

Table S1. Collection information or publication and GenBank accession numbers of the sequences used in phylogenetic analyses.

| | | Specimen | Haplotype | GenBank Accession Number <i>rbc L</i> |
|---|--|-----------------------------|-----------|--|
| Collection site, habitat, date & collectors / Reference | | | | |
| | | ASR202 (WELT A033734) | - | MN149978 |
| <i>Lophurella caespitosa</i> | Arthur's Nose, Wellington South coast, North Island, New Zealand; mid-intertidal; 21.vi.2017; WN | | | |
| <i>Lophurella hookeriana</i> | Yendegaia, Magellan Region, Southern Patagonian, Chile; subtidal (1 m); 22.x.2016; ECM | Y1 | H1 | MN149974 |
| | Yendegaia, Magellan Region, Southern Patagonian, Chile; subtidal (1 m); 22.x.2016; ECM | Y2 | H1 | MN149975 |
| | Falkland Islands / García-Soto & López-Bautista 2018 | - | H2 | MH388599 |
| <i>Lophurella pericladus</i> | Robe, Southern Australia / García-Soto & López-Bautista 2018 | - | H1 | KU564481 |
| | 13th beach, Victoria, Australia; intertidal; 9.xi.2014; tetrasporophyte; PD | PD772 | H1 | MN150010 |
| | Galaneuse Reef, Victoria, Australia; intertidal; 6.xii.2014; female gametophyte; PD | PD2915 | H1 | MN150014 |
| | Queenscliff, Port Phillip Bay, Victoria, Australia; drift; 27.xi.2018; PD | PD4765 | H2 | MN150013 |
| | Queenscliff, Port Phillip Bay, Victoria, Australia; on pontoons in the marina; 30.xi.2018; PD | PD4787 | H2 | MN150005 |
| | Queenscliff, Port Phillip Bay, Victoria, Australia; on pontoons in the marina; 30.xi.2018; PD | PD4789 | H2 | MN150009 |
| | Queenscliff, Port Phillip Bay, Victoria, Australia; on pontoons in the marina; 30.xi.2018; PD | PD4790 | H2 | MN150008 |
| | Queenscliff, Port Phillip Bay, Victoria, Australia; on pontoons in the marina; 30.xi.2018; PD | PD4791 | H2 | MN150007 |
| | Queenscliff, Port Phillip Bay, Victoria, Australia; on pontoons in the marina; 30.xi.2018; PD | PD4792 | H2 | MN150006 |
| | Pebbly Beach, Mallacoota, Victoria, Australia; intertidal; 9.xi.2016; PD, KD & HV | PD2746 | H1 | MN150012 |
| | Shipwreck Creek, Mallacoota, Victoria, Australia; intertidal; 13.xi.2016; male gametophyte; PD, KD & HV | PD2866 | H1 | MN150011 |
| <i>Lophurella nigra</i> sp. nov. | Bastion Point, Mallacoota, Victoria, Australia; subtidal (1 m); 8.xi.2016; female gametophyte; PD, KD & HV | PD2730 | H1 | MN149995 |
| | Bastion Point, Mallacoota, Victoria, Australia; subtidal (1 m); 8.xi.2016; tetrasporophyte and female gametophyte; PD, KD & HV | PD2736 | H2 | MN149998 |
| | Pebbly Beach, Mallacoota, Victoria; intertidal; 9.xi.2016; tetrasporophyte; PD, KD & HV | PD2741 | H2 | MN150000 |
| | The Gardens, Tasmania, Australia; intertidal; 7.xi.2017; male gametophyte; PD & JFC | PD3401 | H2 | MN149999 |
| | Bicheno, Tasmania, Australia; intertidal; 9.xi.2017; PD & JFC | PD3475 | H2 | MN149997 |
| | Bicheno, Tasmania, Australia; intertidal; 9.xi.2017; PD & JFC | PD3555 | H2 | MN149996 |
| <i>Lophurella mutabilis</i> sp. nov. | Killarnei, Victoria, Australia; intertidal; 27.xii.2014; male gametophyte; PD | PD1111 | H1 | MN149980 |
| | Hells Gates, Tasmania, Australia / Savoie & Saunders 2016 | GWS016008 | H5 | KU564481 |
| | Falmouth, Tasmania, Australia / Bustamante et al. 2016, as <i>Womersleyella pacifica</i> | CUK10968 | H4 | KT825866 |
| | Blackmans Bay, Tasmania, Australia; intertidal; 30.x.2017; PD & JFC | PD3072 | H2 | MN149993 |
| | Blackmans Bay, Tasmania, Australia; intertidal; 30.x.2017; tetrasporophyte; PD & JFC | PD3075 | H2 | MN149994 |
| | Blackmans Bay, Tasmania, Australia; intertidal; 30.x.2017; tetrasporophyte; PD & JFC | PD3079 | H2 | MN149992 |
| | Blackmans Bay, Tasmania, Australia; intertidal; 30.x.2017; female gametophyte; PD & JFC | PD3093 | H2 | MN149991 |

