**Приложение 3.** Набор последовательностей 987 пар нуклеотидов фрагмента контрольного района митохондриальной ДНК трёх форм ленка рода *Brachymystax*, использованных в данной работе

#NEXUS

[File generated by DnaSP Ver. 6.12.03; май 15, 2023]

[Haplotype Data from Data File: seqdumpCR4ccIQ.fas]

[Number of sequences: 91 Number of sequences used: 91]

[Number of Sites in the complete Data File: 987]

[Selected Region: 1-987]

[Sites with alignment gaps: considered]

[Invariable sites: removed]

BEGIN TAXA;

DIMENSIONS NTAX=64;

TAXLABELS

Hap\_1

Hap\_2

Hap\_3

Hap\_4

Hap\_5

Hap\_6

Hap\_7

Hap\_8

Hap\_9

Hap\_10

Hap\_11

Hap\_12

Hap\_13

Hap\_14

Hap\_15

Hap\_16

Hap\_17

Hap\_18

Hap\_19

Hap\_20

Hap\_21

Hap\_22

Hap\_23

Hap\_24

Hap\_25

Hap\_26

Hap\_27

Hap\_28

Hap\_29

Hap\_30

Hap\_31

Hap\_32

Hap\_33

Hap\_34

Hap\_35

Hap\_36

Hap\_37

Hap\_38

Hap\_39

Hap\_40

Hap\_41

Hap\_42

Hap\_43

Hap\_44

Hap\_45

Hap\_46

Hap\_47

Hap\_48

Hap\_49

Hap\_50

Hap\_51

Hap\_52

Hap\_53

Hap\_54

Hap\_55

Hap\_56

Hap\_57

Hap\_58

Hap\_59

Hap\_60

Hap\_61

Hap\_62

Hap\_63

Hap\_64;

END;

[Hap# Freq. Sequences]

[Hap\_1: 1 HQ317211Hucho]

[Hap\_2: 1 MK258084H\_taimen]

[Hap\_3: 5 NC\_018342.1 JQ686731.1 KF647844.1 MF373754.1 KF487138.1]

[Hap\_4: 1 KF647843.1]

[Hap\_5: 1 MH885371.1]

[Hap\_6: 1 KF647841.1]

[Hap\_7: 1 KF647840.1]

[Hap\_8: 1 KF647839.1]

[Hap\_9: 1 KF647842.1]

[Hap\_10: 2 MH885372.1 JX227987.1]

[Hap\_11: 1 MH885373.1]

[Hap\_12: 1 MH885370.1]

[Hap\_13: 1 KF487137.1]

[Hap\_14: 1 KF487136.1]

[Hap\_15: 2 MH885368.1 MH885380.1]

[Hap\_16: 1 MH885381.1]

[Hap\_17: 1 MH885369.1]

[Hap\_18: 1 KF487135.1]

[Hap\_19: 1 KF647838.1]

[Hap\_20: 1 KF487132.1]

[Hap\_21: 1 KF487131.1]

[Hap\_22: 1 MH885375.1]

[Hap\_23: 1 MH885377.1]

[Hap\_24: 1 MH885376.1]

[Hap\_25: 1 KF647845.1]

[Hap\_26: 1 MH885374.1]

[Hap\_27: 3 KF647837.1 MF373752.1 KF487134.1]

[Hap\_28: 2 MH885378.1 MH885379.1]

[Hap\_29: 1 MF373753.1]

[Hap\_30: 1 JN680736.1]

[Hap\_31: 1 JN680737.1]

[Hap\_32: 1 JN680738.1]

[Hap\_33: 1 AF125519.1]

[Hap\_34: 1 KX505381.1]

[Hap\_35: 1 KX505382.1]

[Hap\_36: 1 JN680735.1]

[Hap\_37: 1 JN680732.1]

[Hap\_38: 3 JN680731.1 JN680730.1 JQ675732]

[Hap\_39: 1 JN680733.1]

[Hap\_40: 2 KX505380.1 KX505379.1]

[Hap\_41: 1 KX505378.1]

[Hap\_42: 1 KX505377.1]

[Hap\_43: 1 JN680734.1]

[Hap\_44: 1 MF373757.1]

[Hap\_45: 1 MF373756.1]

[Hap\_46: 3 MH885382.1 MH885385.1 MH885384.1]

[Hap\_47: 1 JQ686730lenok]

[Hap\_48: 1 MH885383.1]

[Hap\_49: 1 MH885387.1]

[Hap\_50: 1 MH885386.1]

[Hap\_51: 1 MF373755.1]

[Hap\_52: 1 MH885388.1]

