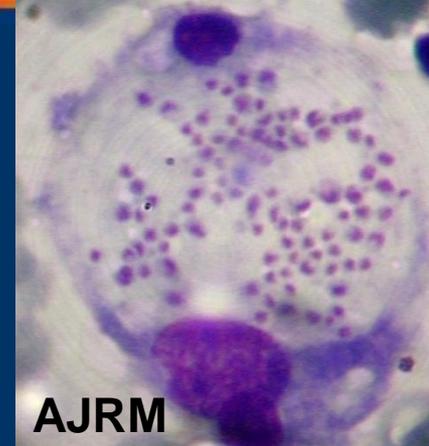




Universidad
Tecnológica
de Pereira



Leishmaniasis Visceral



AJRM

Prof. Alfonso J. Rodríguez-Morales,
MD, MSc, DTM&H, FRSTMH(Lon), FFTM RPCS(Glasg), PhD(c)

Médico parasitólogo, protozoólogo, tropicalista, salubrista, emporiatra - Investigador

Co-Director del **Grupo de Investigación Salud Pública e Infección (“C”)**,

Docente, **Parasitología**, Departamento de Ciencias Básicas,

Docente Transitorio Auxiliar, **Investigación Epidemiológica y Factores de Riesgo**, Departamento de Medicina Comunitaria,
Facultad de Ciencias de la Salud, Universidad Tecnológica de Pereira (UTP), Pereira, Risaralda, Colombia.

Editor, **Journal of Infection in Developing Countries (JIDC)**.

Coordinador, Comisión de **Publicaciones Científicas y Docencia**, Sociedad Latinoamericana de Medicina del Viajero (SLAMVI).

Editorial Board, **Travel Medicine & Infectious Diseases (TMAID)**.

Editor Asociado, revista de la Asociación Colombiana de Infectología, **Infectio (ACIN)**.

Co-Chair, Working Group on **Zoonoses**, International Society of Chemotherapy (WGZ-ISC).

Consejo Consultivo, **Revista Peruana de Medicina Experimental y Salud Pública (RPMESP)**.

Editor Asistente, **Revista Médica de Risaralda (RMR)**.

E-mail: arodriguezm@utp.edu.co

Leishmaniasis

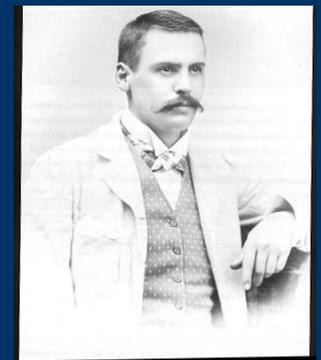
Aspectos Históricos

William **Leishman** y Charles **Donovan**.

Médicos del imperio británico publican en 1903 dos artículos que coincidían en identificar la etiología parasitaria de una vieja enfermedad de la **India: Kala-azar o fiebre Dum-Dum.**



Sir William Boog Leishman FRS
(6 November 1865 – 2 June 1926)



ABOVE: Charles Donovan (1863–1915), a physician in the Indian Medical Service.

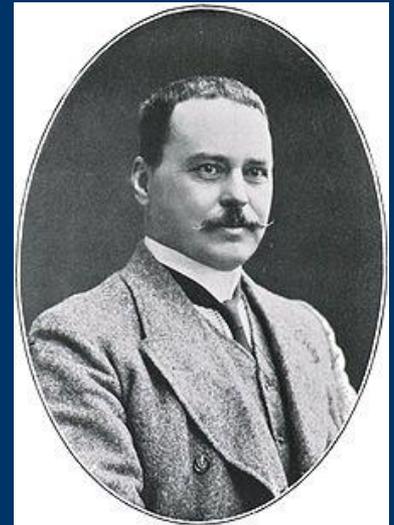
Colonel Charles Donovan MD
(1863–1915)



Leishmaniasis

Aspectos Históricos

Sir Ronald Ross percibe el alcance del descubrimiento y en honor a los investigadores acuña el nombre de la nueva especie: *Leishmania donovani*.



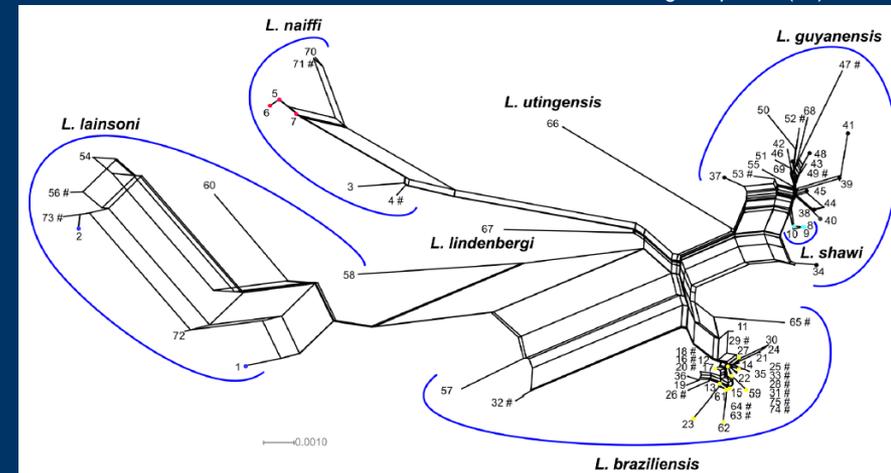
Sir Ronald Ross (1857 - 1932)

Leishmaniasis

Taxonomía

- Eukaryota (super reino);
 - Euglenozoa;
 - Kinetoplastida (o);
 - Trypanosomatidae (f);
 - » Leishmaniinae (sf);
 - » **Leishmania (g)**
 - **Leishmania (Leishmania) (sg)**
 - **Leishmania (Viannia) (sg)**

Boite et al. PLoS Negl Trop Dis 6(11): e1888.



Leishmaniasis

Tropismo de las Especies

Los parásitos del género *Leishmania* se separan en dos grupos:

- **Dermotropos** causales de la leishmaniasis tegumentaria (cutánea y mucocutánea).
- **Viscerotropos** causales de la leishmaniasis visceral (Kala-Azar)

Leishmaniasis

Taxonomía – Subgenero *Leishmania* – *Leishmania* (*Leishmania*)
Le. (*Le.*)

- *Leishmania aethiopica* species complex
- *Leishmania aethiopica*
- *Leishmania aristidesi*
- *Leishmania deanei*
- *Leishmania donovani* species complex
- *Leishmania chagasi*
- *Leishmania donovani*
- *Leishmania infantum*
- *Leishmania donovani* complex sp. CR-2013
- *Leishmania donovani* complex sp. KA-2011
- *Leishmania hertigi*
- *Leishmania major* species complex
- *Leishmania major*
- *Leishmania* cf. *major*
- *Leishmania mexicana* species complex
- *Leishmania amazonensis*
- *Leishmania enriettii*
- *Leishmania mexicana mexicana*
- *Leishmania mexicana venezuelensis*
- *Leishmania pifanoi*
- *Leishmania tropica* species complex
- *Leishmania tropica*
- *Leishmania tropica* complex sp. CR-2013

L. chagasi/infantum

Leishmaniasis

Taxonomía – Subgenero *Viannia* – *Leishmania* (*Viannia*)
Le. (*Vi.*)

- *Leishmania braziliensis* species complex
- *Leishmania braziliensis*
- *Leishmania colombiense*
- *Leishmania equatorensis*
- *Leishmania peruviana*
- *Leishmania garnhami*
- *Leishmania guyanensis* species complex
- *Leishmania guyanensis*
- *Leishmania panamensis*
- *Leishmania shawi*
- *Leishmania lainsoni* species complex
- *Leishmania lainsoni*
- *Leishmania lindenbergi*
- *Leishmania naiffi* species complex
- *Leishmania naiffi*
- *Leishmania utingensis*
- environmental samples
- uncultured *Viannia*

Clasificación del Género *Leishmania*

Género

Leishmania

SubGénero

Leishmania (L.)

Viannia (V.)

Complejo

donovani

tropica

mexicana

hertigi

braziliensis

Especie

L.(L.) donovani

L.(L.) tropica

L.(L.) mexicana

L.(L.) hertigi

L.(V.) braziliensis

L.(L.) infantum

L.(L.) aethiopica

L.(L.) amazonensis

L.(L.) deani

L.(V.) peruviana

L.(L.) chagasi

L.(L.) major

L.(L.) pifanoi

L.(V.) panamensis

L.(L.) archibaldi

L.(L.) gerbilli

L.(L.) garhami

L.(V.) guyanensis

L.(L.) venezuelensis

L.(V.) lainsoni

L.(L.) aristidesi

L.(V.) naiffi

L.(L.) enrietti

L.(V.) shawi

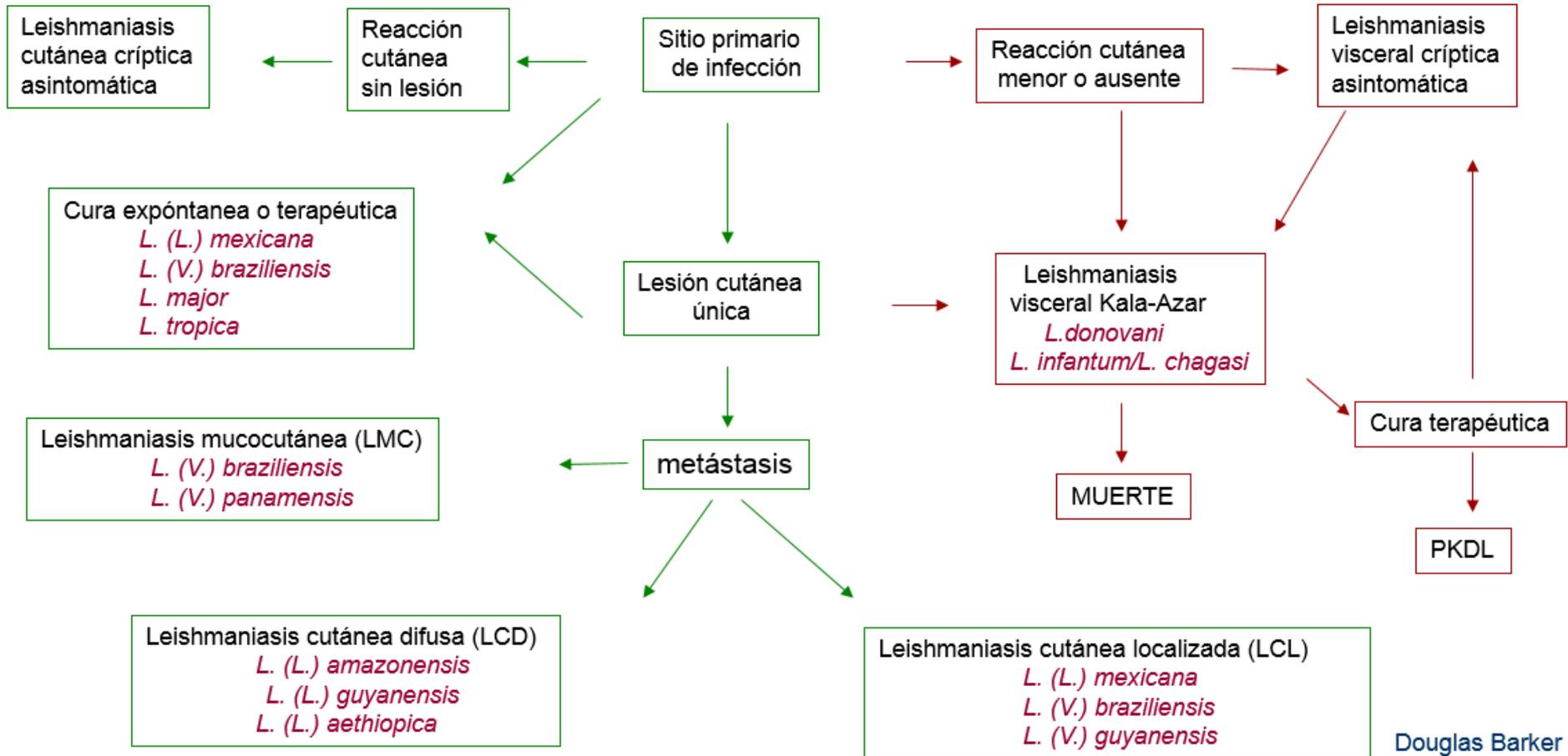
L.(V.) equatorensis

L.(V.) colombiensis

Mendoza, Shaw, Tapia, 1986



Desarrollo de la infección por *Leishmania* sp.



Douglas Barker



DESARROLLO EN EL VECTOR (*LEISHMANIA SP*)

CICLO BIOLÓGICO DE *Leishmania*



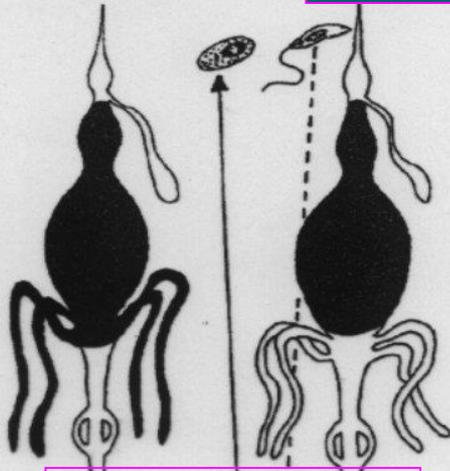
Lutzomyia spp

L. (L) garnhami

L.(L) mexicana

L.(V) braziliensis

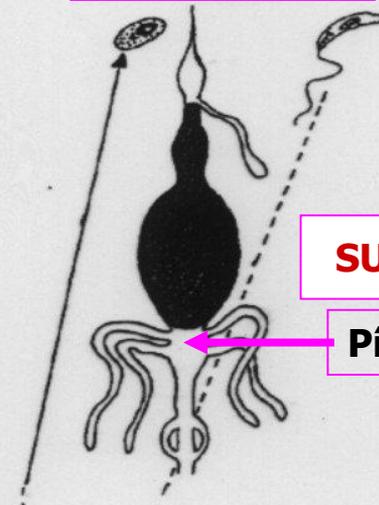
L.(L) donovani



SUPRAPILARIA



PERIPILARIA



SUPRAPILARIA

Píloro

LEISHMANIASIS

- Leishmaniasis : es un grupo de enfermedades de amplia distribución mundial causadas por protozoarios (del orden Kinetoplastida) del género *Leishmania*.
- Endémica en regiones tropicales y subtropicales de 90 países en cinco continentes.
- Reportada en viajeros a zonas endémicas.

Leishmaniasis en el Mundo

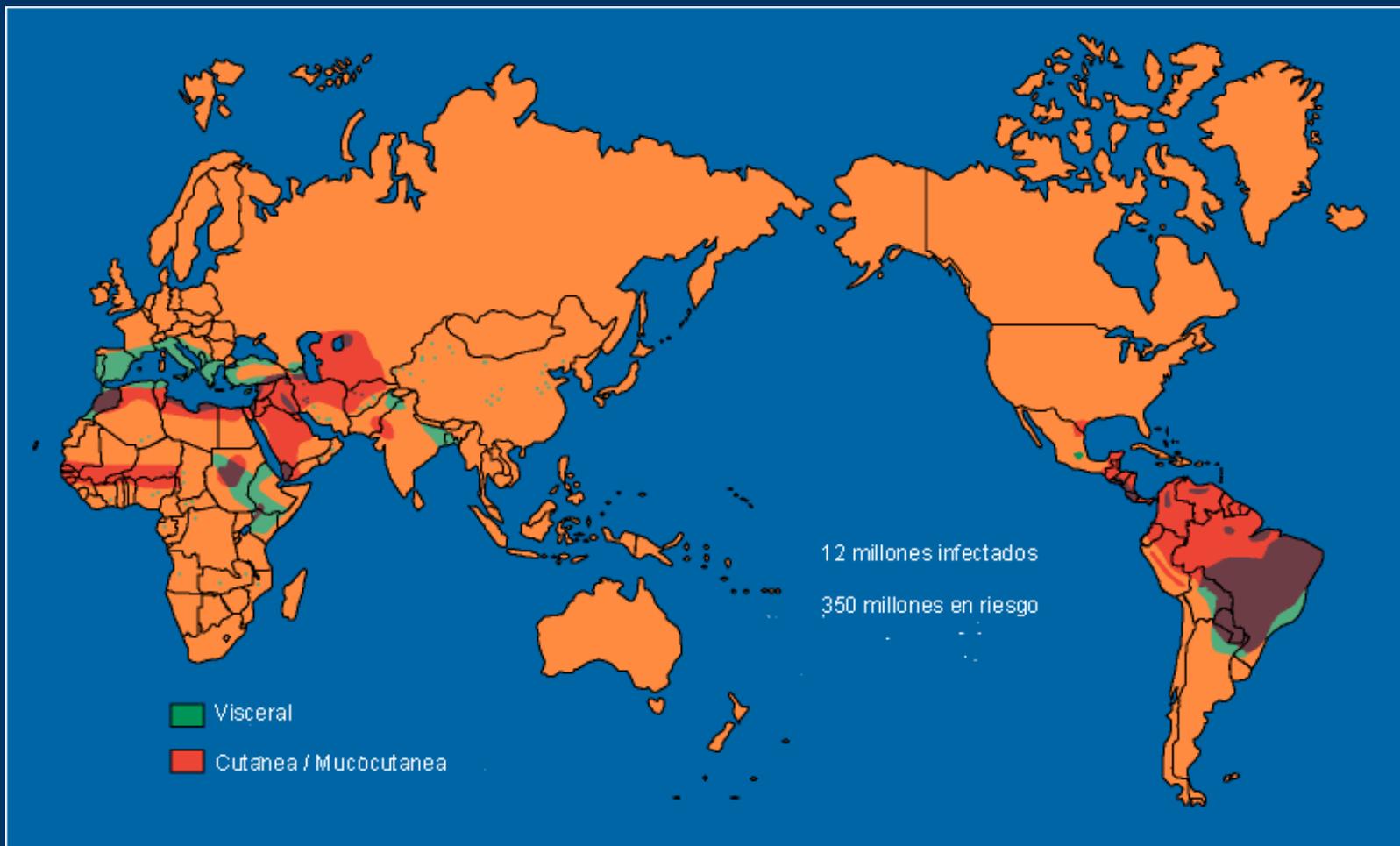




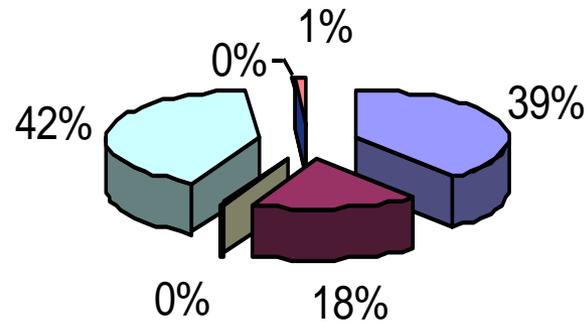
Figure 1 | The distribution of visceral leishmaniasis







Distribución de la leishmaniasis visceral por regiones 1985-2002.



