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Supplementary material

Table S1. Tissue samples of *Lepidocolaptes angustirostris* analyzed in this paper. LOC correspond to locality numbers showed in Figure 1. Geographic coordinates are expressed in decimal degrees.

LOC	Sample number	Locality	City - State	Country	Collection	Latitude	Longitude
	UFG 4011						
1	UFG 4038	Fazenda Embrapa	Macapá - AP	Brazil	LGBUNB	0.40° N	51.05° W
	UFG 4048						
	UFG 4094						
2	UFG 2606	Fazenda Monte Carlo	Urbano Santos - MA	Brazil	MPEG	3.21° S	43.39° W
3	UFG 2600	Fazenda Bonito	Castelo de Piauí - PI	Brazil	MPEG	5.31° S	41.55° W
4	UFG 2611	Santa Tereza	Beneditinos - PI	Brazil	MPEG	5.46° S	42.35° W
5	UFG 2609	Fazenda Caluba	Elesbão Veloso - PI	Brazil	MPEG	6.20° S	42.12° W
6	UFG 2608	Chapada dos Macedos	Jardim do Mulato - PI	Brazil	MPEG	6.08° S	42.63° W
7	UFG 2601	Mancha verde	São João dos Patos - MA	Brazil	MPEG	6.49° S	43.70° W
8	UFG 3913	Fazenda São Pedro	Guadalupe - PI	Brazil	MPEG	6.93° S	43.61° W
9	UFG 2615	Vale do Rio Pratinha	Uruçuí - PI	Brazil	MPEG	7.23° S	44.54° W

10	UFG 3916	Fazenda Arsênio	Parambú - CE	Brazil	MPEG	6.46° S	40.65° W
11	UFG 3914	Comunidade Salseiro	Bocaina - PI	Brazil	MPEG	6.96° S	41.28° W
12	UFG 3919	Parque Nacional da Serra das Confusões	Canto do Buriti - PI	Brazil	MPEG	8.35° S	43.40° W
13	UFG 3917	Parque Nacional da Serra da Capivara	São Raimundo Nonato - PI	Brazil	MPEG	9.02° S	42.70° W
14	UFG 3918	Parque Nacional da Serra das Confusões	Caracol - PI	Brazil	MPEG	9.12° S	43.75° W
15	UFG 3227	Barra do Choça	Bahia	Brazil	MZUSP	14.80° S	40.55° W
16	UFG 1052	Lagoa do Cajoeiro	Matias Cardoso - MG	Brazil	LGBU	14.80° S	43.93° W
	UFG 1053						
17	UFG 3228	Campinaçu	Goiás	Brazil	MZUSP	13.70° S	48.56° W
18	UFG 3685	Estação Ecológica de Águas Emendadas	Brasília - DF	Brazil	LGBUNB	15.80° S	47.84° W
	UFG 3686						
	UFG 2405	Reserva Ecológica do IBGE	Brasília - DF	Brazil	LGBUNB	15.80° S	47.84° W
19	UFG 0438	Fazenda Morro Branco	Aurilândia - GO	Brazil	LGBUNB	16.60° S	50.45° W

	UFG 2978						
20	UFG 3002	Fazenda Ouro e Prata	Nova Xavantina - MT	Brazil	LGBUNB	14.60° S	52.35° W
21	UFG 3611 UFG 3621	Parque Nacional da Chapada dos Guimarães	Chapada dos Guimarães - MT	Brazil	LGBUNB	15.40° S	55.82° W
22	UFG 3912 UFG 3770	Retiro Novo	Nossa Senhora do Livramento - MT	Brazil	MPEG	16.30° S	56.29° W
23	UFG 3794 UFG 3795 GSA 007	Vila Bela da Santíssima Trindade	Vila Bela da Santíssima Trindade - MT	Brazil	MZUSP	15.00° S	59.94° W
24	VGR 221 VGR 323	Laguna Caucaya	Departamento de Santa Cruz	Bolivia	UWBM	18.60° S	63.91° W
25	MACN 5928 MACN 5944	Centro de Producción Yabaré	Provincia de Chiquitos - Dpto Santa Cruz	Bolivia	MACN	17.40° S	62.17° W

