

Recent Investigations into the Toxicity of Known and Unknown Poisonous Plants in the Union of South Africa.

By

DOUW G. STEYN, B.Sc., Dr.Med.Vet., D.V.Sc., Veterinary
Research Officer, Onderstepoort.

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ASCLEPTADACEAE.

Trichocaulon piliferum (L.f.) N.E. Br. (O.P.H. No. 4319; 14.7.33).

Common name.—Ghaap.

Origin.—Barrydale, Cape Province.

Uses.—It is used as a stomachic. The plant has a bitter taste.

State and Stage of Development.—Fresh; no flowers or fruits
were present.

Rabbit.—Received 50 gm. of the fresh plant by stomach tube
on 15.7.33.

Result.—16.7.33; another 50 gm. of fresh plant. The animal
developed no symptoms of poisoning.

AMARYLLIDACEAE.

Buphane disticha (Linn. f.) Herb. (O.P.H. No. 6919; 13.10.33)
= *Buphane toxicaria* Herb.

Common Names.—Gifbol, seeroogblom.

Origin.—Nongoma, Zululand.

State and Stage of Development.—Fresh; no flowers or fruits
present.

Rabbit.—Received 10 gm. of fresh bulb and leaves by stomach
tube.

Result.—Negative.

Rabbit.—Received 80 gm. of fresh bulb and leaves by stomach
tube.

Result.—Fifteen minutes after having been drenched the animal
exhibited pronounced dyspnoea and restlessness. The heart-action
was extremely accelerated and weak. Death occurred 30 minutes
after drenching.

Post Mortem Appearances.—Pronounced hyperaemia and slight
oedema of the lungs; heart in systole.

COMPOSITAE.

Epaltes alata Steetz (O.P.H. No. 3891; 19.6.33; N.H.P. No. 15300).

Distribution.—Pietersburg, Potchefstroom, Bloemhof, Schweizer Reineke, Heidelberg, Waterberg, Transvaal; Kroonstad, Heilbron, Orange Free State; Vryburg, Warrenton, Cape Province; Bechuanaland; Southern Rhodesia; Portuguese East Africa.

Active Principle.

Unknown.

Toxicity of the Plant.

No records of the toxicity of the plant could be found in the literature consulted. The author conducted the following experiments at Onderstepoort: A full-grown sheep, which had received 500 gm. of the fresh plant (collected in the Bloemhof District, Transvaal, in the flowering stage) per os. on each of two consecutive days developed no clinical symptoms (Steyn, 1929). The following experiments were conducted with the plant in the late flowering and seeding stage collected in the Heilbron District, Orange Free State: (a) 400 gm. of the fresh plant followed by 200 gm. on the succeeding day induced transient symptoms of poisoning in a sheep; (b) a full-grown sheep, which had received 100 gm. of the dry plant on each of four consecutive days followed by 200 gm. on each of five consecutive days, died on the ninth day of the experiment; (c) a full-grown sheep, which had received 1,500 gm. of the dry plant in the course of thirty-six hours, died twelve hours after administration of the last dose; (d) 30 gm. of the dry plant administered daily for eleven days had no ill effects on a full-grown sheep; (e) a rabbit (2.2 Kg.), which had received 10 gm. of the dry plant daily for eleven days, and (f) a rabbit (2.1 Kg.), which had received 10 gm. daily for six days followed by 40 gm. daily for four days, developed no symptoms of poisoning.

Symptoms of Poisoning.

Sheep.—The animal, which had received 600 gm. of the fresh plant (see "Toxicity of the Plant") on two days, developed the following symptoms on the fourth day after having received the second dose: paralysis of the front quarters, imperceptible pulse, dyspnoea (accelerated and abdominal breathing), cyanosis of visible mucous membranes and conjunctivae, loss of appetite, and apathy. On the following day the animal managed to rise with difficulty. There was pronounced ataxy of the fore-legs. Fever, apathy, loss of appetite, weak and accelerated pulse, and dyspnoea were present. On the fourteenth day of the experiment the animal appeared normal with the exception of slight weakness in the front quarters. Loss in condition of the animal had occurred in the meantime. Larger amounts of the plant caused death in sheep forty-eight hours after the first dose. The sheep, which had received 100 gm. of the dry plant daily for four days followed by 200 gm. daily for five days developed clinical icterus in addition to the above symptoms. Temperatures as high as 107° F. were recorded.

