

MEDICINE

Antipolio Substance

A substance extracted from shellfish, now being tested on mice, may someday help in the control of polio, influenza and perhaps even cancer in humans—By Faye Marley

► IN THE JUICES of oysters and clams science has now found a substance that promises a new lead to cure and control of polio, flu and even cancer, eventually perhaps in human patients.

Still being tested on mice, the bivalve juice material is considered a hopeful approach by scientists at the National Institutes of Health, the U.S. Public Health Service's major research arm at Bethesda, Md. The substance is called paolin.

Death rates have been reduced about 25% in studies of mice infected with poliovirus type one and influenza B virus.

At Woods Hole, Mass., Dr. M. Rosarii Schmeer found most promising extracts in the common edible thick-shelled American clam, called the quahog, *Mercenaria mercenaria*, when she tried them on mouse tumors. NIH is also working on mouse tumors with paolin.

Dr. Schmeer extracted and purified a substance from the quahog that slowed up the growth in Swiss albino mice of a malignant tumor called sarcoma 180.

The paolin substance was first reported in 1960 when Dr. C. P. Li, a virologist in NIH's division of biologics standards fed mice with canned abalone juice and they showed remarkable resistance to experi-

mental polio. This achievement followed four years of work.

Subsequent work at NIH has been done with Dr. Benjamin Prescott of the National Institute of Allergy and Infectious Diseases.

"Paolins" seem to be a normal constituent of the "water," or acetic acid extracts, of all the mollusk species thus far studied. Paolins have been isolated from the clam, the sea snail, queen conch and squid in addition to the abalone and the oyster.

Clams and oysters were obtained from Chesapeake Bay for experimentation at the National Institutes of Health by Dr. Li. He explained how a paolin had been isolated from oysters as a pure substance by precipitation of acetic acid extracts with alcohol. In this way the experimenters concentrated active paolin into a white powder soluble in water.

Although research on the shellfish substances is still in the laboratory stage, Dr. Li and others have hope for its application to human ailments after the present studies have been expanded. Working with Dr. Li at the division of biologics standards is E. C. Martino. George Caldes, at the National Institute of Allergy and Infectious Diseases is working with Dr. Prescott.

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BIOCHEMISTRY

New Enzyme Discovery

► DISCOVERED: an enzyme.

Result: possibly, in the future, a new attack on the killer, high blood pressure.

The new approach to the treatment of hypertension as the result of the isolation and purification of an enzyme is under way at the National Heart Institute, Bethesda, Md.

The enzyme, called L-tyrosine hydroxylase, has been found in the adrenal glands, brain stem and in a variety of tissues supplied with sympathetic nerves. It controls the first step and the rate of synthesis of a hormone suspected of playing a role in high blood pressure called norepinephrine—NE for short.

The suspicion of NE's role has not been confirmed. Norepinephrine is however a powerful heart stimulant and blood-vessel constrictor.

There is ample evidence that most drugs now used to treat high blood pressure owe their pressure-lowering effects to their ability to interfere with the functions of norepinephrine in the sympathetic nervous system.

Norepinephrine is synthesized and stored in specific nerve endings. When it is needed, the nerve is stimulated, releasing the hor-

mone into the blood stream, where it travels to various target organs.

Some drugs used to treat hypertension prevent either the storage or release of norepinephrine at the nerve endings. Another way to stop the effects of the hormone would be to block its synthesis, which occurs in three separate steps.

Inhibitors have been tried on the last two steps, but failed because the scientists picked wrong enzymes. Two enzymes used are 50 to 500 times more active than L-tyrosine hydroxylase.

The newly isolated enzyme can be strongly inhibited in the test tube and one potent inhibitor is now being tried on laboratory animals.

Once it is possible to block NE synthesis in the body, valuable information will be sought to show the relationship to high blood pressure.

The enzyme studies were made by Drs. Morton Levitt, Toshiharu Nagatsu and Sidney Udenfriend of the National Heart Institute's laboratory of clinical biochemistry, with the collaboration of Drs. Sidney Spector and Albert Sjoerdsma of the experimental therapeutics branch of the Institute.

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Lockheed

'SPACE BUG'—A model of a proposed bug-like one-man craft, only six feet tall and equipped with three mechanical arms, has been developed by engineers of the Lockheed Aircraft Corporation, Burbank, Calif., for transferring materials between satellites in space.

PUBLIC HEALTH

Deadly Snakes Kill 30,000 People Yearly

► AN ESTIMATED 30,000 to 40,000 people in the world die from poisonous snake bites each year.

In the United States, however, the fatalities number only about 15.

In the vast tropical lands of Asia, some 30,000 people are bitten annually, and of this number, 25,000 die from the bites, a report in *Nature*, 202:551, 1964, said.

The world's most deadly snakes are the Indian cobra, *Naja naja*; Russell's viper, *Vipera russelli*; the saw-scaled cobra, *Naja hannah*; the Indian krait, *Bungarus caeruleus*, and the Ceylon krait, *Bungarus ceylonicus*.

In the United States, there are about 40 varieties of poisonous snakes: the big coral snakes which can measure almost four feet long, and the vipers which include the copperheads, cottonmouths and rattlesnakes.

Vipers cause more deaths to human beings because they are so numerous and are active during the day, while the cobras and kraits are mostly active at night.

The rice-growing areas of Bengal and Burma, where the Russell's viper thrives, have the highest death rate from snake poisoning. In Ceylon, the Russell's viper and Ceylon kraits kill almost 300 people each year. In northwest India, the saw-scaled viper, which is the most vicious snake known, accounts for the greatest percentage of deaths.

In Africa, about 800 people die each year from snake bites. In Central and South America, about 4,500 people die from the deadly fer-de-lance, *Bothrops atrox*; the bush master, *Lachesis muta*; and the Brazilian rattlesnake, *Crotalus durissus*.

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