Rickettsia infections

Urban H. Oct -12

Gr neg bacteria, small coccoid

Difficult to cultivate, obligately intracellular

Spread by insects (vectors)

Animal → humans

Infect endothelial cells

Clinical similar first 3-5 days, fever headache, myalgia, vomiting, cough

Rash <50 – 90%, Eschar 0 – 90%

Rickettsia subgroups

	Species	**vectors**
Typhus group	R. prowazeki	Body louse
	R. typhi	Rat flea
Spotted fevers	R. rickettsia	Ticks
	R. africae	Ticks
	R. conori	Ticks
	+ many other	Ticks (mites, fleas)
Scrub typhus	Orientia tsutsugamushi	Mites

Rickettsia Prowaceki
Epidemic louse borne typhus

Human to human

Body louse (in the stool)

Also inhalation aerosol (lab infection)

No animal reservoir (except flying squirell. US)

Chronic human carriers (later relaps)

Disease of human disasters, war, famine,

extreme powerty, prisons, concentration camps

Small endemic foci (Peru, Ethiopia, Burundi)

The body louse

Rash in a man from Burundi

Epidemic louse-borne cont

Transmisson

Louse bites – bacteria multiply in the gut,

new bite - defecates bacteria on skin –

autoinocculation by scrathing

+ possible inhale bacteria – lab risk

Incub period 10-18 days mean 12 days

Epidemic louse-borne cont

Symptoms

Abrupt onset of fever, headache, myalgia, cough

Rash 4-5th day. Small red macules, darken

(≥ 50%) bot ususally not petechial

(No eschar) Trunk, proximal parts of limbs

Meningoencephalitis (≤ 50%) monocytes, severe

Myocarditis

Pneumonitis + Secondary infection

Mortality (≤ 20%) modern data?

Epidemic louse-borne cont

Pathogenesis

Spread lymphohematogenously

Infect endothelial cells (vasculitis)

Incresed vascular permability

- edema, hypovolemia and local ischemia

Large numbers of bacteria in endothelial cells

Few bacteria in the circulation

Epidemic louse-borne cont

Diagnosis

Acute stage	PCR on skin biopsy, blood
Serology.	Paired sera, ELISA or IFL

Single titer cross reactive assays – false pos

Weil Felix test	Old unspecific, false pos

Culture	Not routine

Epidemic louse-borne cont

Differential diagnosis

Relapsing fever, tyfoid, meningococc septicemia

leptospirosis, measels, other virus with rash etc

Treat. Doxycycline 200mg x 1 x I-III (-XIV)

add prednisolon in severe cases

Epidemic louse-borne cont

Prevention

* Delousing
* Doxycycline mass treatment 200mg x 1
  (alt chloramphenicol)

Vaccination

Old vaccine

Not much used

Endemic murine typhus

R. Typhi

Vector: Xenopsylla Cheopsis (rat flea + other)

