DOMINANCE RELATIONSHIPS BETWEEN ALLELES AT THE *PALLIDA* LOCUS IN *ANTIRRHINUM MAJUS*. I THE ALLELES +, *CAR*, *TUB* AND *TIN*. A CORRECTION

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The statistical analysis presented in an article by the author and D. B. RICHARDS (Genetica 46: 211-215, 1976) is corrected.

Statistical Analysis

In the paper (GILBERT & RICHARDS, 1975) a regression analysis was performed which led to erroneous conclusions, owing to heteroskedasticity between genotypes:

Genotype	+/+	+/ <i>car</i>	+/ <i>tub</i>	+/ <i>tin</i>	<i>car/car</i>	<i>car/tin</i>
Variance	.925018	5.08759	4.97319	6.60434	3.79333	1.64051
W	.9589	.9653	.9449	.8736	.9564	.9708

The W is the Shapiro-Wilk W-statistic (SHAPIRO & WILK, 1965), which shows that all the within-genotype values are normally distributed. In this case, Bartlett's test of homoskedasticity is applicable, giving a $\chi^2_{[5]} = 21.1036$, $P = 0.00077$, very highly significant. Thus, it would appear to be necessary to perform a weighted regression analysis, using $1/S^2_i$ as a weight.

This modifies the analysis to:

Source	df	msq	F
Genotypes	5	1459.456053	1459.456053***
Regressions	2	3643.147125	
Linear	1	7242.316833	1977.692***
Quadratic	1	43.977417	12.009*
Residual	3	3.662005	3.662005*
Error	159	1	
Total	164		

Dissection of the residual, which is just significant, would probably not reveal further significant polynomial terms, then the equation is:

$$Y = 35.365 - 6.151 X + 0.234 X^2$$

giving $Y_5 = 10.45$ (*car/tub*)

$$Y_7 = 3.76$$
 (*tub/tub*)

and the degrees of dominance are

	<i>car</i>	<i>tub</i>	<i>tin</i>
$\pm$	.49	.34	.27
	<i>car</i>	.35	0

References

- GILBERT, R. I. & D. B. RICHARDS (1976). Dominance relationships between alleles at the *pallida* locus in *Antirrhinum majus*. I. The alleles +, *car*, *tub* and *tin*. *Genetica* 46: 211–215.
- SHAPIRO, S. S. & M. B. WILK (1965). An analysis of variance test for normality (complete samples). *Biometrika* 52: 591–000.