Table 1. Comparison of Codon Bias Usage in *rbc*L for green algae and *Laurencia* complex with emphasis in preferred codons.

Amino Acid[a]	*Chlamydomonas*[b]	*Chlorella*	*Laurencia s.s*	*Osmundea*	*Palisada*	*Chondrophycus*	*Yuzurua*
			Preferred codon				
Leu [6]	UUA/CUU/CUA	UUA/CUU	UUA/CUU/CUA	UUA	UUA	UUA/CUA	UUA/CUA
Arg [6]	CGU	CGU	CGU/AGA	CGU/AGA	CGU	CGU/AGA	CGU/AGA
Ser [6]	UCU/UCA	UCU/UCA/AGU	UCU/UCA	UCU/UCA	UCU/UCA	UCU/UCA	UCU/UCA
Val [4]	GUU/GUA	GUU/GUA	GUU/GUA	GUU/GUA	GUU/GUA	GUU/GUA	GUU/GUA
Pro [4]	CCU/CCA	CCU/CCA	CCU/CCA	CCU/CCA	CCA	CCU/CCA	CCU/CCA
Thr [4]	ACU/ACA	ACU/ACA	ACU/ACA	ACU/ACA	ACU/ACA	ACU/ACA	ACU/ACA
Ala [4]	GCU/GCA	GCU/GAU	GCU/GCA	GCU/GCA	GCU/GCA	GCU/GCA	GCU/GCA
Gly [4]	GGU	GGU	GGU/GGA	GGU/GGA	GGU	GGU/GGA	GGU/GGA
Ile [3]	AUU/AUC	AUU/AUC	AUU	AUU	AUU	AUU	AUU
Tyr [2]	UAC	UAC/UAU	UAU	UAU	UAU	UAU	UAU
His [2]	CAC	CAC/CAU	CAU	CAU	CAU	CAU	CAU
Gln [2]	CAA/CAG	CAA	CAA	CAA	CAA	CAA	CAA
Asn [2]	AAC	AAC/AAU	AAU	AAU	AAU	AAU	AAU
Lys [2]	AAA	AAA	AAA	AAA	AAA	AAA	AAA
Asp [2]	GAU/GAC	GAU/GAC	GAU	GAU	GAU	GAU	GAU
Glu [2]	GAA	GAA	GAA	GAA	GAA	GAA	GAA
Cys [2]	UGU	UGU	UGC	UGU	UGU	UGU	UGU
Phe [2]	UUC	UUC/UUU	UUU	UUU	UUU	UUU	UUU
Trp [1]	UGG	UGG	UGG	UGG	UGG	UGG	UGG
Met [1]	AUG	AUG	AUG	AUG	AUG	AUG	AUG

[a]Number of synonymous codons for each amino acid are shown in brackets. [b]References: *Chlamydomonas* (Campbell and Gowri, 1990) in reference [11], *Chlorella* (Yoshinaga *et al*., 1988) in reference [12]; all others from GenBank.

Table 2. Comparison of Codon Bias Usage in *rbc*L for green algae and *Laurencia* complex with emphasis in differences on preferred codons.

Differences in preferred codons:[c]	***Chlamydomonas*** [b]	***Chlorella***	***Laurencia s.s***	***Osmundea***	***Palisada***	***Chondrophycus***	***Yuzurua***
Chlamydomonas	-	3	7	9	10	8	6
Chlorella	6	-	9	9	9	9	4
Laurencia s.s	7	5	-	2	5	1	1
Osmundea	5	3	0	-	3	0	1
Palisada	5	1	0	0	-	0	3
Chondrophycus	5	4	0	1	4	-	0
Yuzurua	8	9	2	0	0	0	-

[b]References: *Chlamydomonas* (Campbell and Gowri, 1990) in reference [11], *Chlorella* (Yoshinaga *et al*., 1988) in reference [12] ; all others from GenBank. [c]Number of preferred codons used by this species wich are not used by the other species.

Table 3. Comparison of Codon Bias Usage in *rbc*L for red algae and *Laurencia* complex with emphasis in preferred codons.

