Table S1 *Calculations for Locus based expected segregation ratios* (E) for the BC_1 and BC_{1S1} generations, based on extrapolated observed segregation patterns of the control (S_1) generation for co-dominant and dominant marker (parentage of locus). The BC_1-generation is expected to have the same level and direction of background segregation distortion as the S_1-generation; in the BC_{1S1} generation the background segregation distortion is assumed to have occurred for an additional meiosis event with the same level and direction of distortion. For AFLP loci the expected ratio in the BC_{1S1} is additionally corrected for the proportion of offspring derived from heterozygous plants and homozygous plants. Included are the expected neutral Mendelian segregation ratios. For the S_1 generation the observed segregation ratio of homozygous *L. serriola* alleles is standardized to *L. serriola* = 1.

	Mendelian†	**Co-dominant**	**Dominant (*L. serriola*)**	**Dominant (*L. sativa*)**
BC_1				
$E_{L.\ serriola}$ ($E_{ser(B)}$)	1; -; 1	1	-	1
$E_{heterozygotes}$ ($E_{het(B)}$)	1; -; -	$\left(\frac{O_{het}}{2}\right)$	-	-
$E_{L.\ sativa}$ ($E_{sat(B)}$)	-; -;1	-	-	$\left(\frac{O_{sat}}{3}\right)$
BC_{1S1}				
$E_{L.\ serriola}$	5; 7; 5	$\left(E_{het(B)} + \left(1 + O_{het} + O_{sat}\right)\right)$	7	5
$E_{heterozygotes}$	2; -; -	$\left(E_{het(B)} \times O_{het}\right)$	-	-
$E_{L.\ sativa}$	1; 1; 3	$\left(E_{het(B)} \times O_{sat}\right)$	$\left(3 \times O_{sat}\right)^2$	$\left(\frac{O_{sat}}{3}\right)^2 \times 3$

O_{het}: observed segregation ratio of heterozygotes in the control generation relative to *L. serriola*

O_{sat}: idem for homozygous *L. sativa*.

†: Mendelian expected segregation for co-dominant; dominant (*L. serriola*); dominant (*L. sativa*)