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Biochemistry of plant diseases. VII. Correlation between skin texture and flesh texture in plum varieties.*

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In a previous paper[1] data were presented which led to the belief that the comparative resistance of certain plum varieties to brown rot is due to mechanical resistance to the entrance of the fungus. The more resistant varieties had a tougher skin and a firmer flesh; and, at the same time, they had a higher crude fiber content. Preliminary calculations of correlation by rank between skin and flesh texture indicated that the two factors, tough skin and firm flesh, varied together. If this premise could be proved to hold generally, it would be of value in further work on plums, since only one of the two factors would need to be measured.

A considerable number of measurements of these two constants are now at hand. They cover the three seasons of 1923, 1924, and 1925; they involve over 45 varieties of plums grown at the Fruit Breeding Farm of the University of Minnesota; and they have been taken at all stages of ripeness. These data are presented in the accompanying table.

Each sample, representing a variety at a particular stage of ripeness, consisted of from 4 to 6 plums. The puncture test on the skin and the penetration test on the flesh, as described in the previous paper, were made from 3 to 6 times on each plum. The

Correlation between Skin Texture and Flesh Texture in Plums.

Season	Material	Number of varieties	Stages of Ripeness	Value of n	Coefficient
1923	Lots	11	I thru VI	66	$-.788 \pm .032$
1924	Individuals	5	I thru V	105	$-.415 \pm .055$
1925	Individuals	39	III and IV	243	$-.418 \pm .035$
1925	Individuals	23	III	94	$-.381 \pm .059$
1925	Individuals	25	IV	123	$-.322 \pm .054$
1925	Lots	39	III and IV	50	$-.445 \pm .076$

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[1] Willaman, J. J., Pervier, and Triebold, *Bot. Gaz.*, 1925, lxxx, 121.

values used in the calculations were sometimes the averages of the readings on the individual plums, at other times the averages for the lot. In the 1925 material stages III and IV were used both separately and together. In the other cases all stages were included in one calculation.

It is apparent from the magnitude of the coefficients that a very significant negative correlation exists between the values for the two constants. It should be mentioned that a tough skin gives a high puncture value and a firm flesh a low penetration value. Hence, a negative sign to the cofficients indicates that these two mechanical factors in plums vary together. This relation seems to hold consistently for different seasons, for different varieties, and for different stages of ripeness. It is believed that sufficient evidence is now at hand to warrant the use of the skin test alone in studying the brown rot problem in plums.

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Effect of oxygen and carbon dioxide concentration on inhibition of respiration and photosynthesis by KCN.

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The present paper briefly presents certain facts which extend present knowledge regarding the effects of some of the following external conditions on the velocity of respiration and photosynthesis in the marine kelp *Nereocystis*. Some of the facts do apply, and the others may apply to respiration and photosynthesis of plants in general.

Uniform strips 1 x 10 cm. were cut from the frond of the kelp. The oxygen exchange in respiration and photosynthesis was determined by Winkler's method. Specially made bottles of 25 cc. volume were used. One strip was placed in each bottle for a determination. Three duplicate bottles with strips were used for the same concentration of oxygen, cyanide, etc. Each figure in the tables is, therefore, the average of three duplicate, simulta-