Table S1. Collection information and hindgut diversity for cockroaches and termites used in this study. The diploid number of chromosomes (2n) is provided for populations of the *C. punctulatus* species complex. Genbank accession numbers are provided for the mitochondrial 16S rRNA gene sequences obtained from each insect. The number of described parabasalid species is based on previously published information. Sequencing, OTU, and diversity information are listed for the parabasalid (above) and bacterial (below) communities for each insect.

Species	Family	Collection Location	Genbank accession	Number of described parabasalid species	Number of reads	Number of OTUs	Shannon-Wiener diversity index	Pielou's evenness index
Cryptocercus punctulatus MC[a]	Cryptocercidae	Mt. Collins, NC, USA (2n=45)	KJ438360	19[f]	3013	15	1.58	0.58
					4788	201	3.52	0.66
Cryptocercus punctulatus ML[a]	Cryptocercidae	Mountain Lake, VA, USA (2n=43)	KJ438361	19[f]	5627	17	0.94	0.33
					4065	142	2.36	0.48
Cryptocercus punctulatus SC[a]	Cryptocercidae	South Mountains, NC, USA (2n=43)	KJ438362	19[f]	5958	27	1.73	0.53
					3137	153	2.91	0.58
Calcaritermes nearcticus[b]	Kalotermitidae	Florida, USA	KJ438364	5[f,g]	1124	8	1.72	0.83
					1685	56	1.84	0.46
Calcaritermes nigriceps[b]	Kalotermitidae	Colombia	KJ438363	4[f,g]	916	7	1.34	0.69
					9378	194	4.07	0.77
Cryptotermes sp.[b]	Kalotermitidae	Paraguay	KJ438365	0	2182	11	1.25	0.52
					7399	105	2.54	0.55
Incisitermes banksi[b]	Kalotermitidae	Texas, USA	KJ438366	2[f,h]	1921	2	0.08	0.12

					2394	56	2.11	0.52
Incisitermes immigrans[c]	Kalotermitidae	Hawaii, USA	JX679413	3[f]	3305	5	0.36	0.22
					1619	52	2.88	0.73
Incisitermes minor[b]	Kalotermitidae	Texas, USA	JX847583	4[f]	1157	11	1.13	0.47
					2732	80	3.34	0.76
Incisitermes schwarzi[b]	Kalotermitidae	Colombia	JX679414	1[f]	1964	2	0.02	0.03
					17086	200	4.03	0.76
Kalotermes approximatus[b]	Kalotermitidae	Florida, USA	KJ438367	0	1370	5	1.34	0.83
					1286	33	1.82	0.52
Neotermes connexus[c]	Kalotermitidae	Hawaii, USA	KJ438368	8[f]	1526	7	1.01	0.52
					1368	43	2.42	0.64
Neotermes holmgreni[b]	Kalotermitidae	Colombia	KJ438369	6[f,i]	1572	6	1.20	0.67
					16032	227	4.17	0.77
Neotermes jouteli[b]	Kalotermitidae	Florida, USA	KJ438370	4[f,j]	7408	4	0.89	0.65
					1382	36	2.33	0.65
Paraneotermes simplicicornis[b]	Kalotermitidae	Texas, USA	KJ438371	9[f]	1790	10	1.64	0.71
					1639	87	3.83	0.86
Tauritermes sp.[b]	Kalotermitidae	Paraguay	KJ438372	0	6123	9	0.77	0.35
					7597	161	3.95	0.78

Porotermes adamsoni[c]	Stolotermitidae	Australia	KJ438373	8[f]	8776	14	1.91	0.73
					3547	18	0.81	0.28
Zootermopsis angusticollis Cortes[c]	Archotermopsidae	Cortes Island, BC, Canada	KJ438375	9[f,k]	5246	12	1.47	0.59
					3759	70	2.17	0.51
Zootermopsis angusticollis PSP[d]	Archotermopsidae	Pacific Spirit Park, Vancouver, BC, Canada	KJ438374	9[f,k]	7246	14	1.76	0.67
					3640	72	2.09	0.49
Reticulitermes flavipes[e]	Rhinotermitidae	Iowa, USA	KC494361	11[f,l]	1218	4	0.50	0.36
					2398	105	3.66	0.79
Reticulitermes hesperus[c]	Rhinotermitidae	Galiano Island, BC, Canada	KJ438376	5[f]	4006	6	0.82	0.46
					3387	137	3.95	0.80
Reticulitermes okanaganensis[c]	Rhinotermitidae	California, USA	KJ438377	0	361	4	1.04	0.75
					1339	63	3.14	0.76
Reticulitermes virginicus[b]	Rhinotermitidae	Florida, USA	JX975354	3[f,m]	3169	9	1.03	0.47
					2378	125	3.78	0.78
Coptotermes testaceus[b]	Rhinotermitidae	Colombia	HQ683707	1[n]	334	5	1.19	0.74
					2067	13	0.33	0.13
Coptotermes sp.[c]	Rhinotermitidae	Australia	KJ438378	0	3052	9	1.46	0.67
					11274	63	0.72	0.17
Heterotermes tenuis[b]	Rhinotermitidae	Colombia	HQ683708	6[f]	1124	7	1.33	0.68

