

Reduced *Eimeria* and pinworm loads in hybrid mice of the European house mouse hybrid zone

Alice Balard^{1,2,*}, Victor Hugo Jarquín-Díaz^{1,2}, Jenny Jost¹, Iva Martincová³, Ludovít Ďureje³, Jaroslav Piàlek³, Miloš Macholán⁴, Joëlle Goüy de Bellocq³, Stuart J.E. Baird³, and Emanuel Heitlinger^{1,2}

¹Institute for Biology. Department of Molecular Parasitology. Humboldt University Berlin, Germany

²Leibniz Institute for Zoo and Wildlife Research, Berlin, Germany

³Research Facility Studenec, Institute of Vertebrate Biology, Czech Academy of Sciences, Czech Republic

⁴Laboratory of Mammalian Evolutionary Genetics, Institute of Animal Physiology and Genetics, Czech Academy of Sciences, Czech Republic

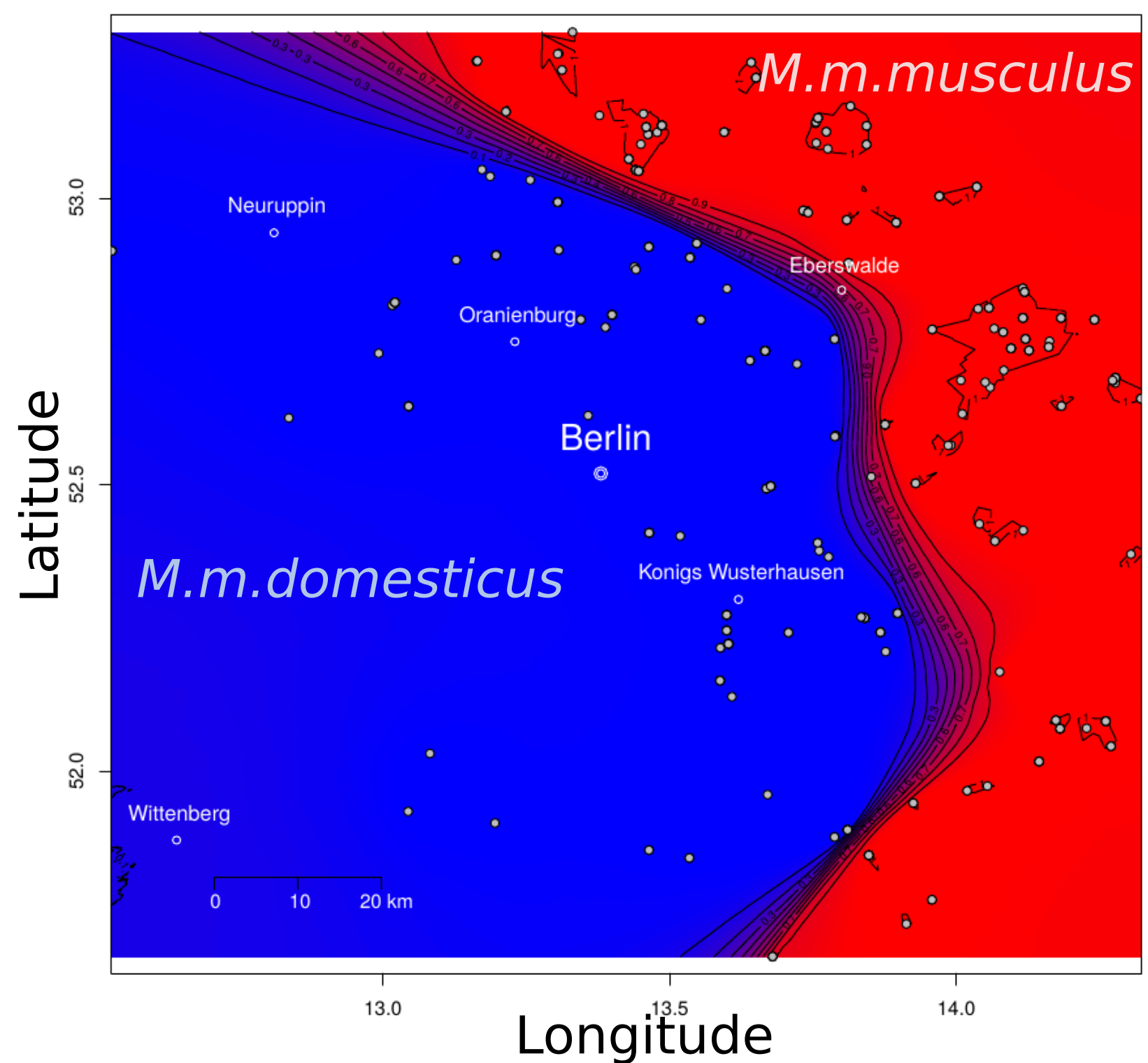
*contact: alice.cam.balard@gmail.com

Are hybrid mice more or less susceptible to parasite infection?

