZ + 0.5 mg/L NAA (shoot); 0.5 mg/L IBA (root)	25±2 °C	12 h/ 12 h	30~60 days	Shoot and root organogenesis	
C. dayanum	mMS[1]	2% suc.	0.2% pg	–	0.1 mg/L Ch; 0.1 mg/L HA9	25 °C	16 h/ 8 h	40 days	PLBs proliferation	Nahar et al. 2011
C. iridioides D. Don	MS	–	0.8% ag	–	0.5 mg/L BAP (shoot); 1 mg/L IBA (root)	25±2 °C	16 h/ 8 h	8 wks	Plantlet regeneration	Pant and Swar 2011
C. f inlaysonianum	MS	–	0.6% ag	–	1.5 mg/L BAP + 0.75 mg/L NAA	25±2 °C	16 h/ 8 h	45 days	Shoot regeneration	Islam et al. 2015
Dendrobium orchid										
Dendrobium hybrid	MS	2% suc.	0.8% ag	1 g/L ac	1 mg/L NAA + 1 mg/L BAP	26±1 °C	16 h/ 8 h	60 days	PLBs and plantlet regeneration	Khatun H et al. 2010
Dendrobium hybrid	MS	2% suc.	0.8% ag	–	1.0 mg/L IAA + 1.0 mg/L IBA	26±1 °C	16 h/ 8 h	–	Rooting	Khatun M et al. 2010
Dendrobium hybrid (Sonia 17 and 28)	1/2 MS	2% suc.	0.7% ag	–	44.4 µM BA + 6.97 µM KIN	25±2 °C	16 h/ 8 h	60 days	PLBs and shoot organogenesis	Martin and Madassery 2006
	1/2 MS	2% suc.	0.7% ag	–	0.44 µM BA (shoot); 2 g/L ac (root)	25±2 °C	16 h/ 8 h	60 days	PLBs to shoots induction, root induction	
Dendrobium sp.	MS	–	–	–	10 mg/L 2,4-D (PLBs); 0.5 mg/L BAP + 0.5 mg/L NAA (shoot)	25±1 °C	–	60 days	PLBs and shoot regeneration	Goswami et al. 2015
Dendrobium sp.	MS	3% suc.	0.8% ag	–	2.5 mg/L NAA; 0.5 or 2.5 mg/L BAP	25±2 °C	16 h/ 8 h	30 & 60 days	PLBs proliferation	Hossen et al. 2021
	MS	3% suc.	0.8% ag	–	0.5 mg/L KIN + 2.5 mg/L BAP + 0.5 mg/L NAA	25±2 °C	16 h/ 8 h	45 days	Shoot regeneration	
	MS	3% suc.	0.8% ag	–	0.5 mg/L KIN + 2.5 mg/L BAP + 5 mg/L NAA	25±2 °C	16 h/ 8 h	45 days	Root induction	
D. densiflorum Lindl. ex Wall.	MS	3% suc.	0.7% ag	100 mg/L MI	5 mg/L BAP + 0.1 mg/L NAA	25±2 °C	16 h/ 8 h	2 months	PLBs proliferation	Luo et al .2008
	MS	3% suc.	0.7% ag	100 mg/L MI	2 mg/L BAP (shoot); 5 mg/L IBA + 5 g/L ac or 2 mg/L Nd (root)	25±2 °C	16 h/ 8 h	–	Shoot and root from PLB	
D. densiflorum Lindl.	MS	–	0.8% ag	–	2 mg/L BAP + 0.5 mg/L NAA (shoot); 1.5 mg/L IBA (root)	25±2 °C	16 h/ 8 h	12 wks	Shoot and root proliferation	Pradhan et al. 2013

Dendrobium cv. Sonia	1/2 MS	3% suc.	0.7% ag	–	1 mg/L BA	25±2 °C	16 h/ 8 h	–	PLBs multiplication	Sheela et al. 2006
D. nobile	MS	3% suc.	0.8% ag	–	1 mg/L mT + 0.5 mg/L NAA + 0.8 mg/L Pu	25±2 °C	12 h/ 12 h	8 wks	shoot proliferation	Bhattacharyya et al. 2016
D. nobile var. Emma white	O753	–	–	–	2 mg/L BAP (shoot); 2 mg/L IBA (root)	–	–	6 wks	Shoot and root proliferation	Asghar et al. 2011
D. nobile Lindl.	MM	3% suc.	0.7% ag	0.5 g/L MeI + 1 g/L Chl + 0.5 g/L L–gl + 250 mg/L Pt + 0.2 g/L *p*- ABC + 0.1 g/L Bio	4 µg/L TRIA (PLB); 2 µg/L TRIA (shoot and root)	25±3 °C	–	6~12 wks (PLB), 5~10 wks (shoot and root)	PLBs and shoot organogenesis	Malabadi et al. 2005
D. nobile Lindl.	MS	3% suc.	0.8% ag	100 mg/L MI	11 µM BA (PLBs); 9.8 µM IBA (root)	25±1 °C	–	10 wks	PLBs, root induction	Nayak et al. 2002
D. fimbriatum Lindl. var. *oculatum* Hk. f.	mNS	–	0.9% ag	10% cw + 0.5 mg/L Nia + 0.5 mg/L + PHCl + 0.1 mg/L T-HCl	0.5 mg/L NAA + 1 mg/L BAP	25±2 °C	10 h/ 14 h	8 wks (PLB)	Callus and shoot regeneration	Roy and Banerjee 2003
D. fimbriatum Lindl. var. *oculatum* Hk. f.	MM	3% suc.	0.9% ag	–	2.4 mg/L (PLB formation); 4.8 mg/L KIN (shoot); 2.4 mg/L BAP (root)	25±2 °C	16 h/ 8 h	–	PLBs, shoor-root generation	Tikendra et al. 2021
D. palpebrae Lindl.	MS	–	0.8% ag	–	1 mg/L NAA + 2 mg/L BAP (in number); 1 mg/L Pic + 2 mg/L BAP (in length)	25±2 °C	14 h/ 10 h	–	Multiple shoot bud initiations	Bhowmik et al. 2020
D. candidum Wall. Ex Lindl.	1/2 MS, LM	3% suc.	–	1 ml/L HYPONeX	2 mg/L BA + 0.1 mg/L NAA	25±1 °C	16 h/ 8 h	75 days	Shoot regeneration	Shiau et al. 2005
D. candidum Wall. Ex Lindl.	1/2 MS	2% suc.	0.6% ag	–	8.8 µM BA + 9.2 µM 2,4-D (callus); 1.08-2.7 µM NAA (Shoot)	25±2 °C	12 h/ 12 h	60 days	Callus and shoot development	Zhao et al. 2008
D. heterocarpum Wall. ex Lindl.	MS	3% suc.	0.8% ag	–	3 µM/L KIN + 12 µM/L NAA	25±2 °C	12 h/ 12 h	–	Plantlet regeneration	Longchar and Deb 2022
D. primulinum Lindl.	MS	3% suc.	0.8% ag	–	1.5 mg/L BAP + 0.5 mg/L NAA (shoot); 0.5 mg/L IAA (root)	25±2 °C	16 h/ 8 h	24 wks (shoot), 16 wks (root)	Shoot multiplication and rooting	Pant and Thapa 2012
D. chrysotoxum Lindl	MM	2% suc.	0.9% ag	–	3.5 mg/L BAP + 0.5 mg/L IBA (shoot); 0.5 mg/L BAP + 3.0 mg/L IBA (shoot)	25±2 °C	12 h/ 12 h	–	Plantlet regeneration	Tikendra et al. 2019
D. chrysanthum	MS	–	0.8% ag	–	5 µM TDZ + 5 µM BAP (shoot); 10 µM NAA	25±2 °C	12 h/ 12 h	30 days	Shooting and rooting	Hajong et al. 2013
D. thyrsiflorum	MS	–	-	–	2 mg/L of TDZ + 0.5 mg/L of NAA	25±1 °C	12 h/ 12 h	5 wks	PLBs and indirect shoot organogenesis	Bhattacharyya et al. 2015
	MS	–	0.3% cg	–	2 mg/L 2iP + 0.5 mg/L IBA	25±1 °C	12 h/ 12 h	–	direct shoot organogenesis	
	1/2 MS	–	-	–	2 mg/L IBA + 0.6 mg/L NAA	25±1 °C	12 h/ 12 h	–	Root induction	
D. wangliangii	1/2 MS	2% suc.	0.56% ag	–	1 mg/L BA + 0.1 mg/L NAA	22±2 °C	16 h/ 8 h	90 days	PLBs organogenesis	Zhao et al. 2013
	1/2 MS	2% suc.	0.56% ag	–	2 mg/L BA + 0.1 mg/L NAA	22±2 °C	16 h/ 8 h	70 days	Shoot organogenesis	
	1/2 MS	2% suc.	0.56% ag	–	2 mg/L of TDZ	22±2 °C	16 h/ 8 h	–	Inflorescences induction	
D. officinale	MS	3% suc.	0.55% cn	–	2 mg/L BA + 0.1 mg/L NAA	26±2 °C	12 h/ 12 h	60 days	Shoot multiplication	Chen et al. 2014
D. formosum	MS	–	–	–	1 mg/L 2,4-D (PLB); 2.5 mg/L BAP + 1 or 2 mg/L NAA (plantlets)	25±1 °C	16 h/ 8 h	60 days	PLBs proliferation and plantlet	Nasiruddin et al. 2003
D. bensoniae	MS	–	–	–	1 mg/L BA + 1.5 mg/L IBA	25±2 °C	14 h/ 10 h	60 days	Shoot regeneration	Riva et al. 2016

Phalaenopsis orchid (reviewed at Khatun et al. 2020)										
Phalaenopsis cv. "Ph908"	NDM	2% suc.	0.3% ag	0.1 g/L MI, 2 mg/L BA, 1 mg/L NAA, 2 mg/L GA3	0.25 mg/L TDZ	25±2 °C	0 h/ 24 h	60 days	PLB formation	Zanello and Cardoso 2019
Phalaenopsis cv. "RP3"	NDM	2% suc.	0.3% ag		0.125 mg/L TDZ + 1 mg/L NAA + 20 mg/L BA	25±2 °C	0 h/ 24 h	60 days	PLB formation	
P. amabilis cv. "Blume"	NP	–	–	–	3 mg/L TDZ + 1 mg/L NAA	25±1 °C	0 h/ 24 h (1st 14 days); 16 h/ 8 h	8 wks	Embryo formation	Mose et al. 2020
P. amabilis cv. "Surabaya"	CM	–	–	–	5 mg/L BAP + 2 mg/L NAA (PLBs); 2 mg/L NAA (root)	25±1 °C	16 h/ 8 h	160 days	PLBs formation and rooting	Balilashaki et al. 2015
P. amabilis var. *formosa*	1/2 MS	2% suc.	0.22% gr	100 mg/L MI + 0.5 mg/L Nia + 0.5 mg/L + PHCl + 0.1 mg/L T–HCl + 2 mg/L gly + 1000 mg/L Pt + 170 mg/L NaH_2PO_4	3 mg/L TDZ	26±1 °C	16 h/ 8 h	45 days	Embryo formation	Chen and Chang 2006
P. amabilis Shimadzu var. *formosa and Phalaenopsis* "Nebula"	1/2 MS	2% suc.	0.22% gr	100 mg/L MI + 0.5 mg/L Nia + 0.5 mg/L + PHCl + 0.1 mg/L T–HCl + 2 mg/L gly + 1000 mg/L Pt + 170 mg/L NaH_2PO_4	4 mg/L TDZ (embryo); 0.5 mg/L of BA (plantlet)	26±1 °C	0 h/ 24 h	60 days	Embryo formation and plantet generation	Gow et al. 2009; Gow et al. 2010
P. gigantea	NDM	–	–	–	1 mg/L NAA + 0.1 mg/L TDZ	25±2 °C	–	6 wks	Callus and PLBs formation	Niknejad et al. 2011
Phalaenopsis "Little Steve"	1/2 MS	2% suc.	0.22% gr	100 mg/L MI + 0.5 mg/L Nia + 0.5 mg/L + PHCl + 0.1 mg/L T–HCl + 2 mg/L gly + 1000 mg/L Pt + 170 mg/L NaH_2PO_4	4.54 μM TDZ	26±1 °C	0 h/ 24 h	30 days	Embryo formation	Kuo et al. 2005
P. amabilis BL. cv. "Golden Horizon"	1/2 MS	2% suc.	0.22% gr	10% cw + 2 g/L Pt + 1 g/L ac + 150 mg/L L–gl	2 mg/L BA + 0.5 mg/L NAA	24±1 °C	16 h/ 8 h	12 wks	PLBs	Sinha and Jahan 2011
P. cornu-cervi (Breda) Blume & Rchb. f.	1/2 MS	–	–	–	0.1 mg/L TDZ + 0.1 mg/L NAA (PLB)	25±1 °C	16 h/ 8 h	45 days	PLBs	Rittirat et al. 2012
	MS	–	–	–	15% cw + 0.2% ac (root)	25±1 °C	16 h/ 8 h	45 days	Root induction	
Oncidium orchid										
Oncidium sp. "Dancing Dolls"	MS	–	0.8% ag	–	2 mg/L BAP + 1.5 mg/L NAA	25±1 °C	12 h/ 12 h	–	Shoot and root organogenesis	Kalimuthu et al. 2007
O. sp. "Gower Ramsey"	1/2 MS	2% suc.	0.22% gr	100 mg/L MI + 2 mg/L gly + 1000 mg/L Pt + 170 mg/L NaH_2PO_4	0.1 μM TIBA or 0.5 μM TIBA	26±1 °C	16 h/ 8 h	8 wks	Embryo formation	Chen et al. 2004
O. tigrinum Llave & Lex.	MS	3% suc.	0.8% ag	–	1-2 mg/L BA + 0.1 mg/L NAA (shoot); 1 g/L ac (root)	25±1 °C	16 h/ 8 h	90 days	Shoot and root induction	Mata-Rosas et al. 2011
O. flexuosum Sims	MS	3% suc.	0.5% ag	–	1.5 μM TDZ	25±2 °C	0 h/ 24 h	90 days	PLBs regeneration	Mayer et al. 2010
Vanda orchid										
Vanda tessellata (Roxb.) Hook. ExG.Don	MS	3% suc.	ag	–	1.5 mg/L BAP + 0.5 mg/L NAA	25±2 °C	16 h/ 8 h	30 days	Seedlings development and shoot elongation	Bhattacharjee et al. 2014

