

**Appendix C** Gene ontology analysis of aphid resistant alfalfa cultivar Zhongmu 1  
(R+Aphids/R-Aphids) transcriptome

GO_Term	Name	Ontology	Percent (%)	Number
GO:0042254	ribosome biogenesis	biological_process	10.26	63
GO:0022613	ribonucleoprotein complex	biological_process	10.26	63
GO:0043043	peptide biosynthetic process	biological_process	11.24	69
GO:0006412	translation	biological_process	11.07	68
GO:0044085	cellular component biogenesis	biological_process	12.87	79
GO:0006518	peptide biosynthetic process	biological_process	11.4	70
GO:0043604	amide biosynthetic process	biological_process	11.56	71
GO:0043603	cellular amide metabolic process	biological_process	11.73	72
GO:0071840	cellular component organization or biogenesis	biological_process	15.96	98
GO:1901566	organonitrogen compound biosynthetic process	biological_process	15.8	97
GO:0006562	proline catabolic process	biological_process	0.65	4
GO:0005975	carbohydrate metabolic process	biological_process	12.05	74
GO:0009065	glutamine family amino acid catabolic process	biological_process	0.65	4
GO:0050832	defense response to fungus	biological_process	0.81	5
GO:0006561	proline biosynthetic process	biological_process	0.65	4
GO:0009620	response to fungus	biological_process	0.81	5
GO:0009225	nucleotide-sugar metabolic process	biological_process	1.79	11
GO:0005840	ribosome	cellular_component	10.42	64
GO:0030529	ribonucleoprotein complex	cellular_component	10.91	67
GO:0043232	intracellular non-membrane-bounded organelle	cellular_component	15.31	94
GO:0043228	non-membrane-bounded organelle	cellular_component	15.31	94
GO:0005861	troponin complex	cellular_component	0.65	4
GO:0005865	striated muscle thin filament	cellular_component	0.65	4
GO:0030016	myofibril	cellular_component	0.65	4
GO:0030017	sarcomere	cellular_component	0.65	4
GO:0036379	myofilament	cellular_component	0.65	4
GO:0043292	contractile fiber	cellular_component	0.65	4
GO:0044449	contractile fiber part	cellular_component	0.65	4
GO:0044444	cytoplasmic part	cellular_component	16.61	102
GO:0005198	structural molecule activity	molecular_function	14.82	91
GO:0003735	structural constituent of ribosome	molecular_function	9.61	59
GO:0042302	structural constituent of cuticle	molecular_function	3.26	20
GO:0004553	hydrolase activity,hydrolyzing O-glycosyl compounds	molecular_function	6.03	37
GO:0016798	hydrolase activity,acting on glycosyl bonds	molecular_function	6.03	37
GO:0004657	proline dehydrogenase activity	molecular_function	0.65	4
GO:0005549	odorant binding	molecular_function	0.98	6
GO:0016160	amylase activity	molecular_function	0.81	5
GO:0004869	cysteine-type endopeptidase inhibitor activity	molecular_function	0.81	5
GO:0016161	beta-amylase activity	molecular_function	0.65	4
GO:0030414	peptidase inhibitor activity	molecular_function	1.47	9
GO:0061134	peptidase regulator activity	molecular_function	1.47	9

