

Report: Hybrid vigor in response to Eimeria in the HMHZ

Alice

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General informations on HMHZ

- 485 mice were captured over three years and had fecal samples processed, from 146 farms.
- From these mice, (*tbc* : *N* had colon content and intestinal tissues collected for PCR and qPCR detection)
- 3.79 mice were caught on average by farm (95% ci : 0.36)
- **Hybrid indexes** were calculated as ratio of M.m.d/M.m.m alleles (between 4 and 14, on average 13 loci)

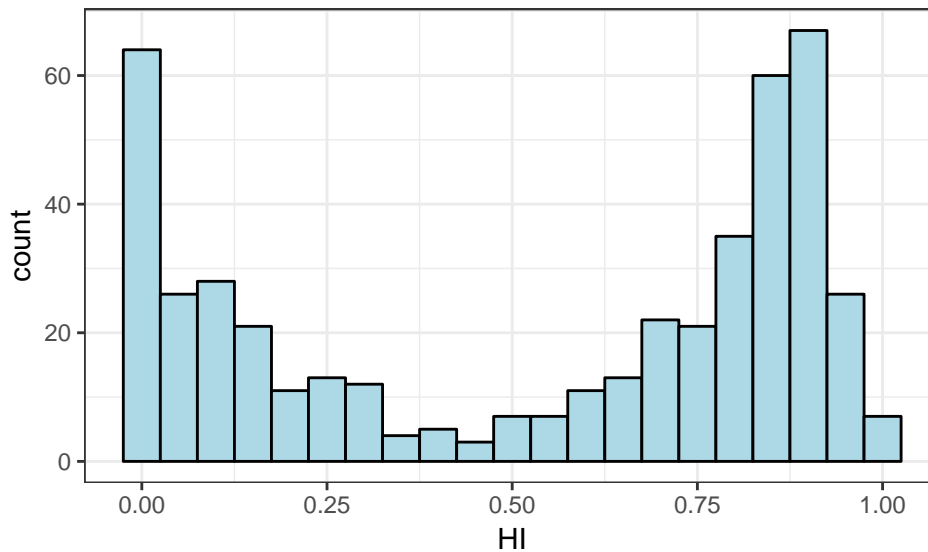


Figure 1: Number of animals caught along the hybrid index

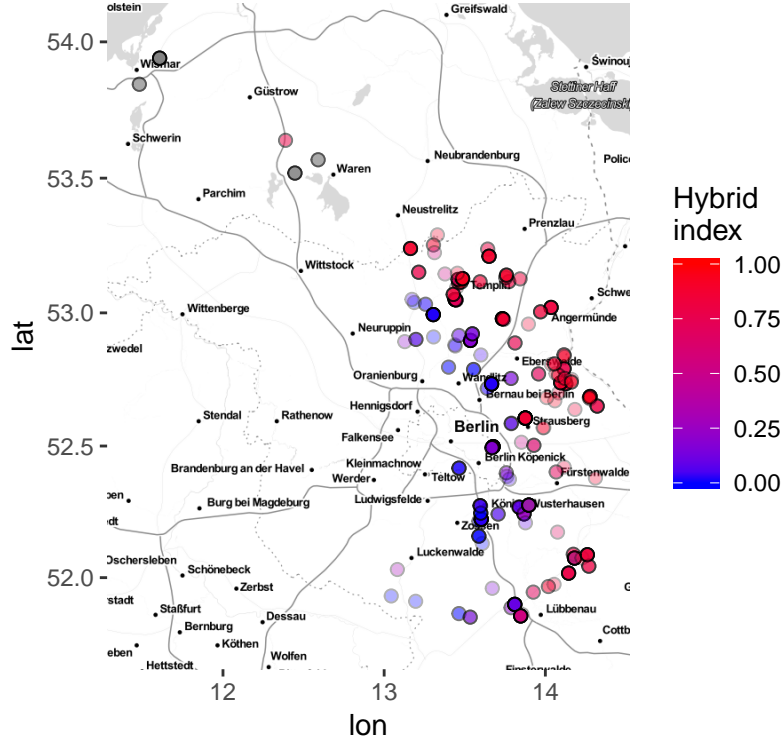


Figure 2: Samples map. Each point correspond to one location, a less pronounced transparency indicating more animals sampled at this location. Hybrid index is represented by a gradient from blue (M.m.d) to red (M.m.m)

The average *Eimeria* prevalence per farm based on oocysts flotation is 15.22. We observed, based on this technique, a variation between years (Table 1).

