

**Appendix B** DEGs cluster and description related the alfalfa cultivars cv. Zhongmu 1 exposed (R+Aphids) and unexposed (R-Aphids) to aphid infestation and cv. SOCA exposed to aphids (S + aphids) or unexposed (S-Aphids) to aphid infestation.

gene_id	NR Description	UP_DOWN_Regulation (S+Aphids/S-Aphids)	log <sub>2</sub> ratio (S+Aphids/S-Aphids)	UP_DOWN_Regulation (R+Aphids/R-Aphids)	log <sub>2</sub> ratio (R+Aphids/R-Aphids)
c98252_g2	Manganese-dependent ADP-ribose/CDP-alcohol diphosphatase	DOWN	-1.53	DOWN	-1.23
c96603_g1	Beta-fructofuranosidase	UP	2.531	UP	1.795
c122890_g1	60S ribosomal protein L27Ae	UP	7.173	UP	5.258
c91095_g1	nuclear envelope pore membrane protein POM121B	UP	12.44	UP	11.78
c107112_g1	F-box protein interaction domain protein	UP	1.834	UP	5.229
c96526_g6	Ribonuclease T2	DOWN	-2.12	UP	1.221
c42663_g1	prislkin-39-like	UP	5.483	UP	5.195
c66994_g1	apyrase	DOWN	-3.24	UP	2.449
c41562_g1	Replication protein A 70 kDa DNA-binding subunit	UP	5.348	DOWN	-10.9
c80768_g1	Photosystem II 10 kDa polypeptide	DOWN	-2.12	DOWN	-1.46
c75578_g1	phloem specific protein	DOWN	-1.06	DOWN	-1.1
c99147_g2	troponin T	UP	6.932	UP	5.195
c52159_g2	Mitochondrial protein	DOWN	-1.21	DOWN	-4.16
c52159_g3	Mitochondrial protein	UP	1.159	DOWN	-5.6
c92335_g1	beta-amylase	DOWN	-2.23	DOWN	-1.36
c67587_g1	heat shock cognate 70 kDa protein	UP	11.74	UP	7.667
c123199_g1	glutamine synthetase	UP	7.525	UP	5.066
c8414_g1	chemosensory protein CSP1	UP	5.44	UP	5.129
c14020_g1	large subunit ribosomal protein	UP	7.231	UP	5.313
c53965_g1	heat shock protein 83	UP	13.1	UP	6.564
c104456_g1	peroxisomal acyl-CoA oxidase	UP	1.396	UP	1.062
c103342_g1	branched-chain amino acid aminotransferase	UP	4.131	UP	1.269
c60122_g1	heme peroxidase homologue	UP	5.658	UP	6.002
c122589_g1	RNA-directed RNA polymerase	DOWN	-3.88	UP	11.92
c100433_g1	MRNA-binding protein	DOWN	-4.76	UP	1.005

c103456_g2	Alkaline alpha galactosidase I	UP	3.824	UP	2.263
c154142_g1	40S ribosomal protein S19-like	UP	6.883	UP	5.114
c73449_g1	Cell wall-associated hydrolase	DOWN	-1.71	DOWN	-9.1
c109275_g1	60S ribosomal protein L10	UP	10.15	UP	5.894
c107524_g3	proline dehydrogenase	UP	1.662	UP	1.29
c165245_g1	Ribosomal protein L22p/L17e family protein	UP	7.612	UP	5.912
c101088_g1	DnaJ homolog subfamily B member	UP	1.784	DOWN	-3.83
c104616_g2	EMG1/NEP1 methyltransferase	DOWN	-1.42	DOWN	-10.7
c103171_g1	long chain base biosynthesis protein 2a	UP	2.556	UP	3.49
c108539_g1	Disease resistance protein	DOWN	-1.61	DOWN	-2.88
c165407_g1	60S ribosomal protein L37	UP	10.66	UP	5.579
c80050_g2	Adenosylhomocysteinase	DOWN	-1.12	DOWN	-1.14
c97503_g1	3'(2'),5'-bisphosphate nucleotidase	UP	5.496	DOWN	-3.3
c102786_g2	auxin-binding protein ABP19a	DOWN	-4.46	UP	1.141
c88290_g1	5'-methylthioadenosine/S-adenosylhomocysteine nucleosidase	DOWN	-2.09	UP	1.29
c103753_g1	Transcription factor bZIP37	DOWN	-1.04	DOWN	-1.04
c20776_g1	myosin regulatory light chain 2-like	UP	6.57	UP	5.844
c68641_g1	cuticular protein analogous to peritrophins 3-D2	UP	5.476	UP	4.8
c101772_g1	aldehyde dehydrogenase family 2 member C4-like	DOWN	-2.24	DOWN	-1.72
c171345_g1	40S ribosomal protein S6	UP	11.23	UP	6.101
c88116_g1	Ethylene-responsive transcription factor SHINE	DOWN	-2.67	UP	1.959
c11706_g1	60S ribosomal protein L26-1-like	UP	6.941	UP	5.155
c108199_g2	UPF0614 protein C14	DOWN	-2.54	UP	3.112
c15786_g1	acidic ribosomal protein P2	UP	6.836	UP	5.039
c108432_g1	serine/threonine-protein phosphatase 7	UP	1.948	UP	1.883
c104349_g1	embryonic abundant-like protein	DOWN	-2.5	DOWN	-1.92
c150539_g1	paramyosin	UP	7.178	UP	5.309
c90425_g2	Chitinase / Hevein / PR-4 / Wheatwin2	UP	1.083	UP	1.168
c96823_g1	Ethylene-responsive transcription factor ERF061	DOWN	-1.96	UP	1.271
c108217_g1	cyclic nucleotide-gated cation channel protein	DOWN	-1.28	DOWN	-1.17

