Phylogenetic analysis of the Critically Endangered *Karpathos water frog* (Anura, Amphibia): conservation insights from complete mitochondrial genome sequencing

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Supplementary material

Table S1. Sequences used in the current study.

N/N	Species	Location	GenBank Accession #	Reference
1	*Pelophylax bedriagae*	Jordan	NC_029200.1	Hofman et al., Unpublished
2	*Pelophylax bedriagae*	Jordan	KP260932.1	Hofman et al., Unpublished
3	*Pelophylax bedriagae*	Turkey	KP260929.1	Hofman et al., Unpublished
4	*Pelophylax bedriagae*	Turkey	KP260934.1	Hofman et al., Unpublished
5	*Pelophylax bedriagae*	Turkey	NC_029197.1	Hofman et al., Unpublished
6	*Pelophylax bedriagae*	Turkey	NC_029201.1	Hofman et al., Unpublished
7	*Pelophylax bedriagae*	Greece	KP260928.1	Hofman et al., Unpublished
8	*Pelophylax cretensis*	Greece	NC_025575.1	Hofman et al., 2016
9	*Pelophylax cretensis*	Greece	KM677928.1	Hofman et al., 2016
10	*Pelophylax cypriensis*	Cyprus	NC_026893.1	Hofman et al., 2016
11	*Pelophylax cypriensis*	Cyprus	KP814009.1	Hofman et al., 2016
12	*Pelophylax epeiroticus*	Greece	NC_026894.1	Hofman et al., 2016
13	*Pelophylax epeiroticus*	Greece	KP814010.1	Hofman et al., 2016
14	*Pelophylax kurtmuelleri*	Greece	KP814011.1	Hofman et al., 2016
15	*Pelophylax kurtmuelleri*	Greece	NC_026895.1	Hofman et al., 2016
16	*Pelophylax kurtmuelleri*	n/a	MT410949.1	Leerhoei, F., Unpublished

17	*Pelophylax lessonae*	Poland	JN627422.1	Hofman et al., 2012
18	*Pelophylax lessonae*	Poland	JN627426.1	Hofman et al., 2012
19	*Pelophylax shqipericus*	Montenegro	NC_026896.1	Hofman et al., 2016
20	*Pelophylax nigromaculatus*		KT878718.1	Jiang et al., 2017
21	*Rana ridibundus*		JN627421.1	Hofman et al., 2012
22	*Rana ridibundus*		JN627423.2	Hofman et al., 2013
23	*Rana plancyi*		EF196679.1	Nie et al., Unpublished
24	*Rana huanrensis*		MZ779046.1	Bae et al., 2022
25	*Rana esculenta*		JN627424.1	Hofman et al., 2012
26	*Rana chosenica*		JF730436.1	Ryu et al., 2011
27	*Pelophylax cerigensis*	Karpathos, Argoni	OQ694802	This study
28	*Pelophylax cerigensis*	Karpathos, Argoni	OQ694796	This study
29	*Pelophylax cerigensis*	Karpathos, Olympos	OQ694793	This study
30	*Pelophylax cerigensis*	Karpathos, Olympos	OQ694794	This study
31	*Pelophylax cerigensis*	Karpathos, Olympos	OQ694795	This study
32	*Pelophylax cerigensis*	Rhodes, Archipolis	OQ694797	This study
33	*Pelophylax cerigensis*	Rhodes, Epta Piges	OQ694798	This study
34	*Pelophylax cerigensis*	Rhodes, Gadouras River	OQ694799	This study
35	*Pelophylax cerigensis*	Rhodes, Apolakia Dum	OQ694800	This study
36	*Pelophylax cerigensis*	Rhodes, Apolakia Dum	OQ694801	This study

Table S2. The best partitioning scheme selected by PartitionFinder.