	MS	3% suc.	ag	–	1 mg/L BAP + 1 mg/L NAA	25±2 °C	16 h/ 8 h	28-35 days	Shoot induction	
	1/2 MS	3% suc.	ag	–	1 mg/L IAA	25±2 °C	16 h/ 8 h	–	Root induction	
V. coerulea Griff ex.Lindl. (Blue Vanda)	P0931	3% suc.	0.7% ag	3 g/L ac	5.36 µM + 3.80 µM	24±2 °C	16 h/ 8 h	8 wks	PLBs proliferation	Roy et al. 2011
V. spathulata Spreng	MM	2% suc.	0.6% ag	–	2:1µM BA:IAA	28±2 °C	12 h/ 12 h	3 months	Shoot multiplication	Decruse et al. 2003
Coelogyne orchid										
Coelogyne cristata	1/2 MS	3% suc.	0.8% ag	–	0.44 mg/L TDZ	22~25 °C	–	60 days	Shoot induction from shoot axis	Naing et al. 2010
C. cristata	1/2 MS	3% suc.	0.8% ag	–	1 mg/L NAA + 2 mg/L BA	22~25 °C	–	8 wks	Shoot induction from pseudobulb	
C. ovalis	KC	3% suc.	0.8% ag	–	10 µM mT + 0.5 µM NAA; 15 µM BAP + 0.5 µM NAA	25±2 °C	16 h/ 8 h	45 days	Shoot and PLBs – induction and proliferation	Singh et al. 2020
C. flaccida	MS	–	0.8% ag	–	4.44 µM NAA + 5.37 µM BA	25±2 °C	12 h/ 12 h	–	Pseudobulb segments regeneration	Kaur and Bhutani 2013
C. flaccida	MS	–	–	–	2 mg/L NAA + 2 mg/L KIN	20±2	16 h/ 8 h	15 wks	Plantlets regeneration	Kalyan and Sil 2015
Bulbophyllum orchid										
Bulbophyllum auricomum Lindl.	MS	3% suc.	0.8% ag	15% cw	2 mg/L BAP + 1.0 mg/L NAA	25±2 °C	16 h/ 8 h	1 and 2 months	Callus induction and PLB proliferation	Aung et al. 2022
B. odoratissimum	MS	3% suc.	0.8% ag	–	4 mg/L BA + 0.5 mg/L IBA	25±2 °C	16 h/ 8 h	12 wks	Shoot multiplication	Prasad et al. 2021
Paphiopedilum orchid										
Paphiopedilum rothschildianum	1/2 MS	3% suc.	3% gr	–	4.0 µM KIN	25±2 °C	0 h/ 24 h	8 wks	PLB formation	Ng et al. 2011
P. rothschildianum	1/2 MS	58 mM suc.	0.22% gr	full-strength MS vitamins, 2 g/L Pt, 170 mg/L NaH_2PO_4	13.56 µM 2,4-D + 4.54 µM TDZ	25±2 °C	0 h/ 24 h	90 days	PLB formation	Masnoddin et al. 2016
Other genus of orchid										
Guarianthe skinneri "Bateman"	MS	3% suc.	0.25% pg	0.1 g/L MI + 0.05 g/L $NaHPO_4$	16.1 µM NAA; 17.1 µM IAA; 6.3 x 10^{-9} µM GA3; 0.0023 µM BA	25~27 °C	16 h/ 8 h	2 month	Shoot regeneration	Coello et al. 2010
	MS	3% suc.	0.25% pg	0.1 g/L MI + 0.05 g/L $NaHPO_4$	5.4 µM NAA; 17.1 µM IAA; 0.001 µM GA3; 4.6 x 10^{-9} µM BA (root)	25~28 °C	16 h/ 8 h	3 months	Root regeneration	
Orchis catasetum	MS	3% suc.	0.8% ag	-	0.5 mg/L BA + 0.5 mg/L NAA	24±2 °C	16 h/ 8 h	60 days	PLBs proliferation & plantlet regeneration	Baker et al. 2014
Eulophia dabia (D. Don) Hochr.	MS	2% suc.	0.9% ag	0.2% ac	1 mg/L BAP 0.5 mg/L NAA; 0.1 or 1 mg/L TDZ (for PLBs)	25±2 °C	12 h/ 12 h	–	Plantlet regeneration	Chauhan et al. 2015
Grammatophyllum speciosum	1/2 MS-LM	2% mal.	–	–	–	25±2 °C	16 h/ 8 h	2 months	PLBs and shoot formation	Sopalun et al. 2010
	1/2 MS-LM	2% suc.	–	–	15 mg/L Ch	25±2 °C	16 h/ 8 h	2 months	PLBs and shoot formation	

	1/2 MS	2% suc.	–	–	2.0 mg/l NAA + 1.0 mg/l BA	25±2 °C	16 h/ 8 h	2 months	PLBs and shoot formation	
Dimorphorchis lowi	KC	2% suc.	0.8% ag	–	2 mg/L KIN (shoot); 1 mg/L IAA + 0.5 mg/L IBA (root)		24 h/ 0 h	180 days	Shoot and root regeneration	Jainol and Gansau 2016
Serapias vomeracea	KC	2% suc.	0.35% pg	–	0.5 mg/L JA; 0.5 mg/L O-Ch	23±1 °C	16 h/ 8 h	90 days	PLB formation	Acemi et al. 2020
	KC	2% suc.	0.35% pg	–	15-20 mg/L P-Ch	23±1 °C	16 h/ 8 h	180 days	Shoot induction	
	KC	2% suc.	0.35% pg	–	10 mg/L O-Ch, 15 mg/L P-Ch	23±1 °C	16 h/ 8 h	180 days	Root induction	
	KC	2% suc.	0.35% pg	–	0.5 mg/L JA; 10 mg/L O-Ch	23±1 °C	16 h/ 8 h	180 days	Tuberization	
Rhynchostylis retusa	VW	2% suc.	–	–	0.1 mg/L NAA + 1 mg/L KIN or BAP	25±1 °C	14 h/ 10 h	–	Callus, PLBs, plantlets	Sunitibala et al. 2018
Hybrid (*Aranda* Wan Chark Kuan "Blue" × *Vanda coerulea* Grifft. ex. Lindl.)	MS	3% suc.	– gr	100 mg/L MI	1.5 mg/L TDZ (PLB); 1.0 mg/L BA + 0.5 m/L IBA (Plantlets)	25±1 °C	14 h/ 10 h	40 (PLBs), and 30 (pllantlets) days	PLB induction and plantlets generations	Gantait et al. 2012
Esmeralda clarkei Rchb. f.	MS	–	0.8% ag	–	1 mg/L BAP (shoot); 1 mg/L NAA (root)	25±2 °C	16 h/ 8 h	120 days	Shoot multiplication and rooting	Paudel and Pant 2012
Aenhenrya rotundifolia (Blatt.) C.S. Kumar and F.N. Rasm.	MM	2% suc.	0.7% ag	–	6.20 µM mT + 2.25 µM TDZ; 6.20 µM mT + 5.37 µM NAA	23±2 °C	16 h/ 8 h	4 wks	shoot proliferation	Sherif et al. 2020
Caladenia huegelii	1/2 MS	60 mM suc.	0.8% ag	500 µM MI + 500 µM MES + 1 µM T–HCl + 2.5 µM pyr + 4 µM NA	5 µM NAA + 2 µM BA	20±0.5 °C	–	–	PLB proliferation	Bustam et al. 2016
Cyrtopodium paludicolum	KC	58.43 mM suc.	0.4% ag	–	1.34 µM NAA + 2.27 µM TDZ	27±2 °C	16 h/ 8 h	–	PLBs proliferation from root tip	Picolotto et al. 2017
Ansellia africana Lindl	MS	3% suc.	0.8% ag	–	0 µM mT + 5 µM NAA +15 µM IBA + 30 µM PG	25±2 °C	12 h/ 12 h	10 wks	Shoots with roots organogenesis	Saleh-E-In et al. 2021
Tolumnia Snow Fairy	1/2 MS	3% suc.	0.8% ag	100 mg/L MI + 170 mg/L NaH_2PO_4	4 mg/L BA	25±2 °C	12 h/ 12 h	16 wks	PLBs organogenesis	Chookoh et al. 2019
Cyrtopodium paranaense	MS	3.5% suc.	1% ag	–	0.2 µM IAA + 9 µM TDZ	25-27 °C	0 h/ 24 h	3 wks	PLBs organogenesis	Guo et al. 2010
Brassavola nodosa "Remar" x "Mas Mejor" hybrid	1/2 MS	3% suc.	0.7% ag	2 mg/L gly + 0.1 mg/L NAA + 30% cw	2 mg/L BA + 3 mg/L adenine sulfate	26±4 °C	16 h/ 8 h	45 days	Shoot multiplication	Xu et al. 2022
	1/2 MS	3% suc.	0.7% ag	2 mg/L gly + 0.1 mg/L NAA + 30% cw	0.5 mg/L NAA or 1 mg/L IBA	26±4 °C	16 h/ 8 h	45 days	Root induction	
Lily										
Cyrtanthus contractus (Fire lily)	MS	3% suc.	0.8% ag	0.1 g/L MI	4.4 µM BA + 1.1 µM NAA	25±2 °C	16 h/ 8 h	8 wks	Shoot induction	Ncube et al. 2015
C. guthrieae (Berg lily)	MS	3% suc.	0.8% ag	0.1 g/L MI	4.4 µM BA + 1.1 µM NAA	25±2 °C	16 h/ 8 h	8 wks	Shoot induction	
C. obliquus (Knysna Lily)	MS	3% suc.	0.8% ag	0.1 g/L MI	6.7 µM BA + 2.7 µM NAA	25±2 °C	16 h/ 8 h	8 wks	Shoot induction	
C. contractus (Fire lily)	MS	3% suc.	0.8% ag	0.1 g/L MI	4.4 µM BA + 1.1 µM NAA + 10 µM TDZ	25±2 °C	16 h/ 8 h	8 wks	Shoot organogenesis	
C. guthrieae (Berg lily)	MS	3% suc.	0.8% ag	0.1 g/L MI	4.4 µM BA + 1.1 µM NAA	25±2 °C	16 h/ 8 h	8 wks	Shoot organogenesis	
C. obliquus (Knysna Lily)	MS	3% suc.	0.8% ag	0.1 g/L MI	6.7 µM BA + 2.7 µM NAA + 10 µM BA	25±2 °C	16 h/ 8 h	8 wks	Shoot organogenesis	
Hemerocallis sp (19 Day lily cultivars)	MS	–	0.4% pg	–	1 , 5 or 10 mg/L TDZ	–	–	69 days	Shoot organogenesis	Matand et al. 2020