■ ATLANTICA ■ URABA ■ PACIFICA ■ CENTRO ■ AMAZONICA ■ ORINOQUIA

VL by *L.infantum* has been diagnosed in Colombia since 1944.

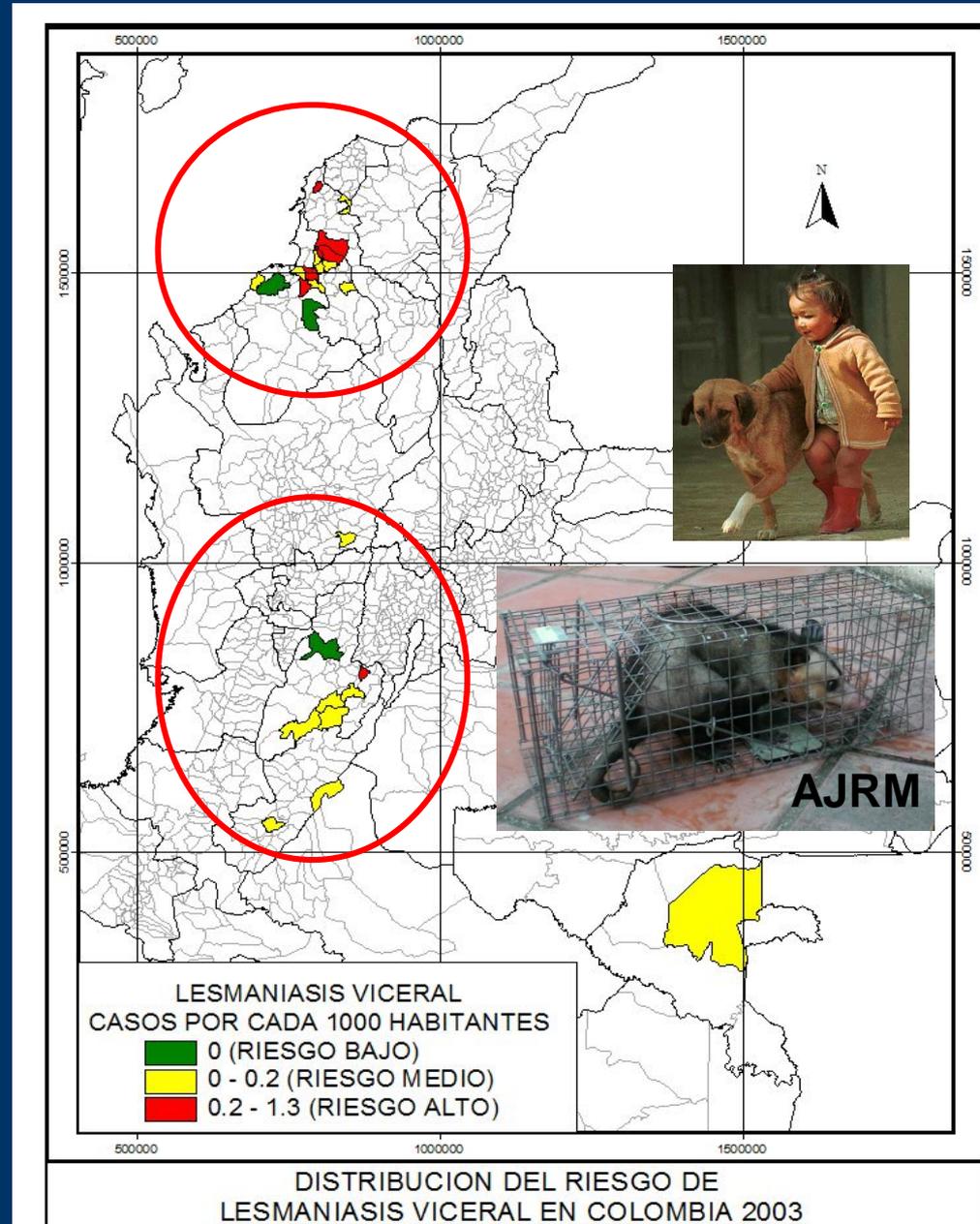
There are two clearly identified foci of VL in Colombia, the most important of which is in the northern coastal area, where *Lu. evansi* is the vector and accounts for 88% of the total number of cases.

The second focus is located in the Magdalena river valley, where *Lu. longipalpis* is the vector and accounts for 12% of cases.

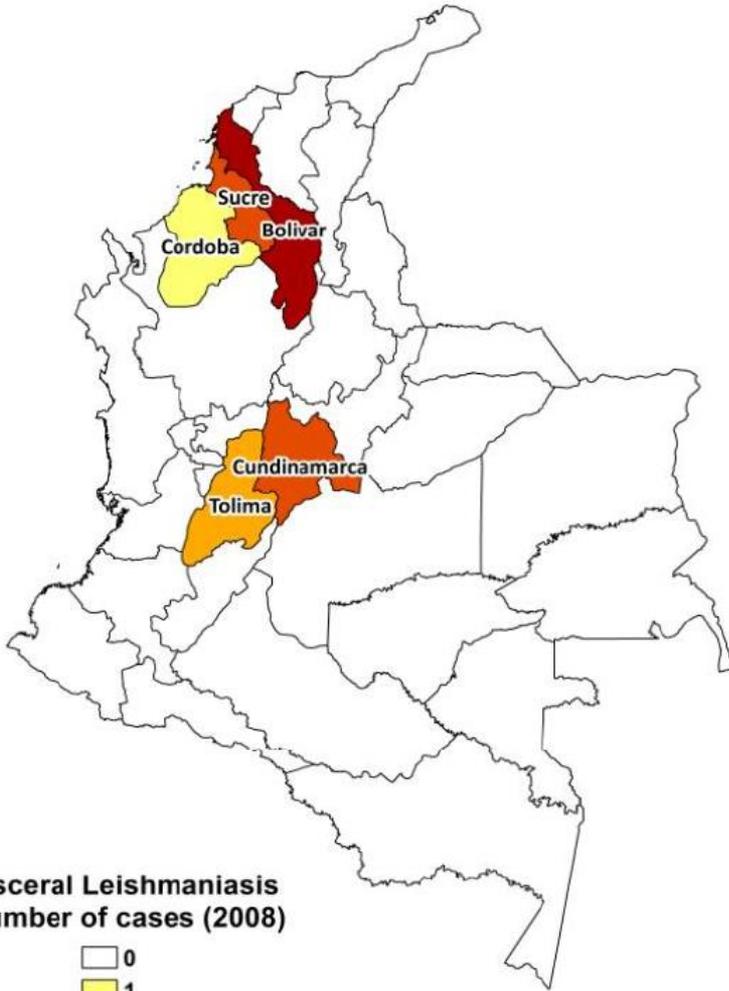
Most cases (89%) occur in children under five years of age [6].

Around 3,449,831 people are at risk for VL in 6 departments.

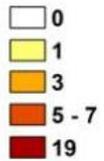
The incidence of VL was 5.4 cases/100,000 inhabitants in 2007.



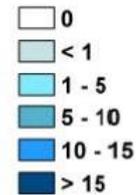
Visceral leishmaniasis



Visceral Leishmaniasis
Number of cases (2008)



Visceral Leishmaniasis
Incidence/10.000 (2008)





Mapping cutaneous, mucocutaneous and visceral leishmaniasis in municipalities of one coastal department of Colombia (Sucre) using Geographic information system (GIS)

Wilmer Villamil¹ & Alfonso J. Rodríguez-Morales²

¹MD, ²MD, MSc, DTM&H, FRSTMH(Lon), FFTM RCPS(Glasg), PhD(c)

¹Hospital Universitario de Sincelejo, Sincelejo, Sucre, Colombia.

¹President, Caribbean Chapter, Colombian Association on Infectious Diseases (ACIN),

²Part-Time Faculty, Epidemiology, Faculty of Health Sciences, Universidad Tecnológica de Pereira, Pereira, Risaralda, Colombia.

²Lecturer, Postgraduate Epidemiology, Fundación Universitaria del Área Andina, Seccional Pereira, Risaralda, Colombia.

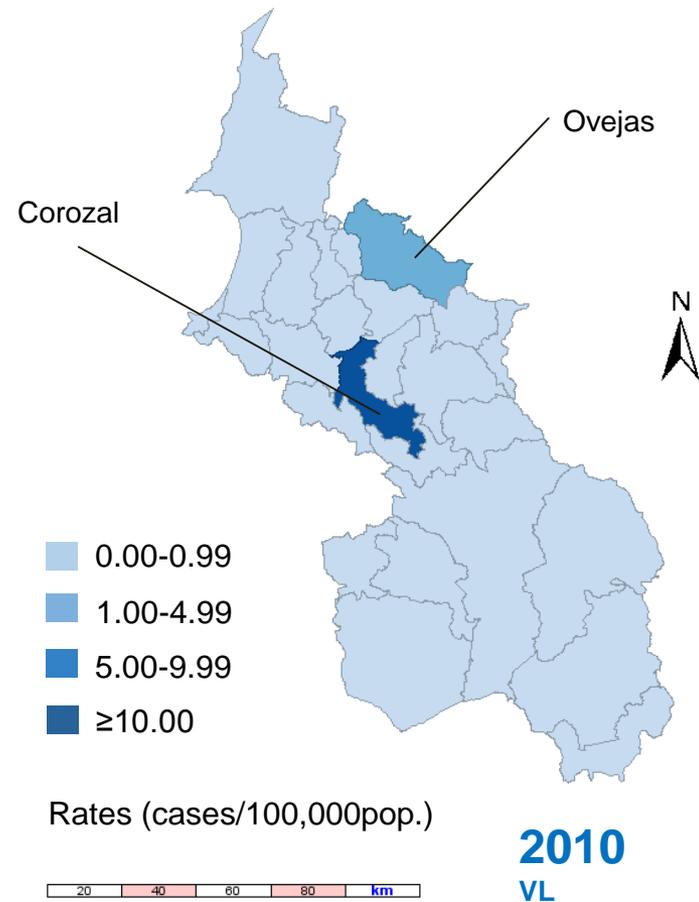
^{1,2}Members, Committee on Zoonoses and Haemorrhagic Fevers,

Colombian Association on Infectious Diseases (ACIN),

Colombia

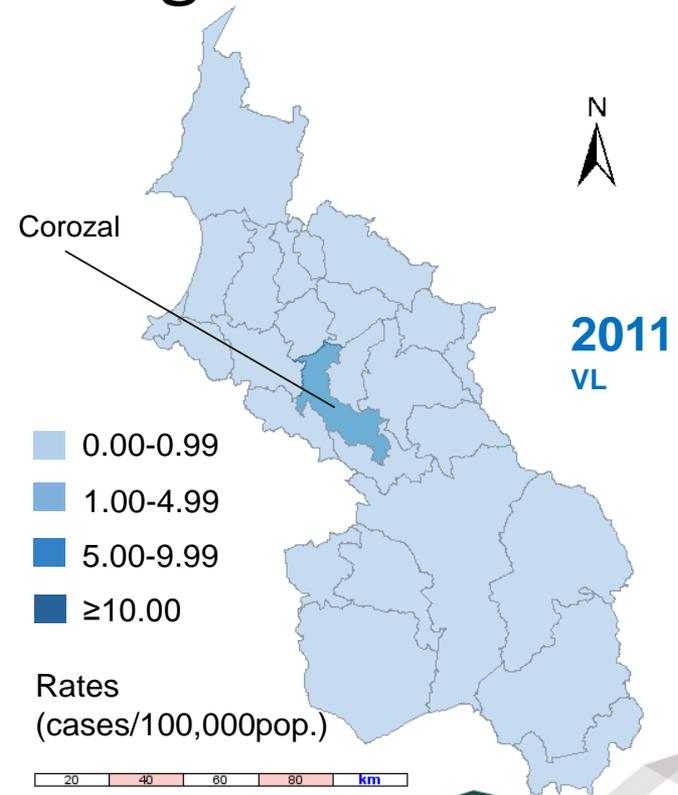
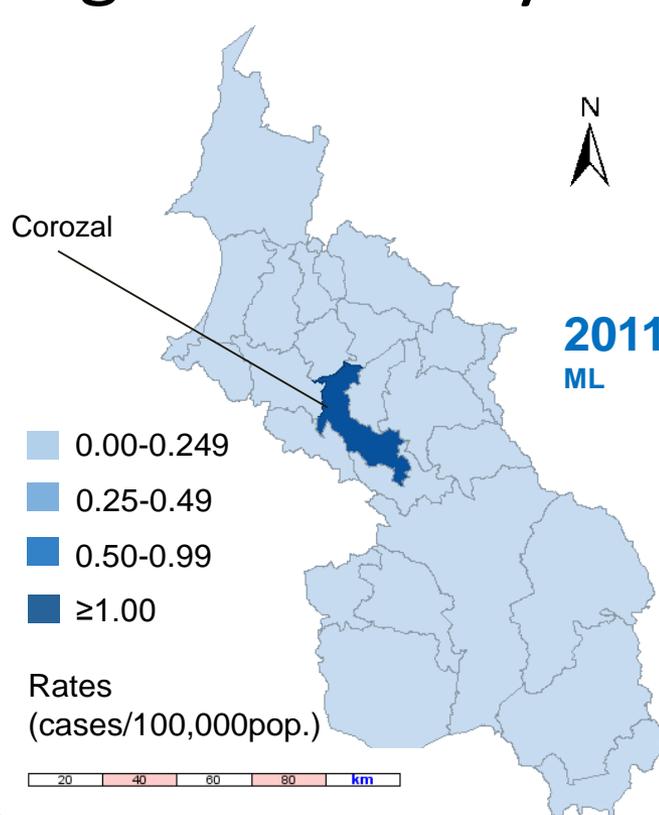
Results

- Highest VL incidence was reported at Corozal municipality (13.28 cases/100,000pop, 2010).
- From 2010 VL incidence rate decreased to 1.65 cases/100,000pop in 2011.



Results

- From those VL patients hospitalized at HUS (diagnosed with rK39 ELISA), 100% survived, being successfully treated with glucantime.





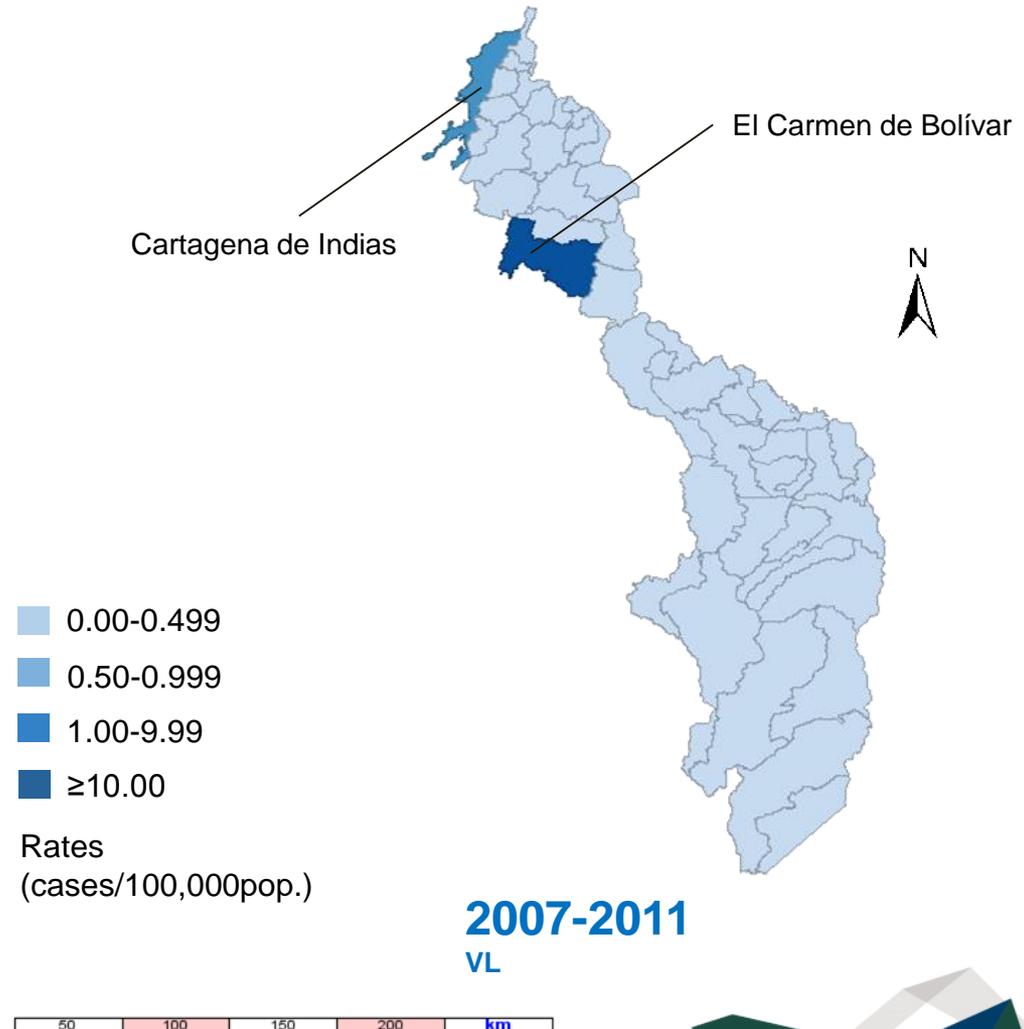
Caracterización geográfica de la leishmaniasis cutánea, mucosa y visceral en los municipios del departamento de Bolívar, Colombia

Claudia Marin-Kelso,¹ Margaret Cuello-Perez,¹
Alfonso J. Rodríguez-Morales.²

¹Escuela de Medicina, Universidad del Sinú Elias Bechara Zainúm, Seccional Cartagena, Cartagena de Indias, Bolívar, Colombia. ²Facultad de Ciencias de la Salud, Universidad Tecnológica de Pereira, Pereira, Risaralda, Colombia.

