

Appendix 1

Figure S1. Hypothetical example how the expected parasite load in a genetically diverse infection is determined from the single-infections.

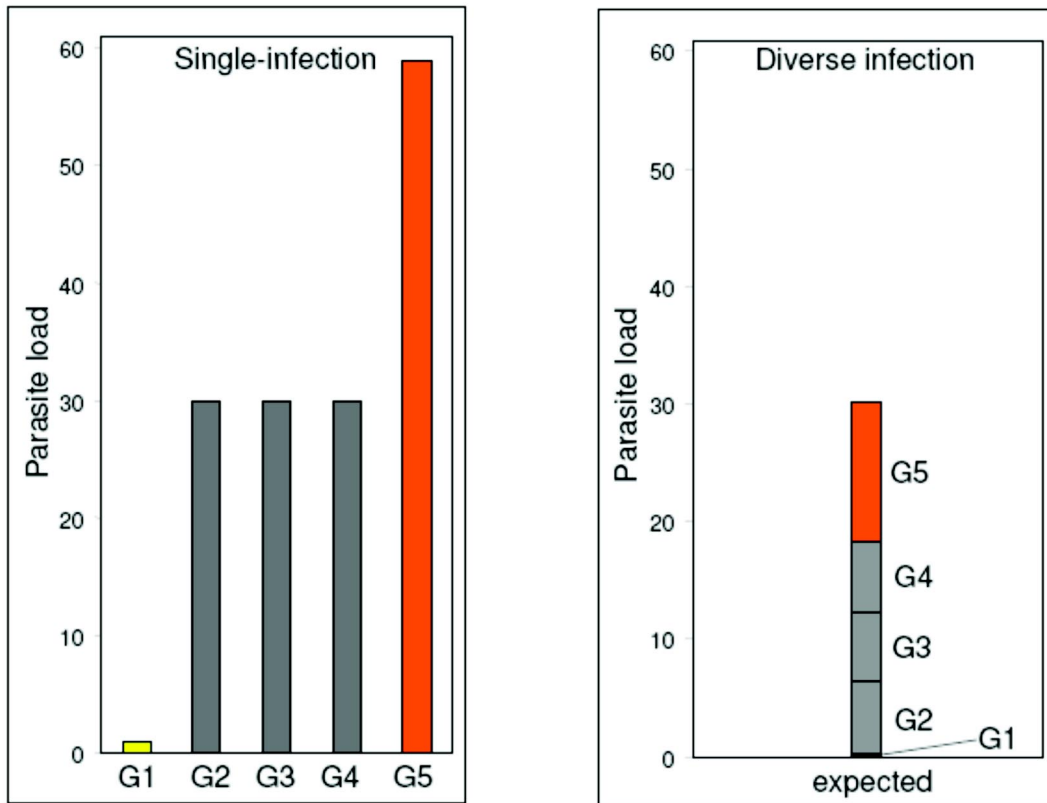


Fig. A1. (a) Parasite load per host in single-infections for five different parasite genotypes. For each genotype, 150 individuals were used to infect each host and the genotypes differ largely in the number of established parasites per host. Here, genotype 5 is the extreme-genotype, as it can establish the largest number. (b) In the diverse infection, a single host is infected with 30 individuals of each of the five genotypes. If the survival rate is proportionally the same in the single-infection and diverse infection, it is expected to find for each genotype 1/5 of the numbers in the single-infection also in the diverse infection.

Figure A2. Graphical illustration of the difference between the average competition and the extreme-genotype effect.

