

ANTIPOISONOUS PROPERTY OF CANAVALIA VIROSA

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ABSTRACT : Canavalia virosa seed is applied on the wound after removing the seed coat. This sticks to the skin till the poison is completely removed and falls off which takes five to seven hours. There is complete relief of the poisoning in the case of Scorpion, Centipede., and the seeds which have been detected and studied here.

Introduction

Poisoning due to snake, scorpion, centipede and insects are very common in tropical countries and some of them are fatal if not attended to in time particularly snake poisoning. The relevant literature in the Ayurvedic system of medicine contain several medicines either alone or in combination for the treatment of snake poison cases (Susrutha Samhitha Kalpam 5/20.29)¹. Biochemical investigations about poisons have also been carried out. Snake bite causes lysis of snake RBC or neurotoxic symptoms leading to death. Venoms of scorpion causes mostly local reaction consisting of sharp burning sensation around the place of sting⁽²⁾, which may last upto several hours. The scorpion venom has been shown to produce, neurotoxic, circulatory and muscular effects when injected in men or experimental animals. The presence of glycoproteins have been identified in Scorpion and other posions. On the basis of

investigation the chemical nature of several poisons have been identified. The tribals of Bastar and cultivated in the herbarium of our Ayurvedic Centre. The plant was identified by the department of Botany, University Calicut, Forest Research Institute, Peechi, and Agricultural University, Coimbatore. Preliminary investigation with the seeds gave positive results in the case of poisoning due to scorpion, centipede etc and biochemical studies were carried out with seeds which contain lectin. Lectins are usually glycoproteins which can specifically react with carbohydrate of other glycoproteins, glycoproteins, glycolipids etc. In the present paper the effect of the seeds in poison cases and the detection of lectin is presented.

Materials and Methods

The seeds were obtained from out Ayurvedic research centre. In the case of poison cases

the seed is directly applied over the wound after removing a portion of the seed coat by rubbing on a rough surface or by other means . The inner portion of the seed get attached to the wound and stick to it for several hours till the symptoms of poisoning disappear. We have found 5 to 7 hours attachment on the wound in the case of scorpion and centipede poisoning. After this period the symptoms disappear and the seed falls off.

The detection and estimation of lectin was carried out by extraction with normal saline and agglutination was quantitatively determined using human, rabbit, sheep and mouse red blood cells.

Human blood of different groups were obtained from the blood banks of Amala Cancer Hospital. Trypsin was obtained from the sigma Chemical Company. Dried seed powder (2gm) was extracted with 20ml of 0.15 M sodium chloride after keeping it for 24 hours at 4⁰ C. This was centrifuged and the supernatant is tested for lectin. The protein content of this solution was estimated by the method of Lowry et al ⁽³⁾. The estimation of lectin was carried out in the supernatant by using red blood cells with and without trypsinisation. The erythrocytes were treated with 0.1% trypsin solution for one hour at 37⁰C and washed three times with 0.02M Phosphate buffer P^H 7.4 Containing 0.15 M sodium chloride (PBS). A 2% solution of erythrocytes was made in the same buffer . A two fold serial dilution each having A volume of 0.1 ml of the sample was prepared in the microtitre plate. All the dilution were mixed with equal volume of suspension and after equal volume of suspension and after sedimentation which may require two hours the titre was estimated based on the serial dilution. The haemagglutination activity was expressed per mg of the protein present in the solution.

Results and Discussion

A number of poison cases with scorpion and centipede have been treated with the seed. It is found that application of the seeds are very effective in relieving the symptoms completely within five to seven hours, during which time the seeds stick to the surface of the skin and falls off afterwards. During this period the patient can be made even after twenty four hours of poisoning with good effect.

Since we have found lectin in the seeds, the anti- poisonous principle of the seeds may be lectin. Lectins are proteins having bifunctional or polyfunctional affinity for carbohydrates which are specific. Thus they interact with glycoproteins or glycolipids and a result of it the biological properties of these compounds are changed.

We are not able to give a proper explanation for this, antipoisonous property but a property of lectin in having affinity for carbohydrates, especially on glycoprotein and their identification may give a hypothesis for the action of the seed. The poisonous nature of the venom are due to glycoproteins which are injected to the blood stream and they are in circulation. The lectin in the seed may react with this glycoproteins in circulation as it comes into contact with the wound by inactivating it by this specific reaction with the carbohydrate portion and in this case the poisonous glycoproteins of venom are made ineffective biologically. The carbohydrate of the venom glycoproteins may get exchanged with lectin thereby making it inactive and this may be the process taking place on application of the seed.

We have detected lectin and found to have activity in 0.1 ml solution containing 2.2

microgram of protein which is equivalent to 451 units per mg of protein. The presence of lectin have been reported in approximately two thousand plants and purified from more than fifty plants.

This is very active as compared to other lectins and we find approximately 4.5% lectin in the seed which is higher than many lectin containing seeds. *Canavalia ensiformis* contain about 2.3% Concanavalin. This lectine of *canavalia virosa* reacts very well with all human blood groups as well as those of rabbit, sheep and mouse both before and after trypsinisation, but the activity is five times increased after trypsinisation.

Canavalia virosa is a plant of legumenosa family and it is the first time the presence of a lectin is reported. Another species of the same family *Canavalia ensiformis* contain the most widely

studied lectin cancanavalin A (Con A). The effect of this seed in other poison cases have not been studied. Work on the purification of this lectin is in progress after which it may be possible to understand how it functions as cure for poisoning.

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References

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