

Short Research Communication:

Bio-Active Molecules

There are several examples of bio-active molecules isolated from animal sources, say, snakes, bees, toads, leeches and some mammals, which have found medicinal applications. These applications have been highlighted in this article.

Thus some of the snake venoms have pain relieving action. This property has been exploited in alleviating the extreme pain of the patients in the terminal stages of cancer. Cobra venom (cobrotoxin), for example, is reported to be a superior alternative to morphine in its pain relieving action. The toxins, derived from vipers, have been employed in the treatment of arthritis and rheumatism. Crotalus toxin (i.e. the venom derived from rattle snake and pit vipers) is claimed to be useful in the treatment of the periodic throbbing headache (migraine). Snake venoms usually produce two different types of effects, namely, enhance the blood clotting or inhibit it. Based on this property the patients afflicted with haemophilic disorder (i.e. prolonged bleeding following even minor injuries) can be treated with blood clotting venoms. These also find application as haemostatic agents in surgery and in the treatment of other hemorrhagic conditions. Likewise the anti-coagulant action of some snake venoms has been successfully employed in the case of patients having the formation of blood clots (thrombosis) in their veins and arteries. These venoms are also described to be useful in the case of 'angina pectoris'; - a condition when the patient has a severe but temporary attack of cardiac pain. An interesting use of the venom derived from rattle snake is in the treatment of epilepsy.

The bee venom, 'melittin' is the bioactive molecule which is reported to provide relief to the patients suffering from the pain of muscles and joints, arthritic and rheumatic disease.

Leech saliva contains two powerful enzymes, called 'Hirudin' and 'hementin', which are reported to prevent and even break the blood clot formation within the blood vessels. These enzymes have a potential use in the treatment of cerebral and heart diseases.

Another enzyme, 'Orgetase' is reported to attack and destroy the built-up of jelly in the eyes of a glaucoma patient. This, therefore, holds a great promise for the cure of blindness due to glaucoma.

The skin gland secretions of toad contain a variety of bioactive molecules, viz. 'batrachotoxin', bufotenine, bufotalin etc. The use of dried and powdered toad skins, for the treatment of heart disease dates back to ancient times. This practice is prevalent even today in some East and South-East Asian countries.

A class of biologically active compounds referred to as 'Prostaglandins', have been isolated from the seminal fluid of mammals. These compounds are capable of inducing abortion and also widen the tubular portion of the blood vessels.

The enzymes, α -amylase, isolated from the pancreas of swine, finds therapeutic application and as a digestive aid enzyme and also is an anti-inflammatory agent.

The liver of a large flat fish, 'halibut' is a source of oil which is rich in Vitamin A and D. Thus, the patient suffering from ill-health due to deficiency of these vitamins, could be corrected by the oral administration of halibut liver. Likewise the liver extract of mammals – rich in folic acid and vitamin B-12 finds application in the treatment of anaemia. The extract of heart muscle of calf embryos is reported to dilate the choked blood vessels of heart patients.

The hormone, 'Andrenaline' secreted by the glands, located near the mammalian kidney, has found useful application as a heart stimulant and provides relief from persistent coughing. For the treatment of acute heart attack the use of enzymes 'hyaluronidases' (isolated from testicles of mammals) have shown encouraging results. Another enzyme called 'Lysozyme' is found in egg white and in high concentration in tear fluid, mucus and in some organs, like heart, spleen and liver. It is used as an antibiotic and in the treatment of cancer and hemorrhagic conditions.

Finally, it may be pointed out here that Unani System of Medicine relies heavily on animal based products. The examples cited above provide support to the claims of Hakeems in respect of the efficacy of some of the animal based products as medicine. A considerable amount of work has been reported about the isolation of a large number of bioactive molecules from plant source. In this context it may be pointed out here that the animal sources have not been fully explored and exploited. Thus there is a great scope for research in this area and there are good chances of isolating organic molecules with very interesting pharmacological activities.

Reference

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