

Unravelling the epidemiology of ticks and tick-borne infections in Benue state, Nigeria.

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Introduction

- North Central Nigeria, with its diverse ecosystems and substantial livestock population, is a breeding ground for ticks and the diseases they carry (tick-borne pathogens).
- This region faces unique challenges due to climate change, land-use alterations, and the movement of livestock (transhumance) from the north. These factors contribute to the spread and emergence of tick-borne diseases like *Anaplasma*, *Babesia*, *Theileria*, and *Rickettsia*.
- These diseases not only harm livestock health and reduce productivity but also pose a risk of zoonotic transmission to humans, causing significant economic and health burdens

Aim

This study seeks to update and compile data on the diversity of ticks affecting cattle in Benue State, Nigeria, encompassing information on their genus and morphology. Furthermore, it aims to explore the origins of cattle and the diversity of tick species in Benue State, aiming to clarify the pathways of pathogen transmission.

Study design

Two surveys across cattle markets in Benue state localities including Katsina-ala, Otukpo and Makurdi were conducted, 1st batch was from January – February 2022 where tick diversity was explored, and 2nd batch was from August - September 2023 where the provenance of the cattle sampled was determined.

Result

- 658 ticks were identified from 218 cattle sampled. The number of ticks per animal ranged between 1 to 15. for every cattle sampled, there was a mean infestation of 3 adult ticks per cattle.



Fig. Tick removal from cattle

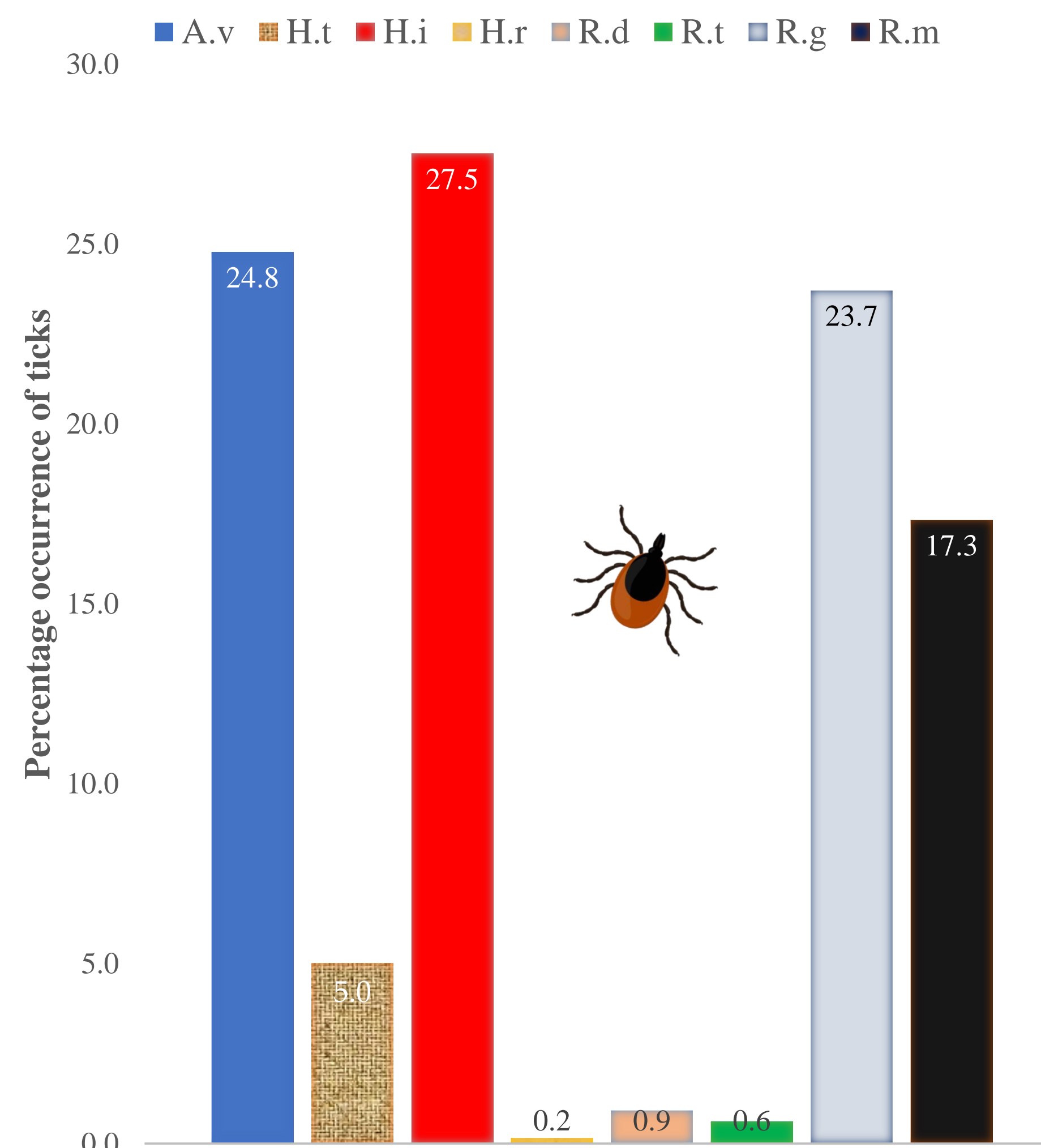


Fig. Percentage occurrence of tick species identified.

