



Testing the Effectiveness of Small Mammal Hair Dye Markers in the Field

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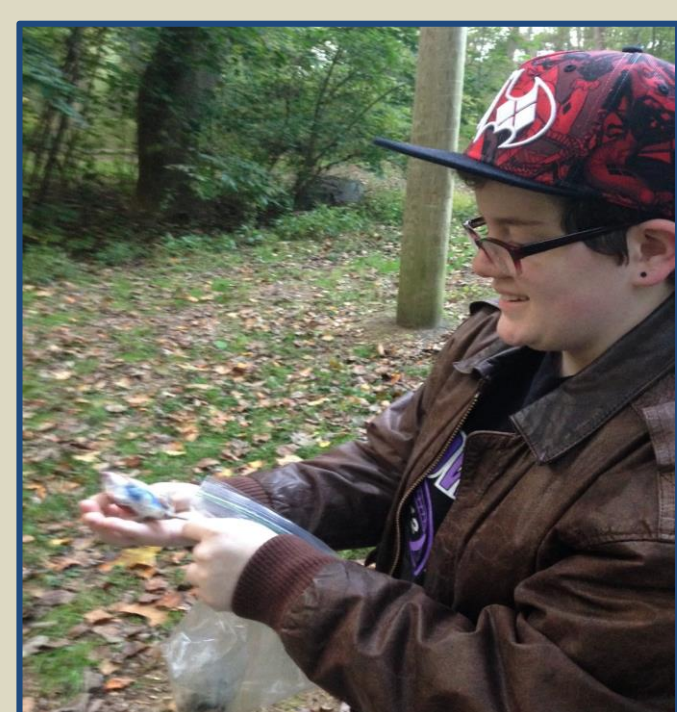
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Introduction

Small mammals heavily influence terrestrial ecosystems, with many considered keystone species (Dickman 1999, Delibes-Mateos 2011). Small mammal research is mainly conducted via live trapping with mark-recapture, which provides estimates of population density, growth rates and movement (Hayes et al. 1996, Goldberg et al. 2002). Marking techniques involve placing an identifiable marker on a captured individual including ear tags, PIT (Passive Integrated Transponder) tags and hair dye. Although ear tags are commonly used, they inhibit grooming and can promote infection (Sikes and Gannon, 2011). PIT tag marking requires a small transponder to be placed subdermally on an individual using a large-bore needle and can be costly for a short-term study (Gibbons and Andrews 2004).

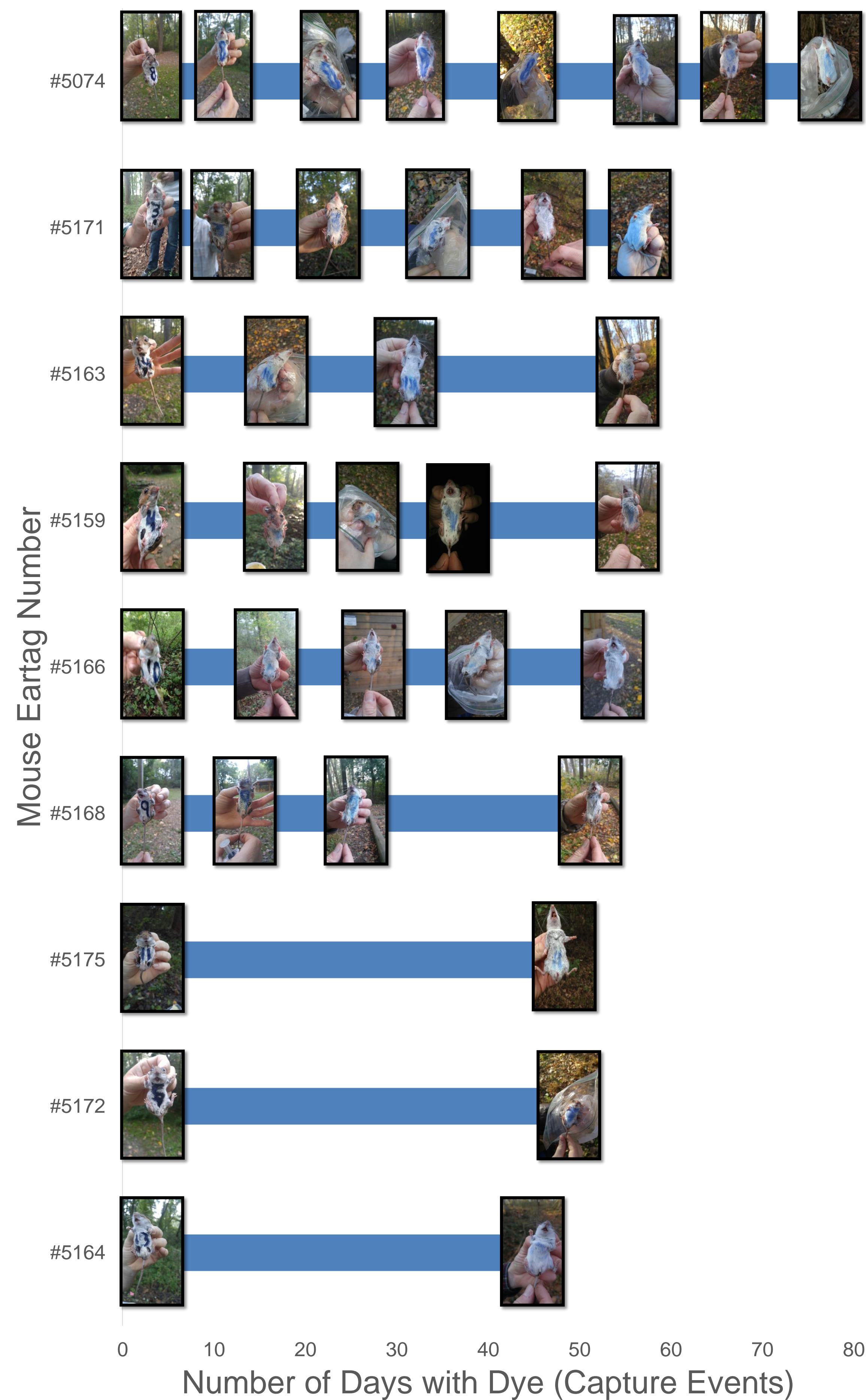
Hair dyes are used to mark small mammals and may be favored for shorter term studies because they are less invasive (Sikes and Gannon, 2011). The replacement of permanent marks (e.g., ear tags, toe-clipping) with temporary marks (ink and dye) can allow for reduced short-term suffering and avoid bodily damage or behavioral changes (Silvy et al. 2012). Our goal was to test non-toxic hair dye products on small mammals to determine their effectiveness in field studies.



