

Table S1. Ubiquitous microbial taxa inhabited the mineral surfaces.

Domain	Phyla	Class	Order	Family	Genera
Archaea					
	Thaumarchaeota	Marine Group I	Incertae Sedis	Incertae Sedis	-
	Euryarchaeota	Halobacteria	-	-	-
Bacteria					
	Actinobacteria	Actinobacteria	-	-	-
	Bacteroidetes	Bacteroidia	Bacteroidales	Marinilabiaceae	Alkaliflexus
	Bacteroidetes	Bacteroidia	Bacteroidales	Porphyromonadaceae	Macellibacteroides
	Bacteroidetes	Bacteroidia	Bacteroidales	Porphyromonadaceae	Paludibacter
	Bacteroidetes	Cytophagia	Cytophagales	Cytophagaceae	Flexibacter
	Bacteroidetes	Cytophagia	Cytophagales	Cytophagaceae	Leadbetterella
	Bacteroidetes	Flavobacteria	Flavobacteriales	Flavobacteriaceae	Chryseobacterium
	Bacteroidetes	Flavobacteria	Flavobacteriales	Flavobacteriaceae	Cloacibacterium
	Bacteroidetes	Flavobacteria	Flavobacteriales	Flavobacteriaceae	Flavobacterium
	Bacteroidetes	Sphingobacteriia	Sphingobacteriales	Chitinophagaceae	Ferruginibacter
	Bacteroidetes	Sphingobacteriia	Sphingobacteriales	Chitinophagaceae	Flavisolibacter
	Bacteroidetes	Sphingobacteriia	Sphingobacteriales	Chitinophagaceae	uncultured
	Bacteroidetes	Sphingobacteriia	Sphingobacteriales	Saprospiraceae	uncultured
	Bacteroidetes	Sphingobacteriia	Sphingobacteriales	Sphingobacteriaceae	Mucilaginibacter
	Bacteroidetes	Sphingobacteriia	Sphingobacteriales	Sphingobacteriaceae	Pedobacter
	Bacteroidetes	SB 1	-	-	-
	Bacteroidetes	Vadin HA 17	-	-	-
	Bacteroidetes	WCHB 1 32	-	-	-
	Chlamydiae	Chlamydiae	Chlamydiales	Simkaniaceae	Candidatus Rhabdochlamydia
	Cyanobacteria	Cyanobacteria	SubsectionIV	FamilyII	Calothrix
	Deinococcus	Deinococci	Deinococcales	Trueperaceae	Truepera
	Thermus				
	Elusimicrobia	Elusimicrobia			
	Firmicutes	Bacilli	Bacillales	Staphylococcaceae	Staphylococcus
	Firmicutes	Bacilli	Lactobacillales	Aerococcaceae	Aerococcus
	Firmicutes	Bacilli	Lactobacillales	Lactobacillaceae	Lactobacillus
	Firmicutes	Bacilli	Lactobacillales	Streptococcaceae	Lactococcus
	Firmicutes	Bacilli	Lactobacillales	Streptococcaceae	Streptococcus
	Firmicutes	Clostridia	Clostridiales	Clostridiaceae	Clostridium
	Firmicutes	Clostridia	Clostridiales	Family XI Incertae Sedis	Anaerococcus
	Firmicutes	Clostridia	Clostridiales	Family XI Incertae Sedis	Finegoldia
	Firmicutes	Clostridia	Clostridiales	Family XIII Incertae Sedis	Mogibacterium

Firmicutes	Clostridia	Clostridiales	Ruminococcaceae	uncultured
Firmicutes	Erysipelotrichia	Erysipelotrichales	Erysipelotrichaceae	Asteroleplasma
Fusobacteria	Fusobacteriia	Fusobacteriales	Fusobacteriaceae	Fusobacterium
Fusobacteria	Fusobacteriia	Fusobacteriales	Leptotrichiaceae	uncultured
Proteobacteria	Alphaproteobacteria	Caulobacterales	Caulobacteraceae	Brevundimonas
Proteobacteria	Alphaproteobacteria	Sphingomonadales	Sphingomonadaceae	Sphingomonas
Proteobacteria	Betaproteobacteria	Burkholderiales	Alcaligenaceae	Paenalcaligenes
Proteobacteria	Betaproteobacteria	Burkholderiales	Comamonadaceae	Variovorax
Proteobacteria	Betaproteobacteria	Neisseriales	Neisseriaceae	uncultured
Proteobacteria	Epsilonproteobacteria	Campylobacteriales	Campylobacteraceae	Campylobacter
Proteobacteria	Gammaproteobacteria	Enterobacteriales	Enterobacteriaceae	Escherichia
				Shigella
Proteobacteria	Gammaproteobacteria	Legionellales	Coxiellaceae	Aquicella
Proteobacteria	Gammaproteobacteria	Legionellales	Coxiellaceae	Coxiella
Proteobacteria	Gammaproteobacteria	Pseudomonadales	Moraxellaceae	Acinetobacter
Proteobacteria	Gammaproteobacteria	Pseudomonadales	Moraxellaceae	Enhydrobacter
Proteobacteria	Gammaproteobacteria	Pseudomonadales	Moraxellaceae	Psychrobacter
Proteobacteria	Gammaproteobacteria	Pseudomonadales	Pseudomonadaceae	Pseudomonas
Proteobacteria	Gammaproteobacteria	Xanthomonadales	Nevskiaceae	Nevskia
Spirochaetae	Spirochaetes	Spirochaetales	Spirochaetaceae	Borrelia
Verrucomicrobia	Verrucomicrobiae	Verrucomicrobiales	Rubritaleaceae	Rubritalea
Verrucomicrobia	Verrucomicrobiae	Verrucomicrobiales	Verrucomicrobiaceae	Akkermansia
Verrucomicrobia	Spartobacteria	-	-	-

Fungi

Ascomycota	Pezizomycotina	-	-	-
Ascomycota	-	-	-	-
Basidiomycota	Agaricomycotina	-	-	-
Basidiomycota	uncultured	-	-	-
Chytridiomycota	Chytridiomycetes	-	-	-
Kickxellomycotina	Glomeromycota	-	-	-
oromycotina	orales	-	-	-