[Hap\_53: 2 MH885397.1 MH885411.1]

[Hap\_54: 2 MH885399.1 MH885410.1]

[Hap\_55: 4 MH885404.1 MH885403.1 MH885405.1 MH885407.1]

[Hap\_56: 1 NC\_024674Brachymystax]

[Hap\_57: 1 MH885391.1]

[Hap\_58: 5 MH885402.1 MH885400.1 MH885390.1 MH885392.1 MH885408.1]

[Hap\_59: 2 MH885406.1 MH885394.1]

[Hap\_60: 2 MH885393.1 MH885409.1]

[Hap\_61: 1 MH885401.1]

[Hap\_62: 2 MH885398.1 MH885396.1]

[Hap\_63: 2 MH885395.1 MH885412.1]

[Hap\_64: 1 KJ730525.]

BEGIN CHARACTERS;

DIMENSIONS NCHAR=164;

FORMAT DATATYPE=DNA MISSING=? GAP=- MATCHCHAR=.;

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[26] nt\_154 [27] nt\_155 [28] nt\_161 [29] nt\_216 [30] nt\_228

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[36] nt\_295 [37] nt\_318 [38] nt\_324 [39] nt\_346 [40] nt\_347

[41] nt\_373 [42] nt\_385 [43] nt\_390 [44] nt\_408 [45] nt\_409

[46] nt\_417 [47] nt\_437 [48] nt\_438 [49] nt\_477 [50] nt\_509

[51] nt\_511 [52] nt\_527 [53] nt\_545 [54] nt\_551 [55] nt\_556

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[126] nt\_861 [127] nt\_862 [128] nt\_864 [129] nt\_865 [130] nt\_866

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[136] nt\_881 [137] nt\_885 [138] nt\_888 [139] nt\_889 [140] nt\_892

[141] nt\_893 [142] nt\_894 [143] nt\_895 [144] nt\_896 [145] nt\_897

[146] nt\_901 [147] nt\_927 [148] nt\_929 [149] nt\_932 [150] nt\_933

[151] nt\_942 [152] nt\_943 [153] nt\_944 [154] nt\_947 [155] nt\_949

[156] nt\_955 [157] nt\_970 [158] nt\_971 [159] nt\_975 [160] nt\_976

[161] nt\_977 [162] nt\_978 [163] nt\_979 [164] nt\_983

;

MATRIX

[ 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 ]

[ \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* ]

Hap\_1 ATGCGAACTTGTGAAGTAGTATATCGCTTACGATCCACGGGTCTACCCTCTTTCTCTATTTGGTTTGCATCCTTGGT-TACATAATAGATCTCGACCCCCACACCTGTCTGCTAC-AAGCTCATGACTTTGAAACTAAGCCCCCTTTTCAGACTGGAGCCCCTT

Hap\_2 .........CACA.GTCGA.....T...C....................T.................T.........-...................-.................-.....................G.....T............G....T..

Hap\_3 ..AT..GTC.A.A..T.......A..T...TA...A.T..ACAAG....T............A........T.....T.CT..GT.--GAT.TAG..-........A........A.--.-T......C.........A.TA.TC..-T....C...ATATTCC

Hap\_4 ..AT..GTC.A.AG.T.......A..T...TA...A.T..ACAAG....T............A........T.....T.CT..GT.--GAT.TAG..-........A........A.--.-T......C.........A.TA.TC..-T....C...ATATTCC

Hap\_5 ..AT..GTC.A.A..T.......A..T...TA...A.T..ACAAG....T..-.........A........T.....T.CT..GT.--GAT.TAG..-........A........A.--.-T....T.C.........A.TA.TC..-T...TC...ATATTCC

Hap\_6 ..AT..GTC.A.A..T.......A..T...TAG..AGT..ACAAG....T............A........T.....T.CT..GT.--GAT.TAG..-........A........A.--.-T....T.C.........A.TA.TC..-T...TC...ATATTCC

Hap\_7 ..AT..GTC.A.A..T.......A..T...TA...A.T..ACAAG....T............A........T.....T.CT..GT.--GAT.TAG..-........A........A.--.-T....T.C.........A.TA.TC..-T...TC...ATATTCC

Hap\_8 ..AT..GTC.A.A..T.......A..T...TA...A.T..ACAAG....T............A.C......T.....T.CT..GT.--GAT.TAG..-........A........A.--.-T....T.C.........A.TA.TC..-T...TC...A.ATTCC

