

Supplementary Materials

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Supplementary Table S1. Collection information, haplotype codes, and GenBank accession numbers of specimens used in this study

Species	Voucher-code	Collection site	Coast	Collection date	Haplotype (<i>cox3</i> + <i>cob</i>)	<i>cox3</i>	<i>cob</i>
<i>Undaria pinnatifida</i>	CNU001299	Busan, Korea	East	Apr 4, 2011	C2	MZ612425	MZ612610
	SRI-P00874	Busan, Korea	East	May 7, 2013	C2	MZ612426	MZ612611
	CNU004667	Busan, Korea	East	Mar 27, 2009	C2	MZ612427	MZ612612
	CNU004668	Busan, Korea	East	Mar 27, 2009	C2	MZ612428	MZ612613
	CNU003962	Busan, Korea	East	May 13, 2009	C2	MZ612429	MZ612614
	CNU004719	Donghae, Korea	East	Jul 5, 2008	C1	MZ612430	MZ612615
	CNU004720	Donghae, Korea	East	Jul 5, 2008	C1	MZ612431	MZ612616
	CNU060509	Donghae, Korea	East	May 27, 2014	C16	MZ612432	MZ612617
	CNU060510	Donghae, Korea	East	May 27, 2014	C4	MZ612433	MZ612618
	CNU060511	Donghae, Korea	East	May 27, 2014	C4	MZ612434	MZ612619
	CNU001026	Gangneung, Korea	East	Feb 19, 2011	C18	MZ612435	MZ612620
	CNU004040	Gangneung, Korea	East	Apr 13, 2008	C1	MZ612436	MZ612621
	CNU004672	Gangneung, Korea	East	Mar 4, 2009	C1	MZ612437	MZ612622
	CNU022014	Gangneung, Korea	East	Apr 27, 2012	C1	MZ612438	MZ612623
	CNU022396	Gangneung, Korea	East	Dec 7, 2008	C1	MZ612439	MZ612624
	CNU022397	Gangneung, Korea	East	Jul 4, 2008	C5	MZ612440	MZ612625
	CNU022493	Gangneung, Korea	East	Jun 4, 2008	C1	MZ612441	MZ612626
	CNU060512	Gangneung, Korea	East	May 27, 2014	C1	MZ612442	MZ612627
	CNU060513	Gangneung, Korea	East	May 27, 2014	C1	MZ612443	MZ612628
	CNU004484	Gangneung, Korea	East	Dec 17, 2005	C1	MZ612444	MZ612629
	CNU030595	Gangneung, Korea	East	Jun 23, 2009	C1	MZ612445	MZ612630
	CNU030812	Gangneung, Korea	East	Jun 23, 2009	C1	MZ612446	MZ612631
	CNU032919	Goseong, Korea	East	Jan 13, 2013	C1	MZ612447	MZ612632
	SRI-P00404	Goseong, Korea	East	May 17, 2012	C1	MZ612448	MZ612633
	CNU022832	Goseong, Korea	East	May 23, 2012	C1	MZ612449	MZ612634
	SRI-P00183	Goseong, Korea	East	Jun 5, 2011	C1	MZ612450	MZ612635
	CNU060515	Goseong, Korea	East	May 26, 2014	C1	MZ612451	MZ612636
	CNU060516	Goseong, Korea	East	May 26, 2014	C1	MZ612452	MZ612637
	CNU060514	Goseong, Korea	East	May 26, 2014	C1	MZ612453	MZ612638
	SRI-P00392	Goseong, Korea	East	May 16, 2012	C1	MZ612454	MZ612639
	SRI-P00398	Goseong, Korea	East	May 16, 2012	C1	MZ612455	MZ612640
	CNU024623	Gyeongju, Korea	East	Jan 21, 2007	C2	MZ612456	MZ612641
	CNU031310	Gyeongju, Korea	East	Jan 21, 2007	C2	MZ612457	MZ612642