c12523_g1	translationally-controlled tumor protein homolog	UP	9.834	UP	5.529
c1622_g1	60S ribosomal protein L13e	UP	7.524	UP	5.753
c106124_g2	expansin A10	DOWN	-1.13	UP	1.034
c90425_g1	Chitinase	UP	2.357	UP	1.691
c20928_g1	60S ribosomal protein L18-2	UP	9.489	UP	5.427
c150812_g1	ATP synthase F0 subunit 6	UP	6.44	UP	5.21
c83077_g1	G protein-coupled receptor-like protein	DOWN	-3.04	DOWN	-1.26
c102262_g1	galactose oxidase/kelch repeat protein	UP	1.828	UP	1.216
c102556_g1	myosin-1-like	UP	8.121	UP	5.458
c96007_g1	Alpha-amylase	UP	2.276	DOWN	-1.91
c123638_g1	COP9 signalosome complex subunit 4	UP	6.838	UP	4.936
c97255_g2	adenine nucleotide alpha hydrolase superfamily protein	UP	2.822	DOWN	-3.22
c101013_g3	raffinose synthase or seed inhibition protein	UP	1.961	UP	1.218
c107557_g1	16S ribosomal RNA gene	DOWN	-5.44	DOWN	-2.06
c152513_g1	60S ribosomal protein L12-like	UP	7.027	UP	4.971
c81865_g1	Blue copper protein	DOWN	-4.95	DOWN	-1.19
c85098_g1	Gibberellin-regulated protein	DOWN	-1.42	UP	1.196
c103419_g1	Cc-nbs-lrr resistance protein	DOWN	-3.16	DOWN	-2.6
c59338_g1	mediator of RNA polymerase II transcription subunit 15-like	UP	5.127	UP	4.819
c93257_g1	lectin	DOWN	-8.17	UP	5.545
c41594_g1	pathogenesis-related thaumatin family protein	UP	3.674	DOWN	-1.13
c105591_g1	Mitochondrial chaperone BCS1	DOWN	-1.3	UP	1.286
c98138_g4	60S acidic ribosomal protein P1	UP	11.47	UP	9.487
c106870_g1	Cyclic nucleotide gated channel	DOWN	-1.19	DOWN	-1.28
c100287_g1	NB-ARC domain disease resistance protein	DOWN	-1.1	UP	1.246
c106156_g1	PPR containing protein	UP	1.385	DOWN	-1.74
c20120_g1	calphotin-like	UP	4.832	UP	6.116
c100527_g2	dehydration-responsive RD22-like protein	DOWN	-1.42	DOWN	-1.29
c107524_g2	proline dehydrogenase	UP	1.842	UP	2.375
c107524_g1	proline dehydrogenase	UP	1.18	UP	1.363

