

Supplementary table 1. List of specimens, with final taxonomic diagnosis, sample number, collection information, and GenBank accessions.

Species	Sample no.	Collection date	Locality	Coordinates	ITS accession
<i>U. chaugulii</i>	U265 ^a	19/04/2018	Xuwen, ZJ	N20°17', E110°04'	MK426982
	U267 ^a	19/04/2018	Xuwen, ZJ	N20°17', E110°04'	MK426980
	U275 ^a	19/04/2018	Xuwen, ZJ	N20°17', E110°04'	MK426981
	QD217-4	06/11/2018	Huiquan Bay, QD	N36°03', E120°20'	MK426983
<i>U. meridionalis</i>	S115	00/08/2007	Taiping Bay, QD	N36°02', E120°21'	
	S023	02/08/2007	Haitou, Ganyu, LYG	N34°56', E119°12'	
	S027	03/08/2007	Yangkou beach, QD	N36°14', E120°41'	
	S079	12/08/2007	Huiquan Bay, QD	N36°03', E120°20'	
	S112	22/08/2007	Huiquan Bay, QD	N36°03', E120°20'	
	S149	22/04/2008	Xuejiadao, QD	N35°53', E120°10'	
	S203	28/04/2008	Haikou, Hainan	N20°01', E110°16'	
	S209	29/04/2008	Yintan, BH	N21°24', E109°09'	
	S217	02/05/2008	Shenzhen Bay, SZ	N22°31', E114°01'	
	S199	25/06/2008	Chunhu, Ningbo	N29°32', E121°31'	
	S599	16/03/2009	Longzhou Pool, XM	N24°34', E118°05'	
	S654	01/06/2011	Haikou, Hainan	N20°01', E110°32'	
	S964	18/06/2014	Aquaculture pond, YC	N33°15', E120°45'	
	S981-1a, S982-1a, S983-1a, U127-1a	00/08/2014	Bathing beach, QHD	N39°55', E119°37'	
	N001, N017-2	09/05/2017	Ninghai, Ningbo	N29°26', E121°33'	
	N005	11/05/2017	Aquaculture pond, YC	N33°15', E120°47'	
	QD188	08/11/2017	Huiquan Bay, QD	N36°03', E120°20'	
	H882, H883, H898, H899, H901	27/11/2017	Huiquan Bay, QD	N36°03', E120°20'	
	H900	27/11/2017	Huiquan Bay, QD	N36°03', E120°20'	MK426975
	H907~H909, H911, H913	29/11/2017	Huiquan Bay, QD	N36°03', E120°20'	
	H910	29/11/2017	Huiquan Bay, QD	N36°03', E120°20'	MK426976
	H912	29/11/2017	Huiquan Bay, QD	N36°03', E120°20'	MK426977
	H926, H927, H929~H939, H941	29/11/2017	Huiquan Bay, QD	N36°03', E120°20'	
	H928	30/11/2017	Huiquan Bay, QD	N36°03', E120°20'	MK426978

	H940	30/11/2017	Huiquan Bay, QD	N36°03', E120°20'	MK426979
	H942~H946, H948~H954	07/12/2017	Huiquan Bay, QD	N36°03', E120°20'	
	H955	07/12/2017	Huiquan Bay, QD	N36°03', E120°20'	MK430433
	H956	07/12/2017	Huiquan Bay, QD	N36°03', E120°20'	MK430433
	U225 ^a	19/04/2018	Xuwen, ZJ	N20°17', E110°04'	MK426967
	U224 ^a , U226~U228 ^a , U233 ^a , U234 ^a	19/04/2018	Xuwen, ZJ	N20°17', E110°04'	
	U262~U264 ^a , U266 ^a , U268~U269 ^a	19/04/2018	Xuwen, ZJ	N20°17', E110°04'	
	U270 ^a	19/04/2018	Xuwen, ZJ	N20°17', E110°04'	MK426973
	U273 ^a	19/04/2018	Xuwen, ZJ	N20°17', E110°04'	MK426974
	U271 ^a , U272 ^a , U274 ^a	19/04/2018	Xuwen, ZJ	N20°17', E110°04'	
	U246-8	23/05/2018	Aquaculture pond, YC	N33°15', E120°47'	MK426970
	U247-3	23/05/2018	Aquaculture pond, YC	N33°15', E120°47'	MK426971
	U261-3	25/05/2018	Aquaculture pond, RZ	N35°29', E119°36'	
	U261-4	25/05/2018	Aquaculture pond, RZ	N35°29', E119°36'	MK426972
	N177-1, N177-2	28/08/2018	Beach, WH	N37°31', E122°09'	
	N186-1, N189-2, N189-5	17/10/2018	Liugong Island, WH	N37°30', E122°11'	
	U277-1 ^a	23/11/2018	Guanhai Gallery, ZJ	N21°13', E110°25'	MK426968
	U277-3 ^a	23/11/2018	Guanhai Gallery, ZJ	N21°13', E110°25'	MK426969
	U277-2 ^a , U277-4~U277-6 ^a	23/11/2018	Guanhai Gallery, ZJ	N21°13', E110°25'	
<i>U. partita</i>	N176-1	28/08/2018	Beach, WH	N37°31', E122°09'	MK426962
	N176-2	28/08/2018	Beach, WH	N37°31', E122°09'	MK426963
	N176-3	28/08/2018	Beach, WH	N37°31', E122°09'	MK426964
	N176-4	28/08/2018	Beach, WH	N37°31', E122°09'	MK426965
<i>U. simplex</i>	N042, N043	15/07/2011	Daishan Island, ZS	N30°17', E122°13'	
	QD068, QD069	01/12/2011	Huiquan Bay, QD	N36°03', E120°20'	
	S743_1a	05/12/2012	Taiping Bay, QD	N36°03', E120°21'	
	S954	17/06/2014	Yanwei Port, LYG	N34°29', E119°47'	
	S961	18/06/2014	Sheyang, YC	N33°45', E120°27'	
	S966	19/06/2014	Dongtai, YC	N32°50', E120°55'	
	S969	19/06/2014	Rudong, NT	N32°31', E121°11'	
	N005-1	11/05/2017	Dafeng, YC	N33°15', E120°47'	
	N067, N074	30/05/2017	Qidong, NT	N31°55', E121°51'	

<i>U. splitiana</i>	N132, N133	31/05/2017	LYG	N34°39', E119°29'	
	U246-11	23/05/2018	Dafeng, YC	N33°15', E120°47'	MK418843
	U246-21, U246-31, U246-32, U246-34	23/05/2018	Dafeng, YC	N33°15', E120°47'	
	U246-33	23/05/2018	Dafeng, YC	N33°15', E120°47'	MK418844
	U246-35	23/05/2018	Dafeng, YC	N33°15', E120°47'	MK430432
	U249-4, U251-1~U251-3	24/05/2018	Sheyang, YC	N33°47', E120°27'	
	U251-4	24/05/2018	Sheyang, YC	N33°54', E120°26'	MK418842
	U255-1	24/05/2018	Yanwei Port, LYG	N34°30', E119°46'	MK418841
	U255-2~U255-5, U255-9, U255-10	24/05/2018	Yanwei Port, LYG	N34°30', E119°46'	
	U258-2	24/05/2018	LYG	N34°39', E119°29'	MK418840
	S549	23/03/2009	Huiquan Bay, QD	N36°03', E120°20'	
	S649	13/03/2010	Heishi Reef, DL	N38°52', E121°34'	
	QD006	13/04/2010	Huiquan Bay, QD	N36°03', E120°20'	
	QD038, QD039-1a, QD040, QD041, QD049	04/05/2010	Taiping Bay, QD	N36°03', E120°21'	
<i>U. tepida</i>	H819	31/05/2017	Beach, YT	N37°28', E121°28'	MK426989
	H820	31/05/2017	Beach, YT	N37°28', E121°28'	MK426988
	H821	31/05/2017	Beach, YT	N37°28', E121°28'	MK426987
	H822	31/05/2017	Beach, YT	N37°28', E121°28'	MK426986
	H824	31/05/2017	Beach, YT	N37°28', E121°28'	MK426990
	S058	09/08/2007	Jiaonan, QD	N35°37', E119°48'	
	S059	09/08/2007	Jiaonan, QD	N35°35', E119°45'	
	S576	15/03/2009	Bathing Beach, XM	N24°30', E118°12'	
	S586	16/03/2009	Gulangyu Island, XM	N24°27', E118°03'	
	QD064	01/12/2011	Huiquan Bay, QD	N36°03', E120°20'	
	S787	21/03/2013	Longzhou Pool, XM	N24°34', E118°06'	
	S979-1a	14/04/2014	Weizhou Island, BH	N21°01', E109°05'	
	QD165	08/11/2017	Huiquan Bay, QD	N36°03', E120°20'	MK426952
	QD166, QD167	08/11/2017	Huiquan Bay, QD	N36°03', E120°20'	
	QD168	08/11/2017	Huiquan Bay, QD	N36°03', E120°20'	MK426959
	QD169	08/11/2017	Huiquan Bay, QD	N36°03', E120°20'	MK426960
	QD171~ QD173, QD177	08/11/2017	Huiquan Bay, QD	N36°03', E120°20'	

QD178, QD182, QD184~ QD187	08/11/2017	Huiquan Bay, QD	N36°03', E120°20'	
QD181	08/11/2017	Huiquan Bay, QD	N36°03', E120°20'	MK426961
H884	27/11/2017	Huiquan Bay, QD	N36°03', E120°20'	MK426955
H886~H888	27/11/2017	Huiquan Bay, QD	N36°03', E120°20'	
H903	27/11/2017	Huiquan Bay, QD	N36°03', E120°20'	MK426956
H904	27/11/2017	Huiquan Bay, QD	N36°03', E120°20'	MK426957
H914, H918	29/11/2017	Huiquan Bay, QD	N36°03', E120°20'	
H919	29/11/2017	Huiquan Bay, QD	N36°03', E120°20'	MK426958
U229 ^a	19/04/2018	Xuwen, ZJ	N20°17', E110°04'	MK426953
U231 ^a , U235 ^a , U276 ^a	19/04/2018	Xuwen, ZJ	N20°17', E110°04'	
U232 ^a	19/04/2018	Xuwen, ZJ	N20°17', E110°04'	MK426954
N172-1~N172-3	18/07/2018	Tiantangpo, FCG	N21°33', E108°28'	
N173-1~N173-3	19/07/2018	Weizhou Island, BH	N21°03', E109°08'	
N180-2	28/08/2018	Beach, WH	N37°31', E122°09'	

^a indicates green-tide samples. BH = Beihai; DL = Dalian; FCG = Fangchenggang; QD = Qingdao; LYG = Lianyungang; NT = Nantong; QHD = Qinhuangdao; RZ = Rizhao; SZ = Shenzhen; WH = Weihai; XM = Xiamen; YC = Yancheng; YT = Yantai; ZJ = Zhanjiang; ZS = Zhoushan.

Supplementary table 2. Information of all highly similar sequences (identity $\geq 98\%$) downloaded from NCBI and identified as from *U. meridionalis* based on phylogenetic analysis.

