

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

	Collection site, habitat, date & collectors / Reference	Specimen	Haplotype	GenBank Accession Number <i>rbc L</i>
<i>Lophurella caespitosa</i>	Arthur's Nose, Wellington South coast, North Island, New Zealand; mid-intertidal; 21.vi.2017; WN	ASR202	-	MN149978
<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 periclados</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

	Collection site, habitat, date & collectors / Reference	Specimen	Haplotype	GenBank Accession Number
	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
	East of Bishop, Stewart Island, New Zealand; low intertidal; 1.iv.2017; RD	ASR85	H6	MN149979
<i>Lophurella pauciramulosa</i> sp. nov.	East of Bishop, Stewart Island, New Zealand; subtidal (10 m); 1.iv.2017; RD	ASR102	-	MN150003
	Green Island, South Island, New Zealand; subtidal (8 m); 31.v.2017; tetrasporophyte; RD & BT	ASR166	-	MN150002
	Green Island, South Island, New Zealand; subtidal (2 m); 31.v.2017; tetrasporophyte; MD & AK	ASR175	-	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.