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Gastric Ascorbic Acid in the Gastritic Guinea Pig[1]

A. W. Breidenbach[2] and F. E. Ray

Cancer Research Laboratory,
University of Florida, Gainesville

Among other things, the rat differs from the human in having a squamous forestomach and an endogenous supply of ascorbic acid. When it was found (*1*) that a chemically induced gastritis in the rat resulted in a decrease of ascorbic acid in the stomach and adrenals, it became of considerable interest to determine if a similar relation exists in an animal having an entirely glandular stomach and lacking endogenous ascorbic acid. The present study, therefore, was carried out on the guinea pig.

TABLE 1

EFFECT OF EUGENOL ADMINISTRATION ON GASTRIC AND ADRENAL ASCORBIC ACID IN THE GUINEA PIG

No. of guinea pigs*	Treatment	Chem. form	Mean ascorbic acid	
			Stomach (mg %)	Adrenal (mg %)
11	H_2O controls (st)†	Oxidized	1.5 ± 0.69	5.3 ± 3.0
		Reduced	14.4 ± 0.42	117.7 ± 7.2
		Total	15.9 ± 0.52‡	123.0 ± 7.5
10	Eugenol (st)‡	Oxidized	1.0 ± 0.25	3.4 ± 2.9
		Reduced	7.9 ± 1.8	84.4 ± 4.4
		Total	8.9 ± 1.9	87.8 ± 2.6

* Weight loss not observed in any animal.
† By stomach tube.
‡ Differences between corresponding totals from the two groups are statistically significant. $P < 0.01$.

Male Rockland Farms guinea pigs weighing 350–450 g received Purina Rabbit Chow Checkers[3] and tap water ad libitum as well as daily intramuscular injections of 25 mg sodium ascorbate in 1.0 ml physiological saline. The guinea pigs were divided into 2 groups. The first group, controls, received 3-ml oral doses of water daily for 7 days. The second group received the same amount of a 1.0% emulsion of eugenol. The ascorbic acid was determined by the method of Roe *et al.* (*2*).

Introduction of the eugenol emulsion to the gastric lumen by stomach tube brought about a grossly evident gastritis which was absent in the water-fed controls. The total ascorbic acid concentration in the stomachs of the gastritic guinea pigs was significantly decreased by approximately 44%. In the same animals there was a simultaneous decrease of about 29% in the adrenals, which was probably associated with a systemic stress response. The ratio of oxidized to reduced ascorbic acid in the stomachs and adrenals of the gastritic animals was not significantly different from that in the controls (Table 1). The decrease in gastric tissue ascorbic acid during an induced gastritis is more pronounced in the guinea pig (44%) than in the rat (13%) (*1*). In the rat a smaller decrease of gastric ascorbic acid resulted, apparently because part of the loss was simultaneously replenished from biosynthetic sources.

The data suggest that the ascorbic acid decrease in the stomach of both species during gastritis is a result of rapid utilization of vitamin C at a site of regeneration. The rapid utilization of ascorbic acid at sites of regeneration also has been suggested by the work of Leise *et al.* (*3*), who reported that the percentage of takes in transplantation of a C 954 hepatoma is increased from 36 to 52% in C57L(Fx) mice when supplementary ascorbic acid is supplied. Moreover, Minor and Ramirez (*4*) have reported that cancer patients utilize more ascorbic acid than patients having nonmalignant disease, as determined by daily measurement of ascorbic acid intake and excretion. The present work suggests a similar rapid utilization of ascorbic acid in the gastritic mucosa.

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Chromosomal Interchanges as a Basis for the Delimitation of Species in *Oenothera*[1]

Adolph Hecht and S. L. Tandon

Department of Botany, State College of Washington, Pullman,* and *Department of Botany, University of Delhi, Delhi, India

The delimitation of two species upon the basis of their failure to form a hybrid is untenable wherever

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[2] Submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, University of Florida. Present address: State Department of Health, Baltimore, Md.
[3] Preliminary analysis of our stock of Purina Rabbit Chow Checkers indicated that the concentration of ascorbic acid was < 0.08 mg %.

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