

The Toxicity of Pumpkin Seed (*Cucurbita pepo L.*)

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THIS investigation was prompted by the fact that recently a report was made by a farmer in the Volksrust district that his sheep, which were running on a land littered with "boer pumpkins", developed symptoms of paralysis and died. The animals were feeding extensively on the pumpkins and were also eating the seed. Stockowners have repeatedly suspected pumpkin seed of causing "craziness" and symptoms of paralysis in stock, ostriches and poultry.

The following experiments were conducted with the seed, which was freshly removed from mature "boer pumpkins":—

(1) A one-year-old sheep (No. 40623, weighing 22 kg.) received 400 grams of the fresh seed per stomach-tube daily on three consecutive days.

Result.—On the third day of the experiment the animal showed diarrhoea. It showed no symptoms of illness and was feeding well. On the third day after the last dose the animal appeared to be in normal health again.

(2) Rabbit A (1.9 kg.) received 20 grams of the fresh seed per stomach-tube daily on three consecutive days.

(3) Rabbit B (1.8 kg.) received 40 grams of the fresh seed per stomach-tube daily on three consecutive days.

Result.—The animals developed no symptoms of poisoning.

It should be mentioned that the entire fresh seed was minced and drenched with water.

LITERATURE.

It is well known that pumpkin seed has been and still is being used as a taenicide both by medical practitioners and laymen. For several decades the seed has been recognized as a tapeworm remedy by the United States Pharmacopoeia. Its anthelmintic action is, however, doubted by some investigators. It should, however, be mentioned that others apparently achieved success by treating cases of tapeworm with pumpkin seed. In 1875 Heckel (Power and Salway, 1910) was able to expel tapeworms by means of the membrane surrounding the embryo. He believed the active principle to be a resin.

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Wolff (Power and Salway, 1910) found this resin to be an efficient taenifuge in doses of 1·0 gram. Power and Salway (1910) isolated a fatty oil and a resin from fresh pumpkin seeds obtained from the United States. Dr. Dale, Director of the Wellcome Research Laboratories, found that doses of 30 c.c. of the fatty oil, isolated by Power and Salway, had no effect on tapeworms in dogs. Also the resin in doses of 0·9 gram had practically no effect on tapeworms in these animals. In addition to these experiments several medical practitioners administered 15 to 60 c.c. of the oil and 1·0 gram of the resin to human beings suffering from tapeworms without achieving any results. In a later publication by Power (1912) he again refers to the value of pumpkin seed as a taenifuge, and states there are no grounds for the incorporation of the seed in the pharmacopoeia. Rath (1929) mentions the following cases: (a) Slop determined as early as 1881, that 150 to 200 seeds, or 15 to 20 grams of the oil contained in the seed, provide a safe means of expelling tapeworms. He stressed the point that the pumpkins should be grown in a warm climate. (b) In 1885 Hartwich investigated the anthelmintic properties; and (c) in 1915 Stefanowicz reported that he had treated fifty cases of infections with *Taenia saginata* and *Taenia solium* with pumpkin seed, and that in one case only was it necessary to repeat the treatment.

Weiss (1928) states that he was able to remove *Taenia saginata* from himself with pumpkin seed. The head of the tapeworm was also expelled a few hours after he had taken 200 shelled seeds followed by a dose of castor oil. The treatment with pumpkin seed was applied after an unsuccessful attempt to remove a tapeworm with *flmaronic oil*. He also mentions other cases of tapeworm infections which were treated successfully with pumpkin seed. He recommends the seed as a safe and efficient tapeworm remedy in doses for adults of from 150-200 seeds. They must be fresh, and must be taken macerated into a porridge with milk. Castor oil should be administered about an hour after the seeds were taken. It is stated that the ingredient (or ingredients) responsible for the expulsion of tapeworms is situated in the thin greyish layer underneath the shell of the seed. Rath (1929) failed to confirm this contention. The seeds should therefore be carefully shelled so as not to remove this layer.

Rath (1929) conducted some experiments with pumpkin seed upon a small earthworm, *Allophora foetida*. Rath extracted from the seed an oil, which he found to be very poisonous to the earthworms, an emulsion of 1:500 with water killing earthworms in 3-4 hours. After extraction with ether, petroleum ether, or alcohol, the seed residue was found to be non-poisonous to earthworms.

Wehmer (1929) gives a full account of the chemical composition of the pumpkin and its seed.

The use of "Melon pumpkin seed", the fresh seeds of *Cucurbita maxima* Duchesne, as a taenifuge is mentioned in The British Pharmaceutical Codex, 1934, p. 374. It is stated that its use should be preceded by the administration of a saline purge, and followed by a dose of castor oil.

Immelmann (1933) also reports favourably on the use of pumpkin seed as a taenifuge.

SUMMARY.

(1) No experimental evidence was obtained to support the contention that pumpkin seed produces paralysis in stock. A young sheep drenched with large amounts of fresh seed developed transient diarrhoea. It is possible that pumpkins grown in different areas differ in their effects on stock.

(2) The evidence found in the literature in regard to the value of the seed as a taenifuge is contradictory. It is possible that the ingredient (or ingredients), which is responsible for the effect of the seed as a taenifuge, varies in the specimens of pumpkin grown in different areas.

(3) The fatty oil and the resin contained in pumpkin seed appears to be non-toxic to animals and human beings when given in moderate doses.

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