Oriental lily										
Lilium orientalis cv. "Starfighter" (Oriental lily)	MS	3% suc.	0.7% ag	–	0.5 mg/L TDZ + 10 mg/L 2,4-D	23±2 °C	16 h/ 8 h	1 month	Shoot organogenesis	Youssef et al. 2019
	MS	3% suc.	0.7% ag	–	0.5 mg/L 2ip + 5 mg/L Pic + 1.0 mg/L BA + 0.2 mg/L NAA	23±2 °C	16 h/ 8 h	3 months	Shoots multiplication	
	MS	6% suc.	0.7% ag	3-6 mg/L pac	–	23±2 °C	16 h/ 8 h	–	Bulblet formation	
Lilium oriental hybrid cv. "Casablanca"	MS	–	–	–	0.5 mg/L BA + 0.4 mg/L BA NAA	–	–	–	adventitious bud regeneration	Javaheri and Kaviani, 2022
Lilium oriental hybrid cv. "Casablanca"	MS	9% suc.	– pg	ac	0.5 mg/L BA	25±2 °C	16 h/ 8 h	8 wks	Shoot proliferation	Han et al. 2005
Tulip										
T. gesneriana cv. "Apeldoorn"	MS	3% suc.	0.8% ag	–	25 or 50 μM Pic + 25 or 50 mg/L TDZ	20±2 °C	–	4 wks	Callus induction and multiplication	Ptak and Bach 2007
	MS	3% suc.	0.8% ag	–	5 μM BA + 0.5 μM NAA	20±2 °C	–	–	Plantlet regeneration	
T. gesneriana cv. "Apeldoorn"	MS	3% suc.	0.8% bag	10 mg/L thi + 1 mg/L pyr + 5 mg/L NA + 10 mg/L gly + 100 mg/L glu + 1g/L Chl	10 mg/L NAA + 0.1~0.5 mg/L TDZ	20 °C	0 h/ 24 h	60 days	Callus induction	Podwyszyńska et al. 2020
T. gesneriana cv. "Prominence"	MS	3% suc.	0.8% bag	Same to above	2.5 mg/L Pic + 0.1 mg/L TDZ	20 °C	0 h/ 24 h	60 days	Callus induction	
Tulipa gesneriana cv. "Blue Parrot"	MS	3% suc.	0.8% bag	Same to above	10 mg/L NAA	20 °C	0 h/ 24 h	60 days	Callus induction	
T. suaveolens	MS	–	–	–	0.5 mg/L BAP + 1 mg/L NAA	25±1 °C	16 h/ 8 h	2.5 months	Shoot formation	Kritskaya et al. 2019
T. tarda cv. "Stapf. "	MS	3% suc.	0.5% ag	–	0.5 μM BAP	20 °C	0 h/ 24 h	12 wks	Callus induction	Maślanka et al. 2014
	MS	6% suc.	0.5% ag	–	0.5 μM BAP	20 °C	0 h/ 24 h	12 wks	Bulb formation	
T. gesneriana cv. "Arma"	MS	3% suc.	0.75% pa	–	1.5 mg/L BA	25±2 °C	–	4 wks	Bulb formation	Ibrahim and Draaj 2020
T. gesneriana cv. "Flaming flag"	MS	3% suc.	0.75% pa	–	1.5 mg/L BA	25±2 °C	–	4 wks	Bulb formation	
Rose										
Rose	MS	3% suc.		400 mg/L MI	0.5 mg/L TDZ + 0.1 mg/LNAA; 0.5 mg/L ZT + 0.1 mg/L NAA	25±2 °C	16 h/ 8 h	25,45, 60 days	Flower induction	Wang et al. 2002
Hybrid *Rosa* sp.	MS	3% suc.	0.6% ag	1 mg/L GA_3	3 mg/L BAP	26±1 ºC	-	-	Shoot induction	Oo et al. 2021
	1/2 MS	1.5% suc.	0.5% ag	–	1 mg/L NAA	26±1 ºC	-	-	Root induction	
Rosa hybrida cv. Eiffel Tower	MS	3% suc.	0.8% ag	–	1 mg/L BAP + 0.5 mg/L KIN	25±2 °C	16 h/ 8 h	4 wks	Shoot multiplication	Tawfik et al. 2018
	1/2 MS	5% suc.	0.8% ag	–	–	25±2 °C	16 h/ 8 h	20 days	Root induction	
Rosa hybrida	MS	-	0.8% ag	–	3 mg/L BAP	25±3 °C	-	3 wks	Shoot induction	Tirkey et al. 2019
Rosa hybrida	MS	3% suc.	0.75% ag	0.3 g/L ac	3 mg/L BAP + 1 mg/L NAA + 0.5 mg/L GA	–	–	–	Shoot proliferation	Khaskheli et al. 2018
	MS	3% suc.	0.75% ag	0.3 g/L ac	3 mg/L IAA	–	–	–	Root induction	
Rosa hybrida cv. Red Masterpiece	MS	3% suc.	0.82% ag	–	3 mg/L BA + 1 mg/L KIN	25±1 °C	16 h/ 8 h	3 wks	Multiple shoot induction	Kanchanapoom et. al. 2009)

Rosa hybrida cv. Heirloom	MS	3% suc.	0.82% ag	–	13.3 mM BA + 9.3 mM KIN	25±1 °C	16 h/ 8 h	3 wks	Multiple shoot induction	Kanchanapoom et. al. 2010
Rosa sp.	MS	3% suc.	0.7% ag	–	4 mg/L 2,4-D	26±1 ºC	16 h/ 8 h	28-30 days	Callus induction	Afrin et al. 2022
	MS	3% suc.	0.7% ag	–	2 mg/L BAP + 0.5 mg/L KIN	26±1 ºC	16 h/ 8 h	26-28 days	Shoot regeneration	
	MS	3% suc.	0.7% ag	–	2 mg/L BAP + 0.5 mg/L KIN + 0.1 mg/L GA3	26±1 ºC	16 h/ 8 h	28 days	Shoot proliferation	
	1/2 MS	3% suc.	0.7% ag	–	1 mg/L IBA + 1 mg/L NAA	26±1 ºC	16 h/ 8 h	15-18 days	Root induction	
Rosa sp. cv. Konstancin	MS	1.9% suc.	0.3% ag	100 mg/L MI + 1 mg/L NA + 1 mg/L pyr + 1 mg/L thi + 2 mg/L gly + 10 mg/L AA	2.2 µM BAP + 0.3 µM GA_3	23±2 °C	16 h/ 8 h	3 wks	Shoot induction	Wojtania et al. 2018
	MS	1.2% suc.	0.3% ag		3.1 µM BAP + 0.9 µM GA_3 + 138 µM Fe-EDTA	23±2 °C	16 h/ 8 h	5 wks	Shoot multiplication	
Rosa indica	MS	3% suc.	–	–	2 or 4 mg/L 2,4-D	25±2 °C	16 h/ 8 h	3 wks	Callus induction	Ali et al. 2018
	MS	3% suc.	–	–	3 mg/L BAP + 3 mg/L IAA	25±2 °C	16 h/ 8 h	3 wks	Shoot regeneration	
Rosa indica	MS	–	–	–	1.5 mg/L BAP or 0.5~1 mg/L BAP + 0.5 mg/L KIN	25±2 °C	16 h/ 8 h	12 days	Shoot induction	Shabbir et al. 2009
	MS	–	–	–	0.5~1 mg/L BAP + 0.5 mg/L KIN	25±2 °C	16 h/ 8 h	12 days	Shoot multiplication	
Rose	MS	3% suc.	0.5% gr	–	3 mg/L BAP + 3 mg/L IAA	–	16 h/ 8 h	4-5 weeks	Shoot organogenesis	Chhalgri et al. 2020
Rosa sp. cv. Red Eden (climbing rose)	MS	3% suc.	0.8% ag	–	0.5 mg/L BA + 0 mg/L NAA	26±2 ºC	–	30 days	Shoot multiplication	Quynh and Pha 2020
Damask rose										
Rosa damascena	MS	–	–	–	4 mg/L BA + 0.1 mg/L NAA (Shoot); 0.5 mg/L NAA (Root)	–	–	4 weeks	Shoot and root induction	Maheswari et al. 2018
R. damascena cv. Azaran	mMS^3	–	–	–	1~2 mg/L BA + 0.1 mg/L GA_3 + 0.1 mg/L NAA	23±3 °C	16 h/ 8 h	every 4 wks	Shoot proliferation and multiplication	Nikbakht et al. 2005
R. damascena cv. Ghamsar	mMS^3	–	–	–	1~2 mg/L BA + 0.1 mg/L GA_3	23±3 °C	16 h/ 8 h	every 4 wks	Shoot proliferation and multiplication	
R. damascena	MS	0.18% suc.	0.8% ag	–	5 µM BA + 1 µM TDZ	25±1 °C	14 h/ 10 h	48 wks	Shoot organogenesis	Kumar et al 2001
R. damascena cv. Almarah	MS	3% suc.	0.8% ag	3 g/L ac	2 mg/L BA + 2 mg/L GA_3	–	–	–	Shoot organogenesis	Alsemaan 2013
R. damascena	MS	3% suc.	0.8% ag	–	2.5~3 mg/L BA + 0.1 mg/L IBA	25 ± 5 °C	16 h/ 8 h	–	Shoot organogenesis	Jabbarzadeh et al. 2005
R. damascena cv. Kashan	MS	–	–	100 mg/L AA	3 mg/L BAP	–	–	–	Shoot proliferation	Mirzaei et al. 2019
Yasooj aromatic rose	MS	–	–	100 mg/L AA	3 mg/L BAP; 1.5 mg/L BAP + 1.5 mg/L 2ip + 0.1 mg/L IBA	–	–	–	Shoot proliferation	
Kashan damask rose × Yasooj aromatic rose	MS	–	–	100 mg/L AA	3 mg/L BAP	–	–	–	Shoot proliferation	
Yasooj aromatic rose	MS	–	–	100 mg/L AA	2 mg/L NAA	–	–	–	Root induction	
China rose										
Rosa chinensis Jacq. var. *minima voss*	MS	4% suc.	–	–	1.5 mg/L TDZ 25±2 °C 16 h/ 8 h	4 wks	Shoot organogenesis	Tibkwang et al. 2018		
Tuberose										
Polianthes tuberosa	MS	–	–	–	0.5 mg/L IAA + 1 mg/L KIN	25±1 °C	16 h/ 8 h	60 days	Plantlet regeneration	Ali et al. 2015
P. tuberosa	MS	–	–	–	0.1 mg/L IAA + KIN	25±1 °C	16 h/ 8 h	60 days	Plantlet regeneration	Ali et al. 2014
P. tuberosa	MS	–	–	–	0.25 mg/L BAP + 0.25 mg/L KIN	–	–	–	Shoot regeneration	Daneshvar et al. 2022
	MS	–	–	–	0.2 mg/L IBA + 0.5 mg/L NAA	–	–	–	Root induction	
P. tuberosa	MS	3% suc.	0.8% ag	–	4 mg/L BAP + 0.1 mg/L NAA	25±2 °C	16 h/ 8 h	60 days	Shoot multiplication	Singh et al. 2020