Amino Acid[a]	*Ceramium*	*Dasya*	*Delesseria*	*Laurencia s.s*	*Osmundea*	*Palisada*	*Chondrophycus*	*Yuzurua*
Preferred codon								
Leu [6]	CUA/UUA	CUA/UUG/CUU/CUG	CUA/UUG/CUG	CUA/UUA/CUU	UUA	UUA	CUA/UUA	CUA/UUA
Arg [6]	AGA/CGU	CGC	AGA/CGC/CGA/CGG	AGA/CGU	AGA/CGU	CGU	AGA/CGU	AGA/CGU
Ser [6]	UCU/UCA	UCU/UCC	UCU/UCA	UCU/UCA	UCU/UCA	UCU /UCA	UCU/UCA	UCU/UCA
Val [4]	GUA/GUU	GUA/GUG	GUA/GUG	GUA/GUU	GUA/GUU	GUA/GUU	GUA/GUU	GUA/GUU
Pro [4]	CCA/CCU	CCU	CCU/CCG	CCA/CCU	CCA/CCU	CCA	CCA/CCU	CCA/CCU
Thr [4]	ACU/ACA	ACU	ACU/ACA/ACC	ACU/ACA	ACU/ACA	ACU/ACA	ACU/ACA	ACU/ACA
Ala [4]	GCA/GCU	GCA/GCC/GCG	GCU/GCC/GCG	GCA/GCU	GCA/GCU	GCA/GCU	GCA/GCU	GCA/GCU
Gly [4]	GGA/GGU	GGA/GGG	GGA/GGG/GGC	GGA/GGU	GGA/GGU	GGU	GGA/GGU	GGA/GGU
Ile [3]	AUU	AUU/AUA	AUU/AUA	AUU	AUU	AUU	AUU	AUU
Tyr [2]	UAU	UAU	UAU	UAU	UAU	UAU	UAU	UAU
His [2]	CAU	CAU	CAU	CAU	CAU	CAU	CAU	CAU
Gln [2]	CAA	CAG	CAG	CAA	CAA	CAA	CAA	CAA
Asn [2]	AAU	AAC	AAU	AAU	AAU	AAU	AAU	AAU
Lys [2]	AAA	AAG	AAG	AAA	AAA	AAA	AAA	AAA
Asp [2]	GAU	GAU	GAU	GAU	GAU	GAU	GAU	GAU
Glu [2]	GAA	GAG	GAG	GAA	GAA	GAA	GAA	GAA
Cys [2]	UGU	UGC	UGC	UGC	UGU	UGU	UGU	UGU
Phe [2]	UUU	UUU	UUC	UUU	UUU	UUU	UUU	UUU
Trp [1]	UGG	UGG	UGG	UGG	UGG	UGG	UGG	UGG
Met [1]	AUG	AUG	AUG	AUG	AUG	AUG	AUG	AUG

[a]Number of synonymous codons for each amino acid are shown in brackets.

Table 4. Comparison of Codon Bias Usage in *rbc*L for red algae and *Laurencia* complex with emphasis in differences on preferred codons.

II. Differences in preferred codons:[c]	***Ceramium***[b]	***Dasya***	***Delesseria***	***Laurencia s.s***	***Osmundea***	***Palisada***	***Chondrophycus***	***Yuzurua***
Ceramium	-	14	9	0	0	0	0	0
Dasya	14	-	3	13	16	18	15	14
Delesseria	18	11	-	17	19	22	18	11
Laurencia s.s	2	13	11	-	2	5	1	1
Osmundea	0	14	11	0	-	3	0	1
Palisada	0	13	11	0	0	-	0	3
Chondrophycus	0	14	12	0	1	4	-	0
Yuzurua	0	15	18	2	0	0	0	-

[b]References: *Ceramium*, *Dasya* and *Delesseria* sequences were taken from GenBank. [c]Number of preferred codons used by this species, wich are not used by the other species.

Table 5. Codon Bias on *rbc*L gene for twenty-five representatives of the *Laurencia s.s* genus.