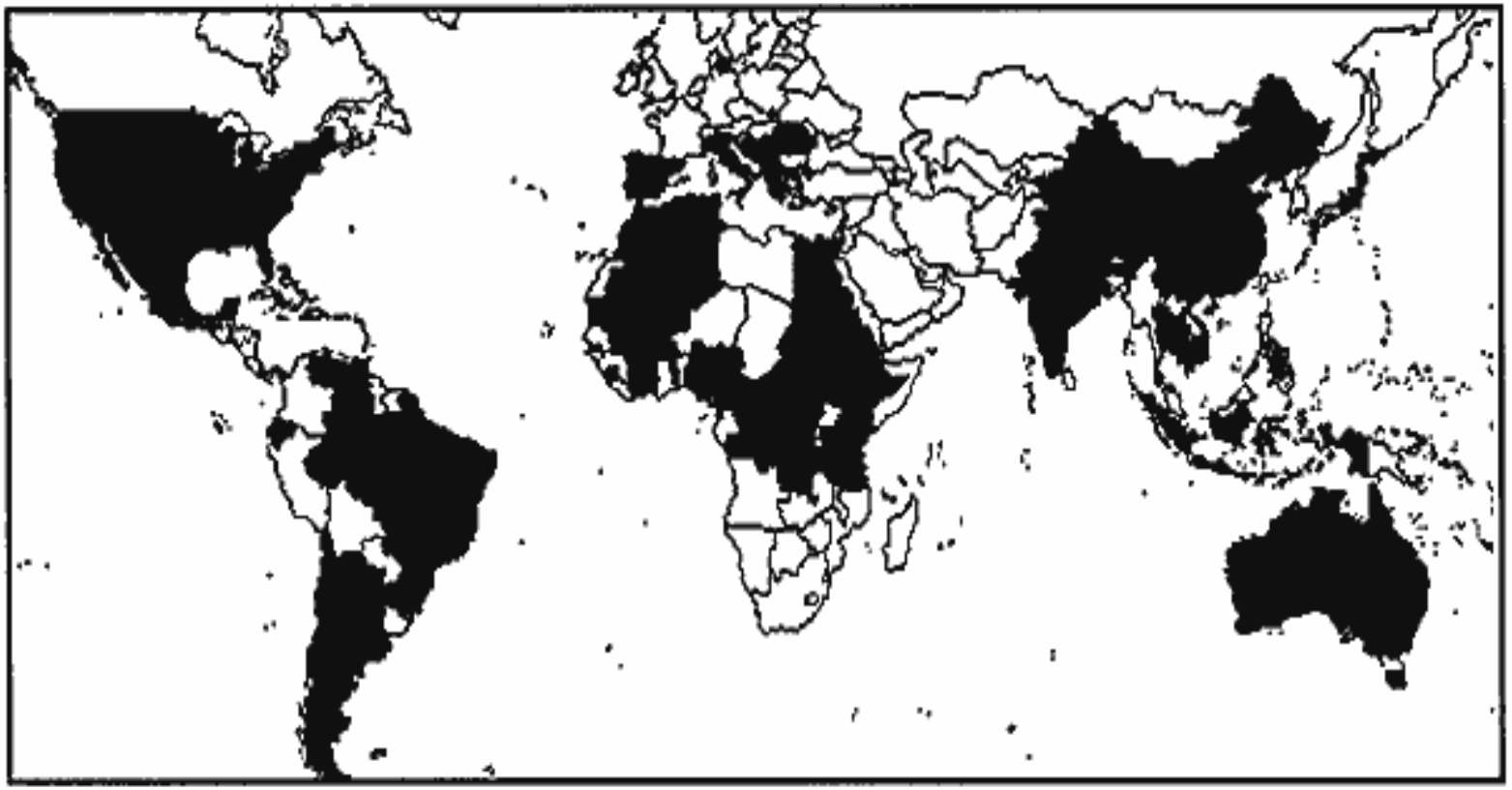
Animal reservoirs: rats, (opossum)

Wide geographical distribution

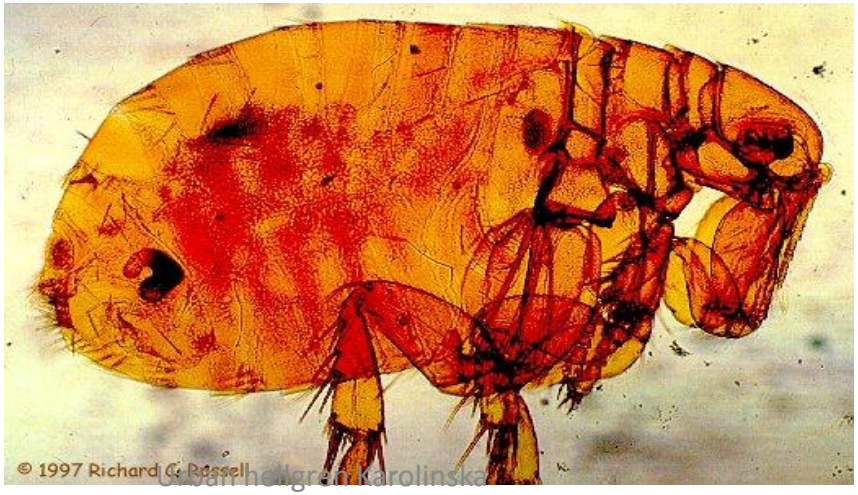
Less severe symptoms, rash (50%), mort 1%

