

Wild mammals and *Leptospira* transmission risk in the French West Indies

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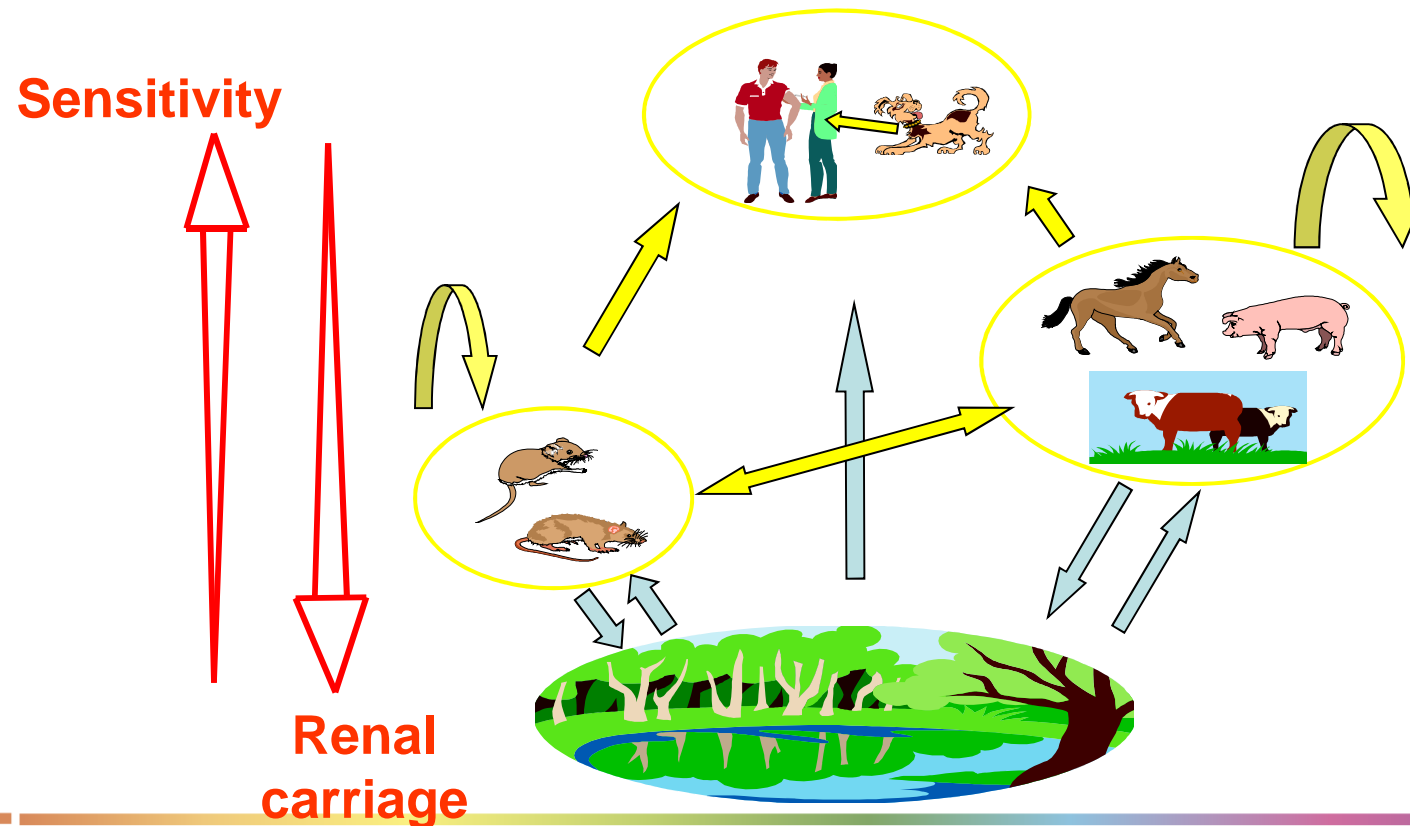
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Background

- *Leptospira interrogans*: pathogenic bacteria responsible of zoonosis
- 25 serogroups, 220 serovars, 6 genomospecies