Annotated species	Marker	GenBank	Author	Title	Collection site	Collection date	Submission time	Publication
<i>U. prolifera</i>	ITS	MG831310	Shen, W.	A new molecular label applied to the study of the Yellow Sea green tide	China: Xiangshan	23/11/2017	22/01/2018	No
<i>U. prolifera</i>	ITS	KT802958	Zhang, Q.	<i>Porphyra</i> aquaculture rafts is the major source of floating green algae in the Yellow Sea: evidence of intraspecific genetic analysis on <i>Ulva prolifera</i>	China: Zhejiang	—	21/09/2015	No
<i>U. prolifera</i>	ITS	KT802959	Zhang, Q.	<i>Porphyra</i> aquaculture rafts is the major source of floating green algae in the Yellow Sea: evidence of intraspecific genetic analysis on <i>Ulva prolifera</i>	China: Zhejiang	—	21/09/2015	No
<i>U. prolifera</i>	ITS	KT802960	Zhang, Q.	<i>Porphyra</i> aquaculture rafts is the major source of floating green algae in the Yellow Sea: evidence of intraspecific genetic analysis on <i>Ulva prolifera</i>	China: Zhejiang	—	21/09/2015	No
<i>Ulva</i> sp.	ITS	KT802953	Zhang, Q.	<i>Porphyra</i> aquaculture rafts is the major source of floating green algae in the Yellow Sea: evidence of intraspecific genetic analysis on <i>Ulva prolifera</i>	China: Guangxi, Qinzhou	—	21/09/2015	No
<i>Ulva</i> sp.	ITS	KT802954	Zhang, Q.	<i>Porphyra</i> aquaculture rafts is the major source of floating green algae in the Yellow Sea: evidence of intraspecific genetic analysis on <i>Ulva prolifera</i>	China: Guangxi, Qinzhou	—	21/09/2015	No
<i>Ulva</i> sp.	ITS	JN183944	Duan <i>et al.</i>	<i>Ulva yongensis</i> sp. nov. from a pond in Ningbo, China	—	—	27/06/2011	No
<i>Ulva</i> sp.	ITS	FJ194957	Lu <i>et al.</i>	Biodiversity of <i>Enteromorpha</i> ITS1 and ITS2 sequence	China	—	07/09/2008	No
<i>Ulva</i> sp.	ITS	FJ374286	Zheng <i>et</i>	Cloning and sequence analysis of 5.8S	China	—	01/10/2008	No

<i>Ulva</i> sp.	ITS	GQ202118	<i>al.</i> Liu <i>et al.</i> 2010	rDNA and ITS region from <i>Ulva</i> sp. Recurrence of the world's largest green-tide in 2009 in Yellow Sea, China: <i>Porphyra yezoensis</i> aquaculture rafts confirmed as nursery for macroalgal blooms	China	—	21/03/2009	Yes
<i>U. prolifera</i>	ITS	JQ963195	Wang <i>et al.</i>	Molecular biology verification of biparental inheritance in cytoplasm DNA of <i>Ulva prolifera</i>	—	09/06/2011	18/04/2012	No
<i>U. prolifera</i>	ITS	JQ963197	Wang <i>et al.</i>	Molecular biology verification of biparental inheritance in cytoplasm DNA of <i>Ulva prolifera</i>	—	09/06/2011	18/04/2012	No
<i>U. prolifera</i>	ITS	JQ963200	Wang <i>et al.</i>	Molecular biology verification of biparental inheritance in cytoplasm DNA of <i>Ulva prolifera</i>	—	09/06/2011	18/04/2012	No
<i>U. prolifera</i>	ITS	JQ963201	Wang <i>et al.</i>	Molecular biology verification of biparental inheritance in cytoplasm DNA of <i>Ulva prolifera</i>	—	09/06/2011	18/04/2012	No
<i>U. prolifera</i>	ITS	KP975378	Chen <i>et al.</i>	—	China: Qingdao	20/08/2014	16/03/2015	No
<i>U. prolifera</i>	ITS	KR006939	Chen <i>et al.</i>	Rapid detection of <i>Ulva compressa</i> by loop-mediated isothermal amplification combined with lateral flow dipstick	—	—	16/03/2015	Yes
<i>Ulva</i> sp.	ITS	AB298457	Shimada <i>et al.</i> 2008	Phylogeography of the genus <i>Ulva</i> (Ulvophyceae, Chlorophyta), with special reference to the Japanese freshwater and brackish taxa	Japan: Tokushima, Tokushima, Yoshino River	18/07/2000	19/03/2007	Yes
<i>Ulva</i> sp.	ITS	AB298458	Shimada <i>et al.</i> 2008	Phylogeography of the genus <i>Ulva</i> (Ulvophyceae, Chlorophyta), with special reference to the Japanese freshwater and brackish taxa	Japan: Okinawa, Ishigaki Is., Hirakubo	30/09/2004	19/03/2007	Yes

<i>Ulva</i> sp.	ITS	AB298459	Shimada <i>et al.</i> 2008	Phylogeography of the genus <i>Ulva</i> (Ulvophyceae, Chlorophyta), with special reference to the Japanese freshwater and brackish taxa	River Japan: Okinawa, Ishigaki	30/09/2004	19/03/2007	Yes
<i>Ulva</i> sp.	ITS	AB298460	Shimada <i>et al.</i> 2008	Phylogeography of the genus <i>Ulva</i> (Ulvophyceae, Chlorophyta), with special reference to the Japanese freshwater and brackish taxa	Japan: Kagoshima, Ichiki- Kushikino	24/11/2005	19/03/2007	Yes
<i>Ulva</i> sp.	ITS	AB298461	Shimada <i>et al.</i> 2008	Phylogeography of the genus <i>Ulva</i> (Ulvophyceae, Chlorophyta), with special reference to the Japanese freshwater and brackish taxa	Japan: Kagoshima, Kagoshima	24/11/2005	19/03/2007	Yes
<i>Ulva</i> sp.	ITS	AB598807	Horimoto <i>et al.</i> 2011	<i>Enteromorpha</i> -like <i>Ulva</i> (Ulvophyceae, Chlorophyta) Growing in the Todoroki River, Ishigaki Island, Japan, with special reference to <i>Ulva meridionalis</i> Horimoto et Shimada, sp. nov	Japan: Okinawa, Ishigaki island, Todoroki River	16/02/2009	05/11/2010	Yes
<i>Ulva</i> sp.	ITS	AB830512	Ogawa <i>et al.</i> 2013	Differences of spatial distribution and seasonal succession among <i>Ulva</i> species (Ulvophyceae) across salinity gradients	Japan: Fukui, Mihama, Lake Kugushi	10/09/2010	09/07/2013	Yes
<i>U. prolifera</i>	<i>rbcL</i>	JQ963232	Wang <i>et al.</i>	Molecular biology verification of biparental inheritance in cytoplasm DNA of <i>Ulva prolifera</i>	—	—	18/04/2012	No
<i>U. prolifera</i>	<i>rbcL</i>	JQ963230	Wang <i>et al.</i>	Molecular biology verification of biparental inheritance in cytoplasm DNA of <i>Ulva prolifera</i>	—	—	18/04/2012	No
<i>U. prolifera</i>	<i>rbcL</i>	JQ963247	Wang <i>et al.</i>	Molecular biology verification of biparental inheritance in cytoplasm DNA of <i>Ulva prolifera</i>	—	—	18/04/2012	No

<i>U. meridionalis</i>	<i>rbcL</i>	AB598813	Horimoto <i>et al.</i> 2011	<i>Enteromorpha</i> -like <i>Ulva</i> (Ulvophyceae, Chlorophyta) growing in the Todoroki River, Ishigaki Island, Japan, with special reference to <i>Ulva</i> <i>meridionalis</i> Horimoto et Shimada, sp. nov	Japan: Tokushima, Tokushima, Yoshino River	18/07/2000	05/11/2010	Yes
<i>Ulva</i> sp.	<i>rbcL</i>	AB598812	Horimoto <i>et al.</i> 2011	<i>Enteromorpha</i> -like <i>Ulva</i> (Ulvophyceae, Chlorophyta) growing in the Todoroki River, Ishigaki Island, Japan, with special reference to <i>Ulva</i> <i>meridionalis</i> Horimoto et Shimada, sp. nov	Japan: Okinawa, Ishigaki island, Todoroki River	16/02/2009	05/11/2010	Yes
<i>Ulva</i> sp.	<i>rbcL</i>	AB830524	Ogawa <i>et</i> <i>al.</i> 2013	Differences of spatial distribution and seasonal succession among <i>Ulva</i> species (Ulvophyceae) across salinity gradients	Japan: Fukui, Mihama, Lake Kugushi	10/09/2010	09/07/2013	Yes

—indicates no information.

Supplementary table 3. Information of all highly similar sequences (identity $\geq 98\%$) downloaded from NCBI and identified as from *U. simplex* based on phylogenetic analysis.

Annotated species	Marker	GenBank	Author	Title	Collection site	Collection date	Submission date	Publication
<i>U. simplex</i>	ITS	AB830507	Ogawa <i>et al.</i> 2013	Differences of spatial distribution and seasonal succession among <i>Ulva</i> species (Ulvophyceae) across salinity gradients	Japan: Fukui, Obama, Minami River	22/08/2011	19/07/2013	Yes
<i>U. simplex</i>	ITS	AB830506	Ogawa <i>et al.</i> 2013	Differences of spatial distribution and seasonal succession among <i>Ulva</i> species (Ulvophyceae) across salinity gradients	Japan: Ibaraki, Ibaraki-cho, Hinuma	05/08/2009	19/07/2013	Yes
<i>U. simplex</i>	ITS	AB830505	Ogawa <i>et al.</i> 2013	Differences of spatial distribution and seasonal succession among <i>Ulva</i> species (Ulvophyceae) across salinity gradients	Japan: Fukui, Wakasa, Lake Kugushi	19/10/2009	19/07/2013	Yes
<i>U. simplex</i>	ITS	AB830504	Ogawa <i>et al.</i> 2013	Differences of spatial distribution and seasonal succession among <i>Ulva</i> species (Ulvophyceae) across salinity gradients	Japan: Fukui, Wakasa, Lake Kugushi	19/10/2009	19/07/2013	Yes
<i>U. linza</i>	ITS	JN093109	Lin <i>et al.</i>	The comparisons of sequence analyses among several species of Ulvaceae using ITS, SSU and <i>rbcL</i>	—	15/03/2011	15/06/2011	No
<i>U. prolifera</i>	ITS	HM047555	Shen <i>et al.</i>	The comparisons of sequence analysis of the ITS region among several types of green algae in Ulvaceae	—	—	30/03/2010	No
<i>U. prolifera</i>	ITS	HM047552	Shen <i>et al.</i>	The comparisons of sequence analysis of the ITS region among several types of green algae in Ulvaceae	—	—	30/03/2010	No
<i>U. simplex</i>	<i>rbcL</i>	AB830517	Ogawa <i>et al.</i> 2013	Differences of spatial distribution and seasonal succession among <i>Ulva</i> species (Ulvophyceae) across salinity gradients	Japan: Fukui, Mihama, Lake Kugushi	09/10/2010	09/07/2013	Yes

— indicates no information.

Supplementary table 4. Information of all highly similar sequences (identity $\geq$ 98%) downloaded from NCBI and identified as from *U. chaugulii* based on phylogenetic analysis.