Methods

- We set two trap lines each with 10 Sherman traps.
- Traps were baited with sunflower seeds and checked <14 hours after baiting. On evenings <8C^o, cotton balls were added to traps to aid in small mammal thermoregulation.
- Captured mammals were ear tagged (except shrews), uniquely marked with the Muromachi Kikai hair dye marker™ and a dot of Clairol™ black hair-dye.
- All captured individuals were weighed, photographed, and released at same site of capture.

Results



Peromyscus leucopus

Results

We captured 26 individual small mammals: 7 short-tailed shrews (*Blarina brevicauda*) and 19 white-footed mice (*Peromyscus leucopus*). The Clairol™ hair-dye did not last long in the field, however the Muromachi Kikai hair dye marker™ was able to be seen for >30 days, and allowed ID of individuals if certain unique marking patterns were used (Figure 1 & 2). This dye has been found to be more effective in comparison to other mammal dyes used in the field (Silvy et al. 2012).



Discussion/Future Plans

The Muromachi Kikai hair dye marker™ shows promise as an effective hair dye for small mammal research for short term studies (i.e., 40-50 days). In a couple of situations, we found that individual mice who lost an ear tag were still able to be identified using the hair dye markings. However, we recommend marking individuals with a distinct character that can still be recognized even with dye fading over time.

Literature Cited

Delibes-Mateos, M., Smith, A. T., Slobodkinoff, C. N., & Swenson, J. E. (2011). The paradox of keystone species persecuted as pests: a call for the conservation of abundant small mammals in their native range. *Biological Conservation*, 144(5), 1335-1346.

Dickman, C. R. (1999). Rodent-ecosystem relationships: a review. *Ecologically-based management of rodent pests. ACIAR Monograph*, (59), 113-133.

Gibbons, J. W., & Andrews, K. M. (2004). PIT Tagging: Simple Technology at Its Best. *BioScience*, 54(5), 447-454.

Goldberg, J. F., Tempa, T., Norbu, N., Hebblewhite, M., Mills, L. S., Wanchuk, T. R., & Luacas, P. (2015, March). Examining Temporal Sample Scale and Model Choice with Spatial Capture-Recapture Models in the Common Leopard *Panthera pardus*. *PLOS ONE PLoS ONE*, 10(11).

Hayes, J. P., Adam, M. D., Anthony, R. G., & Witt, J. W. (1996). Comparison of the Effectiveness of Sherman and Modified Fitch Live-Traps for Capture of Small Mammals. *Northwestern Naturalist*, 77(2), 40.

Sikes, R. S., & Gannon, W. L. (2011). Guidelines of the American Society of Mammalogists for the use of wild mammals in research. *Journal of Mammalogy*, 92(1), 235-253.

Silvy, N.J., R.R. Lopez and M.J. Peterson. 2012. Techniques for marking wildlife. Pages 230- 257 in N.J.Silvy, editor. *The Wildlife Techniques Manual*. The Johns Hopkins University Press, Baltimore, MD, USA.