26	MACN 5663 MACN 5687	Parque Nacional Calilegua	Provincia de Jujuy	Argetina	MACN	23.70° S	64.85° W
	UFG 4285						
27	UFG 4301 UFG 4307	Fazenda Pitangueiras	Bonito - MS	Brazil	LGBUNB	20.80° S	56.58° W
28	MACN 5399 MACN 5434	Reserva Natural Formosa	Provincia de Formosa	Argetina	MACN	24.30° S	61.80° W
	MACN 3155						
29	MACN 3191 MACN 3663	Parque Nacional Pilcomayo	Provincia de Formosa	Argetina	MACN	25.10° S	58.17° W
	MACN 4503						
30	MACN 4506 MACN 4508	Parque Nacional Chaco	Provincia de Chaco	Argetina	MACN	26.80° S	59.60° W
31	MACN 1357 MACN 1404	EBCO	Provincia de Corrientes	Argetina	MACN	27.50° S	58.68° W

32	MACN 4991	Parque Nacional Mburucuya	Província de Corrientes	Argetina	MACN	28.00° S	58.01° W
33	MACN 4339	Parque Nacional El Palmar	Província de Entre Rios	Argetina	MACN	31.90° S	58.24° W
	MACN 6134						
34	MACN 6150	La Para	Província de Córdoba	Argetina	MACN	30.80° S	62.98° W
	MACN 5314						
	MACN 4077						
35	MACN 4086	Nacunan Santa Rosa	Província de Mendoza	Argetina	MACN	34.00° S	67.95° W
	MACN 2117						
36	MACN 2136	Isla las Palmas Baradero	Província de Buenos Aires	Argetina	MACN	33.70° S	59.25° W
37	MACN 4252	Reserva El destino	Província de Buenos Aires	Argetina	MACN	35.10° S	57.39° W

LGBUNB – Laboratório de Genética e Biodiversidade da Universidade de Brasília – Brazil; MPEG – Museu Paranesse Emílio Goeldi – Brazil; MZUSP – Museu de Zoologia da Universidade de São Paulo – Brazil; UWBM - Burke Museum of Natural History, and Culture – USA; MACN – Museo Argentino de Ciencias Naturales – Argentina.

Table S2. Occurrence point for *Lepidocolaptes angustirostris* used in potential niche modeling (see Fig. 4A, for details).

Locality	State	Country	Latitude	Longitude	Reference
Buenos Aires	Buenos Aires	Argentina	36.000° S	60.000° W	Bolívar and Silveira 2015
Reserva El Destino	Buenos Aires	Argentina	35.133° S	57.416° W	Cueto and Cosenave 2000
Catamarca, Alrededores De La Ciudad	Catamarca	Argentina	28.467° S	65.783° W	Bolívar and Silveira 2015
47 km Ne Castelli (C57), Guemes	Chaco	Argentina	25.950° S	60.620° W	Bolívar and Silveira 2015
Belleville	Córdoba	Argentina	32.617° S	62.700° W	Bolívar and Silveira 2015
Unquillo	Córdoba	Argentina	31.233° S	64.317° W	Bolívar and Silveira 2015
Cuay Grande	Corrientes	Argentina	28.667° S	56.283° W	Bolívar and Silveira 2015
Las Lomas, Capital	Corrientes	Argentina	28.480° S	58.980° W	Bolívar and Silveira 2015
Paraná	Entre Ríos	Argentina	31.733° S	60.533° W	Bolívar and Silveira 2015
Río Uruguay	Entre Ríos	Argentina	34.200° S	58.300° W	Bolívar and Silveira 2015
4 km Ne De Laguna Yema, Bermejo	Formosa	Argentina	24.250° S	61.233° W	Bolívar and Silveira 2015
Paraje Ñandhy Vera, Laishi	Formosa	Argentina	26.233° S	58.617° W	Bolívar and Silveira 2015
Guerrero	Jujuy	Argentina	24.217° S	57.850° W	Bolívar and Silveira 2015
Conhelo	La Pampa	Argentina	36.017° S	64.600° W	Bolívar and Silveira 2015
La Pampa, Loventuel	La Pampa	Argentina	36.183° S	65.250° W	Bolívar and Silveira 2015