	MS	3% suc.	0.8% ag	–	1 mg/L 2,4-D + 1 mg/L NAA + 0.5 mg/L BAP or 1 mg/L 2,4-D + 2.25 mg/L BAP	25±2 °C	16 h/ 8 h	60 days	Callus induction	
	MS	3% suc.	0.8% ag	–	0.5 mg/L KIN	25±2 °C	16 h/ 8 h	60 days	Tuber regeneration	
P. tuberosa	WH	2% suc.	0.75% ag	–	0.3 mg/L TDZ + 0.5 mg/L NAA	25±2 °C	16 h/ 8 h	–	Shoot multiplication	Gajbhiye et al. 2011
	WH	1% suc.	0.75% ag	–	2 mg/L IBA	25±2 °C	16 h/ 8 h	–	Root regeneration	
P. tuberosa	WH	1.5% suc.	0.75% ag	1 mg/L GA_3	4 mg/L 2,4-D	25±2 °C	16 h/ 8 h	–	Callus induction	Raghuvanshi et al. 2013
	WH	1.5% suc.	0.75% ag	1 mg/L GA_3	1 mg/L TDZ + 0.5 mg/L NAA	25±2 °C	16 h/ 8 h	–	Shoot proliferation	
	WH	1.5% suc.	0.75% ag	1 mg/L GA_3	2 mg/L TDZ + 0.5 mg/L NAA	25±2 °C	16 h/ 8 h	–	Shoot multiplication	
	WH	1.5% suc.	0.75% ag	1 mg/L GA_3	2 mg/L IBA	25±2 °C	16 h/ 8 h	–	Root induction	
P. tuberosa	MS	3% suc.	0.8% ag	–	3 mg/L IAA + 0.5 mg/L BAP	27 °C	–	–	Callus induction	Sangavai and Chellapandi 2008
	MS	3% suc.	0.8% ag	–	1.5 mg/L BAP + 0.5 mg/L IAA	27 °C	–	–	Shoot induction	
P. tuberosa	MS	–	–	–	2 mg/L BAP + 0.5 mg/L NAA	25±2 °C	16 h/ 8 h	–	Shoot regeneration	Khanchana et al. 2019
	1/2 MS	–	–	–	1 mg/L IBA + 1 mg/L NAA	25±2 °C	16 h/ 8 h	–	Root induction	
P. tuberosa	MS	3% suc.	0.8% ag	–	4 mg/L BAP + 0.5 mg/L NAA + 0.5 mg/L TDZ	–	–	–	Shoot organogenesis and multiplication	Surendranath et al
	1/2 MS	3% suc.	0.8% ag	–	3 mg/L IBA + 1 mg/L NAA	–	–	–	Root organogenesis	
P. tuberosa	MS	2% suc.	0.64% ag	–	4.5 mg/L BAP + 0.05 mg/L NAA	–	–	–	Callus induction	Hernández-Mendoza et al. 2021
	MS	2% suc.	0.64% ag	–	4.5 mg/L BAP + 0.1 mg/L NAA	–	–	–	Shoot regeneration	
	MS	2% suc.	0.64% ag	–	1 mg/L IBAA + 0.1 mg/L BAP	–	–	–	Root induction	
Gladiolus										
Gladiolus grandiflorus cv. "White Friendship"	MS	3% suc.	0.8% ag	–	4 mg/L BAP	25~27 °C	16 h/ 8 h	–	Shoot regeneration	Memon et al. 2010
	MS	3% suc.	0.8% ag	–	2 mg/L IBA	25~27 °C	16 h/ 8 h	–	Root regeneration	
	MS	7% suc.	0.8% ag	–	1 mg/L IBA	25~27 °C	16 h/ 8 h	–	Cormel production	
G. grandiflorus cv. "Pink"	MS	3 % suc.	0.7 % ag	–	2 mg/L BAP + 2 mg/L NAA or 4 mg/L BAP + 1 mg/L NAA	25±1 °C	16 h/ 8 h	14 wks	Shoot regeneration	Torabi et al. 2008
				–	2 mg/L NAA	25±1 °C	16 h/ 8 h	14 wks	Root organogenesis	
				–	4 mg/L BAP + 1 mg/L NAA	25±1 °C	16 h/ 8 h	14 wks	Cormel organogenesis	
Gladiolus hybridus	MS	3% suc.	0.75% ag	–	2 mg/L BAP + 0.5 mg/L 2,4-D	25±2 °C	–	–	Callus induction	Tripathi et al. 2017
		3% suc.	0.75% ag	–	2-3 mg/L BA + 0.5 mg/L NAA	25±2 °C	–	–	Shoot proliferation	
		1.5% suc.	0.75% ag	–	0.5 mg/L IBA + 0.5 mg/L KIN	25±2 °C	–	–	Root proliferation	
G. grandiflorus cv. "White Prosperity"	MS	3% suc.	0.8% ag	–	5 mg/L BA + 0.5 mg/L IAA	25±2 °C	16 h/ 8 h	–	Shoot proliferation	Deshmukh et al. 2021
Gladiolus	MS	-	0.8% ag	–	1 mg/L BAP + 0.5 mg/L KIN	27±2 °C	16 h/ 8 h	27 days	Plantlet regeneration	Mateen 2019
	MS	-	0.8% ag	–	1 mg/L BAP + 0.5 mg/L KIN	27±2 °C	16 h/ 8 h	8 days	Shoot organogenesis	
	MS	-	0.8% ag	–	1 mg/L NAA + 0.25 mg/L KIN	27±2 °C	16 h/ 8 h	21 days	Shoot multiplication	
	MS	-	0.8% ag	–	1 mg/L NAA + 0.5 mg/L IBA	27±2 °C	16 h/ 8 h	8 days	Root organogenesis	
G. hybrida cv. "White Prosperity"	MS	3% suc.	0.7% ag	–	2 mg/L 2,4-D	25±2 °C	16 h/ 8 h	28 days	Shoot regeneration	Devi et al. 2019
G. hybrida cv. "Sylvia"	MS	3% suc.	0.7% ag	–	2 mg/L 2,4-D	25±2 °C	16 h/ 8 h	28 days		
G. hybrida cv. "Amsterdam"	MS	3% suc.	0.7% ag	–	2 mg/L 2,4-D	25±2 °C	16 h/ 8 h	28 days		
G. hybrida cv. "White Prosperity"	B5	3% suc.	0.75% ag	–	1 mg/L BAP	–	–	–	Shoot organogenesis	Kumar et al. 2018
	MS	3% suc.	0.75% ag	–	1 mg/L BAP	–	–	–		

	B5	3% suc.	0.75% ag	–	1.5 mg/L NAA + 1 mg/L BAP	–	–	–	Root organogenesis	
	MS	3% suc.	0.75% ag	–	1.5 mg/L NAA + 1 mg/L BAP	–	–	–		
Peony										
Paeonia suffruticosa	WPM	3% suc.	0.21% gg	–	4 mg/L IBA	25±1 °C	16 h/ 8 h	–	Shoot regeneration and root initiation	Wang et al. 2012a
Ginger Lily/ Butterfly lily										
Hedychium coronarium Koen.	MS	3% suc.	0.8% ag	–	3 mg/L BAP + 3 mg/L KIN + 0.2 mg/L TDZ	25±1 °C	16 h/ 8 h	–	Shoot multiplication	Parida et al. 2013
Cyclamen [reviewed in Jalali et al. 2012]										
Cyclamen mirabile; C. cilicium; C. pseudibericum; C. parviflorum	CIM	3% suc. + 2% glu.	0.37% gr	–	2.5 mg/L 2,4-D + 1 mg/L 2iP	25±1 °C	0 h/ 24 h	16 + 8 wks	Callus	İzgü et al. 2016
C. mirabile	1/2 MS	3% suc.	0.8% ag	–	0.1 mg/L IAA + 0.5 mg/L KIN; 0.5 mg/L NAA + 0.5 mg/L KIN	24±1 °C	16 h/ 8 h	–	Shoot and microtuber induction	Yamaner and Erdag 2008
C. persicum Mill.	MS	3% suc.	0.8% ag	–	1 mg/L NAA + 1 mg/L BA or 0.9 mg/L TDZ (shoot); 0.9 mg/L TDZ (microtuber)	22~24 °C	16 h/ 8 h	–	Shoot and microtuber induction	Abu-Qaoud 2004
Carnation										
Dianthus caryophyllus	MS	3% suc.	0.8% ag	–	1 mg/L BA + 2 mg/L 2,4-D	24±2 °C	16 h/ 8 h	4 wks	Callus induction	Kumar and Kumar 2009
D. caryophyllus	MS	3~4% suc.	0.7% ag	–	8.9 μM BA + 2.9 μM IAA; 10^{-3}% 24-EpiB; 10^{-5}-10^{-6}% RE	22±2 °C	16 h/ 8 h	3, 6 wks	Shoot organogenesis	Lukatkin et al. 2017
Anthurium										
Anthurium andreanum cv. "Jewel"	MS	3% suc.	–	–	3 mg/L 2,4-D + 0.5 mg/L BAP + 0.4 mg/L TDZ (induction); 3 mg/L NAA (compactness)	25±2 °C	16 h/ 8 h	–	Callus induction	Thokchom an Maitra 2017
	MS	3% suc.	–	–	2-3 mg/L BAP + 0.5 mg/L NAA	25±2 °C	16 h/ 8 h	–	Shoot regeneration	
	1/2 MS	3% suc.	–	–	1-2 mg/L NAA	25±2 °C	16 h/ 8 h	–	Root regeneration	
A. andreanum cv. "White Beauty"	1/2 MS	3% suc.	0.6% ag	100 mg/L MI + 250 mg/L NH_4NO_3 + 1mg/L thi + 1 mg/L BAP + 0.1 mg/L 2,4-D	1 mg/L BAP (juvenile leaf as explant)	25±5 °C	16 h/ 8 h	30 days	Shoot organogenesis	Cardoso and Habermann 2014
	MS	3% suc.	0.6% ag	–	1.82 μM TDZ	25 °C	12 h/ 12 h	–	Callus induction	Gu et al. 2012
A. andraeanum cv. "Alabama" and "Sierra"	MS	3% suc.	0.6% ag	–	0.89 μM BA + 2.32 μM KIN + 0.98 μM IBA; 0.89 μM BA + 2.32 μM KIN	25 °C	12 h/ 12 h	–	Shoot regenration	
Zinnia										
Zinnia elegans L.	MS	3% suc.	–	–	1 mg/L 2.4-D + 1 mg/L BA	25±2 °C	8 h/ 16 h	–	Shoot regeneration and callus induction	Ulfer et al. 2020
Vernonia										