c86365_g2	gibberellin receptor GID1	UP	2.822	UP	2.156
c16018_g1	chorion protein S36-like	UP	6.092	UP	5.806
c101122_g1	fasciclin domain protein	DOWN	-2.48	DOWN	-2.23
c125076_g1	60S ribosomal protein L31	UP	6.632	UP	5.082
c102971_g1	chaperone dnaJ-like protein	DOWN	-1.3	DOWN	-1.28
c3955_g1	apolipoprotein D	UP	6.268	UP	4.8
c95474_g1	Lipid transfer protein	UP	1.121	DOWN	-3.24
c19409_g1	RR1 cuticle protein 11	UP	8.291	UP	5.933
c109096_g1	40S ribosomal protein S15a	UP	7.708	UP	5.73
c92090_g1	GPI-anchored protein	DOWN	-2.39	DOWN	-1.18
c137917_g1	heterogeneous nuclear ribonucleoprotein 1	UP	6.312	UP	4.918
c107583_g1	alpha-galactosidase	UP	1.822	UP	1.152
c81912_g1	MLP-like protein	DOWN	-3.91	UP	1.222
c101167_g3	NAC protein	UP	1.108	UP	1.172
c65011_g1	heterogeneous nuclear ribonucleoprotein 1-like	UP	6.699	UP	4.838
c142948_g1	60S ribosomal protein L15-1	UP	7.685	UP	5.918
c100001_g2	polygalacturonase inhibitor	UP	2.634	UP	2.468
c108005_g1	feronia receptor-like kinase	DOWN	-1.02	DOWN	-1.47
c108025_g1	2-succinylbenzoate-CoA ligase	UP	1.149	UP	1.088
c63966_g1	Peroxiredoxin Q	DOWN	-4.95	UP	1.231
c97092_g1	Chitinase	UP	1.5	UP	1.575
c103477_g2	Desiccation protectant protein Lea14-like protein	DOWN	-1.5	DOWN	-1
c100545_g1	class IV chitinase	UP	1.349	UP	1.024
c20643_g1	Mitochondrial protein	DOWN	-1.64	DOWN	-9.2
c105898_g1	serine carboxypeptidase-like protein	UP	1.952	DOWN	-2.25
c86363_g1	photosystem II reaction center W	DOWN	-2.75	DOWN	-1.22
c94190_g1	fasciclin domain protein	DOWN	-2.25	DOWN	-2.1
c97330_g1	Pathogenesis-related protein PR10	UP	1.774	UP	1.116
c105310_g1	Beta-amylase	DOWN	-7.78	DOWN	-1.65
c88701_g1	Protein TIFY 5A	DOWN	-3.53	DOWN	-1.12
c74712_g1	RR1 cuticle protein 1	UP	10.56	UP	6.197
c106033_g3	1a protein	DOWN	-4.95	DOWN	-7.17

c35306_g1	RR1 cuticle protein 1	UP	5.711	UP	5.103
c28434_g1	large subunit ribosomal protein L7e	UP	7.688	UP	5.656
c94983_g4	actin/actin-like protein alternative	UP	7.293	UP	5.367
c88000_g1	transmembrane protein	DOWN	-7.27	DOWN	-5.23
c35478_g1	glyeraldehyde-3-phosphate dehydrogenase	UP	11.32	UP	5.866
c106473_g1	plant invertase/pectin methylesterase inhibitor	UP	3.234	UP	1.386
c152076_g1	DEAD-box RNA helicase	UP	7.408	UP	5.224
c109051_g1	40S ribosomal protein S15-like	UP	7.626	UP	5.575
c107582_g4	adenine nucleotide translocator	UP	8.121	UP	10.07
c93065_g1	Alcohol dehydrogenase-like protein	UP	1.346	DOWN	-1.05
c102083_g3	Receptor-like protein kinase	UP	2.091	UP	1.1
c38025_g1	40S ribosomal protein S13-like	UP	7.164	UP	5.19
c96817_g1	xyloglucan endotransglucosylase/hydrolase family protein	UP	2.889	DOWN	-1.81
c108460_g1	LRR receptor-like kinase	UP	2.834	UP	2.854
c35752_g1	60S ribosomal protein L14e	UP	6.945	UP	4.959
c99717_g2	expansin A10	DOWN	-1.87	UP	1.147
c53540_g1	flocculation protein FLO11-like	UP	10.02	UP	5.56
c92560_g1	transmembrane protein	UP	2.443	UP	1.688
c97746_g2	alpha-L-arabinofuranosidase 1	UP	1.019	UP	1.106
c89717_g1	Desiccation-related protein PCC13-62	UP	9.004	UP	3.627
c108405_g2	functional resistance protein KR1	DOWN	-2.77	UP	1.16
c103375_g3	Lysine-ketoglutarate reductase/saccharopine dehydrogenase	UP	1.752	UP	1.319
c150936_g1	60S ribosomal protein L29	UP	6.779	UP	4.812
c94943_g2	TatD-related deoxyribonuclease	UP	2.093	UP	2.495
c91581_g2	Cold and drought-regulated protein CORA	UP	8.419	DOWN	-9.24
c165252_g1	60S ribosomal protein L13a-like	UP	7.177	UP	5.244
c100713_g2	Alkaline alpha galactosidase I	UP	3.75	UP	2.594
c106770_g2	cytochrome P450 family ABA 8'-hydroxylase	UP	1.718	DOWN	-1.24
c100725_g1	1-aminocyclopropane-1-carboxylate oxidase	DOWN	-2.37	UP	1.146
c100197_g1	Hedgehog-interacting protein	UP	1.245	UP	1.165
c123132_g1	tentative cuticle protein	UP	6.722	UP	7.051

