

Supplementary Files:



Figure S1 *Donacia provosti* larvae.

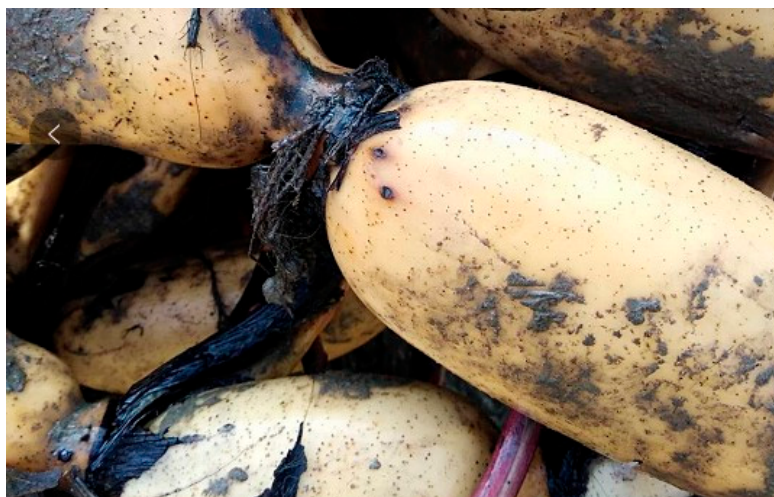


Figure S2 *Donacia provosti* damage characteristics.

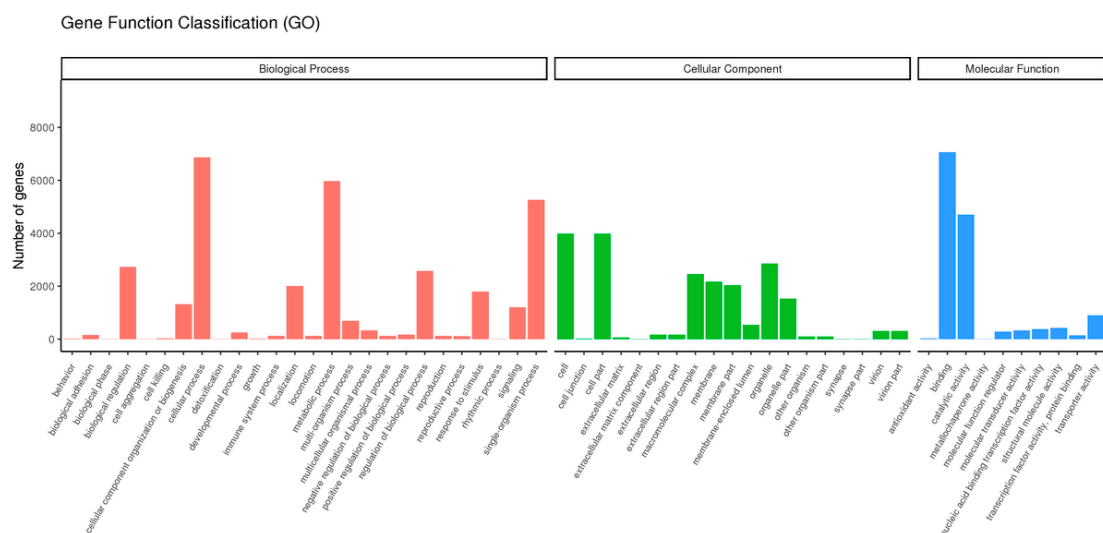


Figure S3. GO Classification of *Donacia provosti* unigenes according to the categories of Biological process, Molecular function, and Cellular component.

