

Supplementary Table 4. Housekeeping genes found in the MG-III bins and the CG-MG-III bins (as Naransigarao et al. 2012).

		Number of housekeeping genes found in the MG-III bins										Number of housekeeping genes found in the CG-MG-III bins								Number of housekeeping genes found in reference genomes				
		Epi1	Epi2A	Epi2B	Epi2C	Epi3	Epi4	Epi5	Epi6	Bathy1	Bathy2	Epi1	Epi2	Epi3	Epi4	Epi5	Epi6	Bathy1	Bathy2	Cayman 92	Cayman 93	Guaymas 31	Guaymas 32	
	% Completeness estimation (Raes et al. 2007)	80	54.3	57.1	5.7	48.6	34.3	2.9	51.4	54.3	68.6	85.7	80	62.9	34.3	2.9	57.1	60	68.6	71.4	34.3	91.4	94.3	
	% Completeness estimation (Albertsen et al. 2013)	35.1	16.2	18.0	4.5	19.8	15.3	3.6	15.3	23.4	18.9	34.2	30.6	24.3	16.2	4.5	21.6	26.1	21.6	21.6	15.3	33.3	37.8	
	% Completeness estimation (Naransigarao et al. 2012)	83.0	45.3	54.7	5.7	45.3	39.6	7.6	54.7	60.4	58.5	84.9	75.2	62.3	43.4	9.4	60.4	64.2	58.5	67.9	35.9	92.5	90.6	
	# of genome-species inside the bin	3.07	1.08	1.03	1.00	1.00	1.00	1.00	1.48	1.09	2.32	1.18	1.43	1	1	1	1.0385	1.14	1	1	1	1	1.86	
Ribosomal genes	16S RNA	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-	3	
	23S RNA	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-	3	
COG	COG classification																							
	COG0008	GlnS COG0008 472 Glutamyl- and glutamyl-tRNA synthetases	3	1	1	-	-	-	-	-	1	-	2	2	-	1	1	-	1	-	1	-	1	1
	COG0012	Predicted GTPase, probable translation factor	1	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	2	-	-	-	1	1
	COG0013	AlaS COG0013 879 Alanine-tRNA synthetase	1	1	-	-	1	1	-	-	2	1	1	2	1	1	-	-	1	1	-	-	1	1
	COG0016	PheS COG0016 335 Phenylalanyl-tRNA synthetase alpha subunit	3	1	-	1	1	-	-	-	1	1	1	2	1	-	-	-	1	1	1	1	1	2
	COG0018	ArgS COG0018 577 Arginyl-tRNA synthetase	2	-	-	-	1	1	1	1	1	-	2	-	1	1	1	1	1	1	-	1	1	2
	COG0024	Map COG0024 255 Methionine aminopeptidase	5	1	1	-	1	1	1	1	2	-	1	2	1	1	1	1	3	-	1	-	1	2
	COG0048	RpsL COG0048 129 Ribosomal protein S12	2	-	1	-	-	1	-	2	1	-	1	1	1	1	-	1	1	-	1	-	1	2
	COG0049	RpsG COG0049 148 Ribosomal protein S7	2	-	1	-	-	1	-	2	1	-	1	1	1	1	-	1	1	-	1	-	1	2
	COG0051	RpsJ COG0051 104 Ribosomal protein S10	1	-	1	-	-	-	-	2	1	-	1	1	1	-	-	1	1	-	1	-	1	2
	COG0060	IleS COG0060 933 Isoleucyl-tRNA synthetase	2	-	-	-	-	-	-	1	-	-	-	1	-	-	-	1	-	-	-	-	1	2
	COG0071	HspA COG0071 146 Molecular chaperone (small heat shock protein)	2	-	-	-	-	1	-	1	1	2	1	-	-	1	-	1	1	1	1	-	1	2
	COG0080	RplK COG0080 141 Ribosomal protein L11	2	1	-	-	-	1	-	1	1	-	1	2	1	1	-	1	1	1	1	-	1	2
	COG0081	RplA COG0081 228 Ribosomal protein L1	1	-	1	-	-	-	-	-	1	1	1	1	1	-	-	-	1	1	1	1	1	1
	COG0085	RpoB COG0085 1060 DNA-directed RNA polymerase, beta subunit/140 kD subunit	-	-	1	-	1	1	-	3	1	3	-	1	1	1	-	1	1	1	1	1	1	2
	COG0086	RpoC COG0086 808 DNA-directed RNA polymerase, beta subunit/160 kD subunit	-	-	1	-	1	1	-	3	1	3	-	1	1	1	-	1	1	1	1	1	1	1
	COG0087	RplC COG0087 218 Ribosomal protein L3	5	-	1	-	-	-	-	-	3	1	1	1	1	-	-	-	-	1	1	1	1	2
	COG0088	RplD COG0088 214 Ribosomal protein L4	5	-	1	-	1	-	-	-	3	1	1	1	-	-	-	-	-	1	1	1	1	2
	COG0090	RplB COG0090 275 Ribosomal protein L2	5	1	1	-	1	-	-	-	3	1	1	1	1	-	-	-	-	1	1	1	1	1