c150825_g1	Translating 80s Ribosome	UP	6.748	UP	4.982
c81867_g2	calreticulin	UP	10.75	UP	5.627
c100799_g1	DEAD-box ATP-dependent RNA helicase	UP	2.102	UP	2.164
c30788_g1	60S ribosomal protein L7a	UP	10.78	UP	5.493
c94181_g1	Speckle-type POZ protein	DOWN	-1.05	DOWN	-1.06
c100240_g1	l-aminocyclopropane-1-carboxylate oxidase homolog 1-like	DOWN	-2.6	UP	1.786
c138341_g1	60S ribosomal protein L27	UP	10.81	UP	5.505
c76830_g1	Beta-amylase	DOWN	-8.43	DOWN	-1.83
c87987_g1	vacuolar processing enzyme	UP	2.349	DOWN	-1.78
c106681_g1	glutamate receptor 3.4	DOWN	-1.4	DOWN	-1.43
c14303_g1	E3 ubiquitin-protein ligase RNF12-B-like	UP	7.783	UP	6.21
c142062_g1	Clathrin	UP	5.644	UP	4.8
c103448_g1	peroxidase family protein	UP	4.455	UP	3.069
c150938_g1	keratin, type II cytoskeletal 1-like	UP	7.326	UP	6.456
c106655_g1	LRR receptor-like kinase	DOWN	-3.39	DOWN	-1.81
c106508_g3	cytochrome c oxidase subunit 2	UP	9.385	UP	5.175
c95825_g1	Ein3-binding f-box protein	UP	1.504	DOWN	-1.1
c93445_g1	Inositol oxygenase	UP	2.362	UP	1.801
c101140_g2	Fibronectin-attachment protein (FAP)	UP	5.301	UP	6.033
c97986_g1	Replication factor A protein	UP	5.882	UP	3.165
c181480_g1	glycine-rich protein 2-like	UP	6.972	UP	4.977
c103024_g1	HSPRO2-like protein	UP	1.149	UP	1.667
c1548_g1	40S ribosomal protein SA-like	UP	11.08	UP	5.872
c82676_g1	Malic enzyme	UP	1.777	DOWN	-1
c79031_g1	Proteasome subunit alpha type-5	UP	7.939	DOWN	-2.94
c105535_g1	galactinol-raffinose galactosyltransferase	UP	2.23	DOWN	-1.79
c107847_g1	fructose-1,6-bisphosphatase	DOWN	-4.31	UP	1.035
c58397_g1	Metallothiol transferase fosB	UP	3.374	UP	2.811
c107784_g1	Beta-glucan-binding protein	UP	3.175	UP	1.244
c13610_g1	60S ribosomal protein L3	UP	8.312	UP	6.374
c96078_g1	Inhibitor of trypsin and hageman factor	UP	3.951	UP	2.682
c110426_g1	60S ribosomal protein L11	UP	7.546	UP	5.638

