**SUPPLEMENTARY TABLE 1.** Taxon and collection data of plastid16S reference sequences and GenBank accession numbers (including newly generated sequences shown in **boldface**) and 16 V4 sequences of Halymeniaceae (Halymeniales) and Bonnemaisoniales. Newly generated 16 V4 OTUs are shown in red (NCBI SRA). SF=Suzanne Fredericq, DWF=Wilson Freshwater, MHH=Max H. Hommersand, JR=Jan Rueness.

 GenBank and SRA accession numbers

**Halymeniaceae**

***Corynomorpha clavata***(Harvey) J. Agardh MK244612

coll. DWF, 19.vi.94, Key Largo, FL

***Cryptonemia* sp**. (N109) MK244613

coll. SF, 9.vii.06, 27o56.429’N, 92o00.460’W, offshore LA, 64.3-73.4m,

***Cryptonemia* sp**. (N53) MK244614

coll. SF, 28.vi.06, 28o37.826’N, 89o33.280’W, offshore LA, 63m,

***Cryptonemia* sp.** (N84) MK244615

coll. SF, 6.vii.06, 27o32.249’N, 84o14.244’W, vic. Florida Middle Grounds,

73-75m

***Cryptonemia* sp**. (N55) MK244616

coll. SF, 30.vi.06, 29o26.82’N, 87o35.10’W, vic. Florida Middle Grounds,

71-81m

*Grateloupia filicina* NC037841

*Grateloupia lanceola* JM767138

*Grateloupia taiwanensis* KC894740

***Halymenia* *rosea*** M. Howe and W. R.Taylor (N93) MK244617

coll. SF, 8.vii.06, 28o05.499’N, 91o01.969’W, offshore LA, 52.6-65.9m

***Halymenia* *rosea*** M. Howe & W. R. Taylor (N40) MK244618

coll. 13.vi.05, 21o48.10’N, 91o55.50’W, Campeche Banks, Mexico, 36-46m

16S V4 OTU 76 ENV10 (= *Halymenia* *rosea*, Ewing Bank, NWGMX) PRJNA508570

***Halymenia* sp**. (16S, N143) MK244619

coll. 22.viii.08, 27o57.866’N, 92o02.619’W, offshore LA, 67m

***Halymenia* sp**. (N31) MK244620

coll. 17.vi.05, 22o11.33’N, 91o08.71’W, Campeche Banks, Mexico, 52-53m

***Halymenia* sp**. (N145) MK244621

coll. 23.viii.08, 28o03.311’N, 92o27.112’W, offshore LA, 62m

***Polyopes constrictus*** (Turner) J. Agardh MK244611

coll. MHH, 31.i.01, LAF240, Kommetjie, South Africa

***Prionitis* *abbreviata*** Setchell and N. L. Gardner 67 (LAF270) MK244610

coll. MHH, 27.ii.96, Bahía Agua Verde, BCS, Mexico

16S V4 OTU 134 ENV10 (= Halymeniaceae sp., Ewing Bank, NWGMx) PRJNA508570

**Bonnemaisoniales**

Bonnemaisoniaceae

*Asparagopsis taxiformis* KX284717

*Bonnemaisonia asparagoides* AY731516

*Bonnemaisonia asparagoides* MK244622

coll. JR, Norway (LAF7129)

***Delisea flaccida*** (Suhr) Papenfuss MK244625

coll. MHH, 19.vii.93, LAF7314, Shark’s Cove, South Africa

***Delisea pulchra*** (Grev.) Montagne MK244627

coll. SF, 9.ii.94, 2-9-94-2-3, Bahia Fildes, Punta Peñon, King George I.,

Antarctic Peninsula

***Delisea sp.*** MK244623

coll. x.95, LAF3380, Izu-Hantoo Peninsula, Japan, 16 m

***Ptilonia magellanica*** (Montagne) J. AgardhMK244626

coll. SF, 19.ii.94, LAF7135, Punta Dungeness, S. Chile

Naccariaceae

***Reticulocaulis* *mucosissimus*** I. A. Abbott MK244624

coll. TS, LAF7313, Hawaii

16S V4 OTU 176 - ENV14 (=*Reticulocaulis mucosissimus*, PRJNA508570

Ewing Bank, NWGMx)