

Chapter V

DISCUSSION

Several methods for determination of blood sugar levels have been developed recently. The simplest and most specific of these methods is the o-toluidine method. It is a rapid, sensitive, precise and reliable method which can be used to determine blood glucose level over a wide range of concentrations, 0 to 800 mg/100 ml of blood. This method is convenient for laboratories with limited facilities.

The animals used in these experiments were apparently normal rabbits which were bought from customers. They were acclimatized in the air-conditioned room and experiments were carried out in that same room. The laboratory determination of the glucose in the blood samples was, however, done outside the animal room. Attempts were made to avoid producing excitement hyperglycemia in the animals, although these were not completely successful and wide fluctuations of the blood glucose level were noticeable in some of the experiments.

Effect of distilled water and of chlorpropamide on blood sugar levels

Distilled water and chlorpropamide were used in some of these experiments as negative and positive control agents. The absence and presence of the hypoglycemic activity of these two agents were clearly confirmed.

In the case of chlorpropamide, when different doses of the drug, 60 and 125 mg/kg of body weight, were orally administered to the healthy rabbits, the blood sugar level began to decline at different periods of time after the administration. In the group receiving chlorpropamide at a dosage of 60 mg/kg (experiment number 1), no significant change in the blood sugar level was observed during the first two hours after the administration but the level was since then reduced until the end of the experiment at the sixth hour. The animals in the group receiving 125 mg/kg of the drug, on the other hand, began to reveal reduction of the blood sugar level since the first or the second hour after the administration until the end of the experiments (experiments number 1, 3 and 8). It is thus apparent that the onset and duration of action of the drug depend upon its dosage level. This is the characteristic behaviour to be expected from the administration of an effective oral hypoglycemic agent.

Effect of aqueous and alcoholic extracts of the berries of *S. sanitwongsei* on the blood sugar level of normal rabbit

The aqueous extract of the berries of *S. sanitwongsei* was given to normal rabbits in the experiments number 2 (5 and 10 g/kg doses), number 3 (5 g/kg dose), number 5 (5 g/kg daily for 3 days), and number 6 (10 g/kg daily for 7 days). Slight, yet statistically significant, reduction of the blood sugar levels was observed only in the experiment number 2 (single-dose). It has already been pointed out in the preceding chapter

that the apparent, slight and only transient reduction of the blood sugar level in that experiment is quite questionable, and that the hypoglycemic activity of S. sanitwongsei, if any, is relatively weak. No other experiments could demonstrate this hypoglycemic activity.

In the case of the alcoholic extract given in the experiment number 4, slight reduction was similarly observed when the 5 g/kg dose was given; but there was no change of the blood sugar levels when the 10 g/kg dose was administered. The hypoglycemic activity of the alcoholic extract is, therefore, also questionable.

The inconsistency in the action of these extracts of S. sanitwongsei in the reduction of the blood sugar in these experiments might, probably, be due to the fact that the active components contained in each extract used were not of the same quantity, because the numbers of the ripe and the young berries in each extract were not proportionally equal, and/or that S. sanitwongsei berries possessed both the hypoglycemic and the hyperglycemic substances (Karunyavanich and Suvagondh, 1949). The possibility of some degree of hyperglycemia caused by excitement of the animals through handling which might offset the hypoglycemic action of the drug, when the latter is weak, should be also considered.

Effect of aqueous extract of the berries of *S. trilobatum* on the blood sugar levels of normal rabbits

The results obtained in the present study showed that in the case of the animals receiving the aqueous extract at 5 g/kg single dose (experiment number 7), and at 5 g/kg daily for three days (experiment number 9), there were slight reductions of the blood sugar below the original control levels (Table 9 and 11). The hypoglycemic effect was, however, not observable in the groups receiving 10 g/kg single dose (experiment number 7), 5 g/kg single dose when compared with chlorpropamide and distilled water (experiment number 8), or 10 g/kg daily for 7 days (experiment number 10); (Table 9, 10 and 12).

These studies on the claimed hypoglycemic effect of the berries of *S. sanitwongsei* and of *S. trilobatum* seem, therefore, to yield similar results that the hypoglycemic activity, if any, is weak, transient, and not consistent.

Peters (1957) already stressed the point that many investigators of crude drugs could not confirm earlier claims concerning the action of the berries on the blood sugar concentration.