Evolution als Änderung der Genfrequenzen

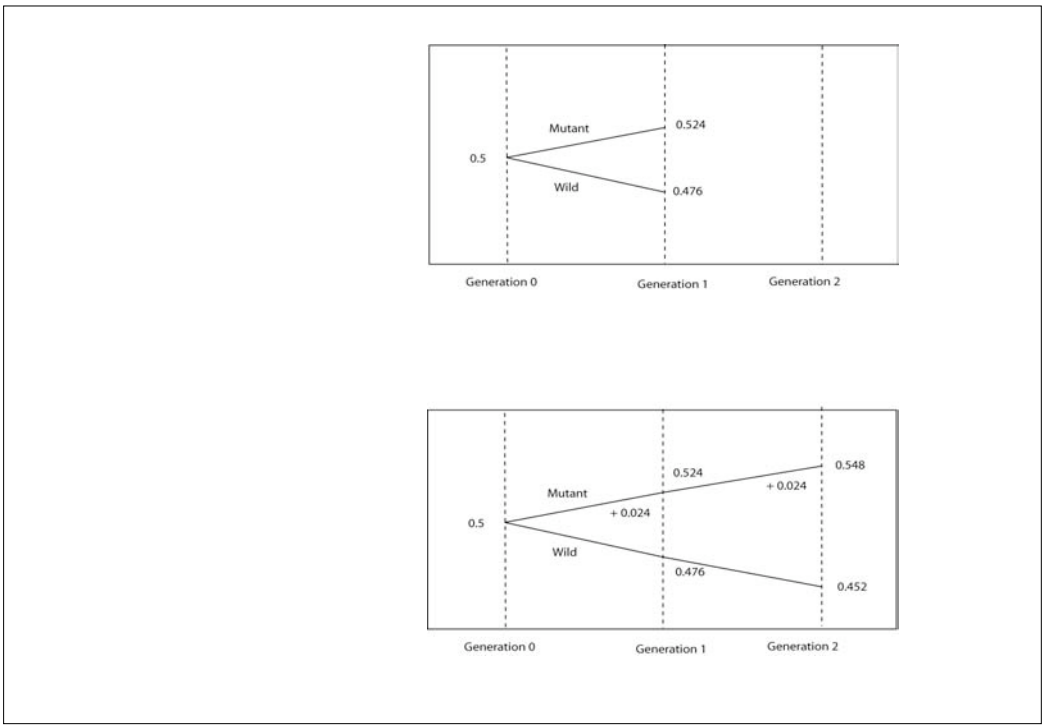
Thema 4

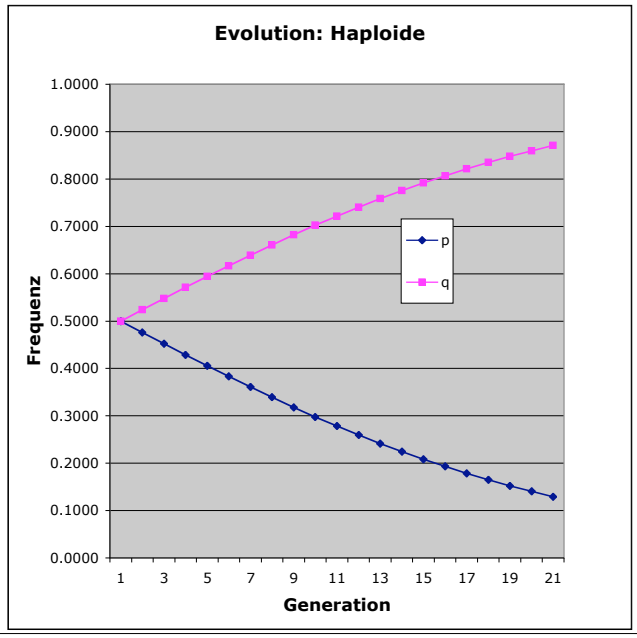
G. LEDYARD STEBBINS GEORGE GAYLORD SIMPSON THEODOSIUS DOBZHANSKY

Th. Dobzhansky

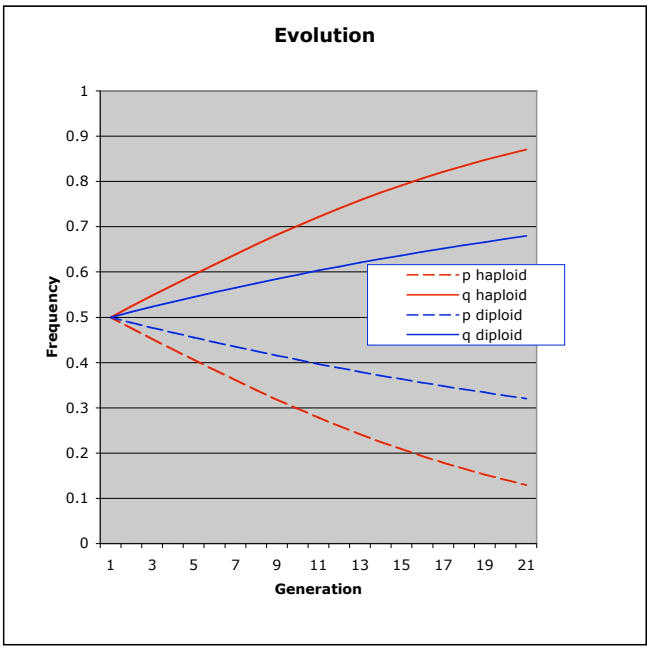
J.B.S. Haldane

Änderung von Genfrequenzen