Vernonia amygdalina	MS	3% suc.	0.3% gr	–	0.5~2.0 mg/L 2,4-D	25±1 °C	–	8 wks	Callus induction	Mei-Yin et al. 2018
	MS	3% suc.	0.3% gr	–	2 mg/L BAP + 2 mg/L NAA	25±1 °C	–	8 wks	Shoot multiplication	
	MS	3% suc.	0.3% gr	–	1 mg/L BAP	25±1 °C	–	8 wks	Leaf proliferation	
V. amygdalina	MS	3% suc.	0.8% ag	2 mg/L NAA	0.5 mg/L BAP + 0.5 mg/L NAA	25±2 °C	16 h/ 8 h	–	Shoot induction	Khalafalla et al. 2007
Croton										
Codiaeum variegatum	MS	2.5% suc.	0.25% pg	25 mg/L malt extract + 25 mg/L Pt	0.5 mg/L BAP	24±2 °C	16 h/ 8 h	6 wks	Shoot organogenesis	Nasib et al. 2008
	MS	2.5% suc.	0.25%pg	–	2 mg/L of IBA	24±2 °C	16 h/ 8 h	6 wks	Root organogenesis	
C. variegatum cv. "Coraz6n de Oro"	MS	3% suc.	0.8% ag	–	4.4 μM BA	24±1 °C	16 h/ 8 h	30 days	Shoot multiplication	Marconi et al. 1997
C. variegatum cv. "Golden Queen"	MS	3% suc.	0.6% ag	–	2 mg/L BA+ 0.2 mg/L IBA	25±2 °C	16 h/ 8 h	10, 20, and 30 days	Bud induction	Wei et al. 2019
	MS	3% suc.	0.6% ag	–	2 mg/L BA+ 0.2 mg/L NAA	25±2 °C	16 h/ 8 h	10, 20, and 30 days	Bud proliferation	
	MS	3% suc.	0.6% ag	–	1.5 mg/L IBA	25±2 °C	16 h/ 8 h	10, 20, and 30 days	Root induction	
C. variegatum cv. "Petra"	MS	6% suc.	0.8% ag	–	2 mg/L NAA	25±1 °C	16 h/ 8 h	45 days	Callus induction	Bakheet et al. 2018
C. variegatum cv. "Gold Dust"	MS	6% suc.	0.8% ag	–	1 mg/L BAP + 25 mg/L Peptone	25±1 °C	16 h/ 8 h	45 days	Callus induction	
Chrysanthemum										
Dendranthema morifolium	MS	–	0.8% ag	0.2 mg/L IBA	0.5~1.0 mg/L NAA + 1.0~1.5 mg/L BAP	25±1 °C	16 h/ 8 h	6 weeks	Shoot multiplication	Waseem et al. 2011
Chrysanthemum cv. "Vivid Scarlet"	MS	–	0.3% gr	1 g/L ac	1 mg/L BA + 2 mg/L NAA	–	16 h/ 8 h	45 days	Shoot formation	Naing et al. 2014
Chrysanthemum cv. "Shinma"	MS	–	0.3% gr	–	0.5 mg/L BA + 0.5 mg/L NAA	–	16 h/ 8 h	45 days	Shoot formation	Naing et al. 2016
C. morifolium cv. "Resomee Splendid"	MS	3% suc.	0.65% ag	–	4.5 mg/L BAP + 1 mg/L NAA (leaf as explant)	25±2 °C	16 h/ 8 h	7 weeks	Shoot organogenesis	Kazeroonian et al. 2018
	MS	3% suc.	0.65% ag	–	1.5 mg/L BAP + 1 mg/L NAA (petiole as explant)	25±2 °C	16 h/ 8 h	7 weeks		
Campsis										
Campsis radicans (L.) Seem.	MS	3% suc.	0.65% ag	–	2.5~5 mg/L IAA or IBA	20±2 °C	16 h/ 8 h	4 weeks	Root formation	Parzymies et al. 2014
Brunfelsia										
Brunfelsia calycina	MS	3% suc.	0.75% ag	–	1 mg/L BA + 0.6 mg/L IAA	–	16 h/ 8 h	–	Shoot regeneration	Liberman et al. 2010
Bougainvillea										
Bougainvillea × buttiana	WPM	3% suc.	0.7% ag	–	2 mg/L BA + 0.2 mg/L NAA.	25±2 °C	16 h/ 8 h	4 weeks	Shoot regeneration	Duhoky and Al-Mizory, 2014
Bottle Brush										

Callistemon citrinus	WPM	3% suc.	0.8% ag	100 mg/L MI + 1 mg/L thi + 0.5 mg/L pyr + 0.5 mg/L NA	0.5 mg/L BA + 0.25 mg/L NAA	25 °C	16 h/ 8 h	–	Shoot proliferation	Papafotiou and Skylourakis, 2010
Petunias										
Petunia hybrida Vilm. cv. "Bravo"	MS	3% suc.	–	MI	1.5 mg/L TDZ + 1 mg/L BAP	24±1 °C	16 h/ 8 h	–	Callus induction and	Farooq et al. 2021
	MS	3% suc.	–	MI	0.5 mg/L IBA + 0.5 mg/L BAP	24±1 °C	16 h/ 8 h	–	Shoot regeneration	
Petunia hybrida	MS	–	–	–	0.6 mg/L BAP + 0.5 mg/L IBA	–	–	–	Shoot multiplication	Habas et al. 2019
Periwinkle										
Catharanthus roseus Don	MS	3% suc.	0.7% ag	100 mg/L MI	3 μM BA + 3 μM KIN + 0.1 μM AgNO3	25±1 °C	12 h/ 12 h	12 days	Shoot formation	Panigrahi et al. 2018
Catharanthus roseus Don	MS	3% suc.	0.7% ag	–	1 mg/L IAA + 4 mg/L BA	–	16 h/ 8 h	4 wks	Callus induction	Hoda 2013
	MS	3% suc.	0.7% ag	–	4 mg/L BA	–	16 h/ 8 h	–	Shoot formation	
	MS	3% suc.	0.7% ag	–	1 mg/L IAA + 4.0 mg/L BA	–	16 h/ 8 h	–	Root formation	
Hibiscus										
Hibiscus coddii subsp. *barnardii*	MS	3% suc.	0.3% gr	–	1 mg/L BAP	24±2 °C	16 h/ 8 h	–	Callus induction	Plessis et al. 2021
H. syriacus	MS	3% suc.	0.3% gr	–	0.01 mg/L TDZ	25±1 °C	16 h/ 8 h	–	Shoot regeneration	Seo et al. 2017
	MS	3% suc.	0.3% gr	–	1 mg/L BAP	25±1 °C	16 h/ 8 h	–	Callus induction	
Begonia										
Begonia rubrovenia var. *meisneri* C.B. Clarke	MS	3% suc.	0.8% ag	–	0.1 mg/L TDZ (shoot); 0.1 mg/L IAA (root)	25±2 °C	12 h/ 12 h	–	Plantlet regeneration	Kumaria et al. 2012
Coleus										
Coleus aromaticus Benth	MS	–	–	–	1.0 mg/L BAP + 40 mg/L Ch (shoot); 0.5 mg/L NAA (root)	24±2 °C	16 h/ 8 h	–	Shoot and root organogenesis	Govindaraju and Arulselvi 2018
Hosta										
Hosta sieboldiana	MS	3% suc.	0.2% gg	–	0.5~1 mg/L Pic	25 °C	16 h/ 8 h	6 wks	Callus induction	Saito and Nakano 2002
H. sieboldiana	MS	3% suc.	0.2% gg	0.5-1 mg/L Pic	0.1 mg/L NAA + 1 or 5 mg/L TDZ	25 °C	16 h/ 8 h	2 months	Plantlet regeneration	
H. capitata (Koidz.) Nakai	MS	3% suc.	0.7% ag	–	2 mg/L TDZ	–	–	–	Shoot multiplication	Choi et al. 2019
H. clausa Nakai and *H. jonesii* M.G.Chung	MS	3% suc.	0.7% ag	–	1 mg/L TDZ	–	–	–	Shoot multiplication	
H. minor (Baker) Nakai	MS	3% suc.	0.7% ag	–	0.5 mg/L BA	–	–	–	Shoot multiplication	
H. venusta F.Maek.	MS	3% suc.	0.7% ag	–	1 mg/L BA; 0.1 mg/L TDZ	–	–	–	Shoot multiplication	
H. yingeri S.B.Jones	MS	3% suc.	0.7% ag	–	0.5 mg/L TDZ	–	–	–	Shoot multiplication	
H. capitata	MS	3% suc.	–	–	3 mg/L BA + 0.1 mg/L NAA	–	16 h/ 8 h	6wks	Shoot regeneration	Pe et al. 2020
H. capitata	MS	3% suc.	–	3 mg/L BA + 0.1 mg/L NAA	20 mg/L NAg	–	16 h/ 8 h	6wks	Plant growth	
H. plantaginea'Joseon'	MS	3% suc.	0.8% ag	0.1 mg/L MI	4 mg/L BA + 0.2 mg/L NAA	23±1 °C	16 h/ 8 h	6wks	Plantlet regeneration	Ku et al. 2016

H. plantaginea'Joseon'	MS	3% suc.	0.8% ag	0.1 mg/L MI	2 or 4 mg/L KIN + 0.2 mg/L-1 NAA	23±2 °C	16 h/ 8 h	6wks	Plantlet regeneration	
H. minor (Baker) Nakai	MS	3% suc.	0.8% ag	–	2.0 μM TDZ + 0.5 μM NAA	–	–	–	Shoot multiplication	Song et al. 2020
H. minor (Baker) Nakai	1/2 MS	3% suc.	0.8% ag	–	2 μM IBA	–	–	–	Root organogenesis	
Bauhinia										
Bauhinia racemosa Lam.	MS	3% suc.	0.8% ag	50 mg/L AA + 25 mg/L AS + 25 mg/L **CA** + 25 mg/L L–arg	3 mg/L BA	26±2 °C	–	30–35 days	Shoot induction	Sharma et al. 2017
	MS	3% suc.	0.8% ag		0.75 mg/L BA	26±2 °C	–	30–35 days	Shoot multiplication	
Morning glory										
Ipomoea purpurea	MS	3% suc.	0.7% ag	–	0.25~0.50 mg/L IBA	23±1 °C	16 h/ 8 h	–	Root organogenesis	Acemi et al. 2018
Merremia quinquefolia	MS	3% suc.	0.8% ag	–	4.0 mg/L BAP	25±2 °C	16 h/ 8 h	45 days	Shoot multiplication	Kher et al. 2015
M. quinquefolia	1/2 MS	3% suc.	–	–	2 mg/L IBA	25±2 °C	16 h/ 8 h	45 days	Shoot multiplication	
Common laburnum										
Laburnum anagyroides	MS	2% suc.	–	–	2.22 μM BAP	24±2 °C	14h /10h	–	Shoot organogenesis	Timofeeva et al. 2014
L. anagyroides	1/2 MS	1% suc.	–	–	2.22 μM BAP	24±2 °C	14h /10h	–	Shoot multiplication	
Lanterns										
Ceropegia attenuata Hook	MS	3% suc.	0.2% gr	–	13.31 μM BAP	25±2 °C	16 h/ 8 h	4 wks	Shoot induction and multiplication	Chavan et al. 2011
C. bulbosa var. bulbosa	MS	3% suc.	0.8% ag	–	8.88 μM BAP + 0.54 μM NAA	25±2 °C	16 h/ 8 h	4 wks	Shoot induction and multiplication	Dhir and Shekhawat 2014
C. bulbosa var. *lushii*	MS	3% suc.	0.8% ag	–	8.88 μM BAP + 0.27 μM NAA	25±2 °C	16 h/ 8 h	4 wks		
C. bulbosa var. bulbosa	MS	3% suc.	0.8% ag	–	8.88 μM BA	25±2 °C	16 h/ 8 h	4 wks	Shoot multiplication	Dhir and Shekhawat 2013
C. elegans	MS	3% suc.	0.8% ag	–	23.2 μM KIN + 5.71 μM IAA	25±2 °C	16 h/ 8 h	4 wks	Shoot multiplication	Krishnareddy and Pullaiah 2012
C. ensifolia	MS	3% suc.	0.8% ag	–	3 mg/L BAP + 0.2 mg/L TDZ	25±2 °C	16 h/ 8 h	6 wks	Shoot multiplication	Reddy et al. 2015
	MS	3% suc.	0.8% ag	–	0.1 mg/L NAA + 0.05 mg/L BAP	25±2 °C	16 h/ 8 h	6 wks	Root organogenesis	
C. evansii	MS	3% suc.	0.8% ag	–	4 mg/L BAP + 0.3 mg/L IAA	25±1 °C	16 h/ 8 h	–	Shoot regeneration and multiplication	Chavan et al. 2015
	MS	3% suc.	0.8% ag	–	2 mg/L NAA + 1.5 mg/L IBA	25±1 °C	16 h/ 8 h	–	Root organogenesis	
C. noorjahaniae	MS	3% suc.	0.2% cg	–	2 mg/L BAP	25±1 °C	16 h/ 8 h	4 wks	Shoot induction and multiplication	Chavan et al. 2014
	1/2 MS	3% suc.	0.2% cg	–	1 mg/L IAA	25±1 °C	16 h/ 8 h	4 wks	Root organogenesis	
C. panchganiensis	MS	3% suc.	0.2% cg	–	13.31 μM BAP + 2.69 μM NAA	25±1 °C	16 h/ 8 h		Shoot induction and multiplication	Chavan et al. 2013
	MS	3% suc.	0.2% cg	–	9.05 μM 2,4-D	25±1 °C	16 h/ 8 h	–	Callus induction	
	1/2 MS	175 mM suc.	–	–	4.44 μM BAP (flower bud); 17.74 μM BAP (microtuber); 7.36 μM IBA (root)	25±1 °C	16 h/ 8 h	–	Flower bud, microtuber formation, and rooting	