Taxa, GenBank Accession Number/ Amino Acid[a]	Leu [6]	Arg [6]	Ser [6]	Val [4]	Pro [4]	Thr [4]	Ala [4]	Gly [4]	Ile [3]	Tyr [2]	His [2]	Gln [2]	Asn [2]	Lys [2]	Asp [2]	Glu [2]	Cys [2]	Phe [2]	Trp [1]	Met [1]
Laurencia aldingensis Saito & Womersley. JF810351.	UUA CUA	CGU	UCU	GUA GUU	CCA	ACU ACA	GCA GCU	GGU	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGC	UUU	UGG	AUG
L. arbuscula Sonder. AF465810.	UUA CUA	CGU	UCU	GUA GUU	CCA CCU	ACU ACA	GCA GCU	GGU	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGU	UUU	UGG	AUG
L. brongniartii J. Agardh. EF061654.	UUA CUA	CGU	UCU	GUA GUU	CCA	ACU ACA	GCA GCU	GGU	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGC	UUU	UGG	AUG
L. caraibica P.C. Silva. EF658642.	UUA	CGU	UCU	GUA GUU	CCA	ACU ACA	GCA GCU	GGU	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGC	UUU	UGG	AUG
L. caduciramulosa Masuda et Kawaguchi. FJ904933.	UUA	CGU	UCU	GUA GUU	CCA	ACU ACA	GCA GCU	GGU	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGU	UUU	UGG	AUG
L. catarinensis Cordeiro-Marino & Fujii. AF465808.	UUA	CGU	UCU	GUA GUU	CCA	ACU ACA	GCA GCU	GGU	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGU	UUU	UGG	AUG
L. complanata (Suhr) Kützing. AF465813.	UUA	CGU	UCU	GUA GUU	CCA	ACU ACA	GCA GCU	GGU	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGU	UUU	UGG	AUG
L. filiformis (C. Agardh) Montagne. AF465818.	UUA	CGU	UCU	GUA GUU	CCA	ACU ACA	GCA GCU	GGU	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGU	UUU	UGG	AUG
L. flexuosa Kützing. AF465815.	UUA	CGU	UCU	GUA GUU	CCA	ACU ACA	GCA GCU	GGU	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGC	UUU	UGG	AUG
L. intricata J.V. Lamouroux. EF658644.	UUA	CGU	UCU	GUA GUU	CCA	ACU ACA	GCA GCU	GGU	AUU	UAU	CAC	CAA	AAU	AAA	GAU	GAA	UGC	UUU	UGG	AUG
L. marilzae Gil-Rodríguez, Sentíes et M.T. Fujii. EF686003.	UUA	CGU AGA	UCU UCA	GUA GUU	CCA CCU	ACU ACA	GCA GCU	GGU	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGC	UUU	UGG	AUG
L. majuscula (Harvey) A.H.S. Lucas. EF686000.	UUA	CGU	UCU	GUA GUU	CCA	ACU ACA	GCA GCU	GGU	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGU	UUU	UGG	AUG
L. pyramidalis Bory de Saint-Vincent ex Kützing. FJ785316.	UUA CUA	CGU AGA	UCU UCA	GUA GUU	CCA CCU	ACU ACA	GCA GCU	GGU	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGU	UUU	UGG	AUG
L. natalensis Kylin. AF465816.	UUA	CGU	UCU	GUA GUU	CCA	ACU ACA	GCA GCU	GGU	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGU	UUU	UGG	AUG
L. obtusa (Hudson) J.V. Lamouroux. AF281881.	UUA	CGU	UCU	GUA GUU	CCA	ACU ACA	GCA GCU	GGU	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGC	UUU	UGG	AUG
L. oliveirana Yoneshigue. JF810352.	UUA	CGU	UCU	GUA GUU	CCA	ACU ACA	GCA GCU	GGU	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGU	UUU	UGG	AUG
L. pacifica Kylin. AY588411.	UUA	CGU	UCU	GUA GUU	CCA	ACU ACA	GCA GCU	GGU	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGU	UUC	UGG	AUG
L. rigida J. Agardh. AY920852.	UUA	CGU	UCU	GUA GUU	CCA	ACU ACA	GCA GCU	GGU	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGU	UUU	UGG	AUG
L. translucida Fujii & Cordeiro-Marino. AF465805.	UUA	CGU	UCU UCA	GUA GUU	CCU CCA	ACU ACA	GCA GCU	GGU	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGU	UUU	UGG	AUG
L. venusta Yamada. EF061655.	UUA	CGU AGA	UCU	GUA GUU	CCA	ACU ACA	GCA GCU	GGU	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGU	UUU	UGG	AUG
L. viridis Gil-Rodríguez & Haroun. EF685999.	UUA	CGU AGA	UCU	GUA GUU	CCA	ACU ACA	GCU GCA	GGU	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGC	UUU	UGG	AUG
L. cf. ***kuetzingii***. FJ785322.	UUA	CGU AGA	UCU UCA	GUA GUU	CCA CCU	ACU ACA	GCA GCU	GGU GGA	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGC	UUU	UGG	AUG
L. cf. ***macdermidiae***. FJ785314.	UUA	CGU AGA	UCU UCA	GUA GUU	CCA CCU	ACU ACA	GCA GCU	GGU GGA	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGC	UUU	UGG	AUG
L. cf. ***mariannensis***. FJ785313.	UUA	CGU AGA	UCU UCA	GUA GUU	CCA CCU	ACU ACA	GCA GCU	GGU GGA	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGC	UUU	UGG	AUG
L. cf. ***nidifica***. FJ785315.	UUA	CGU AGA	UCU UCA	GUA GUU	CCA CCU	ACU ACA	GCA GCU	GGU GGA	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGC	UUU	UGG	AUG

[a]Number of synonymous codons for each amino acid are shown in brackets.

Table 6. Codon Bias of *rbc*L gene in representatives of genera *Chondrophycus*, *Osmundea*, *Palisada* and *Yuzurua*.