Table 1: Prevalence of *Eimeria* based on OPG per year

	2015	2016	2017
FALSE	92.0	126	167.00
TRUE	10.0	24	66.00
prevalence(%)	9.8	16	28.33

Improving *Eimeria* oocysts detection

22 new samples were detected while diluting by 0.1mL PBS instead of 1mL before counting in Neubauer chamber.

Adjusted R-squared = 0.81 represents the amount of variation in y explained by x.

<https://www.r-bloggers.com/correlation-and-linear-regression/> (for Lorenzo)

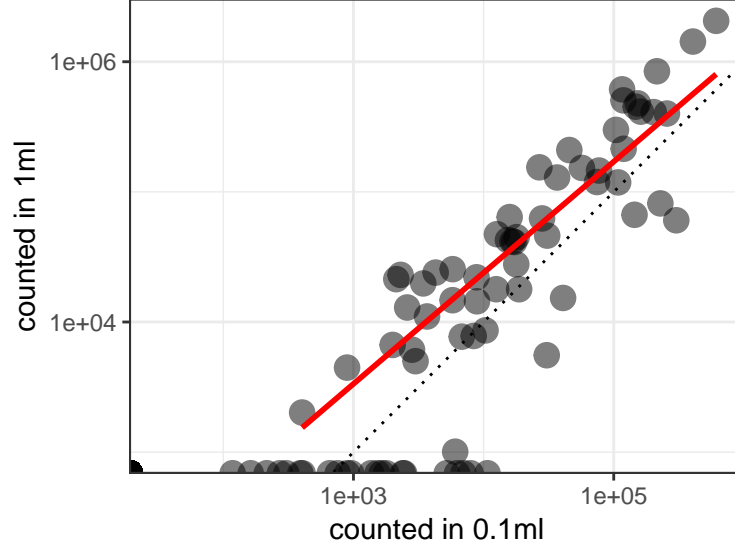


Figure 3: Comparison of OPG depending on dilution level. Red line represents linear relationship between both axis, dotted line represents the function $y = x$

Missing data (to complete with Victor)

Some mice do not have an hybrid index yet: SK_3174, AA_0411, AA_0412, AA_0489, AA_0490, AA_0491, AA_0495, AA_0496, AA_0497, AA_0498, AA_0499, AA_0500, AA_0501, AA_0502, AA_0503, AA_0504, AA_0505, AA_0506, AA_0511, AA_0512, AA_0513, AA_0514, AA_0515

PCR

Table 2: Prevalence of Eimeria based on positive AP5 PCR, per year

	2015	2016	2017
negative	0	0	33.00
positive	0	0	8.00
prevalence(%)	NaN	NaN	19.51

PCR.positive means that AP5 was positive AND another marker gave a sequence

Table 3: Prevalence of Eimeria based on positive AP5 PCR AND the obtention of a sequence of another marker (COI, 18S or ORF470), per year

	2015	2016	2017
FALSE	0	0	36.0
TRUE	0	0	5.0
prevalence(%)	NaN	NaN	12.2

qPCR

Table 4: Prevalence of Eimeria based on positive qPCR, per year

	2015	2016	2017
negative	0	125.00	0
positive	0	19.00	0
prevalence(%)	NaN	13.19	NaN

Comparison oocysts flotation, PCR, qPCR

Plot a venn diagram here

Testing hybrid vigor along HMHz

Oocyst shedding proxy

First approximation:

```
## `geom_smooth()` using method = 'loess' and formula 'y ~ x'
```