					1768	26	0.99	0.31
Prorhinotermes simplex[b]	Rhinotermitidae	Florida, USA	JX975355	5[f,m]	5233	5	0.81	0.50
					3372	14	0.29	0.11

collected by [a]C. Nalepa, [b]R. H. Scheffrahn, [c]P. J. Keeling, [d]V. Tai, and [e]B. Stay.

[f]Yamin, M.A. 1979. Flagellates of the orders Trichomonadida Kirby, Oxymonadida Grassé, and Hypermastigida Grassi and Foà reported from lower termites (Isoptera Families Mastotermitidae, Kalotermitidae, Hodotermitidae, Termopsidae, Rhinotermitidae, and Serritermitidae) and from the wood-feeding roach *Cryptocercus* (Dictyoptera, Cryptocercidae). *Sociobiology*. 4:3–119.

[g]Gile, G.H. et al. 2011. Molecular and morphological analysis of the family Calonymphidae with a description of *Calonympha chia* sp. nov., *Snyderella kirbyi* sp. nov., *Snyderella swezyae* sp. nov. and *Snyderella yamini* sp. nov. *Int J Syst Evol Micr*. 61:2547-2558.

[h]Harper, J.T. et al. 2009. The inadequacy of morphology for species and genus delineation in microbial eukaryotes: an example from the parabasalian termite symbiont *Coronympha*. *PLoS ONE*. 4:e6577

[i]Dolan, M.F. and Kirby, H. 2002. *Gyronympha*, *Prosnyderella* and *Criconympha*, three new genera of calonymphids (Parabasalia: Trichomonadida) from wood-eating termites. *Europ. J. Protistol*. 38:73-81.

[j]Gile, G.H. et al. 2013. Morphology and molecular phylogeny of *Staurojoenina mulleri* sp. nov. (Trichonymphida, Parabasalia) from the hindgut of the kalotermitid *Neotermes jouteli*. *J Euk Microbiol*. 60:203-213.

[k]Tai, V. et al. 2013. Single-cell DNA barcoding using sequences from the small subunit rRNA and internal transcribed spacer region identifies new species of *Trichonympha* and *Trichomitopsis* from the hindgut of the termite *Zootermopsis angusticollis*. *PLoS ONE*. 8:e58728.

[l]Brugerolle, G. and Bordereau, C. 2006. Immunological and ultrastructural characterization of spirotrichonymphid flagellates from *Reticulitermes grassei* and *R. flavipes* (syn. *R. santonensis*), with special reference to *Spirotrichonympha*, *Spironympha* and *Microjoenia*. *Organisms Diversity and Evolution*. 6: 109-123.

[m]James, E. R. et al. 2013. *Cthulhu Macrofasciculumque* n. g., n. sp. and *Cthylla Microfasciculumque* n. g., n. sp., a newly identified lineage of parabasalian termite symbionts. *PLoS ONE*. 8:e58509.

[n]Saldarriaga, J.F. et al. 2011. Morphology and molecular phylogeny of *Pseudotrichonympha hertwigi* and *Pseudotrichonympha paulistana* (Trichonymphea, Parabasalia) from neotropical rhinotermitids. *J Euk Microbiol*. 58:487-496.

