INTRODUCTION
Mao has shared this planet of ours with noxious and venomous insects and has often suffered from their sting. The first acquaintance of man with scorpion sting must have occurred during the haze of pre-historic times. During the succession of millennia after that, man has never lost his fear and repugnance of scorpions as their sting is sometimes fatal, but always extremely painful. It is no wonder that scorpion-venom using the term scorpion in an omnibus fashion to describe its many species—has been subjected to research in many laboratories all over the world.

Interest in venom research has been closely related to the applied significance of such research. In general, treatment of envenomation is very often less than satisfactory. No doubt a contributory factor is the inadequate knowledge available about many species. Obviously logical and adequate therapy would have to be devised in the context of adequate information about venom constituents, their biological activity and biochemical characteristics.

Investigation into these aspects of venom has its own problems. Interspecies variation has to be taken into account. A classical example is the remarkable variation between the pharmacodynamic activity of snake venoms from colubridae and vipersidae. Thus the findings with one species cannot be extrapolated to another. Secondly, the venom output depends partly upon the age and sex of the insect, and sometimes upon the season too. Also, the method of obtaining the venom may introduce other problems. In many species, the venom is
obtained by macerating the sco containing venom and thereafter subjecting it to various extraction procedures. In such circumstances, the material obtained is a mixture of the venom and the sco wall; the later may possibly contribute toxic ingredients not normally present in venom. Thirdly, almost any venom is a mixture of several substances, so that the pharmacodynamic action of the whole venom is an algebraic sum of the pharmacodynamic action of the individual constituents. It is conceivable and different constituents may have directly opposite actions, tending to cancel out each other when the whole venom is employed, so that these actions may be missed. Fourthly, some of the constituents may be labile, and easily degraded or destroyed during experimental manipulation unless special precautions are taken. Finally, there is a great deal of antigenic variation in venom and its constituents which has to be taken into account in the production of antivenin.

Some information is available regarding the pharmacodynamics of venom from certain species of scorpions, but regarding many other species very little is known. Virtually nothing is known about the pharmacodynamic activity of the scorpion Heterometrus bengalensis, a species very common in this part of India. Scorpion sting is common in this part of the country; a number of young children die in Calcutta hospitals every year as a result of scorpion bite. It has not been possible to devise rational therapy; it is not surprising that such therapy is less than fully efficient. Different substances are used on the basis of their being antidotes to the venom concerned. In the absence of information concerning the pharmacodynamic activity of the venom, it is difficult to evaluate whether a given substance is an antidote or to screen compounds for such activity.
Fig. 1.0.1: *Heterometrus bengalensis* (C.L. Koch, 1842)
The use of antivenin also plays a major role in many types of envenomation. However the antigenic content may vary from species to species and this is a problem which is only partly solved by the use of polyvalent serum. A clear understanding of the pharmacodymanic activity of a given venom will enable location of such of its actions as are critical for pathophysiological changes, so that measures can be developed to modify or abolish these.

In course of the present investigation, the present worker has tried to study the active constituents of *Heterometrus bengalensis* venom, including a smooth muscle contractile fraction which does not seem to have been reported earlier. It is hoped that this will lead to a better understanding of the nature and actions of this venom. Such information may help later to explore avenues of rational therapy of scorpion sting in this part of the world.