The evolution of the genetic architecture of traits under artificial selection

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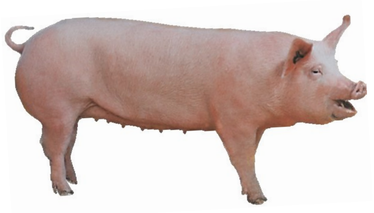


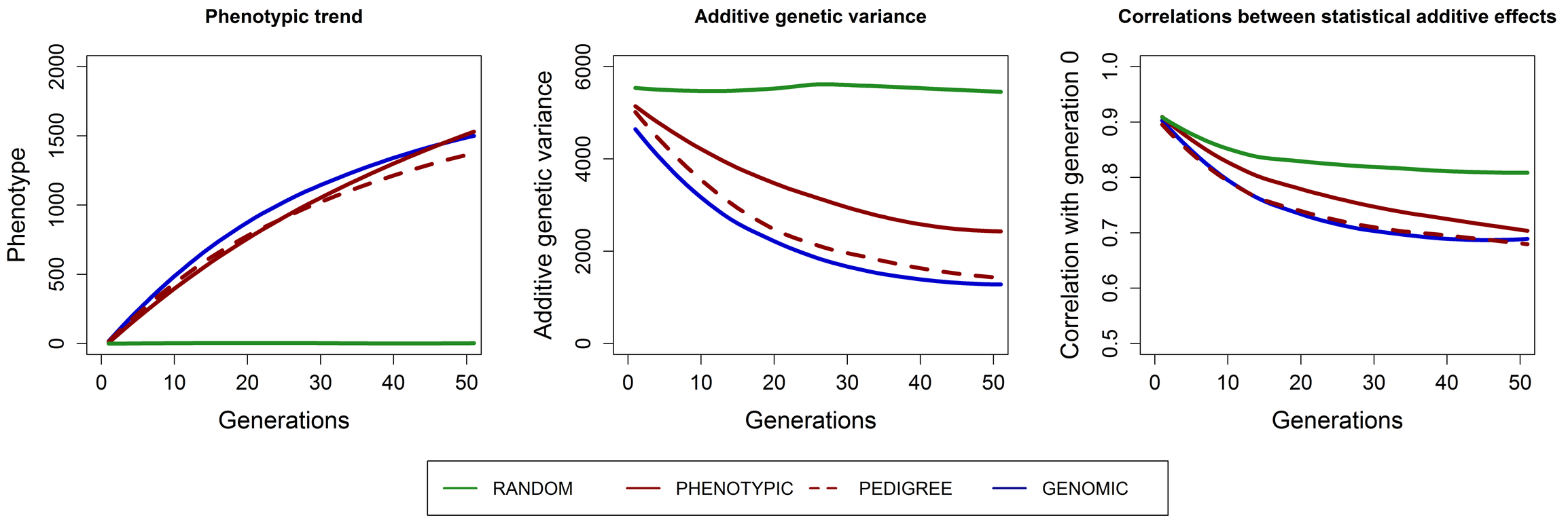
Genetic architecture is changing over time:
A result of changing allele frequencies and non-additive effects

Random selection:
DRIFT
- No selection accuracy
- Random changes across genome

Classical artificial selection:
EVOLUTION
- Moderate selection accuracy
- Equal selection pressure across genome

Genomic selection:
REVOLUTION?
- High selection accuracy
- Focus on genes with large effects, 'ignores' genes with small effects

RESULTS



CONCLUSION

Traits change faster with stronger selection pressure:
- Larger drop in additive genetic variance
- Statistical additive effects change faster

Optimal short-term gain ≠ optimal long-term gain

METHODS

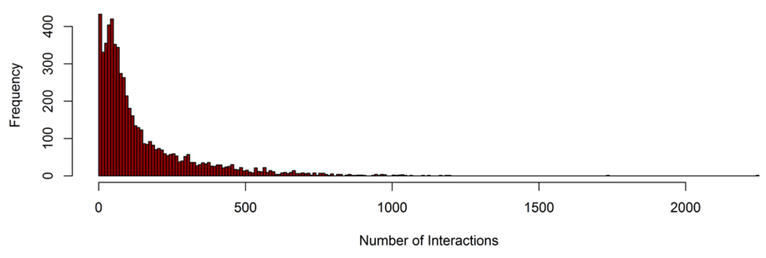
Simulated population
- 100♂ and 100♀
- Selection intensity: 20%
- ~0.6 new mutations per individual

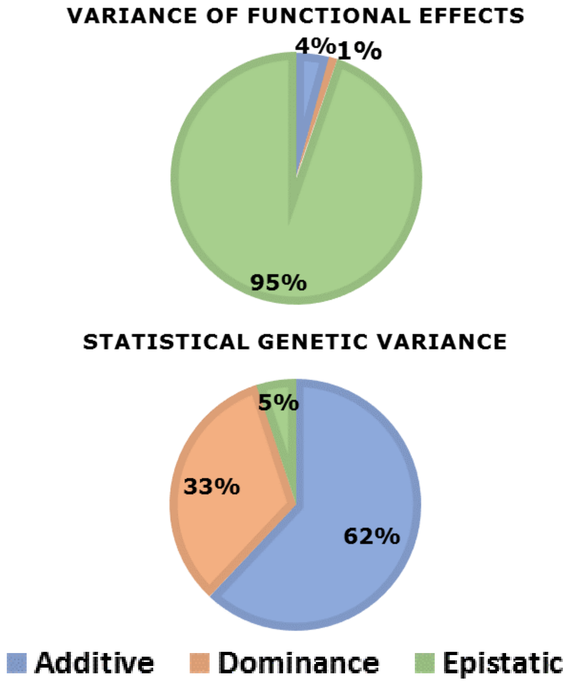
Additive effects
- 100% loci
- a ~ N(0,1)

Dominance effects
- 100% loci
- δ ~ N(0.2, 0.3)
- d = δ * abs(a)

Epistatic effects
- 90% loci
- Interaction matrix yeast
- ε_{ij} ~N(0,0.2) per genotype class
- $e_{ij} = \varepsilon_{ij} * abs(a_i * a_j)$

Number of interactions per locus





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