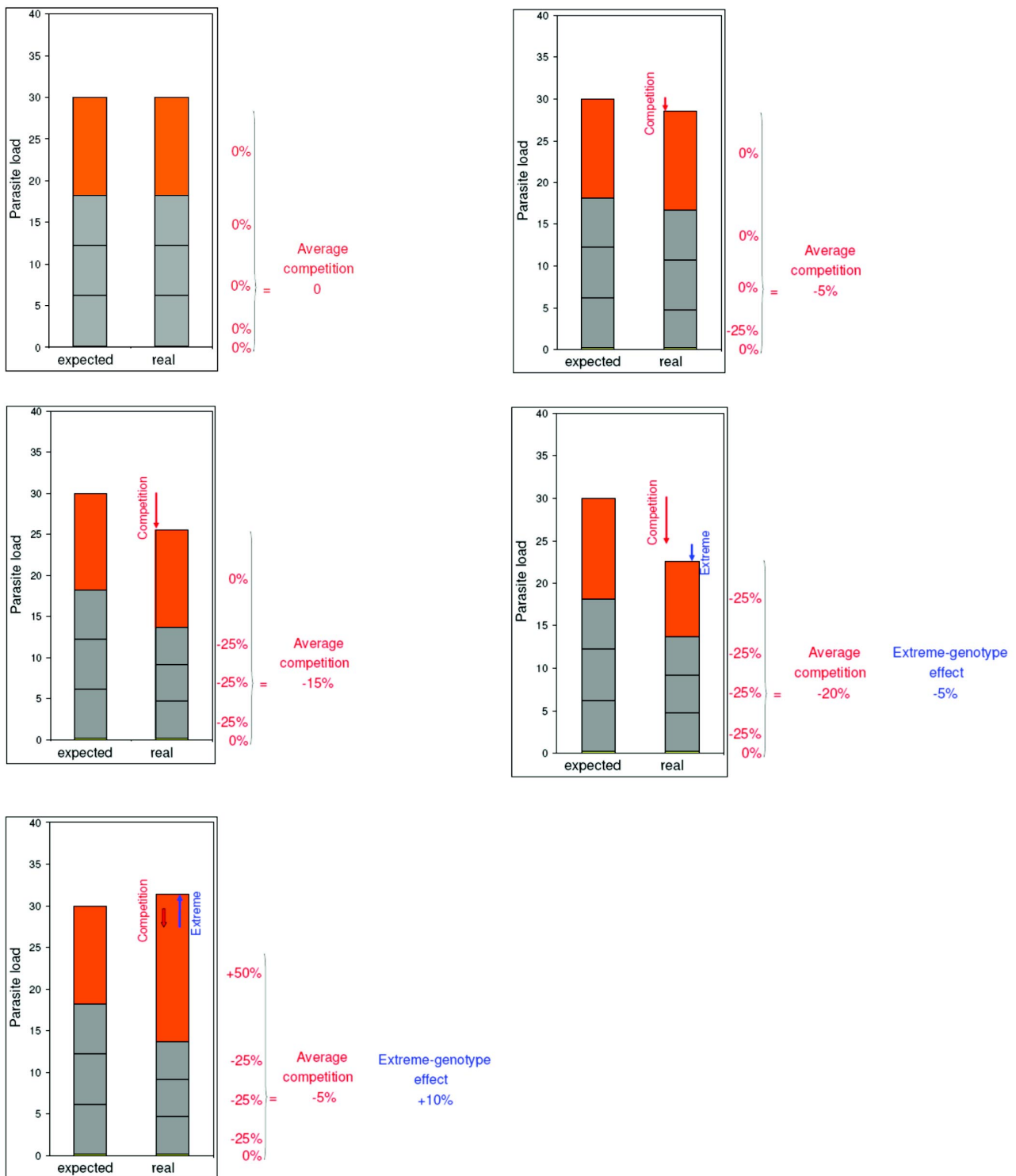


Fig. A2. (a) A comparison of the expected value with the numbers of parasites of each genotype actually found within a host allows to measure for the influence of infection diversity on total parasite load. If the numbers of all five genotypes are equal to the expected numbers, there is no competition or extreme-genotype effect and total parasite load is equal to the expectation. (b) One of the grey genotypes is reduced by 25% compared to its expected value. This results in a competition effect, averaged over all five genotypes, of 5% and total parasite load is reduced by 5%. (c) If the second and third of the grey genotypes are also reduced by 25% the average competition effect increases to 15% and total parasite load is reduced by 15%. (d) Reducing the dominant genotype (orange) by 25% also adds another 5% to the average competition effect. However, because of its over-proportional effect, total parasite load is decreased by more than 20%. This over-proportional effect, which is independent of competition, is called the extreme-genotype effect. In this case the extreme-genotype effect reduces the total parasite load by an additional 5%. (e) If the dominant genotype (orange) is increased by 50%, the average competition effect over all five genotypes is still negative. However, because of its over-proportional effect the extreme-genotype effect leads to an increase in the total parasite load, despite of a negative effect of competition.

