

THE TOXICITY OF (A) *NEORAUTANENIA FICIFOLIA* (BENTH.)
C. A. SMITH AND (B) *NEORAUTANENIA CORIACEA* C. A. SMITH

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(A) *NEORAUTANENIA FICIFOLIA*

In 1953 Steyn and Venter¹ reported a fatal case of poisoning with the tuber (rootstock) of *Rhoicissus cuneifolius* in a Bantu man. *Unfortunately, the plant was wrongly identified at the time and, after publication of the article, it was correctly identified as Neorautanenia ficifolia (Benth.) C. A. Smith (Figs. 1 and 2).*

Recently, Dr. C. J. F. Grobler, of the Voortrekker Hospital, Kroonstad, O.F.S., submitted to me the rootstock of a plant which proved to be *Neorautanenia ficifolia*, with the report that it had caused serious poisoning in a Bantu man who had ploughed it up on a land in the Eastern Free State and had eaten a small piece of it. The rootstock proved to be negative for hydrocyanic acid. Biological tests with the rootstock on rabbits yielded results identical to those described previously by Steyn and Venter,¹ and the symptoms described in the man by Dr. Grobler resemble those recorded by Steyn and Venter¹ in 1953. I should add that the first symptom seen in the rabbits was dilatation of the pupil, which did not react to light. Rootstock material of *Neorautanenia ficifolia* was handed to Dr. P. R. Enslin, Head of the Section of Organic Chemistry, National Chemical Research Laboratory, Council for Scientific and Industrial Research, Pretoria. He will isolate the toxic principle(s), which appears to be a severe paralytic agent.

Histology

Dr. R. C. Tustin, Section of Pathology, Onderstepoort Laboratories, kindly examined the specimens of rabbit organs histologically and submitted the following report:

The most apparent histopathological changes in the organs were as follows:

Rabbit A (4.5 kg.). Received 50.0 G. of the fresh tuber and died one-and-a-half hours after administration.

Kidney. Fairly severe hyperaemia present in parts.

Some tubuli show cloudy swelling. Glomeruli appear swollen and some cells pyknotic.

Liver. Mild infiltration of round cells into portal tracts. *Myocardium.* Nothing unusual.

Spleen. Phagocytosis by macrophages of multiple round bluish-staining objects, fairly numerous.

These objects (I could not identify them) vary greatly in size—from that of an anaplasma to a babesia. They stain dark blue with giemsa and red with BB. (i.e. negative for iron).



Fig. 1. Leaf, flowers and pod of *Neorautanenia ficifolia* (Benth.) C. A. Smith.

Rabbit B (3.4 kg.). Received 25.0 G. of the fresh tuber. The animal died 20 minutes after administration of the plant.

Liver. Cytoplasm of majority of liver cells shows degenerative changes. Mild round-cell infiltration into portal tracts.

Spleen. As for 'A' above, and mild haemosiderosis.

Kidney. Mild nephrosis manifested by pyknosis of nuclei of tubular cells.

Myocardium. Nothing unusual.

Rabbit C (3.0 kg.). Received 45.0 G. of the fresh tuber in the course of 4 days. Killed for postmortem purposes 24 hours after the last dose. The animal showed slight symptoms of poisoning.

Liver. Very mild fatty changes. Moderate infiltration of round cells into portal tracts.

Spleen. As for 'B', and an increase in the number of neutrophils.

Myocardium. Nothing unusual.

Lungs. Nothing unusual.

Kidney. Very mild nephrosis.

Rabbit D (3.5 kg.). Received 95.0 G. of the fresh tuber in the course of 5 days.

Liver. Congestion. Very mild round-cell infiltration into portal tracts.

Spleen. Congestion severe.

Myocardium. Nothing unusual.

Lung. Nothing unusual.

Kidney. Nothing unusual.

The kidneys appear to be most severely affected by the toxin with mild degenerative changes present in the liver of some. The spleens of those that died showed a haemosiderosis (mild) plus these rather peculiar 'objects'.

(B) NEORAUTANENIA CORIACEA (WILD SWEET PEA)

In 1931 Steyn² reported on the results of chemical and biological tests conducted with the rootstock of *Neorautanenia coriacea* collected in the North-Western Transvaal. No hydrocyanic acid was detectable in the specimen, and a full-grown female goat drenched with 600.0 G. of the fresh rootstock developed no symptoms of poisoning.

Subsequently, more material of this plant was submitted from the same area. Also in this case the rootstock contained no hydrocyanic acid, and a full-grown female goat which was drenched with 1.5 kg. of the fresh rootstock, suffered no ill-effects. The rootstock of *Neorautanenia coriacea* is used as a fish-poison by the Bantu in the North-Western Transvaal.

DISCUSSION

To the many appeals I have made in the past, I wish to add the following:

A point which is of such great importance in connection



Fig. 2. Runner with flowers of *Neorautanenia ficifolia* (Benth.) C. A. Smith.

with plant poisoning, especially in children, and which I have stressed so frequently, is again in evidence in this case, viz. the extreme urgency of teaching all the people in our country to distinguish between edible and poisonous wild plants. Education in this respect should begin in our primary schools.

Yet another fatal case of plant poisoning (through ignorance) has been added to the long list of deaths. Let us hope that the tragedy described in this article will serve to expedite the efforts which we have, for so many years, been making to supply all our schools with coloured plates of those poisonous plants which have taken toll of so many lives, and, saddest of all, the lives of so many children. There can hardly be anything sadder than deaths in children which are preventable if we but do our duty.

I am indebted to Dr. C. J. F. Grobler for bringing this case of poisoning to my notice; to Dr. S. Goldberg, of Viljoenskroon, O.F.S., for further material of *Neorautanenia ficifolia* for investigation; to Dr. R. C. Tustin for examining the specimens of animal organs histologically; and to Miss M. Bennett and Miss I. C. Verdoorn, both of the Division of Botany, Pretoria, for identification of the plants.

REFERENCES

1. Steyn, D. G. and Venter, I. D. (1953): S.Afr. Med. J., 27, 64.
2. Steyn, D. G. (1931): 17th Rep. Dir. Vet. Serv. and An. Ind., p. 707.