

**Table S1.** List of *Thermotogales* genes related to glycolytic pathways.

Data have been exported from Ensembl Bacteria database.

Legends: T\_nea = *Thermotoga neapolitana*; T\_mar = *Thermotoga maritima*; T\_napt = *Thermotoga naphthophila*; T\_pet = *Thermotoga petrophila*; T\_RQ7 = *Thermotoga RQ7*; PT\_therm = *Pseudotherrmotoga thermophila*; PT\_let = *Pseudotherrmotoga lettingae*; PT\_hyp = *Pseudotherrmotoga hypogea*; ED = Entner Doudoroff; EMP = Embden-Meyerhof-Parnas; OPP = Oxidative pentose phosphate; GL = Glycerolipids; SL = Sphingolipid.

Enzyme descriptions	Function	T_nea	T_mar	T_napt	T_pet	T_RQ7	PT_therm	PT_let	PT_Hyp
Uronate isomerase	Alternative flux to ED	CTN_RS03150	TM_0064	Tnap_0694	Tpet_0860	TRQ7_04655	Theth_0974	Tlet_1289	AJ81_09875
Fructokinase	Alternative flux to Glycolysis	CTN_RS01910	TM_0296	Tnap_0934	Tpet_0616	TRQ7_03345	no hit	no hit	no hit
Sugar kinase, FGGY family	Alternative flux to Glycolysis	CTN_RS02885	TM_0116	Tnap_0746	Tpet_0808	TRQ7_04390	no hit	Tlet_0361	AJ81_08065
Xylose isomerase	Alternative flux to Glycolysis	CTN_RS03555	TM_1667	Tnap_1139	Tpet_1124	TRQ7_05035	Theth_0156	no hit	no hit
Mannose-1-phosphate guanylyltransferase	Alternative flux to Glycolysis	CTN_RS07660	TM_1033	Tnap_1731	Tpet_1717	TRQ7_09155	Theth_1470	no hit	no hit
Phosphomannomutase	Alternative flux to Glycolysis	CTN_RS09015	TM_0769	Tnap_0567	Tpet_0159	TRQ7_00800	Theth_1507	Tlet_0937	AJ81_02140
Mannose-6-phosphate isomerase	Alternative flux to Glycolysis	CTN_RS09200	TM_0736	Tnap_0534	Tpet_0193	TRQ7_00980	Theth_1059	Tlet_0682	no hit
KDGP aldolase	ED	CTN_RS03140	TM_0066	Tnap_0696	Tpet_0858	TRQ7_04645	Theth_0690	no hit	no hit
6-Phosphogluconate dehydratase	ED	CTN_RS00550	TM_0551	Tnap_0331	Tpet_0369	TRQ7_02055	Theth_0197	no hit	no hit
Galactosyltransferase-related protein	Galactose metabolism	CTN_1824	TM_0756	Tnap_0554	Tpet_0172	TRQ7_00870	no hit	Tlet_0254	AJ81_09525
Galactosyltransferase-related protein	Galactose metabolism	CTN_1825	no hit	no hit	no hit	no hit	no hit	no hit	no hit
Fructose-bisphosphate aldolase	EMP	CTN_RS01890	no hit	Tnap_0944	no hit	TRQ7_03325	no hit	no hit	no hit
Aldose 1-epimerase	EMP	CTN_RS01980	TM_0282	Tnap_0912	Tpet_0630	TRQ7_03430	Theth_0155	no hit	no hit
6-phosphofructokinase	EMP	CTN_RS02345	TM_0209	Tnap_0839	Tpet_0715	TRQ7_03850	Theth_1881	Tlet_196	AJ81_03340
PfkB domain protein	EMP	CTN_RS03135	TM_0067	Tnap_0697	Tpet_0857	TRQ7_04640	Theth_1108	Tlet_1863	AJ81_10650
phosphoglycerate mutase	EMP	CTN_RS04760	TM_1774	Tnap_1040	Tpet_1062	TRQ7_06255	Theth_1289	Tlet_0278	AJ81_06730
Glucokinase	EMP	CTN_RS05065	TM_1469	Tnap_1340	Tpet_1323	TRQ7_06560	Theth_0713	Tlet_0610	AJ81_00855
Glucose-6-phosphate isomerase	EMP	CTN_RS06015	TM_1385	Tnap_1418	Tpet_1398	TRQ7_07525	Theth_0337	Tlet_1660	AJ81_05140
Phosphoglycerate mutase	EMP	CTN_RS06075	TM_1374	Tnap_1429	Tpet_1409	TRQ7_07585	no hit	no hit	no hit
PfkB domain protein	EMP	CTN_RS08725	TM_0828	Tnap_0099	Tpet_0099	TRQ7_00500	no hit	Tlet_1061	no hit
Sugar kinase, pfkB family	EMP	CTN_RS08895	TM_0795	Tnap_0134	Tpet_0133	TRQ7_00675	no hit	Tlet_0330	no hit
Bifunctional PGK/TIM	EMP	CTN_RS09440	TM_0689	Tnap_0486	Tpet_0241	tpiA	Theth_0581	Tlet_0996	tpiA
Bifunctional PGK/TIM	EMP	CTN_RS09445	TM_0689	Tnap_0485	Tpet_0242	pgk	Theth_0582	Tlet_0997	pgk
Glucose-6-phosphate isomerase	EMP	CTN_RS01845	no hit	no hit	no hit	no hit	no hit	Tlet_0193	no hit
L-arabinose isomerase	L-arabinose metabolism	CTN_RS02010	TM_0276	Tnap_0906	Tpet_0648	TRQ7_03515	Theth_1129	no hit	no hit
UDP-glucose 4-epimerase	Leloir Pathway - galactose metabolism	CTN_RS00775	TM_0509	Tnap_0289	Tpet_0413	TRQ7_02280	Theth_0127	Tlet_1082	AJ81_01250
Galactose-1-phosphate uridylyltransferase	Leloir Pathway - galactose metabolism	CTN_RS06920	TM_1191	Tnap_1580	Tpet_1561	TRQ7_08370	Theth_1357	Tlet_1103	AJ81_08655