Aims of the study

- To assess *Leptospira* prevalence in the French West Indies:
 - For 4 wild mammals species
 - In different biotopes (with/ without freshwater)
- To consider the risk of contamination for humans and domestic animals

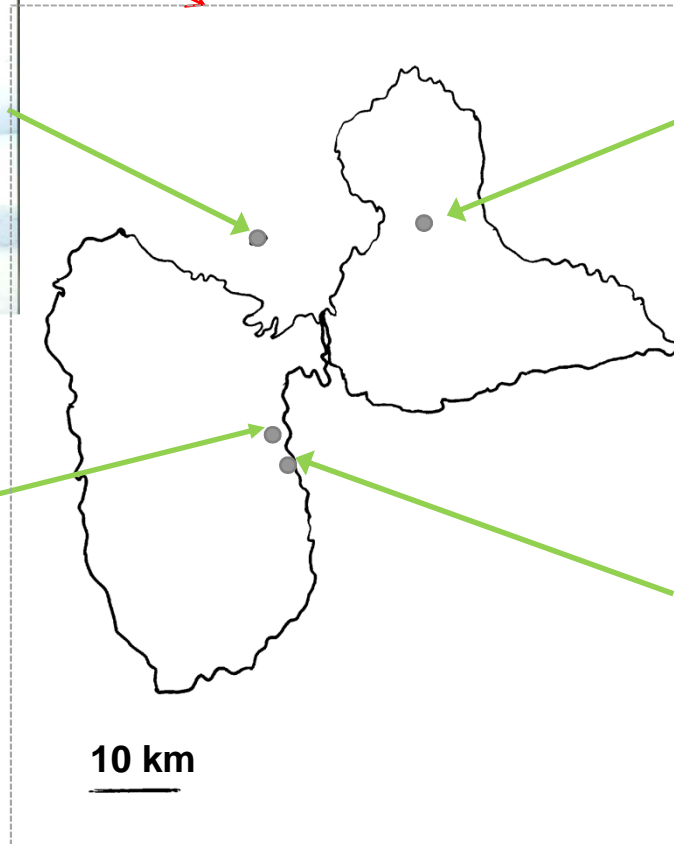
Material and methods

- Trapping of: rats (*R.rattus* & *R.norvegicus*), mice (*M.domesticus*) and mongooses (*H.auroponstatus*)



Material and methods: trapping

In 4 locations in Guadeloupe and one in Martinique

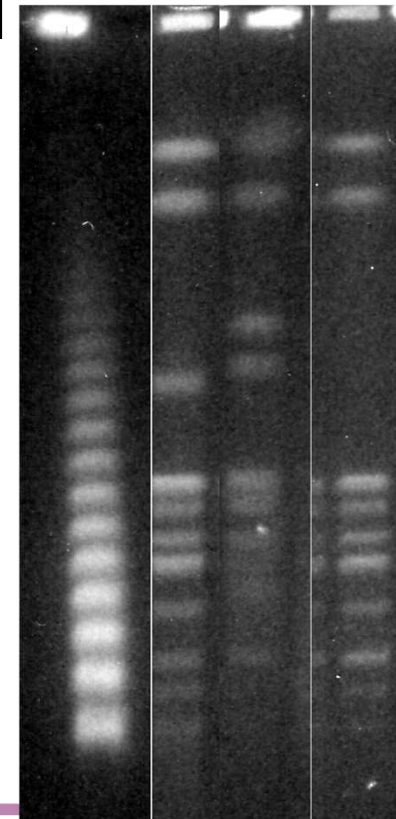


Sugar cane crops



Material and methods: analysis

- Sérology: MAT
- Bacteriology: isolation
- Strain identification (PFGE) and characterization (in vivo)



Results: animals submitted to diagnosis

	Martinique/ Fajou islet	Guadeloupe	Guadeloupe exclued Fajou	Remarks
Serology	0/139; 0/45	48/144, 33%	48/100, 48%	IH, SEJ
Bacteriology	0/10	28/71, 39%	28/61, 46%	IH, BAL, SEJ, AUS
Sero and/or bacterio	-	65/160, 40%	65/150, 43%	
Remarks	No freshwater		Presence of freshwater	