Taxa, GenBank Accession Number/ Amino Acid[a]	Leu [6]	Arg [6]	Ser [6]	Val [4]	Pro [4]	Thr [4]	Ala [4]	Gly [4]	Ile [3]	Tyr [2]	His [2]	Gln [2]	Asn [2]	Lys [2]	Asp [2]	Glu [2]	Cys [2]	Phe [2]	Trp [1]	Met [1]
Chondrophycus cartilagineus (Yamada) Garbary & Harper. AF489859.	UUA CUA	CGU AGA	UCU UCA	GUA GUU	CCA CCU	ACU ACA	GCA GCU	GGU GGA	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGU	UUU	UGG	AUG
C. intermedius (Yamada) Garbary & J.T. Harper. DQ787585.	UUA CUA	CGU AGA	UCU UCA	GUA GUU	CCU CCA	ACU ACA	GCU GCA	GGU GGA	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGU	UUU	UGG	AUG
C. tronoi (E. Ganzon-Fortes) K.W. Nam. AF489864.	UUA CUA	CGU AGA	UCU UCA	GUA GUU	CCA CCU	ACU ACA	GCA GCU	GGU GGA	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGU	UUU	UGG	AUG
Chondrophycus cf. ***undulatus*** FJ785307.	UUA CUA	CGU AGA CGC	UCU UCA	GUA GUU	CCU CCA	ACU ACA	GCU GCA	GGU GGA	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGU	UUU	UGG	AUG
Chondrophycus sp. 1. FJ785309.	UUA CUA	CGU AGA CGC	UCU UCA	GUA GUU	CCU CCA	ACU ACA	GCU GCA	GGU GGA	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGU	UUU	UGG	AUG
Chondrophycus sp. 2. FJ785310.	UUA CUA	CGU AGA CGC	UCU UCA	GUA GUU	CCU CCA	ACU ACA	GCU GCA	GGU GGA	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGU	UUU	UGG	AUG
Chondrophycus sp. 3. FJ785311.	UUA CUA	CGU AGA	UCU UCA	GUA GUU	CCU CCA	ACU ACA	GCU GCA	GGU GGA	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGU	UUU	UGG	AUG
Osmundea blinksii (Hollenberg & I.A. Abbott) K.W. Nam. AY172575.	UUA	CGU	UCU UCA	GUU GUA	CCU CCA	ACU	GCU GCA	GGU	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGU	UUU	UGG	AUG
O. hybrida (A.P. de Candolle) K.W. Nam. FJ785317.	UUA	CGU	UCU	GUA	CCA	ACU ACA	GCU GCA	GGU	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGU	UUU	UGG	AUG
O. osmunda (S.G. Gmelin) K.W. Nam & Maggs. AF281877.	UUA	CGU AGA	UCU	GUU GUA	CCA	ACU ACA	GCU GCA	GGU	AUU	UAU	CAU	CAA	AAC	AAA	GAU	GAA	UGU	UUU	UGG	AUG
O. pinnatifida (Hudson) Stackhouse. AF281876.	UUA	CGU AGA	UCU	GUA GUU	CCA	ACU ACA	GCU GCA	GGU	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGU	UUU	UGG	AUG
O. ramosissima (Oeder) Athanasiadis. AF281880.	UUA	CGU	UCU	GUU GUA	CCA	ACU ACA	GCU GCA	GGU	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGU	UUU	UGG	AUG
O. spectabilis (Postels & Ruprecht) K.W. Nam var. ***spectabilis.*** AY172574.	UUA	CGU AGA	UCU UCA	GUU GUA	CCU CCA	ACU ACA	GCU GCA	GGU	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGU	UUU	UGG	AUG
O. spectabilis var. ***diegoensis*** (E.Y. Dawson) K.W. Nam. AY172572.	UUA CUA	CGU AGA	UCU UCA	GUU GUA	CCU CCA	ACU ACA	GCU GCA	GGU GGA	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGU	UUU	UGG	AUG
O. sinicola (Setchell & N.L. Gardner) K.W. Nam. AY588407.	UUA	CGU AGA	UCU	GUU GUA	CCU CCA	ACU ACA	GCU GCA	GGU	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGU	UUU	UGG	AUG
O. splendens (Hollenberg) K.W. Nam. AY172576.	UUA	CGU	UCU UCA	GUU GUA	CCU CCA	ACU	GCU GCA	GGU	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGU	UUU	UGG	AUG
O. truncata (Kützing) K.W. Nam & Maggs. AF281879.	UUA	CGU AGA	UCU	GUU GUA	CCU CCA	ACU ACA	GCU GCA	GGU	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGU	UUU	UGG	AUG
Palisada corallopsis Sentíez, Fujii & Díaz. EF061646.	UUA	CGU AGA	UCU	GUA GUU	CCA CCU	ACU ACA	GCU GCA	GGU	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGU	UUU	UGG	AUG
P. flagellifera (J. Agardh) K.W. Nam. EF061647.	UUA CUA	CGU AGA	UCU	GUA GUU	CCA CCU	ACU ACA	GCU GCA	GGU	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGU	UUU	UGG	AUG
P. furcata (Cordeiro-Marino et M.T. Fujii) Cassano et M.T. Fujii. GU330226.	UUA CUA	CGU AGA	UCU	GUA GUU	CCA CCU	ACU ACA	GCU GCA	GGU	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGU	UUU	UGG	AUG
P. patentiramea (Montagne) Cassano, Sentíes, Gil-Rodríguez & M.T. Fujii. AF489862.	UUA CUA	CGU AGA	UCU UCA	GUA GUU	CCA CCU	ACU ACA	GCU GCA	GGU	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGU	UUU	UGG	AUG
P. perforata (Bory de Saint-Vincent) K.W. Nam. EF658641.	UUA CUA	CGU AGA	UCU UCA	GUA GUU	CCA	ACU ACA	GCU GCA	GGU	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGU	UUU	UGG	AUG
P. thuyoides (Kützing) Cassano, Sentíes, Gil-Rodríguez & M.T. Fujii. EF685998.	UUA CUA	CGU AGA	UCU	GUA GUU	CCA	ACU ACA	GCU GCA	GGU	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGU	UUU	UGG	AUG
P. cf. ***cruciata***. FJ785319.	UUA CUA	CGU AGA	UCU UCA	GUA GUU	CCA CCU	ACU ACA	GCU GCA	GGU	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGU	UUU	UGG	AUG
P. cf. ***robusta***. FJ785321.	UUA	CGU AGA	UCU UCA	GUA GUU	CCA CCU	ACU ACA	GCU GCA	GGU	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGU	UUU	UGG	AUG
Yuzurua poiteaui (J.V. Lamouroux) Martin-Lescanne. EF061653.	UUA CUA	CGU AGA	UCU	GUA GUU	CCA CCU	ACU ACA	GCU GCA	GGU	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGU	UUU	UGG	AUG
Y. poiteaui (J.V. Lamouroux) Martin-Lescanne) var. ***gemmifera*** (Harvey) M.J. Wynne. EF061649.	UUA CUA	CGU AGA	UCU	GUA GUU	CCA CCU	ACU ACA	GCU GCA	GGU	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGU	UUU	UGG	AUG
Yuzurua sp. *(*as ***P. papillosa****-3)*. AY172577.	UUA	CGU	UCU	GUA	CCA	ACU	GCU	GGU	AUU	UAU	CAU	CAA	AAU	AAA	GAU	GAA	UGU	UUU	UGG	AUG

	CUA	AGA	UCA	GUU	CCU	ACA	GCA													

[a]Number of synonymous codons for each amino acid are shown in brackets.