Änderung von Genfrequenzen

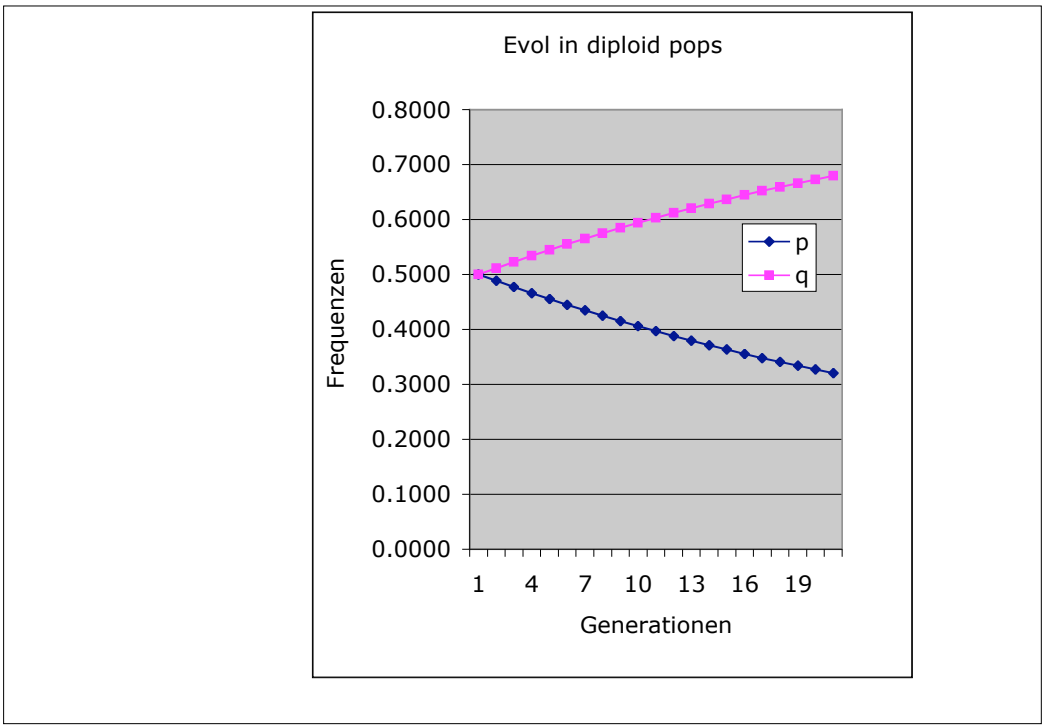


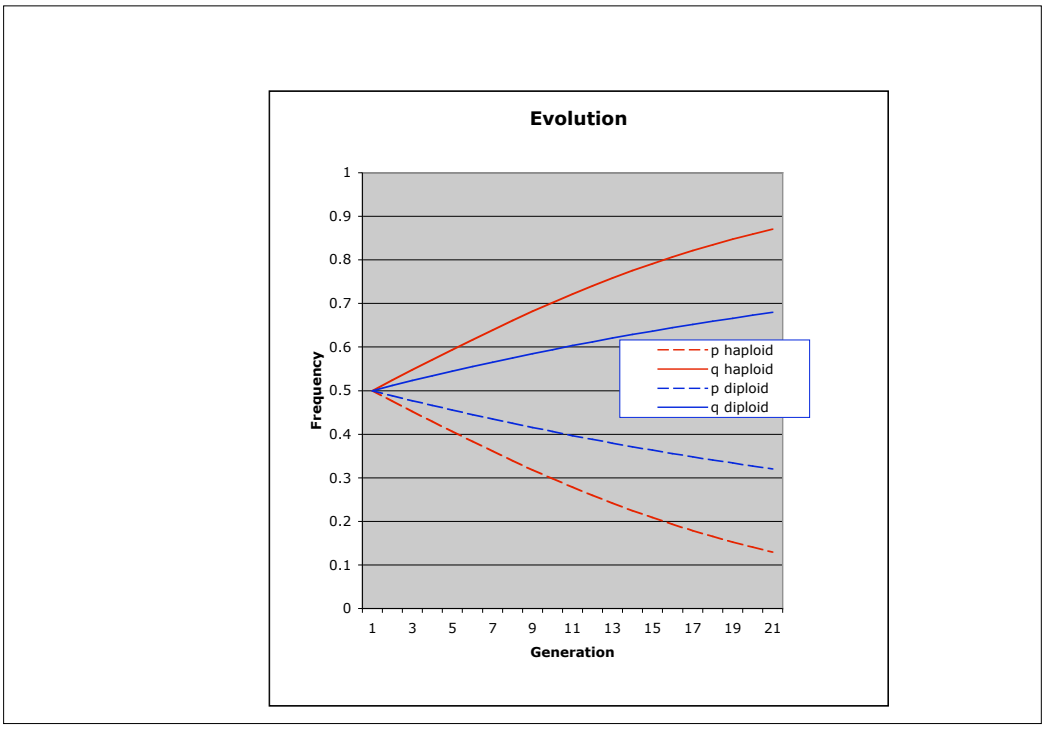
Stadium	Wild	Heterozygot	Mutant	TOTAL
Individuen	A1A1	A1A2	A2A2	100
Frequenz A1, A2	**p**		**q**	p + q = 1
Frequenz	$\mathbf{p^2}$	**2pq**	$\mathbf{q^2}$	1.0
Fitness	1	1 + ds	1 + s	
Nachkommen	p^2	2pq(1+ds)	q^2 (1+s)	w = p^2 + 2pq(1+ds) +q^2(1+s)
Frequenz, neu	$\frac{p^2}{w}$	$\frac{2pq(1+ds)}{w}$	$\frac{q^2(1+s)}{w}$	1.0
	$p' = \frac{p(1+sdq)}{w}$		$q' = \frac{q(1+s[q+dp])}{w}$	p'+q' = 1
(Individuen, neu) = 100	A1' = p' 100		A2' = q' 100	100

w = mittlere Fitness der Population

d = Dominanz ($0 \le d \le 1$)