Annotated species	Marker	GenBank	Author	Title	Collection site	Collection date	Submission date	Publication
<i>U. chaugulii</i>	ITS	KT429219	Kazi <i>et al.</i> 2016	Morphological and molecular characterization of <i>Ulva chaugulii</i> sp. nov., <i>U. lactuca</i> and <i>U. ohnoi</i> (Ulvophyceae, Chlorophyta) from Indian coast	India: Vayangani	06/09/2014	14/08/2015	Yes
<i>U. chaugulii</i>	ITS	KT429218	Kazi <i>et al.</i> 2016	Morphological and molecular characterization of <i>Ulva chaugulii</i> sp. nov., <i>U. lactuca</i> and <i>U. ohnoi</i> (Ulvophyceae, Chlorophyta) from Indian coast	India: Vayangani	06/09/2014	14/08/2015	Yes
<i>U. lactuca</i>	ITS	AF099725	Woolcott <i>et al.</i> 1999	<i>Ulva</i> and <i>Enteromorpha</i> (Ulvales, Ulvophyceae, Chlorophyta) in eastern Australia: comparison of morphological features and analyses of nuclear sequence data	Australia: Alexandria Bay	—	20/10/1998	Yes
<i>Ulva</i> sp.	ITS	KF195500	Lawton <i>et al.</i> 2013	Algal bioremediation of waste waters from land-based aquaculture using <i>Ulva</i> : selecting target species and strains	Australia: Good Fortune Bay Fisheries	—	30/03/2013	Yes
<i>U. linza</i>	ITS	KC661339	Gupta <i>et al.</i>	Molecular phylogeny of genus <i>Ulva</i> from Indian coast	—	—	02/02/2013	No
<i>U. linza</i>	ITS	KC661343	Gupta <i>et al.</i>	Molecular phylogeny of genus <i>Ulva</i> from Indian coast	—	—	02/02/2013	No
<i>U. chaugulii</i>	ITS	KU377311	Pirian <i>et al.</i> 2016	Molecular and morphological characterisation of <i>Ulva chaugulii</i> , <i>U. paschima</i> and <i>U. ohnoi</i> (Ulvophyceae)	Iran: Persian Gulf,	30/03/2013	04/01/2016	Yes

				from the Persian Gulf, Iran	Hormuz island			
<i>U. chaugulii</i>	ITS	KU377312	Pirian <i>et al.</i> 2016	Molecular and morphological characterisation of <i>Ulva chaugulii</i> , <i>U. paschima</i> and <i>U. ohnoi</i> (Ulvophyceae) from the Persian Gulf, Iran	Iran: Persian Gulf, Hormuz island	30/03/2013	04/01/2016	Yes
<i>U. chaugulii</i>	ITS	KU377313	Pirian <i>et al.</i> 2016	Molecular and morphological characterisation of <i>Ulva chaugulii</i> , <i>U. paschima</i> and <i>U. ohnoi</i> (Ulvophyceae) from the Persian Gulf, Iran	Iran: Persian Gulf, Bandar-Abbas	28/01/2013	04/01/2016	Yes
<i>U. chaugulii</i>	ITS	KU377314	Pirian <i>et al.</i> 2016	Molecular and morphological characterisation of <i>Ulva chaugulii</i> , <i>U. paschima</i> and <i>U. ohnoi</i> (Ulvophyceae) from the Persian Gulf, Iran	Iran: Persian Gulf, Qeshm island	30/03/2013	04/01/2016	Yes
<i>U. chaugulii</i>	ITS	KU377315	Pirian <i>et al.</i> 2016	Molecular and morphological characterisation of <i>Ulva chaugulii</i> , <i>U. paschima</i> and <i>U. ohnoi</i> (Ulvophyceae) from the Persian Gulf, Iran	Iran: Persian Gulf, Bandar-Abbas	08/03/2013	04/01/2016	Yes
<i>U. chaugulii</i>	<i>rbcL</i>	MG704804	Krupnik <i>et al.</i> 2018	Native, invasive and cryptogenic <i>Ulva</i> species from the Israeli Mediterranean Sea: risk and potential	Israel: Herzliya,	—	16/12/2017	Yes
<i>U. compressa</i>	<i>rbcL</i>	KC661379	Gupta <i>et al.</i>	Molecular phylogeny of genus <i>Ulva</i> from Indian coast	—	—	02/02/2013	No
<i>U. chaugulii</i>	<i>rbcL</i>	KP710832	Kazi <i>et al.</i> 2016	Morphological and molecular characterization of <i>Ulva chaugulii</i> sp. nov., <i>U. lactuca</i> and <i>U. ohnoi</i> (Ulvophyceae, Chlorophyta) from India	India: Vayangani	09/06/2014	22/01/2015	Yes
<i>U. chaugulii</i>	<i>rbcL</i>	KP710829	Kazi <i>et al.</i>	Morphological and molecular	India:	09/06/2014	22/01/2015	Yes

			2016	characterization of <i>Ulva chaugulii</i> sp. nov., <i>U. lactuca</i> and <i>U. ohnoi</i> (Ulvophyceae, Chlorophyta) from India	Vayangani			
<i>U. chaugulii</i>	<i>rbcL</i>	KP710833	Kazi <i>et al.</i> 2016	Morphological and molecular characterization of <i>Ulva chaugulii</i> sp. nov., <i>U. lactuca</i> and <i>U. ohnoi</i> (Ulvophyceae, Chlorophyta) from India	India: Vayangani	09/06/2014	22/01/2015	Yes
<i>U. chaugulii</i>	<i>rbcL</i>	KP710831	Kazi <i>et al.</i> 2016	Morphological and molecular characterization of <i>Ulva chaugulii</i> sp. nov., <i>U. lactuca</i> and <i>U. ohnoi</i> (Ulvophyceae, Chlorophyta) from India	India: Vayangani	09/06/2014	22/01/2015	Yes
<i>U. chaugulii</i>	<i>rbcL</i>	KP710830	Kazi <i>et al.</i> 2016	Morphological and molecular characterization of <i>Ulva chaugulii</i> sp. nov., <i>U. lactuca</i> and <i>U. ohnoi</i> (Ulvophyceae, Chlorophyta) from India	India: Vayangani	09/06/2014	22/01/2015	Yes
<i>U. chaugulii</i>	<i>tufA</i>	MG976862	Krupnik <i>et al.</i> 2018	Native, invasive and cryptogenic <i>Ulva</i> species from the Israeli Mediterranean Sea: risk and potential	Israel	—	18/02/2018	Yes
<i>U. chaugulii</i>	<i>tufA</i>	MG976863	Krupnik <i>et al.</i> 2018	Native, invasive and cryptogenic <i>Ulva</i> species from the Israeli Mediterranean Sea: risk and potential	Israel	—	18/02/2018	Yes
<i>Ulva</i> sp.	<i>tufA</i>	KF195535	Lawton <i>et al.</i> 2013	Algal bioremediation of waste waters from land-based aquaculture using <i>Ulva</i> : selecting target species and strains	Australia	—	05/06/2013	Yes

— indicates no information.

Supplementary table 5. Information of all highly similar sequences (identity $\geq$ 98%) downloaded from NCBI and identified as from *U. tepida* based on phylogenetic analysis.

Annotated species	Marker	GenBank	Author	Title	Collection site	Collection date	Submission date	Publication
<i>U. intestinalis</i>	ITS	HM047554	Shen <i>et al.</i>	The comparisons of sequence analysis of the ITS region among several types of green algae in Ulvaceae	—	—	30/03/2010	No
<i>U. intestinalis</i>	ITS	HM047556	Shen <i>et al.</i>	The comparisons of sequence analysis of the ITS region among several types of green algae in Ulvaceae	—	—	30/03/2010	No
<i>U. intestinalis</i>	ITS	HM047557	Shen <i>et al.</i>	The comparisons of sequence analysis of the ITS region among several types of green algae in Ulvaceae	—	—	30/03/2010	No
<i>Ulva</i> sp.	ITS	HM047558	Shen <i>et al.</i>	The comparisons of sequence analysis of the ITS region among several types of green algae in Ulvaceae	—	—	30/03/2010	No
<i>Ulva</i> sp.	ITS	HM047559	Shen <i>et al.</i>	The comparisons of sequence analysis of the ITS region among several types of green algae in Ulvaceae	—	—	30/03/2010	No
<i>U. intestinalis</i>	ITS	KT802950	Zhang, Q.	<i>Porphyra</i> aquaculture rafts is the major source of floating green algae in the Yellow Sea: evidence of intraspecific genetic analysis on <i>Ulva prolifera</i>	China: Xiamen coastline, Fujian	—	21/09/2015	No
<i>U. intestinalis</i>	ITS	KT802949	Zhang, Q.	<i>Porphyra</i> aquaculture rafts is the major source of floating green algae in the Yellow Sea: evidence of intraspecific genetic analysis on <i>Ulva prolifera</i>	China: Xiamen coastline, Fujian	—	21/09/2015	No
<i>U. intestinalis</i>	ITS	MF139229	Shen, W.	—	—	—	19/03/2017	No
<i>U. intestinalis</i>	ITS	MF139300	Shen, W.	—	—	—	19/03/2017	No
<i>U. intestinalis</i>	ITS	MF139301	Shen, W.	—	—	—	19/05/2017	No

<i>U. sapora</i>	ITS	AB298462	Shimada <i>et al.</i> 2008	Phylogeography of the genus <i>Ulva</i> (Ulvophyceae, Chlorophyta), with special reference to the Japanese freshwater and brackish taxa	Japan: Okinawa, Naijou	09/05/2005	09/03/2007	Yes
<i>U. sapora</i>	ITS	AB298463	Shimada <i>et al.</i> 2008	Phylogeography of the genus <i>Ulva</i> (Ulvophyceae, Chlorophyta), with special reference to the Japanese freshwater and brackish taxa	Japan: Okinawa, Naijou	09/05/2005	09/03/2007	Yes
<i>Ulva</i> sp.	ITS	AB598809	Shimada <i>et al.</i> 2008	<i>Enteromorpha</i> -like <i>Ulva</i> (Ulvophyceae, Chlorophyta) growing in the Todoroki River, Ishigaki Island, Japan, with special reference to <i>Ulva meridionalis</i> Horimoto et Shimada, sp. nov	Japan: Okinawa, Ishigaki island, Todoroki River	16/02/2009	05/11/2010	Yes
<i>U. tepida</i>	ITS	AB904766	Masakiyo <i>et al.</i> 2014	Species Diversity of the Genus <i>Ulva</i> (Ulvophyceae, Chlorophyta) in Japanese Waters, with special reference to <i>Ulva tepida</i> Masakiyo et S. Shimada sp. nov	Japan: Okinawa, Kyann	31/09/2012	18/01/2014	Yes
<i>U. tepida</i>	ITS	AB904767	Masakiyo <i>et al.</i> 2014	Species Diversity of the Genus <i>Ulva</i> (Ulvophyceae, Chlorophyta) in Japanese Waters, with special reference to <i>Ulva tepida</i> Masakiyo et S. Shimada sp. nov	Japan: Kanagawa, Fujisawa	08/03/2012	18/01/2014	Yes
<i>U. paschima</i>	ITS	KF385501	Bast <i>et al.</i> 2014	Strong endemism of bloom-forming tubular <i>Ulva</i> in Indian west coast, with description of <i>Ulva paschima</i> sp. nov. (Ulvales, Chlorophyta)	India: Ponnani	02/06/2012	12/07/2013	Yes
<i>U. paschima</i>	ITS	KF385504	Bast <i>et al.</i> 2014	Strong endemism of bloom-forming tubular <i>Ulva</i> in Indian west coast, with description of <i>Ulva paschima</i> sp. nov. (Ulvales, Chlorophyta)	India: Anjuna	20/05/2012	12/07/2013	Yes
<i>U. paschima</i>	ITS	KF385506	Bast <i>et al.</i> 2014	Strong endemism of bloom-forming tubular <i>Ulva</i> in Indian west coast, with	India: Kundapur	20/05/2012	12/07/2013	Yes