	SRI-P00844	Gyeongju, Korea	East	May 7, 2013	C30	MZ612458	MZ612643
	SRI-P00849	Gyeongju, Korea	East	May 7, 2013	C2	MZ612459	MZ612644
	SRI-P00862	Gyeongju, Korea	East	May 7, 2013	C2	MZ612460	MZ612645
	SRI-P00868	Gyeongju, Korea	East	May 7, 2013	C2	MZ612461	MZ612646
	CNU001091	Gyeongju, Korea	East	Apr 4, 2011	C2	MZ612462	MZ612647
	CNU008673	Pohang, Korea	East	May 20, 2009	C22	MZ612463	MZ612648
	CNU022373	Pohang, Korea	East	Feb 27, 2005	C24	MZ612464	MZ612649
CNU060505	Pohang, Korea	East	May 27, 2014	C22	MZ612465	MZ612650	
CNU060506	Pohang, Korea	East	May 27, 2014	C23	MZ612466	MZ612651	
CNU060507	Pohang, Korea	East	May 27, 2014	C22	MZ612467	MZ612652	
CNU060501	Pohang, Korea	East	May 28, 2014	C2	MZ612468	MZ612653	
CNU030252	Pohang, Korea	East	Apr 15, 2007	C20	MZ612469	MZ612654	
SRI-P00916	Pohang, Korea	East	May 7, 2013	C22	MZ612470	MZ612655	
SRI-P00922	Pohang, Korea	East	May 7, 2013	C22	MZ612471	MZ612656	
CNU022378	Pohang, Korea	East	Feb 27, 2005	C22	MZ612472	MZ612657	
CNU022379	Pohang, Korea	East	Feb 27, 2005	C22	MZ612473	MZ612658	
CNU033235	Pohang, Korea	East	Mar 15, 2013	C22	MZ612474	MZ612659	
CNU033236	Pohang, Korea	East	Mar 15, 2013	C24	MZ612475	MZ612660	
CNU002419	Pohang, Korea	East	Jan 31, 2002	C22	MZ612476	MZ612661	
CNU002420	Pohang, Korea	East	Jan 31, 2002	C21	MZ612477	MZ612662	
CNU022467	Samcheok, Korea	East	Feb 26, 1997	C1	MZ612478	MZ612663	
CNU022375	Samcheok, Korea	East	Feb 28, 2005	C1	MZ612479	MZ612664	
CNU022376	Samcheok, Korea	East	Feb 28, 2005	C3	MZ612480	MZ612665	

Supplementary Table S1. Continued

Species	Voucher-code	Collection site	Coast	Collection date	Haplotype (<i>cox3</i> + <i>cob</i>)	<i>cox3</i>	<i>cob</i>
	SRI-P00988	Ulleungdo, Korea	East	Jun 26, 2013	C2	MZ612481	MZ612666
	SRI-P00994	Ulleungdo, Korea	East	Jun 26, 2013	C2	MZ612482	MZ612667
	SRI-P01000	Ulleungdo, Korea	East	Jun 26, 2013	C2	MZ612483	MZ612668
	SRI-P01005	Ulleungdo, Korea	East	Jun 26, 2013	C2	MZ612484	MZ612669
	CNU005061	Ulleungdo, Korea	East	Jun 25, 2004	C31	MZ612485	MZ612670
	CNU005062	Ulleungdo, Korea	East	Jun 24, 2004	C2	MZ612486	MZ612671
	SRI-P00976	Ulleungdo, Korea	East	Jun 25, 2013	C32	MZ612487	MZ612672
	SRI-P00898	Ulsan, Korea	East	May 7, 2013	C28	MZ612488	MZ612673
	SRI-P00904	Ulsan, Korea	East	May 7, 2013	C27	MZ612489	MZ612674
	SRI-P00886	Ulsan, Korea	East	May 7, 2013	C2	MZ612490	MZ612675
	CNU060508	Ulsan, Korea	East	May 28, 2014	C2	MZ612491	MZ612676
	SRI-P00172	Ulsan, Korea	East	May 18, 2011	C29	MZ612492	MZ612677
	CNU022398	Yangyang, Korea	East	Jul 5, 2008	C17	MZ612493	MZ612678