**Appendix C** Gene ontology analysis of aphid susceptible alfalfa cultivar SOCA

(S+Aphids/S-Aphids) transcriptome

GO_Term	Name	Ontology	Percent(%)	Number
GO:0055114	oxidation-reduction process	biological_process	16.33	389
GO:0006118	obsolete electron transport	biological_process	3.74	89
GO:0008152	metabolic process	biological_process	64.9	1546
GO:0044710	single-organism metabolic process	biological_process	34.26	816
GO:0022613	ribonucleoprotein complex biogenesis	biological_process	5.21	124
GO:0042254	ribosome biogenesis	biological_process	5.12	122
GO:0006804	obsolete peroxidase reaction	biological_process	1.39	33
GO:0015979	photosynthesis	biological_process	3.11	74
GO:0006979	response to oxidative stress	biological_process	1.43	34
GO:0005975	carbohydrate metabolic process	biological_process	10.33	246
GO:0006081	cellular aldehyde metabolic process	biological_process	1.97	47
GO:1901566	organonitrogen compound biosynthetic process	biological_process	12.26	292
GO:0015976	carbon utilization	biological_process	1.22	29
GO:1901564	organonitrogen compound metabolic process	biological_process	21.16	504
GO:0009765	photosynthesis,light harvesting	biological_process	0.25	6
GO:0071554	cell wall organization or biogenesis	biological_process	1.72	41
GO:0006739	NADP metabolic process	biological_process	1.51	36
GO:0044085	cellular component biogenesis	biological_process	7.6	181
GO:0043604	amide biosynthetic process	biological_process	7.18	171
GO:0006098	pentose-phosphate shunt	biological_process	1.43	34
GO:0005618	cell wall	cellular_component	1.68	40
GO:0005840	ribosome	cellular_component	5.79	138
GO:0030312	external encapsulating structure	cellular_component	1.89	45
GO:0034357	photosynthetic membrane	cellular_component	1.97	47
GO:0009521	photosystem	cellular_component	1.85	44
GO:0030529	ribonucleoprotein complex	cellular_component	6.26	149
GO:0044436	thylakoid part	cellular_component	2.06	49
GO:0009579	thylakoid	cellular_component	2.06	49
GO:0042651	thylakoid membrane	cellular_component	0.8	19
GO:0009654	photosystem II oxygen evolving complex	cellular_component	0.59	14
GO:0048046	apoplast	cellular_component	0.71	17
GO:0044444	cytoplasmic part	cellular_component	13.77	328
GO:0009523	photosystem II	cellular_component	1.26	30
GO:0071944	cell periphery	cellular_component	3.78	90
GO:0019898	extrinsic component of membrane	cellular_component	0.84	20
GO:0009522	photosystem I	cellular_component	0.59	14
GO:0005737	cytoplasm	cellular_component	16.5	393
GO:0009507	chloroplast	cellular_component	1.85	44
GO:0016491	oxidoreductase activity	molecular_function	16.83	401
GO:0003735	structural constituent of ribosome	molecular_function	4.66	111
GO:0016209	antioxidant activity	molecular_function	2.18	52
GO:0005198	structural molecule activity	molecular_function	7.47	178
GO:0048037	cofactor binding	molecular_function	6.21	148
GO:0009055	electron carrier activity	molecular_function	3.06	73
GO:0020037	heme binding	molecular_function	3.44	82

GO:0016684	oxidoreductase activity,acting on peroxide as acceptor	molecular_function	1.51	36
GO:0046906	tetrapyrrole binding	molecular_function	3.48	83
GO:0005199	structural constituent of cell wall	molecular_function	0.42	10
GO:0004601	peroxidase activity	molecular_function	1.39	33
GO:0042302	structural constituent of cuticle	molecular_function	0.88	21
GO:0050662	coenzyme binding	molecular_function	4.7	112
GO:0016762	xyloglucan:xyloglucosyl transferase activity	molecular_function	0.5	12
GO:0016701	oxidoreductase activity,acting on single donors with incorporation of molecular oxygen	molecular_function	1.13	27
GO:0004553	hydrolase activity,hydrolyzing O-glycosyl compounds	molecular_function	3.82	91
GO:0051213	dioxygenase activity	molecular_function	1.64	39
GO:0016798	hydrolase activity,acting on glycosyl bonds	molecular_function	3.95	94
GO:0017150	tRNA dihydrouridine synthase activity	molecular_function	0.34	8
GO:0016616	oxidoreductase activity,acting on the CH-OH group of donors,NAD or NADP as acceptor	molecular_function	3.11	74