				description of <i>Ulva paschima</i> sp. nov. (Ulvales, Chlorophyta)				
<i>U. paschima</i>	ITS	KU377310	Pirian <i>et al.</i> 2016	Molecular and morphological characterisation of <i>Ulva chaugulii</i> , <i>U.</i> <i>paschima</i> and <i>U. ohnoi</i> (Ulvophyceae) from the Persian Gulf, Iran	Iran: Persian Gulf, Bandar- Abbas	17/02/2013	04/01/2016	Yes
<i>U. paschima</i>	ITS	KU377309	Pirian <i>et al.</i> 2016	Molecular and morphological characterisation of <i>Ulva chaugulii</i> , <i>U.</i> <i>paschima</i> and <i>U. ohnoi</i> (Ulvophyceae) from the Persian Gulf, Iran	Iran: Persian Gulf, Bandar- Abbas	25/01/2013	04/01/2016	Yes
<i>U. paschima</i>	ITS	KU377308	Pirian <i>et al.</i> 2016	Molecular and morphological characterisation of <i>Ulva chaugulii</i> , <i>U.</i> <i>paschima</i> and <i>U. ohnoi</i> (Ulvophyceae) from the Persian Gulf, Iran	Iran: Persian Gulf, Bandar- Abbas	03/03/2013	04/01/2016	Yes
<i>U. paschima</i>	ITS	KU377306	Pirian <i>et al.</i> 2016	Molecular and morphological characterisation of <i>Ulva chaugulii</i> , <i>U.</i> <i>paschima</i> and <i>U. ohnoi</i> (Ulvophyceae) from the Persian Gulf, Iran	Iran: Persian Gulf, Bandar- Abbas	17/02/2013	04/01/2016	Yes
<i>U. paschima</i>	ITS	KU377307	Pirian <i>et al.</i> 2016	Molecular and morphological characterisation of <i>Ulva chaugulii</i> , <i>U.</i> <i>paschima</i> and <i>U. ohnoi</i> (Ulvophyceae) from the Persian Gulf, Iran	Iran: Persian Gulf, Bandar- Abbas	30/03/2013	04/01/2016	Yes
<i>U. paschima</i>	ITS	KU377305	Pirian <i>et al.</i> 2016	Molecular and morphological characterisation of <i>Ulva chaugulii</i> , <i>U.</i> <i>paschima</i> and <i>U. ohnoi</i> (Ulvophyceae) from the Persian Gulf, Iran	Iran: Persian Gulf, Bandar- Abbas	14/02/2013	04/01/2016	Yes
<i>U. paschima</i>	ITS	KU377304	Pirian <i>et al.</i> 2016	Molecular and morphological characterisation of <i>Ulva chaugulii</i> , <i>U.</i> <i>paschima</i> and <i>U. ohnoi</i> (Ulvophyceae) from the Persian Gulf, Iran	Iran: Persian Gulf, Bandar- Abbas	28/01/2013	04/01/2016	Yes
<i>U. paschima</i>	ITS	KU377303	Pirian <i>et al.</i> 2016	Molecular and morphological characterisation of <i>Ulva chaugulii</i> , <i>U.</i>	Iran: Persian Gulf, Bandar-	14/01/2013	04/01/2016	Yes

				<i>paschima</i> and <i>U. ohnoi</i> (Ulvophyceae) from the Persian Gulf, Iran	Abbas			
<i>U. tepida</i>	ITS	KF534755	Lawton <i>et al.</i> 2014	Methods for the induction of reproduction in a tropical species of filamentous <i>Ulva</i>	Australia	—	12/08/2013	Yes
<i>U. tepida</i>	ITS	KF195487	Lawton <i>et al.</i> 2013	Algal bioremediation of waste waters from land-based aquaculture using <i>Ulva</i> : selecting target species and strains	Australia: Bribie Island	—	30/05/2013	Yes
<i>U. tepida</i>	ITS	KF195498	Lawton <i>et al.</i> 2013	Algal bioremediation of waste waters from land-based aquaculture using <i>Ulva</i> : selecting target species and strains	Australia: Good Fortune Bay Fisheries	—	30/05/2013	Yes
<i>U. tepida</i>	ITS	KF195490	Lawton <i>et al.</i> 2013	Algal bioremediation of waste waters from land-based aquaculture using <i>Ulva</i> : selecting target species and strains	Australia: Bribie Island, QLD	—	30/05/2013	Yes
<i>U. tepida</i>	ITS	KF195503	Lawton <i>et al.</i> 2013	Algal bioremediation of waste waters from land-based aquaculture using <i>Ulva</i> : selecting target species and strains	Australia: James Cook University	—	30/05/2013	Yes
<i>U. tepida</i>	ITS	KF195513	Lawton <i>et al.</i> 2013	Algal bioremediation of waste waters from land-based aquaculture using <i>Ulva</i> : selecting target species and strains	Australia: Pacific Reef Fisheries	—	30/05/2013	Yes
<i>U. tepida</i>	ITS	KF195517	Lawton <i>et al.</i> 2013	Algal bioremediation of waste waters from land-based aquaculture using <i>Ulva</i> : selecting target species and strains	Australia: Australian Prawn Farms	—	30/05/2013	Yes
<i>U. tepida</i>	ITS	KF195518	Lawton <i>et al.</i> 2013	Algal bioremediation of waste waters from land-based aquaculture using <i>Ulva</i> : selecting target species and strains	Australia: Caloundra	—	30/05/2013	Yes
<i>U. tepida</i>	ITS	KF195519	Lawton <i>et al.</i> 2013	Algal bioremediation of waste waters from land-based aquaculture using <i>Ulva</i> : selecting target species and strains	Australia: Caloundra	—	30/05/2013	Yes
<i>U. tepida</i>	ITS	KT374006	Phillips <i>et al.</i> 2016	<i>Ulva sapora</i> sp. nov., an abundant tubular species of <i>Ulva</i> (Ulvales) from the tropical Pacific Ocean	Australia: Bribie Island	—	06/08/2015	Yes
<i>U. tepida</i>	ITS	KT374007	Phillips <i>et</i>	<i>Ulva sapora</i> sp. nov., an abundant tubular	Australia:	—	06/08/2015	Yes

			<i>al.</i> 2016	species of <i>Ulva</i> (Ulvales) from the tropical Pacific Ocean	Shelley Beach, Caloundra Australia:	—			
<i>U. tepida</i>	ITS	KT374008	Phillips <i>et al.</i> 2016	<i>Ulva sapora</i> sp. nov., an abundant tubular species of <i>Ulva</i> (Ulvales) from the tropical Pacific Ocean	Great Fortune Bay Fisheries Australia	—	06/08/2015	Yes	
<i>U. tepida</i>	ITS	KT374009	Phillips <i>et al.</i> 2016	<i>Ulva sapora</i> sp. nov., an abundant tubular species of <i>Ulva</i> (Ulvales) from the tropical Pacific Ocean	Australia	—	06/08/2015	Yes	
<i>U. tepida</i>	ITS	KT370410	Phillips <i>et al.</i> 2016	<i>Ulva sapora</i> sp. nov., an abundant tubular species of <i>Ulva</i> (Ulvales) from the tropical Pacific Ocean	Australia: Shelley Beach, Caloundra	—	06/08/2015	Yes	
<i>U. tepida</i>	ITS	KT370411	Phillips <i>et al.</i> 2016	<i>Ulva sapora</i> sp. nov., an abundant tubular species of <i>Ulva</i> (Ulvales) from the tropical Pacific Ocean	Australia	—	06/08/2015	Yes	
<i>U. tepida</i>	ITS	MH828288	Chávez-Sánchez <i>et al.</i> 2019	First report, along with nomenclature adjustments, of <i>Ulva ohnoi</i> , <i>U. tepida</i> and <i>U. torta</i> (Ulvaceae, Ulvaes, Chlorophyta) from northwestern Mexico.	Mexico: Baja California	05/07/2017	02/09/2018	Yes	
<i>U. tepida</i>	ITS	MG704799	Krupnik <i>et al.</i> 2018	Native, invasive and cryptogenic <i>Ulva</i> species from the Israeli Mediterranean Sea: risk and potential	Israel	—	16/12/2017	Yes	
<i>Ulva</i> sp.	<i>rbcL</i>	AB598814	Horimoto <i>et al.</i> 2011	<i>Enteromorpha</i> -like <i>Ulva</i> (Ulvophyceae, Chlorophyta) growing in the Todoroki River, Ishigaki Island, Japan, with special reference to <i>Ulva meridionalis</i> Horimoto et Shimada, sp. nov.	Japan: Okinawa, Ishigaki island, Todoroki River	16/02/2009	05/11/2010	Yes	
<i>U. tepida</i>	<i>rbcL</i>	MG704834	Krupnik <i>et al.</i> 2018	Native, invasive and cryptogenic <i>Ulva</i> species from the Israeli Mediterranean Sea: risk and potential	Israel	—	17/12/2017	Yes	

<i>U. tepida</i>	<i>rbcL</i>	MG976872	Krupnik <i>et al.</i> 2018	Native, invasive and cryptogenic <i>Ulva</i> species from the Israeli Mediterranean Sea: risk and potential	Israel	—	18/02/2018	Yes
<i>U. tepida</i>	<i>tufA</i>	MG976872	Krupnik <i>et al.</i> 2018	Native, invasive and cryptogenic <i>Ulva</i> species from the Israeli Mediterranean Sea: risk and potential	Israel	—	18/02/2018	Yes
<i>U. intestinalis</i>	<i>tufA</i>	KC661439	Gupta <i>et al.</i>	Molecular phylogeny of genus <i>Ulva</i> from Indian coast	—	—	02/02/2013	No

— indicates no information.

Supplementary table 6. Information of all highly similar sequences (identity $\geq$ 98%) downloaded from NCBI and identified as from *U. partita* based on phylogenetic analysis.