	CNU006210	Yangyang, Korea	East	Feb 8, 2010	C19	MZ612494	MZ612679
	CNU006211	Yangyang, Korea	East	Feb 8, 2010	C1	MZ612495	MZ612680
	CNU006214	Yangyang, Korea	East	Feb 8, 2010	C33	MZ612496	MZ612681
	CNU006216	Yangyang, Korea	East	Feb 8, 2010	C1	MZ612497	MZ612682
	CNU006217	Yangyang, Korea	East	Feb 8, 2010	C1	MZ612498	MZ612683
	CNU006218	Yangyang, Korea	East	Feb 8, 2010	C1	MZ612499	MZ612684
	CNU006219	Yangyang, Korea	East	Feb 8, 2010	C1	MZ612500	MZ612685
	CNU032896	Yangyang, Korea	East	Jan 13, 2013	C1	MZ612501	MZ612686
	CNU032951	Yangyang, Korea	East	Jan 13, 2013	C1	MZ612502	MZ612687
	CNU032952	Yangyang, Korea	East	Jan 13, 2013	C1	MZ612503	MZ612688
	CNU060502	Yeongdeok, Korea	East	May 28, 2014	C1	MZ612504	MZ612689
	CNU060503	Yeongdeok, Korea	East	May 28, 2014	C1	MZ612505	MZ612690
	CNU060504	Yeongdeok, Korea	East	May 28, 2014	C1	MZ612506	MZ612691
	SRI-P00123	Yeongdeok, Korea	East	Mar 9, 2011	C1	MZ612507	MZ612692
	SRI-P00127	Yeongdeok, Korea	East	Mar 9, 2011	C1	MZ612508	MZ612693
	SRI-P00826	Yeongdeok, Korea	East	Mar 29, 2013	C22	MZ612509	MZ612694
	SRI-P00820	Yeongdeok, Korea	East	Mar 29, 2013	C22	MZ612510	MZ612695
	CNU004011	Baekryeongdo, Korea	West	Jul 21, 2008	C1	MZ612511	MZ612696
	CNU004012	Baekryeongdo, Korea	West	Jul 21, 2008	C1	MZ612512	MZ612697
	CNU022401	Baekryeongdo, Korea	West	Jul 21, 2008	C1	MZ612513	MZ612698
	CNU031857	Boryeong, Korea	West	Mar 18, 2007	C1	MZ612514	MZ612699
	CNU031859	Boryeong, Korea	West	Mar 18, 2007	C2	MZ612515	MZ612700
	CNU008681	Buan, Korea	West	Mar 24, 2009	C2	MZ612516	MZ612701
	SRI-P00195	Shinan, Korea	West	Jul 20, 2011	C1	MZ612517	MZ612702
	SRI-P00207	Shinan, Korea	West	Jul 20, 2011	C1	MZ612518	MZ612703
	CNU005724	Taeon, Korea	West	Nov 10, 2007	C2	MZ612519	MZ612704
	CNU004296	Taeon, Korea	West	May 9, 2009	C2	MZ612520	MZ612705
	CNU000858	Taeon, Korea	West	May 25, 2009	C1	MZ612521	MZ612706
	CNU022489	Taeon, Korea	West	Dec 9, 2011	C1	MZ612522	MZ612707
	CNU012930	Taeon, Korea	West	Aug 5, 2011	C2	MZ612523	MZ612708
	CNU003900	Taeon, Korea	West	May 25, 2009	C1	MZ612524	MZ612709
	CNU003846	Taeon, Korea	West	May 25, 2009	C1	MZ612525	MZ612710
	CNU003847	Taeon, Korea	West	May 25, 2009	C1	MZ612526	MZ612711
	CNU003848	Taeon, Korea	West	May 25, 2009	C34	MZ612527	MZ612712
	CNU008773	Geoje, Korea	South	May 11, 2009	C2	MZ612528	MZ612713
	CNU008774	Geoje, Korea	South	May 11, 2009	C2	MZ612529	MZ612714
	SRI-P00928	Geoje, Korea	South	May 23, 2013	C2	MZ612530	MZ612715
	CNU004331	Geoje, Korea	South	Mar 1, 2003	C2	MZ612531	MZ612716
	SRI-P00410	Goheung, Korea	South	May 23, 2012	C1	MZ612532	MZ612717
