

Table S1. Reference sequences of *Leishmania spp.* obtained from GenBank database for phylogenetic analysis.

Strain code	Species	Accession number	reference
169-83	<i>L. aethiopica</i>	FN395020.1	Fraga et al. 2010
GERE	<i>L. aethiopica</i>	FN395018.1	Fraga et al. 2010
LTB0016	<i>L. amazonensis</i>	L14605.1	Boch & Lager, 1993
M2269	<i>L. amazonensis</i>	MG029123.1	Espada et al. 2018
CUM180	<i>L. braziliensis</i>	FN395039.1	Fraga et al. 2010
CUM29	<i>L. braziliensis</i>	FN395041.1	Fraga et al. 2010
CUM555	<i>L. braziliensis</i>	FR872760.1	Odiwuor et al. 2012
CUM663	<i>L. braziliensis</i>	FR872761.1	Odiwuor et al. 2012
LC2177	<i>L. braziliensis</i>	FN395042.1	Fraga et al. 2010
LH2182	<i>L. braziliensis</i>	FN395040.1	Fraga et al. 2010
LH3851	<i>L. braziliensis</i>	FR872763.1	Odiwuor et al. 2012
M2904	<i>L. braziliensis</i>	JF449366.1	Ramirez et al. 2011
PA_029	<i>L. braziliensis</i>	KX573945.1	Miranda et al
PA_029	<i>L. braziliensis</i>	KX573945.1	Miranda et al
MAIKE	<i>L. chagasi</i>	FN395035.1	Fraga et al. 2010
DEVI	<i>L. donovani</i>	MN728741.1	Fernandez-Arevalo et al. 2020
LEM3463	<i>L. donovani</i>	MN728759.1	Fernandez-Arevalo et al. 2020
GAE1	<i>L. guyanensis</i>	HF586406.1	Van der Auwera et al. 2013
M4147	<i>L. guyanensis</i>	KX573934.1	Miranda et al
PA_467	<i>L. guyanensis</i>	KX574011.1	Miranda et al
PL11	<i>L. guyanensis</i>	MW658405.1	Van der Auwera et al. 2022
PL21	<i>L. guyanensis</i>	MW658386.1	Van der Auwera et al. 2022
PL6	<i>L. guyanensis</i>	MW658403.1	Van der Auwera et al. 2022
BUCK	<i>L. infantum</i>	MN728753.1	Fernandez-Arevalo et al. 2020
Gilani	<i>L. infantum</i>	MN728756.1	Fernandez-Arevalo et al. 2020
IMT260	<i>L. infantum</i>	FN395032.1	Fraga et al. 2010
CUM71	<i>L. lainsoni</i>	FN395047.1	Fraga et al. 2010
LC1581	<i>L. lainsoni</i>	FN395048.1	Fraga et al. 2010
LC2525	<i>L. lainsoni</i>	FN395050.1	Fraga et al. 2010
LH2344	<i>L. lainsoni</i>	FN395049.2	Fraga et al. 2010
LRC-L137	<i>L. major</i>	FN395023.1	Fraga et al. 2010
UQ_8	<i>L. major</i>	FN395022.1	Fraga et al. 2010
LEM2223 (SOLIS)	<i>L. mexicana</i>	HF586401.1	Van der Auwera et al. 2013

LEM2284 (LM)	<i>L. mexicana</i>	HF586413.1	Van der Auwera et al. 2013
LH2312	<i>L. mexicana</i>	FN395038.1	Fraga et al. 2010
M379	<i>L. mexicana</i>	EU599091.1	Fraga et al. 2010
CRE88	<i>L. naiffi</i>	HF586373.1	Van der Auwera et al. 2013
M5210	<i>L. naiffi</i>	FN395056.2	Fraga et al. 2010
M5533	<i>L. naiffi</i>	GU071183.1	da Silva et al. 2010
PA_156	<i>L. naiffi</i>	KX573968.1	Miranda et al
PA_481	<i>L. naiffi</i>	MT469994.1	Miranda et al
LS94	<i>L. panamensis</i>	EU599094.1	Montalvo et al. 2010
M4039	<i>L. panamensis</i>	FN395055.1	Fraga et al. 2010
PA_002	<i>L. panamensis</i>	KX573937.1	Miranda et al
PA_007	<i>L. panamensis</i>	KX573939.1	Miranda et al
PA_014	<i>L. panamensis</i>	KX573942.1	Miranda et al
PA_166	<i>L. panamensis</i>	KX573971.1	Miranda et al
PA_197	<i>L. panamensis</i>	KX573975.1	Miranda et al
IM2326	<i>L. shawi</i>	GU071175.1	da Silva et al. 2010
	<i>L. tarentolae</i>	AY423868.1	Brochu et al. 2004
DD7	<i>L. tropica</i>	FN395025.1	Fraga et al. 2010
NLB_030B	<i>L. tropica</i>	FN395026.1	Fraga et al. 2010
PA_024	<i>Leishmania sp.</i>	KX573943.1	Miranda et al
PA_026	<i>Leishmania sp.</i>	KX573944.1	Miranda et al
PA_066	<i>Leishmania sp.</i>	KX573946.1	Miranda et al
PA_090	<i>Leishmania sp.</i>	KX573953.1	Miranda et al
PA_119	<i>Leishmania sp.</i>	KX573961.1	Miranda et al
PA_196	<i>Leishmania sp.</i>	MT469987.1	Miranda et al
PA_372	<i>Leishmania sp.</i>	KX573991.1	Miranda et al

Table S2. Summary of Bayes factor comparisons for phylogenetic hypotheses tested: monophyly (constrained) and non-monophyly (unconstrained) of the strains typed as *L. (V.) panamensis*. All the strains previously typed as *L. (V.) panamensis* by monoclonal antibodies, MLEE and ITS1 sequencing were included.

Constrained			Unconstrained	
Run	Arithmetic mean	Harmonic mean	Arithmetic mean	Harmonic mean
1	-2773.81	-2820.17	-2757.33	-2801.39
2	-2766.76	-2821.11	-2755.69	-2811.99
Total	-2767.46	-2820.74	-2756.20	-2811.30