An estimated 73,000 small mammals from 140 species have been trapped for research purposes in West African nations since 1974.

32,000 individual rodents have been tested for 32 microorganisms, many of which are potential zoonotic pathogens.

Rodent trapping to explore rodent ecology and zoonotic disease risk: A scoping review

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INTRODUCTION

- Rodents represent 40% of all mammalian species and are important components of small mammal assemblages globally.[1]
- In sub-Saharan Africa they contribute to agricultural crop loss in addition to being hosts for zoonotic pathogens of importance to local human populations.[2]
- Trapping of individual rodents, identification to species and assays for the presence of potential zoonotic pathogens provides a source of data for understanding the potential ecological and human health impact of changing small mammal populations.
- This scoping review synthesises research conducted in West Africa specifically to;
  a) identify the aims of rodent research and summarise methodological approaches
  b) identify the locations, habitats and rodent species that have been studied
  c) identify potential zoonoses tested for and which host species they are found in.

METHODS

1. Systematic search of online databases for studies conducted within the United Nations West Africa subregion
2. Data were extracted using a standardized tool.
3. Locations of trapping activity was imputed from study details if required

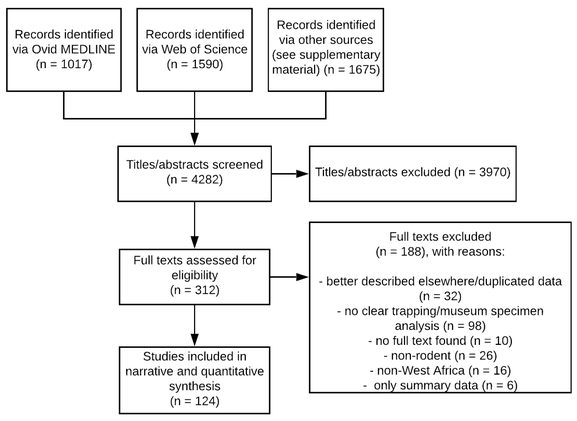

Fig. 1: PRISMA flow diagram for literature search, inclusion and exclusion and included studies.

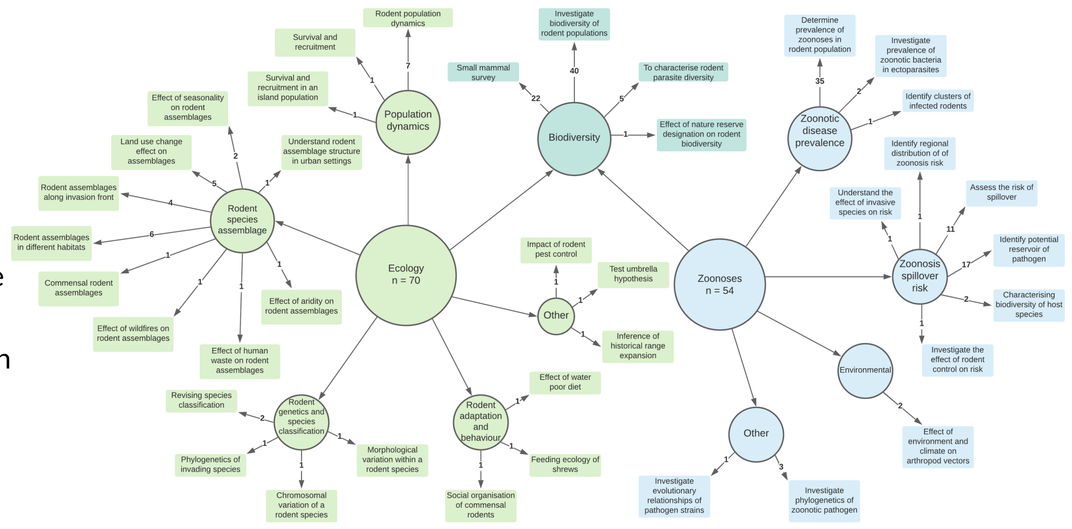

Fig 2: The aims of studies included in the review separated by whether they were conducted to explore Ecological aims or Zooonotic disease aims

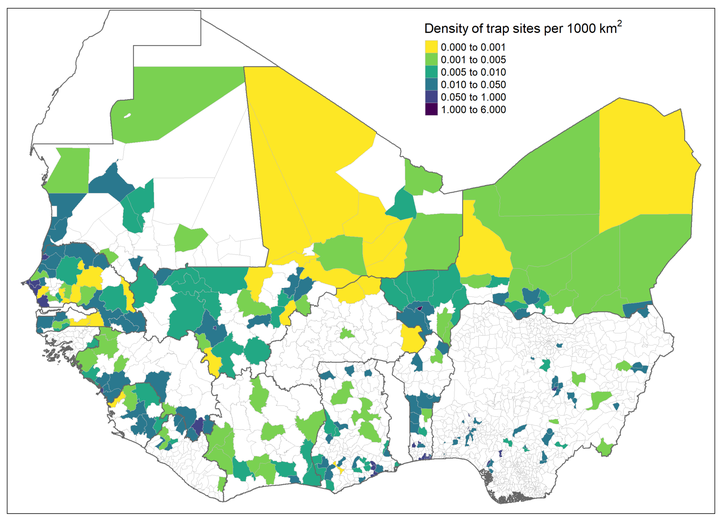

Fig 3: The density of rodent trapping sites across West Africa at second administrative level. Measured as number of trap sites per 1000 km^2