Änderung von Genfrequenzen





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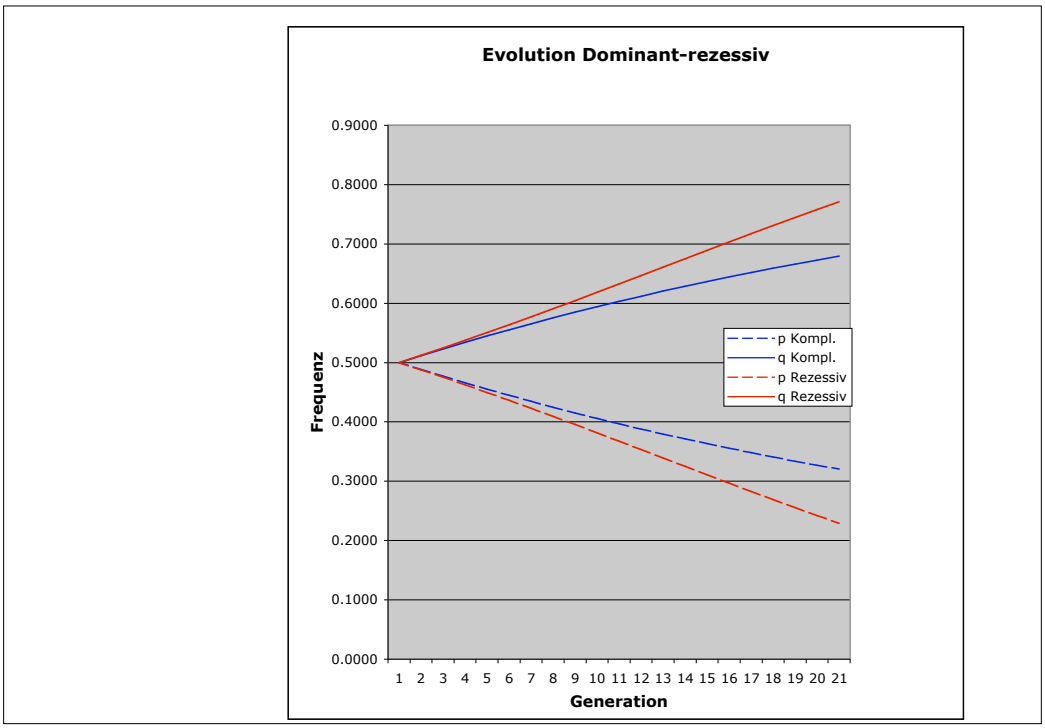
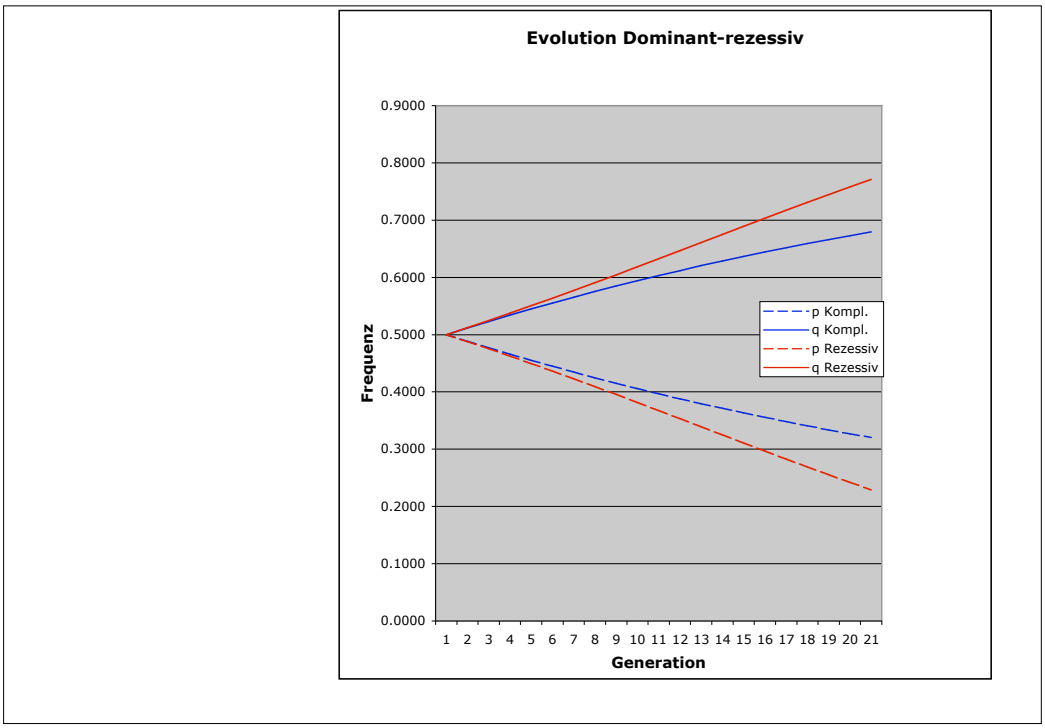