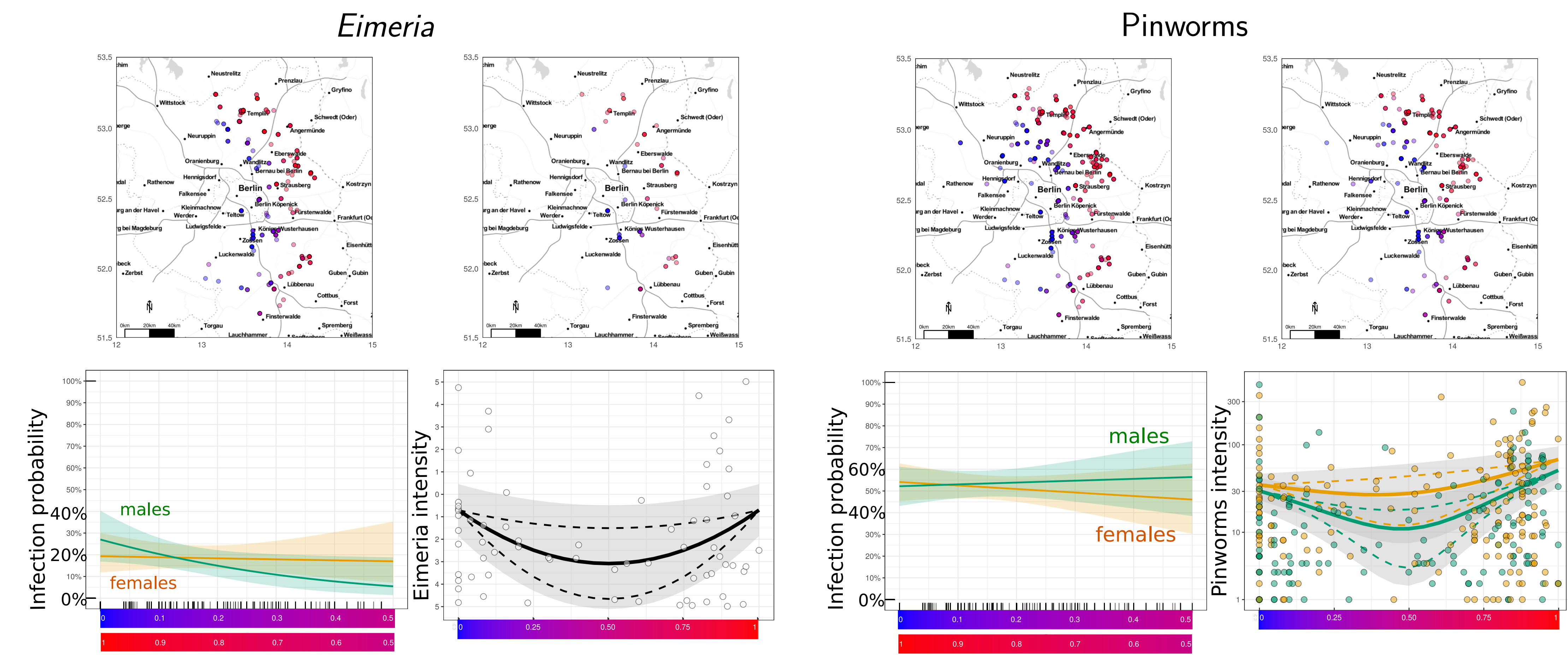
- Parasite models:
 - *Eimeria* spp., obligate intracellular parasite (Apicomplexa: Coccidia). **High impact on host health expected**
 - Pinworms *Aspiruluris tetraptera* and *Syphacia obvelata* (Nematoda: Oxyurida). **Low impact on host health expected**
- Host model: *Mus musculus domesticus*, *M. m. musculus* and their hybrids
- Recombinant hybrid mice are expected to present higher/lower-intensity of infection than the average of parental genotypes

How and where did we do that?

