Receptors for histamine in the mucosa, concerned in histamine-stimulated acid secretion, have only recently been defined by BLACK et al.[64]. A specific blocker of mucosal histamine receptors given the trade name burimamide, inhibits to about equal degree acid secretion evoked by histamine, pentagastrin and food. This discovery of a histamine receptor for acid secretion provides strong support for the operation of a single final stimulatory agent, i.e. histamine, and complies with the notion of the secretory device as seen in Figure 7.

Zusammenfassung.

Die hier geschilderte Periode der Histaminforschung ist durch die Erkenntnis gekennzeichnet, dass grosse Veränderungen in der Geschwindigkeit der Histaminbildung unter physiologischen Verhältnissen vorkommen. In der Magenmucosa bedingen Gastrin und Nahrungszufuhr eine Mobilisierung von Histamin und eine Erhöhung der Aktivität der Histidindecarboxylase. Bei verschiedenen Formen von normalem und malignem Wachstum wird in den Geweben «Nascent-Histamin» gebildet, dessen Wirkung exogenes Histamin nicht ausüben kann und auch nicht mit Antihistaminen antagonisiert wird[65].

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SPECIALIA

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Effects of *s*-Triazines on Protein Synthesis in Leaves of Peas (*Pisum sativum* L.) and Sweet Corn (*Zea mays* L.) and on the Ultrastructure of Pea Cotyledons

Sublethal concentrations of *s*-triazines cause an increase of proteins in leaves and seeds of several species of plants[1–4]. The protein-stimulative properties of simazine have been attributed to its action on nitrate reductase activity[2,5]. However, WU et al. have presented evidence that *s*-triazines influence not only the activity of nitrate reductase but also of transaminase, glutamate dehydrogenase, cytochrome oxidase, starch phosphorylase, pyruvate kinase, and δ-aminolevulinate dehydratase[6,7]. Application of these compounds to bush bean plants has resulted in an increased number of rough endoplasmic reticula and protein bodies in the cotyledons[8].

The present study was undertaken to ascertain the effect of *s*-triazines on protein synthesis evaluated as amino acid incorporation in the leaves of peas and sweet corn and ultrastructure of protein bodies of pea cotyledons.

Material and methods. For amino acid incorporation study, 2 and 5 mg/l solutions were made of *s*-triazines, simazine (2-chloro-4, 6-*bis* (ethylamino)-*s*-triazine), propazine (2-chloro-4, 6-*bis*(isopropylamino), igran (2-methylthio-4-ethylamino-6-isobutylamino-*s*-triazine), and prometone (2-methoxy-4, 6-*bis*(isopropylamino)-*s*-triazine). The 2 mg/l solutions were each sprayed on the leaves of the 27-day-old pea plants and the solutions containing 5 mg/l were each sprayed on the 42-day-old sweet corn plants until run-off. Triton-B 1956 was used as a surfactant. Leaf discs were cut with a cork borer from both the controls and treated plants after spraying. The discs were incubated in a medium containing radioactive amino acids. The rate of incorporation of L-leucine-U-^{14}C into protein of leaf discs was measured by using the method of KEY[9].

For ultrastructural study, 2 mg/l water solution of simazine, containing Triton-B 1956 was uniformly sprayed on the leaves of 40-day-old peas. The developing cotyledons were harvested 16 days later (12 days after anthesis). For the electron microsopic study, slices of developing pea cotyledons, approximately 1 mm^3, were fixed in glutaraldehyde and post-fixed in 3% OsO_4. After fixation, tissues were washed with 0.1*M* phosphate buffer. pH 7.3, dehydrated in graded ethanol and embedded in Epon 812. The blocks were sectioned with a glass knife on a Sorvall

