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ABSTRACT

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1. Introduction

 $\begin{array}{c} \mathbf{j} & \mathbf{r} \\ \mathbf{j} & \mathbf{r} \\ \mathbf{j} \\ \mathbf{r} \\ \mathbf$

 $\begin{bmatrix} \mathbf{r} & \mathbf{r}$

2. Materials and methods

2.1. Sample collection and DNA extraction

S. malacanthus (, ee: 20060805036), erf e $f_1 \in C$, $f_2 = F_1, G_2$] A. f_2006_{eff}]. A. $f_1 \in e$ e $f_2 = f_1$] D A [. e f_1] $f_2 = f_2$] $f_1 = f_2$ [. $f_2 = f_1$] $f_2 = f_2$] $f_1 = f_2$] $f_2 = f_2$] $f_2 = f_2$] $f_1 = f_2$] $f_2 = f_2$] $f_1 = f_2$] $f_2 = f_2$] $f_2 = f_2$] $f_1 = f_2$] $f_2 = f_2$] $f_1 = f_2$] $f_2 = f_2$] $f_2 = f_2$] $f_1 = f_2$] $f_2 = f_2$] $f_1 = f_2$] $f_2 = f_2$] $f_1 = f_2$] $f_2 = f_2$] $f_3 = f_2$] $f_2 = f_2$] $f_3 = f_3$]

2.2. Primer design, PCR amplification, and sequencing

Table 1

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1	tRNA ^{Phe} -12S rRNA	,A C, ,AA MAAA CA, CAC,	C AC C YC, YA A CC	(1) (2014)
2	12S rRNA -16S rRNA	AA A A., A. A. AA AA	CAACCA C_A_¥ACCAC _A	• t].(2014)
3	16S rRNA-16S rRNA	AACCC _C_C CAAA A _	A C.CCA A	a.e. t.t
4	16S rRNA-16S rRNA	, ACC , CAAA , A C MAA,CAC,	ACA ALA AAACL ACCL ALL	, [t].(2014)
5	16S rRNA- tRNA ^{GIn}	CA CC C.AAAC	A A , , , ADA A CAC	• t].(2014)
6	tRNA ^{GIn} - tRNA ^{Asn}	A AAA AA 🗸 🖌 AACCCA.	C CA C AAC.AA A	• t].(2014)
7	ND2-COII	ACA_CC_CA_AC_CACCACC_A	A_A A_CAAA CCCA A_	a.e. t.t
8	COII- tRNA ^{Lys}	, vCAA AC C C ,CACCY ,	CACCA C CAAA CC A	• t].(2014)
9	tRNA ^{Lys} -COIII	A C . Y CC AA CC AA	LCA C D LC ACYAL	• t].(2014)
10	COIII- tRNA ^{Gly}	,AA, C CACCAA CACA¥ C	_CCYYAACCAA AC_	• t].(2014)
11	COIII-ND4L	A AC _A_AC C_C	Α C_A CC_CACAA CA AA	a.e. t.t
12	tRNA ^{Arg} -ND4	AA AMCMC, AC C.	,C , C CC AAD C∀A	• t].(2014)
13	ND4-ND4	CC_C A CCA_	A. ,A C ,,AC,A ,,AA, ,AC	a.e. t.t
14	ND4-ND5	, CA , , A, A, C ,C	A_AA_ C_CC A CA A	a.e. t.t
15	ND5-ND5	A CC ACA.AAC ACC	AA	a.e. t.t
16	ND5- tRNA ^{Glu}	ACCY, AA,		• t].(2014)
17	ND6- Cytb	, CC AA,AA CAAA AC,AC	C AAA .CC.C .	u.i 1.1
18	Cytb- D-loop	CCCCACCCA_ACYACA_	LAC_ACA	a. e. 5.5
19	D-loop-12S rRNA	CACCCY, C,CCCAAA CYA	, C AC., CA. , AA	n i tit

D A. $e \in f_1$ if $(A_1, e_1) \in f_1$, $(A_1, e_2) \in f_2$, $(A_1,$] to]to restrict]] terms of]ere Crellore to, extinct on ended on a local terms of the second states of the sec are rest fire eres] e.

2.3. Sequence editing and analysis

 $[t] = 2e \quad A.e. \quad [i] \quad 13e \quad f_{i} \rightarrow \dots e e \quad f_{i} \quad e \quad [e \quad f_{i} \quad f_{i}$

2.4. Phylogenetic analyses

C. estimate intervent in the entry of the problem o

3. Results

3.1. General features of S. malacanthus mtDNA achieved in this study

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3.2. Mitogenomic dataset characteristics



4. Discussion

A ere $(f_{1}, f_{2}, f_{3}, f_{3},$

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