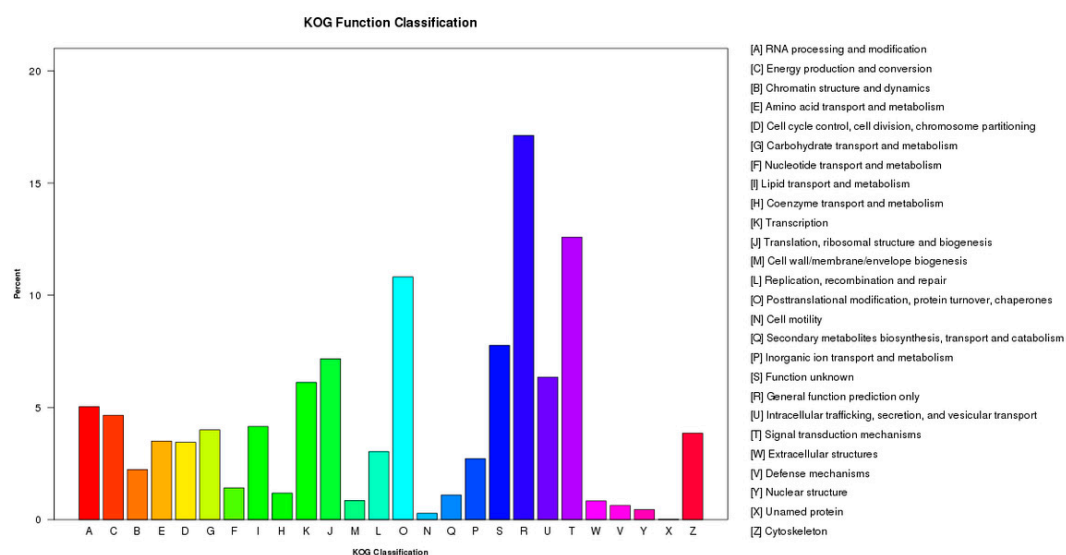


Figure S4. KOG annotations of *Donacia provosti* predicted proteins. A total of 6,678 predicted proteins has a KOG classification among the 26 categories.

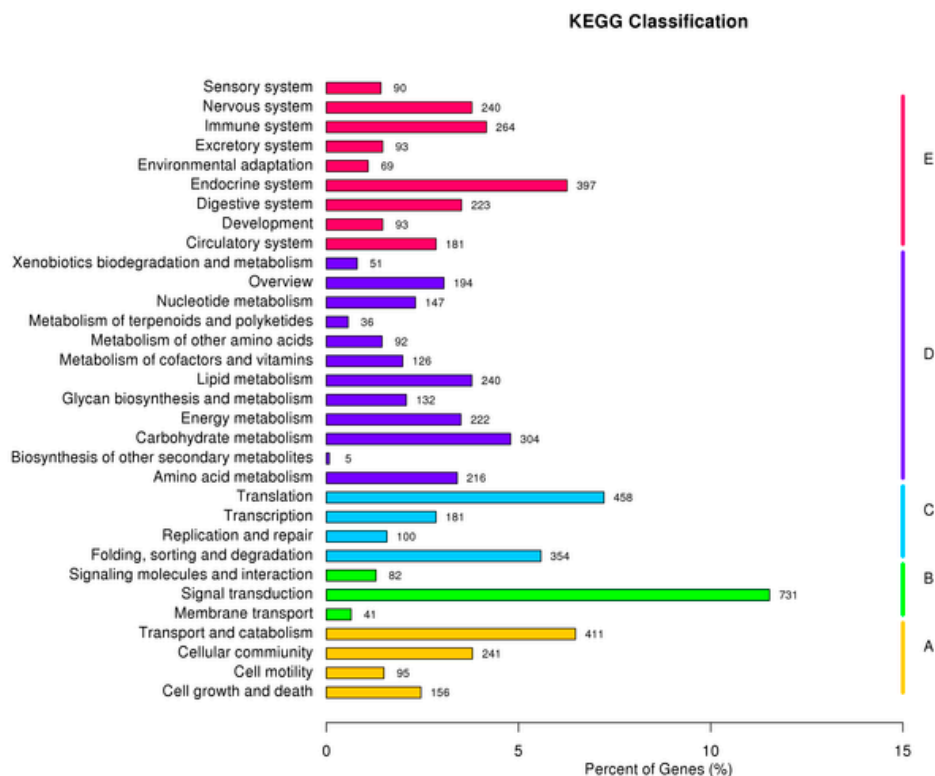


Figure S5. KEGG annotation of *Donacia provosti* predicted proteins. A Cellular Processes, B Environmental Information Processing, C Genetic Information Processing, D Metabolism, E Organismal Systems.

