

# BIBLIOGRAPHY OF PHARMACEUTICAL RESEARCH

Compiled by A. G. DuMez, Reporter on the Progress of Pharmacy.

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SOME EFFECTS RESULTING FROM EATING VELVET BEANS.

BY EMERSON R. MILLER, O. N. MASSENGALE AND M. A. BARNES.

The velvet bean can be traced back as far as about 1875 in Florida. Its origin, however, is not definitely known.

At first it was used only as an ornamental vine, but later was cultivated as a soil improver and a forage crop, the acreage gradually increasing until about 1917 when approximately five million acres were in cultivation in the Southeastern Atlantic and Gulf States. Since then the acreage has decreased to less than three million acres.

As the velvet bean is a member of the legume family, it was reasonable to suppose it might be used as food for man. It is reported that at the Florida Agricultural Experiment Station several persons ate small quantities of cooked velvet beans with the result that in some cases vomiting was caused, while in others both vomiting and purging occurred.

In order to have first-hand knowledge in this matter we have, ourselves, eaten small amounts of cooked velvet beans and have been assisted by several students some of whom ate rather freely of them.

One of us ate about an ounce and a half of coarsely ground velvet beans which had been boiled in water about six hours and were then seasoned with salt, pepper and butter. Neither the taste nor the odor of the raw beans was disagreeable to us, but the taste of the cooked beans was very unpleasant even after the addition of a large amount of butter. We found it almost impossible to force ourselves to eat them.

No appreciable effect, aside from the taste, was noticed until about an hour after eating the beans. Gradually there appeared a feeling of fullness and heaviness in the stomach, headache, nausea, irritation and restlessness, but in our case

no vomiting or purging. The general effect might be summed up in the expression, "a horrible feeling that one does not wish to undergo the second time."

Along with this experiment we had a very disagreeable experience by simply remaining in the room in which about four pounds of coarsely ground beans were boiled for several hours in an open vessel. Very soon after boiling began it was noticed that some substance was given off, which produced a burning or smarting sensation in the eyes and also a pronounced headache, a feeling that the head would burst or split open in the region of the temples. This sensation was still more noticeable when five pounds of beans were cooked in an autoclave under a pressure of fifteen pounds and the pressure suddenly released.

Another one of us ate about an ounce and a half of velvet beans boiled, whole, for several hours. The results in this case were similar to those just related. A sleepless night was passed with great restlessness. Vomiting was voluntarily induced in order to gain relief, but the disagreeable effect lasted for some time, nevertheless.

Several students ate variable quantities of finely powdered velvet beans which had been cooked by boiling in water for one and a half hours and then seasoned with salt and butter. In two or three cases each student ate as much as seventy grams or about two and one-third ounces. One person soon complained of the unpalatability of the beans, stating that he could scarcely force himself to eat them and that he felt very much as if he might vomit. This student ate less than an ounce.

Of five students who ate of the beans, only one reported that vomiting was caused. In this case seventy grams of cooked finely ground beans were eaten about five o'clock P.M. Very little supper was eaten that evening as there was no desire to eat. No appreciable unpleasant effects were felt until about midnight, when the student awoke with a sensation of heat, attended with perspiration and a feeling of slight nausea followed by sudden vomiting.

Another student who ate seventy grams of beans at five o'clock P.M. ate no supper that evening as there was no feeling of hunger. This student found it difficult to eat the beans and reported that they caused headache and nausea which lasted eight or nine hours. He awoke about three o'clock in the morning unusually hot and wet with sweat.

From these results it will be seen that the velvet bean contains some substance not found in any legumes commonly used as food for man. We have identified in the velvet bean an amino acid which is a pyrocatechin derivative. This substance had previously been identified only in the pods of the Horse Bean (*Vicia faba*). Guggenheim found that two and a half grams of this amino acid when taken by mouth produced extreme nausea and that he was compelled to vomit three times within ten minutes. Hence we conclude that the disagreeable effects resulting from eating velvet beans are due in part at least to the presence of this amino acid.

However, our experience in cooking velvet beans has shown that some other disturbing substance is present, either as such or is developed during the process of cooking. This is a volatile substance the nature of which has not yet been determined, though there are indications that it is a sulphur compound.