c48749_g1	ATP synthase subunit alpha	UP	7.841	UP	5.854
c105353_g1	Cinnamyl alcohol dehydrogenase	DOWN	-2.54	UP	1.231
c86843_g2	Cytosolic fructose-1 6-bisphosphatase	UP	5.101	UP	4.29
c124390_g1	ribosomal protein S25	UP	7.391	UP	5.345
c92812_g1	Serine carboxypeptidase	UP	3.316	DOWN	-1.62
c90645_g1	D-cysteine desulphydrase	DOWN	-1.3	DOWN	-1.27
c95609_g2	proline-rich protein	UP	2.809	UP	2.503
c125484_g1	FKBP-type peptidyl-prolyl cis-trans isomerase	UP	7.147	UP	5.087
c100665_g1	aspartic proteinase nepenthesin-like protein	DOWN	-5.12	DOWN	-1.18
c104442_g1	seed linoleate 9S-lipoxygenase	DOWN	-3.18	UP	1.476
c63514_g1	RR1 cuticle protein 2	UP	8.337	UP	6.155
c99200_g1	membrane protein	DOWN	-2.77	UP	1.312
c183961_g1	40S ribosomal protein S16-1	UP	7.064	UP	5.195
c94143_g1	Kunitz-type trypsin inhibitor-like 2 protein	DOWN	-4.52	UP	1.101
c109571_g1	chemosensory protein CSP2	UP	5.021	UP	4.948
c97267_g1	cystathionine beta-lyase/cystathionine gamma-synthase	UP	3.544	DOWN	-1.24
c86868_g1	Ribosomal protein S5/S7	UP	6.76	UP	5.239
c103436_g2	TMV resistance protein N	UP	3.01	UP	2.215
c88856_g1	cytochrome P450 family protein	UP	1.401	UP	1.342
c62838_g1	eukaryotic translation elongation factor 1 gamma	UP	7.142	UP	5.066
c94996_g1	kelch repeat F-box protein	UP	2.273	UP	1.375
c103899_g1	TMV resistance protein N	UP	5.738	UP	6.277
c99263_g1	ankyrin repeat plant-like protein	UP	3.169	DOWN	-3.59
c32672_g1	cytochrome c oxidase subunit I	UP	12.17	UP	7.56
c104160_g1	Sieve element-occluding protein	DOWN	-4.35	UP	1.878
c60824_g1	enolase 1	UP	7.285	UP	4.812
c96558_g1	Ethylene responsive transcription factor 2b	UP	2.675	DOWN	-1.46
c96759_g2	Patatin-like protein	UP	1.13	UP	2.025
c122644_g1	ATP synthase F0 subunit 9	UP	7.54	UP	5.936
c139568_g1	60S acidic ribosomal protein P0	UP	7.847	UP	5.796
c96367_g2	cytidine/deoxycytidylate deaminase family	UP	4.076	UP	1.044

	protein				
c109171_g1	60S ribosomal protein L21	UP	6.729	UP	4.857
c96667_g1	1-deoxy-D-xylulose 5-phosphate reductoisomerase	DOWN	-7.99	DOWN	-1.44
c40520_g1	neurofilament heavy polypeptide-like	UP	10.47	UP	6.475
c95330_g1	tropomyosin-like	UP	7.067	UP	5.469
c103962_g2	Peroxidase	UP	2.077	DOWN	-1.07
c8440_g2	beta subunit of mitochondrial ATP synthase	UP	10.1	UP	5.367
c77689_g1	ATP-dependent RNA helicase eIF4A	UP	10.82	UP	6.195
c93528_g1	Tryptophan synthase beta chain	DOWN	-6.17	DOWN	-2.51
c20427_g1	BURP domain-containing protein	DOWN	-3.65	UP	2.311
c106701_g1	tyrosine kinase family protein	DOWN	-3.24	DOWN	-3.56
c105269_g1	1-aminocyclopropane-1-carboxylate oxidase	UP	1.297	UP	2.781
c100755_g1	Quinone oxidoreductase-like protein	DOWN	-4.33	DOWN	-2.09
c1237_g1	thioredoxin H	UP	10.18	UP	4.894
c106618_g1	Fasciclin-like arabinogalactan protein	DOWN	-1.85	DOWN	-2.96
c84065_g1	Pathogenesis-related protein 1a	DOWN	-1.52	UP	2.755
c73506_g1	60S ribosomal protein L22-2	UP	7.874	UP	5.879
c167640_g1	component of cytosolic 80S ribosome and 60S large subunit	UP	6.915	UP	5.103
c108743_g1	60S ribosomal protein L9	UP	7.115	UP	5.253
c60962_g1	antigen LPMC-61	UP	4.609	UP	4.999
c100335_g1	PP1/PP2A phosphatase pleiotropic regulator PRL1	UP	1.048	DOWN	-1.27
c88807_g1	CTP synthase like protein	DOWN	-2.1	UP	2.296
c152635_g1	cuticle protein 16.5, isoform B-like	UP	9.875	UP	6.999
c93246_g1	Cathepsin B	UP	4.461	UP	5.567
c93527_g1	GDSL-like lipase/acylhydrolase	DOWN	-1.15	UP	1.187