Table 7. Inter-generic Codon Bias measures, G/C percentages of red and green algae genera and results of the Kruskal-Wallis ANOVA Test (p-values).

Genera	SChi^2	ENC	CBI	Used Codons	Preferred Codons	Percent of Codons % NNG/C
Ceramium	0.83	36.53	0.59	49	26	7.0
Chondrophycus	0.89	34.96	0.65	50	28	7.0
Chlamydomonas	1.51	28.96	0.72	40	30	24.9
Chlorella	1.17	31.19	0.68	44	33	19.5
Dasya	0.15	55.43	0.20	53	27	55.0
Delesseria	0.21	56.48	0.29	58	33	54.0
Laurencia s.s	0.86	35.45	0.62	50	29	10.0
Osmundea	0.86	34.67	0.65	51	27	7.0
Palisada	0.81	35.71	0.61	51	24	8.0
Yuzurua	0.74	35.97	0.60	54	28	7.0
p-values	0.0001	0.0003	0.0004	0.0002	0.0001	0.00025

Table 8. Inter-specific Codon Bias measures and G/C percentages of *Laurencia* complex.

Taxa	SChi²	ENC	CBI	Used Codons	Preferred Codons	Percent of Codons % NNG/C
Chondrophycus cartilagineus	0.89	33.01	0.62	50	27	7.4
C. intermedius	0.88	35.40	0.63	50	28	7.0
C. tronoi	0.90	34.14	0.66	50	28	7.1
C. cf. *undulatus*	0.87	35.56	0.65	50	29	7.5
C. sp. 1	0.85	35.63	0.63	51	29	8.3
C. sp. 2	0.95	34.20	0.65	50	29	8.6
C. sp. 3	0.89	33.60	0.68	52	28	8.5
Laurencia aldingensis	0.84	35.69	0.62	53	24	12.5
L. arbuscula	0.80	36.85	0.59	50	25	8.0
L. brongniartii	0.83	36.20	0.61	49	24	12.5
L. caraibica	0.74	37.71	0.59	57	23	13.0
L. caduciramulosa	0.82	36.29	0.60	53	23	8.6
L. catarinensis	0.83	36.36	0.59	50	23	8.6
L. complanata	0.94	33.66	0.66	35	23	8.6
L. filiformis	0.87	35.51	0.62	49	23	8.6
L. flexuosa	0.83	35.67	0.62	47	23	13.0
L. intricata	0.91	34.57	0.64	47	23	17.3
L. marilzae	0.77	37.48	0.60	54	26	11.5
L. majuscula	0.81	37.17	0.57	52	23	8.6
L. natalensis	0.88	35.20	0.63	50	23	8.6
L. obtusa	0.91	34.73	0.66	49	23	13.0
L. oliveirana	0.87	34.76	0.64	49	23	8.6
L. pacifica	0.84	36.94	0.62	48	23	13.0
L. pyramidalis	0.87	35.82	0.63	51	27	8
L. rigida	0.98	34.02	0.66	48	23	8.6
L. scoparia	0.84	38.48	0.55	46	25	8
L. translucida	0.85	38.00	0.58	47	25	8
L. venusta	0.83	36.16	0.60	52	24	8.3
L. viridis	0.86	35.10	0.63	50	24	12.5
L. cf. *kuetzingii*	0.80	36.75	0.62	51	27	8.0
L. cf. *macdermidiae*	0.92	34.39	0.64	47	27	13.0
L. cf. *mariannensis*	0.86	35.09	0.64	49	27	10.0
L. cf. *nidifica*	0.90	33.78	0.64	52	27	8.2

Table 8. Continued.

Taxa	SChi²	ENC	CBI	Used Codons	Preferred Codons	Percent of Codons % NNG/C
Osmundea blinksii	0.78	36.24	0.66	54	24	8.3
O. hybrida	0.89	35.37	0.64	50	22	9.0
O. osmunda	0.85	34.70	0.66	51	24	12.5
O. pinnatifida	0.93	33.68	0.66	49	24	8.3
O. ramosissima	0.82	34.70	0.63	48	23	8.6
O. spectabilis var *spectabilis*	0.82	35.01	0.65	54	26	7.6
O. spectabilis var *diegoensis*	0.82	34.94	0.65	54	28	7.1
O. sinicola	0.81	34.84	0.62	52	25	8
O. splendens	0.81	35.70	0.67	54	24	8.3
O. truncata	0.92	34.85	0.65	46	25	8
Palisada corallopsis	0.86	34.27	0.63	53	25	8
P. flagellifera	0.84	34.56	0.64	49	26	7.6
P. furcata	0.83	34.55	0.63	49	26	7.7
P. patentiramea	0.81	35.46	0.61	50	27	7.4
P. perforata	0.78	36.41	0.60	51	26	7.6
P. thuyoides	0.84	34.61	0.59	48	25	8.0
P. cf. *cruciata*	0.87	34.02	0.62	48	27	8.4
P. cf. *robusta*	0.88	34.42	0.61	48	26	8.6
Yuzurua poiteaui	0.73	35.97	0.6	53	27	7.4
Y. poiteaui var. *gemmifera*	0.73	36.55	0.59	54	26	7.6
Yuzurua sp. (as *P. papillosa-3*)	0.78	35.60	0.61	49	27	7.5

