APPENDICES

Appendix A

Glossary

Adventitious: Development of organs such as bud, root and shoot from unusual location such as shoot tissue from callus.

Agar: Polysaccharide is obtained from red algae. Agar is a gelling agent and is used for a supporting plant.

Aseptic: Free from infection and microorganisms such as bacteria, fungi and virus.

Aseptic technique: Technique is used for prevent contamination of microorganisms in tissue culture.

Autoclave: An instrument which sterilize media and laboratory wares by using steam under pressure.

Biosynthesis: Formation of compounds by cells.

Biotechnology: Biological system is used for improving products.

Buffer: Solution is used for controlling condition of acid or base in media.

Callus: Undifferentiated and disorganized cells.

Cell: The smallest unit of living organisms.

Cell culture: Growing of single or clump cells.

Clone: A group of cells, tissues or plants which are genetically identical.

Contamination: Growing of microorganisms in tissue culture media.

Culture room: Room for tissue culture which can control humidity, light and temperature.

Dedifferentiation: Reversion of differentiated to undifferentiated cells.

Differentiation: Growing of new cells, tissues and organs for specific functions.

Explant: The part of plant is used to initiate a culture.

Growth regulator: Compounds influence plant growth.

***In vitro*:** Plant grows in glass or in a controlled environment.

***In vivo*:** Plant grows under natural conditions.

Laminar air flow cabinet: A sterilized place is used for transferring cells.

Liquid media: Media without solidifying agents.

Macronutrients: Minerals which plant requires for developing in a large amounts.

Media: The mixture of chemical compounds for culturing cells.

Metabolite: The products derive from metabolism.

Micronutrients: Minerals which plant requires for developing in a small amounts.

Micropropagation: Production of plants on a very small scale.

Sterile: Free from microorganisms.

Subculture: Transplanting cells, tissues or organs to a new media.

Surfactant: Wetting agents increase solubility property.

Suspension culture: Culture of cells in liquid media.

Tissue culture: The culture of cells, tissues, organs or seeds under controlled conditions in a media.

Totipotency: The capability of cells or tissues to regenerate into a whole plant.

Tween 20: The brand name of a surfactant.

Yeast extract: Mixture of chemical compounds obtain from yeast.

Appendix B

Murashige and Skoog media (MS, 1962)

Table 33. The chemical constituents of Murashige and Skoog media.

Constituents	Chemical form	Amount (mg/l)
Macronutrients		
Magnesium sulfate	$MgSO_4.7H_2O$	370
Potassium phosphate	KH_2PO_4	170
Potassium nitrate	KNO_3	1900
Ammonium nitrate	NH_4NO_3	1650
Calcium chloride	$CaCl_2.2H_2O$	440
Micronutrients		
Boric acid	H_3BO_3	6.2
Manganese sulfate	$MnSO_4.H_2O$	15.6
Zinc sulfate	$ZnSO_4.7H_2O$	8.6
Sodium molybdate	$NaMoO_4.2H_2O$	0.25
Copper sulfate	$CuSO_4.5H_2O$	0.025
Cobalt chloride	$CoCl_2.6H_2O$	0.025
Potassium iodide	KI	0.83
Ferrous sulfate	$FeSO_4.7H_2O$	27.8
Ethylenediamine tetraacetic acid	Na_2EDTA	37.3
Vitamins		
Thiamine HCl	$C_{12}H_{17}CIN_40_5.HCl$	0.5
Pyridoxine HCl	$C_8H_{11}NO_3.HCl$	0.5
Nicotinic acid	$C_6H_5NO_2$	0.05
Myo-inositol	$C_6H_{12}O_6$	100
Sucrose (g)	30	
pH	5.8	

Appendix C

Modified Vacin and Went media (VW, 1949)

Table 34. The chemical constituents of Modified Vacin and Went media.

Constituents	Chemical form	Amount (mg/l)
Macronutrients		
Tricalcium phosphate	$Ca_3(PO_4)_2$	200
Potassium nitrate	KNO_3	525
Potassium phosphate	KH_2PO_4	250
Magnesium sulfate	$MgSO_4.7H_2O$	250
Ammonium sulfate	$(NH_4)_2SO_4$	500
Micronutrients		
Manganese sulfate	$MnSO_4.H_2O$	6.8
Coconut water (ml)	150	
Iron chelate (ml)	5	
Sucrose (g)	20	
pH	5.0	

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