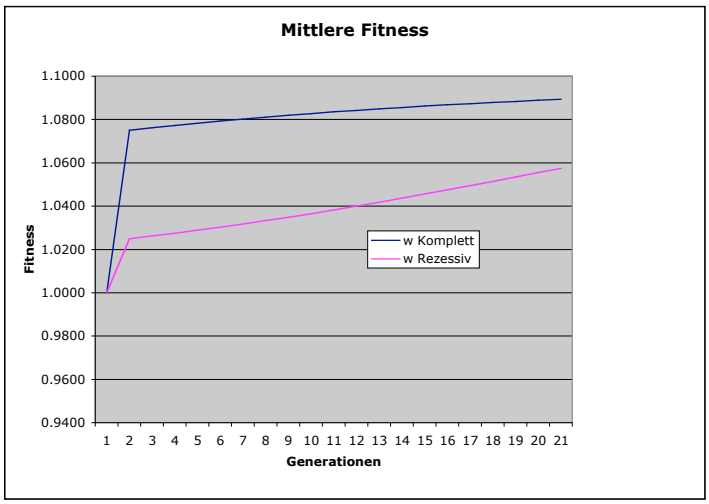
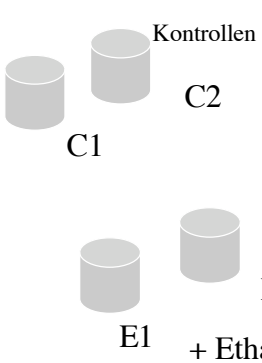
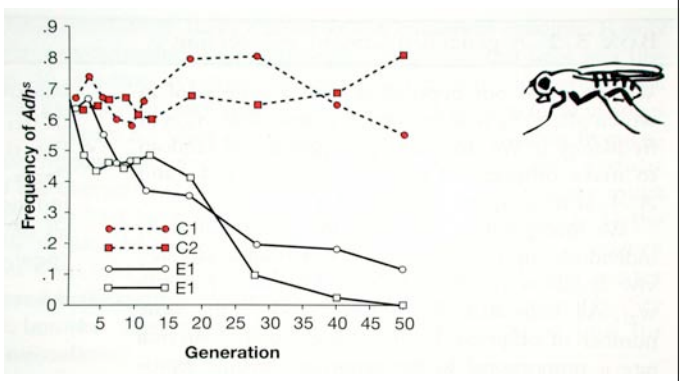