Subset	Best Model	# sites	Partition names
1	GTR+I+G	944	12S
2	GTR+I+G	1604	16S
3	GTR+I+G	1102	ND1_1, ND4_1, ATP6_1, ND4L_1
4	GTR+I+G	1558	ND3_2, ND4L_2, ND4_2, ND1_2, ATP6_2, ND2_2
5	GTR+G	670	ND2_3, ND1_3
6	GTR+G	1123	ND5_1, ND3_1, ATP8_1, ND2_1
7	GTR+I+G	517	COX1_1
8	GTR+I+G	746	COX1_2, COX2_2
9	GTR+I+G	892	ND3_3, COX1_3, ND6_1, ND4L_3
10	GTR+I+G	873	CYTB_1, COX3_1, COX2_1
11	GTR+I+G	490	COX2_3, COX3_3
12	GTR+G	222	ATP8_2, ND6_2
13	GTR+G	55	ATP8_3
14	GTR+I+G	1287	ATP6_3, ND5_3, ND4_3
15	GTR+I+G	643	CYTB_2, COX3_2
16	GTR+I+G	607	ND5_2
17	GTR+G	167	ND6_3
18	GTR+I+G	381	CYTB_3

Table S3. Genetic p-distances % between the *Pelophylax* groups (below diagonal) and Standard Error values (above diagonal) based on 1,000 permutations.

	P. lessonae	*P. bedriagae (Jordan)*	*P. bedriagae (Greece)*	*P. bedriagae (Turkey)*	*P. epeiroticus*	*P. cretensis*	*P. kurtmuelleri*	*P. cerigensis (Karpathos)*	*P. cerigensis (Rhodes)*	*P. cypriensis*	*P. shqipericus*	*P. nigromaculatus*	*R. ridibundus*	*R. plancyi*	*R. huanrensis*	*R. esculenta*	*R. chosenica*
P.lessonae		0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.4	0.0	0.3
P.bedriagae (Jordan)	12.9		0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.4	0.3	0.3
P.bedriagae (Greece)	12.6	5.2		0.1	0.3	0.3	0.2	0.1	0.1	0.2	0.2	0.3	0.2	0.3	0.4	0.3	0.3
P.bedriagae (Turkey)	12.7	5.4	2.7		0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.3	0.2	0.3	0.4	0.3	0.3
P.epeiroticus	13.2	9.9	10.2	10.1		0.1	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.3	0.4	0.3	0.3
P.cretensis	13.4	8.6	8.7	8.7	10.7		0.2	0.0	0.3	0.2	0.3	0.3	0.2	0.3	0.4	0.3	0.3
P.kurtmuelleri	12.9	5.3	5.2	5.1	10.2	8.7		0.2	0.2	0.2	0.2	0.3	0.0	0.3	0.4	0.3	0.3
P.cerigensis (Karpathos)	12.5	5.3	1.5	2.8	10.0	8.8	5.2		0.0	0.2	0.2	0.3	0.1	0.3	0.4	0.3	0.3

P.cerigensis (Rhodes)	12.5	5.3	1.5	2.8	10.0	8.8	5.2	0.1		0.2	0.2	0.3	0.1	0.3	0.4	0.3	0.3
P.cypriensis	12.6	5.7	5.0	5.0	10.2	8.6	5.4	4.8	4.9		0.3	0.3	0.2	0.3	0.4	0.3	0.3
P.shqipericus	7.3	13.1	12.6	12.8	13.3	13.7	12.8	12.7	12.7	13.1		0.3	0.3	0.3	0.3	0.2	0.3
P.nigromaculatus	16.9	16.2	16.2	16.2	16.6	16.5	16.3	16.3	16.3	16.3	16.9		0.3	0.1	0.3	0.3	0.0
R.ridibundus	12.8	5.3	5.1	5.1	10.1	8.6	1.0	5.1	5.1	5.4	12.8	16.3		0.3	0.4	0.0	0.3
R.plancyi	17.1	16.4	16.4	16.4	16.9	16.8	16.4	16.5	16.4	16.5	17.1	1.6	16.4		0.4	0.3	0.1
R.huanrensis	22	21.6	21.7	21.6	21.9	22	21.7	21.7	21.7	21.8	22.1	21.3	21.7	21.5		0.4	0.4
R.esculenta	0.2	12.9	12.5	12.7	13.2	13.5	12.9	12.5	12.5	12.5	7.2	16.8	12.7	17.1	22.1		0.3
R.chosenica	16.9	16.3	16.3	16.3	16.9	16.6	16.4	16.4	16.4	16.4	16.9	1.3	16.4	1.3	21.3	16.9	

