

Table S1. Sampling localities and accession numbers.

N: number of individuals sequenced. COIA: segment A of the cytochrome oxidase subunit I gene. COIB: segment B of the cytochrome oxidase subunit I gene. cyt b: cytochrome oxidase b gene segment. ND4: NADH dehydrogenase subunit 4 gene segment. Superscript letter in the accession number: ^a sequenced in [11], ^b sequenced in [7], ^c sequenced in [9]. Accession number without superscript indicates sequences obtained in this study. --- : segment not amplified.

Locality	Latitude/longitude	N	Taxa	Species	GenBank accession number			
					COIB	COIA	cyt b	ND4
La Rioja			Out	<i>T. eratyrusiformis</i>	MN117859 ^c	GQ336898 ^a	KC236979 ^b	MZ348418
Corazones	18°28'47" S/70°19'27" W	13	C2	<i>M. gajardoi</i>	KC236913 ^b	MZ348366	KC236946 ^b	MZ348391
			C15	<i>M. gajardoi</i>	KC236914 ^b	MZ348366	KC236947 ^b	MZ348392
			C16	<i>M. gajardoi</i>	KC236915 ^b	MZ348366	KC236948 ^b	MZ348393
			C21	<i>M. gajardoi</i>	KC236916 ^b	MZ348366	KC236949 ^b	---
			C37	<i>M. gajardoi</i>	KC236917 ^b	MZ348366	KC236950 ^b	MZ348391
Caleta Vitor	18°45'45" S/ 70°20'34" W	13	V3	<i>M. gajardoi</i>	KC236918 ^b	MZ348367	KC236951 ^b	MZ348394
			V8	<i>M. gajardoi</i>	KC236919 ^b	MZ348367	KC236952 ^b	MZ348395
			V10	<i>M. gajardoi</i>	KC236920 ^b	MZ348368	KC236953 ^b	MZ348396
Caleta Camarones	19°12'16" S/ 70°16'08" W	13	Ca3	<i>M. gajardoi</i>	KC236921 ^b	MZ348369	KC236954 ^b	MZ348397
			Ca5	<i>M. gajardoi</i>	KC236922 ^b	MZ348369	KC236955 ^b	MZ348396
Río Seco	21°00'06" S/70°09'52" W	15	RS1	<i>M. gajardoi</i>	KC236923 ^b	MZ348370	KC236956 ^b	---
			RS12	<i>M. gajardoi</i>	KC236925 ^b	MZ348371	KC236958 ^b	---
			RS34	<i>M. gajardoi</i>	KC236926 ^b	MZ348371	KC236959 ^b	---
Caleta San Marcos	21°06'56" S/70°07'30" W	11	SM8	<i>M. gajardoi</i>	KC236924 ^b	MZ348371	KC236957 ^b	---
Santa María Island	23°25'51" S/70°36'31" W	16	ISMa1	<i>M. sp</i>	MN117861 ^c	MZ348372	MN117875 ^c	MZ348398
			ISMa7	<i>M. sp</i>	MN117862 ^c	MZ348372	MN117876 ^c	MZ348399
Santa María Continent	23°28'3" S/70°37'2" W	17	COSMA1	<i>M. sp</i>	MN117863 ^c	MZ348373	MN117877 ^c	MZ348400
			COSMA7	<i>M. sp</i>	MN117864 ^c	MZ348373	MN117878 ^c	MZ348401
Médano	24°36'51" S/70°33'31" W	11	Me34	<i>M. parapatrica</i>	KC236928 ^b	---	KC236961 ^b	MZ348405
Pan de Azúcar Island	26°10'27" S/70°39'58" W	26	IPA1	<i>M. parapatrica</i>	MN117865 ^c	MZ348374	MN117879 ^c	MZ348402
			IPA2	<i>M. parapatrica</i>	MN117866 ^c	---	MN117880 ^c	MZ348403
			IPA16	<i>M. parapatrica</i>	MN117867 ^c	MZ348375	MN117881 ^c	MZ348402
			IPA20	<i>M. parapatrica</i>	MN117868 ^c	MZ348376	MN117882 ^c	MZ348403
			IPA36	<i>M. parapatrica</i>	MN117869 ^c	MZ348376	MN117883 ^c	MZ348402
Pan de Azúcar Continent	26° 8'34" S/ 70°40'10" W	23	COPA3S2	<i>M. parapatrica</i>	MN117870 ^c	MZ348377	MN117884 ^c	MZ348404
Caleta Zenteno	26°51'08" S/70°48'36" W	16	Z8	<i>M. parapatrica</i>	KC236929 ^b	MZ348378	KC236962 ^b	MZ348406