Galactokinase	Leloir Pathway - galactose metabolism	CTN_RS06925	TM_1190	Tnap_1581	Tpet_1562	TRQ7_08375	Theth_1358	Tlet_1104	AJ81_08650
Galactose-1-phosphate uridylyltransferase	Leloir Pathway - galactose metabolism	CTN_RS08380	TM_0896	Tnap_0031	Tpet_0031	TRQ7_00155	Theth_1918	Tlet_1398	AJ81_04540
Phosphopentomutase	OPP	CTN_RS02625	TM_0167	Tnap_0797	Tpet_0758	TRQ7_04125	Theth_1262	Tlet_1089	AJ81_01695
6-phosphogluconate dehydrogenase	OPP	CTN_RS01150	TM_0438	Tnap_0220	Tpet_0482	TRQ7_02665	Theth_1114	Tlet_0874	AJ81_08290
Ribulose-phosphate 3-epimerase	OPP	CTN_RS04470	TM_1718	Tnap_1088	Tpet_1014	TRQ7_05965	Theth_1779	Tlet_1855	AJ81_04160
Ribose-5-phosphate isomerase	OPP	CTN_RS07445	TM_1080	Tnap_1687	Tpet_1664	TRQ7_08905	Theth_0182	Tlet_0343	AJ81_02730
transketolase, N-terminal subunit	OPP	CTN_RS08085	no hit	no hit	no hit	TRQ7_06195	Theth_0768	Tlet_1329	AJ81_09105
transketolase, C-terminal subunit	OPP	CTN_RS08090	no hit	no hit	no hit	no hit	no hit	Tlet_1330	AJ81_09100
Glucose-6-phosphate 1-dehydrogenase	OPP/ED	CTN_RS07110	TM_1155	Tnap_1615	Tpet_1595	TRQ7_08560	no hit	no hit	no hit
6-phosphogluconolactonase	OPP/ED	CTN_RS07115	TM_1154	Tnap_1616	Tpet_1596	TRQ7_08565	Theth_1366	no hit	no hit
rhamnulokinase	Rhamnose metabolism	CTN_RS07480	TM_1073	Tnap_1694	Tpet_1671	TRQ7_08945	no hit	no hit	no hit
rhamnulose-1-phosphate aldolase	Rhamnose metabolism	CTN_RS07485	TM_1072	Tnap_1695	Tpet_1672	TRQ7_08950	no hit	no hit	no hit
L-rhamnose isomerase	Rhamnose metabolism	CTN_RS07490	TM_1071	Tnap_1696	Tpet_1673	TRQ7_08955	no hit	no hit	no hit
Xylose isomerase protein	Rhamnose metabolism	CTN_RS01245	TM_0416	Tnap_0208	Tpet_0504	TRQ7_02765	Theth_1096	no hit	AJ81_08265
Xylose isomerase protein	Rhamnose metabolism	CTN_RS08925	TM_0789	Tnap_0141	Tpet_0140	TRQ7_00705	Theth_1372	Tlet_1752	no hit
Sugar kinase, FGGY family	Ribulose metabolism	CTN_RS01970	TM_0284	Tnap_0916	Tpet_0628	TRQ7_03405	Theth_1115	Tlet_1150	AJ81_03675
L-ribulose-5-phosphate 4-epimerase	Ribulose metabolism	CTN_RS01975	TM_0283	Tnap_0915	Tpet_0629	TRQ7_03410	Theth_1119	Tlet_1139	AJ81_03685

