**Table S1.** Details of collection locations, methods and depths from Balleny & Scott Islands, and the inner and outer Ross Sea. Reference specimens are either deposited at Te Papa (WELT number format Axxxxxx, e.g., A023616) or are held at NIWA (all other numbers). Where available GenBank numbers are included in the Species collected column.

| **Location** | **Ref #** | **Voyage** | **Station** | **Collection date** | **Collection method** | **Depth (m)** | **Latitude (˚S)** | **Longitude****(˚E)** | **Species collected** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Balleny Islands & Scott Island** |
| Young Island | A023616A023591ASJ366 | TAN0402 | 257 | 5-Mar-04 | Trawl | 1261-1395 | 66.216167  | 162.4415  | *Desmarestia menziesii Ballia* sp.*Georgiella confluens*  |
| Young Island | ASJ369ASJ370AASJ370BASJ368ASJ372ASJ371 | TAN0402 | 258 | 5-Mar-04 | Sled | 1505-1570 | 66.219667  | 162.4813333 | *Desmarestia menziesii Himantothallus grandifolius Palmaria decipiens* Halymeniaceae *Plocamium* sp.  |
| Young Island | A023602 | TAN0402 | 254 | 5-Mar-04 | Trawl | 720-985 | 66.359833 | 162.5418333 | *Himantothallus grandifolius*  |
| Young Island | A025995A025987A025997A025996A025989A025990A025998A025988A025999/BA025999/AA026000/AA026000/BA026000/CA026000/D | TAN0102 | K0809 | Feb-01 | Dredge | 238-292 | 66.488 | 162.369 | *Desmarestia menziesii Himantothallus grandifolius Georgiella confluens Notophycus fimbriatus*  |
| Young Island | A023677A023674A023657A023626A023673A023606ASJ408AASJ402ASJ403ASJ404ASJ406ASJ409ASJ413ASJ414 ASJ417 | TAN0602 | 448 | 11-Mar-06 | Sled | 85-63 | 66.556816 | 162.5698333 | *Himantothallus grandifolius Desmarestia menziesii* *Ballia* sp.*Palmaria decipiens Pterothamnion* sp. *Antarcticothamnion polysporum*  *Georgiella confluens Phyllophora antarctica* Halymeniaceae  *Plocamium* sp. |
| Young Island | A023609 | TAN0402 | 249 | 5-Mar-04 | Trawl | 555-574 | 66.558333 | 163.018 | *Himantothallus grandifolius*  |
| Young Island | A023589A023655A023668A023682ASJ357ASJ361ASJ363 | TAN0402 | 245 | 5-Mar-04 | Sled | 378-380 | 66.675167 | 162.757 | *Desmarestia menziesii Himantothallus grandifolius Ballia* sp*.* *Palmaria decipiens Georgiella confluens* *“Pugetia” Phyllophora antarctica Plocamium* sp. |
| Young Island | A023603 | TAN0402 | 246 | 5-Mar-04 | Trawl | 377-383 | 66.6815 | 162.783 | *Himantothallus grandifolius*  |
| Borradaile Island, east | A023698 | TAN0602 | 447 | 11-Mar-06 | Sled | 130-74 | 66.48165 | 162.7108167 | *Ballia* sp*.* *Palmaria* *decipiens* *Plocamium* sp. |
| Borradaile Island | A023695A023631A023594A023638A023652A023687A023666A023618A023671A023675A023659A023628ASG434AASG436ASG435ASG440 | Tiama | Wendy's Rock | 22-Feb-06 | Dive | 15 | 66.531167 | 162.72195 | *Desmarestia menziesii Ballia* sp. *Antarcticothamnion polysporum*  *Georgiella confluens Phycodrys antarctica* Delesseriaceae *Notophycus fimbriatus "Pugetia"*  *Phyllophora antarctica* (GQ323775) *Phyllophorella* sp. (ON211594)  *Plocamium* sp. (ON211594) *Hymenocladiopsis* sp. *Rhodymenia* sp. |