Annotated species	Marker	GenBank	Author	Title	Collection site	Collection date	Submission date	Publication
<i>U. partita</i>	ITS	LC021416	Ichihara <i>et al.</i> 2015	<i>Ulva partita</i> sp. nov., a novel <i>Enteromorpha</i> -like <i>Ulva</i> species from Japanese coastal areas	Japan: Kochi	09/12/2014	26/01/2015	Yes
<i>Ulva</i> sp.	ITS	AB830498	Ogawa <i>et al.</i> 2013	Differences of spatial distribution and seasonal succession among <i>Ulva</i> species (Ulvophyceae) across salinity gradients	Japan: Fukui, Wakasa, Shikimi	01/04/2009	09/07/2013	Yes
<i>Ulva</i> sp.	ITS	AB830497	Ogawa <i>et al.</i> 2013	Differences of spatial distribution and seasonal succession among <i>Ulva</i> species (Ulvophyceae) across salinity gradients	Japan: Fukui, Mihama, Hiruga	20/04/2009	09/07/2013	Yes
<i>Ulva</i> sp.	ITS	AB830496	Ogawa <i>et al.</i> 2013	Differences of spatial distribution and seasonal succession among <i>Ulva</i> species (Ulvophyceae) across salinity gradients	Japan: Fukui, Mihama, Hiruga	20/04/2009	09/07/2013	Yes
<i>Ulva</i> sp.	ITS	AB830499	Ogawa <i>et al.</i> 2013	Differences of spatial distribution and seasonal succession among <i>Ulva</i> species (Ulvophyceae) across salinity gradients	Japan: Fukui, Mihama, Hiruga	27/06/2011	09/07/2013	Yes
<i>Ulva</i> sp.	ITS	AB275846	Shimada <i>et al.</i> 2008	Phylogeography of the genus <i>Ulva</i> (Ulvophyceae, Chlorophyta), with special reference to the Japanese freshwater and brackish taxa	Japan: Hokkaido, Rumoi Naoko Yokoyama	09/08/2004	28/06/2009	Yes
<i>U. partita</i>	<i>rbcL</i>	LC021415	Ichihara <i>et al.</i> 2015	<i>Ulva partita</i> sp. nov., a Novel <i>Enteromorpha</i> -like <i>Ulva</i> species from Japanese coastal areas	Japan: Kochi	09/12/2014	26/06/2015	Yes
<i>Ulva</i> sp.	<i>rbcL</i>	AB830518	Ogawa <i>et al.</i> 2013	Differences of spatial distribution and seasonal succession among <i>Ulva species</i> (Ulvophyceae) across salinity gradients	Japan: Fukui, Mihama, Hiruga	19/10/2009	09/07/2013	Yes

Supplementary table 7. Information of all highly similar sequences (identity $\geq 98\%$) downloaded from NCBI and identified as from *U. splitiana* based on phylogenetic analysis.

Annotated species	Marker	GenBank	Author	Title	Collection site	Collection date	Submission date	Publication
<i>U. prolifera</i>	ITS	MF041742	Lamb <i>et al.</i>	Identification of the macroalgal assemblage and molecular diversity of <i>Ulva</i> sp. in Jamaica Bay, New York	—	—	20/05/2017	No
<i>U. prolifera</i>	ITS	MF041741	Lamb <i>et al.</i>	Identification of the macroalgal assemblage and molecular diversity of <i>Ulva</i> sp. in Jamaica Bay, New York	—	—	20/05/2017	No
<i>U. prolifera</i>	ITS	MF041740	Lamb <i>et al.</i>	Identification of the macroalgal assemblage and molecular diversity of <i>Ulva</i> sp. in Jamaica Bay, New York	—	—	20/05/2017	No
<i>U. prolifera</i>	ITS	MF041739	Lamb <i>et al.</i>	Identification of the macroalgal assemblage and molecular diversity of <i>Ulva</i> sp. in Jamaica Bay, New York	—	—	20/05/2017	No
<i>Ulva</i> cf. <i>prolifera</i>	ITS	KC582304	Guidone <i>et al.</i> 2013	Molecular and morphological diversity of Narragansett Bay (RI, USA) <i>Ulva</i> (Ulvales: Chlorophyta) populations	USA: Brenton Point, Newport	25/02/2008	04/01/2013	Yes
<i>Ulva</i> cf. <i>prolifera</i>	ITS	KC582305	Guidone <i>et al.</i> 2013	Molecular and morphological diversity of Narragansett Bay (RI, USA) <i>Ulva</i> (Ulvales: Chlorophyta) populations	USA: Brenton Point, Newport	25/02/2008	04/01/2013	Yes
<i>Ulva</i> cf. <i>prolifera</i>	ITS	KC582306	Guidone <i>et al.</i> 2013	Molecular and morphological diversity of Narragansett Bay (RI, USA) <i>Ulva</i> (Ulvales: Chlorophyta) populations	USA: Sylvia Drive, Warwick	18/02/2008	04/01/2013	Yes
<i>Ulva</i> cf. <i>prolifera</i>	ITS	KC582307	Guidone <i>et al.</i> 2013	Molecular and morphological diversity of Narragansett Bay (RI, USA) <i>Ulva</i> (Ulvales: Chlorophyta) populations	USA: Sylvia Drive, Warwick	18/02/2008	04/01/2013	Yes
<i>U. prolifera</i>	ITS	AF185938	Blomster <i>et al.</i> 2010	Species-specific oligonucleotide probes for macroalgae: molecular discrimination of	Netherland	13/09/1999	—	Yes

<i>U. prolifera</i>	ITS	AF185939	Blomster <i>et al.</i> 2010	two marine fouling species of <i>Enteromorpha</i> (Ulvophyceae) Species-specific oligonucleotide probes for macroalgae: molecular discrimination of two marine fouling species of <i>Enteromorpha</i> (Ulvophyceae)	Netherland	13/09/1999	—	Yes
<i>U. prolifera</i>	ITS	AJ234304	Tan <i>et al.</i> 1999	Molecular phylogenetic evidence for a reversible morphogenetic switch controlling the gross morphology of two common genera of green seaweeds, <i>Ulva</i> and <i>Enteromorpha</i>	Scotland	23/10/1998	—	Yes
<i>U. prolifera</i>	ITS	AJ234305	Tan <i>et al.</i> 1999	Molecular phylogenetic evidence for a reversible morphogenetic switch controlling the gross morphology of two common genera of green seaweeds, <i>Ulva</i> and <i>Enteromorpha</i>	Scotland	23/10/1998	—	Yes
<i>U. clathrata</i>	ITS	AF153492	Malta, <i>et al.</i> 2010	Free-floating <i>Ulva</i> (Ulvaceae, Chlorophyta) in the southwest Netherlands; species or morphotypes? A morphological, molecular and ecological comparison	Greenland: Disko Island	—	24/05/1999	Yes
<i>U. prolifera</i>	<i>rbcL</i>	AY255864	Hayden <i>et al.</i> 2003	Linnaeus was right all along: <i>Ulva</i> and <i>Enteromorpha</i> are not distinct genera	—	—	13/03/2003	Yes
<i>U. prolifera</i>	<i>rbcL</i>	KP233770	Kang <i>et al.</i> 2014	Re-evaluation of green-tide forming species in the Yellow Sea	China	14/02/2010	05/12/2014	Yes
<i>U. prolifera</i>	<i>rbcL</i>	KP233771	Kang <i>et al.</i> 2014	Re-evaluation of green-tide forming species in the Yellow Sea	United Kingdom	18/06/2010	05/12/2014	Yes
<i>Ulva</i> cf. <i>prolifera</i>	<i>rbcL</i>	KC582351	Guidone <i>et al.</i>	Molecular and morphological diversity of Narragansett Bay (RI, USA) <i>Ulva</i> (Ulvales: Chlorophyta) populations	USA: Sylvia Drive, Warwick, RI	14/04/2008	04/01/2013	Yes
<i>U. prolifera</i>	<i>tufA</i>	HQ610394	Saunders <i>et al.</i> 2010	An evaluation of <i>rbcL</i> , <i>tufA</i> , UPA, LSU and ITS as DNA barcode markers for the marine green macroalgae	Canada: Newfoundland and Labrador,	11/07/2006	15/11/2010	Yes

<i>U. prolifera</i>	<i>tufA</i>	HQ610395	Saunders <i>et al.</i> 2010	An evaluation of <i>rbcL</i> , <i>tufA</i> , UPA, LSU and ITS as DNA barcode markers for the marine green macroalgae	St. Paul, Bonne Bay Canada: Manitoba, Gravel Pit E of Churchill	12/07/2007	15/11/2010	Yes
<i>U. prolifera</i>	<i>tufA</i>	EF595302	Rinkel <i>et al.</i> 2012	A molecular phylogeny of <i>Acrochaete</i> and other endophytic green algae (Ulvales, Chlorophyta)	United Kingdom: North Devon, Combe Martin Bay	27/10/2004	07/05/2007	Yes
<i>U. prolifera</i>	<i>tufA</i>	MF124266	Bringloe <i>et al.</i> 2017	Updates to the marine algal flora of the boulder patch in the Beaufort Sea off northern Alaska as revealed by DNA barcoding	USA: Alaska, Endicott island	26/07/2015	17/05/2017	Yes
<i>Ulva cf. prolifera</i>	<i>tufA</i>	MF124264	Bringloe <i>et al.</i> 2017	Updates to the marine algal flora of the boulder patch in the Beaufort Sea off northern Alaska as revealed by DNA barcoding	USA: Alaska, Endicott Boat Launch, Prudhoe Bay	21/08/2014	17/05/2017	Yes
<i>Ulva cf. prolifera</i>	<i>tufA</i>	EF595301	Rinkel <i>et al.</i> 2012	A molecular phylogeny of <i>Acrochaete</i> and other endophytic green algae (Ulvales, Chlorophyta)	United Kingdom: Westernness, Gortnachullish Eilean Ighe	11/07/2004	07/05/2007	Yes
<i>Ulva cf. prolifera</i>	<i>tufA</i>	EF595334	Rinkel <i>et al.</i> 2012	A molecular phylogeny of <i>Acrochaete</i> and other endophytic green algae (Ulvales, Chlorophyta)	Iceland	06/07/2005	07/05/2007	Yes

— indicates no information.