Hap\_9 ..AT..GTC.A.A..T.......A..T...TA...A.T..ACAAG....T............A........T.....T.CT..GT.--GAT.TAG..-........A........A.--.-T......C.........A.TA.TC..-T...TC...ATATTCC

Hap\_10 ..AT..GTC.A.A..T.......A..T...TA...A.T..ACAAG....T..-.........A........T.....T.CT..GT.--GAT.TAG..-........A........A.--.-T......C.........A.TA.TC..-T....C...ATATTCC

Hap\_11 ..AT..GTC.A.A..T.......AT.T...TA...A.T..ACAAG....T..-.........A........T.....T.CT..GT.--GAT.TAG..-........A........A.--.-T......C.........A.TA.TC..-T....C...ATATTCC

Hap\_12 ..AT..GTC.A.A..T.......A..T...TA...A.T..ACAAG....T..-.........A........T.....T.CT..GT.--GAT.TAG..-........A........A.--.-T......C.........A.TA.TCC.-T....C...ATATTCC

Hap\_13 ..AT..GTC.A.A..T.......A..T...TA...A.T..ACAAG....T.........G..A........T.....T.CT..GT.--GAT.TAG..-........A........A.--.-T......C.........A.TA.TC..-T....C...ATATTCC

Hap\_14 ..AT..GTC.A.A..T.......A..T...TA...A.T..ACAAG....T............A........T.....T.CT..GT.--GAT.TAG..-........A........A.--.-T......C.........A.TA.TC.G-T....C...ATATTCC

Hap\_15 ..AT..GTC.A.A..T.......AT.T...TA...A.T..ACAAG....T..-.........A........T.....T.CT..GT.--GAT.TAG..-........A........A.--.-T......C.........A.TA.TC..-T....C...ATA.TC.

Hap\_16 ..AT..GTC.A.A..T.......AT.T...TA...A.T..ACAAG....T.G-.........A........T.....T.CT..GT.--GAT.TAG..-........A........A.--.-T......C.........A.TA.TC..-T....C...ATA.TC.

Hap\_17 ..AT..GTC.A.A..T.......A..T...TA...A.T..ACAAG....T..-.........A........T.....T.CT..GT.--GAT.TAG..-...A..GGA........A.--.-T......C....C.A..A.TA.TC..-T....C...ATA.TC.

Hap\_18 ..AT..GTC.A.A..T.......A..T...TA...A.T..ACAAG....T............A........T.....T.CT..GT.--GAT.TAG..-.T.A..GGA........A.--.-T.G....C....C.A..A.TA.TC..-T....C...ATA.TC.

Hap\_19 ..AT..GTC.A.A..T.......A..T...TA...A.T..ACAAG....T............A..G.....T.....T.CT..GT.--GAT.TAG..-.T.A....A........A.--.-T......A....CGA..AGTA.TC..-T....C...ATA.TC.

Hap\_20 ..AT..GTC.A.A..T...G.G.A..T...TA.G.A.T..ACAAG....T............A.....GCAT.CTACT.CTC.GT.--GAT.TAGTA-....C...A......T.A.--.-T......C..C.C....A..A.TC..-T....C...ATA.TC.

Hap\_21 ..AT..GTC.A.A..T.......A..T...TA...A.T..ACAAG....T............A..GC...AT.....T.CT..GT.--GATATAGTA-ATTACA.GACTCAGAT.A.--G-T.G.C.CCA.CCC.AC.A..A.TC..-T....C...ATA.TC.

Hap\_22 ..AT..GTC.A.A..T.......A..T...TA...A.T..ACAAG....T..-.........A........T.....T.CT..GT.--GA..TAG..-........A........A.--.-T......C.........A.TA.TC..-T....C...ATA.TC.

Hap\_23 ..AT..GTC.A.A..T.......A..T...TA...A.T..ACAAG....T.G-.........A........T.....T.CT..GT.--GA..TAG..-........A........A.--.-T......C.........A.TA.TC..-T....C...ATA.TC.

Hap\_24 ..AT..GTC.A.A..T.......A..T...TA...A.T..ACAAG....T..-.........A........T.....T.CT..GT.--GA..TAG..-........A........A.--.-T......C......A..A.TA.TC..-T....C...ATA.TC.

Hap\_25 ..AT..GTC.A.A..T.......A..T....A...A.T..ACAAG....T............A........T.....T.CT..GT.--GA..TAG..-........A........A.--.-T......C.........A.TA.TC..-T....C...ATA.TC.

Hap\_26 ..AT..GTC.A.A..T.......A..T....A...A.T..ACAAG....T..-.........A........T.....T.CT..GT.--GA..TAG..-........A........A.--.-T......C.........A.TA.TC..-T....C...ATA.TC.

