

The curse of the prey: Sarcoptes mite molecular analysis reveals potential prey-to-predator parasitic infestation in wild animals from Maasai Mara, Kenya

Francis, Gakuya; Luca, Rossi; Jackson, Ombui; Ndichu, Maingi; Gerald, Muchemi; William, Ogara; Ramón C, Soriguer; Samer, Alasaad

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Abstract

Recently, there have been attempts to understand the molecular epidemiology of *Sarcoptes scabiei*, to evaluate the gene flow between isolates of *S. scabiei* from different hosts and geographic regions. However, to our knowledge, a molecular study has not been carried out to assess the molecular diversity and gene flow of *Sarcoptes* mite in a predator/prey ecosystem. Results: Our study revealed an absence of gene flow between the two herbivore (Thomson's gazelle and wildebeest)- and between the two carnivore (lion and cheetah)-derived *Sarcoptes* populations from Masai Mara (Kenya), which is in discrepancy with the host-taxon law described for wild animals in Europe. Lion- and wildebeest-derived *Sarcoptes* mite populations were similar yet different from the Thomson's gazelle-derived *Sarcoptes* population. This could be attributed to *Sarcoptes* cross-infestation from wildebeest ("favourite prey") of the lion, but not from Thomson's gazelle. The cheetah-derived *Sarcoptes* population had different subpopulations: one is cheetah-private, one similar to the wildebeest- and lion-derived *Sarcoptes* populations, and another similar to the Thomson's gazelle-derived *Sarcoptes* mite population, where both wildebeest and Thomson's gazelle are "favourite preys" for the cheetah. Conclusions: In a predator/prey ecosystem, like Masai Mara in Kenya, it seems that *Sarcoptes* infestation in wild animals is prey-to-predator-wise, depending on the predator's "favorite prey". More studies on the lion and cheetah diet and behavior could be of great help to clarify the addressed hypotheses. This study could have further ramification in the epidemiological studies and the monitoring protocols of the neglected *Sarcoptes* mite in predator/prey ecosystems. Keywords: *Sarcoptes scabiei*, microsatellites, genetic structure, gene flow, cheetah, lion, wildebeest, Thomson's gazelle, favorite prey.