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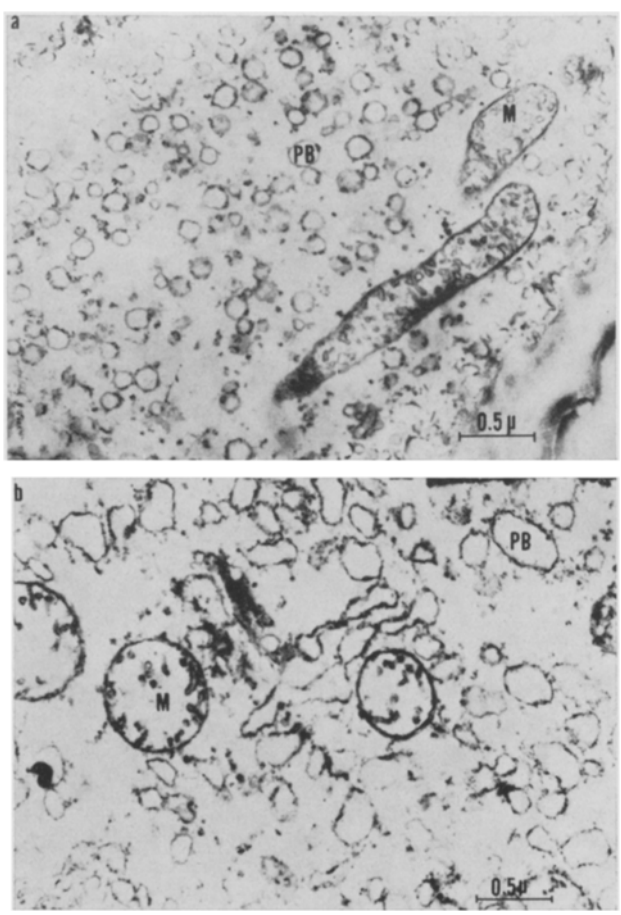
Incorporation of L-leucine-U-^{14}C into protein in leaf discs of peas and sweet corn 8 days after treatment with *s*-triazine compounds

Compounds	Concentration (mg/l)	Pea	Sweet corn
		Specific radioactivity (dpm/0.1 g discs)	Specific radioactivity (dpm/0.1 g discs)
Control	–	1024	434
Simazine	5	1237[a]	498[b]
	2	1194[b]	506[b]
Propazine	5	1208[b]	493[b]
	2	1222[b]	501[b]
Prometone	5	1231[b]	510[b]
	2	1229[b]	517[b]
Igran	5	1184[b]	503[b]
	2	1197[b]	509[b]

[a] Analysis of variance and comparison of means by Tukey's ω-procedure. [b] Significantly different from control at 0.05 level.

MT-2 ultramicrotome. The sections approximately 80 µm thick were mounted on the 200-mesh copper grids and stained with uranyl acetate and Reynold's lead, and examined with a Zeiss EM-9 A electron microscope.



Electron micrographs of portions of pea cotyledon parenchyma cells showing protein bodies, a) from control plants, untreated, note that the protein bodies are small and spherical in shape, b) from the plant treated with 2 mg/l of simazine. PB, protein bodies; M, mitochondria.

Results and discussion. The leaf discs from the pea and sweet corn plants treated with any of the 4 *s*-triazines had higher rates of incorporation of L-leucine-U-^{14}C into soluble proteins than those from the controls (Table). The observed L-leucine-U-^{14}C incorporation rates by the leaf discs from *s*-triazine-treated plants appear to be indicative of the rates of protein synthesis and enzyme activities in intact plants reported earlier from this laboratory[4, 6, 7].

Marked changes were noted in the ultrastructure of the cotyledon parenchyma cells of peas treated with simazine. The most obvious changes noted were in the shape and size of the protein bodies (Figure). These changes are similar to those observed in this laboratory on bean cotyledons following application of atrazine, simazine, igran, and GS-14254[8]. The cotyledones from the *s*-triazine-treated bean plants contained more protein bodies and more rough endoplasmic reticula. In germinating seeds of *Vicia faba*, the loss of an electron-dense material from the protein bodies was concurrent with the decrease in nitrogen in the cotyledon and almost certainly represented the transfer of the protein to the growing apex[10]. In other words, the decrease or increase in the protein content of the cotyledons can be explained on the basis of the structural changes in the protein bodies.

Zusammenfassung. Nachweis, dass die Blattbehandlung mit subletaler Konzentration von Simazin, Propazin, Igran und Prometon die Protein-Synthese bei Erbse und Mais vermehrt. Die Blattbehandlung mit Simazin zerstörte die Ultrastruktur des Samenlappens bei der Erbse.

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