Variation in reproductive traits among house mice from different regions of the Americas

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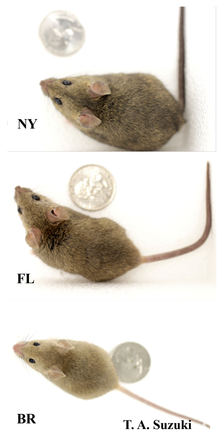
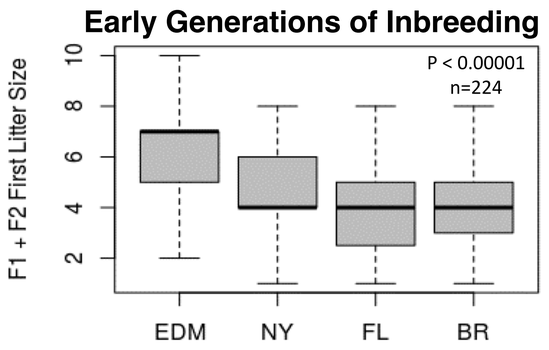
Environmental Adaptation in House mice

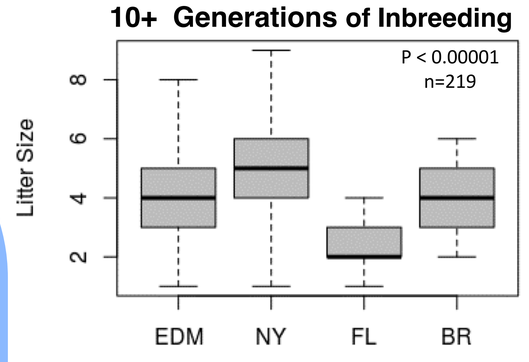
- There is strong evidence of adaptation to climatic gradients across populations in the Americas.[1,2,3]
- Variation in body size among these populations largely follows Bergmann's Rule, with larger mice at higher latitudes and as been shown to have a genetic basis.[1,2]
- Body size is expected to affect litter size in mammals, with litter size generally increasing with body mass.[4]
- Reproductive traits directly impact fitness. Life history theory predicts that body size and climatic/resource seasonality could affect reproductive investment strategy.



Litter Size Varies Among Populations



- Dams from Canada (EDM) have sig. larger litters than all others.
- Dams from New York (NY) tend to have larger litters than dams from Florida (FL) or Brazil (BR).

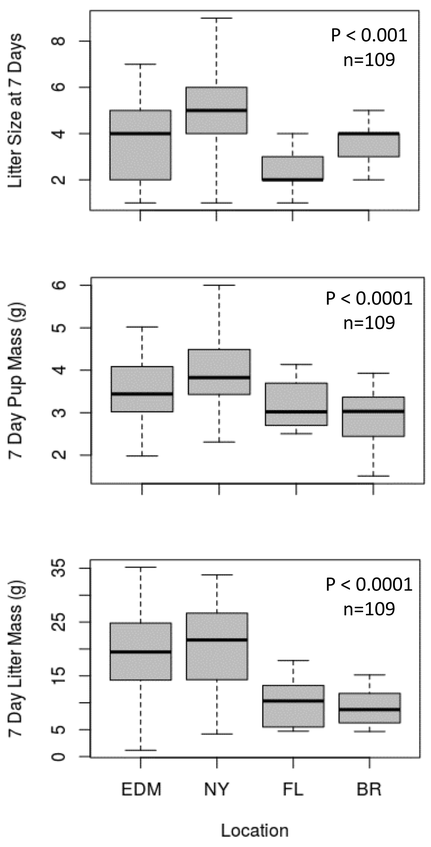


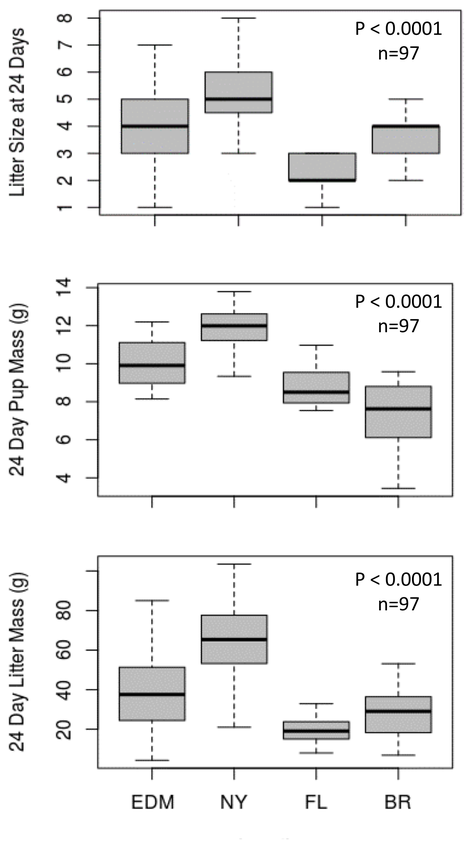
- Dams from NY have the largest litters.
- Dams from EDM and BR have more pups than FL

Mice from higher-latitude locations tend to have larger litters & **Mice from higher-latitudes tend to have larger pups** & **Mice from higher-latitudes have larger overall litter mass**

Reproductive investment strategy may be under direct or indirect selection as populations adapt to environmental variation.

- **Increased sampling is needed, particularly for BR and FL.**
- **Maternal care assays and crosses are underway to learn more about reproductive investment in these populations.**





@7 days, NY dams have more pups than dams from other strains	X	NY pups are larger than pups from BR	=	NY litter mass is higher than litter mass from other strains
@24 days, NY strains have more pups than all other strains & EDM strains have more than FL	X	NY pups are larger than all others. EDM pups are larger than BR	=	NY litter mass is greater than all other strains. EDM litter mass is greater than FL

Pup mass and litter mass vary among populations

References: [1] Lynch, CB. 1992. Clinal variation in cold adaptation in *Mus musculus*: verification of predictions from laboratory populations. *Am. Nat.* [2]Phifer-Rixey, *et al.* 2018. The genomic basis of environmental adaptation in house mice. *PLOS Genetics* [3]Ferris *et al.*, in prep. [4]Lord, R. 1960. Litter size and latitude in North America. *The American Midland Naturalist.*

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