Conclusiones

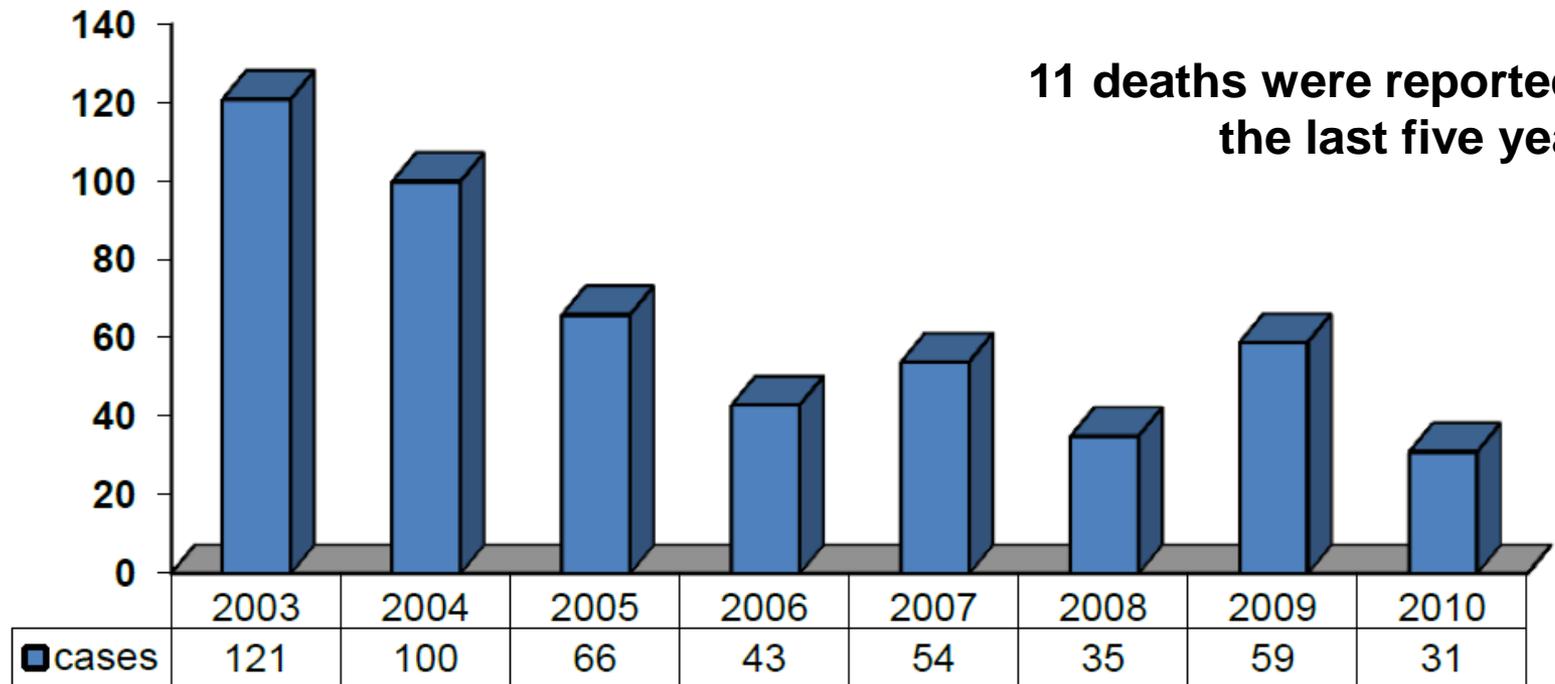
- En tanto la LV en dos municipios del norte (El Carmen de Bolívar y en Cartagena de Indias).



Leishmaniasis Visceral

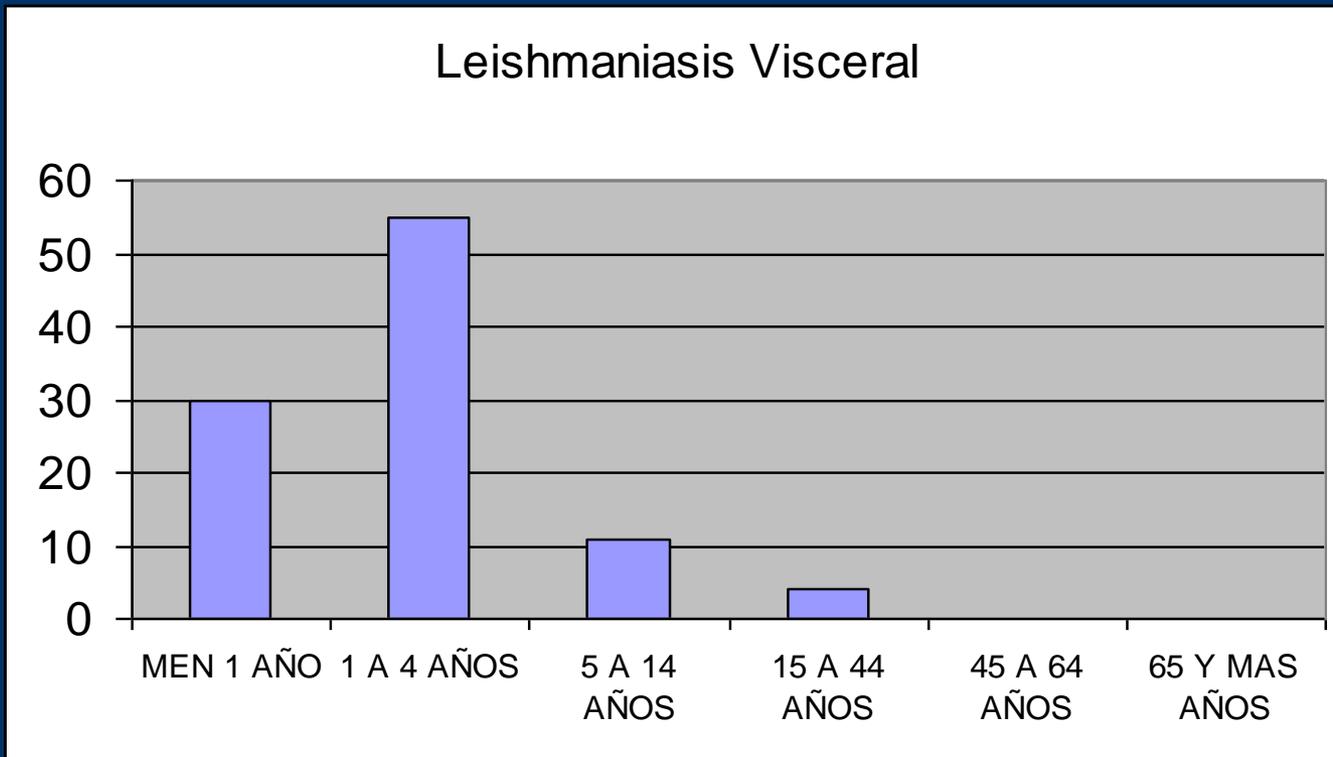
Colombia 2003-2010

Visceral leishmaniasis trend

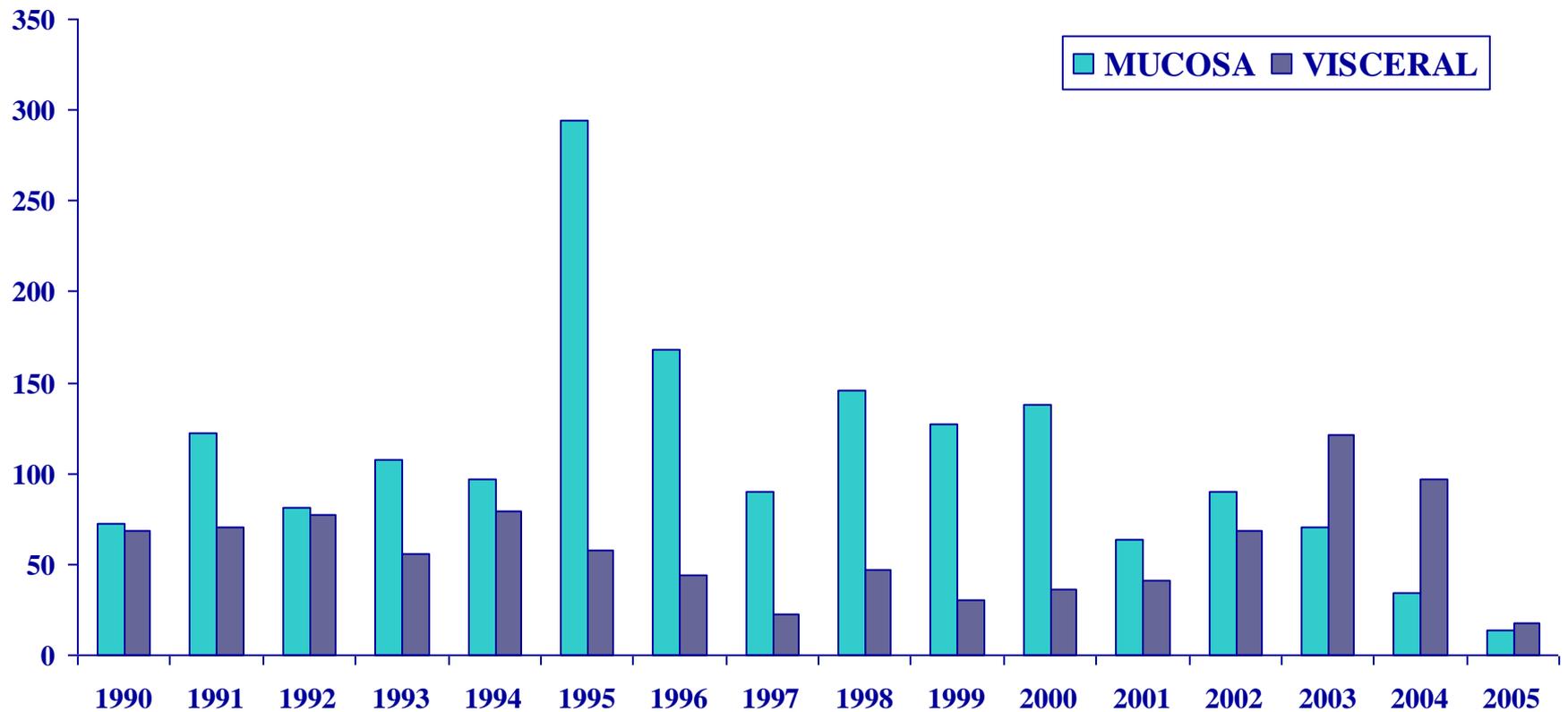


Leishmaniasis visceral en Colombia 2004

Distribución por GRUPO DE EDAD



Leishmaniasis mucosa y visceral Colombia 1990 – 2005*



* 2005 hasta sem 14

Burden of Zoonotic Diseases in Venezuela during 2004 and 2005

Jesus A. Benitez,^a Alfonso J. Rodriguez-Morales,^b Paul Vivas,^c
and Jorge Plaz^{a,*}

^a*Direction of Environmental Health, Ministry of Health, Maracay, Venezuela*

^b*Universidad de Los Andes, Trujillo, Venezuela*

^c*Hospital Regional de Especialidades Médicas Número 1 Licenciado Ignacio Garcia Tellez, Instituto Mexicano de Seguridad Social (IMSS), Merida Yucatan, México*

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Annals of the New York Academy of Sciences

TABLE 1. Distribution of Selected Zoonoses in Animals and Humans, Venezuela, 2004 and 2005

Disease	2004	2005	Total	%
Rabies in dogs and cats	182	80	262	12.9
Rabies in other species	18	14	32	1.6
Rabies in humans	5	0	5	0.2
Rabies (Total)	205	94	299	14.7
EEE in humans	0	0	0	0.0
WNV in humans	0	0	0	0.0
VEE in humans	0	0	0	0.0
EEE in animals	13	0	13	0.6
WNV in animals	0	0	0	0.0
VEE in animals	9	11	20	1.0
Encephalitis (Total)	22	11	33	1.6
Encephalitis in humans (Total)	0	0	0	0.0
Leptospirosis in humans	37	60	97	4.8
Cutaneous leishmaniasis, humans	16	35	51	2.5
Cutaneous leishmaniasis, dogs	0	2	2	0.1
Visceral leishmaniasis, humans	2	10	12	0.6
Visceral leishmaniasis, dogs	0	393	393	19.3
Leishmaniasis (Total)	18	403	421	20.9
Leishmaniasis in humans (Total)	2	10	12	0.6
Cysticercosis in humans	161	14	175	8.6
Teniasis in humans	18	0	18	0.9
Brucellosis in animals	0	34	34	1.7
Brucellosis in humans	29	10	39	1.9
Toxoplasmosis in humans	14	0	14	0.7
Yellow fever	5	12	17	0.8
All selected zoonoses (Total)	772	1265	2037	100.0

Abbreviations: EEE, East equine encephalitis; WNV, West Nile virus; VEE, Venezuelan equine encephalitis.

Sylvatic



Urban



Domestic-rural





Coinfección *Leishmania* y HIV El problema de la cuenca Mediterránea

- Leishmaniasis es una enfermedad “oportunista” en individuos infectados con VIH/SIDA.
- La transmisión puede ser a través de intercambio de jeringas entre consumidores de drogas.
- Aparición de “nuevas cepas de parásitos”: mas virulentos y resistentes a quimioterapia.

Coinfección Leishmaniasis y VIH

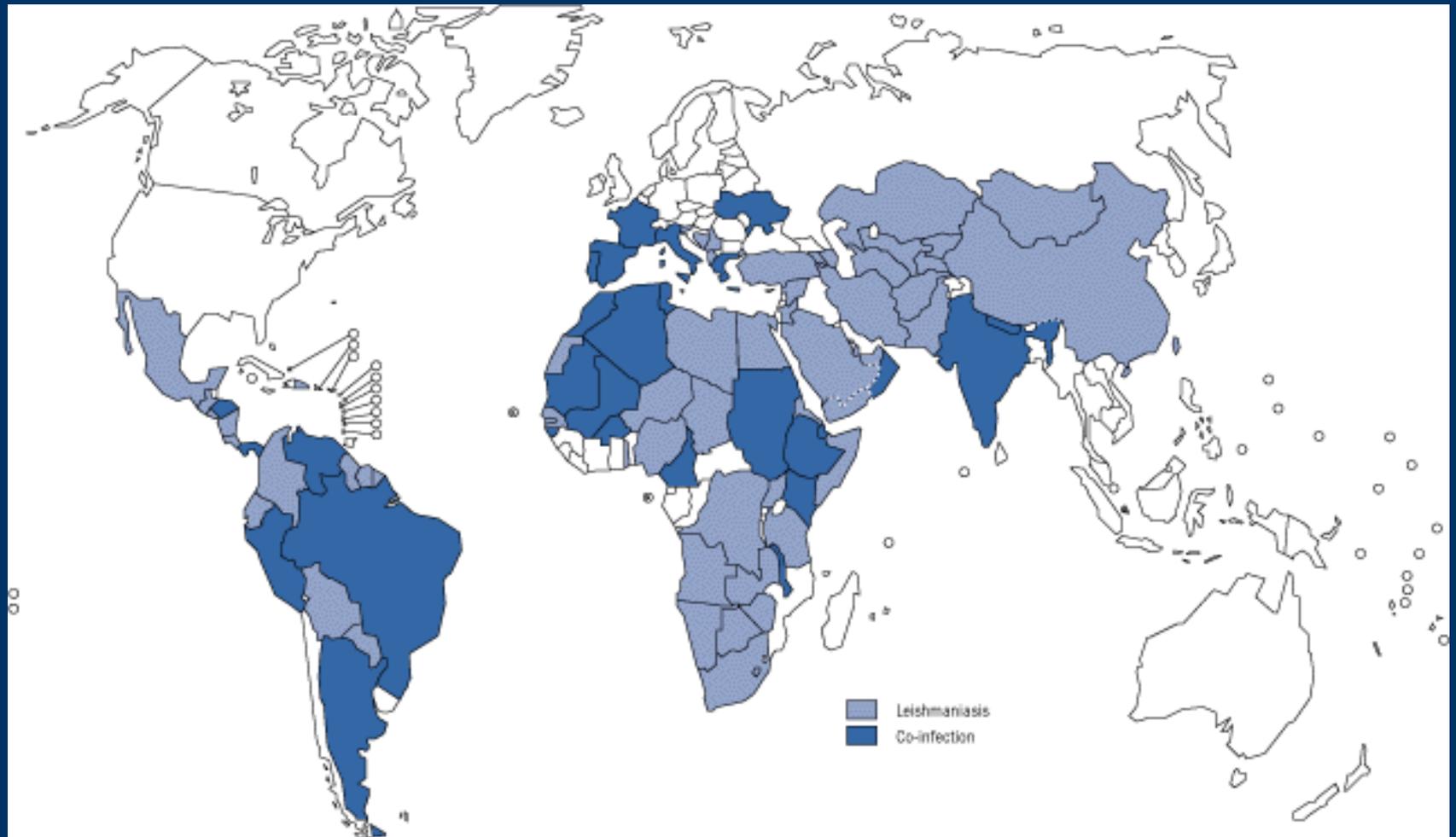
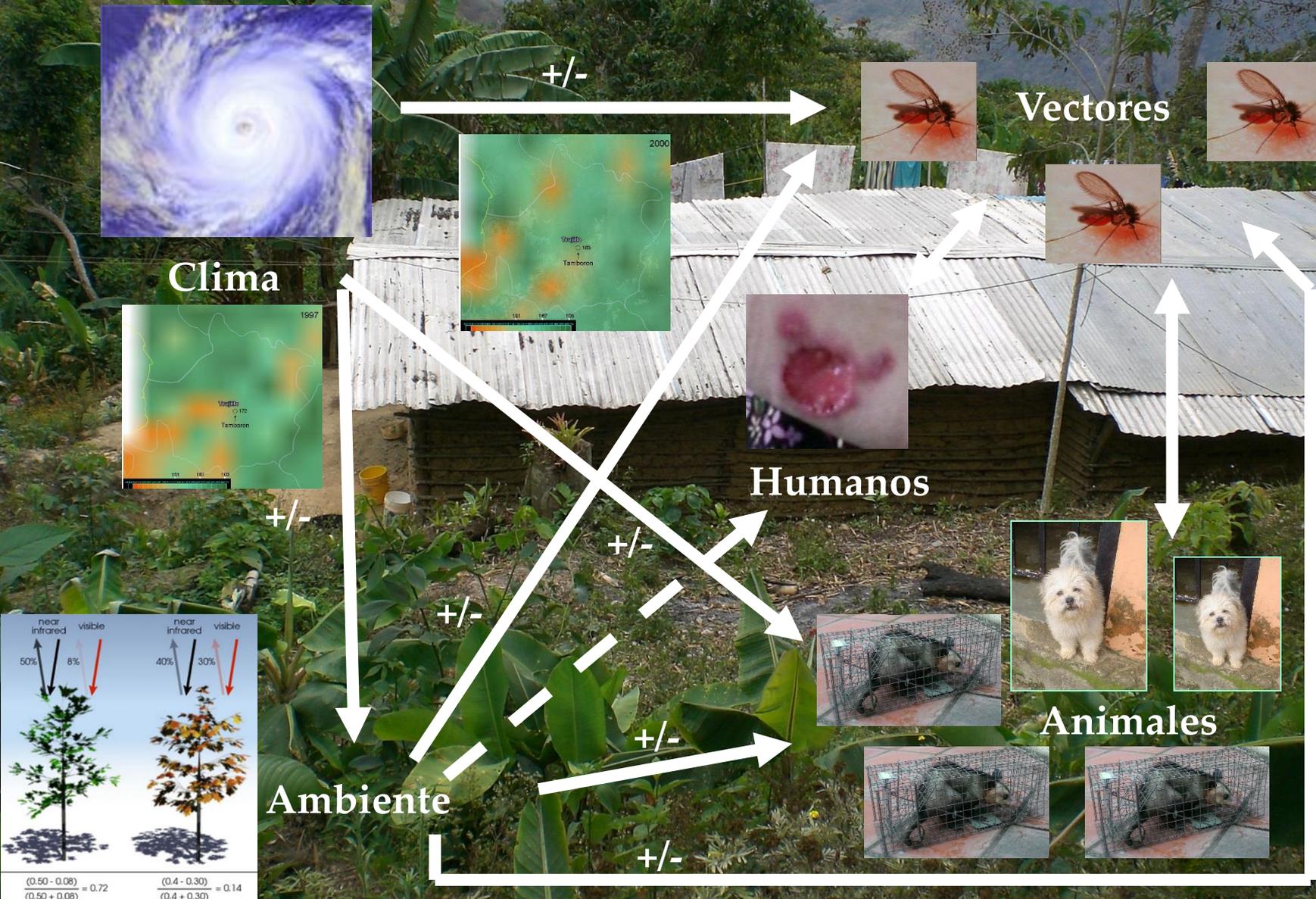