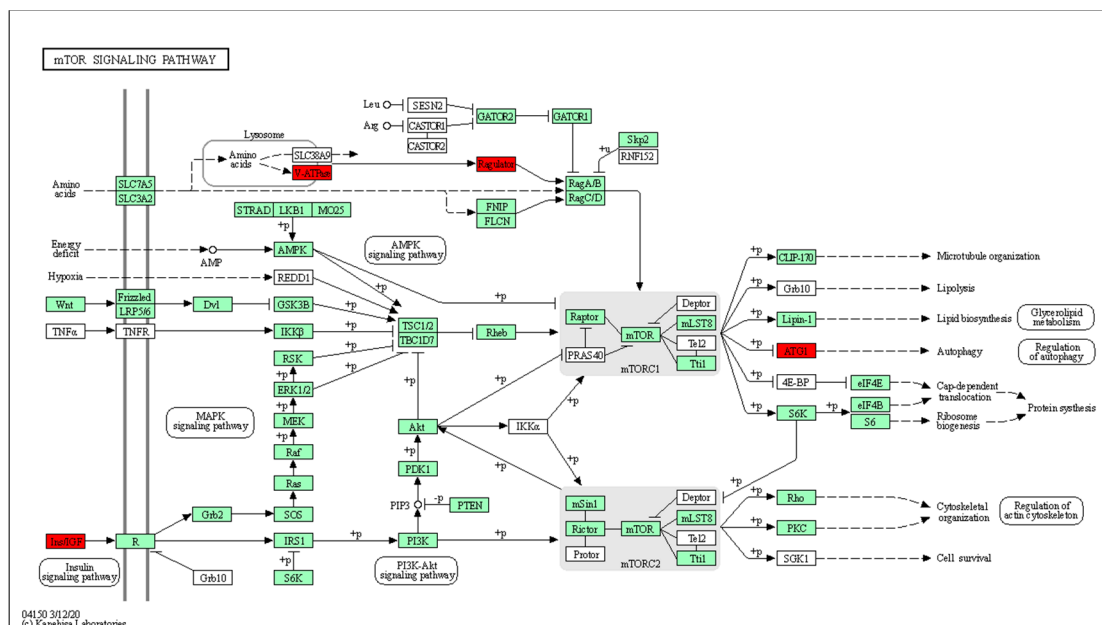


Figure S6 mTOR signaling pathway.

Table S1 List of species with number of unigenes larger than 190

Species	Number of unigenes
<i>Anoplophora glabripennis</i>	6,562
<i>Leptinotarsa decemlineata</i>	3,211
<i>Tribolium castaneum</i>	955
<i>Onthophagus taurus</i>	489
<i>Aethina tumida</i>	381
<i>Dendroctonus ponderosae</i>	337
<i>Myzus persicae</i>	261
<i>Cryptotermes secundus</i>	226
<i>Acyrthosiphon pisum</i>	192