La Rioja, Sañogasta	La Rioja	Argentina	29.300° S	67.600° W	Bolívar and Silveira 2015
Reserva de Telteca	Mendoza	Argentina	32.350° S	68.050° W	Blendinger 2008
Nācuman, Santa Rosa	Mendoza	Argentina	34.050° S	67.967° W	Bolívar and Silveira 2015
Aguaray	Salta	Argentina	22.267° S	63.733° W	Bolívar and Silveira 2015
El Bananal, Urundel?	Salta	Argentina	23.550° S	64.417° W	Bolívar and Silveira 2015
Pozo Negro, Villa General Roca, General Belgrano	San Luis	Argentina	32.650° S	66.467° W	Bolívar and Silveira 2015
Gato Colorado, El Tostado	Santa Fé	Argentina	28.033° S	61.500° W	Bolívar and Silveira 2015
Villa Constitución, Islar Río Parana	Santa Fé	Argentina	33.233° S	60.333° W	Bolívar and Silveira 2015
Suncho Corral	Santiago del Estero	Argentina	27.933° S	63.450° W	Bolívar and Silveira 2015
Concepción	Tucumán	Argentina	27.333° S	63.583° W	Bolívar and Silveira 2015
Tapia	Tucumán	Argentina	26.600° S	65.300° W	Bolívar and Silveira 2015
Laguna Cayaca	Cordillera	Bolivia	18.673° S	63.917° W	UWBM
Yabaré	Chiquitos	Bolivia	17.433° S	61.167° W	Bolívar and Silveira 2015
próximo a localidade El Tuná, 300 m N do Rio Mercedes	Velasco	Bolivia	16.550° S	59.650° W	American Museum of Natural History
Macapá, Campus Experimental da EMBRAPA, BR 156 km 48	Amapá	Brazil	00.450° N	50.933° W	Bolívar and Silveira 2015
Alto Salitre , Morro do chapéu	Bahia	Brazil	11.408° S	41.164° W	Silveira and Machado 2012
Tartarugalzinho, Fazenda Casemiro	Bahia	Brazil	01.383° S	50.750° W	Bolívar and Silveira 2015

Fazenda do Marcelo, Vicinal	Bahia	Brazil	14.923° S	40.727° W	Bolívar and Silveira 2015
Palmas de Monte Alto, Fazenda Boa Vista	Bahia	Brazil	14.283° S	43.333° W	Bolívar and Silveira 2015
Santa Rita de Cássia	Bahia	Brazil	11.350° S	43.867° W	Bolívar and Silveira 2015
Pau-a-pique, Remanso, BA	Bahia	Brazil	09.527° S	41.646° W	Ross et al 2006
IBGE	Brazilia	Brazil	15.883° S	47.842° W	Lab. Genetica e Biodiversidade
Ipú, Serra do Ibiapaba	Ceara	Brazil	04.333° S	40.700° W	Bolívar and Silveira 2015
Itapipoca	Ceara	Brazil	03.500° S	39.583° W	Bolívar and Silveira 2015
Aurilândia	Goiás	Brazil	16.679° S	50.456° W	Lab. Genetica e Biodiversidade
Campinaçu	Goiás	Brazil	13.915° S	48.504° W	Bolívar and Silveira 2015
Cana Brava	Goiás	Brazil	13.850° S	46.950° W	Bolívar and Silveira 2015
Lagoa Formosa, Cabeceiras	Goiás	Brazil	15.800° S	46.980° W	Bolívar and Silveira 2015
Grajaú, Transmaranhão km 36, Fazenda Canto da Onça	Maranhão	Brazil	06.217° S	46.117° W	Bolívar and Silveira 2015
Piritoró	Maranhão	Brazil	04.383° S	44.333° W	Fonoteca Neotropical "Jacques Viellard
Arinos	Mato Grosso	Brazil	14.450° S	56.217° W	Bolívar and Silveira 2015
Chavantina, Rio das Mortes	Mato Grosso	Brazil	11.750° S	50.733° W	Bolívar and Silveira 2015