Experiment mit *Drosophila melanogaster*
2 Allele Adh^F, Adh^S





high oil

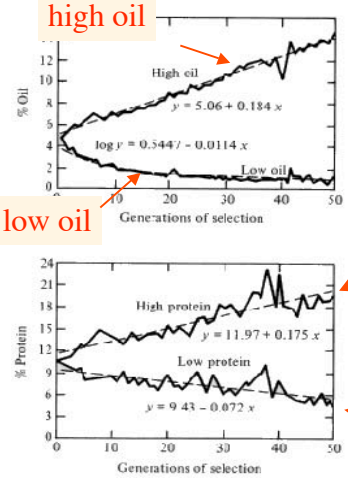


Fig. 11.5 Results of selection experiments in corn (*Zea mays*), selected for high oil content, low oil content, high protein content, or low protein content. Reprinted from *Agronomy Journal*, volume 44, 1952, page 61 by permission of the American Society of Agronomy, Inc., Madison, Wisc.

low oil

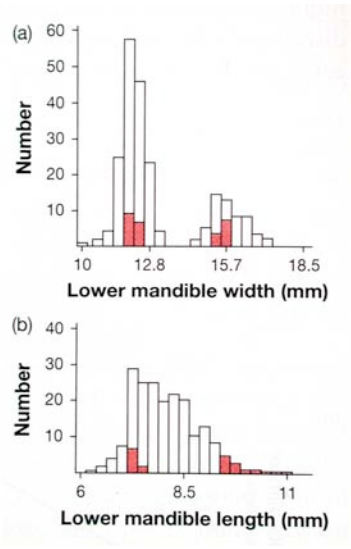
Mais (*Zea mays*)

high protein

low protein

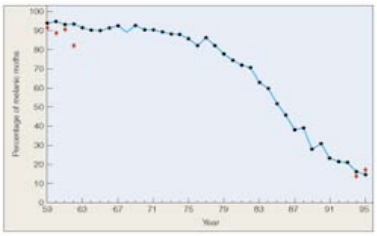
Beispiel:
Schnabelgrösse bei Afrikan. Finken

nicht überlebt
überlebt



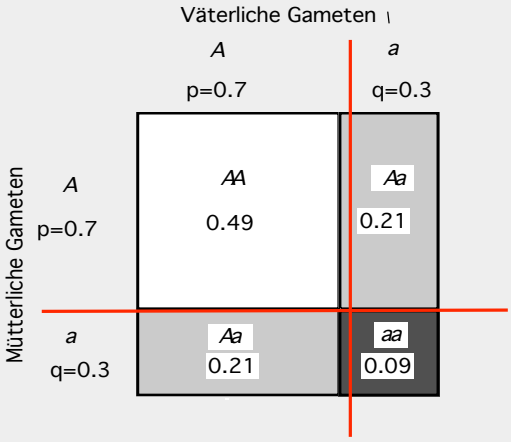
Freeman,S., Herron, J.C. (1998) Fig .6.25

Melanic and wild-type *Biston betularia*



Frequency of melanic form in England (1959-1995)

HWG: Schema



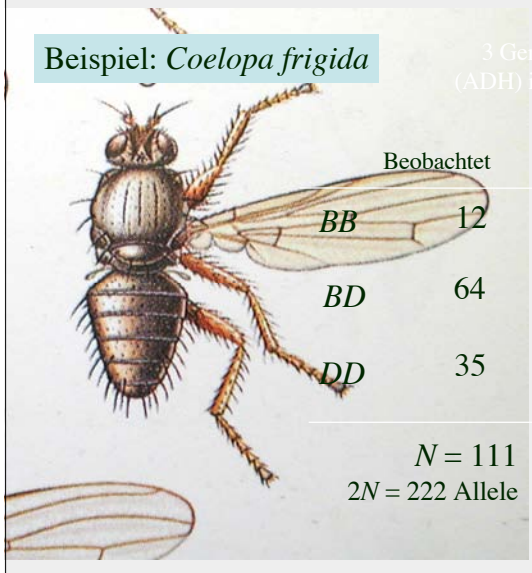
Beispiel: Motte (*Panaxia dominnula*)

$\chi^2 = \sum(B-E)^2/E$

	Beobachtet	Erwartet		χ^2
AA	1469	$p_A^2N=$	1467.1	0.002
AB	138	$2p_Ap_BN=$	141.5	0.087
BB	5	$p_B^2N=$	3.4	0.753
$N = 1612$				

Beispiel: *Coelopa frigida*

3 Genotypen
(ADH) in England



	Beobachtet	Erwartet Frequenz	Erwartet Individuen
BB	12	0.157	17.43
BD	64	0.478	53.06
DD	35	0.365	40.51
$N = 111$		1.000	111.00
$2N = 222$ Allele			

Beispiel: Fliegen (*Coelopa frigida*)

	Beobachtet	Erwartet Frequenz	Erwartet Individuen
BB	12	0.157	17.43
BD	64	0.478	53.06
DD	35	0.365	40.51
	$N = 111$	1.000	111.00

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