Hap\_27 ..AT..GTC.A.A..T.......A..T...TA...A.T..ACAAG....T............A........T.....T.CT..GT.--GAT.TAG..-........A........A.--.-T......C.........A.TA.TC..-T....C...ATA.TC.

Hap\_28 ..AT..GTC.A.A..T.......A..T...TA...A.T..ACAAG....T..-.........A........T.....T.CT..GT.--GAT.TAG..-........A........A.--.-T......C.........A.TA.TC..-T....C...ATA.TC.

Hap\_29 ..AT..GTC.A.A..T.......A..T...TA...A.T..ACAAG....T............A........T.....T.CT..GT.--GAT.TAG..-........A........A.--.-T......C.........A.TATTCC.-T....C...ATA.TC.

Hap\_30 ..AT..GTC.A.A..T.......A..T.C.TA...A.T..A.AAG....T..-.........A........T.....T.CT..GT.--GAT.TAG..-........A........-.--.-T......C.A.......A.TATTC..-T....CA..ATATTC.

Hap\_31 ..AT..GTC.A.A..T.......A..T.C.TA...A.T..A.AAG....T..-.......A.A........T.....T.CT..GT.--GAT.TAG..-........A........-.--.-T......C.A.......A.TATTC..-T....CA..ATATTC.

Hap\_32 ..AT..GTC.A.A..T.......A..T.C.TA...A.T..A.AAG....T..-.........A........TC....T.CT..GT.--GAT.TAG..-........A........-.--.-T......C.A.......A.TATTC..-T....CA..ATATTC.

Hap\_33 ..AT..GTC.A.A..T.......A..T.C.TA...A.T..A.AAG....T..CAGGACC...AA.......TC....T-CT..GT.--GAT.TAG..-........A........-.--.-T......C.A.......A.TATTC..-T....CA..ATATTC.

Hap\_34 ..AT..GTC.A.A..T.......A..T.C.TA...A.T..A.AAG....T............A........TC....T.CT..GT.--GAT.TAG..-........A........-.--.-T......C.A.......A.TATTC..-T....CA..ATATTC.

Hap\_35 ..AT..GTC.A.A..T.......A..T.C.TA...A.T..A.AAG....T............A........T.....T.CT..GT.--GAT.TAG..-........A........-.--.-T......C.A.......A.TATTC..-T....CA..ATATTC.

Hap\_36 ..ATC.GTC.A.A..T.......AT.T.C..A...A.T..ACAAGA...T..-.........A..............T.CT...T.--GAT.TAG..-........A........-.--.-T......C.........A.TATTC..-T....C...ATA.TC.

Hap\_37 ..ATC.GTC.A.A..T.......AT.T.C..A...A.T..ACAAG....T..-........AA..............T.CT...T.--GAT.TAG..-........A........-.--.-T......C.........A.TATTC..-T....C...ATA.TC.

Hap\_38 ..ATC.GTC.A.A..T.......AT.T.C..A...A.T..ACAAG....T..-.........A..............T.CT...T.--GAT.TAG..-........A........-.--.-T......C.........A.TATTC..-T....C...ATA.TC.

Hap\_39 ..ATC.GTC.A.A..T.......AT.T.C..A...A.T..ACAAG....T..-.......A.A..............T.CT...T.--GAT.TAG..-........A........-.--.-T......C.........A.TATTC..-T....C...ATA.TC.

Hap\_40 ..ATC.GTC.A.A..T.......AT.T.C..A...A.T..ACAAG....T............A..............T.CT...T.--GAT.TAG..-........A........-.--.-T......C.........A.TATTC..-T....C...ATA.TC.

Hap\_41 ..ATC.GTC.A.A..T.......AT.T.C..A...A.T..ACAAG....T............A..............T.CT...T.--GAT.TAG..-........A........-.--.-T......C.........A.TA.TC..-T....C.A.ATATTCC

Hap\_42 ..AT..GTC.A.A..T.......AT.T.C......A.T..ACAAG....T............A..............T.CT.C.T.--GAT.TAG..-........A........-.--.-T......C.........A.TA.TC..-T....C...ATA.TC.

Hap\_43 ..AT..GTC.A.A..T.......AT.T.C......A.T..ACAAG....T..-.........A..............T.CT.C.T.--GAT.TAG..-........A........-.--.-T......C.........A.TA.TC..-T....C...ATA.TC.

Hap\_44 GCAT..GTC.A.A..T......CAT..CC..A..TA.T..A.AAG.T..TC...........A..............-.CT...T---GAT.TAG..-........A........-T--.-TG...............A..ATTC..-TG.......A.ATTC.