**Table S2.** List of *Thermotogales* genes related to organic catabolism.

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Legends: T\_nea = *Thermotoga neapolitana*; T\_mar = *Thermotoga maritima*; T\_napt = *Thermotoga naphthophila*; T\_pet = *Thermotoga petrophila*; T\_RQ7 = *Thermotoga RQ7*; PT\_therm = *Pseudothermotoga thermophila*; PT\_let = *Pseudothermotoga lettingae*; PT\_hyp = *Pseudothermotoga hypogea*; ED = Entner Doudoroff; OPP = Oxidative pentose phosphate; GL = Glycerolipids; SL = Sphingolipid.

Enzyme descriptions	Function	T_nea	T_mar	T_napt	T_pet	T_RQ7	PT_therm	PT_let	PT_Hyp
Beta-glucosidase	Cellulose degradation	CTN_RS03345	TM_0025	Tnap_0656	Tpet_0898	TRQ7_04830	Theth_1706	Tlet_1036	AJ81_10125
Beta-glucosidase A	Cellulose degradation	CTN_RS03850	no hit	Tnap_0602	Tpet_0952	TRQ7_05335	no hit	no hit	no hit
Endoglucanase	Cellulose degradation	CTN_RS07580	TM_1050	Tnap_1715	Tpet_1701	TRQ7_09075	Theth_0081	Tlet_1475	AJ81_08450
Endoglucanase	Cellulose degradation	CTN_RS07585	TM_1049	Tnap_1716	Tpet_1702	TRQ7_09080	Theth_0080	Tlet_1476	AJ81_08455
Endoglucanase	Cellulose degradation	CTN_RS07590	TM_1048	Tnap_1717	Tpet_1703	TRQ7_09085	Theth_0079	Tlet_1477	AJ81_08460
Glycosidase	Complex sugar metabolism	CTN_RS03875	TM_1852	Tnap_0607	Tpet_0947	TRQ7_05360	Theth_1559	Tlet_1029	AJ81_05985
Glycosidase	Complex sugar metabolism	CTN_RS06735	TM_1225	Tnap_1567	Tpet_1543	TRQ7_08205	Theth_1559	Tlet_1437	AJ81_07270
Beta-glucuronidase	Complex sugar metabolism	CTN_RS07520	TM_1062	Tnap_1703	Tpet_0490	TRQ7_09015	no hit	no hit	no hit
Glycosidase	Complex sugar metabolism	CTN_RS08960	TM_0782	Tnap_0147	Tpet_0146	TRQ7_00745	no hit	no hit	no hit
Lipase	Fatty acid metabolism	CTN_RS06200	TM_1350	Tnap_1453	Tpet_1433	TRQ7_07710	no hit	Tlet_0745	no hit
Glycoside hydrolase, family 4	Galactose, GL and SL metabolism	CTN_RS09115	TM_0752	Tnap_0550	Tpet_0177	TRQ7_00895	Theth_0146	Tlet_1131	AJ81_07280
Alpha-galactosidase	Glycoproteins and GL metabolism	CTN_RS06915	TM_1192	Tnap_1579	Tpet_1560	TRQ7_08365	no hit	Tlet_1443	AJ81_07275
Beta-N-acetylglucosaminidase CbsA	Glycosaminoglycan degradation	CTN_1768	no hit	no hit	no hit	TRQ7_00605	no hit	no hit	no hit
Beta-N-acetylglucosaminidase CbsA	Glycosaminoglycan degradation	CTN_1769	TM_0809	Tnap_0120	Tpet_0119	TRQ7_00605	no hit	no hit	AJ81_05230