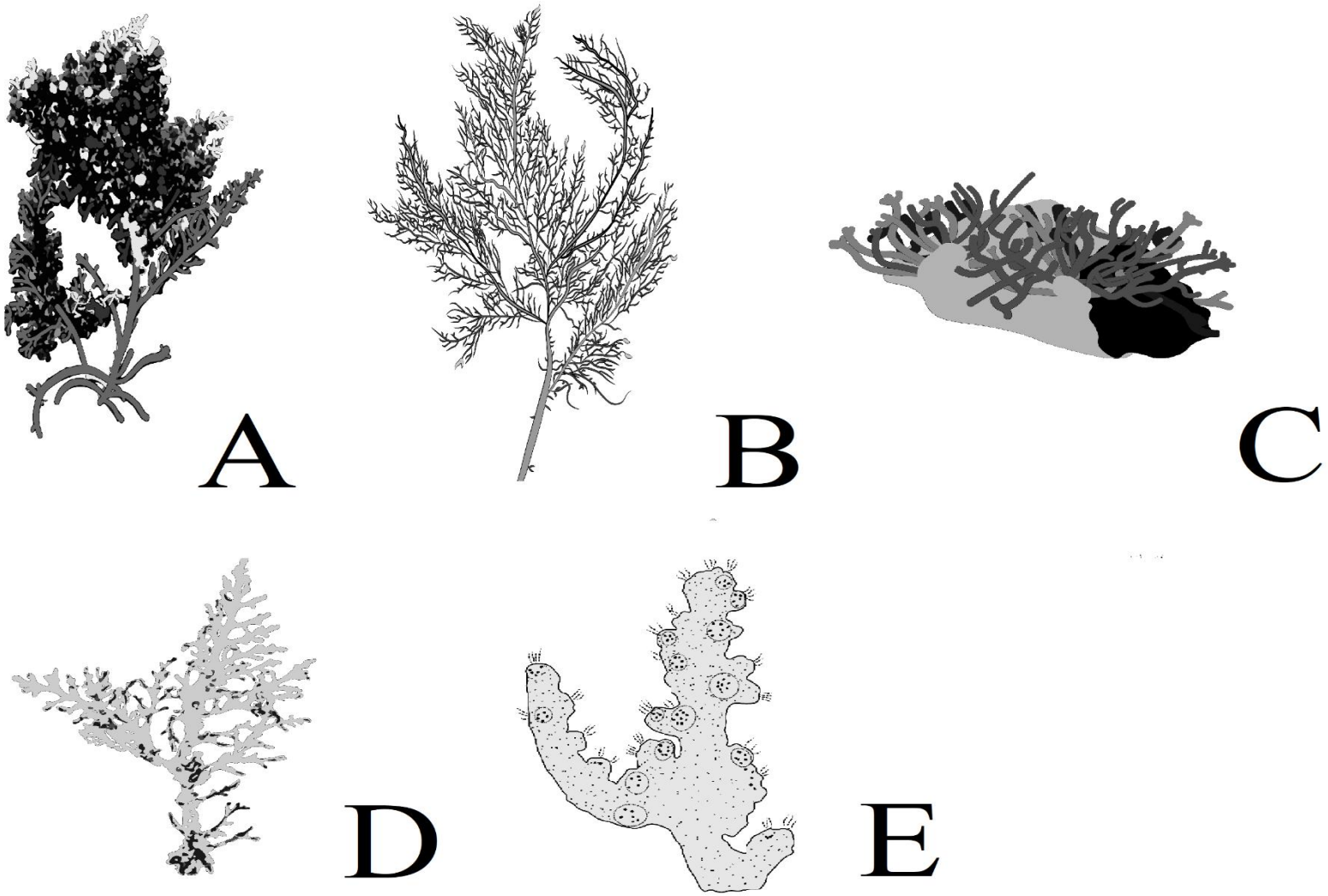

Figure 1. Habit of *Chondrophycus* (**A**), *Laurencia* (**B**), Osmundea (**C**), *Palisada* (**D**), *Yuzurua* (**E**).