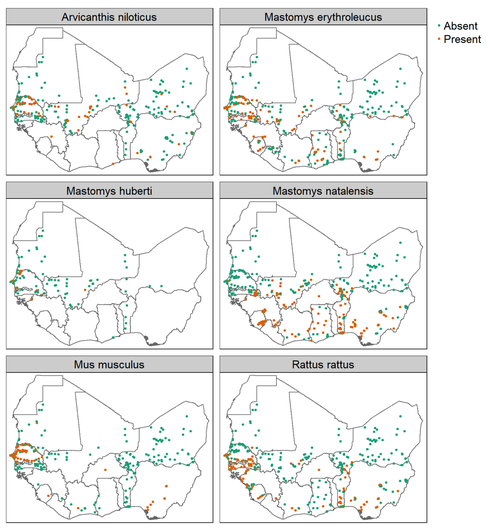

Fig 4: The presence and absence of the 6 most commonly trapped rodent species

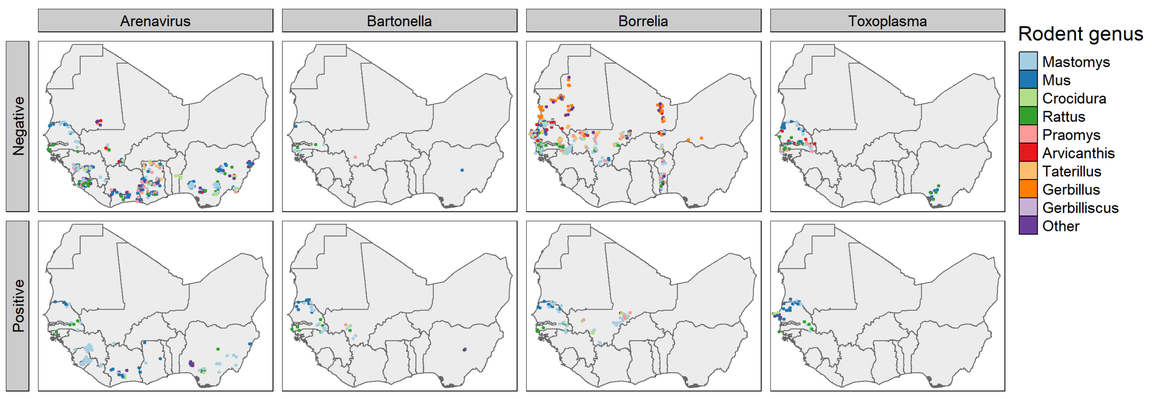

Fig 5: The locations of positive and negative results for the four most commonly tested microorganisms. The colour of the points relates to the genus of the rodent assayed.

RESULTS

- 124 studies were identified, 69 ecology and 55 zoonotic disease studies.
- Rodent trapping studies have occurred in 17 countries across West Africa (all except Gambia and Togo). No standardised approach was adopted for habitat classification.
- 69% of included studies reported some measure of trapping effort.
- 73,164 individuals were trapped from 147 species or genera of small mammals.
- *Mastomys*, *Rattus*, *Mus*, *Arvicanthis* and *Praomys* were the most identified genera of rodents.
- 32,014 individuals from 97 species were investigated for infection with 32 microorganisms.
- *Lassa mammarenavirus* was most detected, followed by *Bartonella sp.*, *Borrelia sp.*, and *Toxoplasma sp.*.
- Further results can be explored using the RShiny app https://diddrog11.shinyapps.io/scoping_review_app/

DISCUSSION

- Senegal, Nigeria, Ghana and Guinea were the most investigated countries. Large cities and their surroundings were more often studied than less densely populated areas.
- Commensal rodents were more commonly trapped and were more often found to harbor microorganisms with zoonotic potential.

References:

1. American Society of Mammologists. 2021. “ASM Mammal Diversity Database.” https://www.mammaldiversity.org/.

2. Fiedler, LA. 1988. “Rodent Pest Problems and Management in Eastern Africa.” *Bulletin Phytosanitaire de La FAO (FAO)*; *Boletin Fitosanitario de La FAO (FAO)*.

The link to my website with a more detailed report: https://www.dsimons.org/posts/scoping-review/index.html
Or scan the below QR code

The link to the associated app is: https://diddrog11.shinyapps.io/scoping_review_app/
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