Paired serum for diagnosis

Treatment doxycycline 100mg bid x VII - XV



Geographical distribution of murine typhus



The vector

Spotted fevers

R. Rickettsia

Rocky mountain spotted fever

Vector: ixoid ticks

Different animal reservoirs

US and Canada, Mexico (Central + South Amer.)

Fever, headache, muscular pain, cough,

rash (≤ 90%). Meningoencephalitis. Mort 3-5%

50 year old male

Safari in The Kreuger Park May 9 – 12th 2002

May 21st to OPD

2 d fever, muscular pain, tender right groin

Good general condition, no rash

2mm crusted (black) wound right leg (+lymphadenitis)

Crp 46 mg/l, platelets, liver enz. normal, malaria neg

Suspected diagnosis?

50 year old male cont

Epidemiology: Tick bites, walking safari

African tick bite fever??

Doxycycline 200mg x 1 x V, afebrile after 2 days

		May 21st	June 10th
Rickettisa	IgM	<20	80
Conorii / Africae	IgG	<20	80

Three other colleagues had similar fever

At leat one had a black crust……..

41 y female with fever
walking safari S. Africa
low platlets (88) and WBC (2.5)

Spotted fevers cont

R. Africae – African tick - bite fever

-92 separate species

South Africa, (Sub-Saharan Africa, savanna)

Ticks. A. hebreaum, A. variegatum

Animal reservoirs: cattle (hippo, rhino)

Seroprevalens indigenous population $\leq$ 50%

Outbrakes in travellers, game parks, adventures

R. Africae cont

Incubation 4-10 days

Eschar (90%) , often no rash (< 50%)