Table 2. Estimated Prevalence of Neglected Infections of Poverty in the US.

Neglected Disease Category	Disease	Estimated Number of Cases	Major Regions or Populations at Risk	References
Soil-transmitted helminth infections	Ascariasis	<4 million	Appalachia, American South	[29]
	Toxocariasis	1.3–2.8 million	Inner cities, American South, Appalachia	[14,79,84]
	Strongyloidiasis	68,000–100,000	Appalachia, African refugees	[14,19,25,35]
	Trichinellosis	16 (insufficient data)	Arctic Alaska	[149]
Platyhelminth Infections	Cysticercosis	41,400–169,000	US–Mexico borderlands	[19,96,113]
	Schistosomiasis	8,000	African refugees	[89,90]
	Echinococcosis	Insufficient data	Tribal Lands and Arctic Alaska	—
Protozoan Infections	Giardiasis	2.0–2.5 million	All regions	[123,147]
	Trichomoniasis	880,000 (black women)	American South, inner cities	[14,66]
	Cryptosporidiosis	300,000	All regions	[123]
	Chagas disease	3,000 to >1 million	US–Mexico borderlands, American South	[11,102,103,105,109]
	Cyclosporiasis	16,624	All regions	[123]
	Congenital toxoplasmosis	≤4,000 annually	American South, inner cities, US–Mexico borderlands, Arctic Alaska	[65]
	Leishmaniasis	Insufficient data	US–Mexico borderlands	—
	Amebiasis	Insufficient data	US–Mexico borderlands	—
Bacterial Infections	Congenital syphilis	1,528 between 2000 and 2002	American South, inner cities	[62]
	Brucellosis	1,554	US–Mexico borderlands	[122,123]
	Bovine tuberculosis	129 cases between 1994 and 2000	US–Mexico borderlands	[124]
	Leprosy	166	US–Mexico borderlands	[148]
	Trench fever	Insufficient data	Inner cities	—
	Leptospirosis	Insufficient data	Inner cities	—

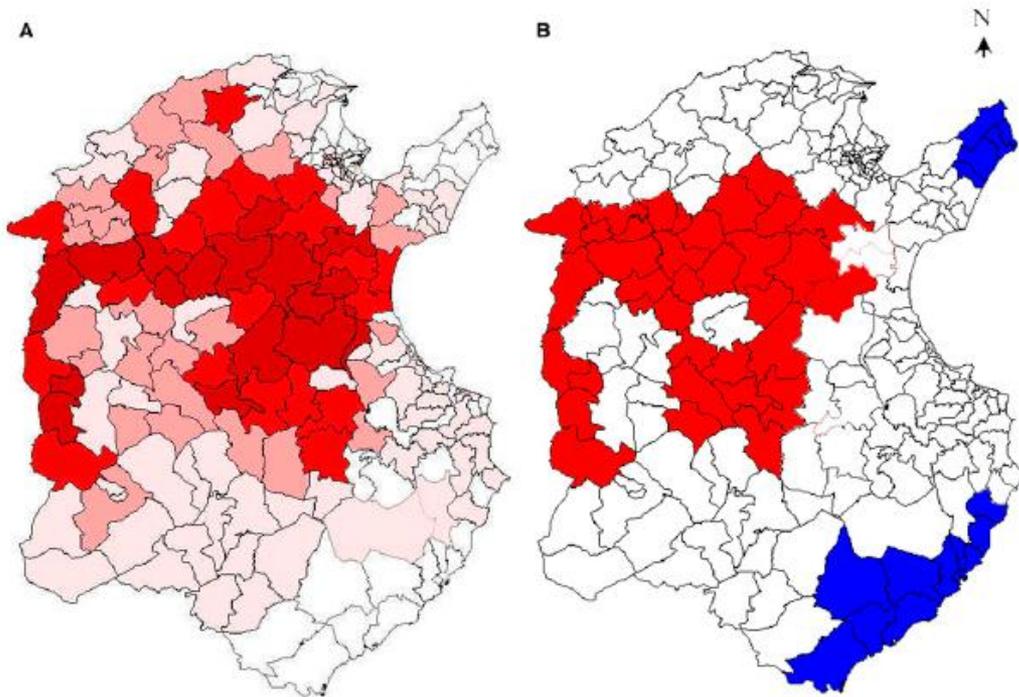
Ecología de la Leishmaniasis Cutánea



Visceral Leishmaniasis in Tunisia: Spatial Distribution and Association with Climatic Factors

Kais Ben-Ahmed, Karim Aoun, Fakhri Jeddi, Jamila Ghrab, Mhamed-Ali El-Aroui, and Aïda Bouratbine*

Laboratoire de Recherche 05SP03, Laboratoire de Parasitologie, Institut Pasteur de Tunis, Tunis, Tunisia; Laboratoire de Recherche Opérationnelle de Décision et de Contrôle de Processus, Institut Supérieur de Gestion de Tunis, Tunis, Tunisia



Incidence rate

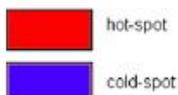
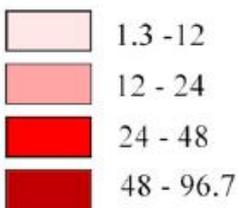


FIGURE 3. Spatial distribution of Mediterranean visceral leishmaniasis (MVL) in northern and central Tunisia. A, Northern and central Tunisia showing mean MVL incidence rate per district. B, Local indicator of spatial association map. This figure appears in color at www.ajtmh.org.

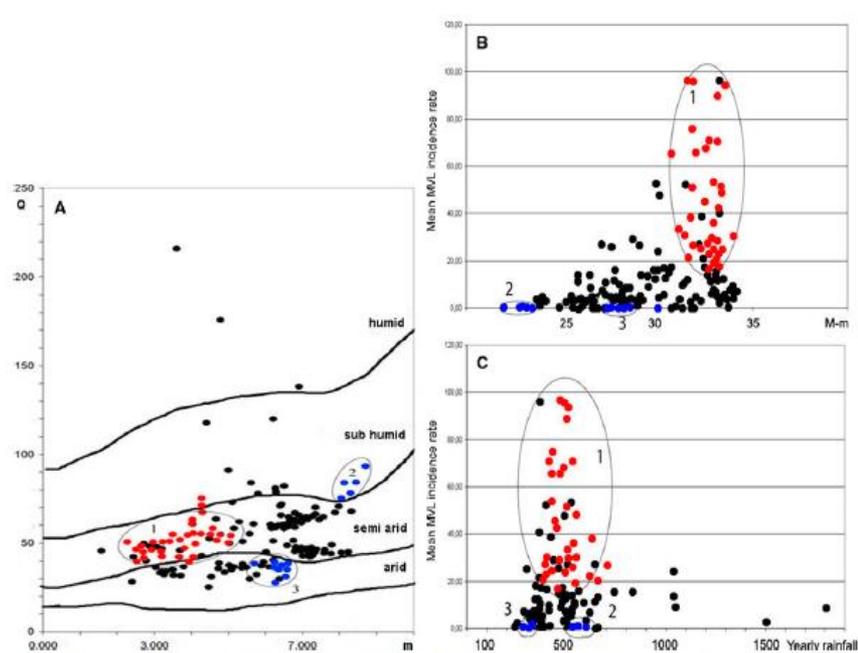


FIGURE 4. Location of a hot-spot and cold-spots according to climatic and bioclimatic parameters in Tunisia. A, Location of districts on Emberger's pluviometric climagram according to their minimal temperature of the coldest month (m) and Emberger's pluviometric quotient (Q_p). B, Location of districts according to continentality index ($M - m$) and mean incidence rate of Mediterranean visceral leishmaniasis (MVL). C, Location of districts according to yearly rainfall and mean MVL incidence rate. 1 = hot-spot; 2 and 3 = cold-spots. This figure appears in color at www.ajtmh.org.

TABLE 1

Poisson spatial regression (Bayesian parameters estimates and 95% credibility intervals) of leishmaniasis in Tunisia

Parameter	Posterior mean	2.5% quantile	97.5% quantile	Posterior median
β_0 - Intercept	-1.701	-50.015	43.034	-1.87
$\beta_1 - P$	0.00236*	0.00024	0.027	0.00269
$\beta_2 - Ic$	0.089*	0.028	0.585	0.093

* Indicates parameters that are significant at the 5% level.

Temperature-derived potential for the establishment of phlebotomine sandflies and visceral leishmaniasis in Germany

Dominik Fischer, Stephanie M. Thomas, Carl Beierkuhnlein

Department of Biogeography, University of Bayreuth, Universitätsstrasse 30, D-95447 Bayreuth, Germany

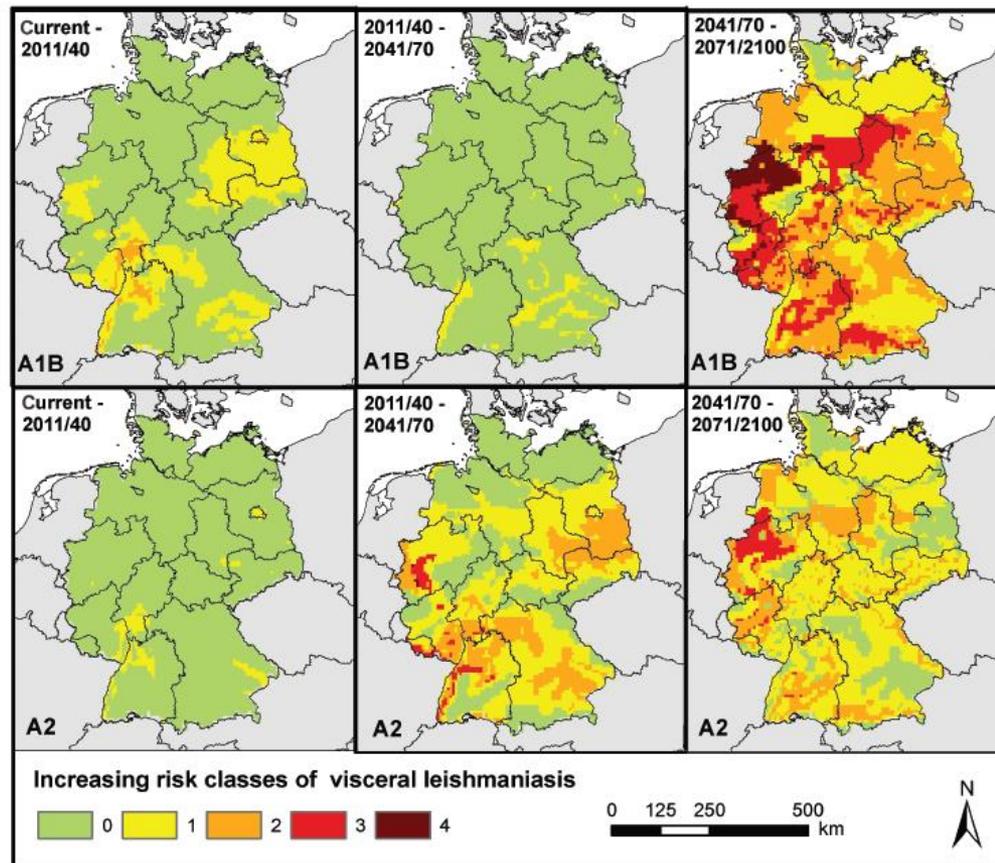


Fig. 4. Temporal variation in classification results for visceral leishmaniasis. Classified results for each time period (30-year averages) were subtracted from the following one for each scenario separately, in order to detect temporal trends in risk class variation.

Association of *Lutzomyia longipalpis* (Diptera: Psychodidae) population density with climate variables in Montes Claros, an area of American visceral leishmaniasis transmission in the state of Minas Gerais, Brazil

Érika Monteiro Michalsky¹, Consuelo Latorre Fortes-Dias², João Carlos França-Silva³, Marília Fonseca Rocha⁴, Ricardo Andrade Barata¹, Edelberto Santos Dias^{1*}

¹Instituto de Pesquisas René Rachou-Fiocruz, Av. Augusto de Lima 1715, 30190-002 Belo Horizonte, MG, Brasil
²Fundação Ezequiel Dias, Belo Horizonte, MG, Brasil ³Universidade Federal de Minas Gerais, Belo Horizonte, MG, Brasil
⁴Secretaria Municipal de Saúde, Montes Claros, MG, Brasil

Main statistical parameters of the multiple linear regression that associates the number of *Lutzomyia longipalpis* specimens captured in Montes Claros (Sep/02-Aug/03) with local climate variables

Regression parameters				
Name	Calculated value	Climate variables		
		rf (mm)	tp (°C)	rh (%)
Rsq	0.752	-	-	-
F-to-remove	-	5.988	12.81	15.69
P value	-	0.040	0.007	0.004
VIP	-	1.970	1.236	2.043

Regression diagnostics		
Month	Predicted	Studentized residuals
Sept/02	128	- 2.346
Oct/02	239	2.083
Nov/02	87	- 0.423
Dec/02	135	0.780
Jan/03	0 ^a	0.529
Feb/03	64	- 0.203
Mar/03	26	- 0.308
Apr/03	61	0.261
May/03	1	0.261
Jun/03	0 ^a	1.152
Jul/03	1	0.201
Aug/03	47	- 0.747



Relationship between rainfall and temperature: observations on the cases of visceral leishmaniasis in São Luis Island, State of Maranhão, Brazil

Relações entre pluviometria e temperatura: observações sobre a ocorrência de casos de leishmaniose visceral na Ilha de São Luis, Estado do Maranhão, Brasil

Graça Maria de Castro Viana¹, Maria do Desterro Soares Brandão Nascimento^{1,3}, Érica Milena Fernandes Rabelo¹, João Arnaud Diniz Neto¹, José Roberto Binda Júnior¹, Carolina de Souza Galvão¹, Alessandro Carvalho dos Santos¹, Onildo Martins Santos Júnior¹, Rodrigo Artur Souza de Oliveira¹ and Rafael Silva Guimarães¹

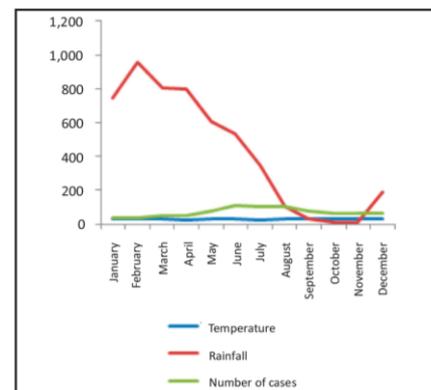


FIGURE 1 - Correlation between the number of human visceral leishmaniasis cases and rainfall (mm) and mean temperature (°C) between 2002 and 2010.

The increase in rainfall was positively associated with an increased number of VL cases ($p < 0.001$).