| Borradaile Island | A023577A023601A023648A023623A023619A023685A023663A023680A023664A023661A023660A023662A023665A023583A023639A023642 | Tiama | Landing | 15-Feb-06 | Dive | 14 | 66.59325 | 162.6941667 | *Monostroma hariotii Elachista antarctica Desmarestia menziesii Himantothallus grandifolius* Dumontiaceae(ON211589)*Ballia* sp. (GQ323777) *Tethysphytum antarcticum* (GQ323782, GQ323776) *Palmaria decipiens* (ON211587) *Antarcticothamnion polysporum*  *Georgiella confluens Iridaea* sp.  *Phyllophora antarctica* *Plocamium* sp.  |
| Buckle Island | A023636A023608A023679A023667A023620A023684A023592 | TAN0602 | 430 | 9-Mar-06 | Sled | 70-120 | 66.69665 | 163.1838333 | *Desmarestia menziesii Himantothallus grandifolius Antarcticothamnion polysporum*  *Iridaea* sp. Halymeniaceae  *Plocamium* sp. *Trematocarpus*?  |
| Buckle Island | A023669A023672ASJ392 | TAN0602 | 436 | 10-Mar-06 | Sled | 772 | 66.601817 | 163.08965 | *“Pugetia”*  Halymeniaceae*Plocamium* sp.  |
| Buckle Island | A023678A023607ASJ393ASJ395B | TAN0602 | 442 | 10-Mar-06 | Sled | 140-150 | 66.75615 | 163.06015 | *Desmarestia menziesii* *Himantothallus grandifolius Palmaria decipiens*  Halymeniaceae |
| Buckle Island | A027861/AA027861/BA027861/C | Tiama | Cape McNab | 18-Feb-06 | Dive | 0 | 66.887517 | 163.29615 | *Prasiola crispa* |
| Buckle Island | A023615A023629A023617A023622A023686A023643A023653A023595 | Tiama | Scott Cove | 18-Feb-06 | Dive | 15 | 66.8792 | 163.2973833 | *Lambia antarctica Desmarestia menziesii Ballia* sp. *Palmaria decipiens Antarcticothamnion polysporum Georgiella confluens Phyllophora antarctica Plocamium* sp.*Rhodymenia* sp. |
| Sturge Island | A023625ASJ373BASJ374B | TAN0602 | 420 | 8-Mar-06 | Sled | 103-108 | 67.231317 | 164.7115 | *Desmarestia menziesii Georgiella confluens* |
| Sturge Island, east | A023630ASJ376 | TAN0602 | 422 | 8-Mar-06 | Sled | 315-288 | 67.204317 | 164.761 | *Ballia* sp*.* *Georgiella confluens*   |
| Sturge Island | A023658A023670A023676A023637A023593A023641A023624A023621A023612A023600A023627A023614 | Tiama | Cape Smythe | 19-Feb-06 | Dive | 15 | 67.616667 | 164.666667 | *Antarctosaccion applanatum Geminocarpus geminatus Desmarestia menziesii Palmaria decipiens Antarcticothamnion polysporum Georgiella confluens Notophycus fimbriatus Phyllophora antarctica* Halymeniaceae *Plocamium* sp.*Rhodymenia* sp. |
| Sturge Island | A025992A025994A025991A025993 | TAN0102 | K0807 | Feb-01 | Dredge | 134-148 | 67.568 | 164.9583 | *Desmarestia menziesii Georgiella confluens Phycodrys antarctica* *“Pugetia”*  |
| S-100 | ASJ433 | TAN0402 | 228 | 4-Mar-04 | Grab | 99 | 67.422167 | 163.916667 | NGC indet. |
| S-100 | ASJ356 | TAN0402 | 232 | 4-Mar-04 | Sled | 96-117 | 67.420167 | 163.9428333 | *Phycodrys antarctica* |
| Scott Island | A023590ASJ419 | TAN0802 | 247 | 7-Mar-08 | Sled | 150-137 | 67.3875 | 179.8971667 | *Desmarestia menziesii Palmaria decipiens*  |
| **Outer Ross Sea** |
| Cape Adare | A023579ANT096ANT099ANT100 | Italica  | IT 17, 18, 19,23,24 | 15-Feb-04 | Dredge | 230.0 | 71.307617 | 170.482967 | *Desmarestia menziesii Palmaria decipiens Phycodrys antarctica Phyllophora antarctica*  |
| Cape Adare | A023645A023640A023578 | Italica  | IT 20, 21, 22 | 15-Feb-04 | Dredge | 421.6 | 71.289733 | 170.65335 | *Desmarestia menziesii Palmaria decipiens* (ON211588) *Phycodrys antarctica Phyllophora antarctica*  |