mild self limiting disease, 3-7 days

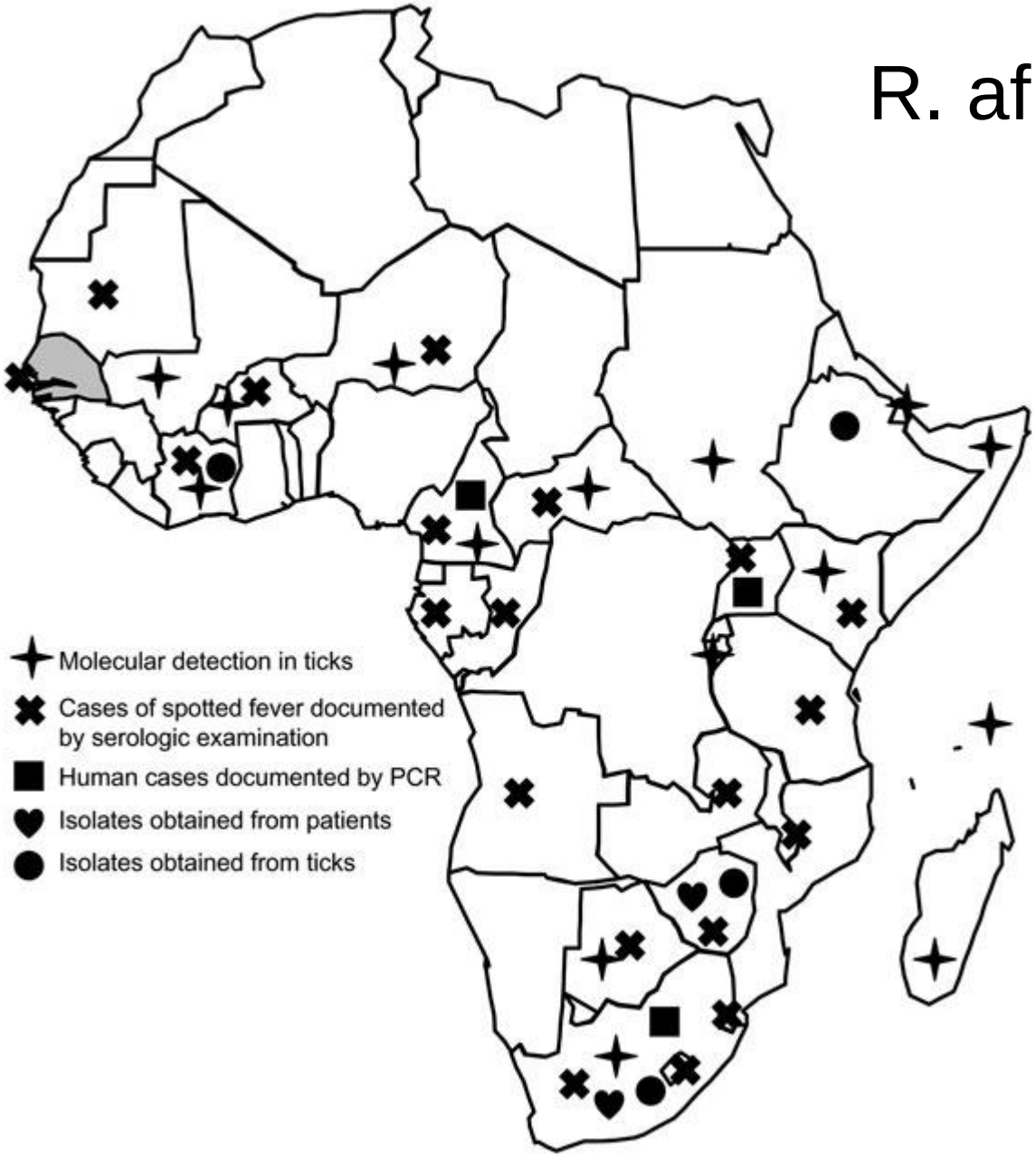
Often thrombocytopenia, elevated liver enz

Treat with Doxycycline 200mg x V-VII

Takes >3w before pos serology

IgM and IgG simultaneosly, IgM more unspecific

R. africae in Africa



Amblyomma Hebeaum

Spotted fevers cont

R. Conorii

Animal reservoirs (dog + other)

Transmitted by ticks

High fever and rash (97%, eschar (50%)

Usually mild disease, fever < 1w

Wide geographical distribution (many strains)

Southern Europe, Africa, Middle East,

Central Asia

R. Conorii cont

<u>Mediterranean spotted fever (MSF)</u>

(Fièvre Boutonneuse)

R. Conorii, Malish strain

Dog tick from dogs, rabbits, rodents

Southern France, Spain, Italy (Sicilly)