Results

- No difference could be shown between:
 - sex and age of animal
 - Locations where *Leptospira* is present
 - Species, except for the bacteriological results with more isolation in mice (9/10, due to one location)

- But
 - A minimum of freshwater seems necessary for the maintenance of leptospires in an habitat and within a population
 - Some divergence between serological response of the host and genotypical identification of the strain

Discussion: relation strain/host/biotope

- All animals are seropositive vs Icterohaemorrhagiae (IH) serogroup except 5 mongooses (Sejroe (SEJ))
- Specificity Serogroup/host exist: e.g. Ballum (BAL) and mice. If we take R.rattus widely renal carrier (37%):
 - i) carrier of IH strains/banana plantation/ 19/24 R.norvegicus sero+ vs IH
 - li) carrier of Ballum arborea strain/ sugar can plot/ mice infected by BAL
 - lii) carrier of Australis (AUS) strain/tropical rain forest/mongooses infected by AUS/IH/SEJ

Discussion: impact on animal and public health

- High level of leptospiral shedding in the 61 animals considered (71 not contaminated- 10 from Fajou): 46% (95% CI: 33.5-58.5)
- Most (18/24) of the strains isolated are highly pathogenic for gerbils and represent an infectious risk when spread in environment
- Wild animals exert a considerable infectious pressure in an optimal habitat for bacterial maintenance and transmission

Discussion: impact on animal and public health

	Results	Références
Wild fauna, 2000	Isolation of IH, SEJ, AUS, BAL	Présent study
Dogs, 2008*	79/104 (76%) sero+ vs: IH, PYR, SEJ , AUS, BAL	G.André-Fontaine, com pers, 2009
Cattle, 2002*	139/199 (70%) horses & 26/200 (13%) cows sero+ vs: IH, PYR, AUS, BAL, SEJ for horses and SEJ , IH for cows	G.André-Fontaine, com pers, 2009
Men 2001-2004	11.2 to 41.2/100 000 from 2001 to 2004 2003-2004: BAL (32%) reached the second position after IH (56%)	Hermann-Storck et al, 2005&2007

*: perform with a SEJ and BAL strain from our study

Discussion: public health

- Herrmann-Sorck et al, 2007
 - contact with rodent, pigs and cattle: BAL more than IH
 - Freshwater: IH more than BAL
- Our results showed that:
 - wild animals exert a high infectious pressure
 - They are spreading leptospire directly in contact with human or indirectly in the biotope of occupational and living areas: high zoonotic risk

Conclusion/recommendations

- First time that several species of wild fauna are investigated in the same locations in French West Indies
- Evidence of strain community with domestic animals
- Evidence of serogroup community with men
- Prophylactic measures are need (gloves, wash hands)
- Contrôle of rodents
- Early detection of the disease

Thank you for your attention



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Results

	Total Guadeloupe			<i>Tropical rain forest</i>				<i>Fajou Islet</i>			
	Nb	Sero	Bact	Nb	A.I.	Sero	Bact	Nb	A.I.	Sero	Bact
<i>R. rattus</i>	118	33/101	14/46 ^a	25	0.09	11/18	7/13	37	0.19	0/36	0/8
<i>R. norvegicus</i>	24	7/22	2/8 ^a	0	-	-	-	0	-	-	-
<i>M. musculus</i>	51	1/4	9/10 ^b	0	-	-	-	0	-	-	-
<i>H. javanicus</i>	17	7/17	3/7 ^a	5	0.02	4/5	3/4	8	0.05	0/8	0/2
Total animals	210	48/144	28/71	30	-	15/23	10/17	45	-	0/44	0/10

	<i>Sugar cane plot</i>				<i>Banana plot</i>			
	Nb	AI	Sero	Bact	Nb	AI	Sero	Bac
<i>R. rattus</i>	1	0.003	1/1	1/1	55	0.1	21/46	6/24
<i>R. norvegicus</i>	5	0.016	3/3	0/1	19	0.04	4/19	2/7
<i>M. musculus</i>	37	0.1	0/1	9/9	14	0.03	1/3	0/1
<i>H. javanicus</i>	3	0.01	2/3	-	1	0.002	1/1	0/1
Total animals	46	-	6/8	10/11	89	-	27/ 69	8/33