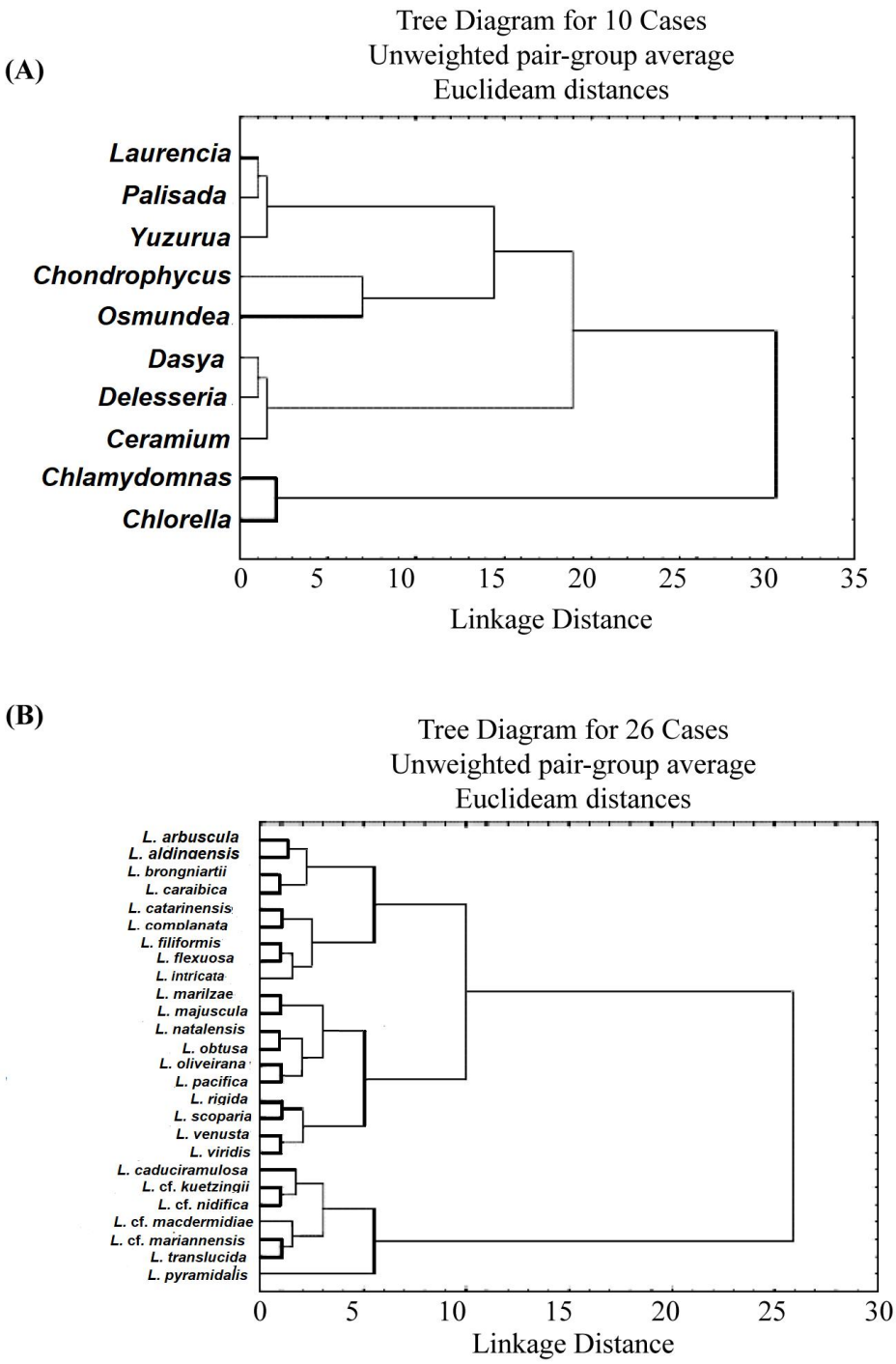

Figure 2. Cluster of general groups (A), and *Laurencia s.s* species (B) *rbc*L gene based on codon employment similarity as measured by the Long and Gillespie (1991) procedure in reference [34].