Dracaena/ Snake plant										
Dracaena sanderiana Sander ex Mast	MS	–	–	–	6.78 µM 2,4-D (callus); 7.84 µM BAP (shoot); 7.38 µM IBA (root)	25±2 °C	16 h/ 8 h	–	Callus, shoot and root induction	Aslam et al. 2013
Hyacinths										
Lachenalia viridiflora (Turquoise hyacinth)	MS	3% suc.	–	0.1 g/L MI	2.5 µM Pic + 1 µM TDZ	25±2 °C	16 h/ 8 h	6 wks	Embryogenic callus induction	Kumar et al. 2016
	MS	3% suc.	–	0.1 g/L MI	5 µM phloroglucinol	25±2 °C	16 h/ 8 h	6 wks	Plantlet regeneration	
Hyacinthus orientalis subsp. *chionophyllus* Wendelbo	MS	3% suc.	0.7% ag	2 mg/L BA + 0.5 mg/L IAA	1 mg/L JA + 0.25 mg/L 2iP	24±2 °C	16 h/ 8 h	12 wks	Bulb formation	Doğan et al. 2020
	MS	3% suc.	0.7% ag	2 mg/L BA + 0.5 mg/L IAA	2 mg/L JA + 1 mg/L IAA	24±2 °C	16 h/ 8 h	12 wks	Bulb formation	
Dumb cane										
Dieffenbachia cv. "Camouflage", "Camille", "Octopus", "Star Bright"	MS	–	0.6% ag	–	5 µM TDZ + 1 µM 2,4-D	22±3 °C	16 h/ 8 h	8 wks	Callus	Shen et al. 2008
	MS	–	0.6% ag	–	80 µM 2iP + 2 µM IAA	22±3 °C	16 h/ 8 h	8 wks	Shoot organogenesis	
Ixora										
Ixora coccinea	MS	–	–	0, 0.5, 2 and 4 mg/L Kinetin and Zeatin	0, 0.5, 2 and 4 mg/L of different type of cytokinins BAP or 0.5 mg/L IBA	25±2 °C	–	8 wks	Shoot multiplication	Onsa et al. 2018
Rhododendron										
Rhododendron fortunei	WPM	1.5% suc.	0.7% ag	4 mg/L 6P or ZT	1.0 mg/L NAA	25 °C	116 h/ 8 h	90 days	Axillary shoot induction	Wei et al. 2018
Lantena										
Lantana camara L	MS	–	–	–	12.0e20 mM TDZ (shoot), 5 or 10 mM NAA (root), 21.5 mM NAA and 22.5 mM BA (callus)	25±2 °C	16 h/ 8 h	4 wks	Shoot multiplication, callus and root induction	Veraplakorn et al. 2018
Oleander										
Nerium oleander L.	MS	3% suc.	0.7% ag	–	8.8 µM TDZ or 4.4 µM BA	25±2 °C	16 h/ 8 h	45 days	Shoot proliferation	Vila et al. 2010
Jasmine										
Jasminum grandiflorum L.	MS	–	–	–	1 mg/L BAP + 45 mg/L cw	25±2 °C	16 h/ 8 h	4 wks	Shoot proliferation	Rahman et al. 2018
	MS	–	–	–	1.5 mg/L IBA	25±2 °C	16 h/ 8 h	14–23 days	Rooting	
Passion Flower										
Passiflora caerulea L	MS	–	–	–	2 mg/L BAP + 1 mg/L KIN	26±1 °C	16 h/ 8 h	54 days	Direct shoot induction	Rathod et al. 2014
Honey Suckle										
Lonicera japonica "Japanese honeysuckle"	DKW	3% suc.	0.7% ag	100 mg/L MI	5 µM BA	25 °C	16 h/ 8 h	12 wks	Axillary micro shoots	Osburn et al. 2009
L. japonica "Amur honeysuckle"	MS	3% suc.	0.7% ag	100 mg/L MI	2.5 µM BA ± 1.25 µM IBA	25 °C	16 h/ 8 h	4 wks	Shoot proliferation	

Heliconia										
Heliconia rostrata and *H. bihai*	MS	6% suc.	0.8% ag	0.25% ac	1 mg/L BAP + 1 mg/L GA_3	27±1 °C	16 h/ 8 h	45 days	Callus formation	Souza et al. 2008
Angelonia										
Agelonia integerrima MS 2019	3% suc.	0.7% ag –	1 mg/L	BAP + 0.1 mg/L NAA	– – – Multiplication	Winhelmann et al.				
Gardenia										
Gardenia jasminoides Ellis	1/2 MS	3% suc.	0.7% ag	–	1 mg/L BA	–	–	6 wks	Shoot multiplication	Amer et al. 2019
Gerbera										
Gerbera jamesonii Bolus	MS	3% suc.	0.8% ag	1 mg/L KIN	1 mg/L BA	25±2 °C	16 h/ 8 h	4 wks	Shoot regeneration	Minerva et al. 2012
Treasure Flower										
Gazania rigens	MS	3% suc.	–	–	0.2 mg/L BA + 1.0 mg/L IAA (100%), or 0.5 mg/L BA + 1.0 mg/L IAA (98%), or 0.5 mg/L BA + 0.5 mg/L IAA (97%), or 1 mg/L BA + 1 mg/L IAA (97%), or 1.0 mg/L BA + 0.5 mg/L IAA (98%), or 0.5 mg/L BA (97%)	25±2 °C	16 h/ 8 h	–	Callus induction	Yalcın-Mendı et al. 2009
Cypress Vine										
Ipomoea quamoclit	MS	3 % suc.	0.7 % ag	0.3 mg/L KIN	0.3 mg/L BAP	23±2 °C	16 h/ 8 h	–	F lower bud induction	Haque et al. 2013
Bleeding Heart										
Lamprocapnos spectabilis Fukuhara	mMS[4]	3% suc.	0.8% ag	–	1.11 µM BA + 1.23 µM IBA	23±1 °C	16 h/ 8 h	10 wks	Axillary bud activation	Kulus and Miler 2021
Coral Vine										
Antigonon leptopus	MS	–	0.7% ag	1 mg/L 2ip	0.2 mg/L IBA	24±2 °C	16 h/ 8 h	4 wks	Shoot formation	Ghareeb and Taha 2018
	MS	–	0.7% ag	1 mg/L 2ip	0.5 mg/L + 0.2 mg/L IBA or 1 mg/L + 0.2 mg/L IBA	24±2 °C	16 h/ 8 h	4 wks	Shoot multiplication	
Amaranthus										
Amaranthus	MS	3% suc.	0.6% ag	–	1.5 mg/L NAA	26±2 °C	16 h/ 8 h	–	Rooting	Tour et al. 2020
	MS	3% suc.	0.6% ag	–	1.5 mg/L BA + 0.1 mg/L NAA	27±2 °C	16 h/ 8 h	–	Shoot multiplication	
	MS	3% suc.	0.6% ag	–	1.5 mg/L BA + 0.5 mg/L NAA	26±2 °C	16 h/ 8 h	4 wks	Direct shoots initiation	
Alocasia										
Alocasia amazonica, A. cuprea, A. robusta, A. longiloba and A. chaii	MS	3% suc.	0.75% ag	100 mg/L MI	2 mg/L BA	23±2 °C	24 h/ 0 h	4 wks	Shoot proliferation.	Bhatt et al. 2013
Silver Nerve Plant										
Fittonia Albivenis (Lindl. ex Veitch) Brummitt	1/2 MS	–	–	–	1.5 or 0.5 mg/L	25 °C	16-h	–	Shoot formation	Belokurova et al. 2019
Money plant										

Epipremnum aureum "Linden" and "Andre"	MS	2% suc.	0.6% ag.	1, 5 or 10 μ*M* TDZ	0.5 or 1.0 μM NAA	25 °C	16 h/ 8 h	45 days	Shoot regeneration	Qu et al. 2002
Epipremnum aureum "Älbino"	MS	0.25% suc.	5 g/L ag	2 mg/L CPPU, 10 mg/L AA	0.2 mg/L NAA	23 °C	24 h/ 0 h	37 days	Chorophyll development	Hung et al. 2021
Spider plant										
Chlorophytum borivilianum Sant. Et Fernand	MS	–	–	20 mg/L $AdSO_4$	2 mg/L BAP + 1 mg/L NAA	–	–	45 days	shoot induction and shoot proliferation	Khatri et al. 2019
Common rue										
Ruta graveolens	MS	3% suc.	1% ag	–	10 μM BA + 2.5 μM NAA	25±2 °C	16 h/ 8 h	8 wks	Shoot regeneration	Faisal et al 2018
R. graveolens	MS	3% suc.	0.8% ag	–	11 μM BA + 2.5 μM NAA	24±3 °C	16 h/ 8 h	8 wks	Shoot regeneration	Faisal et al 2005
Mezereum										
Daphne mezereum "Alba"	MS	Suc.	ag	MI	1 mg/L BA + 0.1 mg/L NAA; 0.3 mg/L GA3 + 1 mg/L mT	–	–	6 wks	Shoot organogenesis	Nowakowska et al. 2019

Table S2. Effective elicitors for the in vitro culture in ornamentals.

Plant species	**Media**	**Carbon source**	**Solidifying agent**	**Media supplements**	**Effective concentration and combinations**	**Temperature (°C)**	**Light /dark cycle**	**Culture period**	**Target of regeneration**	**References**
Cymbidium										
Cymbidium insigne	mMS[1]	2% suc.	0.22% pg	–	1 mg/L 5-ALA		16 h/ 8 h	8 wks	PLB regeneration	Nahar and Shimasaki 2014
C. insigne	mMS[1]	2% suc.	0.2% pg	–	0.1 mg/L MeJA or 0.1 mg/L Lysozyme	25 **°C**	16 h/ 8 h	6 wks	PLB regeneration	Nahar et al. 2015
C. finlaysonianum	mMS[1]	2% suc.	0.22 % pg	–	0.01 mg/L 5-ALA		16 h/ 8 h			
Cymbidium Twilight Moon 'Day Light'	TC	2% suc.		0.1 mg/L NAA + 0.1 mg/L KIN + 2 g/L Tt	1-2 mg/L $AgNO_3$			60 days	PLB	da Silva 2013
Dendrobium										
Dendrobium sp	VW	2% suc.	–	50 ml/L cw, 0.525 g/L KNO_3, 0.25 g/L KH_2PO_4, 0.5 g/L $(NH_4)_2S0_4$, 0.007 g/L $MnSO_4.4H_2O$, 0.025 g/L $MgS0_4.7H_20$, 0.028 g/L $FeS0_4.7H_20$ and 0.037 g/L Na_2- EDTA, 10 mg/L auxin, 5 mg/L cytokines and 2 mg/L 2,4-D	15 ppm of Ch	–	–	3, 6 and 9 wks	PLB organogenesis	Restanto et al 2016
Dendrobium sp cv. 'Eiskul'	mVW	2% suc.	0.8% ag	15% cw	10 or 20 mg/L of 80% O-Ch (PLBs); 10 mg/L of 80% O-Ch or 80% P-Ch (plantlets)	25±2 **°C**	16 h/ 8 h	3 months	PLB-shoot induction	Pornpienpakdee et al. 2010
D. phalaenopsis	VW	2% suc.	1.2% ag	15% cw + 0.525 gL KNO_3 + 0.25 g/L KH_2PO_4 + 0.5 g/L $(NH_4)_2SO_4$ + 0.007 g/L $MnSO_4{\cdot}4H_2O$ + 0.025g/L $MgSO_4{\cdot}7H_2O$ + 0.028 g/L $FeSO_4{\cdot}7H_2O$ + 0.037 g/L Na_2-EDTA	15 ppm (PLB) or 20 ppm (plantlet) of 1 kDa O-Ch-shrimp	27 **°C**	16 h/ 8 h	12 wks	PLB and plantlet regeneration	Nge et al. 2006
D. bigibbum var. *compactum*	mVW	2% suc.	0.8% ag	15% cw	10 mg/L O-Ch/P-Ch (70%, 80%, and 90%, except 90% O-Ch)	25 **°C**	16 h/ 8 h	12 wks	PLB organogenesis	Kananont et al. 2010