Dumbá	Mato Grosso	Brazil	14.500° S	51.000° W	Bolívar and Silveira 2015
Nossa Senhora do Livramento	Mato Grosso	Brazil	16.366° S	56.299° W	MPEG
Tapirapoan	Mato Grosso	Brazil	14.850° S	57.750° W	Bolívar and Silveira 2015
Campo Grande	Mato Grosso do Sul	Brazil	20.450° S	54.617° W	Bolívar and Silveira 2015
Corumbá	Mato Grosso do Sul	Brazil	19.017° S	57.650° W	Bolívar and Silveira 2015
Fazenda Beija-Flor, margem esquerda do Rio Sucuruí, Três Lagoas	Mato Grosso do Sul	Brazil	21.130° S	56.470° W	Bolívar and Silveira 2015
margem direita do Rio Sucuruí, Três Lagoas	Mato Grosso do Sul	Brazil	20.800° S	51.717° W	Bolívar and Silveira 2015
Corumbá	Mato Grosso do Sul	Brazil	18.975° S	56.647° W	Coleção Zoológica de Referência da Seção de Vírus Transmitidos por Artrópodes - Banco de Aves
Antonio Dias	Minas Gerais	Brazil	16.500° S	41.883° W	Cunha and Vasconcelos 2009
Baependi	Minas Gerais	Brazil	21.950° S	44.883° W	Bolívar and Silveira 2015
Piraporã	Minas Gerais	Brazil	17.350° S	44.933° W	Bolívar and Silveira 2015
Santa Barbara	Minas Gerais	Brazil	19.983° S	43.466° W	Cunha and Vasconcelos 2009
Uberlândia	Minas Gerais	Brazil	18.876° S	48.255° W	Valadão et al 2006
Reserva Brisa do Indaiá, Quartel General	Minas Gerais	Brazil	19.236° S	45.803° W	Freitas et al 2009
Oliveira, Sítio Jacaré	Minas/mato grosso	Brazil	12.000° S	53.400° W	Bolívar and Silveira 2015

Fazenda Fartura, Retiro 8	Pará	Brazil	09.833° S	50.367° W	Bolívar and Silveira 2015
Monte Alegre, Serra do Ererê	Pará	Brazil	02.017° S	54.167° W	Bolívar and Silveira 2015
Reserva Indígena Missão Tiriós	Pará	Brazil	02.233° S	55.950° W	Bolívar and Silveira 2015
Riosinho, margem esquerda do Rio Fresco, Posto Nilo-Peçanha	Pará	Brazil	06.650° S	51.983° W	Bolívar and Silveira 2015
Coremas	Paraíba	Brazil	07.017° S	37.967° W	Bolívar and Silveira 2015
Fazenda Campos Bons 38 km N. Floresta	Pernambuco	Brazil	08.290° S	38.580° W	Bolívar and Silveira 2015
Arcoverde	Pernambuco	Brazil	08.418° S	37.053° W	Fonoteca Neotropical "Jacques Vielliard
Bocaina, Comunidade Salseiro	Piauí	Brazil	06.950° S	41.283° W	Bolívar and Silveira 2015
Mato dos Jegues	Piauí	Brazil	06.765° S	43.820° W	Olmos and Brito 2007
Parque Nacional da Serra das Confusões	Piauí	Brazil	09.226° S	43.463° W	Bolívar and Silveira 2015
Ribeiro Gonçalves	Piauí	Brazil	07.530° S	45.243° W	Bolívar and Silveira 2015
Campus da Empresa Brasileira de pesquisa agropecuária EMBRAPA_Seropédica	Rio de Janeiro	Brazil	22.763° S	43.688° W	Luz et al 2007
Franca	São Paulo	Brazil	20.533° S	47.400° W	Bolívar and Silveira 2015
Santa Madalena	São Paulo	Brazil	22.667° S	53.150° W	Bolívar and Silveira 2015
Parque Ibirapuera	São Paulo	Brazil	23.587° S	46.658° W	Fonoteca Neotropical "Jacques Vielliard