Treat: Doxycycline 200mg x 1 x I - V

Scrub typhus

Orientia tsutsugamushi

Vector: Trombiculid mites

Transovarian transmission in mites

Rodents reservoir

Fokal distribution particulary in S-E Asia

> 1million cases / year

Soldiers, farmers, hikers etc

Orientia tsutsugamushi, cont

Incubation 5-10 days

Fever, headache, rash (50%), eschar (35%),

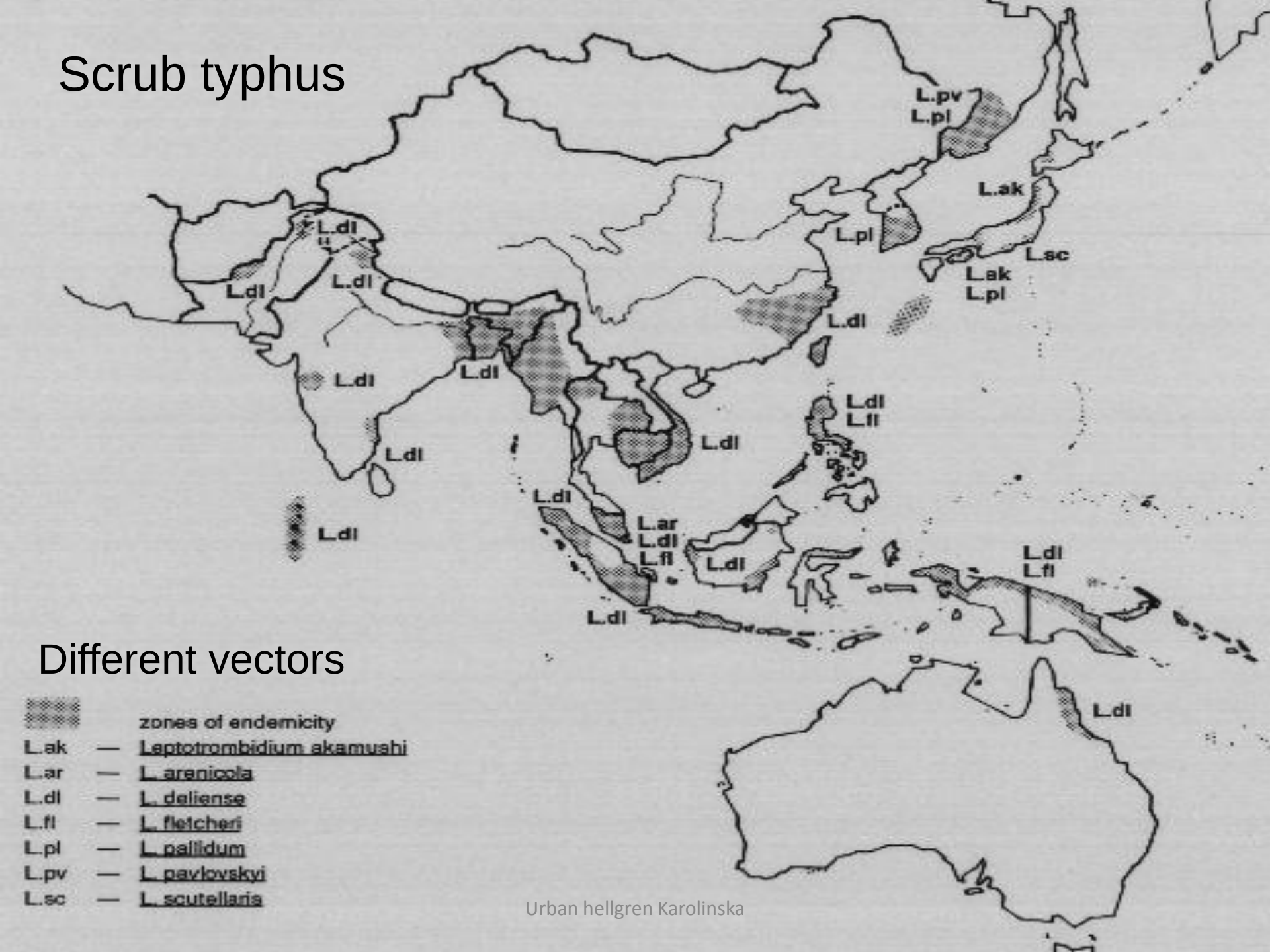
(meningoencephalitis, myocarditis)

Diagnosis: Serology (PCR)

Treatment: Doxycyline 200mg/d x III – XIV)

Mortality < 2%

Scrub typhus



Different vectors

zones of endemicity

L.ak — Leptotrombidium akamushi
L.ar — L. arenicola
L.dl — L. deliense
L.fl — L. fletcheri
L.pl — L. pallidum
L.pv — L. pavlovskyi
L.sc — L. scutellaris