	CNU060498	Sangjokam, Korea	South	May 28, 2014	C1	MZ612533	MZ612718
	CNU060499	Sangjokam, Korea	South	May 28, 2014	C25	MZ612534	MZ612719
	CNU060500	Sangjokam, Korea	South	May 28, 2014	C25	MZ612535	MZ612720
	CNU004686	Sangjokam, Korea	South	Mar 28, 2009	C1	MZ612536	MZ612721
	CNU004687	Sangjokam, Korea	South	Mar 28, 2009	C25	MZ612537	MZ612722
	CNU008659	Jindo, Korea	South	May 23, 2009	C1	MZ612538	MZ612723
	SRI-P01024	Jindo, Korea	South	Jul 18, 2013	C1	MZ612539	MZ612724
	SRI-P01030	Jindo, Korea	South	Jul 18, 2013	C17	MZ612540	MZ612725
	SRI-P00970	Jindo, Korea	South	May 9, 2013	C1	MZ612541	MZ612726
	CNU003906	Jindo, Korea	South	May 22, 2009	C1	MZ612542	MZ612727
	CNU003907	Jindo, Korea	South	May 22, 2009	C2	MZ612543	MZ612728
	SRI-P00952	Jindo, Korea	South	May 27, 2013	C2	MZ612544	MZ612729
	CNU004638	Jindo, Korea	South	Apr 5, 2008	C2	MZ612545	MZ612730

Supplementary Table S1. Continued

Species	Voucher-code	Collection site	Coast	Collection date	Haplotype (cox3 + cob)	cox3	cob
	CNU004639	Jindo, Korea	South	Apr 5, 2008	C2	MZ612546	MZ612731
	CNU004626	Jindo, Korea	South	Apr 5, 2008	C25	MZ612547	MZ612732
	CNU004635	Jindo, Korea	South	Apr 5, 2008	C1	MZ612548	MZ612733
	CNU004636	Jindo, Korea	South	Apr 5, 2008	C2	MZ612549	MZ612734
	CNU004637	Jindo, Korea	South	Apr 5, 2008	C2	MZ612550	MZ612735
	CNU004571	Jindo, Korea	South	Apr 6, 2008	C25	MZ612551	MZ612736
	CNU004574	Jindo, Korea	South	Apr 6, 2008	C1	MZ612552	MZ612737
	CNU004656	Jindo, Korea	South	Mar 28, 2009	C1	MZ612553	MZ612738
	CNU004657	Jindo, Korea	South	Mar 28, 2009	C1	MZ612554	MZ612739
	CNU003836	Jinhae, Korea	South	Jun 12, 2009	C2	MZ612555	MZ612740
	SRI-P00933	Tongyeong, Korea	South	May 24, 2013	C34	MZ612556	MZ612741
	SRI-P00940	Tongyeong, Korea	South	May 24, 2013	C2	MZ612557	MZ612742
	CNU060496	Wando, Korea	South	Apr 14, 2014	C1	MZ612558	MZ612743
	CNU060497	Wando, Korea	South	Apr 14, 2014	C1	MZ612559	MZ612744
	CNU001363	Yeosu, Korea	South	Mar 20, 2011	C16	MZ612560	MZ612745
	CNU002483	Yeosu, Korea	South	Jun 24, 2007	C26	MZ612561	MZ612746
	CNU004174	Jeju, Korea	Jeju	Jul 21, 2005	C1	MZ612562	MZ612747
	CNU029697	Jeju, Korea	Jeju	Jul 21, 2005	C1	MZ612563	MZ612748
	CNU004126	Jeju, Korea	Jeju	May 22, 2005	C1	MZ612564	MZ612749
	CNU004911	Jeju, Korea	Jeju	May 22, 2005	C1	MZ612565	MZ612750
	CNU004886	Jeju, Korea	Jeju	May 24, 2005	C1	MZ612566	MZ612751
	CNU004893	Jeju, Korea	Jeju	May 24, 2005	C6	MZ612567	MZ612752
	CNU004143	Jeju, Korea	Jeju	May 23, 2005	C1	MZ612568	MZ612753
	CNU004887	Jeju, Korea	Jeju	May 23, 2005	C1	MZ612569	MZ612754
