

THE ROLE OF RODENTS IN THE
MAINTENANCE OF THE EAST AFRICAN
TICK-BORNE RELAPSING FEVER
AETIOLOGICAL AGENT,
BORRELIA DUTTONII

BY

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Introduction: Tick-borne
Relapsing Fever in Tanzania

- Aetiology: *Borrelia duttonii*
- Vector: soft ticks, *Ornithodoros spp*
- Mode of transmission: saliva or coxal fluid of the infected soft tick vector
- Incidence: up to 5% in Dodoma
- Risk groups: under fives (3%), pregnant women (7.5%) in Mvumi
- 6th commonest cause of admission

Intro. Cont....

- 7th commonest cause of mortality among children in Mvumi
- Clinical signs: fever with 2 or more relapses, headache, general body weakness
- Complications: neurological signs e.g. deafness, ophthalmoplegia, hemiplegia
- Other complications: abortion in pregnant women

Study Justification

- Only humans currently are known to be hosts for TBRF in East Africa
- A clue on Presence of *Borrelia* in Blood smear of insectivore, *Crocidura spp*, from Morogoro
- A need to have comprehensive data on the epidemiology (Reservoir?) of TBRF to enhance its control

Study Objectives

- To find out whether commensal rodents could be potential reservoirs (hosts) for *Borrelia spp* in Tanzania
- To determine the presence of TBRF agents in ticks and rodents

Methodology

- Study Area: Mvumi area, Dodoma, Tanzania
- Samples taken from: Rodents, humans and ticks
- Sample size: Rodent (n= 250), tick (n=250), humans (n=7).

Detection of Borrelia

- Borrelia cultures attempted from human blood, rodent blood and tick haemolymph
- Rodent blood smears stained by Giemsa and examined in Ordinary microscope for Borrelia detection
- Haemolymph examined under OM
- PCR done using human, rodent and tick samples

RESULTS

- 2 out of 7 blood samples from TBRF patients positive for Borrelia in culture
- No growth of Borrelia from 50 rodent blood samples and 50 tick samples
- No Spirochetes observed from 250 rodent blood smears
- No Spirochete observed in 250 haemolymphs examined under DFM

PCR Outcome

- 2 out of 7 human DNA samples gave the expected DNA band of approx. 668bp for Relapsing Fever Borrelia
- 1 *Rattus spp* from Mvumi mission produced the expected band
- 1 tick DNA sample also positive for Borrelia

AGE for PCR products

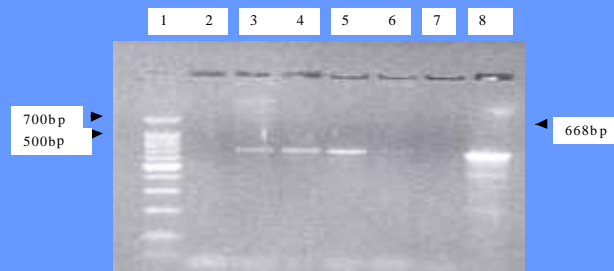


Figure 1: Agarose gel electrophoresis showing the PCR products using the 16S rRNA gene-based primers, BBRNA8 and BBRNA14. DNA molecular weight markers (lane 1); human negative samples (lane 2 and 6); human positive sample (lane 3); rodent blood sample (lane 4); tick sample (lane 5); negative control sample (lane 6); negative control sample (lane 7); and positive *Borrelia duttonii* sample (lane 8)

DISCUSSION

- Borrelia isolation was only positive with the human cultures
- Borrelia detected in 2 human samples, 1 rodent and 1 tick by PCR with 668bp frag.
- PCR more sensitive than culture
- Borrelia detected in a commensal rodent, *Rattus rattus*

DISC. Continue...

- Detection of Borrelia in TBRF endemic area suggest that it might be *B. duttonii*
- Alternatively, the detected Borrelia might be a closely related strain?
- Likely that rodents are hosts for Borrelia in Tanzania

Conclusion

- Rodents in Tanzania naturally infected with *Borrelia*
- Detected *Borrelia* either *B. duttonii* or closely related strain
- A need to continue focusing on ticks to combat TBRF (+ rodents?)
- More study: isolation and characterization, Rodent and other mammal surveillance extended to other areas of TZ

.....t..h..a..n..k..s.....

.....the end.....