Effects of toe clipping on a wild rodent

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Introduction

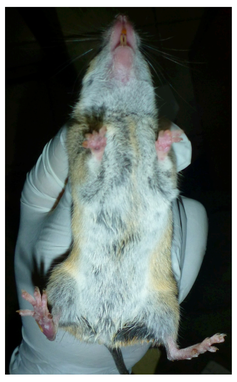
Toe clipping is a widely used method for permanent marking of small mammals, but its effects are not well known, despite the ethical and scientific implications. Most studies do not find any clear effects, but there is some indication that toe clipping can affect survival in specific cases. Although effects on survival are arguably the most important, more subtle effects are also plausible, yet very few studies have included body condition and none have investigated mobility. We analysed the effects of toe clipping in natural conditions on *Mastomys natalensis*, a common, morphologically and behaviourally intermediate small rodent.

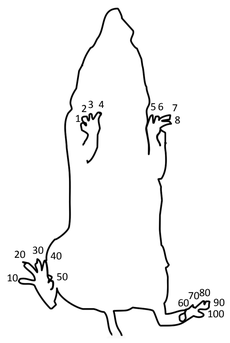
Methods

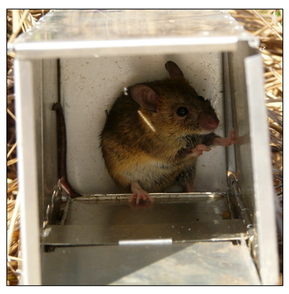
In Morogoro, Tanzania, a permanent capture-mark-recapture program has been maintained since 1994, with monthly 3-night trapping sessions using 300 traps spaced 10m apart in a rectangular grid of 300x100m. The dataset consists of 36425 separate captures of 15471 individuals in 212700 trap nights.

Up to 6 toes were clipped, with a maximum of 1 front paw clip and 2 hind paw clips, which allows around 2800 unique individuals simultaneously (Fig.1) .

Movement and body weight change were compared between newly clipped animals and those that were clipped at least one month earlier. We also tested whether survival, home range, weight change or travel distance correlated with the number of clipped toes.

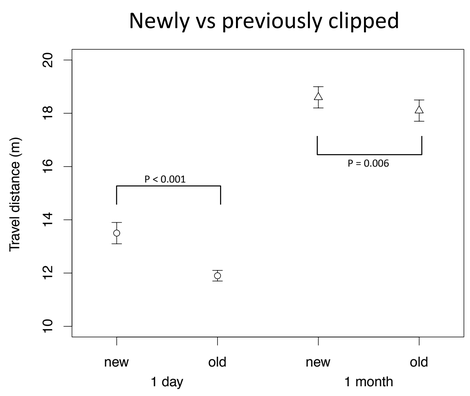




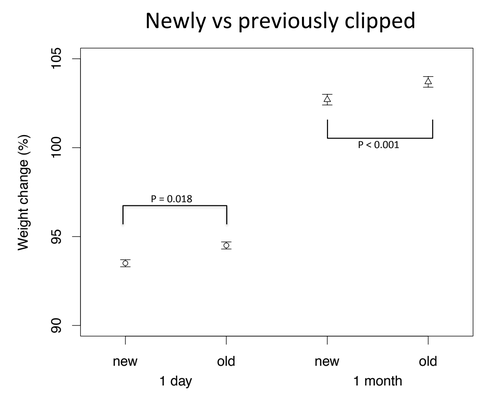


Results

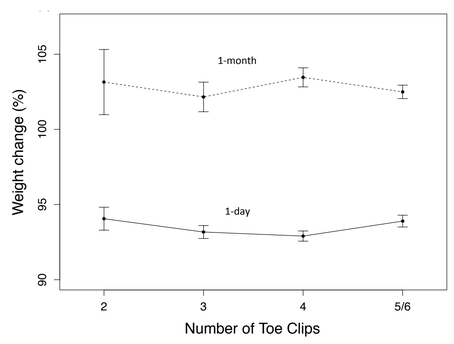
Travel distance (1-day and 1-month)



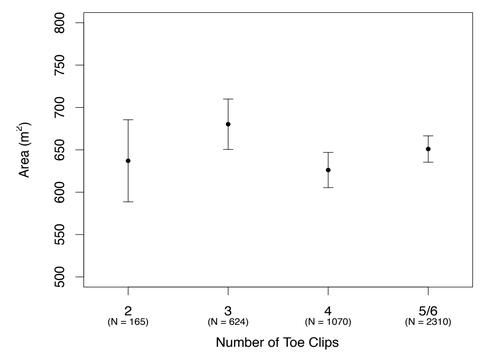
Weight change (1-day and 1-month)



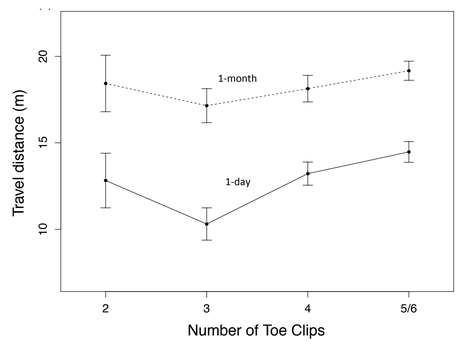
Weight change vs number of clipped toes



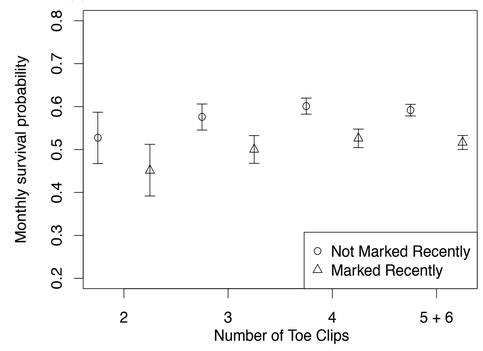
Home range area vs number of clipped toes



Travel distance vs number of clipped toes



Survival vs number of clipped toes



Conclusion

Newly clipped animals travelled slightly further than those that were clipped previously, and had a lower change in body weight. This effect on body weight was small, and for an animal of average weight would translate into about 0.6g. None of the variables were affected by the number of clipped toes. This suggests that newly clipped animals are not affected by clipping itself, but instead show some effects of being trapped for the first time. We can conclude that the combination of trapping, handling and marking has a detectable effect on multimammate mice, while there is no evidence for a clear effect of toe clipping. Although ethical guidelines often advise against the use of toe clipping, our results support a number of other studies that do not find clear adverse effects of toe clipping.

Our study suggests a re-evaluation of ethical guidelines on small mammal experiments in order to reach a rational, fact-based decision on which marking method to use.

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