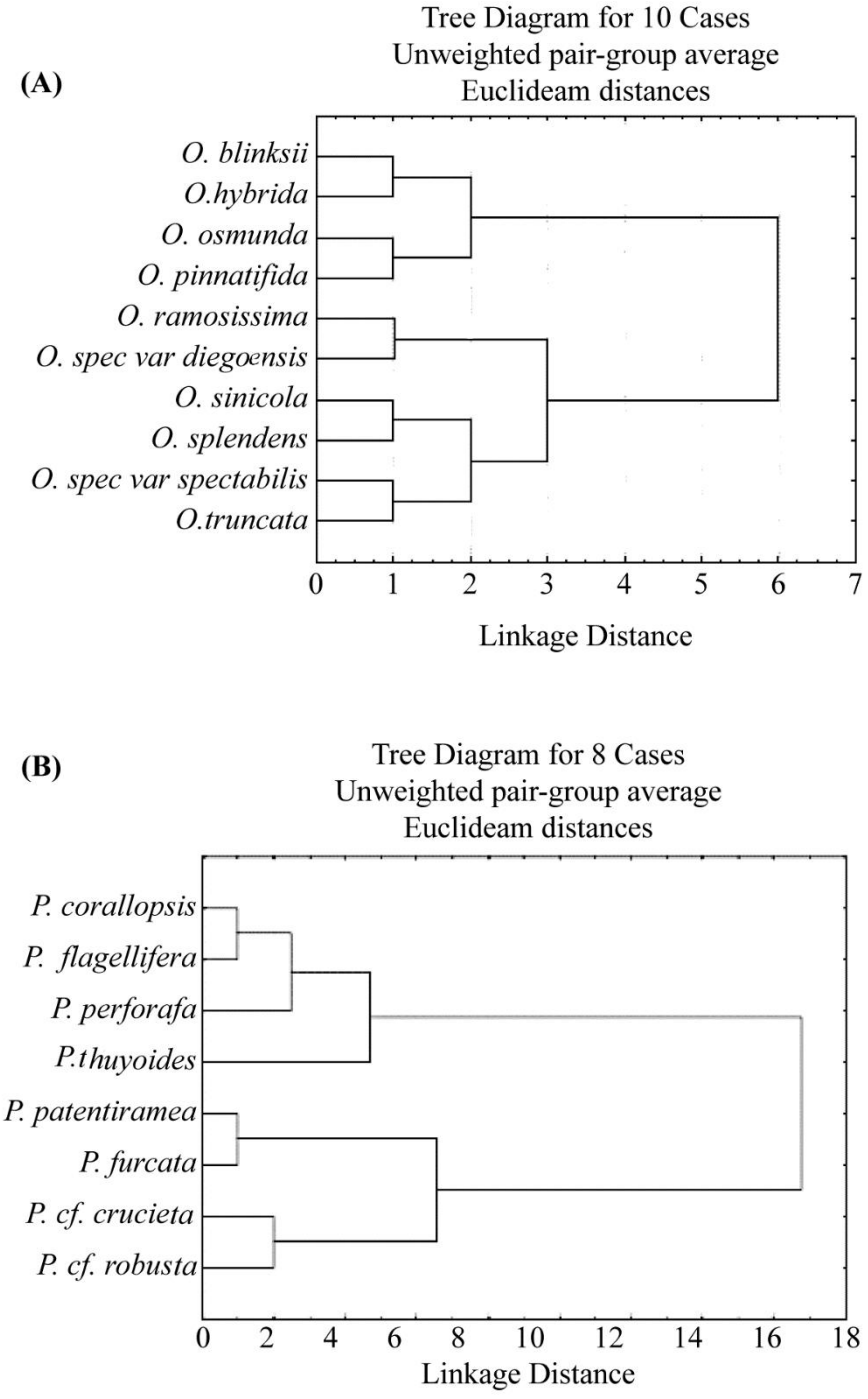

Figure 3. Cluster of *Osmundea* (A) and *Palisada* (B) genera *rbc*L gene based on codon employment similarity as measured by the Long and Gillespie (1991) procedure in reference [34].

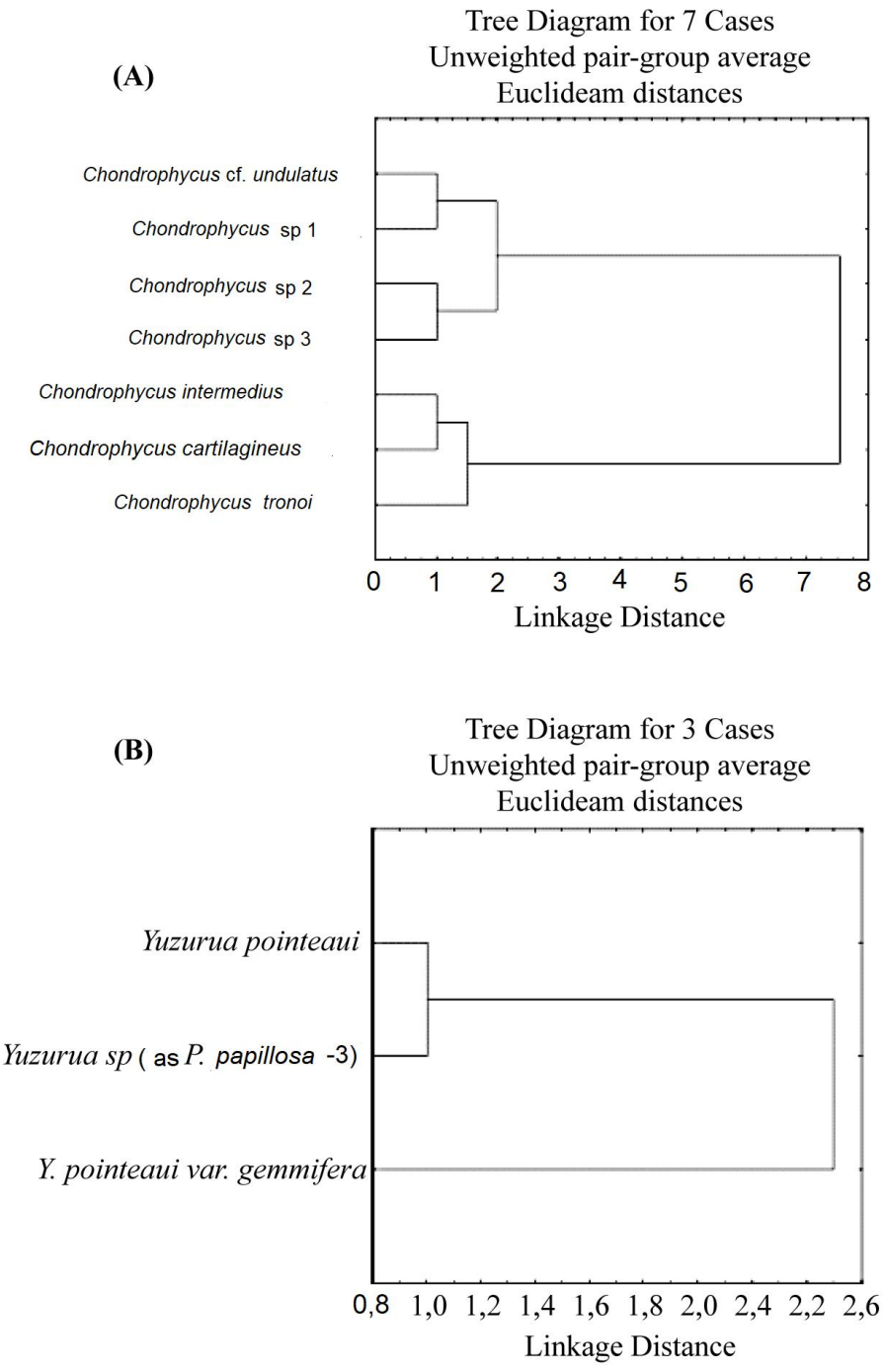

Figure 4. Cluster of *Chondrophycus* (A) and *Yuzurua* (A) genera *rbc*L gene based on codon employment similarity as measured by the Long and Gillespie (1991) procedure in reference [34].