

TITLE

STUDIES OF BIOLOGICAL DIVERSITY OF THE TICK RHIPICEPHALUS
APPENDICULATUS (ACARINA: IXODIDAE) IN RELATIONSHIP
TO TRANSMISSION OF THELLERIA PARVA (APICOMPLEXA:
THELLERIDAE) IN KENYA

BY

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ABSTRACT

This study was undertaken to examine whether different populations of Rhipicephalus appendiculatus, the African brown ear tick, found inhabiting different geographically isolated zones in Kenya are biologically different to such an extent that they may be assigned subspecies status.

The biological characteristics investigated included size of unfed females, engorgement weights of larvae, nymphs and females, egg production, duration of moulting of larvae and nymphs, isoenzyme studies and comparative transmission of Theileria parva stocks by R. appendiculatus. Ticks were collected from five geographically isolated zones in Kenya for investigation. The work was carried out to provide epidemiological information for East Coast fever (ECF) control.

In this three-host tick species, some significant differences in weights of engorged nymphs and females, size of unfed females, weights of eggs per tick and moulting duration were noted between the different tick stocks. In the case of engorged females, statistical differences were noted between Kilifi (FS1) and Kiambu (FS2); Kilifi and South Nyanza (FS4); and, Uasin Gishu (FS3) and Muguga laboratory (MLS) tick populations.

Significant differences in size of unfed females were noted between FS2 and FS3; and, FS2 and MLS. In the case of the mean weight of eggs, significant differences were shown between FS1 and MLS only.

Significant differences in moulting duration was also noted in larvae but not in nymphs. In the former, statistical differences were recorded between FS2 and FS3; FS3 and FS4; FS1 and FS3; and , FS2 and MLS.

Out of the eleven enzymes examined, ten showed polymorphism in most of the five tick populations while only one, i.e. peptidase 7, was monomorphic. Four enzymes (peptidase 1, PEP 2, malate dehydrogenase and glucosephosphate isomerase) showed differences in the tick populations. This confirms further that the tick populations, under investigation do differ.

Differences were also noted in the five populations as regards to their efficiency to become infected with Theileria parva parasites. It was concluded that R. appendiculatus found in different geographical zones show differences in some important biological characteristics. These features that showed differences in the tick populations might be important in the control of the vector and also might have an influence on ECF transmission.