Figure S3. Diagram of infection design.

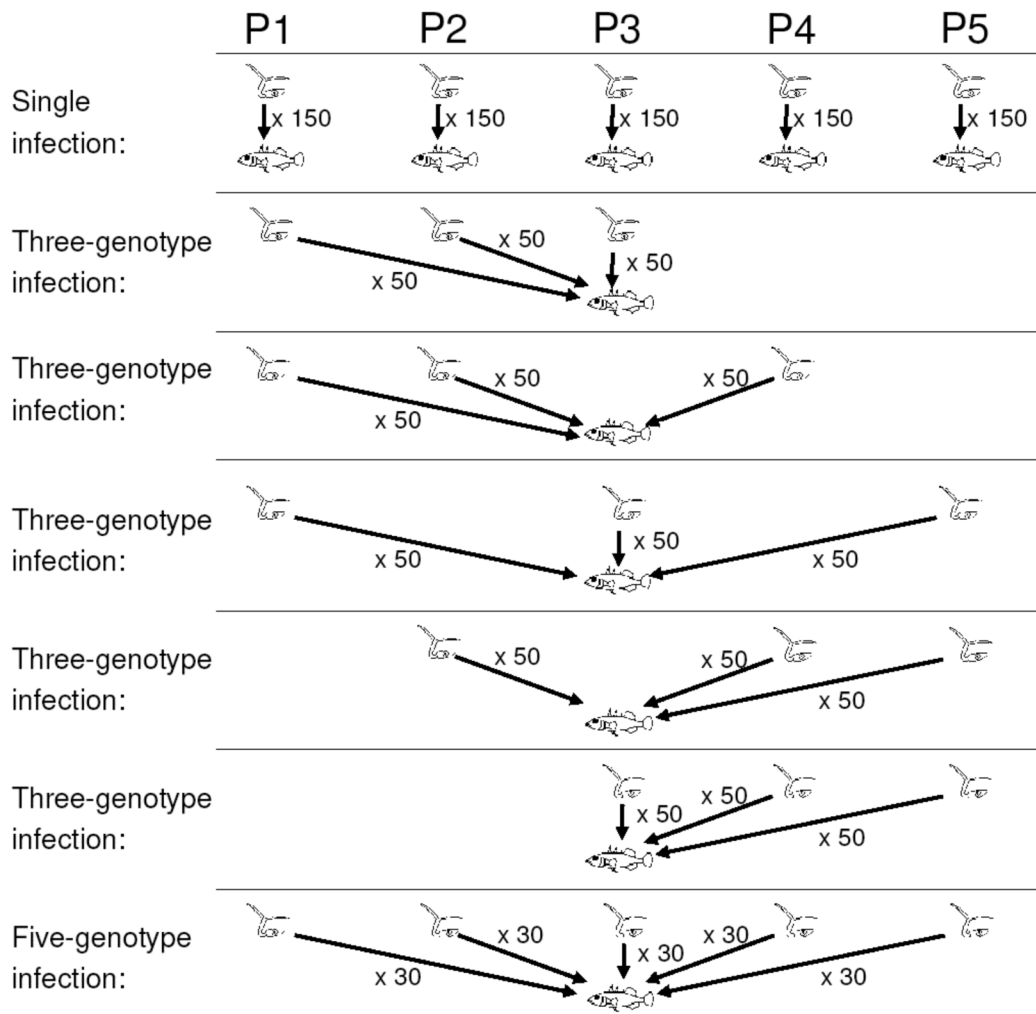


Fig. A3. P1 to P5 stand for the parasite genotypes, the parasites are represented pictorially (above the arrows). All parasites in the same column belong to the same genotype. The numbers next to the arrow represent the number of parasites used to infect a fish. If several arrows point to a fish, it was infected with the sum of the numbers near the arrows. The whole infection design was repeated for four to five fish from each of the five fish families.