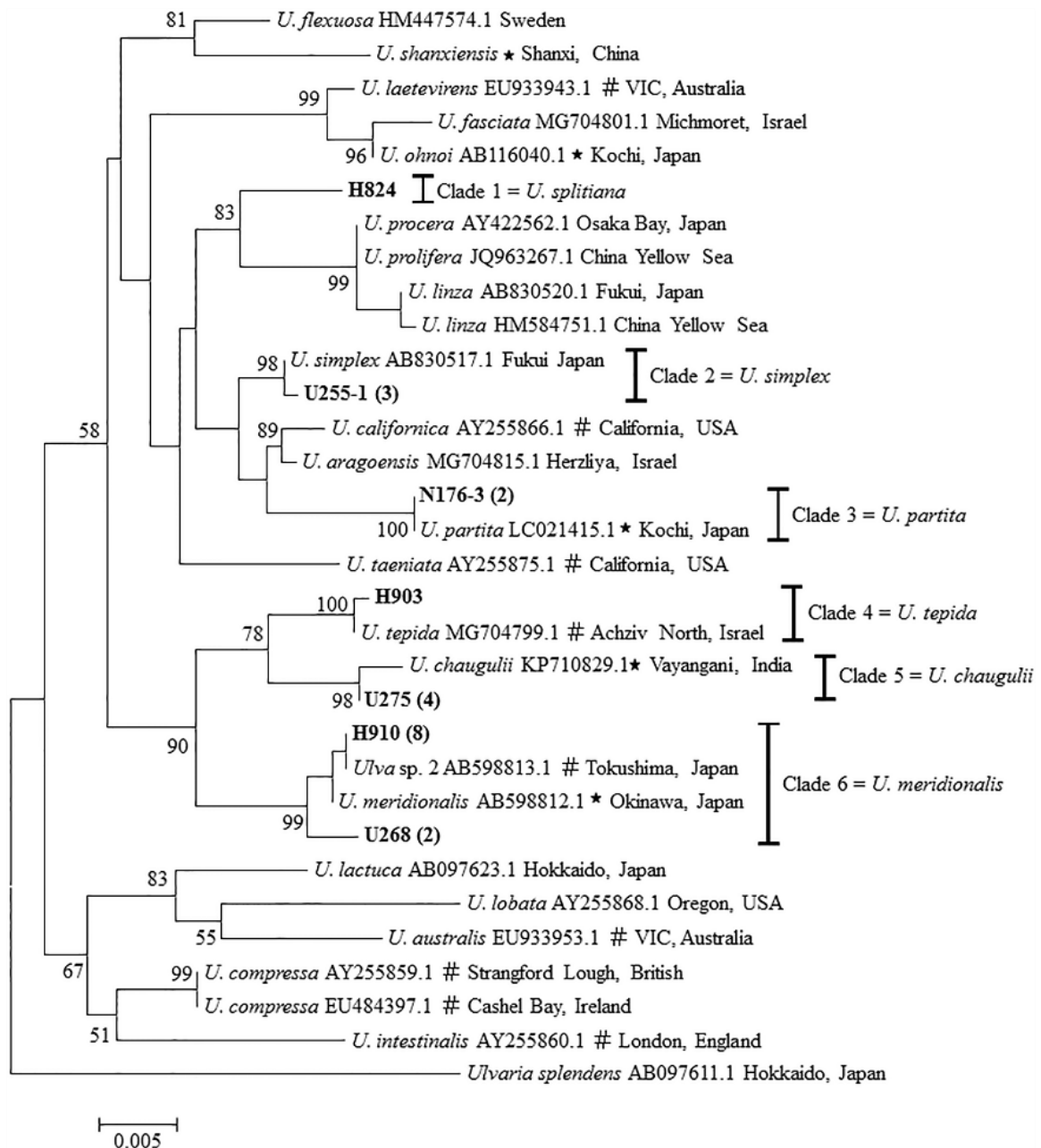
Supplementary table 8. The genetic diversity for ITS of six *Ulva* species samples from China and overseas.

Species	Genetic diversity from Chinese specimens	N ^a	Genetic diversity from overseas specimens	N ^b	Genetic diversity of global specimens	N ^c
<i>U. chaugulii</i>	0.002	4	0.009	9	0.009	13
<i>U. meridionalis</i>	0.024	90	0.016	7	0.024	97
<i>U. partita</i>	0.000	4	0.004	6	0.004	10
<i>U. simplex</i>	0.008	34	0.004	4	0.008	38
<i>U. splitiana</i>	0.006	12	0.006	4	0.006	16
<i>U. tepida</i>	0.020	42	0.017	32	0.020	74

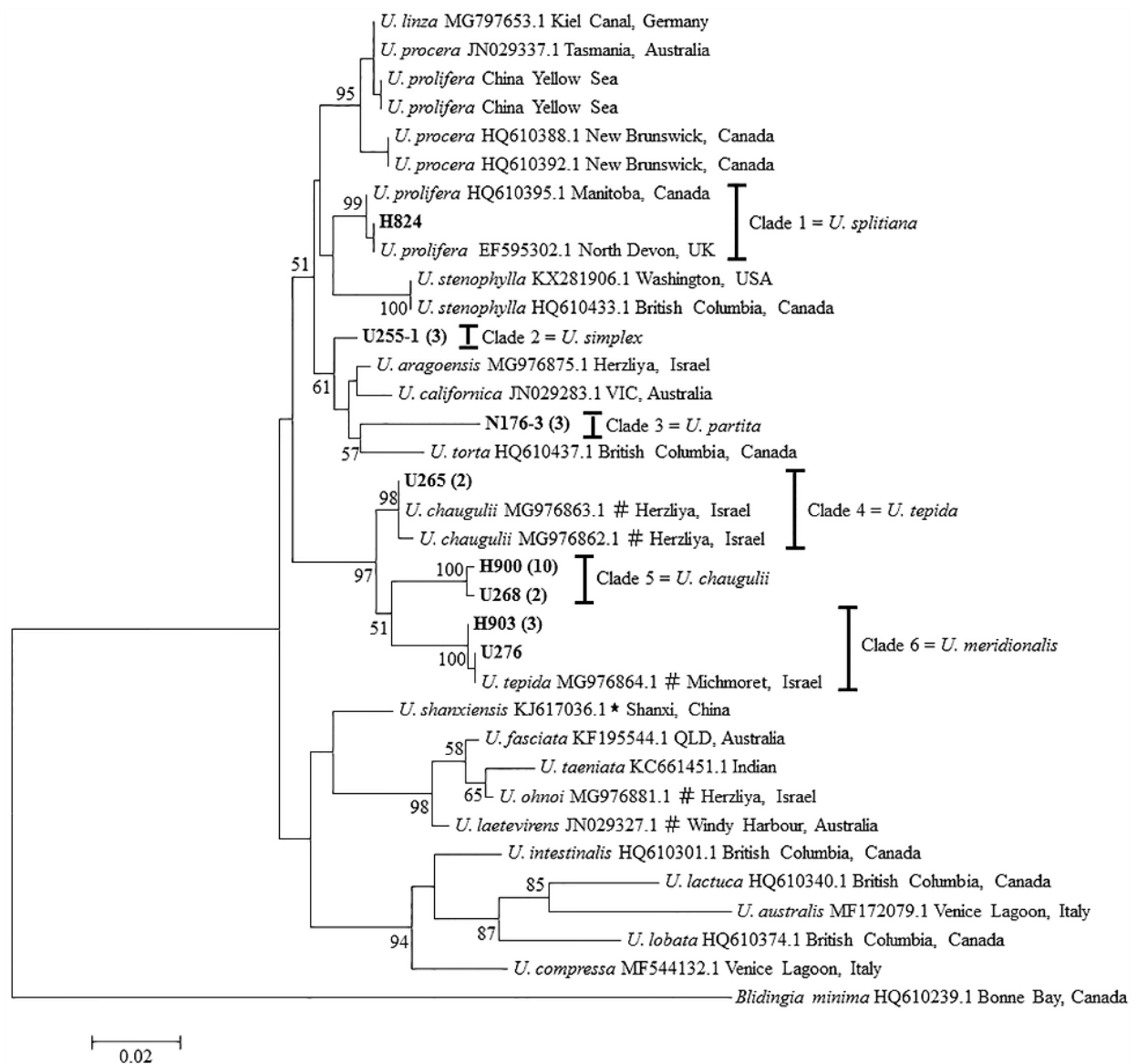
N^a indicates the number of Chinese individuals.

N^b indicates the number of overseas individuals.

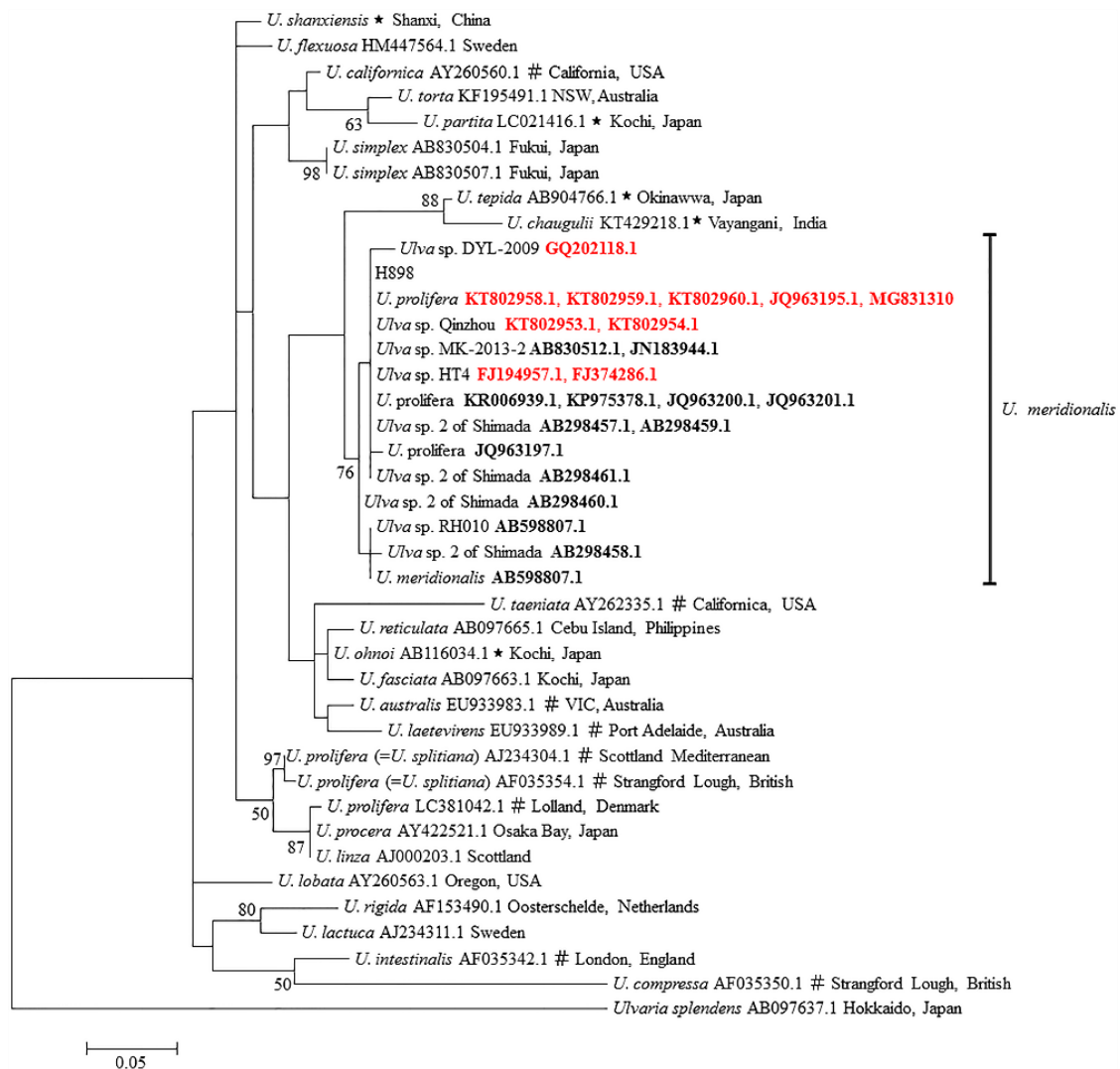
N^c indicates the number of global individuals including Chinese samples and overseas samples.