D. formosum	mVW	2% suc.	0.8% ag	15% cw	10 or 20 mg/L of 70% P-Ch	25 **°C**	16 h/ 8 h	12 wks		
D. thyrsiflorum	1/2 MS	–	–	2 mg/L IBA + 0.6 mg/L NAA	0.5 mg/L PG	25±1 **°C**	12 h/ 12 h	5 wks	Rooting	Bhattacharyya et al. 2015
Phalaenopsis										
Phalaenopsis cv. 'Fmk02010'	mMS[1]	2% suc.	0.22% pg	–	0.01 mg/L CCC	25±2 °C	16 h/ 8 h	42 days	PLB regeneration	Mehraj et al. 2019
Phalaenopsis cv. 'Fmk02010'	mMS[1]	2% suc.	0.2% pg	–	0.1 mg/L HA9 + HA12	25±2 °C	16 h/ 8 h	42 days	PLBs proliferation	Mehraj and Shimasaki 2017
Phalaenopsis cv. 'Fmk02010'	mMS[1]	2% suc.	0.2% pg	–	0.1 mg/L HA9; 0.1 mg/L HA12	25±2 °C	16 h/ 8 h	42 days	PLBs proliferation	Sultana et al. 2015a
Phalaenopsis cv. 'Fmk02010'	mMS[1]	2% suc.	0.2% pg	–	0.1 mg/L NAG; 0.1 mg/L 5-ALA	25±2 °C	16 h/ 8 h	6 wks	PLBs proliferation	Sultana et al. 2015b
Cattleya										
Cattleya loddigesii	KC		0.5% ag	–	5 mL/L K_2SiO_3 + 20 mg/L Na_2SiO_3	25±1 **°C**	16 h/ 8 h	120 days	Rooting	Soares et al. 2011
Rose										
Rosa x *hybrida* cv. Sena	1/2 MS	3% suc.		0.1 g/L MI + 0.5 mg/L BA	2 mg/L $AgNO_3$			20 , 60 days	Flower induction	Matos et al. 2020
Rosa sp cv. Red Eden (climbing rose)	1/2 MS	3% suc.	0.8% ag	–	30 μM $AgNO_3$	26±2 °C	–		Flower and root induction	Quynh and Pha 2020
Anthurium										
Anthurium andraeanum cv. Alabama and Dakota	1/2 MS	3% suc.		0.1 g/L MI + 0.5 mg/L KIN + 1.5 g/L ac	1 mg/L $AgNO_3$			60 days	Shoot multiplication	Cardoso 2019
	1/2 MS	3% suc.		0.1 g/L MI + 0.1 mg/L IBA + 1.5 g/L ac	1-2 mg/L $AgNO_3$			60 days	Rooting	
Morning glory										
Ipomoea purpurea	MS	3% suc.			5 mg/L Ch (mixture O-Ch-DP 2-15)			–	Shoot induction and growth	Acemi et al. 2018
Periwinkle										
Catharanthus roseus	MS	3% suc.		100 mg/L MI	3 μM BA + 3 μM KIN + 0.1 μM $AgNO_3$			–	Plantlet regeneration and flower induction	Panigrahi et al. 2018
Tulip										
Tulipa gesneriana cv. New Beet	1/2 MS	7% suc.	0.1% ac	–	100 μM Pu + 100 μM Spe + 5 mL of 0.1% MeJA	16 °C	16 h/ 8 h	13 wks	Bulb formation	Podwyszyńska et al. 2015
T. gesneriana cv. New Beet	1/2 MS	7% suc.	0.1% ac	–	50 μM Pu + 5 mL of 0.1% MeJA	16 °C	16 h/ 8 h	13 wks	Bulb formation	
T. gesneriana cv. Fringed Black	1/2 MS	7% suc.	0.1% ac	–	100 μM Pu + 5 mL of 0.1% MeJA	16 °C	16 h/ 8 h	13 wks	Bulb formation	
T. gesneriana cv. P14 (late flowering, Lily-flowered Group)	1/2 MS	7% suc.	0.1% ac	–	500 μM Orn + 5 mL of 0.1% MeJA	16 °C	16 h/ 8 h	13 wks	Bulb formation	

T. gesneriana cv. P20 (meadseason flowering, Fringed Group)	1/2 MS	7% suc.	0.1% ac	–	100 μM Pu + 5 mL of 0.1% MeJA or 100 μM Spe + 5 mL of 0.1% MeJA	16 °C	16 h/ 8 h	13 wks	Bulb formation	
Hyacinths										
Hyacinthus orientalis subsp. *chionophyllus* Wendelbo	MS	3% suc.	0.7% ag	2 mg/L BA+ 0.5 mg/L IAA	1 mg/L JA + 0.25 mg/L 2iP	24±2 °C	16 h/ 8 h	12 wks	bulb formation	Doğan et al. 2020
	MS	3% suc.	0.7% ag	2 mg/L BA+ 0.5 mg/L IAA	2 mg/L JA + 1 mg/L IAA	24±2 °C	16 h/ 8 h	12 wks	bulb formation	

Table S3. Effective organic additives for the in vitro culture in ornamentals.

Plant species	Media	Carbon source	Solidifying agent	Media supplements	Effective factors	Temperature (°C)	Light /dark cycle	Culture period	Target of regeneration	Ref
Phalaenopsis orchid										
Phalaenopsis Hybrid 'Pink'	MS	2% suc.	–	–	10% carrot juice	–	15 h/ 7 h	4 months	Plantlet regeneration	Zahara et al. 2017
	VW	2% suc.	–	–	20% carrot juice	–	15 h/ 7 h	4 months	Plantlet regeneration	
P. amabilis 'Blume'	NP	–	–	–	15% tomato extract	25±1 °C	0 h/ 24 h (1st 14 days); 16 h/ 8 h	12 wks	somatic embryogenesis and plantlet generations	Mose et al. 2020
P. amabilis BL. cv. 'Golden Horizon	1/2 MS	2% suc.	0.22% gr	10% cw + 2 g/L peptone + 1 g/L ac + 150 mg/L L-glutamone	2.5 g/L banana powder	24±1 °C	16 h/ 8 h	4, 6, and 8 wks	Rooting	Sinha and Jahan 2011
Bulbophyllum auricomum Lindl.	MS	3% suc.	0.8% ag	–	15% coconut water (cw)	25±2 °C	16 h/ 8 h	1 and 2 months	Callus induction and PLB proliferation	Aung et al. 2022
Paphiopedilum rothschildianum	1/2 MS	3% suc.	3% gr	–	60 g/L BH	25±2 °C	0 h/ 24 h	8 wks	PLB proliferation	Ng et al. 2012
P. rothschildianum	1/2 MS	3% suc.	3% gr	–	30% cw	25±3 °C	1 h/ 24 h	9 wks	PLB proliferation	
Dendrobium orchid										
Dendrobium macrostachyum	MS	3% suc.	0.8% ag	–	15% cw	25±2 °C	–	10 wks	Shoot regeneration	Pyati et al. 2002
D. officinale	MS	3% suc.	0.55% cn	2 mg/L BA + 0.1 mg/L NAA	100 g/L potato extract	26±2 °C	12 h/ 12 h	6 days	Shoot multiplication	Chen et al. 2014
D. densiflorum Lindl.	MS	3% suc.	0.8% ag	0.01 g/L MI	15% cw	25±2 °C	16 h/ 8 h	–	PLB proliferation and shoot development	Pant et al. 2022

Table S4. Effective light emitting diodes (LEDs) for the in vitro culture in ornamentals.

Plant speces	Effective LEDs	Media	Carbon source	Solidifying agent	Media supplements	Temperature (°C)	Light /dark cycle	Clture period	Organogenesis/ regenaration	Ref
Cymbidium orchid										
Cymbidium "Twilight Moon "Day Light"	100% red	NN	2% suc.	0.8% bag	0.1 mg/L NAA + 0.01 mg/L TDZ	–	16 h/ 8 h	1 month	Callus proliferation	Le and Tanaka 2004
	25% red +75% blue	NN	2% suc.	0.8% bag	0.1 mg/L NAA + 0.01 mg/L TDZ	–	16 h/ 8 h	1 month	PLBs formation	
Cymbidium "Golden Bird"	Red light (1:0)	VW	2% suc.	–	2 g/L tryptone + 1 ml/L NN microelements	25±1 °C	16 h/ 8 h	–	Plantlet regeneration	Tanaka et al. 1998
Cymbidium Waltz 'Idol'	Red + green	mMS[1]	2% suc.	0.2% pg	–	25±2 °C	16 h/ 8 h	6 wks	PLB regeneration	Kaewjampa and Shimasaki 2012
Cymbidium (eight hybrids)	Different ratios (1:0; 1.5:1; 1:1; 1:1.5; 0:1) of red and blue	TC1	2% suc.	0.8% bag	0.1 mg/L NAA + 0.1 mg/L KIN + 2 g/L tryptone	25±1 °C	16 h/ 8 h	–	PLB regeneration	da Silva 2014b
Phalaenopsis orchid										
Phalaenopsis cv. 'Fmk02010'	Red → white	mMS[1]	2% suc.	0.22% pg	–	25±2 °C	16 h/ 8 h	42 days	PLB regeneration	Mehraj et al. 2019
	Blue → white	mMS[1]	2% tre.	0.22% pg	–	25±2 °C	16 h/ 8 h	42 days	PLB regeneration	
	Red → green → white	mMS[1]	2% mal.	0.22% pg	–	25±2 °C	16 h/ 8 h	42 days	PLB regeneration	
Phalaenopsis Hybrid	80% red + 20% blue	VW	1 % suc.	–	–	–	–	4 months	PLB organogenesis	Wongnok et al. 2008
	90% red + 10% blue				–	–	–	–	Shoot regeneration	
Phalaenopsis	White or blue + red	MS	–	0.25% pg	PGRs supplemented (not specified)	24±2 °C	16 h/ 8 h	60 days	Plantlet regeneration	Bello-Bello et al. 2017
Dendrobium orchid										
Dendrobium officinale	Different ratios (1:0; 0:1; 1:1; 2:1; 1:2) of red and blue	1/2 MS	3% suc.	0.7% ag	0.5 g/L NAA, 0.2 g/L 6-BA,	25±2 °C	16 h/ 8 h	30, 60, and 90 days	PLB regeneration	Lin et al. 2011
D. sonia	Yellow	MS	3% suc.	0.6% ag	11.1 μM BAP + 11.42 μM IAA	22±2 °C	16 h/ 8 h	4 wks	Shoot and PLB regeneration	Billore et al. 2017
D. sonia	Yellow	MS	3% suc.	0.6% ag	2.5 mg/L BAP + 2 mg/L IAA	22~25 °C	16 h/ 8 h	–	Plantlet regeneration	Billore et al. 2019
D. kingianum	Blue	mMS[1]	2% suc.	0.22% pg	–	25±1 °C	16 h/ 8 h	4 wks	PLB regeneration	Habiba et al. 2014
D. okinawense	Red	mMS[1]	2% suc.	0.22% pg	–	25±1 °C	16 h/ 8 h	42 days	PLB proliferation	Mehbub et al. 2022
Cattleya orchid										
Cattleya Lindl. hybrid Red, NAA al. 2007	blue MS 3% suc. 0.8% bag 2	mg/L	AS + 5	mg/L BA	+ 0.2 mg/L ZT + 1 mg/L 23±1 °C 16 h/ 8 h 3	months	Plantlet		regeneration Cybularz-Urban et	
Oncidium orchid										
Oncidium "Gower Ramsey"	Red	MS	3% suc.	0.6% ag	0.1 g/L BA + 0.5 mg/L NAA	25±2 °C	16 h/ 8 h	30 days	PLB regeneration	Mengxi et al. 2011
Orchids in other genus										
Paphiopedilum delenatii	Blue	SH	3% suc.	0.9% ag	1 mg/L TDZ + 0.3 mg/L NAA	25±3 °C	16 h/ 8 h	4 months	Shoot regeneration	Luan et al. 2015
Bletilla ochracea Schltr.	Green, oranage	NDM	2% suc.	0.2% pg	–	25±2 °C	16 h/ 8 h	3 wks	Seed germination	Godo et al. 2011
B. ochracea Schltr.	Red, oranage	NDM	2% suc.	0.2% pg	–	25±2 °C	16 h/ 8 h	4 wks	Rhizoid	
B. ochracea Schltr.	White, blue	NDM	2% suc.	0.2% pg	–	25±2 °C	16 h/ 8 h	3 months	Plantlet regeneration	
B. ochracea Schltr.	White, blue	NDM	2% suc.	0.2% pg	–	25±2 °C	16 h/ 8 h	3 months	Pseudobulb	
Calanthe	Red + blue		1.5% & 3% suc.	0.2% ag	–	25±2 °C	16 h/ 8 h	8 wks	Plantlet regeneration	Baque et al. 2011
Doritaenopsis	Red + blue	mHm	2% suc.	0.55% ag	30 g/L potato homogenate, 2 g/L Pt, 0.5 g/L ac	–	16 h/ 8 h	2, 5, 8 wks	Plantlet regeneration	Shin et al. 2008
Microlaelia lundii	Blue	SM	3% suc.	0.8% ag	1 g/L ac	25±2 °C	16 h/ 8 h	200 days	Plantlet regeneration	Favetta et al. 2017
Rose										