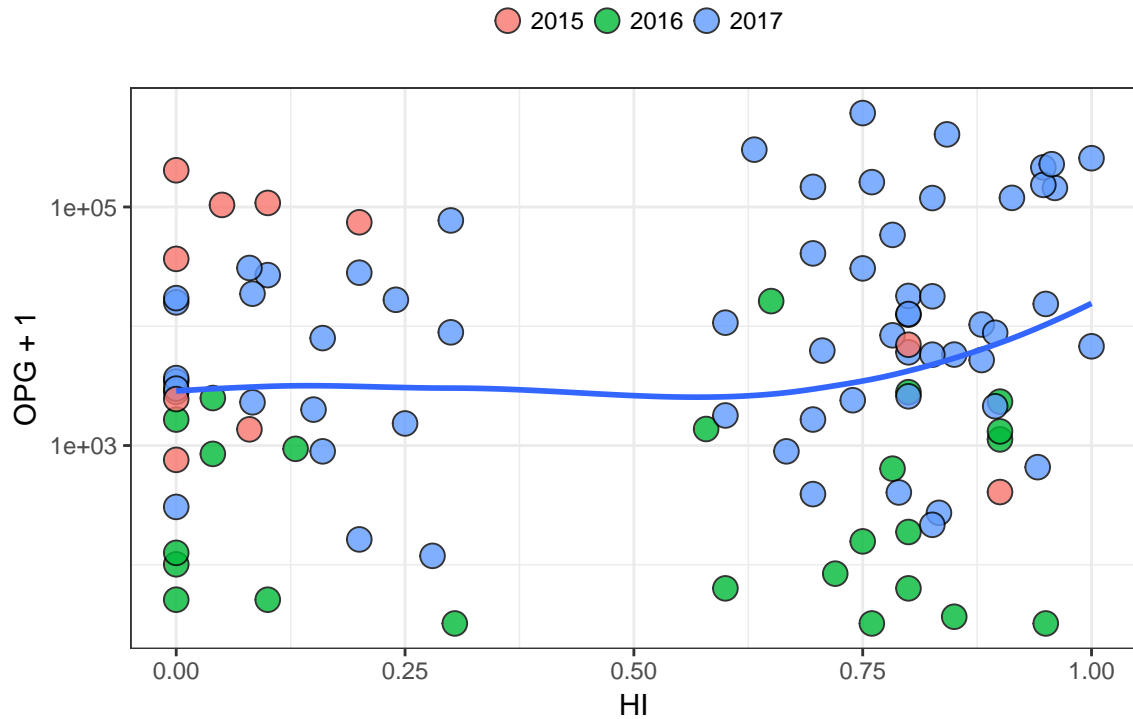


Figure 4: OPG along HI, colored per year. Blue line represent a smooth function (method = loess)

Statistical model (dvp...)

qPCR proxy

tbc

BCI proxy

First approximation:

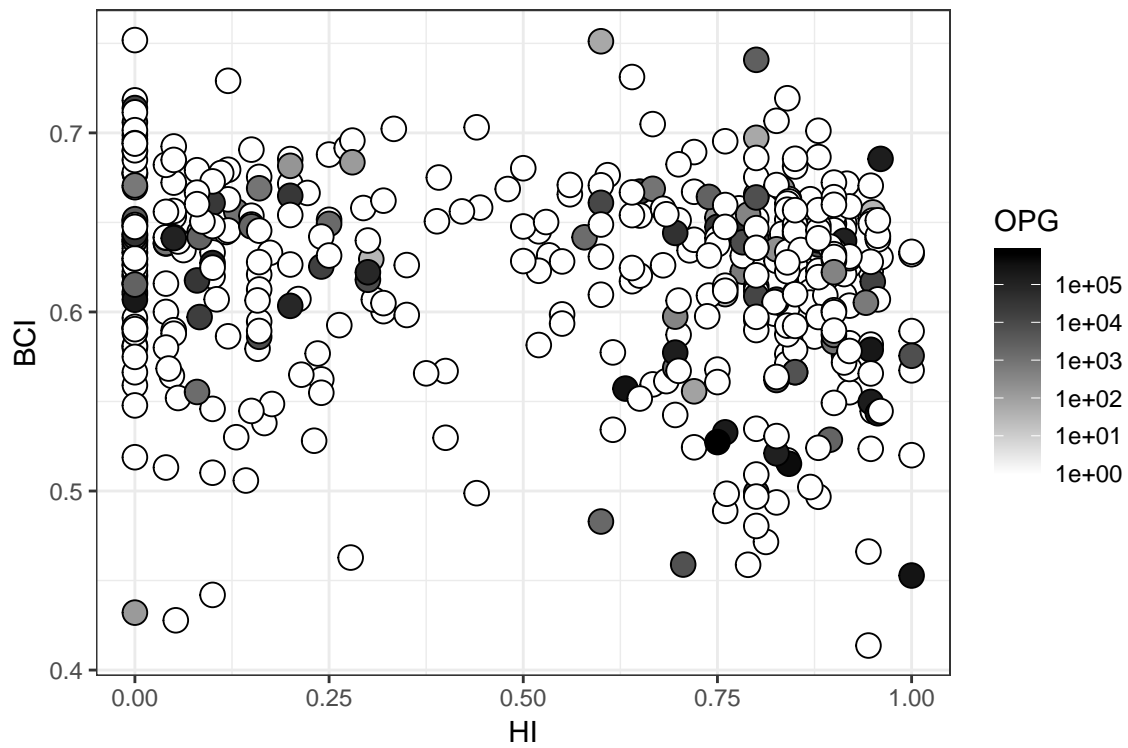


Figure 5: BCI along HI, colored per level of OPG