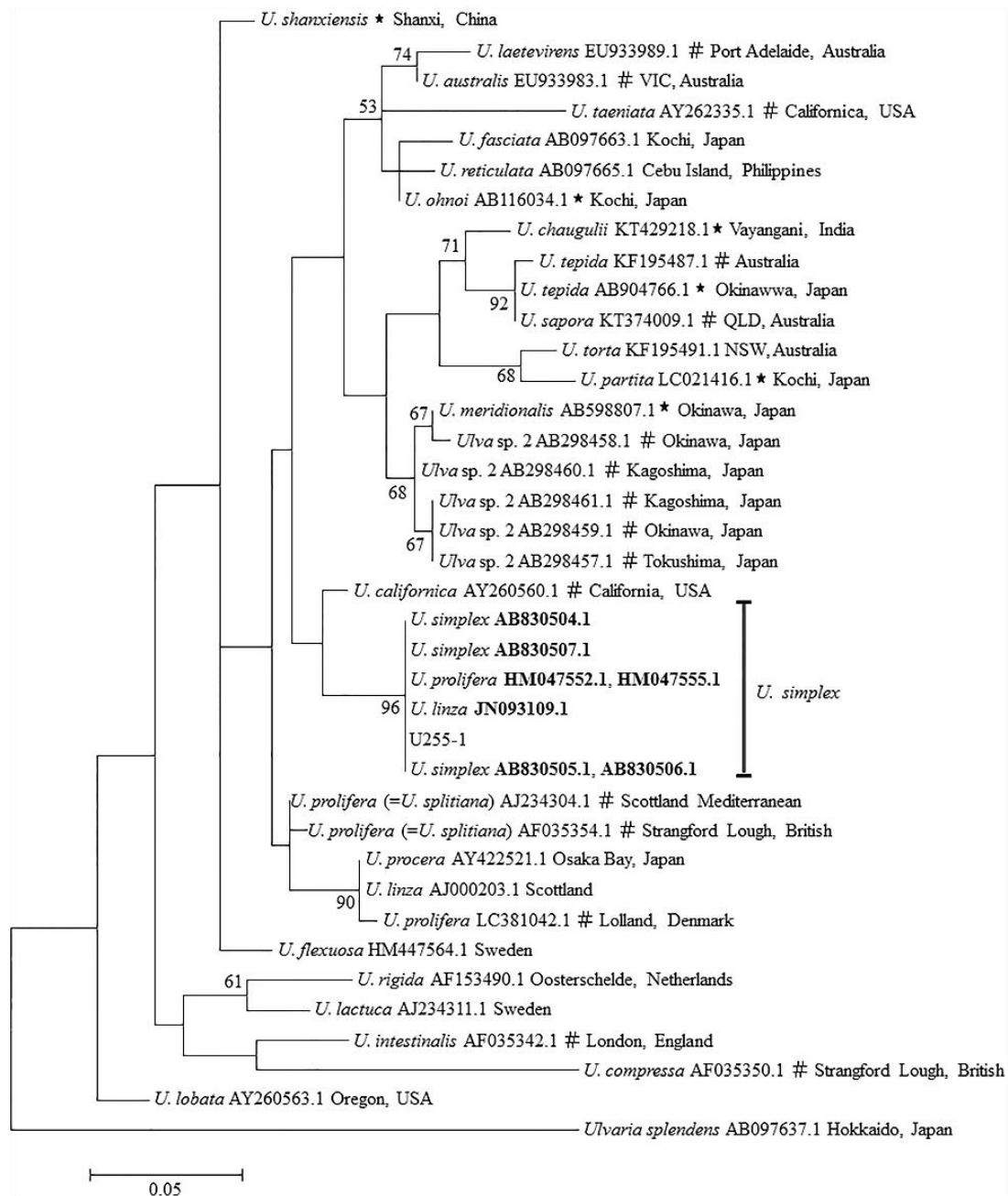
Supplementary fig. 1. ML phylogenetic tree based on DNA sequences of *rbcL*. Numbers at the nodes indicate the bootstrap values. GenBank accession numbers and localities for all reference sequences were provided. Asterisks indicate the sequences generated from the holotype specimens. Sequences with a “#” symbol were from lectotype materials or topotype materials, or matched to the sequences from holotype materials or topotype materials. Numbers in brackets following the sample no. represent the total amount of the highly identical sequences (identity ≥ 99.5%).



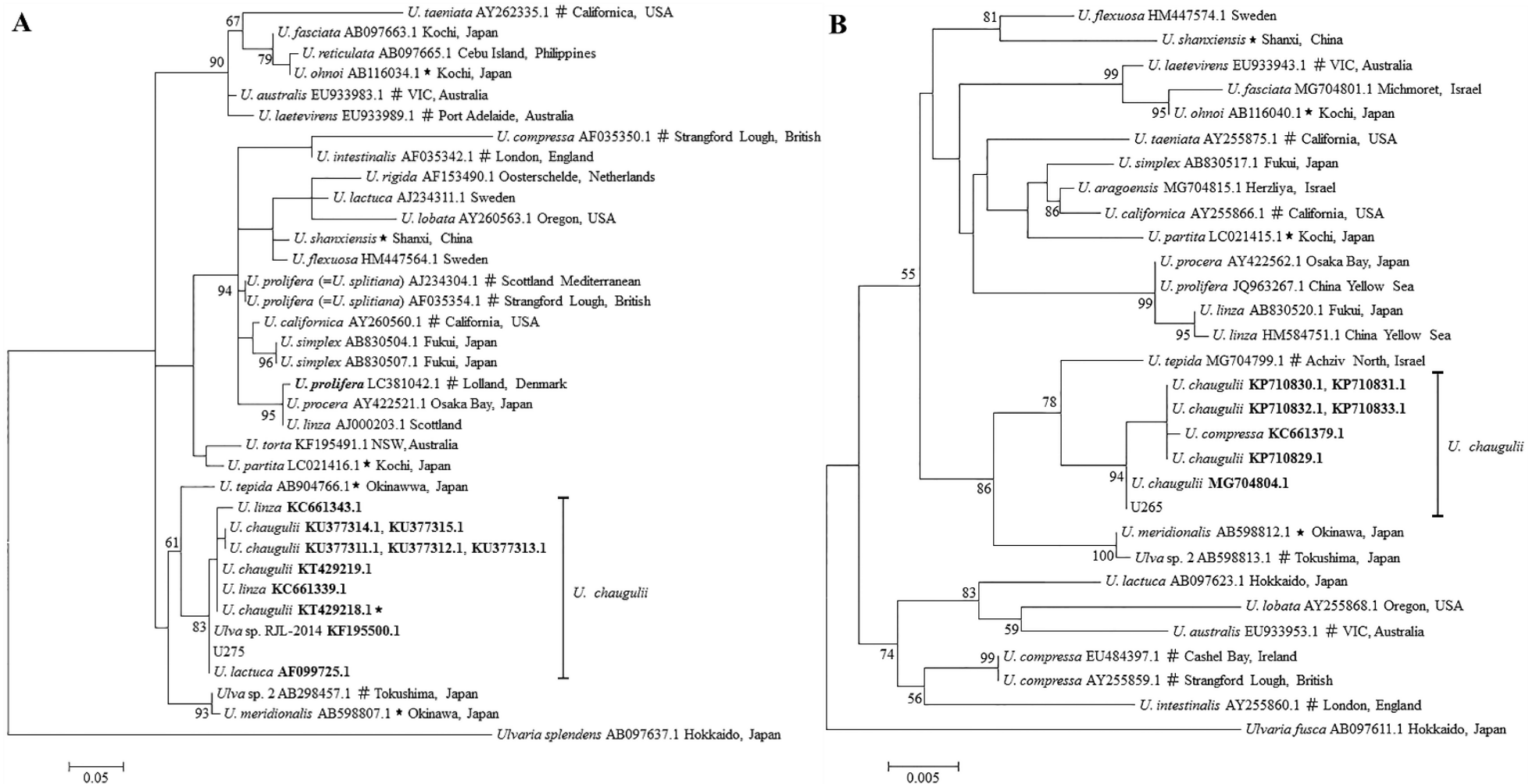
Supplementary fig. 2. ML phylogenetic tree based on DNA sequences of *tufA*. Numbers at the nodes indicate the bootstrap values. GenBank accession numbers and localities for all reference sequences were provided. Asterisks indicate the sequences generated from the holotype specimens. Sequences with a “#” symbol were from lectotype materials or topotype materials, or matched to the sequences from holotype materials or topotype materials. Numbers in brackets following the sample no. represent the total amount of the highly identical sequences (identity $\geq$ 99.5%).



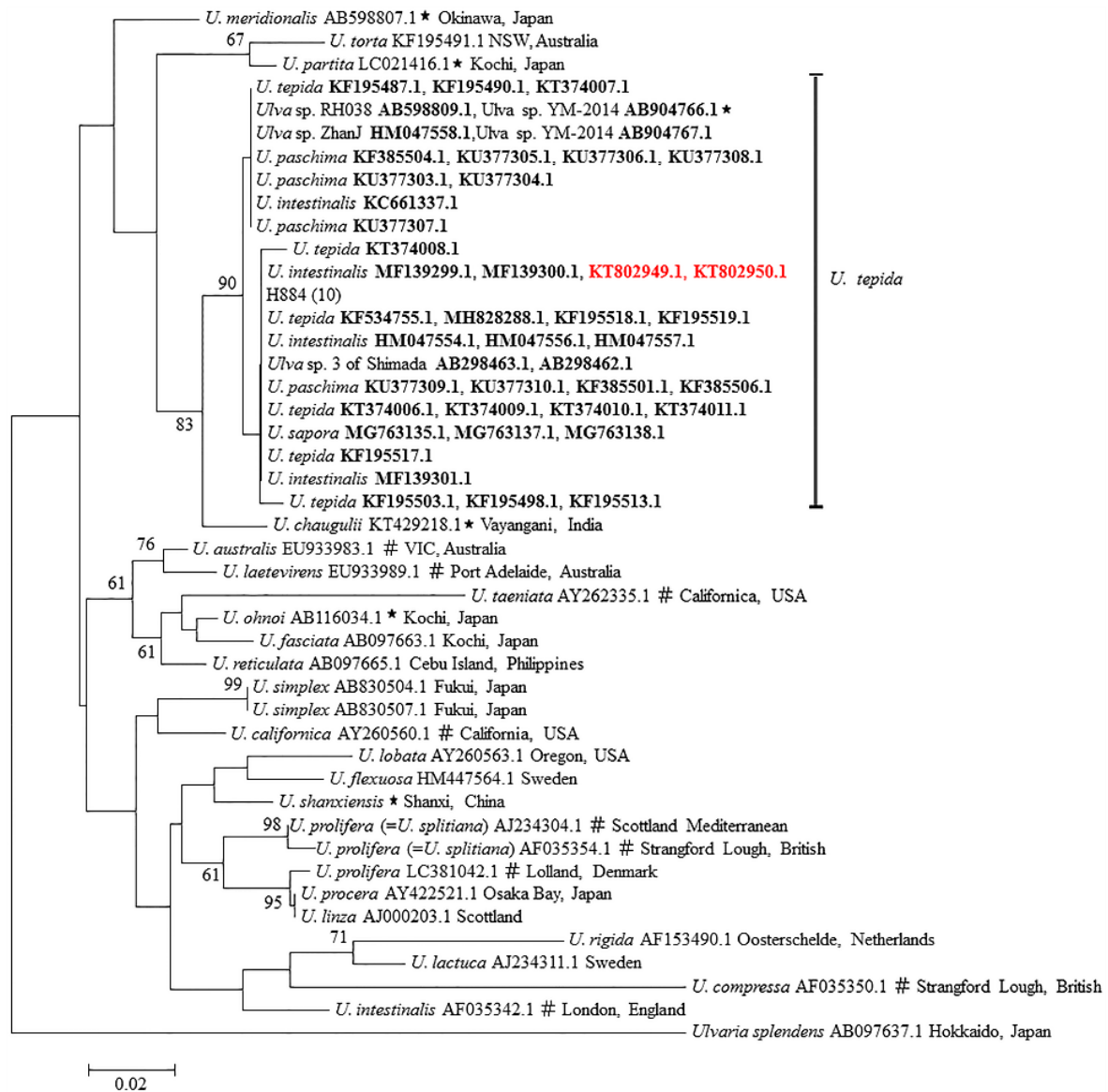
Supplementary fig. 3. ML phylogenetic tree based on DNA sequences of ITS, with special reference to *U. meridionalis*. Sequences with accessions numbers in bold were confirmed to be conspecific of *U. meridionalis*. Sequences with accessions numbers in red were from samples collected in China. Asterisks indicate the sequences generated from the holotype specimens. Sequences with a “#” symbol were from lectotype materials or topotype materials, or matched to the sequences from holotype materials or topotype materials. Numbers at the nodes indicate the bootstrap values.