Hap\_45 GCAT..GTC.A.A..T......CAT..CCG.A..TA.T..A.AAG....T............A..............-.CT...T---GAT.TAG..-.T......A........-T--.-TG...............A..ATTC..-TG.......A.ATTC.

Hap\_46 GCAT..GTC.A.A..T......CAT..CC..A..TA.T..A.AAG....T..-.........A..............-.CT...T---GAT.TAG..-........A........-T--..TG...............A..ATTC...TG.......A.ATTC.

Hap\_47 GCAT..GTC.A.A..T......CAT..CC..A..TA.T..A.AAG....T............A..............-.CT.C.T---GAT.TAG..-........A........-T--..TG...............A..ATTC...TG.......A.ATTC.

Hap\_48 GCAT..GTC.A.A..T......CAT..CC..A..TA.T..A.AAG....T..-........................-.CT...T---GA..TAG..-........A........-T--..TG...............A..ATTC...TG.......A.ATTC.

Hap\_49 GCAT..GTC.A.A..T......CAT..CC..A...A.T..A.AAG....T..-.........A..............-.CT...T---GAT.TAG..-........A........-T--..TG...............A..ATTC...TG.......A.ATTC.

Hap\_50 GCAT..GTC.A.A..T......CAT..CC..A...A.T..A.AAG....T..-.........A..............-.CT...T---GAT.TAG..-........A.......T-T--..TG...............A..ATTC...TG.......A.ATTC.

Hap\_51 .CAT..GTC.A.A..T......CAT..CC..A..TA.T..A.AAG..G.T............A..............-.CT...T---GAT.TAG..-........A........-T--.-TG...............A..ATTC..-TG.......A.ATTC.

Hap\_52 .CAT.GCTC.A.A..T......CATA..C..A..TA.T..A.AAG....T..-.........A..............-.CT...T---GAT.TAG..-........A........-G--..TG.AG............A..ATTC...TGAG.....A.ATTC.

Hap\_53 ...T..GTC.A.A..T......CAT......A...A..AAA.AAG....T..-.........A..............-.C...G..--G...TAG..-.................-.--..T................A..ATTC...T........A.ATTC.

Hap\_54 ...T..GTC.A.A..T......CAT......A...A..AAA.AAG....T..-.........A..............-.T...G..--G...TAG..-.................-.--..T................A..ATTC...T........A.ATTC.

Hap\_55 ...T..GTC...A..T......CAT......A...A..AAA.AAG...CT..-.........A..............-.T...G..--G...TAG..-.................-.--..T................A..ATTC...T........A.ATTC.

Hap\_56 ...T..GTC...A..T......CAT......A...A..AAA.AAG...CT..-.........A..............-.T...G...-G...TAG..-.................-.--..T................A..ATTC...T........A.ATTC.

Hap\_57 ...T..GTC.A.A..T......CAT......A...A..AAA.AAG...CT..-.........A..............-.T...G...-G...TAG..-.................-.--..T................A..ATTC...T........A.ATTC.

Hap\_58 ...T..GTC.A.A..T......CAT......A...A..AAA.AAG...CT..-.........A..............-.T...G..--G...TAG..-.................-.--..T................A..ATTC...T........A.ATTC.

Hap\_59 ...T..GTC.A.A..T......CAT......A...A..AAA.AAG....T..-.........A..............-.T...G..--G...TAG..-.................-.--..T...................ATTC...T..........ATTC.

Hap\_60 ...T..GTC.A.A..T......CAT......A...A..AAA.AAG...CT..-.........A..............-.T...G..--G...TAG..-.................-.--..T...................ATTC...T..........ATTC.

Hap\_61 ...T..GTC.A.A..T......CAT......A...A..AAA.AAG...CT..-.........A..............-.T...G..--G...TAG..-.................-.--..T................A..ATTC...T..........ATTC.

Hap\_62 ...T..GTC.A.A..T....G.CAT......A...A..AAA.AAG....T..-.........A..............-.T...G..--G.T.TAG..-.................-.--..T................A..ATTC...T........A.ATTC.

Hap\_63 ..AT..GTC.A.A..T....G.CAT......A...A..AAA.AAG....T..-.........A..............-.T...G..--G.T.TAG..-.................-.--..T................A..ATTC...T........A.ATTC.

Hap\_64 ...T..GTC.A.A..T......CAT......A...A..AAA.AAG....T..-.........A..............-.T...G...-G.T.TAG..-.................-.--..T................A.TATTC...T........ATATTC.

;

END;