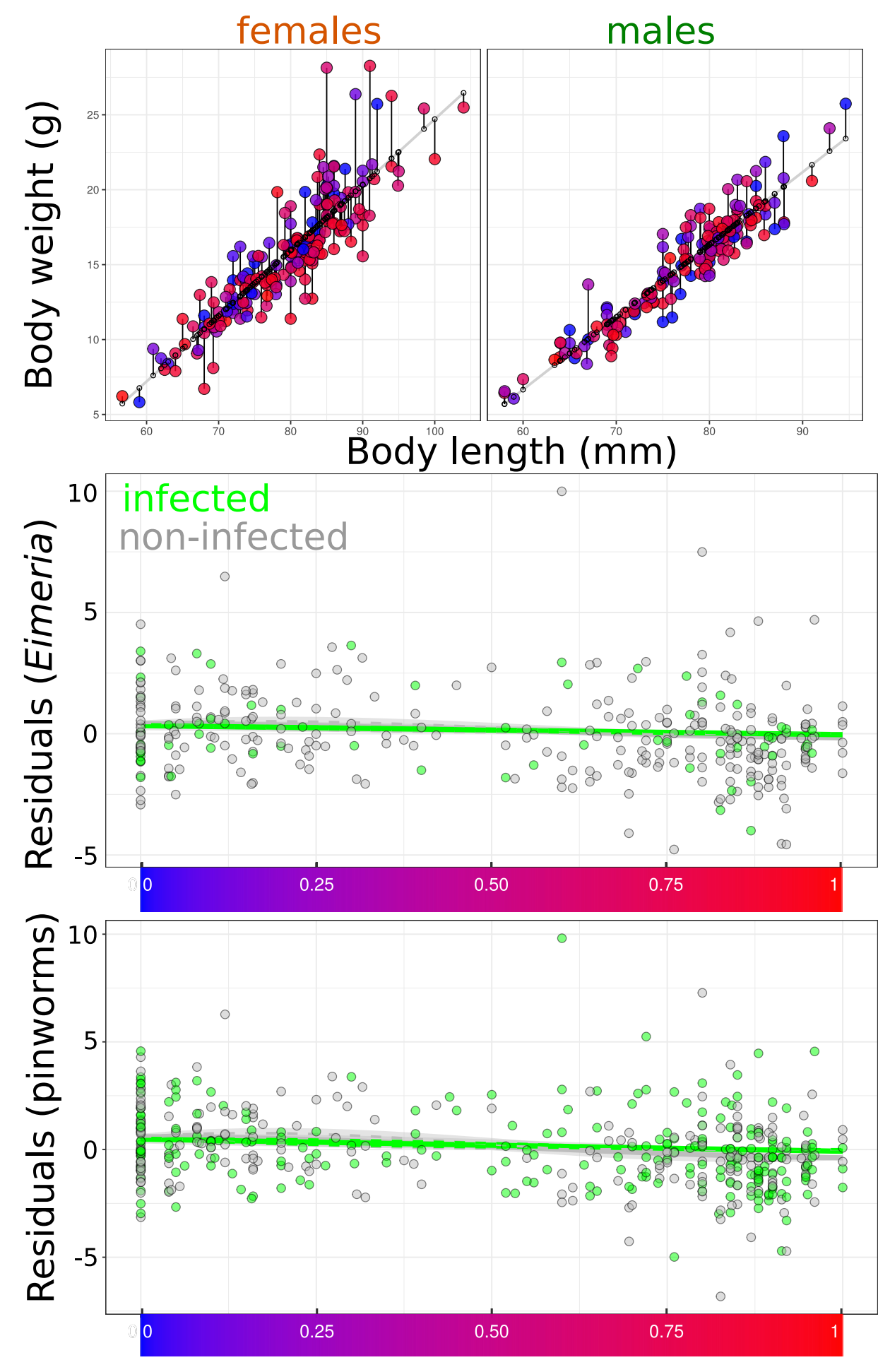
- Sampling 660 mice over 4 years in a new transect of the European house mouse hybrid zone
- Host genotyping (4-14 diagnostic markers) on the 0-1 scale (equal admixture hybrids = 0.5)
- *Eimeria* intensity estimated by quantitative PCR, pinworm intensity by count
- Modelling of parasite intensity along hybrid index, test hybrid effect by maximum likelihood
- Logistic regression presence/absence of parasite in direction of the hybrid zone centre
- Body condition = residuals body length/body weight. Modelling of body condition along hybrid index, test hybrid effect by maximum likelihood, test difference between infected/non-infected



Eimeria spp. and pinworm intensities are lower in hybrids than in parental mice



Mouse body condition



- Lower intensity of both lowly (pinworms) and highly (*Eimeria*) pathogenic parasites in hybrid compared to parental mice
- No indication of lower prevalence in the centre of the hybrid zone
- No indication of differential impact of infection on body condition along hybrid gradient

What does this mean?

- Independence of hybrid resistance from the parasite pathogenicity level
- Intrinsic components of the host-parasite interaction, instead of ecological and epidemiological factors (e.g. host density troughs), explain intensity reduction in the absence of prevalence reduction
- Impact of parasite infection on host health in hybrid zones remains an open question. Differences in host health could contribute as one component to the overall fitness of hybrids
- Change to a parasitological perspective: impact of host hybridization on parasites is obvious

References

Balard *et al.* (unpublished) Reduced *Eimeria* and pinworm loads in hybrid mice of the European house mouse hybrid zone
R package used for modelling: Balard, A., and E. Heitlinger. 2019. Alicebalard/parasiteLoad DOI: 10.5281/zenodo.2535547

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