

Diversity and distribution of fleas on rodents in South Africa

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Within southern Africa, flea fauna is divided into 30 genera and approximately 106 described species. Host species lists for fleas, and distribution maps for flea species are out-dated (maps developed in 1961) and very little genetic data exist to support current taxonomic descriptions. Also, it is expected that phylogeographic investigations can result in the detection of cryptic divergence for many species since parasites usually have a close relationship with their host(s) and the host's environment. Fleas display variable levels of host specificity (from highly host specific (1-2 hosts) to hostopportunistic/ generalist) and these are related to ecological, behavioural, physiological and biochemical traits of a particular host or range of host species. In South Africa, several vicariant breaks have been identified for host species. From a genealogical perspective it is hypothesised that the geographic structure of highly host specific flea species will be determined mostly by host evolution (e.g. coevolution between parasite and host) whereas moderate and non-specific fleas are less influenced by the host and mostly by the physical environment (e.g. humidity and temperature). Without proper knowledge of the taxonomy and factors affecting the diversity and distribution of Siphonaptera in South Africa, it is very difficult to predict the potential future changes in flea distribution. The latter is critically important since fleas are known vectors for various pathogens which are reportedly re-emerging and on the increase worldwide due to changes in flea vector distribution. The current study aims to document the diversity and distribution of South African Siphonaptera associated with small mammals. Molecular data will be linked to each of the morphologically identified flea species. By using phylogeographic information, the data will be used to predict future patterns of distribution based on habitat suitability models.