

# “Effectiveness of fipronil as a systemic control agent against *Xenopsylla cheopis* (Siphonaptera: Pulicidae) in Madagascar”

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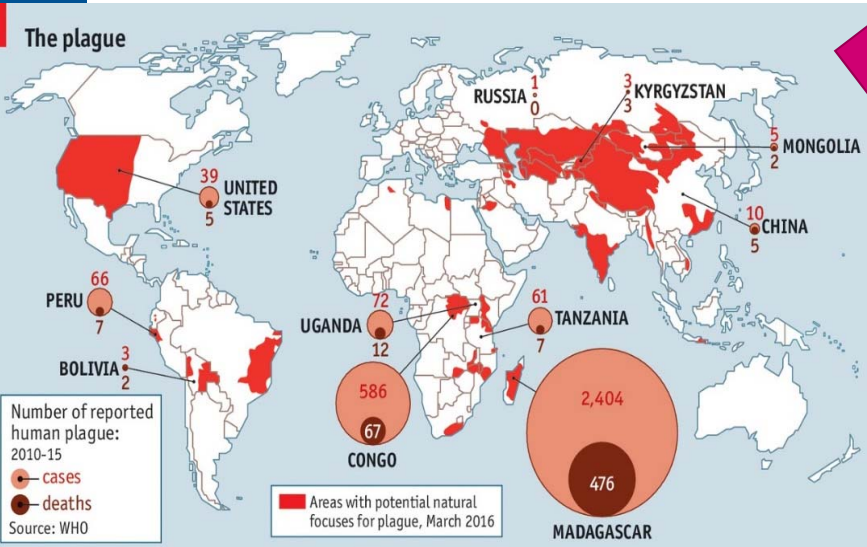
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## Plague in Madagascar

- ~ 74% of worldwide cases in 2014

### Worldwide Reported Cases of Plague 2010-2015



- Mandatory reportable disease
- Bubonic form is most common

## Plague transmission cycle

**Pathogenic bacteria:** *Yersinia pestis*

**Vector:** *Xenopsylla cheopis*

**Reservoir hosts:** *Rattus norvegicus*, *R. rattus*

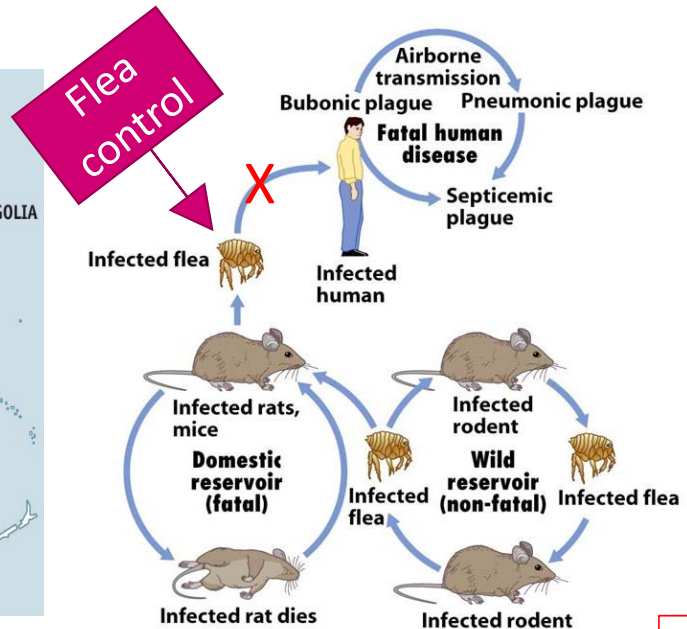
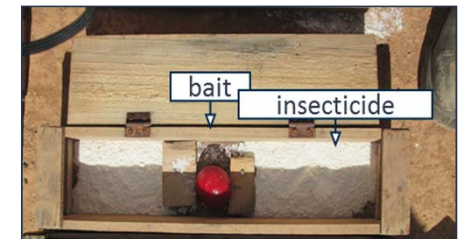


Figure 27-15 Brock Biology of Microorganisms 11/e © 2006 Pearson Prentice Hall, Inc.

## Existing vector controls in Madagascar



### Insecticidal dusting



### Kartman-box



- Fleas resistance to insecticides
- One insecticide used during decades (deltamethrin)



# Assessing Fipronil systemic activity against *X. cheopis*

## Methodology

## Results

Fleas Susceptibility by systemic application

vs

Fleas susceptibility by contact



Fipronil + rodent baits



Ingested by rodent



Toxic for fleas by blood ingestion



Collection on field



Rearing in Insectarium



Insecticide test (WHO, 1975)  
Fipronil-impregnated paper

- No resistance to fipronil found
- Fipronil was more toxic by the systemic way:  
LD50= 1.8ppm vs LD50= 16.4ppm
- Low dose was efficient
- No palatability problem



Fipronil in systemic way is suitable for controlling on-host *X. cheopis*

# ขอขอบคุณ, Thank you, Misaotra tompoko, Merci

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