Table S2 List of gene pairs with Ka/Ks larger than one

Gene pair ID		Ka/Ks	Description
<i>Donacia provosti</i>	<i>Leptinotarsa decemlineata</i>		
Cluster-865.1	rna-XM_023170247.1	2.92629	PREDICTED: homeotic protein spalt-major isoform X5 [Tribolium castaneum]
Cluster-2724.11667	rna-XM_023160785.1	2.10042	ubiquitin-conjugating enzyme E2 L3 [Leptinotarsa decemlineata]
Cluster-4953.0	rna-XM_023163868.1	1.9729	GTP-binding nuclear protein Ran [Orbicella faveolata]
Cluster-2724.4879	rna-XM_023163408.1	1.95824	dynactin subunit 3 [Anoplophora glabripennis]
Cluster-2724.19997	rna-XM_023169285.1	1.86627	transmembrane protein 185B [Anoplophora glabripennis]
Cluster-2724.10463	rna-XM_023164662.1	1.86161	TIMELESS-interacting protein [Anoplophora glabripennis]
Cluster-2724.14159	rna-XM_023159393.1	1.8027	UDP-GlcNAc:betaGal beta-1,3-N-acetylglucosaminyltransferase-like protein 1 isoform X1 [Leptinotarsa decemlineata]
Cluster-2724.15400	rna-XM_023158726.1	1.75495	ER membrane protein complex subunit 2-like [Anoplophora glabripennis]
Cluster-2724.17421	rna-XM_023165804.1	1.73552	small nuclear ribonucleoprotein F [Anoplophora glabripennis]
Cluster-2724.12272	rna-XM_023173748.1	1.67871	aldose reductase-like [Leptinotarsa decemlineata]
Cluster-2724.4629	rna-XM_023172695.1	1.62534	palmitoyltransferase ZDHHC3 [Anoplophora glabripennis]
Cluster-2724.5357	rna-XM_023157511.1	1.62374	LIRP-like [Anoplophora glabripennis]
Cluster-2724.6055	rna-XM_023160810.1	1.60735	twinkle protein, mitochondrial [Leptinotarsa decemlineata]
Cluster-2724.8746	rna-XM_023166297.1	1.60475	probable ATP-dependent RNA helicase DDX46 [Anoplophora glabripennis]
Cluster-2724.4458	rna-XM_023159903.1	1.59358	PREDICTED: uncharacterized protein LOC660933 [Tribolium castaneum]
Cluster-2724.17411	rna-XM_023158176.1	1.57414	charged multivesicular body protein 1b [Leptinotarsa decemlineata]
Cluster-2724.8472	rna-XM_023174304.1	1.57149	translation machinery-associated protein 16 homolog [Leptinotarsa decemlineata]
Cluster-2724.9697	rna-XM_023169368.1	1.53299	serine..threonine-protein kinase ULK2 isoform X2 [Anoplophora glabripennis]
Cluster-2724.7689	rna-XM_023172044.1	1.48623	DNA replication complex GINS protein PSF2 [Anoplophora glabripennis]
Cluster-2724.15777	rna-XM_023164962.1	1.46514	adrenodoxin-like protein, mitochondrial [Anoplophora glabripennis]
Cluster-2724.7913	rna-XM_023165526.1	1.46453	tetratricopeptide repeat protein 7B [Anoplophora glabripennis]
Cluster-2724.19469	rna-XM_023156727.1	1.46433	probable splicing factor 3B subunit 5 [Anoplophora glabripennis]
Cluster-2724.1072	rna-XM_023171405.1	1.44307	UDP-glucuronosyltransferase 2B31 [Anoplophora glabripennis]
Cluster-2724.2670	rna-XM_023159710.1	1.43624	zinc finger MYND domain-containing protein 11 [Anoplophora glabripennis]
Cluster-2724.17677	rna-XM_023168468.1	1.42807	39S ribosomal protein L46, mitochondrial isoform X1 [Anoplophora glabripennis]
Cluster-2724.11966	rna-XM_023170166.1	1.41905	protein seele isoform X1 [Leptinotarsa decemlineata]
Cluster-2724.9696	rna-XM_023166069.1	1.41138	uncharacterized protein LOC111510180 [Leptinotarsa decemlineata]