Ribeirão Bonito	São Paulo	Brazil	21.975° S	48.279° W	Coleção Zoológica de Referência da Seção de Vírus Transmitidos por Artrópodes - Banco de Aves
Itapetininga	São Paulo	Brazil	23.666° S	48.000° W	Coleção Zoológica de Referência da Seção de Vírus Transmitidos por Artrópodes - Banco de Aves
Fazenda Roma, margem direita do Rio Tocantins, Santa Rosa de Tocantins	Tocantins	Brazil	11.267° S	48.450° W	Bolívar and Silveira 2015
Mata do Rio Galhão	Tocantins	Brazil	10.527° S	46.106° W	Bolívar and Silveira 2015
Puerto Guaraní	Alto Paraguay	Paraguai	21.300° S	57.917° W	Bolívar and Silveira 2015
San Rafael	Itapúa	Paraguai	26.667° S	54.883° W	Bolívar and Silveira 2015
Escobar	Paraguarí	Paraguai	25.650° S	57.017° W	Bolívar and Silveira 2015
Rio Negro	Presidente Hayes	Paraguai	23.400° S	57.333° W	Bolívar and Silveira 2015
San Gregorio, Artigas	Artigas	Uruguai	30.550° S	57.867° W	Bolívar and Silveira 2015
Rio Negro, R. O., Del Uruguay	Rio Negro	Uruguai	32.750° S	57.333° W	Bolívar and Silveira 2015
Arari, Ilha do Marajó	Pará	Brazil	00.900° S	49.040° W	University of Michigan Museum of Zoology - GBIF ID:767307271
Guarai	Tocantins	Brazil	08.820° S	48.490° W	e-bird Observation dataset - GBIF ID: 944073679

Estrada para canudos	Bahia	Brazil	10.060° S	38.480° W	e-bird Observation dataset - GBIF ID: 1185937130
Area aripuana	Mato Grosso	Brazil	09.160° S	60.730° W	e-bird Observation dataset - GBIF ID: 829031155
Triangulo		Bolivia	11.450° S	66.300° W	e-bird Observation dataset - GBIF ID: 832320030
Flor de Oro		Bolivia	13.540° S	61.010° W	e-bird Observation dataset - GBIF ID: 197137708
Estancia Motacuzal	El Beni	Bolivia	13.750° S	64.630° W	e-bird Observation dataset - GBIF ID: 587915596
Barba Azul Nature Reserve		Bolivia	13.760° S	66.100° W	e-bird Observation dataset - GBIF ID: 117750213
Puerto Moscoso		Bolivia	13.630° S	68.730° W	e-bird Observation dataset - GBIF ID: 197136613
Rio Torotoro		Bolivia	18.130° S	65.760° W	e-bird Observation dataset - GBIF ID: 961183164
Parque Nacional das Emas	Goiás	Brazil	18.260° S	52.890° W	e-bird Observation dataset - GBIF ID: 1196944745
Enceso		Paraguay	21.210° S	61.640° W	e-bird Observation dataset - GBIF ID: 962857624
San Francisco , Calilegua, Valle Grande	Jujuy	Argentina	22.030° S	66.150° W	Fundacion Miguel Lillo Provider - GBIF ID:730444244

Ocloyas	Jujuy	Argentina	23.940° S	65.220° W	Macaulay Library Audio and Video Collection - GBIF ID:1147042609
Restinga de Massambaba	Rio de Janeiro	Brazil	22.930° S	42.300° W	e-bird Observation dataset - GBIF ID: 977183623
Bosque Alemão	Paraná	Brazil	25.410° S	49.290° W	e-bird Observation dataset - GBIF ID: 588202889
Tacuaremba		Uruguai	31.740° S	56.010° W	e-bird Observation dataset - GBIF ID: 976556876
Reserva Natural Chancani	Córdoba	Argentina	31.380° S	65.480° W	e-bird Observation dataset - GBIF ID: 1163523988
Reserva Ecológica Mar Del Plata	Buenos Aires	Argentina	38.060° S	57.540° W	e-bird Observation dataset - GBIF ID: 829291214

Table S3. Pairwise Φ_{ST} values among *Lepidocolaptes angustirostris* lineages. The values on the lower diagonal represent the mitochondrial gene (ND2) based on K2P distance matrix. The values on the upper diagonal represent the nuclear gene (FIB5) based on p-distance matrix. Significant values ($p < 0.05$) are showed in bold.