Rose	Blue	MS	3% suc.	0.25% gr	0.5 mg/L BAP + 0.1 g/L MI + 0.1g/L Ferrum	26±1 °C	16 h/ 8 h	2, and 4 wks	Plantlet regeneration	Azmi et al. 2015
Rosa × kordesii	80% red + 20% blue	MS	3% suc.	0.25% gr	1.5 g/L BAP + 0.1 mg/L IBA + 0.1 g/L MI + 0.1g/L Ferrum	26±1 °C	16 h/ 8 h	30 days	Plantlet regeneration	Azmi et al. 2014
Chrysanthemum										
Chrysanthemum× grandiflorum	8% blue + 2% green + 65% red + 25% far-red	MS	3% suc.	0.8% gr	–	23±0.5 °C	16 h/ 8 h	10 wks	Plantlet regeneration	Miler et al. 2019
C. morifolium cv. Ramat. Ellen	78% red + 14% blue + 8% far-red	MS	–	–	0.2 mg/L IAA + 0.05 mg/L BAP + ½ NH_4NO_3 + ½ KNO_3	–	–	42 days	Plantlet regeneration	Kurilčik et al. 2008
Dendranthema grandiflorum cv. Kitam 'Cheonsu'	Red, and far-red (plant growth), red + blue (stomata size)	MS	3% suc.	0.24% gr	–	25 °C (day) and 18 °C (night)	16 h/ 8 h	5 wks	Plantlet regeneration	Kim et al. 2004
Weeping fig										
Ficus benjamina	WF	MS	3% suc.	0.6% gr	4 mg/L BA + 30 mg/L addenine sulfate	23±0.5 °C	16 h/ 8 h	12 wks	Plantlet regeneration	Miler et al. 2019
Gerbera										
Gerbera jamesonii	70% red + 30% blue with 80 μmol m^{-2} s^{-1} photosynthetic photon flux density	MS	3% suc.	0.5% bag	5 μM BA + 0.5 μM NAA	23/21±1 °C	16 h/ 8 h	6 wks	Shoot multiplication	Cioć et al. 2019
G. jamesonii	12% blue + 19% green + 61% red + 8% far-red; 8% blue + 2% green + 65% red + 25% far-red; 1% UV + 20% blue + 39% green + 35% red + 5% far-red;	MS	3% suc.	0.8% gr	3 mg/L KIN	23±0.5 °C	16 h/ 8 h	8 wks	Plantlet regeneration	Miler et al. 2019
G. jamesonii	Red (shoot), blue (leaf size)	MS	3% suc.	0.5% bag	1 μM IAA	25 °C (day) and 23 °C (night)	16 h/ 8 h	6 wks	Acclimatization efficiency	Pawłowska et al. 2018a
G. jamesonii cv. "Dura"	50% red + 50% blue (SM); 70% red + 30% blue (SM, PPC, abc); 100% red (SE); 100% blue (LDW)	MS	3% suc.	0.5% bag	5 μM BA + 0.5 μM NAA	25 °C (day) and 23 °C (night)	16 h/ 8 h	6 wks	Shoot multiplication (SM); shoot elongation (SE); Photosynthetic pigment content (PPC); chlorophyll a and b and carotenoids (abc); Leaf dry weight (LDW)	Pawłowska et al. 2018b
Coral bells										
Heuchera× hybrida	8% blue + 2% green + 65% red + 25% far-red	MS	3% suc.	0.8% gr	0.1 mg/L BA + 0.1 mg/L IAA	23±0.5 °C	16 h/ 8 h	13 wks	Plantlet regeneration	Miler et al. 2019
Bleeding heart										
Lamprocapnos spectabilis	WF	MS	3% suc.	0.8% gr	0.25 mg/L BA + 0.25 mg/L IAA	23±0.5 °C	16 h/ 8 h	9 wks	Plantlet regeneration	Miler et al. 2019
Anthurium										
Anthurium andreanum	Blue or white or blue + red	MS	–	0.25% pg	PGRs supplemented (not specified)	24±2 °C	16 h/ 8 h	60 days	Plantlet regeneration	Bello-Bello et al. 2017
A. andreanum	Blue + red	MS	–	–	2 mg/L BAP	–	–	61 days	Plantlet regenaration	Martínez-Estrada et al. 2016
A. andreanum Lind.	Blue, blue + red	MS	3% suc.	0.6% ag	–	25 °C	12 h/ 12 h	60 days	Plantlet regeneration	Gu et al. 2012
	Red + blue	MS	3% suc.	0.6% ag	–	25 °C	12 h/ 12 h	60 days	Rooting	

Anthurium (Violeta and Pink Lady)	100% red (callus); 25% red + 75% blue or 100% blue (torpedo callus)	NN	–	–	1 mg/L 2,4-D + 1 mg/L KIN + 1 mg/L BA	24 °C (day) and 18 °C (night)	16 h/ 8 h	30-50 days	Callus	Budiarto 2010
	100% red or 75% red + 25% blue (SI); 25% red + 75% blue or 100% blue (SM)	NN	–	–	1 mg/L 2,4-D + 1 mg/L KIN + 1 mg/L BA	24 °C (day) and 18 °C (night)	16 h/ 8 h	60 days	Shoot induction and multiplication	
Heliconia										
Heliconia champneiana cv. Splash	100% red or (70% red + 30% blue	MS	3% suc.	0.18 gg	3 mg/L BAP	25±2 °C	16 h/ 8 h	6, 12 wks	Plantlet regeneration	Rodrigues et al. 2018
Paeony										
Paeonia suffruticosa	80% red + 20% blue	WPM	3% suc.	0.21 gg	4 mg/L IBA	25±1 °C	16 h/ 8 h	45 days	Plantlet regeneration	Wang et al. 2012b
Spurflowers										
Plectranthus scutellarioides	80% red + 20% green	MS	3% suc.	0.8% ag	0.5 g/L 2-(N-morpholino) ethane sulfonic acid	25±1.5 °C	16 h/ 8 h	28 days	Plantlet regeneration	Cho et al. 2019
Crown of thorns										
Euphorbia millii	Blue	MS	3% suc.	0.8% ag	1 mg/L BA + 0.3 mg/L IAA	25 °C	16 h/ 8 h	8 wks	Plantlet regeneration	Dewir et al. 2005
Lilies										
Spathiphyllum cannifolium	red, red + far-red (1:1)	MS	3% suc.	0.2% gr	1 mg/L BA + 0.3 mg/L IAA	25 °C	16 h/ 8 h	2 wks	Shoot proliferation	Dewir et al. 2005
Lilium hybrid "Pesaro"	Red + blue	MS	3% suc.	0.24% gr	1 mg/L BA + 0.3 mg/L NAA	–	–	60 days	Bulblets generation	Lian et al. 2012
Giant protea										
Protea cynaroides	red	MS	3% suc.	0.9% ag	–	21±2 (day) and 12±2 °C (night)	16 h/ 8 h	45 days	Shoot and root regeneration	Wu and Lin 2012
Red ginger										
Alpinia purpurata "Red Ginger" and "Pink"	white (other LED were not applied)	MS	3% suc.	0.6% ag	1.5 mg/L BAP + 0.1 mg/L NAA + 100 mg/L MI	25±2 °C	16 h/ 8 h	55 days	Plantlet regeneration	Pinheiro et al. 2019
Tsuru-rindo										
Tripterospermum japonicum	red (root), 70% red + 30% blue (plant growth)	MS 3%	suc.	0.3% gr –	24±1 °C 16 h/ 8 h 2, and 4 wks Plantlet				regeneration Moon et al. 2006	
Hosta										
Hosta plantaginea "Joseon"	red	MS	3% suc.	0.8% ag	0.1 mg/L MI	23±1 °C	16 h/ 8 h	6wks	Plantlet regeneration	Ku et al. 2016
Poplar										
Populus euramericana "Dorskamp"	50% red + 50% blue	1/2 MS	3% suc.	0.3% gr	4.4 μM BA + 2.2 μM ZT	24±1 °C	16 h/ 8 h	4 wks	Shoot regeneration	Kwon et al. 2015

Table S5. Studies in combination of light emitting diodes (LEDs) and plant growth regulators in vitro culture in ornamentals.

Plant species	**Effective LEDs**	**Media**	**Carbon source**	**Solidifying agent**	**Effective PGRs**	**Temperature**	**Photoperiod (light/dark)**	**Culture period**	**Organogenesis/ regeneration**	**Ref**

Cymbidium orchid										
Cymbidium dayanum	Green	mMS[1]	2% suc.	0.2% pg	0.1 mg/L chondroitin sulfate	25±1 °C	16 h/ 8 h	5-7 wks	PLB regeneration	Nahar et al. 2016
C. finlaysonianum	Green	mMS[1]	2% suc.	0.2% pg	1 mg/L chondroitin sulfate	25±1 °C	17 h/ 8 h	5-7 wks	PLB regeneration	
C. insigne	Green	mMS[1]	2% suc.	0.2% pg	1 mg/L CS	25±1 °C	16 h/ 8 h	8 wks	PLB regeneration	Nahar et al. 2013
C. dayanum	Blue	mMS[1]	2% suc.	0.2% pg	1 mg/L HA9	–	16 h/ 8 h	5 wks	PLBs proliferation	Nahar et al. 2017
	red or green	mMS [1]	2 % suc.	0.2 % pg	1 mg/L Ch	–	17 h/ 8 h	6 wks	PLBs proliferation	
Dendrobium orchid										
Dendrobium okinawense	green	mMS[1]	2% suc.	0.22% pg	0.01 mg/L PCIB	25±1 °C	16 h/ 8 h	42 days	PLB proliferation	Mehbub et al. 2022
D kingianum	White (other LEDs were not used)	mMS [1]	2 % suc.	0.22 % pg	**Expt BA** : 0.1 g/L; **Expt HA9**: 0.1 mg/L	25±1 °C	16 h/ 8 h	5 wks	PLB regeneration	Habiba et al. 2014
Gerbera										
Gerbera jamesonii cv. Queen Rebecca	red, green	MS	–	–	5 mg/L KN	20-23 °C	16h /8h	8 wks	Shoot multiplication	Gabryszewska and Rudnicki 1995
	red	MS	–	–	5 mg/L IAA	20 -24 °C	16 h /8h	9 wks	Rooting	
Myrtle										
Myrtus communis	red	MS	3% suc.	0.5% bio ag	1 or 5 μM BA	23/21±1 °C (day/night)	16h /8h	6 wks	Plantlet regeneration	Cioć et al. 2018
	100 % blue or 70% red + 30% blue	MS	3 % suc.	0.5 % bio ag	5 μM BA		16 h /8h	6 wks	Fresh weight	
Bells of Ireland/ Shellflower										
Moluccella laevis L.	PAR LED	MS	3% suc.	0.6% ag	3 μM BA + 0.5 μM NAA	25±0.5 °C	16h /8h	3 wks	Shoot multiplication	Zielińska et al. 2020

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