Arabinogalactan endo $\beta$ -1,4- galactosidase	L-Arabinogalactan metabolism	CTN_RS06855	TM_1201	no hit	Tpet_1555	TRQ7_08325	no hit	Tlet_0913	AJ81_06985
Alpha-L-arabinofuranosidase	L-arabinosides metabolism	CTN_RS01985	TM_0281	Tnap_0911	Tpet_0631	TRQ7_03435	Theth_1120	Tlet_1148	AJ81_03690
Laminarinase	Laminarin metabolism	CTN_RS03350	TM_0024	Tnap_0655	Tpet_0899	TRQ7_04835	Theth_1707	no hit	AJ81_10130
Beta-mannanase	Mannans metabolism	CTN_RS03085	TM_0076	Tnap_0706	Tpet_0848	TRQ7_04590	Theth_0138	Tlet_0355	AJ81_08050
Mannonate dehydratase	Mannans metabolism	CTN_RS03125	TM_0069	Tnap_0699	Tpet_0855	TRQ7_04630	Theth_0144	no hit	AJ81_02520
D-mannonate oxidoreductase	Mannans metabolism	CTN_RS03130	TM_0068	Tnap_0698	Tpet_0856	TRQ7_04635	Theth_0145	no hit	no hit
Alpha-mannosidase	Mannans metabolism	CTN_RS03870	TM_1851	Tnap_0606	Tpet_0948	TRQ7_05355	Theth_1470	Tlet_0117	no hit
Beta-mannosidase Man2	Mannans metabolism	CTN_RS04100	TM_1624	Tnap_1182	Tpet_1167	TRQ7_05590	no hit	no hit	AJ81_04960
Alpha-mannosidase-related protein	Mannose metabolism	CTN_RS06710	no hit	Tnap_1561	Tpet_1538	TRQ7_08180	no hit	no hit	no hit
Beta-mannosidase	Mannosides metabolism	CTN_RS06730	TM_1227	Tnap_1565	Tpet_1542	TRQ7_08200	no hit	no hit	no hit
Alpha-L-fucosidase	Metabolism of glycan structures	CTN_RS01885	TM_0306	no hit	Tpet_0611	TRQ7_03320	no hit	no hit	no hit
Alpha-xylosidase	Metabolism of xyloglucosaccharide	CTN_RS01875	TM_0308	Tnap_0947	Tpet_0609	TRQ7_03310	no hit	no hit	no hit
L-fucose isomerase	Metabolism of xyloglucosaccharide	CTN_RS01880	TM_0307	Tnap_0946	Tpet_0610	TRQ7_03315	no hit	Tlet_0019	AJ81_05845
Alpha-glucuronidase	S-glycosil metabolism	CTN_RS03195	TM_0055	Tnap_0685	Tpet_0869	TRQ7_04695	Theth_0154	no hit	AJ81_08105
Alpha-amylase	Starch and glycogen metabolism	CTN_RS03640	TM_1650	Tnap_1156	Tpet_1141	TRQ7_05120	no hit	no hit	no hit
Alpha-amylase	Starch and glycogen metabolism	CTN_RS03775	TM_1840	Tnap_0587	Tpet_0965	TRQ7_05260	Theth_1308	Tlet_1230	AJ81_08690
Alpha amylase, catalytic region precursor	Starch and glycogen metabolism	CTN_RS03845	no hit	Tnap_0601	Tpet_0953	TRQ7_05330	no hit	no hit	no hit
Alpha-glucosidase	Starch and malto-oligosaccharides	CTN_RS07505	TM_1068	Tnap_0550	Tpet_1676	TRQ7_08980	Theth_1600	Tlet_1131	AJ81_07280
Alpha-glucosidase	Starch and malto-oligosaccharides	CTN_RS07740	no hit	no hit	no hit	no hit	Theth_1760	no hit	AJ81_05200
Maltodextrin glycosyltransferase	starch and malto-oligosaccharides	CTN_RS09025	TM_0767	Tnap_0565	Tpet_0161	TRQ7_00810	Theth_0516	Tlet_0880	AJ81_09420
Glucose-1-phosphate adenylyltransferase	Starch and Sucrose metabolism	CTN_RS02190	TM_0240	Tnap_0869	Tpet_0684	TRQ7_03695	Theth_1285	Tlet_0282	AJ81_06750
Glucose-1-phosphate adenylyltransferase	Starch and Sucrose metabolism	CTN_RS02195	TM_0239	Tnap_0869	Tpet_0685	TRQ7_03700	Theth_1286	Tlet_0281	AJ81_06745
Alpha-glucosidase	Starch and Sucrose metabolism	CTN_RS03750	TM_1834	Tnap_0577	Tpet_0970	TRQ7_05235	Theth_1439	Tlet_1387	AJ81_02400
Cellobiose-phosphorylase	Starch and Sucrose metabolism	CTN_RS03855	TM_1848	Tnap_0603	Tpet_0951	TRQ7_05340	no hit	no hit	no hit
Glycoside hydrolase family 57	Starch and Sucrose metabolism	CTN_1055	no hit	Tnap_1374	Tpet_1356	TRQ7_06730	Theth_1823	Tlet_1778	no hit
Glycoside hydrolase family 57	Starch and Sucrose metabolism	CTN_1056	no hit	Tnap_1374	Tpet_1356	TRQ7_06730	Theth_1823	Tlet_1778	AJ81_03035
Beta-fructosidase	Starch and Sucrose metabolism	CTN_RS05350	TM_1414	Tnap_1397	Tpet_1379	TRQ7_06855	no hit	no hit	no hit
6-phospho-beta-glucosidase bglT	Starch and Sucrose metabolism	CTN_RS06460	TM_1281	Tnap_1513	Tpet_1490	TRQ7_07930	Theth_0444	Tlet_0045	AJ81_01665
Amidohydrolase	Starch metabolism	CTN_RS08180	TM_0936	Tnap_1808	Tpet_1806	TRQ7_09565	Theth_0559	Tlet_0938	AJ81_02135
Glycosyl transferase, group 1	Transferring of saccharide moieties	CTN_RS00140	no hit	no hit	no hit	no hit	no hit	no hit	no hit
Glycosyl transferase, family 2	Transferring of saccharide moieties	CTN_RS00150	no hit	no hit	no hit	no hit	no hit	no hit	no hit
Glycosyl transferase group 1	Transferring of saccharide moieties	CTN_RS00190	TM_0619	Tnap_0409	Tpet_0307	TRQ7_01666	Theth_1609	Tlet_1182	no hit
Glycosyl transferase, group 1	Transferring of saccharide moieties	CTN_RS06715	TM_1230	Tnap_1562	Tpet_1539	TRQ7_08185	Theth_1628	Tlet_0082	AJ81_05910
Glycosyl transferase family 2	Transferring of saccharide moieties	CTN_RS06720	TM_1229	Tnap_1563	Tpet_1540	TRQ7_08190	Theth_1626	Tlet_0084	AJ81_05920
Glycoside hydrolase family 2,	Transferring of saccharide moieties	CTN_RS07475	TM_1074	Tnap_1693	Tpet_1670	TRQ7_08940	no hit	no hit	no hit
Glycosyl transferase family 2	Transferring of saccharide moieties	CTN_RS09090	TM_0757	Tnap_0555	Tpet_0171	TRQ7_00865	Theth_1345	Tlet_0258	AJ81_06250

