

CHEMISTRY

Janet Hopson reports from the meeting in Anaheim, Calif., of the American Chemical Society

Prostaglandins in plants

Since their discovery in 1957, the fatty acid substances known as prostaglandins have received considerable attention. They are found in many mammalian tissues and are implicated in an astonishing array of biological reactions, from uterine contractions to platelet aggregation.

Now three biochemists from North Dakota State University at Fargo have found prostaglandin-like fatty acids in plants. Don C. Zimmerman, Paul Feng and Brady A. Vick obtained a complicated substance they call 12-oxo-PDA for short, by reacting linoleic acid (a common plant fatty acid) with extracts from flax seed and lettuce and sunflower seedlings. This 12-oxo-PDA closely resembles prostaglandin A1 found only in mammalian tissue.

This discovery is significant in both theoretical and practical ways: Early indications are that 12-oxo-PDA may act as a growth regulator in plants — which represents a further analog to its activity in mammalian tissue as a regulator of the growth messenger cyclic AMP.

More immediate, however, is the promise that 12-oxo-PDA can be harvested from common plants and either modified or used directly to mimic, inhibit or stimulate naturally occurring human prostaglandins.

Resisting pecan scabs

A dastardly fungus called pecan scab is the most important disease of the pecan tree, which, in turn, provides an important cash crop for farmers in the American South. Pecan scab can slash the yield in a stricken orchard by half, and is causing nut farmers a net loss of \$50 million per year.

Now, agricultural chemist Paul Hedin of the United States Department of Agriculture's Boll Weevil Research Laboratory in Mississippi State, Miss., has found a yellow pigmented plant substance called "juglone" in fungus-resistant pecan trees, but not in those susceptible to the fungus. This same chemical occurs in walnuts and hickories, and, when leached from leaves, the substance prevents other plants from growing under walnut trees.

Hedin and colleagues are now trying to breed this juglone trait into susceptible trees, to confer resistance and to avoid the need for expensive and hard-to-apply fungicides.

Wood to alcohol by way of fungi

"Sick" fungi may hold the key to turning wood, paper, cloth and plant materials into ethynol. And industrial chemists at Rutgers University have created the sickest fungi yet.

One creative fuel-producing scheme involves breaking down the cellulose in wood and other waste materials to glucose, then fermenting that sugar to useful alcohol. The first step employs an enzyme called cellulase, which occurs naturally in wood-rotting fungi and a few other microorganisms. But cellulase is quite expensive to harvest, and this expense has been a major block to the expansion of this wood-to-alcohol industry.

Now, D.E. Eveleigh and colleagues S. Cuskey and B. Montencourt have created a very sick strain of the fungus *Trichoderma* that makes very large amounts of cellulase. They mutated natural strains of fungi with chemicals, then grew the altered organisms on a special growth medium which, oddly enough, contains oxenbile and chrysanthemum hormones (among other components).

After screening thousands of strains, the team found one that cannot turn off its production of cellulase, and thus makes 15 times more than normal. Industrial application, however, remains in the future.

BEHAVIOR

Weight-watching: Seeing isn't believing

Those of us who suck in our stomachs while standing in front of a mirror, who skip toast at breakfast to justify eating chocolate mousse after dinner and who, on occasion, might even readjust the bathroom scale because we figure it's off by a few pounds — Take heart. We are not alone.

In a study of 179 male and female undergraduates, Fordham University researcher Susan H. Gray examined how various people perceive their own body images. She reports in *PERCEPTUAL AND MOTOR SKILLS* (Vol. 45, No. 3, p. 1035) that overweight and underweight individuals "were more likely to distort their weight-related appearance than were normal weight respondents."

Among those surveyed (volunteers ranged from 18 to 60 years old), 32.8 percent were underweight, 36.2 percent were normal weight and 31.1 percent were overweight, according to Metropolitan Life Insurance Co. standards. In their self-ratings, "the underweight perceived themselves to weigh more than they actually did, whereas overweight respondents perceived themselves as appearing to weigh less than they actually did," Gray says. Of the total sample, 65.9 percent perceived themselves as normal weight (about 30 percent more than actually *were* normal weight), while only 7.8 percent viewed themselves as underweight and 26.3 percent as overweight. Nearly half the sample inaccurately perceived their weight appearance, and females tended to perceive themselves as heavier, while males saw themselves as lighter. In terms of overall body image, older persons, blacks and Hispanics and normal weight subjects tended to have a more positive self concept than young people, whites and overweight persons.

Children of working mothers

The question of how, or if, a working mother's time away from home affects a child's development has become more critical as increasing numbers of mothers embark on careers. In one of the latest studies of working mothers, University of Michigan researchers compared preschool children of employed and non-employed mothers.

In examining the youngsters' interactive play behavior, researchers Margaret Owen and Lindsay Chase-Lansdale found essentially no differences between the two groups. "Maternal employment seems to have no adverse effects on the children's adjustment," they say.

However, they did find significant differences among children *within* the employed mothers group. Youngsters of mothers who were more "sensitive" to the possible impact of their work schedule on the child were "more socially competent" than children of other working mothers. Sensitive mothers, according to the researchers, were those observant of their child's ability to make friends, become independent or develop in other ways that might be influenced by the mother's work schedule. The results suggest it is the quality, rather than the amount, of time that is the key factor. "Many mothers we interviewed suggested that because their time with their children was more limited, it was more precious," they say.

Welcome to Antarctica: Pop. 1

Some population observers are reacting with alarm to signs of the first baby boom in a previously untroubled region of the globe: the Antarctic. Cooler heads, however, may be thwarting widespread panic. The Population Reference Bureau, Inc., notes that the son born Jan. 7 to Silvia Morello de Palma, wife of Capt. Jorge Palma, chief of Argentina's Esperanza station near the South Pole, is the world's first native born Antarctic.