Cluster-2724.8608	rna-XM_023164659.1	1.40224	NSFL1 cofactor p47 [Anoplophora glabripennis]
Cluster-2724.10512	rna-XM_023166186.1	1.39254	uncharacterized protein LOC108905236 [Anoplophora glabripennis]
Cluster-2724.1940	rna-XM_023157652.1	1.39058	zinc finger protein ZFP69 isoform X1 [Anoplophora glabripennis]
Cluster-2724.6191	rna-XM_023165242.1	1.36932	PREDICTED: 39S ribosomal protein L13, mitochondrial [Dendroctonus ponderosae]
Cluster-2724.19937	rna-XM_023156725.1	1.36599	N-acetyltransferase ESCO2 [Anoplophora glabripennis]
Cluster-2724.12587	rna-XM_023166835.1	1.36045	V-type proton ATPase subunit d [Leptinotarsa decemlineata]
Cluster-2724.18399	rna-XM_023160042.1	1.34297	COMM domain-containing protein 4 [Anoplophora glabripennis]
Cluster-2724.11150	rna-XM_023160109.1	1.30929	interleukin enhancer-binding factor 2 homolog [Anoplophora glabripennis]
Cluster-2724.1113	rna-XM_023166665.1	1.29696	succinate dehydrogenase assembly factor 4, mitochondrial [Anoplophora glabripennis]
Cluster-2724.1793	rna-XM_023160326.1	1.29162	uncharacterized protein LOC108910374 isoform X1 [Anoplophora glabripennis]
Cluster-2724.9240	rna-XM_023160179.1	1.28195	ubiquinone biosynthesis monooxygenase COQ6, mitochondrial [Anoplophora glabripennis]
Cluster-2724.6166	rna-XM_023158017.1	1.27882	kinesin-like protein KIF3A [Anoplophora glabripennis]
Cluster-2724.7753	rna-XM_023167874.1	1.2697	uncharacterized protein LOC108916674 [Anoplophora glabripennis]
Cluster-2724.4701	rna-XM_023160521.1	1.25986	Ankyrin repeat containing protein [Acanthamoeba castellanii str. Neff]
Cluster-2724.12153	rna-XM_023158112.1	1.25019	protein yippee-like 5 [Anoplophora glabripennis]
Cluster-2724.12451	rna-XM_023162019.1	1.22864	vacuolar protein sorting-associated protein 72 homolog [Anoplophora glabripennis]
Cluster-2724.13315	rna-XM_023167910.1	1.22435	PREDICTED: cuticular protein analogous to peritrophins 1-H isoform X1 [Tribolium castaneum]
Cluster-2724.18632	rna-XM_023162138.1	1.21982	protein farnesyltransferase..geranylgeranyltransferase type-1 subunit alpha [Anoplophora glabripennis]
Cluster-2724.19239	rna-XM_023168057.1	1.20714	uncharacterized protein LOC108907222 [Anoplophora glabripennis]
Cluster-2724.3186	rna-XM_023158032.1	1.20489	mitochondrial import receptor subunit TOM70 [Anoplophora glabripennis]
Cluster-2724.10149	rna-XM_023165266.1	1.18949	uncharacterized protein LOC111691779 [Anoplophora glabripennis]
Cluster-2724.12806	rna-XM_023161499.1	1.18812	m7GpppN-mRNA hydrolase [Leptinotarsa decemlineata]
Cluster-2724.11425	rna-XM_023157388.1	1.18338	40S ribosomal protein S19 [Anoplophora glabripennis]
Cluster-2724.5474	rna-XM_023156520.1	1.18073	charged multivesicular body protein 2a [Leptinotarsa decemlineata]
Cluster-2724.5301	rna-XM_023157318.1	1.1734	uncharacterized protein C7orf50 [Anoplophora glabripennis]
Cluster-2724.9129	rna-XM_023166749.1	1.16672	peroxiredoxin-5, mitochondrial [Anoplophora glabripennis]
Cluster-2724.14456	rna-XM_023171909.1	1.16475	protein-serine O-palmitoleoyltransferase porcupine [Anoplophora glabripennis]
Cluster-2724.12495	rna-XM_023158233.1	1.1603	serine..arginine-rich splicing factor 7-like isoform X2 [Anoplophora glabripennis]
Cluster-2724.9679	rna-XM_023174634.1	1.15916	uncharacterized protein LOC108906306 [Anoplophora glabripennis]
Cluster-2724.7527	rna-XM_023164602.1	1.158	DNA-directed RNA polymerases I, II, and III subunit RPABC4 [Anoplophora glabripennis]