Biotic factors and occurrence of *Lutzomyia longipalpis* in endemic area of visceral leishmaniasis, Mato Grosso do Sul, Brazil

Everton Falcão de Oliveira^{1*}, Elaine Araújo e Silva², Carlos Eurico dos Santos Fernandes³, Antonio Conceição Paranhos Filho⁴, Roberto Macedo Gamarra⁴, Alisson André Ribeiro⁴, Reginaldo Peçanha Brazil⁵, Alessandra Gutierrez de Oliveira^{1,3}

Linear correlation coefficients between the environmental variables and abundance of *Lutzomyia longipalpis*

Variables	Male	Female	Total
NDVI			
Habitat complexity	0.24 ^a	0.18 ^a	0.24 ^a
Habitat heterogeneity	-0.06	0.09	-0.01
Vegetation cover	0.25 ^a	0.27 ^a	0.26 ^a

$\alpha: p < 0.01$; NDVI: normalized difference vegetation index.

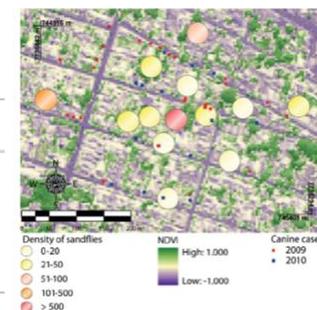


Fig. 2: distribution of canine cases reported and the abundance of sandflies in the study area, Campo Grande, state of Mato Grosso do Sul, 2009-2010.

Leishmaniasis visceral en la zona urbana del distrito de Cartagena, Colombia, 2011

Clara del Pilar Zambrano¹, Martha Ayala², Patricia Fuya³, Omar Cantillo⁴, Andrea Romero²

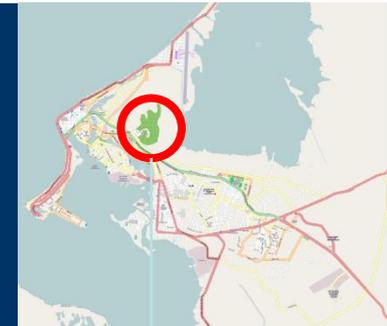
¹ Grupo de Enfermedades Transmitidas por Vectores, Subdirección de Vigilancia y Control en Salud Pública, Instituto Nacional de Colombia, Bogotá, D.C., Colombia

² Grupo de Parasitología, Subdirección Red Nacional de Laboratorios, Bogotá, D.C., Colombia

³ Grupo de Entomología, Subdirección Red Nacional de Laboratorios, Bogotá, D.C., Colombia

⁴ Grupo Biología y Control de Enfermedades Infecciosas, Universidad de Antioquia, Medellín, Colombia

- La cercanía de las viviendas al foco “silvestre” del Cerro de la Popa y sus características de bosque seco primario, las deficientes condiciones de saneamiento, el desconocimiento de los síntomas y de las formas de transmisión fueron los principales factores asociados. Se obtuvieron 6 pruebas de Montenegro positivas en dos niños y 4 adultos. En la búsqueda activa se identificaron tres niños con títulos de IFI de 1/16 (no reactivos). El estudio entomológico identificó *Lutzomyia evansi*, vector confirmado en el intradomicilio y en el peridomicilio; también, reservorios caninos confirmados mediante serología, PCR en tejidos e histopatología sugestiva; se confirmó por PCR, un reservorio silvestre *Didelphis marsupialis*



LEISHMANIASIS

Leishmaniasis visceral:

- Forma grave y potencialmente mortal de la parasitosis si no es tratada.
- Se manifiesta como un **síndrome febril prolongado**, hepatoesplenomegalia, pancitopenia y hemaciación pronunciada.
- Las células principalmente infectadas son del sistema fagocítico mononuclear, de médula ósea, bazo, hígado y ganglios linfáticos.

Visceral Leishmaniasis

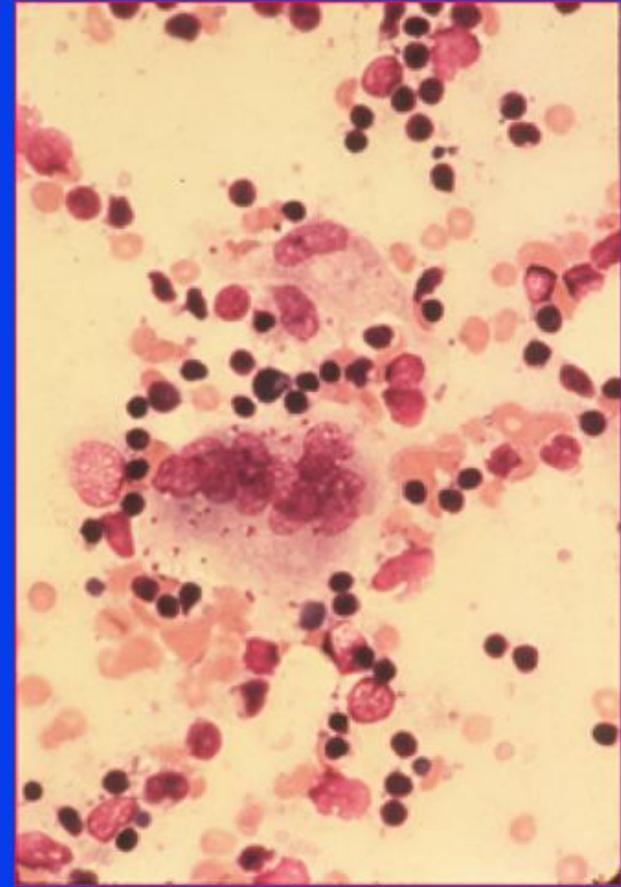
Hx: febrile illness of acute, subacute, or chronic onset in Spaniard

Epi: Exposure to sandflies, zoonosis; rare in travelers, common in endemic populations. Currently epidemic in India, Sudan, & Brazil.

PE: fever, cachexia, hepatosplenomegaly (splenomegaly may be massive), generalized lymphadenopathy

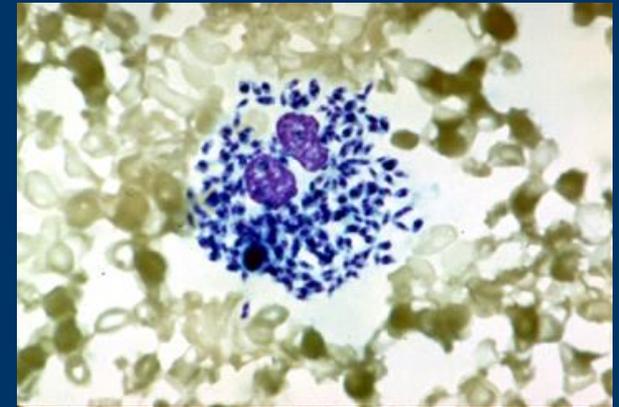
Lab: Pancytopenia with relative lymphocytosis, hypergammaglobulinemia, hypoalbuminemia. Intracellular amastigotes in bone marrow or splenic aspirates. Serology (+). K39 strip.

Rx: Miltefosine. Pentavalent antimony IV/IM X 28d. Amphotericin B (desoxycholate or liposomal) first-line if available, affordable.



Visceral leishmaniasis and HIV

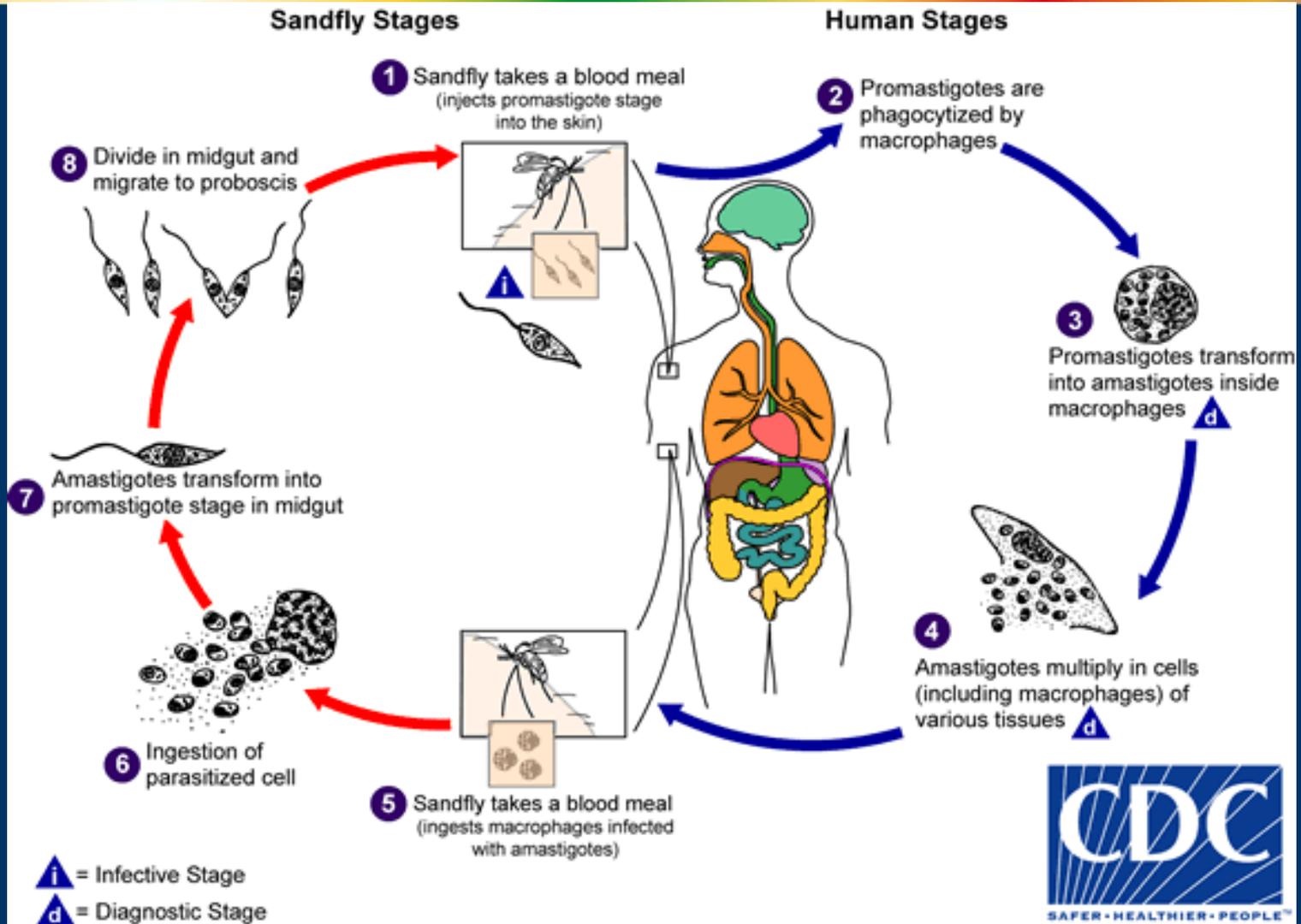
- Mediterranean region, Asia, Africa, tropical areas in America
- CD4 < 200
- Fever, weight loss, hepatosplenomegaly
- Pancytopenia
- Peripheral parasitemia in 50%, serologies are negative in 50%
- Treatment is similar but less efficacious, need for secondary prophylaxis

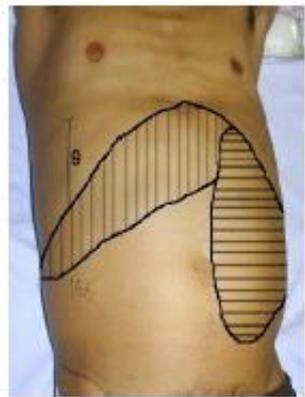
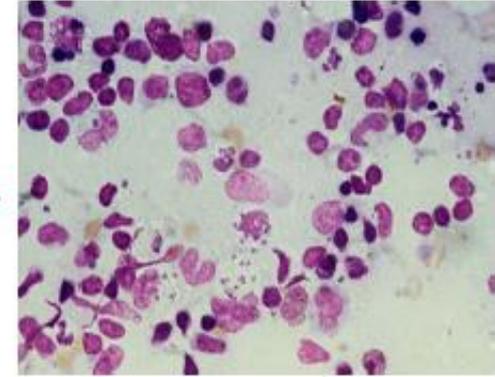


Leishmania

Leishmaniasis

Ciclo de Vida





**Visceral
Leishmaniasis**



**Cutaneous
Leishmaniasis**



**Mucosal
Leishmaniasis**



**Disseminated
Leishmaniasis**



**Difuse
Leishmaniasis**

LEISHMANIASIS

- Diagnóstico: Microscopia-Biopsia (MO, Bazo, Hígado)
- IDR o Prueba de Montenegro
- ELISA: Prueba ampliamente utilizada para el diagnóstico de la **Leishmaniasis visceral** a nivel mundial.
- Ventajas:
 - Posibilidad de automatización.
 - Se puede evaluar mayor número de muestras.
 - Buenos resultados con proteínas recombinantes derivadas de ***L. infantum* (rK39, rK26)**.

LEISHMANIASIS

- Prueba rápida tipo strip (Dipstick) con rK39:
- Fenómeno de aglutinación entre el antígeno rK39 y los anticuerpos específicos del suero de prueba.
- Se utiliza una tira comercial de nitrocelulosa impregnada en banda con el antígeno (rK39).
- Resultado inmediato de tipo cualitativo.
- Sensibilidad y especificidad mayor del 90%.
- Rápido, económico, fácil de almacenar.



LEISHMANIASIS

IFI

PCR:

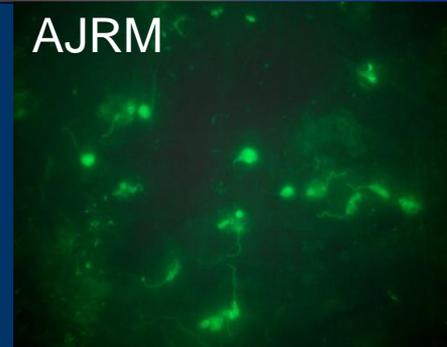
- Técnica diagnóstica molecular sensible y específica.
- Actualmente automatizada.
- Se puede realizar de manera simple o combinada con otras técnicas moleculares e inmunológicas:

PCR-ELISA.

PCR-Tiempo real.

PCR en nido.

AJRM



An alternative immunohistochemical method for detecting *Leishmania* amastigotes in paraffin-embedded canine tissues

Wagner Luiz Tafuri^{a,*}, Renato de Lima Santos^b, Rosa Maria Esteves Arantes^a,
Ricardo Gonçalves^b, Maria Norma de Melo^c,
Marilene Suzan Marques Michalick^c, Washington Luiz Tafuri^a

^a*Departamento de Patologia Geral, Instituto de Ciências Biológicas (ICB), Universidade Federal de Minas Gerais (UFMG),
Av. Antônio Carlos, 6627, Campus Pampulha, Belo Horizonte, MG/Brasil-CEP 31270-901, Brazil*

^b*Departamento de Clínica e Cirurgia, Escola de Veterinária, Universidade Federal de Minas Gerais (UFMG), Brazil*

^c*Departamento de Parasitologia, Instituto de Ciências Biológicas (ICB), Universidade Federal de Minas Gerais (UFMG), Brazil*

Received 1 October 2003; received in revised form 19 April 2004; accepted 13 May 2004

Available online 23 July 2004



Diagnóstico de LV



- Métodos definitivos (detección del parásito, Giemsa, estudio histopatológico con H&E) tienen baja sensibilidad
- Particularmente importante en órganos, que tienen bajas parasitemias en riñones, pulmones, SNC, testículos o en algunos casos en la piel.
- Técnica inmunohistoquímica para la detección de *Leishmania* (amastigotes) en tejidos en parafina fijados con formalina

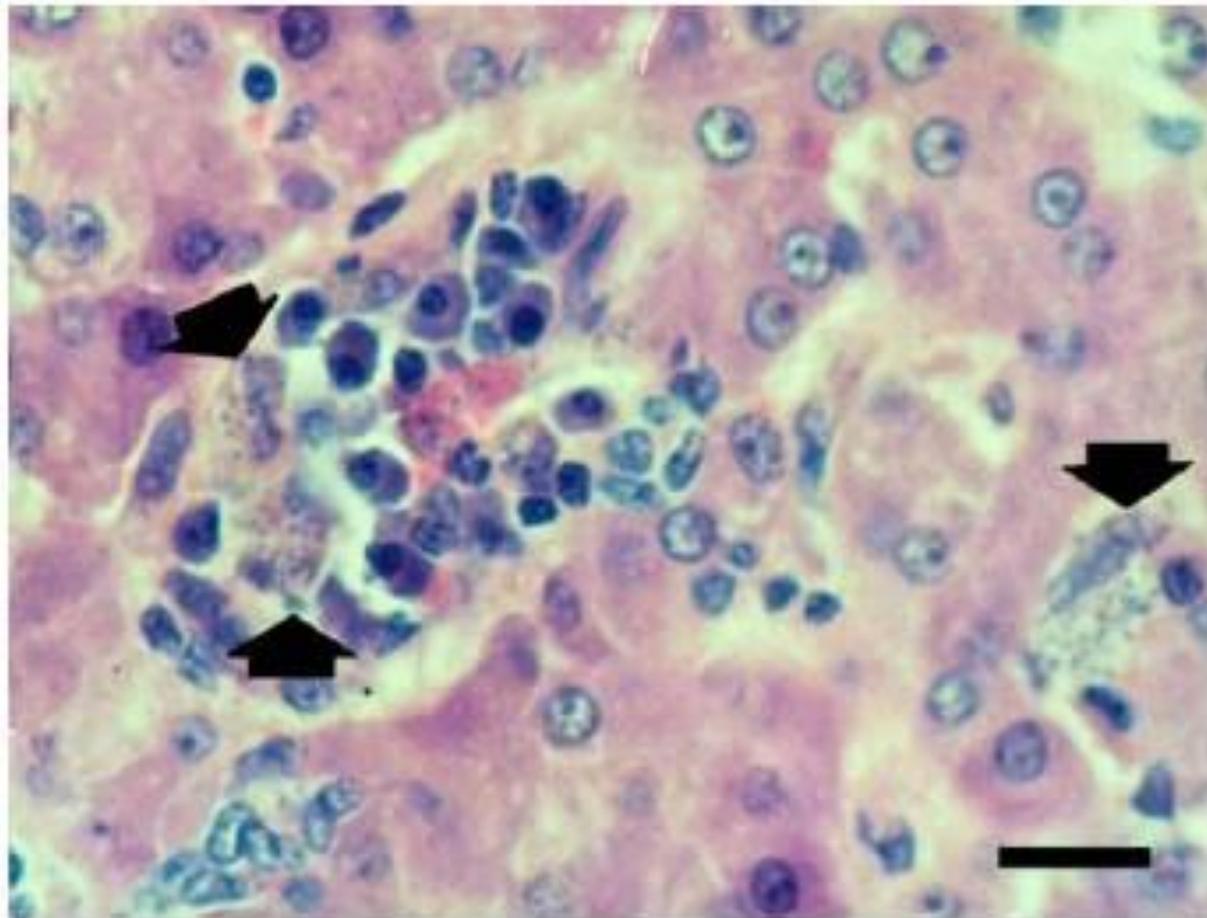


Fig. 1. Liver, naturally infected dog: hepatic intralobular granuloma formation composed by macrophages loaded with amastigotes (arrows), plasmocytes and lymphocytes. Hematoxylin-Eosin. Bar=12.5 μ m.