			Z12	<i>M. parapatrica</i>	KC236930 ^b	MZ348378	KC236963 ^b	MZ348407
Inca de Oro	26°48'15" S/69°57'14" W	9	Inca1	<i>M. spinolai</i>	MN117871 ^c	---	MN117885 ^c	MZ348408
			Inca2	<i>M. spinolai</i>	MN117872 ^c	---	MN117886 ^c	MZ348408
			Inca11	<i>M. spinolai</i>	MN117873 ^c	---	MN117887 ^c	MZ348409
Llanos de Challe	28°08'52" S/71°04'32" W	8	Lla1	<i>M. spinolai</i>	KC236931 ^b	MZ348379	KC236964 ^b	---
			Lla3	<i>M. spinolai</i>	KC236932 ^b	MZ348379	KC236965 ^b	---
			Lla4	<i>M. spinolai</i>	KC236933 ^b	MZ348380	KC236966 ^b	MZ348410
			Lla13	<i>M. spinolai</i>	KC236934 ^b	MZ348381	KC236967 ^b	MZ348411
Alto del Carmen	28°43'21" S/70°31'02" W	14	AC2	<i>M. spinolai</i>	KC236935 ^b	MZ348382	KC236968 ^b	MZ348412
			AC11	<i>M. spinolai</i>	KC236936 ^b	MZ348383	KC236969 ^b	MZ348412
Caleta Toro	30°44'30" S/71°42'05" W	14	T1	<i>M. spinolai</i>	KC236937 ^b	MZ348384	KC236970 ^b	MZ348414
Monte Patria	30°51'16" S/70°41'51" W	14	Mp1	<i>M. spinolai</i>	KC236939 ^b	---	KC236972 ^b	MZ348413
			Mp4	<i>M. spinolai</i>	KC236940 ^b	---	KC236973 ^b	MZ348413
RN Las Chinchillas	31°30'28" S/ 71°06'19" W	11	RNCh26	<i>M. spinolai</i>	KC236941 ^b	MZ348385	KC236974 ^b	MZ348415
			RNCh176	<i>M. spinolai</i>	KC236942 ^b	MZ348386	KC236975 ^b	MZ348415
			RNCh345	<i>M. spinolai</i>	KC236943 ^b	MZ348387	KC236976 ^b	MZ348416
San Felipe	32°51'24" S/70°29'13" W	4	SF1	<i>M. spinolai</i>	MN117874 ^c	MZ348388	MN117888 ^c	---
Til Til	33°06'19" S/70°55'53" W	11	Til1	<i>M. spinolai</i>	KC236944 ^b	MZ348389	KC236977 ^b	MZ348417
			Til32	<i>M. spinolai</i>	KC236945 ^b	MZ348390	KC236978 ^b	MZ348417

Table S2. Historical and mutational parameters used in the coalescent simulations analysis.

Parameter	Prior distribution	
	Type	Initial-Final interval
Ne	Uniform	200,000 - 450,000
t1	Uniform	1300000 - 1600000
t2	Uniform	1700000 - 2100000
t3	Uniform	2000000 - 2600000
Mean mutation rate	Uniform	1.00E-8 - 5.00E-8