Cluster-2724.6124	rna-XM_023168881.1	1.15754	zinc finger CCHC domain-containing protein 4 [Anoplophora glabripennis]
Cluster-2724.19728	rna-XM_023168364.1	1.14417	DNA..RNA-binding protein KIN17 [Anoplophora glabripennis]
Cluster-2724.7533	rna-XM_023167827.1	1.14396	uncharacterized protein LOC111511807 [Leptinotarsa decemlineata]
Cluster-2724.6156	rna-XM_023165162.1	1.13637	trafficking protein particle complex subunit 6B [Anoplophora glabripennis]
Cluster-2724.11583	rna-XM_023169201.1	1.09581	26S proteasome non-ATPase regulatory subunit 12 [Anoplophora glabripennis]
Cluster-2724.2029	rna-XM_023168612.1	1.09568	transient receptor potential channel pyrexia-like isoform X1 [Leptinotarsa decemlineata]
Cluster-2724.2735	rna-XM_023158705.1	1.08433	protein PRRC1 [Anoplophora glabripennis]
Cluster-2724.8588	rna-XM_023168706.1	1.08067	probable phospholipid hydroperoxide glutathione peroxidase [Leptinotarsa decemlineata]
Cluster-2724.17642	rna-XM_023174187.1	1.07675	26S proteasome non-ATPase regulatory subunit 13 [Leptinotarsa decemlineata]
Cluster-2724.6906	rna-XM_023167847.1	1.07344	regulator complex protein LAMTOR4 homolog [Anoplophora glabripennis]
Cluster-2724.9880	rna-XM_023156878.1	1.06693	SWI..SNF-related matrix-associated actin-dependent regulator of chromatin subfamily B member 1 [Anoplophora glabripennis]
Cluster-2724.5990	rna-XM_023161016.1	1.06682	mitochondrial import receptor subunit TOM22 homolog [Anoplophora glabripennis]
Cluster-2724.12324	rna-XM_023159072.1	1.06484	5'-3' exoribonuclease 2 homolog [Anoplophora glabripennis]
Cluster-2724.9784	rna-XM_023163758.1	1.06456	probable peptidyl-tRNA hydrolase 2 [Anoplophora glabripennis]
Cluster-2724.8564	rna-XM_023169323.1	1.06119	golgin subfamily A member 7 [Leptinotarsa decemlineata]
Cluster-2724.18993	rna-XM_023163520.1	1.05185	uncharacterized protein LOC111508101 isoform X1 [Leptinotarsa decemlineata]
Cluster-2724.3964	rna-XM_023160252.1	1.0497	argininosuccinate lyase [Anoplophora glabripennis]
Cluster-2724.13509	rna-XM_023156704.1	1.04818	UDP-glucuronosyltransferase 2B15 [Anoplophora glabripennis]
Cluster-2724.16264	rna-XM_023162708.1	1.04651	LOW QUALITY PROTEIN: selenoprotein F [Anoplophora glabripennis]
Cluster-2724.8063	rna-XM_023162057.1	1.04607	nucleolar complex protein 2 homolog [Anoplophora glabripennis]
Cluster-2724.15826	rna-XM_023164542.1	1.03893	enhancer of split mbeta protein-like [Anoplophora glabripennis]
Cluster-2724.7520	rna-XM_023156778.1	1.03882	Protein couch potato-like Protein [Tribolium castaneum]
Cluster-2724.11785	rna-XM_023168031.1	1.03666	translationally-controlled tumor protein homolog [Leptinotarsa decemlineata]
Cluster-2724.7271	rna-XM_023173705.1	1.03623	Cytochrome b5-like Protein [Tribolium castaneum]
Cluster-2724.7274	rna-XM_023173847.1	1.03181	leucine-rich repeat protein SHOC-2 isoform X1 [Anoplophora glabripennis]
Cluster-2724.10504	rna-XM_023168801.1	1.02782	60S ribosomal protein L29 [Anoplophora glabripennis]
Cluster-2724.8398	rna-XM_023164356.1	1.02736	28S ribosomal protein S9, mitochondrial [Leptinotarsa decemlineata]
Cluster-2724.4720	rna-XM_023160351.1	1.02032	probable RNA-binding protein 18 [Anoplophora glabripennis]
Cluster-2724.8044	rna-XM_023169701.1	1.01858	solute carrier family 15 member 1 [Anoplophora glabripennis]

Cluster-2724.10849	rna-XM_023172726.1	1.01646	V-type proton ATPase subunit E [Leptinotarsa decemlineata]
Cluster-2724.9463	rna-XM_023160460.1	1.01544	WD repeat-containing and planar cell polarity effector protein fritz [Anoplophora glabripennis]
Cluster-2724.17243	rna-XM_023173708.1	1.01382	WD repeat-containing protein 5 [Anoplophora glabripennis]
Cluster-2724.17379	rna-XM_023172260.1	1.01331	charged multivesicular body protein 2b-B [Anoplophora glabripennis]
Cluster-2724.11547	rna-XM_023166664.1	1.0108	sperm-associated antigen 7 [Anoplophora glabripennis]
Cluster-2724.5878	rna-XM_023160638.1	1.0072	AN1-type zinc finger protein 1-like [Leptinotarsa decemlineata]
Cluster-2724.12953	rna-XM_023173478.1	1.00498	asparagine synthetase [glutamine-hydrolyzing] [Anoplophora glabripennis]