| Cape Adare | A023647ANT101ANT102 | Italica  | IT 25 | 15-Feb-04 | Dredge | 120.4 | 71.3121 | 170.4227 | *Monostroma hariotii Palmaria decipiens Phycodrys antarctica*  |
| Cape Adare | ANT104ANT105 | Italica  | IT 26, 27, 28 | 16-Feb-04 | Dredge | 515.6 | 71.259317 | 170.7042 | *Himantothallus grandifolius Palmaria decipiens*  |
| Possession Island | A026038A026037A026044A026025A026032A026026A026027A026024A026033A026035A026045A026031/BA026031/AA026041A026042/BA026040A026042/AA026039A026043A026028A026030A026023A026034A026029A026036A026021A026022 | TAN0102 | K0802 | Feb-01 | Dredge | 26-30 | 71.876 | 171.1992 | *Monostroma hariotii Geminocarpus geminatus Elachista antarctica Desmarestia menziesii Himantothallus grandifolius Ballia* sp. *Palmaria decipiens Antarcticothamnion polysporum Notophycus fimbriatus Gainia mollis* *Plocamium* sp.  |
| Possession Island | A026007A026005A026006 | TAN0102 | K0805 | Feb-01 | Hand | 1 | 71.89365 | 171.1664333 | *Palmaria decipiens*  |
| Possession Island | A026001A026002A026012A026018A026013A026010A026015A026019A026011A026020A026016A026014A026009A026017A026003A026004 | TAN0102 | K0806 | Feb-01 | Dredge | 90-95 | 71.8745 | 171.2398 | *Desmarestia menziesii Callithamnion* sp. *Phycodrys antarctica “Pugetia”* |
| Possession Island | A023613A023604 | TAN0402 | 136 | 25-Feb-04 | Grapnel | 24-38 | 71.879667 | 171.16 | *Geminocarpus geminatus Himantothallus grandifolius* |
| Cape Hallett | ASF024 | Italica | IT 1 | 05-Feb-04 | Dredge | 475 | 72.269 | 170.46095 | NGC indet. |
| Cape Hallett | ANT094 | Italica  | IT 15 | 11-Feb-04 | Dredge | 406.8 | 72.28615 | 170.1928833 | *Iridaea* sp*. Palmaria decipiens Phycodrys antarctica*  |
| Cape Hallett | ASF016 | Italica  | IT 16 | 11-Feb-04 | Dredge | 408.8 | 72.316667 | 170.266667 | *Phycodrys antarctica* |
| Cape Hallett | ANT107 | Italica  | IT 29 | 16-Feb-04 | Dredge | 196.0 | 72.286233 | 170.2341333 | *Phycodrys antarctica* |
| Cape Hallett | A023644 | Italica  | IT 4 | 9-Feb-04 | Dredge | 105.2 | 72.281916 | 170.2849 | *Phycodrys antarctica* |
| Cape Hallett | A023654A023611A023610/AA023610/BA023649ASF017 | Italica  | IT 5, 6, 9, 10, 11, 12, 13, 14 | 11-Feb-04 | Dive | 16-18 | 72.3104 | 170.25615 | *Himantothallus grandifolius* NGC indet. *Phyllophora antarctica* (GQ323778)  |
| Cape Hallett | ANT112 | Italica  | IT 7 | 10-Feb-04 | Dredge | 391.2 | 72.282467 | 170.2035 | *Phycodrys antarctica* |
| Cape Hallett | A023646 | Italica  | IT 8 | 11-Feb-04 | Dredge | 353.2 | 72.292133 | 170.4905 | *Phycodrys antarctica* |
| Cape Hallett | A026008 | TAN0102 | K0803 | Feb-01 | Dredge | 30-49 | 72.31167 | 170.1875 | *Phycodrys antarctica* |
| Ross1 | A023585 | TAN0402 | 101 | 18-Feb-04 | Sled | 565-571 | 71.201167 | 170.9405 | *Desmarestia menziesii*  |
| Ross1 | A023586 | TAN0402 | 105 | 18-Feb-04 | Sled | 470-462 | 71.2575 | 170.6346667 | *Desmarestia menziesii*  |
| Ross1 | A023587 | TAN0402 | 116 | 18-Feb-04 | Sled | 312-315 | 71.298833 | 170.5405 | *Desmarestia menziesii*  |
| Ross1 | A023588 | TAN0402 | 122 | 18-Feb-04 | Trawl | 395-400 | 71.272167 | 170.594 | *Desmarestia menziesii*  |
| Ross1 | ASJ349 | TAN0402 | 123 | 19-Feb-04 | Grab | 243 | 71.313167 | 170.501 | *Palmaria decipiens* |