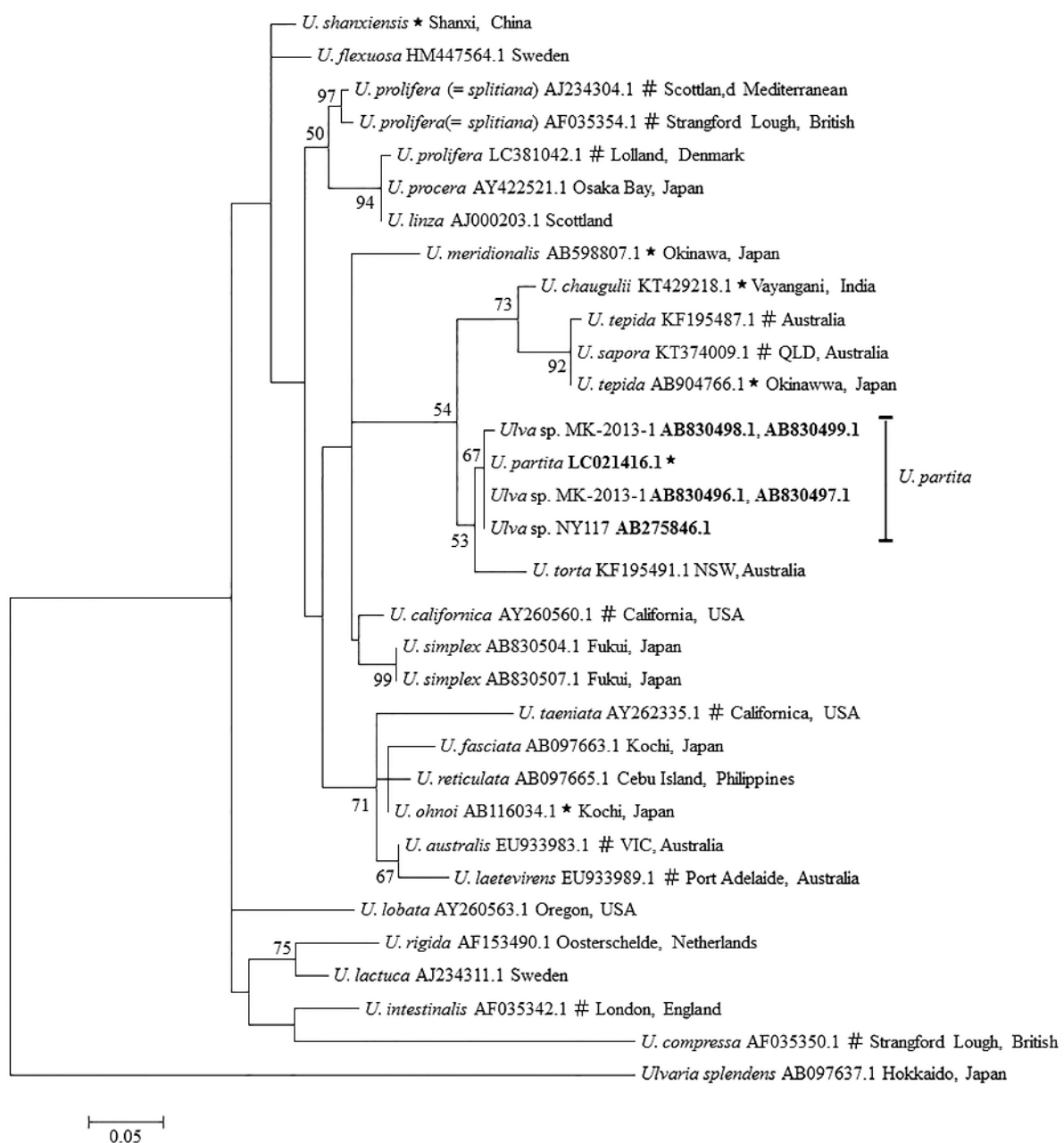
Supplementary fig. 4. ML phylogenetic tree based on DNA sequences of ITS, with special reference to *U. simplex*. Sequences with accessions numbers in bold were confirmed to be conspecific of *U. simplex*. Sequences with accessions numbers in red were from samples collected in China. Asterisks indicate the sequences generated from the holotype specimens. Sequences with a “#” symbol were from lectotype materials or topotype materials, or matched to the sequences from holotype materials or topotype materials. Numbers at the nodes indicate the bootstrap values.



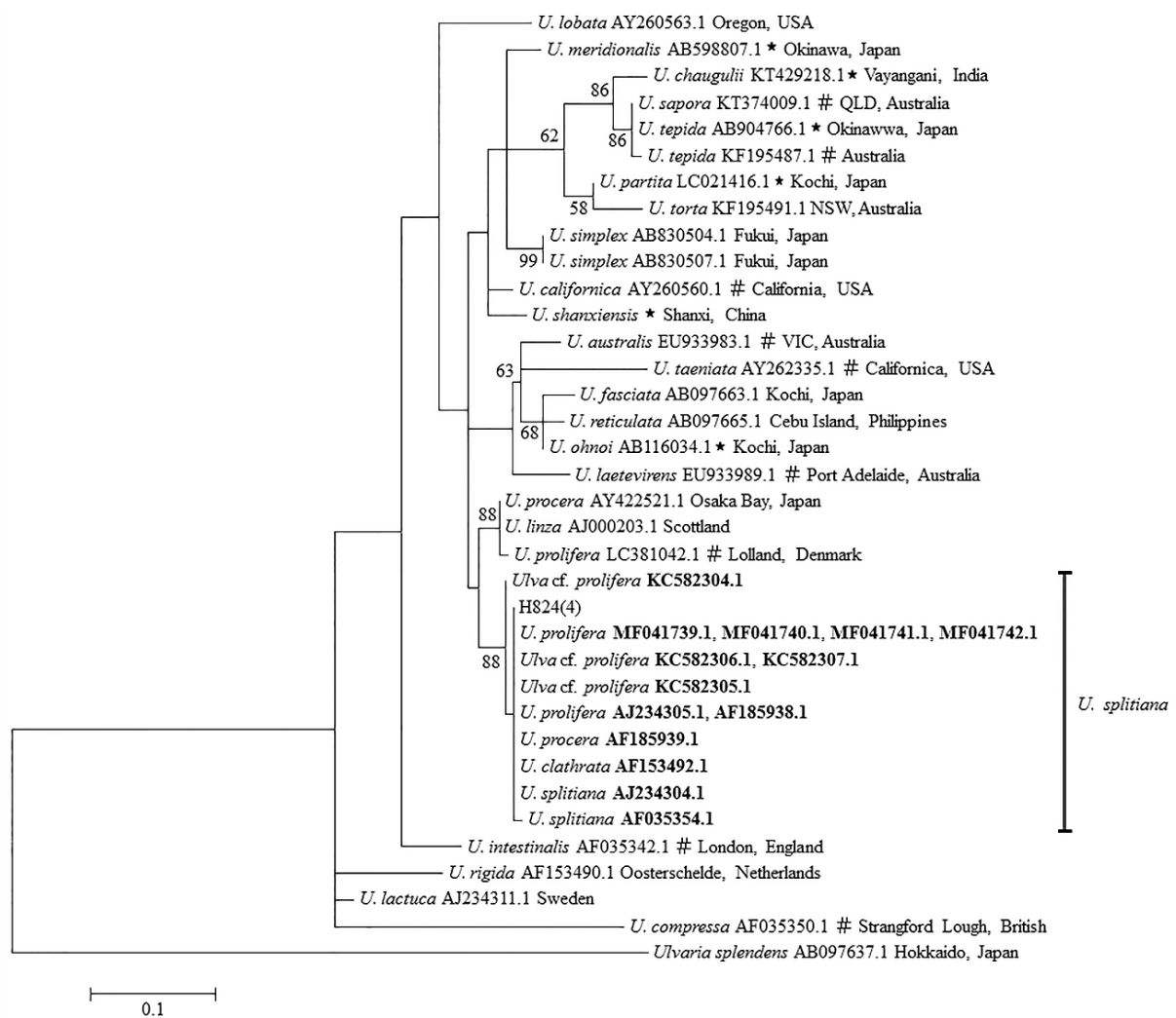
Supplementary fig. 5. ML phylogenetic tree based on DNA sequences of ITS (A) and *rbcL* (B), with special reference to *U. chaugulii*. Sequences with accessions numbers in bold were confirmed to be conspecific of *U. chaugulii*. Sequences with accessions numbers in red were from samples collected in China. Asterisks indicate the sequences generated from the holotype specimens. Sequences with a “#” symbol were from lectotype materials or topotype materials, or matched to the sequences from holotype materials or topotype materials. Numbers at the nodes indicate the bootstrap values.



Supplementary fig. 6. ML phylogenetic tree based on DNA sequences of ITS, with special reference to *U. tepida*. Sequences with accessions numbers in bold were confirmed to be conspecific of *U. tepida*. Sequences with accessions numbers in red were from samples collected in China. Asterisks indicate the sequences generated from the holotype specimens. Sequences with a “#” symbol were from lectotype materials or topotype materials, or matched to the sequences from holotype materials or topotype materials. Numbers at the nodes indicate the bootstrap values.



Supplementary fig. 7. ML phylogenetic tree based on DNA sequences of ITS, with special reference to *U. partita*. Sequences with accessions numbers in bold were confirmed to be conspecific of *U. partita*. Sequences with accessions numbers in red were from samples collected in China. Asterisks indicate the sequences generated from the holotype specimens. Sequences with a “#” symbol were from lectotype materials or topotype materials, or matched to the sequences from holotype materials or topotype materials. Numbers at the nodes indicate the bootstrap values.



Supplementary fig. 8. ML phylogenetic tree based on DNA sequences of ITS, with special reference to *U. splitiana*. Sequences with accessions numbers in bold were confirmed to be conspecific of *U. splitiana*. Sequences with accessions numbers in red were from samples collected in China. Asterisks indicate the sequences generated from the holotype specimens. Sequences with a “#” symbol were from lectotype materials or topotype materials, or matched to the sequences from holotype materials or topotype materials. Numbers at the nodes indicate the bootstrap values.