	Caatinga	W_Cerrado	NE_Cerrado	Chaco	E_Cerrado
Caatinga	-	0.197	0.012	0.213	0.022
W_Cerrado	0.737	-	0.577	0.002	0.175
NE_Cerrado	0.707	0.700	-	0.447	0.027
Chaco	0.803	0.644	0.763	-	0.187
E_Cerrado	0.709	0.484	0.646	0.490	-

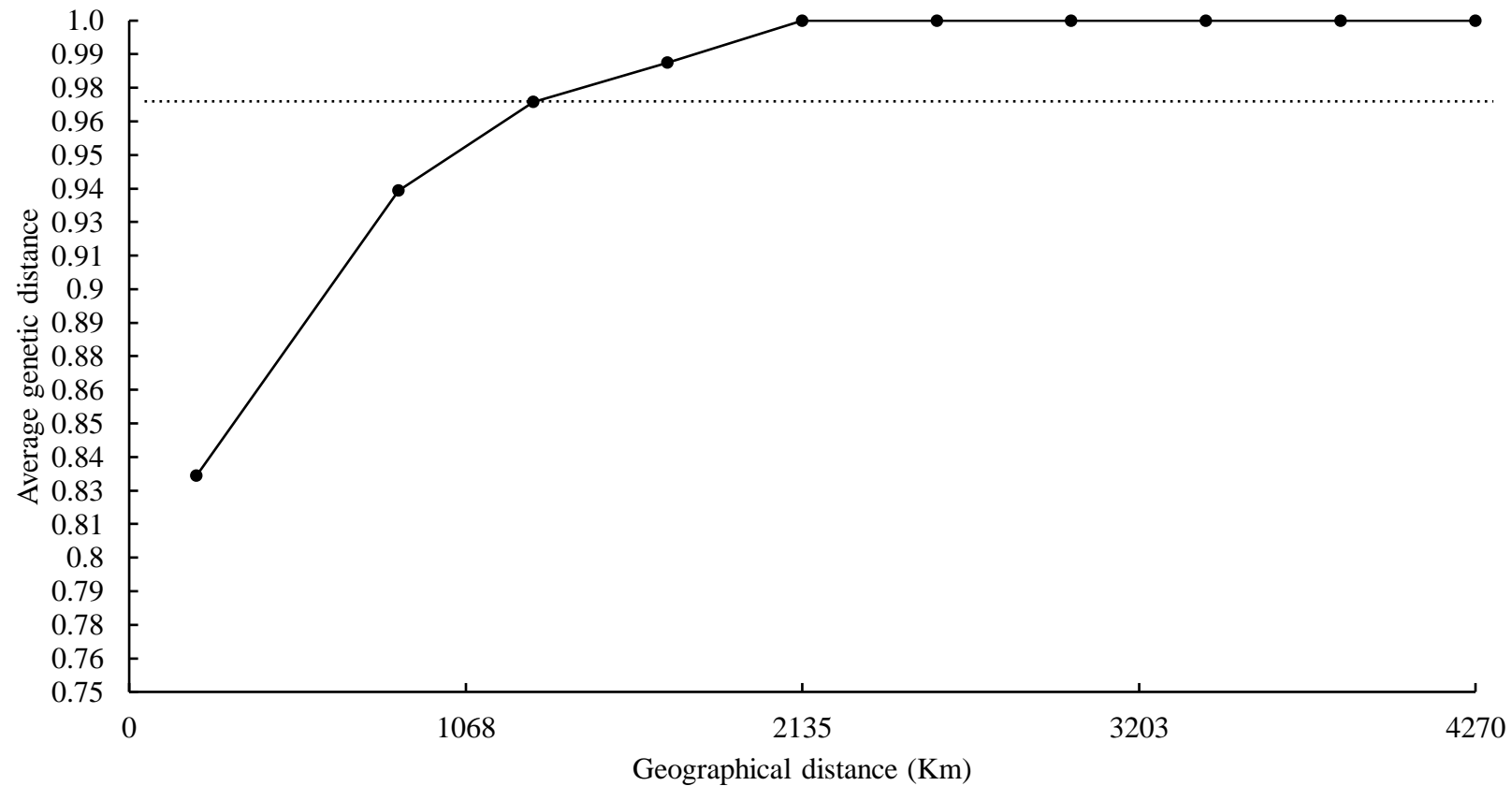


Figure S1. Spatial autocorrelation analysis for *Lepidocolaptes angustirostris* based on average genetic distance of ND2 gene between pairs of individuals that fall within distance class y , considering 10 classes and 1,000 permutations. Dotted line corresponds the null hypothesis of non-difference of a correlation by chance. Dots below the dotted line represent the geographical classes with spatial autocorrelation whereas the dots above the dotted line represent the classes where there is not special autocorrelation.