| Ross2 | A023581ASJ354ANT089ANT090 | TAN0402 | 194 | 28-Feb-04 | Grab | 246 | 71.6215 | 170.9261667 | *Desmarestia menziesii Himantothallus grandifolius Palmaria decipiens Phyllophora antarctica*  |
| Ross3 | A023580 | TAN0402 | 20 | 5-Feb-04 | Trawl | 400-415 | 71.740667 | 171.644 | *Desmarestia menziesii*  |
| Ross3 | ASJ431ASJ432ANT087 | TAN0402 | 26 | 9-Feb-04 | Trawl | 230-219 | 71.778167 | 170.963833 | *Desmarestia menziesii Himantothallus grandifolius* |
| Ross3 | A023584ASJ342 | TAN0402 | 29 | 9-Feb-04 | Trawl | 270-275 | 71.756 | 171.2635 | *Desmarestia menziesii Himantothallus grandifolius* |
| Ross3 | ANT088 | TAN0402 | 30 | 9-Feb-04 | Grab | 277 | 71.746333 | 171.291333 | *Himantothallus grandifolius* |
| Ross4 | A023582 | TAN0402 | 140 | 26-Feb-04 | Sled | 231-240 | 72.0135 | 170.7745 | *Desmarestia menziesii*  |
| Ross5 | A023605 | TAN0402 | 67 | 13-Feb-04 | Trawl | 272-286 | 72.321 | 170.4751667 | *Himantothallus grandifolius* |
| **Inner Ross Sea** |
| Faraglione | A023651A023635A023650 | Italica  | IT 30, 31, 32, 33, 36 | 20-Feb-04 | Dive | 16-20 | 74.7177 | 164.1129167 | *Iridaea* sp. (GQ323780)  *Phyllophora antarctica* (GQ323779, GQ323781) |
| Terra Nova Bay | ANT108 | Italica  | IT 34 | 20-Feb-04 | Dredge | 362.8 | 74.727317 | 164.22445 | *Phyllophora antarctica* |
| Terra Nova Bay | ASF022 | - | - | 30-Jan-04 | - | 80 | 74.8 | 164.649 | NGC indet. |
| Sth of Adelie Cove | A023681 | Italica  | IT 40 | 22-Feb-04 | Dive | 20.0 | 74.843667 | 164.0096 | *Plocamium* sp. |
| Nth of Cape Russell | ANT110ANT111ASF006 | Italica  | IT 37, 38, 39 | 21-Feb-04 | Dive | 13.5 | 74.8725 | 163.9671667 | *Iridaea* sp. (ON211586)  *Phyllophora antarctica*  |
| Cape Russell | ANT109 | Italica  | IT 35 | 21-Feb-04 | Dredge | 208.0 | 74.83465 | 164.09345 | *Phyllophora antarctica* |
| Franklin Island | ASM074ASM070ASM071ASM075ASM072ASM073 | - | - | 13-Feb-12 | Hand | - | 76.08 | 168.32 | *Desmarestia menziesii* *Iridaea* sp. (ON211582, ON211583, ON211585) *Plocamium* sp.  |
| Dunlop Island | A028361 | - | DI3 | 25-Oct-02 | Dive | 19 | 77.233333 | 163.5 | NGC indet. |
| Spike Cape | A028211A028364A028359A028365/AA028365/BA028360/AA028360/B | - | SC1, SC2, SC3 | 30-Oct-02 to 02-Nov-02 | Dive | 15-19 | 77.3 | 163.5666 | NGC indet. |
| Cape Evans | A023123 | - | - | 24-Nov-01 | Dive | 19.5 | 77.3 | 163.5666 | *Iridaea* sp. |
| Cape Evans | A023124 | - | - | 30-Nov-01 | Dive | 19 | 77.6393 | 166.4033 | *Iridaea* sp. |
| Cape Evans | A023120A023121 | - | - | 17-Nov-01 | Dive | 21 | 77.6393 | 166.4033 | *Phyllophora antarctica* |
| Cape Evans | A034416A034417A034418ANT115ANT116ANT119 | - | - | 08-Nov-04 | Dive | 16-21 | 77.6359 | 166.4163 | NGC indet., *Tethysphytum antarcticum* (ON211596, ON211597, ON211598) |
| Cape Evans | ASK019 | - | - | 19-Nov-09 | Dive | 18 | 77.6393 | 166.4033 | *Phyllophora antarctica* |
| Cape Evans | A034415 | - | - | Nov-13 | Dive | 14 | 77.635258 | 166.414382 | *Iridaea* (ON211584) |
| Cape Evans | ANT007ANT008ANT009ANT010ANT011ANT012ANT013ANT014ANT017ANT018ANT019ANT020 | - | - | 24-Oct-16 | Dive | 22 | 77.634917 | 166.414056 | NGC indet.*Phyllophora antarctica* |
| McMurdo Jetty | A034411A034412A034413A034414 | - | - | 08-Dec-14 | Hand | - | 77.847636 | 166.6576889 | *Phyllophora antarctica* (ON211590, ON211591, ON211592, ON211593) |