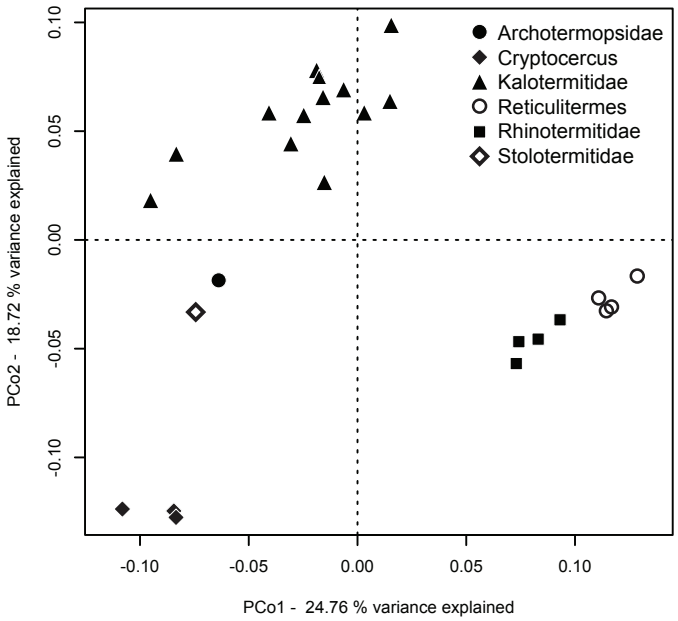

Figure S1. Principle coordinates analysis of the genetic distances between mitochondrial 16S rRNA sequences of the insects. The insects are represented by symbols based on their phylogenetic grouping: solid diamonds - Cryptocercidae, solid triangles - Kalotermitidae, open diamond - Stolotermitidae, solid circles - Archotermopsidae, open circles - Reticulitermes, and solid squares - Rhinotermitidae.

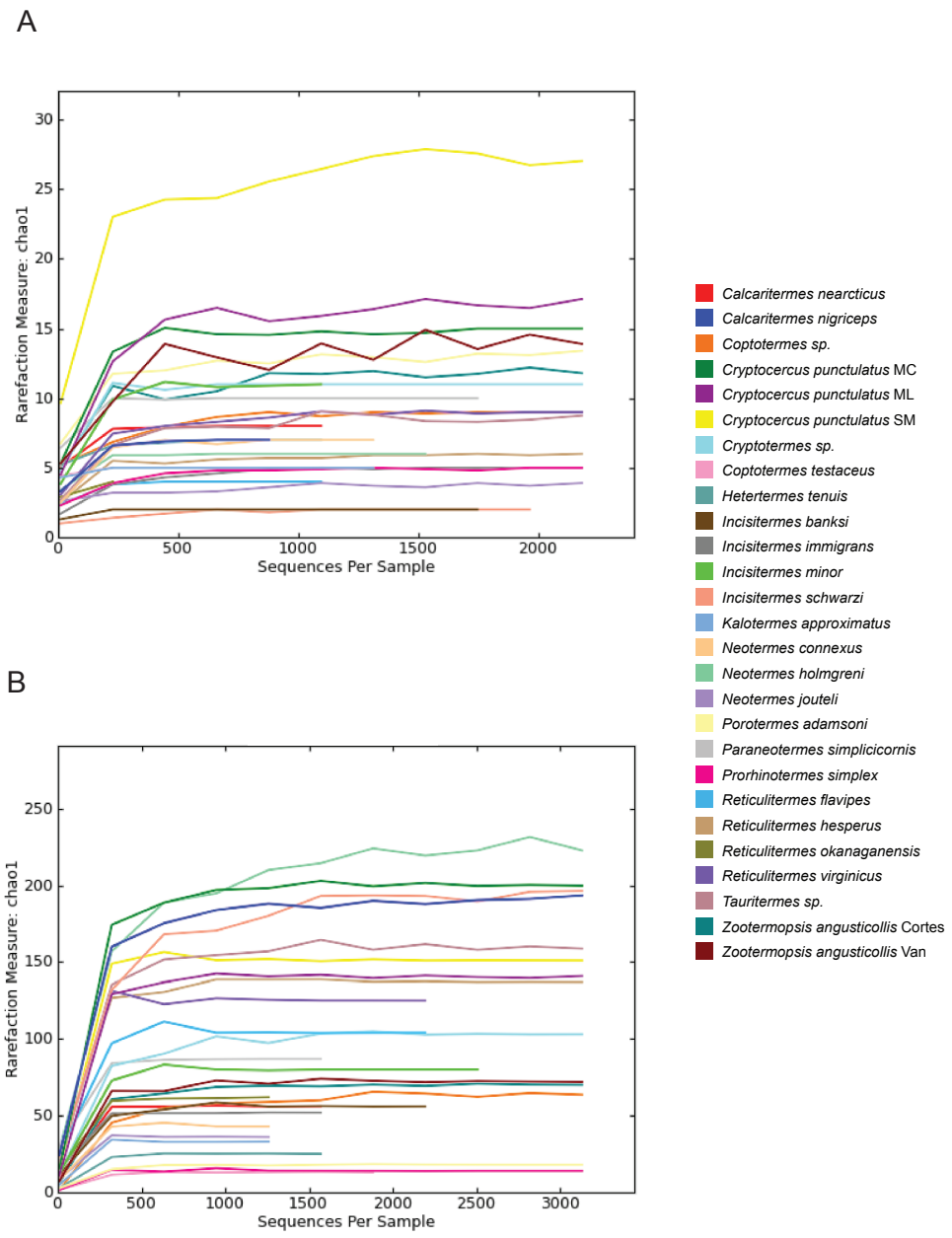

Figure S2. A) Rarefaction curves based on subsampled, normalized abundances calculated using the Chao1-estimator for parabasalid OTUs sampled from hindguts of *Cryptocercus* cockroaches and lower termites. B) Rarefaction curves for bacterial OTUs. Figure legend applies to both A and B.