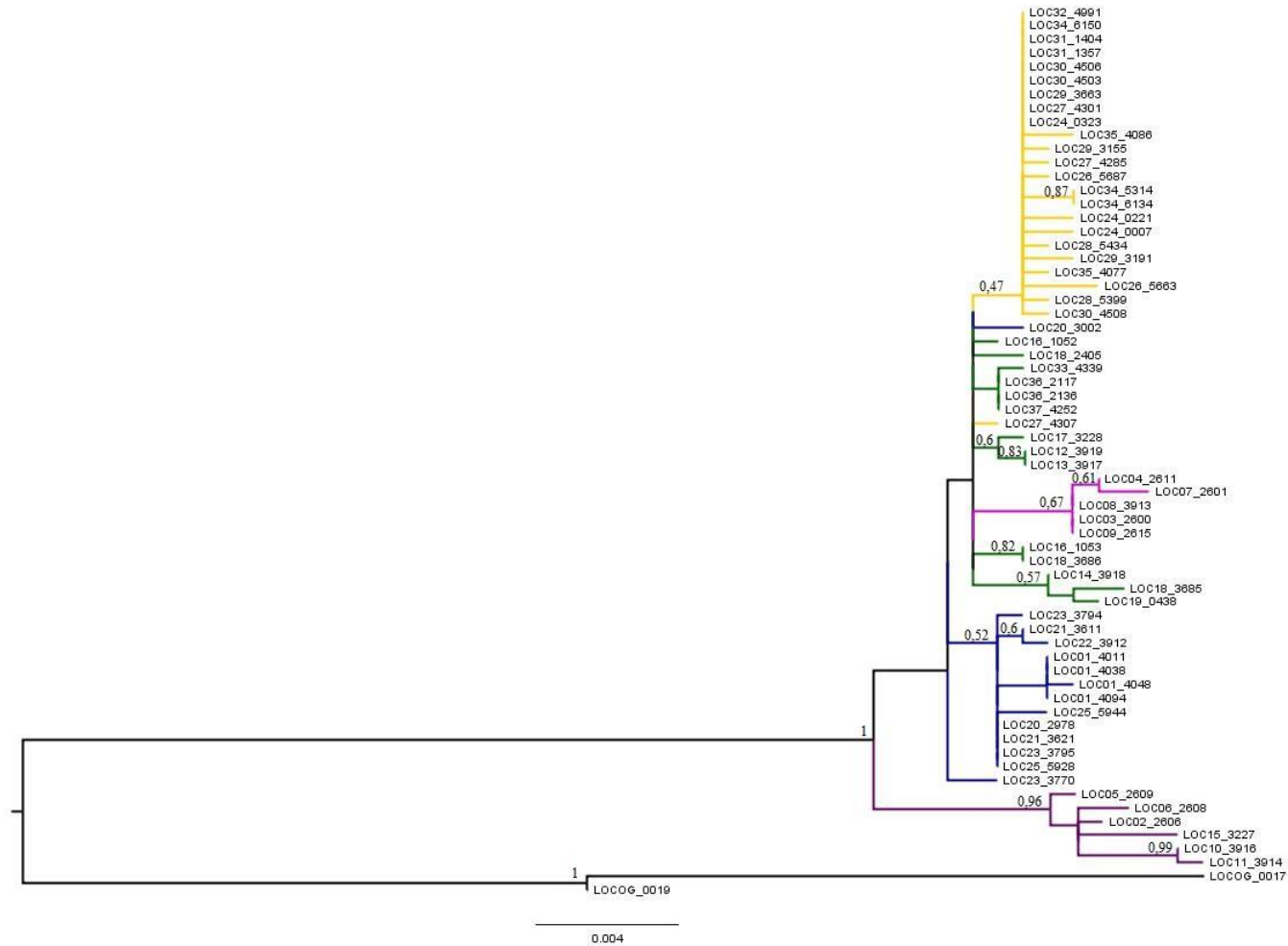


Figure S2. Maximum likelihood phylogenetic tree showing the *Lepidocolaptes angustirostris* lineage relationships. Support values are shown in each node. The colors correspond to populations defined by genetic structure analysis: Caatinga (purple), W_Cerrado (blue), NE_Cerrado (pink), Chaco (yellow) and E_Cerrado (green).

