



**Figure S2 Comparison of variation within blocks between models.** Theoretical lines are from Ohta 1982 ( $\pi_w^A$ ), Innan 2002 ( $\pi_w^B$ ) and Innan 2003 ( $\pi_w^C$ ). Circles show results from simulations ( $\pi_w^{sim}$ ) with increasingly higher running times in order to reach equilibrium for smaller IGC rates. Simulations were run for 100 thousand generations for  $C = 0.5, 1, 5, 10, 50$ ; 3 million generations for  $C = 0.1, 0.01$ ; and 6 million generations for  $C = 0.001$ . In the latter case, despite high running times, equilibrium has not yet been reached. Theoretical predictions do not take into account the increasingly high waiting times to reach equilibrium for low IGC rates and thus forward simulations might be very useful to have predictions in this regime.