	COG0091	RplV COG0091 120 Ribosomal protein L22	5	1	1	-	1	-	-	-	3	1	1	1	-	-	-	-	-	1	1	1	1	2
	COG0092	RpsC COG0092 233 Ribosomal protein S3	5	1	1	-	1	-	-	-	3	1	1	1	1	-	-	-	-	1	1	1	1	2
	COG0093	RplN COG0093 122 Ribosomal protein L14	6	1	1	-	1	-	-	1	-	3	1	2	1	-	-	1	-	1	1	1	1	2
	COG0094	RplE COG0094 180 Ribosomal protein L5	6	1	1	-	1	-	-	1	1	3	1	2	1	-	-	1	1	1	1	1	1	2
	COG0096	RpsH COG0096 132 Ribosomal protein S8	6	1	1	-	1	-	-	1	1	3	1	2	1	-	-	1	1	1	1	1	1	2
	COG0097	RplF COG0097 178 Ribosomal protein L6P/L9E	6	1	1	-	1	-	-	1	1	3	1	2	1	-	-	1	1	1	1	1	1	2
	COG0098	RpsE COG0098 181 Ribosomal protein S5	6	1	1	-	1	-	-	1	1	3	1	2	1	-	-	1	1	1	1	1	1	2
	COG0099	RpsM COG0099 121 Ribosomal protein S13	2	-	-	-	-	1	-	-	1	2	-	-	-	1	-	-	-	1	-	-	1	2
	COG0100	RpsK COG0100 129 Ribosomal protein S11	2	-	-	-	-	1	-	-	2	2	-	-	-	1	-	-	-	1	1	1	1	2
	COG0102	RplM COG0102 148 Ribosomal protein L13	1	1	-	-	-	1	-	1	-	3	1	1	-	1	-	1	1	1	1	-	1	2
	COG0103	RplS COG0103 130 Ribosomal protein S9	1	1	-	-	-	1	-	1	-	3	1	1	-	1	-	1	1	1	1	-	1	2
	COG0124	HisS COG0124 429 Histidyl-tRNA synthetase	-	-	-	-	-	-	2	1	-	1	-	-	-	-	-	-	1	-	1	-	1	2
	COG0130	TruB COG0130 271 Pseudouridine synthase	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-	-	1	1	2
	COG0143	MetG COG0143 558 Methionyl-tRNA synthetase	2	1	1	-	-	-	-	1	-	2	1	-	1	-	-	1	-	1	1	-	1	1
	COG0164	RnhB COG0164 199 Ribonuclease HII	2	2	-	1	1	-	-	-	2	-	1	1	1	-	-	-	2	-	-	-	1	2
	COG0177	Nth COG0177 211 Predicted EndoII-related endonuclease	1	-	-	1	1	1	-	1	1	1	1	1	1	1	-	1	1	1	1	1	1	2
	COG0180	TrpS COG0180 314 Tryptophanyl-tRNA synthetase	1	-	1	-	1	1	1	1	1	-	3	1	1	1	1	1	1	1	-	1	1	1
	COG0186	RpsQ COG0186 87 Ribosomal protein S17	6	1	1	-	1	-	-	1	-	3	1	2	1	-	-	1	-	1	1	1	1	2
	COG0197	RplP COG0197 146 Ribosomal protein L16/L10E	5	2	-	-	1	1	-	-	1	-	1	1	1	1	-	-	1	-	-	-	1	2
	COG0200	RplO COG0200 152 Ribosomal protein L15	6	1	1	-	1	-	-	1	1	3	1	2	1	-	-	-	1	1	1	1	1	2
	COG0201	SecY COG0201 436 Preprotein translocase subunit SecY	5	1	1	-	-	-	-	1	1	3	1	2	1	-	-	-	1	1	1	1	1	2
	COG0250	NusG COG0250 178 Transcription antiterminator	1	1	-	-	-	1	-	1	-	-	1	2	1	1	-	1	1	-	-	-	1	2
	COG0256	RplR COG0256 125 Ribosomal protein L18	6	1	1	-	1	-	-	1	1	3	1	2	1	-	-	-	1	1	1	1	1	1
	COG0441	ThrS COG0441 589 Threonyl-tRNA synthetase	1	-	1	-	-	-	-	3	1	-	1	1	-	-	-	1	1	-	1	1	1	2
	COG0459	GroL COG0459 524 Chaperonin GroEL (HSP60 family)	1	-	-	-	1	1	-	1	1	1	2	1	1	1	-	1	2	1	1	1	2	4
	COG0468	RecA COG0468 279 RecA/RadA recombinase	4	-	2	-	1	1	1	1	1	1	1	2	1	1	1	2	1	1	1	1	1	4
	COG0480	FusA COG0480 697 Translation elongation factors (GTPases)	2	-	1	-	-	1	-	2	1	-	1	1	1	1	-	1	1	-	1	-	1	1
	COG0495	LeuS COG0495 814 Leucyl-tRNA synthetase	1	1	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	1	1	1	2
	COG0522	RpsD COG0522 205 Ribosomal protein S4 and related proteins	2	-	-	-	-	1	-	-	-	1	2	-	-	1	-	-	-	1	1	-	1	2
	COG0525	ValS COG0525 877 Valyl-tRNA synthetase	-	-	1	-	-	-	-	-	-	3	1	1	1	1	-	-	-	1	-	1	1	2
	COG0532	InfB COG0532 509 Translation initiation factor 2 (IF-2; GTPase)	1	-	1	-	-	-	-	-	1	1	1	2	1	1	1	-	1	1	-	1	1	1