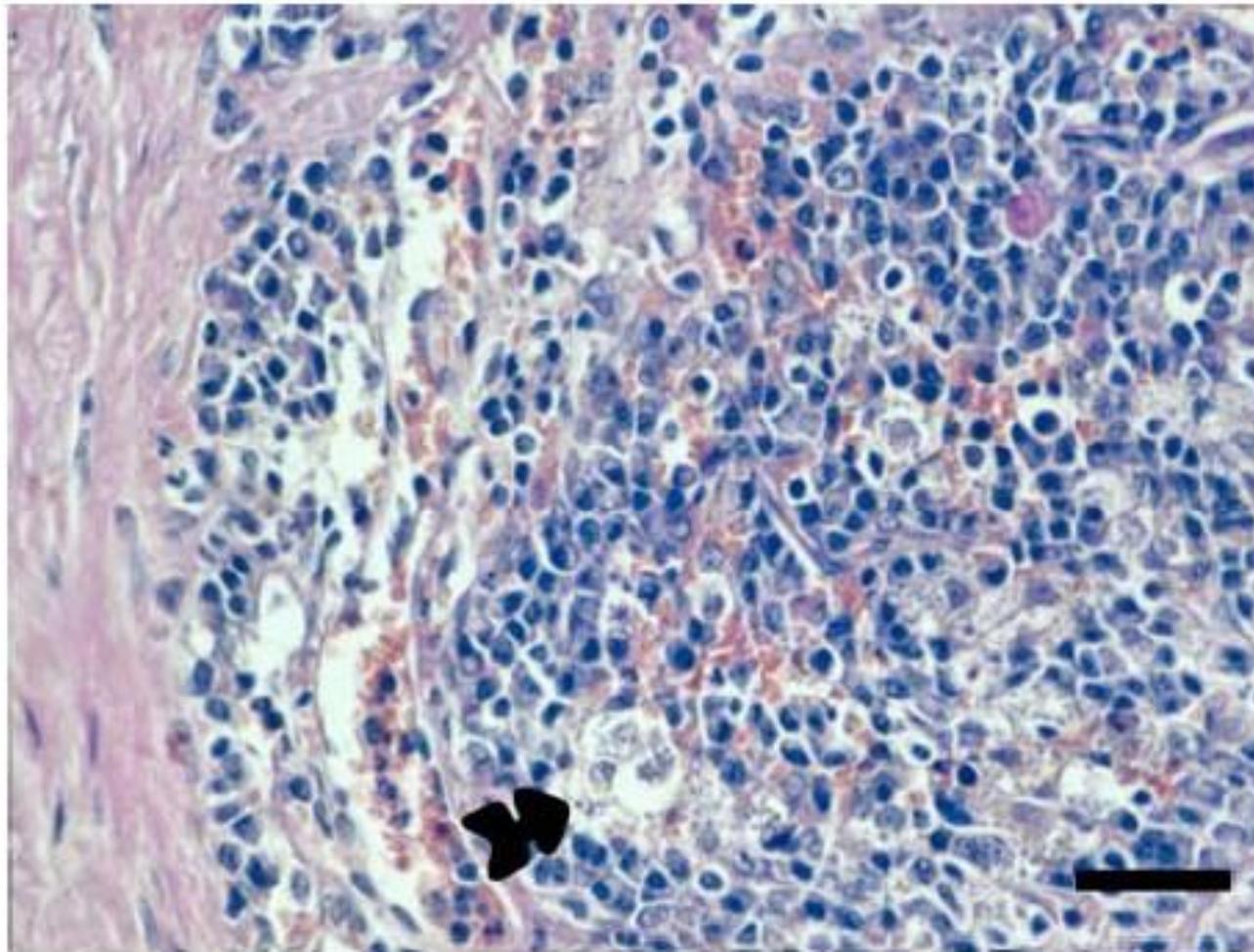


Fig. 3. Spleen, naturally infected dog: macrophages of red pulp loaded with *Leishmanias* (arrows). Hematoxylin-Eosin. Bar= 12.5 μm .

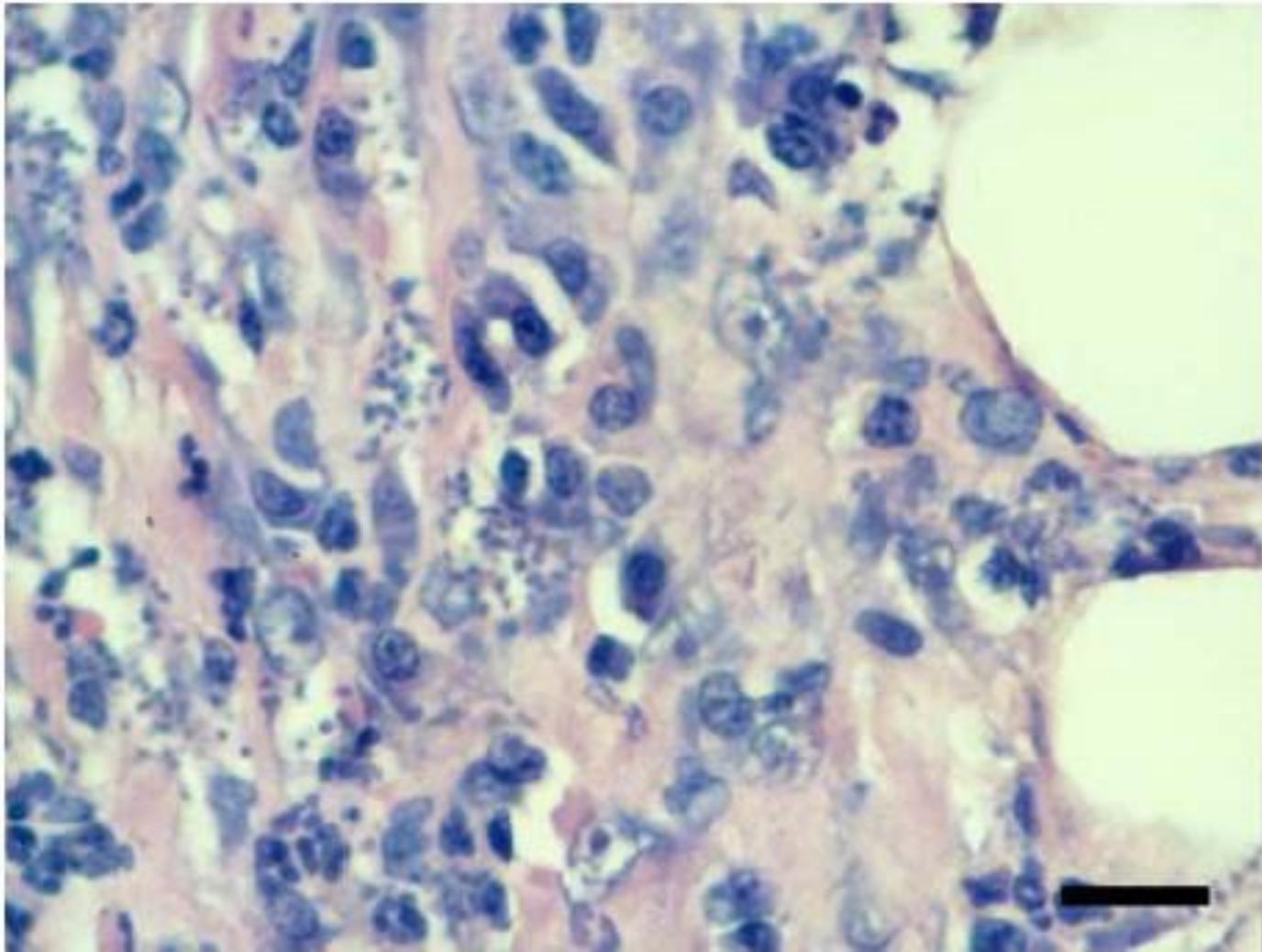


Fig. 5. Bone marrow, naturally infected dog: *Leishmania* amastigotes within mononuclear cells (arrow). Hematoxylin–Eosin. Bar=12.5 μ m.

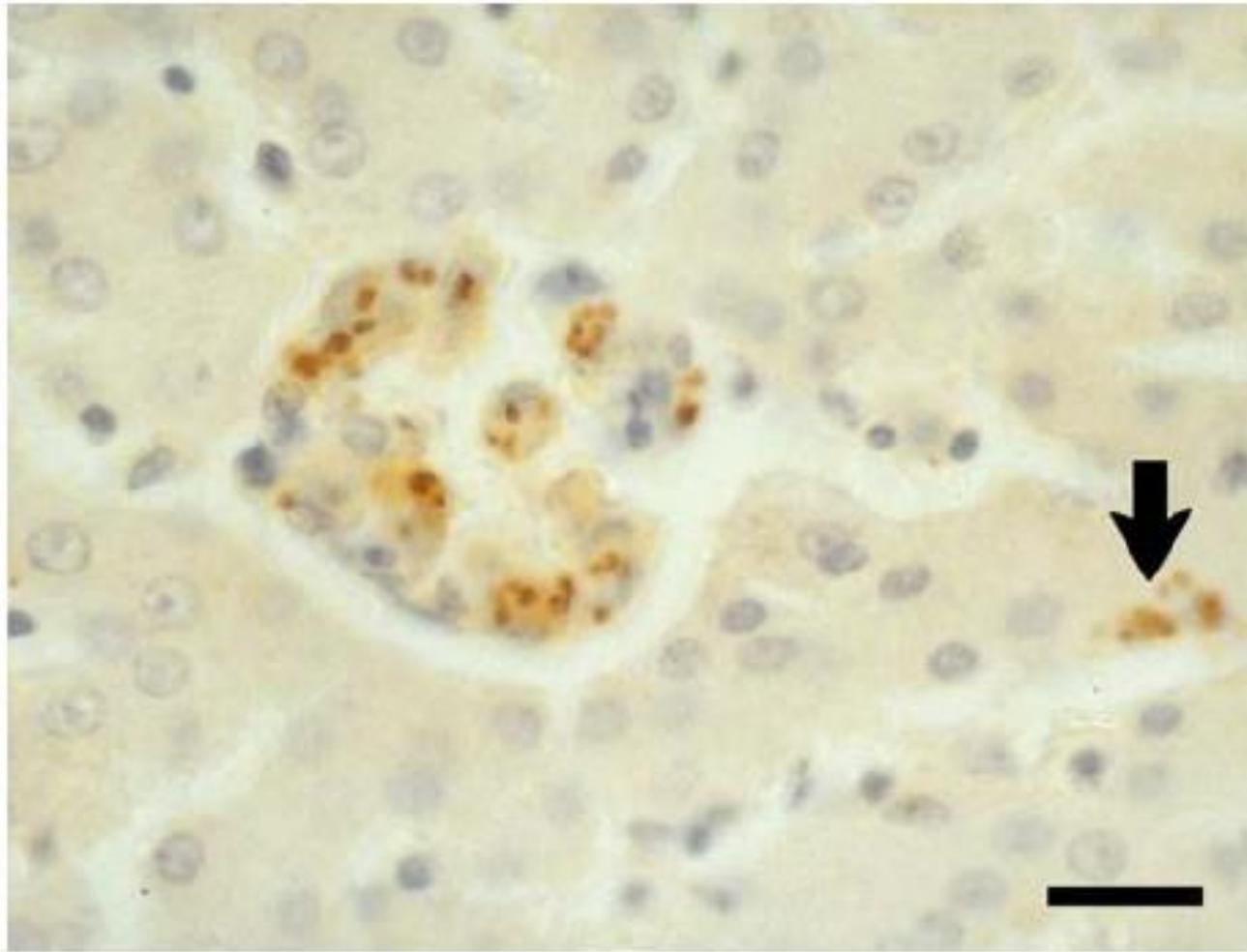


Fig. 2. Liver, naturally infected dog: immunolabeled amastigotes within a Kupffer cell (arrow). Streptavidin–biotin peroxidase complex method. Bar=12.5 μ m.

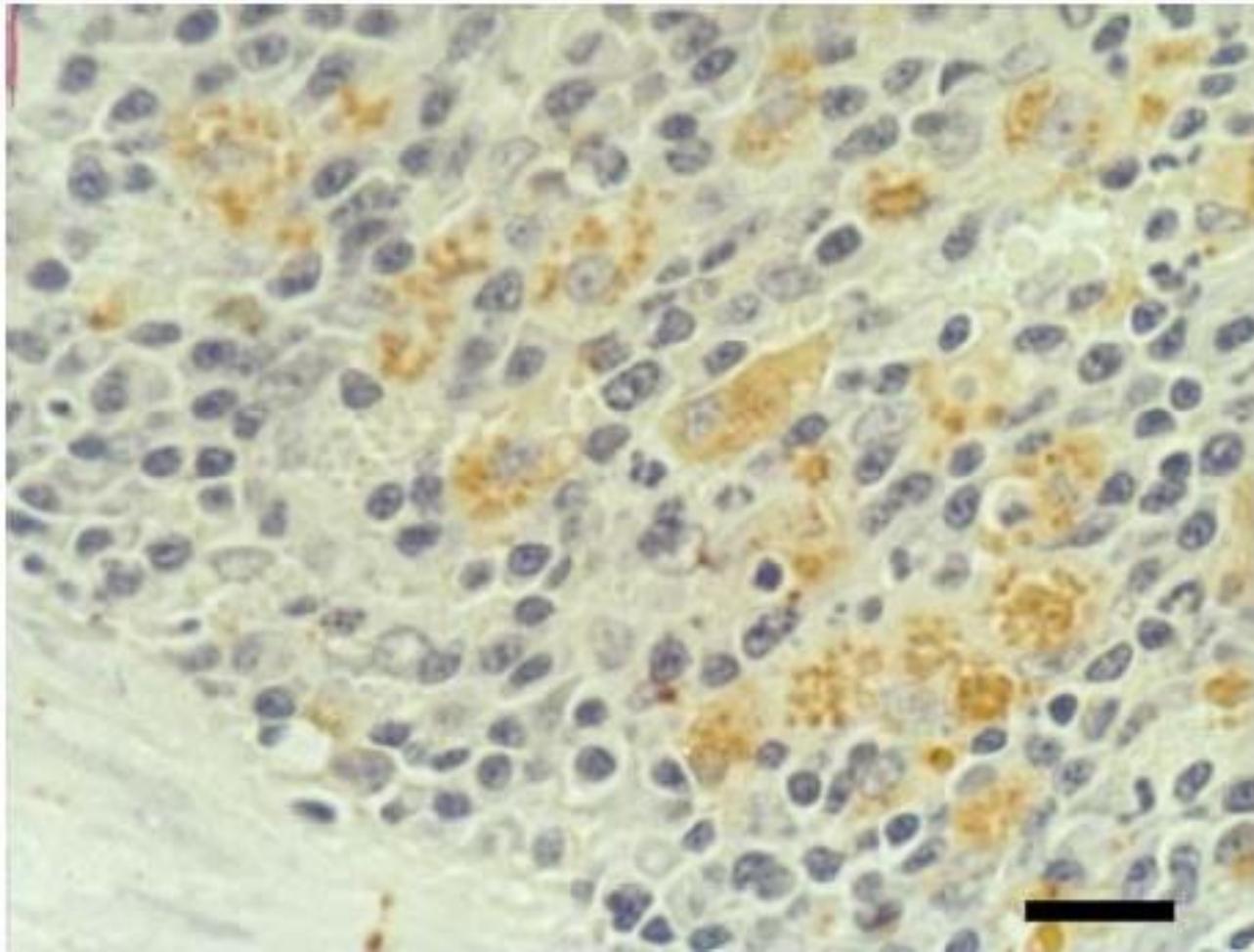


Fig. 4. Spleen, naturally infected dog: several immunolabeled amastigotes within macrophages. Streptavidin–biotin peroxidase complex method. Bar=12.5 μ m.