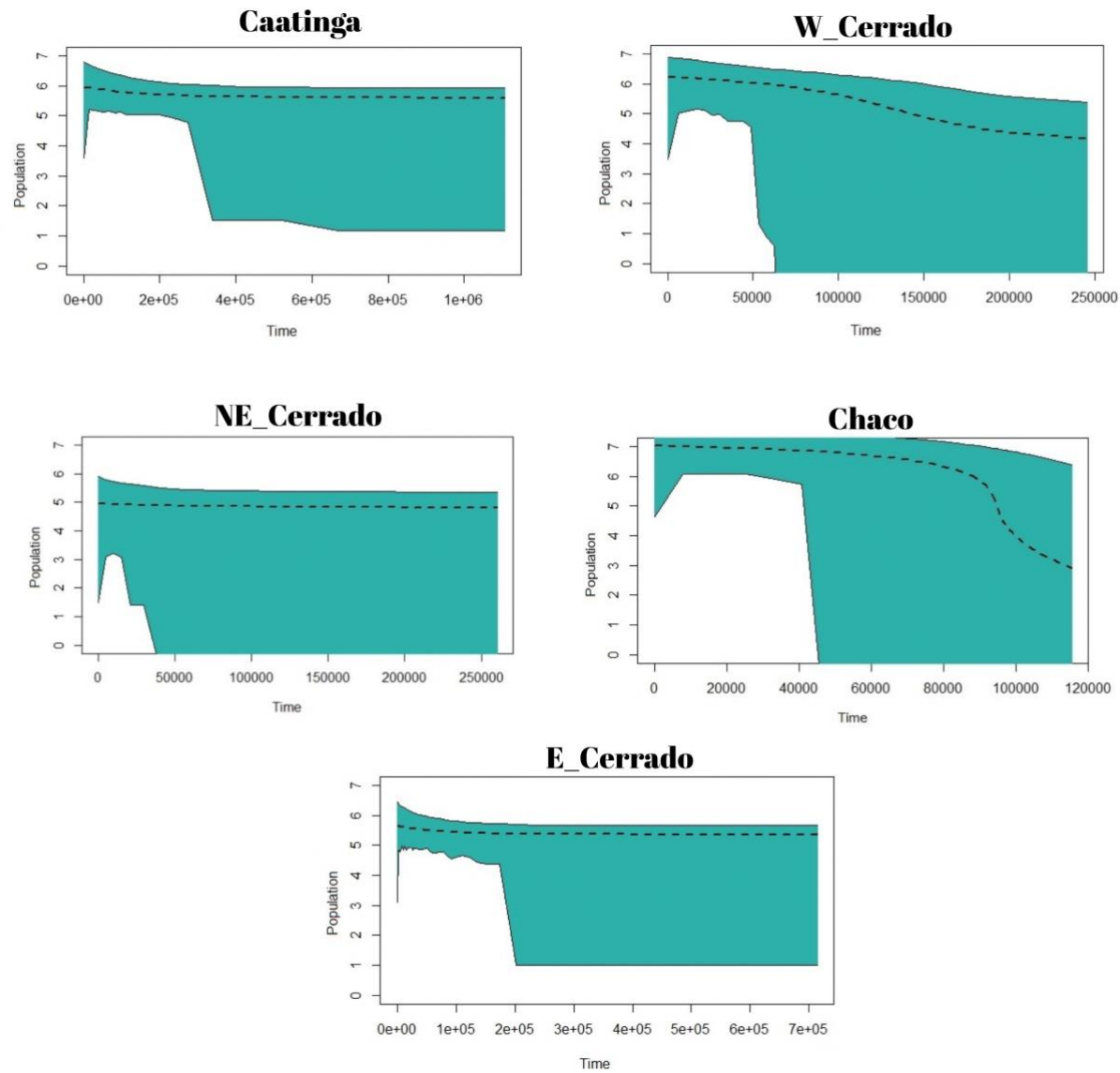


Figure S3. Extended Bayesian Skyline Plot analyses showing the trend of effective population size through the time (dashed line) for different genetic lineages of *Lepidocolaptes angustirostris* identified in this study. The standard deviation is represented by green block.