

ABSTRACT

The hypoglycaemic principle present in *Capsicum frutescens* (Bird pepper) was isolated and purified. Insulin binding studies were done on insulin receptors from red and white blood cells in an attempt to identify the mechanism of action.

The method of isolation and purification involved blending and then stripping of the pepper using column technique, Flash Column Chromatography, Thin Layer Chromatography (TLC), and High Performance Liquid Chromatography (HPLC). The hypoglycaemic effect was monitored by Oral Glucose Tolerance Tests (OGTT) with dogs.

Insulin binding studies were conducted with erythrocytes and monocytes obtained from dogs previously treated with a purified capsaicinoid fraction and capsaicin standard. In addition plasma insulin levels and blood glucose levels were measured at this time using the Coat-a-Count and the glucose oxidase methods, respectively.

The results showed that the capsaicinoids were responsible for the hypoglycaemia observed in the dogs ($P < 0.05$).

The results also indicated that the capsaicin and dihydrocapsaicin were the two major active principles present in the capsaicinoids. It also showed that these active principles were causing the hypoglycemia that was seen in the dogs ($P < 0.05$).

It was shown in dogs treated with the capsaicinoid fraction, that there was an increase in plasma insulin concentration ($P < 0.05$) and a decrease in insulin binding on the receptor for the monocytes ($P < 0.05$).

Similar results were obtained with the capsaicin standard ($P < 0.05$).

The insulin receptor affinity studies showed that in dogs treated with the capsaicinoid fraction and capsaicin, there was a decrease in affinity of insulin for the insulin receptor in both the erythrocytes and monocytes ($P < 0.05$).

Again similar results were obtained for the capsaicin standard ($P < 0.05$).

In the receptor number calculations with dogs treated with capsaicin, there were less receptors involved in both erythrocytes and monocytes when insulin was binding to the insulin receptor ($P < 0.05$).

Taken together, it can be concluded that the major hypoglycaemic principle present in *Capsicum frutescens* were the capsaicinoids of which capsaicin and dihydrocapsaicin are the major compounds.

Capsaicin was seen to cause an increase in plasma insulin levels. This subsequently led to a decrease in the binding of insulin to the insulin receptor given that the receptor conformation was altered when insulin was in excess. This regulatory mechanism likely occurs in order to prevent unwanted hypoglycaemia from occurring.