UDP-Gal/UDP-GlcNAc glycosyltransferase	Transferring of saccharide moieties	CTN_RS09635	no hit	no hit	no hit	TRQ7_01420	no hit	no hit	no hit
Acetyl xylan esterase	xylans and xylo-oligosaccharides	CTN_RS03080	TM_0077	Tnap_0707	Tpet_0847	TRQ7_04585	no hit	Tlet_0356	AJ81_08055
Endo-1,3-beta-xylanase	xylans and xylo-oligosaccharides	CTN_RS03090	no hit	no hit	no hit	no hit	no hit	no hit	no hit
Endo-1,4-beta-xylanase B precursor	xylans and xylo-oligosaccharides	CTN_RS03120	TM_0070	Tnap_0700	Tpet_0854	TRQ7_04625	Theth_1635	no hit	AJ81_08020
Endo-1,4-beta-xylanase A precursor	xylans and xylo-oligosaccharides	CTN_RS03160	TM_0061	Tnap_0691	Tpet_0863	TRQ7_07985	Theth_1636	no hit	AJ81_08020
Endo-1,4-beta-glucanase A	xylans and xylo-oligosaccharides	CTN_RS05505	TM_1524	Tnap_1285	Tpet_1268	TRQ7_07005	no hit	no hit	no hit
Endo-1,4-beta-glucanase B	xylans and xylo-oligosaccharides	CTN_RS05510	TM_1525	Tnap_1284	Tpet_1267	TRQ7_07010	no hit	no hit	no hit
Beta-galactosidase	Glucan metabolism	CTN_RS06900	TM_1195	Tnap_1577	Tpet_1557	TRQ7_08350	no hit	no hit	AJ81_09820
Beta-galactosidase	Glucan metabolism	CTN_1381	TM_1193	Tnap_1578	Tpet_1559	TRQ7_08360	Theth_1637	Tlet_0915	no hit
Beta-galactosidase	Glucan metabolism	CTN_1382	TM_1193	Tnap_1578	Tpet_1559	TRQ7_08360	Theth_1637	Tlet_0915	no hit