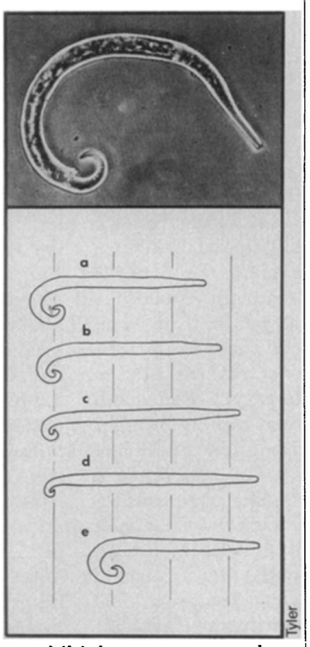
BIOLOGY

Synthetic steroids boost plant growth

Five hundred pounds of pollen of the rape plant yield 10 milligrams of a substance that accelerates plant growth. The growth promoter is a steroid called brassinolide. Bhushan Mandava, who discovered brassinolide, and Malcolm Thompson of the USDA Agricultural Research Center in Beltsville, Md., have synthesized several analogs, which they call brassinosteroids. They reported at the recent Middle Atlantic Regional Meeting of the American Chemical Society that the synthetic compounds boost harvests of radishes and lettuce 15 to 30 percent and of bean and pepper plants 6 to 7 percent in field tests. Mandava estimates that while brassinolide would be too expensive to synthesize for commercial use, the analogs produced commercially would cost only $5 to $10 to treat several acres. "The brassinosteroids are the first steroidal compounds that show promise for increasing crop yield as well as biomass," he says.

Hop-along nematode

A new type of locomotion has been discovered in a small unsegmented worm. Seth Tyler of Washington State University reports that a species of nematode recently discovered on ocean beaches in Maine hops on the tip of its tail from one sand grain to the next. The worm is named *Theristus caudasaliens* ("cauda" for tail and "salient" for hopping) after its locomotion style. "The tail is curled like a watch spring, and the animal essentially springs from one attachment point to the next," Tyler says. Secretions from one set of gland cells momentarily attach the tail tip to the sand, and secretions from other gland cells seem to release the hold. Tyler and Priscilla J.M. Adams have observed the tail with electron microscopy. They find three gland cells involved in adhesion and two presumably in release. Several species in the nematode phylum also exhibit locomotory modes other than the most common whipping, undulatory movement. Tail hopping is the seventh form of progressive locomotion on the nematode list.



New compounds from sweetbread

Normal development of a child's immune system requires a properly functioning thymus gland. Hormones from the gland may also be required to maintain the immune system throughout life. Two substances recently discovered in calf thymus glands are likely to play a role in such development and maintenance. Karl Folkers and colleagues at the University of Texas in Austin have isolated small amounts of two thymic polypeptide molecules, which they suspect to be hormones. One, which they have named thymone A, has about 70 amino acids; the other, thymone B, has at least 13. Several thymic hormones have already been characterized as helping bone marrow stem cells mature into immune system T cells and increase T cell effectiveness (SN: 1/26/80, p. 61). Folkers also has isolated from thymus the coenzyme glutathione, which is suspected of playing a role in the transport of amino acids across membranes.

BIOMEDICINE

Opiate antagonist counters obesity

Brain peptides have already been found to exert a variety of remarkable effects, from pain relief and enhanced pleasure to improved concentration and relief from depression. Now Candace Pert of the National Institute of Mental Health in Bethesda, Md., and other scientists, are finding that one of the peptides — beta-endorphin — appears to be involved in obesity. Pert and NIMH colleagues will soon be reporting in PEPTIDES that an opiate antagonist can slow weight gain, apparently by reducing levels of beta-endorphin.

Naltrexone, an opiate antagonist, was given to young obese mice for five weeks; other young obese mice received saline during the same period and served as controls. All of the animals had continuous access to food during the study period. During and at the end of the study period Pert, along with co-workers Lillian Recant, Nancy R. Voyles and Mark Luciano, measured the animals' body weights and pituitary gland and bloodstream levels of beta-endorphin. They found that the obese rats given naltrexone gained weight more slowly than did the control animals. Pituitary gland and bloodstream levels of beta-endorphin were also significantly lower in the naltrexone-treated rats than in the control rats. So it may be that naltrexone can slow weight gain in obese animals by reducing levels of beta-endorphin in their pituitary glands and bloodstreams.

Vasopressin boosts learning, memory

Another brain peptide — vasopressin — was reported in 1978 to improve learning and memory, both in rats and in a handful of amnesiac patients (SN: 2/11/78, p. 88). The same findings have now been confirmed and extended by Herbert Weingartner and colleagues at the National Institute of Mental Health.

The researchers gave either a synthetic analog of vasopressin or a placebo to a handful of healthy human subjects, depressed subjects and senile subjects daily for two or three weeks. The subjects did not know when they were getting the peptide and when they were getting the placebo. They were tested daily for learning and memory responses.

As the researchers report in the Feb. 6 SCIENCE, the peptide improved learning and memory in all three groups of volunteers compared with when they were getting the placebo. However, the means by which vasopressin boosts learning and memory is not understood.

The cereal marathon

In 1975, the results of studies reported in CONSUMER REPORTS showed that Maypo 30-Second Oatmeal, Cheerios and Special K were "far and away the most nutritious" of all cereals tested (SN: 2/15/75, p. 103). Now, similar studies have once again been conducted, and the results are reported in the February CONSUMER REPORTS. Maypo 30-Second Oatmeal and Cheerios once again took first place, along with Instant Quaker Oatmeal, All Bran, Familia, Kretschmer Sun Country Granola, Shredded Wheat and some others. Special K, however, was this time found to be only fairly nutritious, as were Froot Loops, Wheaties, Hearty Granola and other cereals. Corn Chex, Corn Flakes, Fruity Pebbles and Total were a few found to be the least nutritious.

Variations in ingredients, the authors of the studies report, make it difficult to pinpoint why certain cereals were found more nutritious than others, since wheat, oat and corn cereals scored in both high and low categories. However, none of the rice cereals were found to be very nutritious. And while moderate vitamin and mineral fortification seemed to improve the nutritional qualities of the hot cereals, this was not so with the ready-to-eat cereals.