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| | Tinderbox, Tasmania, Australia; subtidal (1 m); 31.x.2017; PD & JFC | PD3139 | H2 | MN149990 |
| | Tinderbox, Tasmania, Australia; subtidal (1 m); 31.x.2017; PD & JFC | PD3106 | H4 | MN149984 |
| | Southport, Tasmania, Australia; intertidal; 1.xi.2017; tetraspophyte; PD & JFC | PD3164 | H4 | MN149983 |
| | Southport, Tasmania, Australia; intertidal; 1.xi.2017; tetraspophyte; PD & JFC | PD3172 | H4 | MN149982 |
| | Binalong Bay, Tasmania, Australia; intertidal; 8.xi.2017; tetraspophyte; PD & JFC | PD3411 | H4 | MN149986 |
| | Binalong Bay, Tasmania, Australia; intertidal; 8.xi.2017; PD & JFC | PD3423 | H4 | MN149987 |
| | Bicheno, Tasmania, Australia; intertidal; 9.xi.2017; tetrasporophyte; PD & JFC | PD3478 | H4 | MN149989 |
| | Bicheno, Tasmania, Australia; intertidal; 9.xi.2017; tetrasporophyte; PD & JFC | PD3483 | H4 | MN149988 |
| | Bicheno, Tasmania, Australia; intertidal; 9.xi.2017; female gametophyte; PD & JFC | PD3457 | H3 | MN149981 |
| | The Gardens, Tasmania, Australia; intertidal; 7.xi.2017; PD & JFC | PD3376 | H4 | MN149985 |
| | | ASR85 | | |
| | East of Bishop, Stewart Island, New Zealand; low intertidal; 1.iv.2017; RD | (WELT A033735) | H6 | MN149979 |
| | | ASR102 | | |
| <i>Lophurella pauciramulosa</i> sp. nov. | East of Bishop, Stewart Island, New Zealand; subtidal (10 m); 1.iv.2017; RD | (WELT A033736) | - | MN150003 |
| | | ASR166 | | |
| | Green Island, South Island, New Zealand; subtidal (8 m); 31.v.2017; tetrasporophyte; RD & BT | (WELT A033737) | - | MN150002 |
| | | ASR175 | | |
| | Green Island, South Island, New Zealand; subtidal (2 m); 31.v.2017; tetrasporophyte; MD & AK | (WELT A033738) | - | MN150001 |
| <i>Lophurella tasmanica</i> sp. nov. | Port Arthur, Tasmania, Australia; intertidal; 13.xi.2017; tetraspophyte; PD & JFC | PD3584 | - | MN150004 |
| Outgroup | | | | |
| <i>Echinothamnion hookeri</i> | Wynyard, Tasmania, Australia; drift; 4.xi.2017; PD & JFC | PD3272 | - | MN149976 |
| <i>Echinothamnion hystrix</i> | Wynyard, Tasmania, Australia; drift; 4.xi.2017; PD & JFC | PD3294 | - | MN149977 |

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References

- Bustamante, D.E., B.Y. Won & T.O. Cho. 2016. *Pterosiphonia spinifera* (Rhodomelaceae, Ceramiales) previously described as *P. arenosa* from Korea and reported as *P. pennata* from Peru. *Algae*, **31**: 105-115.
- Savoie, A.M. & Saunders, G.W. (2016). A molecular phylogenetic and DNA barcode assessment of the tribe Pterosiphonieae (Ceramiales, Rhodophyta) emphasizing the Northeast Pacific. *Botany*, **94**: 917-939.