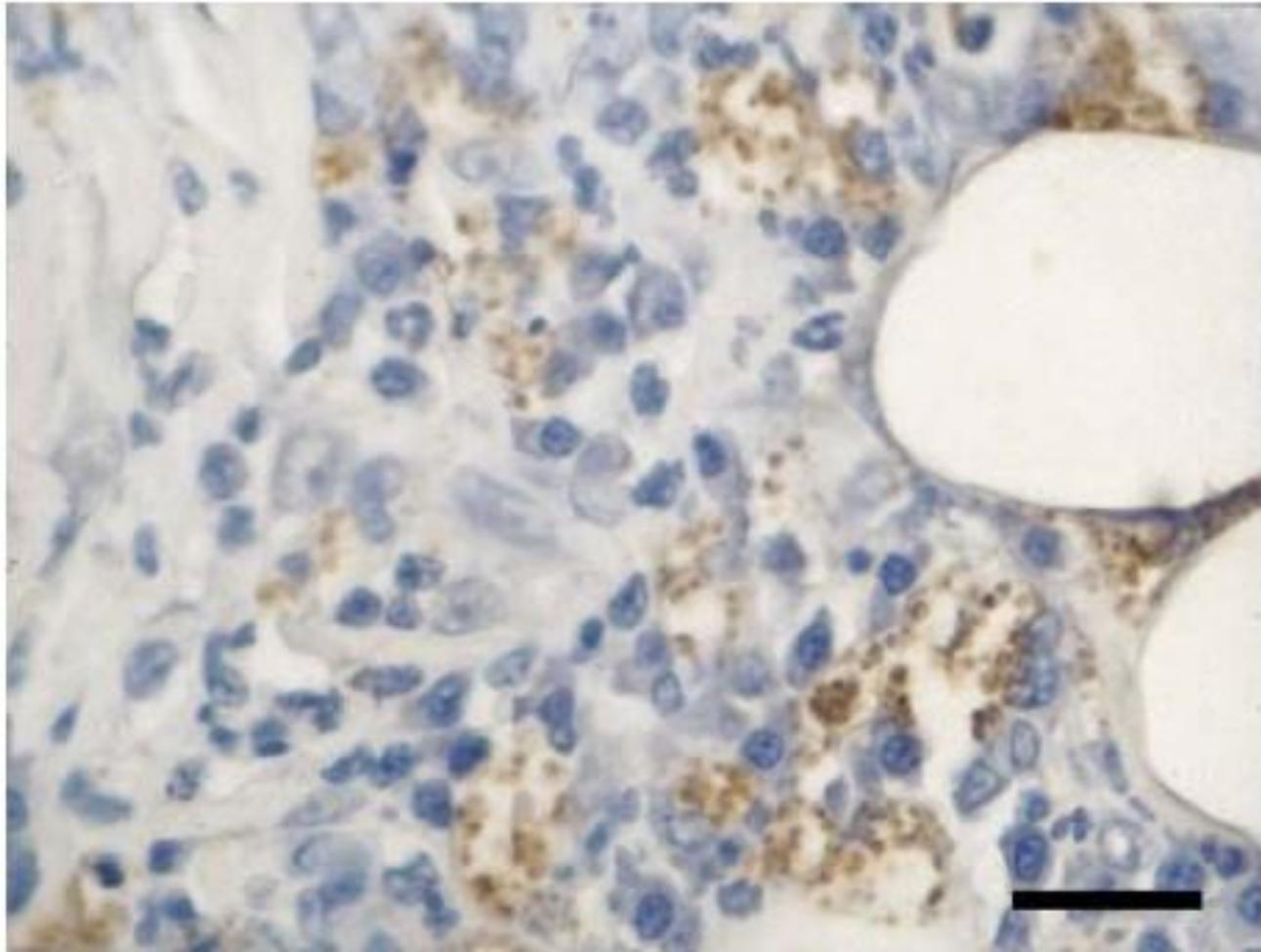


Fig. 6. Bone marrow, naturally infected dog: immunolabeled amastigotes can be seen. Streptavidin–biotin peroxidase complex method. Bar=12.5 μm .

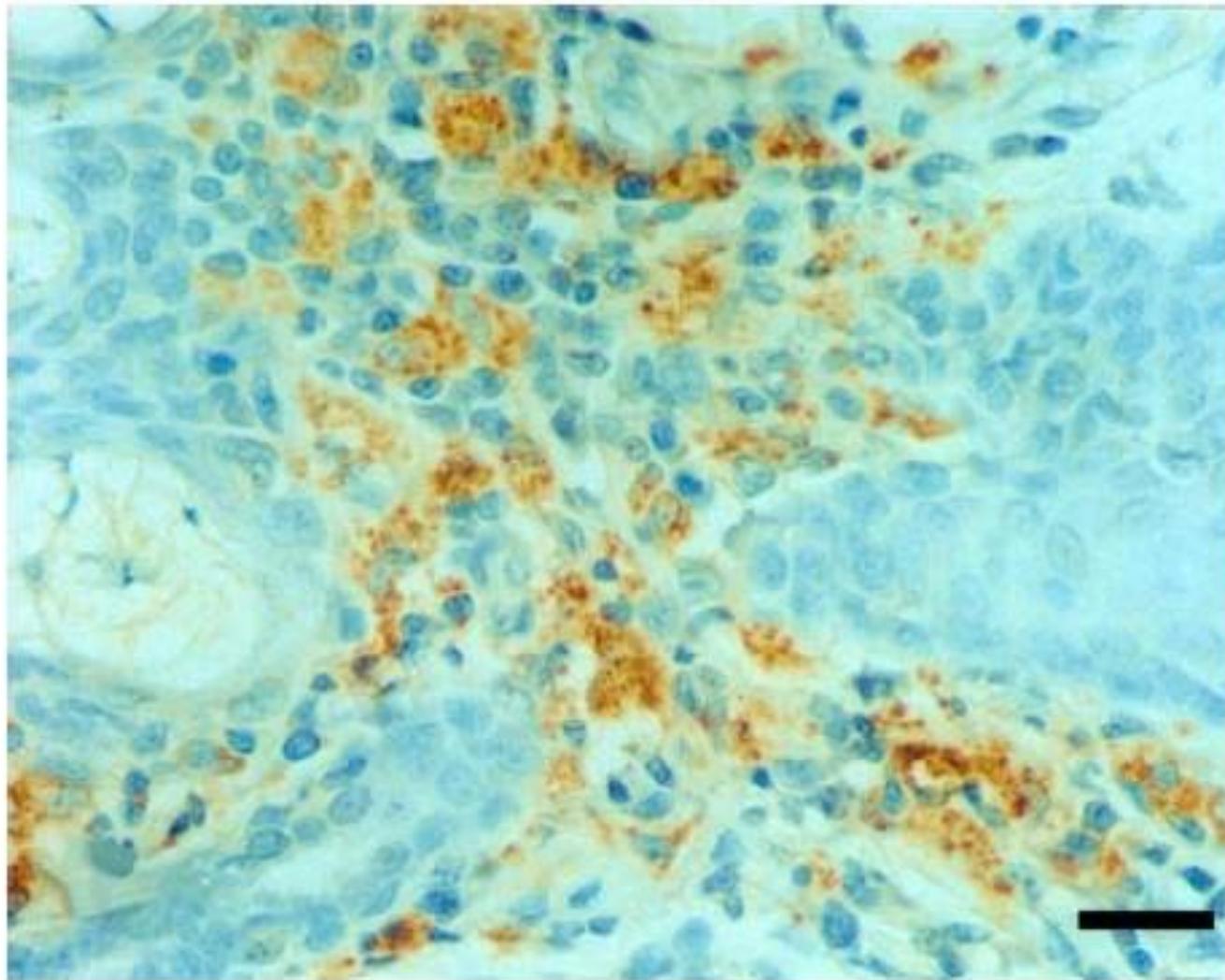


Fig. 7. Nose skin, naturally infected dog: immunohistochemical reaction using serum from an infected dog. Bar=12.5 μm .

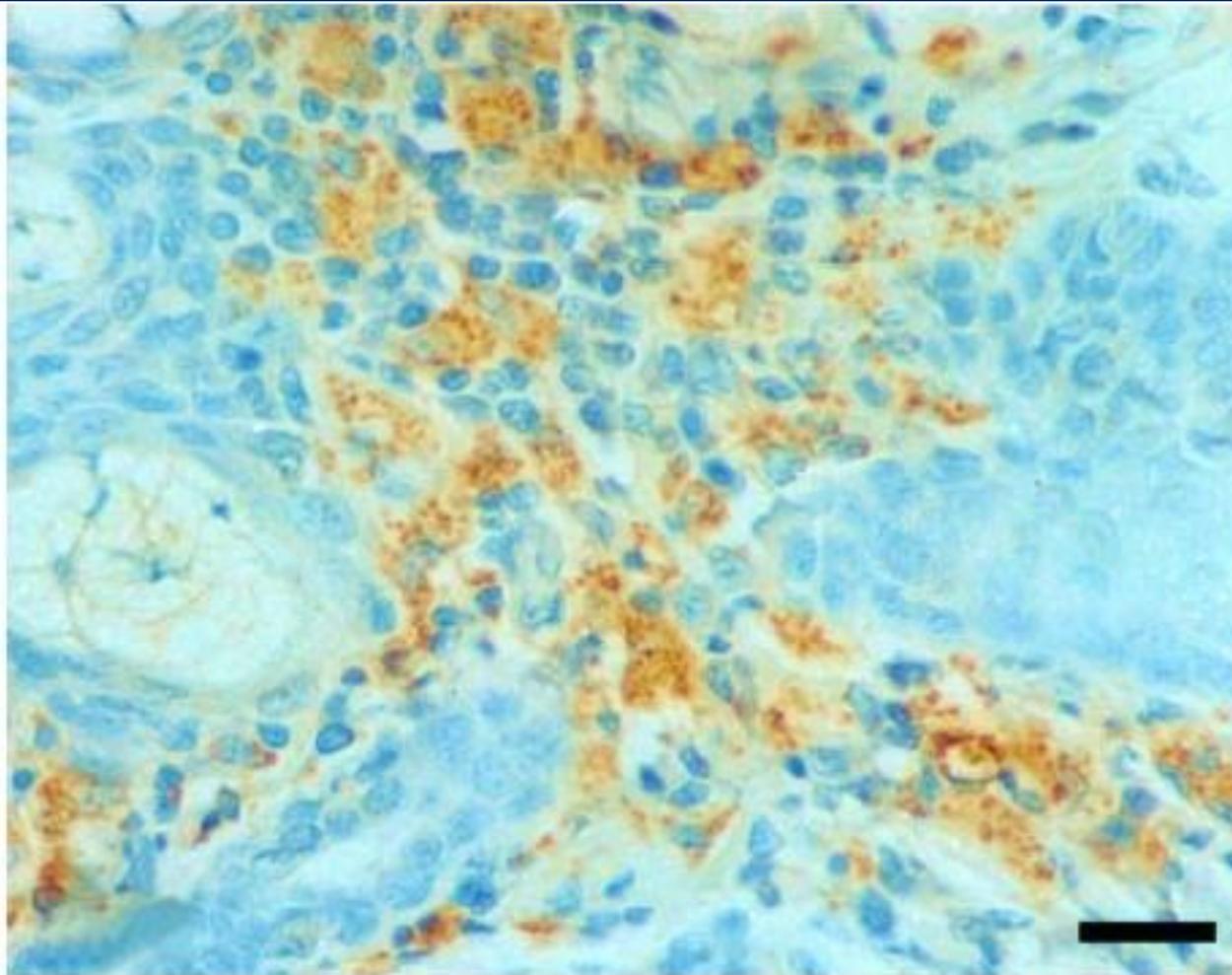


Fig. 8. Nose skin, naturally infected dog: monoclonal anti-*L. chagasi* (LPG) antibody showing several immunolabeled amastigotes within macrophages. Streptavidin–biotin peroxidase complex

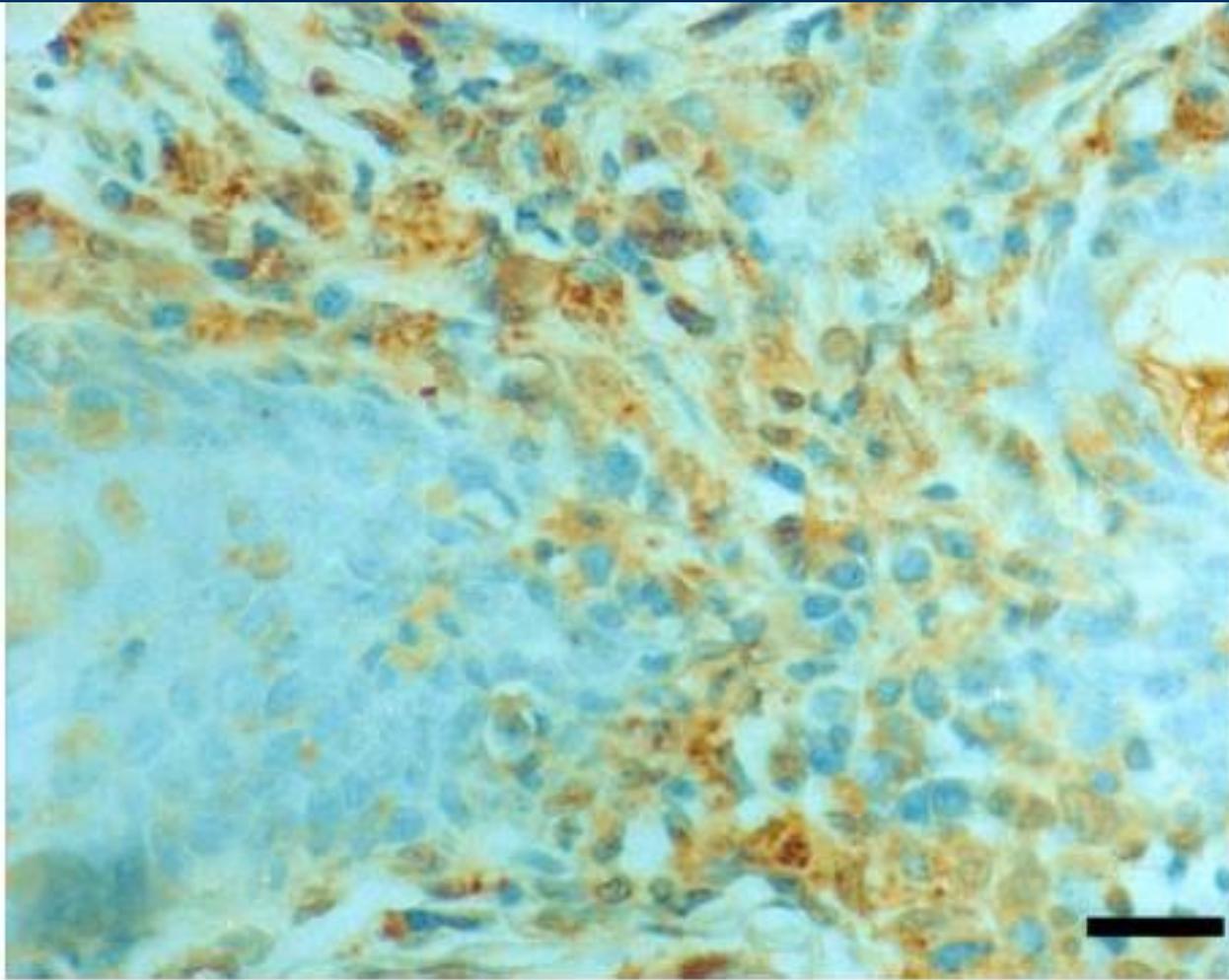


Fig. 9. Nose skin, naturally infected dog: rabbit serum anti-*Leishmania* showing several immunolabeled amastigotes within macrophages. Streptavidin-biotin peroxidase complex method.



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Veterinary Parasitology 121 (2004) 239–245

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Rapid detection of *Leishmania infantum*
infection in dogs: comparative study using
an immunochromatographic dipstick
rk39 test and direct agglutination

M. Mohebbali*, M. Taran, Z. Zarei

*School of Public Health, Institute of Public Health Research, Tehran University of Medical Sciences,
P.O. Box 6446, Tehran 14155, Iran*

Received 3 October 2003; received in revised form 3 February 2004; accepted 9 February 2004

2.2. Dipstick

The dipstick test (Cypress Diagnostic Company, Belgium) was carried out according to the manufacturer's instructions. The dipsticks were briefly placed into 50 μ l of serum. After 1–4 min a red control line and, if positive, a second line appeared on the test field. The test is based on a combination of protein-A colloidal gold conjugate and rk39 *Leishmania* antigen to detect anti-*Leishmania* antibody in serum or plasma.

2.3. Direct agglutination test

The *L. infantum* antigens for this study were prepared in the protozoology unit of the School of Public Health in Tehran University of Medical Sciences. The principal phases of the procedure for making DAT antigen were mass production of promastigotes of *L. infantum* LON-49 in RPMI1640 plus 10% fetal bovine serum, trypsinization of the parasites, staining with Coomassie brilliant blue and fixing with formaldehyde 2% (Harith et al., 1989; Edrissian et al., 1996). The dog serum samples were tested by DAT according to the methods described by Harith et al. (1989). Specific *Leishmania* antibodies at a 1:320 and above were considered as positive (Harith et al., 1989).

Development of a Dipstick Assay for Detection of *Leishmania*-Specific Canine Antibodies

Henk D. F. H. Schallig,^{1*} Luís Cardoso,² Marieke Hommers,¹ Nel Kroon,¹ Guus Belling,³
Manuela Rodrigues,² Saul J. Semião-Santos,⁴ and Hans Vetter³

KIT (Koninklijk Instituut voor de Tropen/Royal Tropical Institute), KIT Biomedical Research,¹ and Department of Microbiology, Academic Medical Centre,³ Amsterdam, The Netherlands, and Departamento de Higiene e Sanidade, ICETA, Universidade de Trás-os-Montes e Alto Douro, Vila Real,² and DepBio/CDI-LEISH, Universidade de Évora, Évora,⁴ Portugal

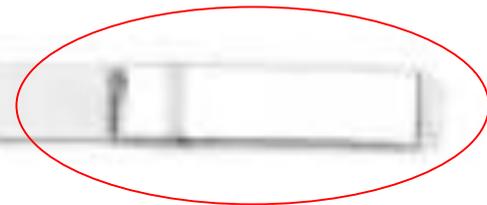
Received 7 July 2003/Returned for modification 19 September 2003/Accepted 5 October 2003

		DAT TITRE
A	K-13-1500	< 1:100
B	K-00-1500	1:200
<hr/>		
C	K-101-1500	1:800
D	K-61-1500	1:1600
E	K-93-1500	1:6400

FIG. 1. Optimization of dipstick test conditions. The best result was obtained by using an antigen concentration of 750 $\mu\text{g/ml}$, a serum dilution of 1:50, and a conjugate dilution of 1:1,500. Under these conditions, samples from a negative control from an area where CanL is not endemic (A) and a negative control from an area of endemicity (B) are negative with the dipstick test, whereas samples from dogs with suspected (C), symptomatic (D), and confirmed (E) cases of CanL are positive with the dipstick test.