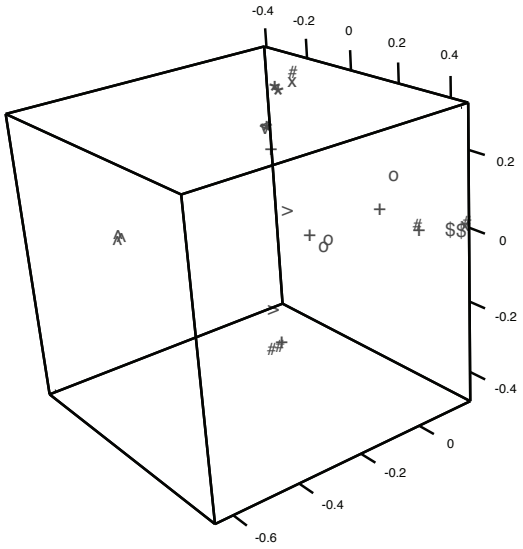

Figure S3. A) Principle coordinates analysis (PCoA) using unweighted UniFrac distances between parabasalid communities. The communities are represented by symbols based on the geographic sampling location of the host insect: > - Australia, < - California, # - Colombia, x - Hawaii, v - Iowa, + - Florida, * - PacificNW, ^ - SouthAppalachian, o - Texas, and $ - Paraguay.

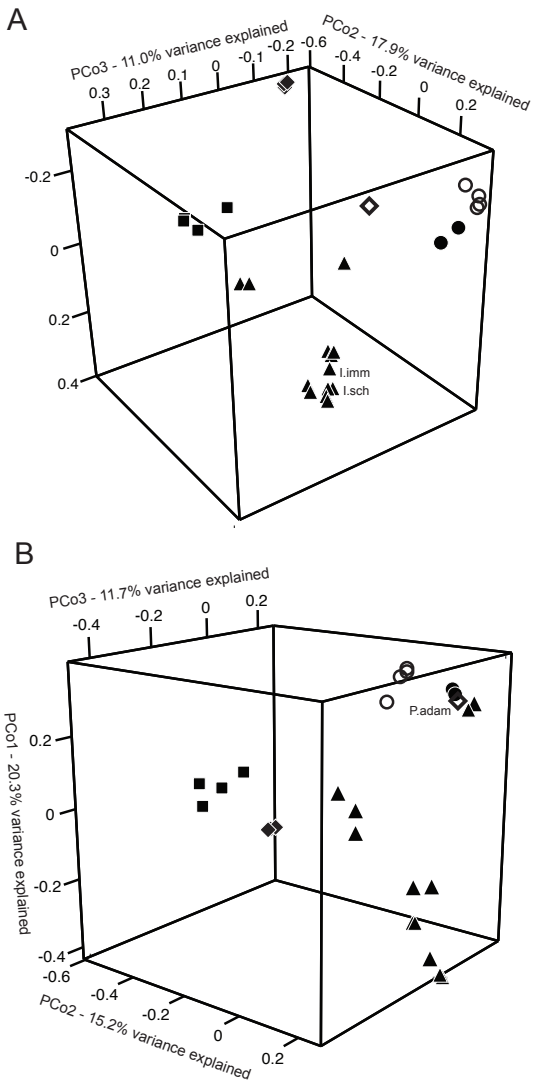

Figure S4. A) Principle coordinates analysis (PCoA) using unweighted UniFrac distances between parabasalid communities with *Trichonympha* OTUs removed from the *Incisitermes immigrans* and *Incisitermes schwarzi* hindgut communities. B) Unweighted UniFrac PCoA of the parabasalid communities with the Spirotrichonympha-like sequences removed from the *Porotermes adamsoni* community. The communities are represented by symbols based on the phylogenetic grouping of the host insect: solid diamonds - Cryptocercidae, solid triangles - Kalotermitidae, open diamond - Stolotermitidae, solid circles - Archotermopsidae, open circles - Reticulitermes, and solid squares - Rhinotermitidae.