A.V= *Amblyomma variegatum*; H.T= *Hyalomma truncatum*; H.I= *Hyalomma impeltatum*; H.R= *Hyalomma rufipes*; R.D = *Rhipicephalus decoloratus*; R.T= *Rhipicephalus turanicus*; R.G= *Rhipicephalus geigy*; R.M= *Rhipicephalus microplus*

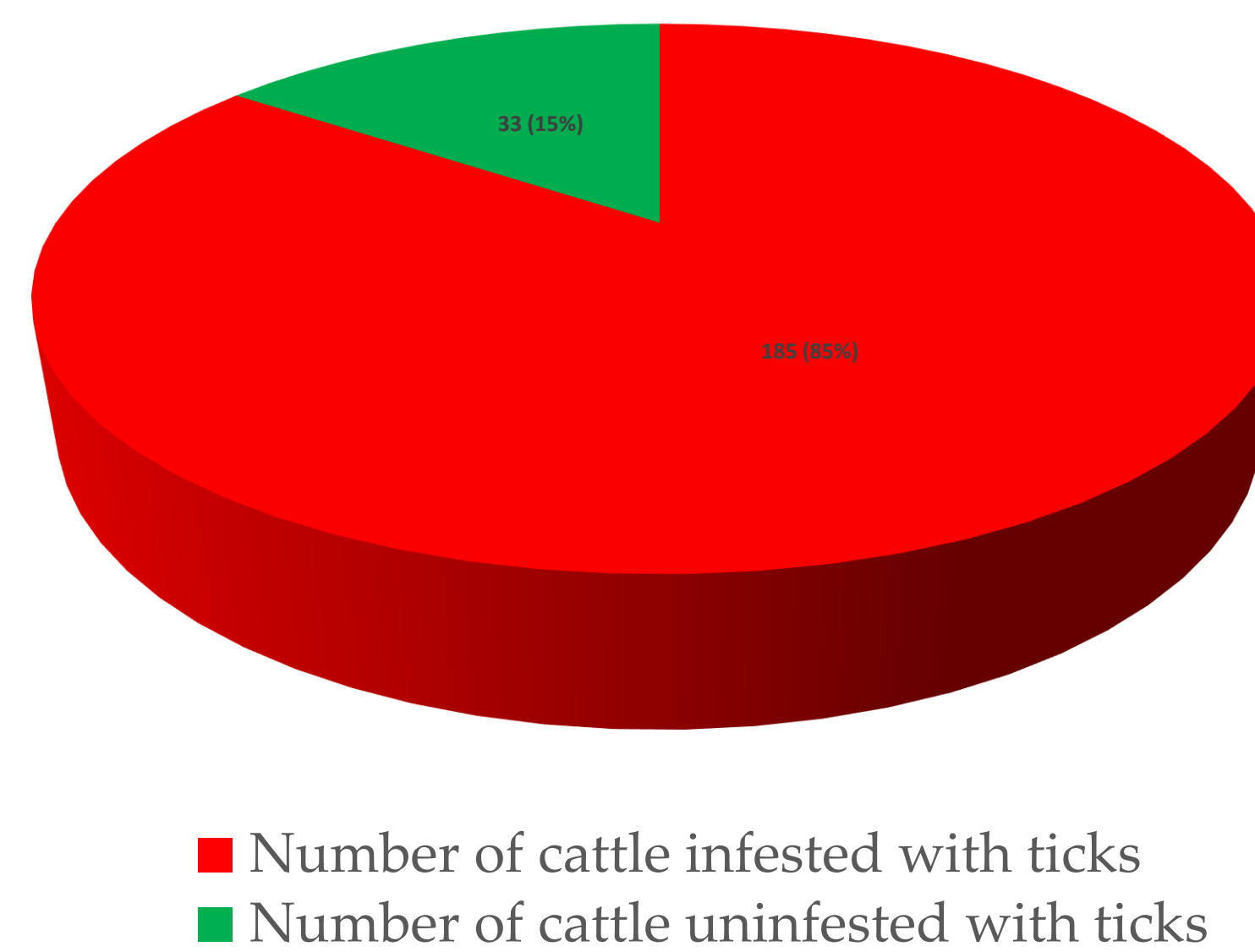


Fig. Percentage infestation of cattle by ticks



Fig. *Rhipicephalus turanicus*



Fig. *Hyalomma truncatum*

Tick Diversity

- Eight tick species belonging to four genera (*Amblyomma*, *Hyalomma*, *Rhipicephalus*, and *Rhipicephalus (Boophilus)*) were found.
- Four species dominated: *Hyalomma impeltatum* (27.5%), *Amblyomma variegatum* (24.8%), *Rhipicephalus geigy* (23.7%) and *Rhipicephalus microplus* (17.3%).
- Hyalomma truncatum* (5.0%), *Rhipicephalus turanicus* (0.6%), *Rhipicephalus decoloratus*, (0.9%) and *Hyalomma rufipes* (0.2%) were also present

Cattle Provenance

- The cattle market in Benue State is dynamic, drawing livestock from nearby regions (Lafia, Jos, Taraba and Yola) and farther north, as well as from neighbouring African countries (Cameroon, Chad). These cattle usually stay for three weeks before they are sold, processed for meat, or shipped to the southern parts of Nigeria.



Fig. *Hyalomma impeltatum*



Fig. : *Amblyomma.variegatum*

Conclusion

The high number of *Hyalomma* ticks found in Benue was surprising compared to past studies. This, especially the prevalence of *H. impeltatum* (a Sahel tick), suggests climate change and cross-border movement may have introduced these ticks.

Next Steps

Screen for pathogens in the ticks collected and move everything to a qPCR because this gives higher throughput.



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