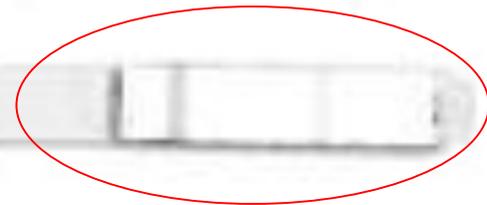
B K-00-1500

NEG



C K-101-1500

POS



Polymerase Chain Reaction Using Noninvasively Obtained Samples, for the Detection of *Leishmania infantum* DNA in Dogs

Dalit Strauss-Ayali,^{1,2} Charles L. Jaffe,² Ofer Burshtain,¹ Liat Gonen,¹ and Gad Baneth¹

¹School of Veterinary Medicine, Hebrew University of Jerusalem, Rehovot, and ²Kuvin Center for the Study of Tropical and Infectious Diseases, Hebrew University–Hadassah Medical School, Jerusalem, Israel

The Journal of Infectious Diseases 2004;189:1729–33

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0022-1899/2004/18909-0024\$15.00



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PCR as a rapid and sensitive tool in the diagnosis of human and canine leishmaniasis using *Leishmania donovani* s.l.-specific kinetoplastid primers

S. Cortes, N. Rolão, J. Ramada, L. Campino*

Unidade de Leishmanioses, Centro Malária Outras Doenças Tropicais, Instituto de Higiene e Medicina Tropical (IHMT), Universidade Nova de Lisboa, Rua da Junqueira 96, 1349-008 Lisboa, Portugal

Received 6 December 2002; accepted 2 June 2003

Table 1 *Leishmania* strains tested by PCR with MC1 and MC2 primers

Species	WHO code	Disease	Place of origin
<i>L. major</i>	MHOM/SU/1973/5-ASKH	CL	Sudan
<i>L. major</i>	MHOM/IL/67/Jericho II:LV561	CL	Israel
<i>L. tropica</i>	MHOM/SU/1974/K27	CL	Sudan
<i>L. braziliensis</i> ^a	MHOM/PT/99/IMT252	CL	Portugal
<i>L. guyanensis</i> ^a	MHOM/PT/96/IMT217	CL	Portugal
<i>L. infantum</i> MON-1	MHOM/PT/89/IMT 163	VL	Portugal (north)
<i>L. infantum</i> MON-1	MCAN/PT/94/IMT 205	CanL	Portugal (south)
<i>L. infantum</i> MON-1	MCAN/PT/2000/IMT 278	CanL	Portugal (south)
<i>L. infantum</i> MON-1	MHOM/PT/2000/IMT 279	VL	Portugal (north)
<i>L. infantum</i> MON-1	MHOM/PT/2000/IMT 260	CL	Portugal (centre)
<i>L. infantum</i> MON-24 ^b	MHOM/PT/92/IMT 181	VL	Portugal (north)
<i>L. infantum</i> MON-29	MHOM/PT/89/IMT 202	CL	Portugal (south)
<i>L. infantum</i>	MHOM/BR/72/46	VL	Brazil
<i>L. infantum</i>	MHOM/BR/058	VL	Brazil
<i>L. infantum</i>	MHOM/BR/74/0PP75	VL	Brazil
<i>L. donovani</i> MON-18 ^c	MHOM/PT/92/IMT 180	VL	Portugal (centre)
<i>L. donovani</i>	MHOM/ET/67/HV3:LV9	VL	Ethiopia

VL: visceral leishmaniasis; CL: cutaneous leishmaniasis; CanL: canine leishmaniasis.

^a Imported cases from Central and South America.

^b Campino et al. (1994a).

^c Campino et al. (1994b).

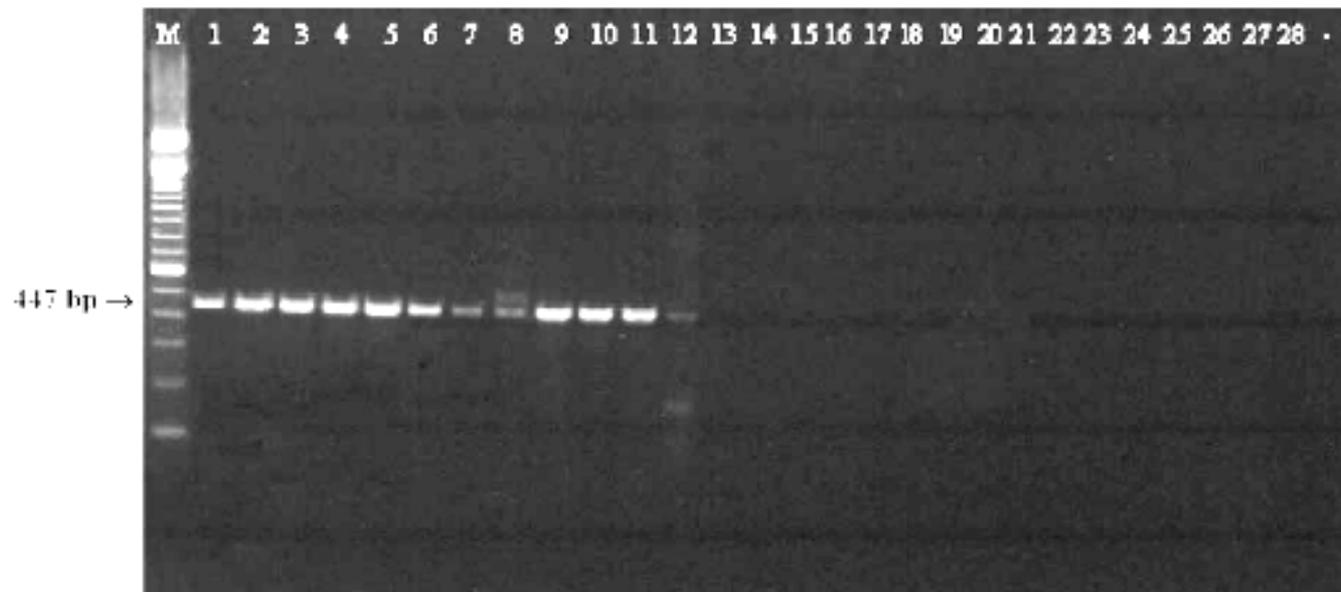


Fig. 1 PCR amplification of a kinetoplastid minicircle sequence of different *Leishmania* species, other protozoa and micro-organisms and several clinical samples, using MC primers. M, 100-bp DNA molecular marker; Lanes 1–5, *L. infantum* MON-1; Lane 6, *L. infantum* MON-24; Lane 7, *L. infantum* MON-29; Lane 8, *L. donovani* MON-18; Lane 9, *L. donovani*; Lanes 10–12, *L. infantum* (from Brazil); Lanes 13–14, *L. major*; Lane 15, *L. tropica*; Lane 16, *L. braziliensis*; Lane 17, *L. guyanensis*; Lane 18, *T. cruzi*; Lane 19, *T. b. brucei*; Lane 20, *P. falciparum*; Lane 21, *P. carinii*; Lane 22, *Mycobacterium tuberculosis*; Lane 23, *M. avium*; Lane 24, blood from healthy human volunteer; Lane 25, blood from HIV-infected patient; Lane 26, bone marrow from healthy dog; Lane 27, spleen from healthy fox; Lane 28, spleen from healthy mouse; (–), no DNA.

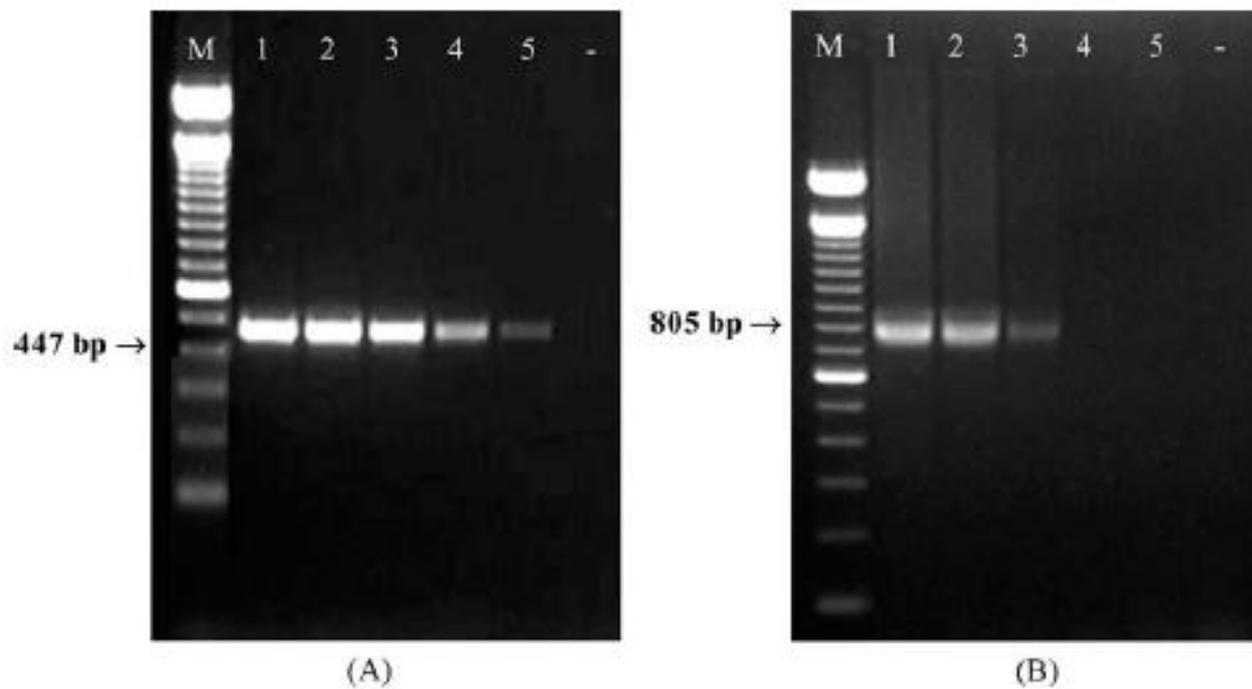


Fig. 2 Sensitivity of the kinetoplastid DNA PCR assay using MC1/MC2 primers (A) and AJS1/DB8 primers (B). Genomic DNA of *L. infantum* MON-1 strain (IMT 205) was serially 10-fold diluted and the indicated amounts subjected to PCR: M, 100-bp DNA molecular marker; Lane 1, 10^4 parasites; Lane 2, 10^3 parasites; Lane 3, 10^2 parasites; Lane 4, 10 parasites; Lane 5, 1 parasite; (-), negative control (no DNA).

PROFILAXIS Y CONTROL DE LA LTA



Diagnósticos Diferenciales

- Leishmaniasis visceral:
 - malaria, sífilis, tuberculosis, lupus eritematoso sistémico, fiebre tifoidea, brucelosis, histoplasmosis, síndrome de esplenomegalia tropical, esquistosomiasis, leucemia, linfoma, leptospirosis, rickettsiosis, parvovirus

Opciones terapéuticas

- Estibogluconato de sodio (Pentosam)
- Antimoniato de meglumina (Glucantime)
- Anfotericina B y Anfotericina B liposomal
- Miltefosina
- Paromomicina

Investigación

Recent Pat Antiinfect Drug Discov. 2015 Apr 10. [Epub ahead of print]

Study of the Scientific Production on Leishmaniasis in Latin America.

Perilla-González Y, Gómez-Suta D, Delgado-Osorio N, Hurtado-Hurtado N, Baquero-Rodriguez JD, López-Isaza AF, Lagos-Grisales GJ, Villegas S, Rodríguez-Morales AJ.

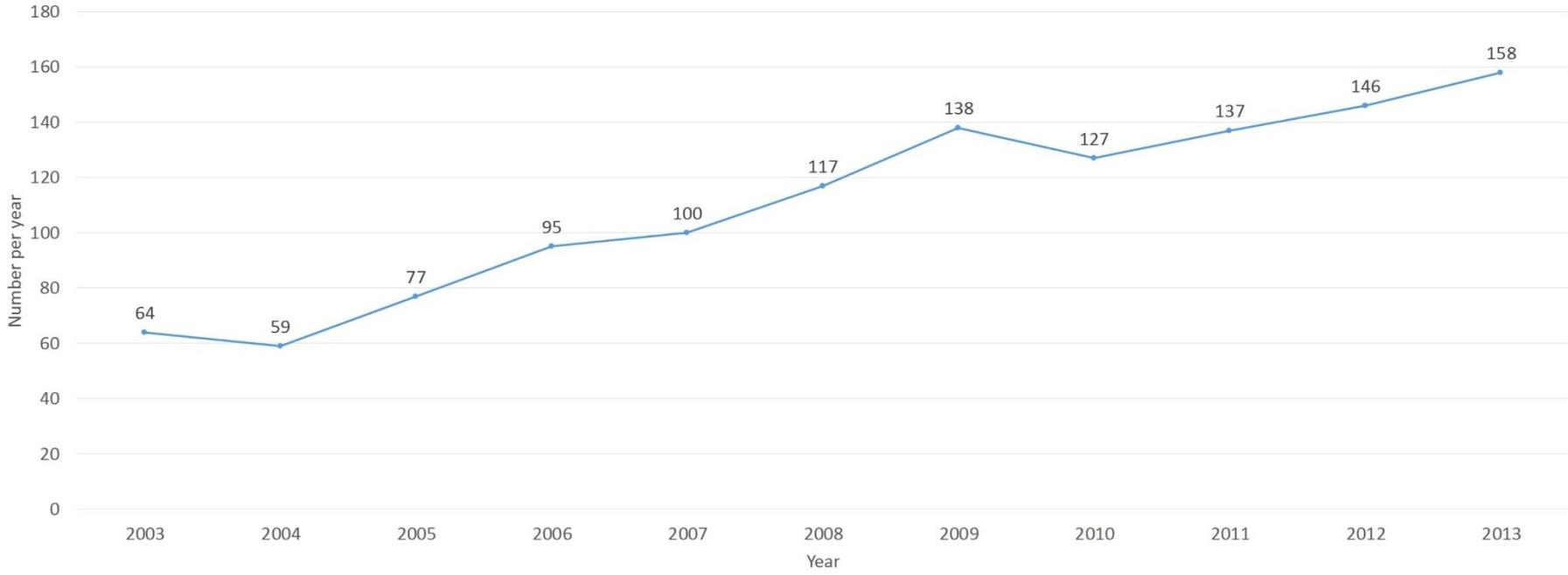
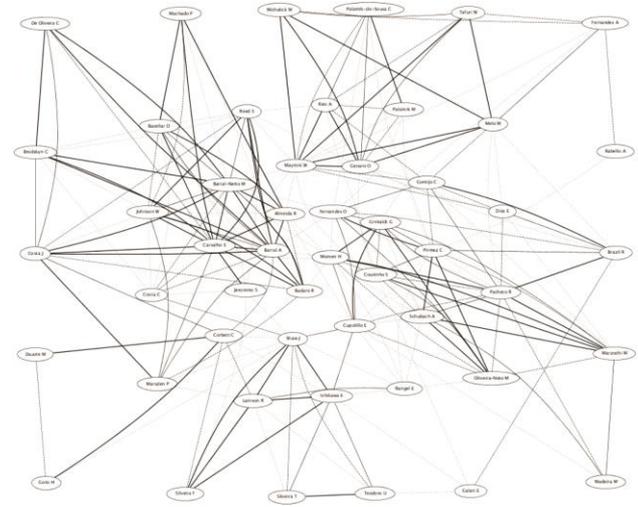
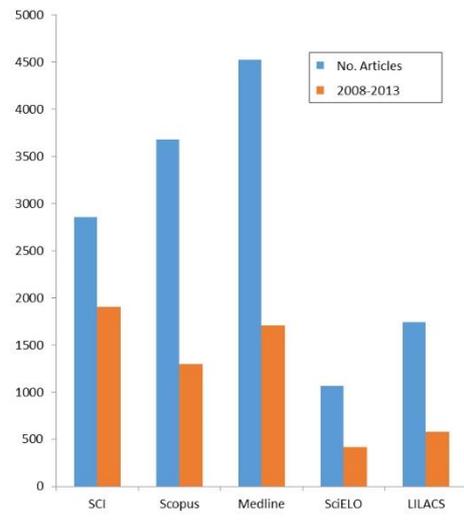
Abstract

Leishmaniasis is a highly relevant neglected tropical disease. It has important consequences in affected populations, including a high fatality rate in its visceral form. It is present in Latin America, then it is necessary to promote more research on it. A bibliometric assessment of the Latin American scientific production in leishmaniasis was done.

METHODS: Bibliometric study at SCI (1980-2013), MEDLINE/GOPUBMED (1802-2013), Scopus (1959-2013), SCIELO (2004-2013), LILACS (1980-2013). Different study types, characterized by years, city/country of origin, journals and more productive authors, by country, cites and H index.

RESULTS: At SCI, 2857 articles were found (17.7% of the total). Brazil was the highest producer (58.1%), followed by Colombia (9.9%) and Venezuela (5.6%); the region received 41186 citations, 54.2% of Brazil (H index=62), 12.1% Colombia (H index=30) and 4.5% of Venezuela (H index=25). At Scopus, there are 3681 (14.7% of the total), 53.2% Brazil, 6.8% Colombia and 6.0% Venezuela; 38.46% at Brazil were from Fundação Oswaldo Cruz; 30.6% of Colombia corresponded to Universidad de Antioquia; 31.34% at Venezuela were from Universidad Central de Venezuela. At Medline there are 4525 records (60.6% of Brazil). At SciELO there are 1068 records (67.5% Brazil). At LILACS, there are 1740 records (56.0% Brazil).

CONCLUSIONS: Scientific production of Brazil predominates in the region, with one single institution generating more articles than Colombia and Venezuela together. Scientific production in bibliographical data bases, particularly regional, is still relatively low, and the disease neglected when compared to other tropical conditions such as dengue and malaria.



**Recent Pat Antiinfect Drug Discov. 2015 Apr 10. [Epub ahead of print]
 Study of the Scientific Production on Leishmaniasis in Latin America.
 Perilla-González Y, Gómez-Suta D, Delgado-Osorio N, Hurtado-Hurtado N, Baquero-Rodriguez JD, López-Isaza AF, Lagos-Grisales GJ, Villegas S, Rodríguez-Morales AJ.**

Leishmaniasis Visceral

Conclusiones

- Patología sistémica de gran importancia
- Focos conocidos
- Transmisión vectorial (metaxénica)
- Inmunopatología de gran importancia
- Puede cursar de forma más severa en pacientes con estados de inmunosupresión

Leishmaniasis Visceral

Conclusiones

- Necesidad de mayor estudio e investigación, control y vigilancia, en ciertas zonas del país
- Tratamiento con antimoniales
- Epidemiología desconocida en Risaralda.