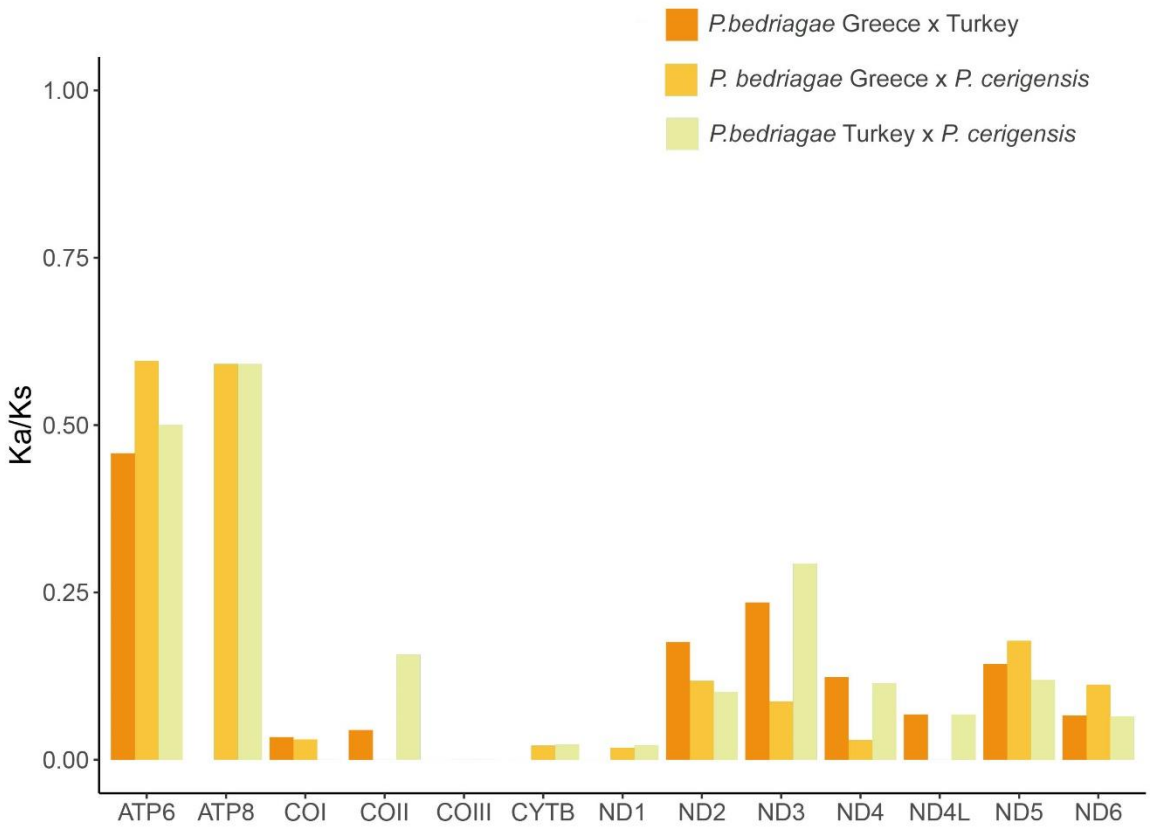

Figure S1. Rates of synonymous (Ks) and non-synonymous (Ka) nucleotide substitutions Ka/Ks for the 13 protein coding genes.