	CNU031869	Jeju, Korea	Jeju	May 24, 2005	C1	MZ612570	MZ612755
	CNU004142	Jeju, Korea	Jeju	May 23, 2005	C1	MZ612571	MZ612756
	CNU004888	Jeju, Korea	Jeju	May 23, 2005	C1	MZ612572	MZ612757
	CNU004791	Jeju, Korea	Jeju	Jul 20, 2005	C1	MZ612573	MZ612758
	CNU004792	Jeju, Korea	Jeju	Jul 20, 2005	C7	MZ612574	MZ612759
	CNU002983	Jeju, Korea	Jeju	Jun 4, 2002	C7	MZ612575	MZ612760
	CNU004608	Jeju, Korea	Jeju	Apr 18, 2008	C9	MZ612576	MZ612761
	CNU004610	Jeju, Korea	Jeju	Apr 18, 2008	C8	MZ612577	MZ612762
	CNU004620	Jeju, Korea	Jeju	Apr 18, 2008	C8	MZ612578	MZ612763
	CNU002995	Jeju, Korea	Jeju	Jun 6, 2002	C2	MZ612579	MZ612764
	CNU002996	Jeju, Korea	Jeju	Jun 6, 2002	C2	MZ612580	MZ612765
	CNU003013	Jeju, Korea	Jeju	Jun 6, 2002	C2	MZ612581	MZ612766
	CNU003015	Jeju, Korea	Jeju	Jun 6, 2002	C2	MZ612582	MZ612767
	CNU004644	Jeju, Korea	Jeju	Apr 13, 2008	C1	MZ612583	MZ612768
	CNU004655	Jeju, Korea	Jeju	Apr 13, 2008	C1	MZ612584	MZ612769
	CNU004576	Jeju, Korea	Jeju	Apr 2, 2008	C12	MZ612585	MZ612770
	CNU004578	Jeju, Korea	Jeju	Apr 2, 2008	C11	MZ612586	MZ612771
	CNU004234	Jeju, Korea	Jeju	Feb 23, 2005	C1	MZ612587	MZ612772
	CNU032538	Jeju, Korea	Jeju	Jan 8, 2013	C1	MZ612588	MZ612773
	CNU004598	Jeju, Korea	Jeju	Apr 2, 2008	C13	MZ612589	MZ612774
	CNU004607	Jeju, Korea	Jeju	Apr 2, 2008	C10	MZ612590	MZ612775
<i>Undaria crenata</i>	SRI-P00083	Ulleungdo, Korea	East	Jul 29, 2009	C2	MZ612591	MZ612776
	SRI-P00604	Wando, Korea	South	Jun 11, 2013	C2	MZ612592	MZ612777
	SRI-P00706	Wando, Korea	South	Jun 7, 2013	C1	MZ612593	MZ612778
	SRI-P00712	Wando, Korea	South	Jun 7, 2013	C1	MZ612594	MZ612779
	SRI-P00717	Wando, Korea	South	Jun 7, 2013	C1	MZ612595	MZ612780
	SRI-P00434	Jeju, Korea	Jeju	Aug 15, 2012	C1	MZ612596	MZ612781
	CNU004170	Jeju, Korea	Jeju	Jul 21, 2005	C1	MZ612597	MZ612782
	CNU024202	Jeju, Korea	Jeju	Jun 20, 2012	C8	MZ612598	MZ612783
	CNU024203	Jeju, Korea	Jeju	Jun 20, 2012	C1	MZ612599	MZ612784
	CNU032768	Jeju, Korea	Jeju	Jan 9, 2013	C1	MZ612600	MZ612785
	CNU041264	Jeju, Korea	Jeju	Jun 7, 2013	C15	MZ612601	MZ612786
	CNU041266	Jeju, Korea	Jeju	Jun 7, 2013	C15	MZ612602	MZ612787
	CNU041267	Jeju, Korea	Jeju	Jun 7, 2013	C1	MZ612603	MZ612788
	CNU041268	Jeju, Korea	Jeju	Jun 7, 2013	C1	MZ612604	MZ612789
	CNU041269	Jeju, Korea	Jeju	Jun 7, 2013	C13	MZ612605	MZ612790
	CNU041270	Jeju, Korea	Jeju	Jun 7, 2013	C14	MZ612606	MZ612791
	CNU041895	Jeju, Korea	Jeju	Jun 30, 2013	C17	MZ612607	MZ612792
	CNU041896	Jeju, Korea	Jeju	Jun 30, 2013	C17	MZ612608	MZ612793
	CNU041897	Jeju, Korea	Jeju	Jun 30, 2013	C1	MZ612609	MZ612794