Post Mortem Appearances.

General cyanosis; slight hydroperitoneum and hydropericardium; pronounced oedema and hyperaemia of the lungs; subepicardial and subendocardial haemorrhages; degenerative changes in the myocard; pronounced degenerative changes in the liver (boiled appearance). In more protracted cases there was slight general icterus, extensive fatty degeneration with slight pigmentation of the liver, and haemorrhages in and ulceration of the abomasal mucosa.

Senecio bupleuroides D C. (O.P.H. No. 9698; 7.12.32;
N.H.P. No. 14384).

Origin.—Potgietersrust, Transvaal.

State and Stage of Development.—Fresh and in the flowering stage.

Sheep 35330.—Received 400 gm. of fresh leaves, stems and flowers on each of two consecutive days.

Result.—Negative.

DICHAPETALACEAE.

Dichapetalum cymosum (Hook.), Engl.

Common Names.—Gifblaar, blaargif, blinkblaar.

Origin.—Rietondale, Pretoria.

As stock-owners report favourable results in connection with the treatment of gifblaar poisoning with vinegar and kaffir-beer, it seemed desirable to ascertain whether an acid environment had any detrimental effect on the active principle of this plant. An experiment was conducted on the following lines: (a) The M.L.D. of an aqueous extract of the dried root per Kg. body-weight of rabbit was determined; (b) an aqueous extract of the dried root was rendered acid by the addition of acetic acid and left standing for five hours before administration to rabbits; and (c) an acid aqueous extract of the dried root was prepared by extracting for twenty-four hours with distilled water acidified with acetic acid.

The aqueous extract prepared by immersing the dried root in distilled water was neutral.

The M.L.D. of each of the above extracts per Kg. body-weight of rabbit was 15 cc. (equivalent to 2.5 gm. dry root). An acid environment therefore appears to have no detrimental effect on the active principle of gifblaar.

GENTIANACEAE.

Enicostemma littorale Blume (O.P.H. No. 15,111; 3.3.33).

Origin.—Modderfontein, P.O. Zebediela, Transvaal.

State and Stage of Development.—Fresh and in early flowering stage.

Rabbit.—Received 30 gm. of fresh flowers, leaves and stems by stomach tube.

Result.—Negative.

Homeria pura N.E. Br. (O.P.H. No. 5281; 27.9.32)
(N.H.P. No. 10572).

Common Names.—Yellow tulip, geel tulp.

Origin.—Left bank of Vaal River, Vredefort District, Orange Free State.

Active Principle.

Unknown.

Toxicity of the Plant.

No reference to the toxicity of the plant could be found in the literature consulted. The author conducted experiments with the fresh leaves of the plant in the flowering stage. A full-grown rabbit, which had received 15 gm. of the fresh leaves, developed paralysis of the fore-quarters, accelerated and weak heart-action, and pronounced dyspnoea, and died one and a half hours after administration of the plant. A second rabbit died one hour after having received 30 gm. of the fresh leaves.

Autopsy revealed general cyanosis, pronounced dilatation of both ventricles of the heart, and congestion of the liver and lungs.

LILIACEAE.

Albuca sp. (O.P.H. Spec. 6726; 3.10.33) (N.H.P. No. 15726).

Origin.—Klipriviersval, P.O. Meyerton, Johannesburg.

State and Stage of Development.—Fresh and in flowering stage.

Rabbit.—Received 40 gm. of fresh bulbs, leaves and flowers by stomach tube.

Result.—Twenty hours after having been drenched the animal was listless, took no food and suffered from diarrhoea. Death occurred about thirty-six hours after drenching.

Post Mortem Appearances.—Hyperaemia of the lungs, acute catarrhal gastritis with pronounced hyperaemic patches on mucosa; patchy hyperaemia of mucosa of small intestine.

Ornithogalum Saundersiae Baker (O.P.H. No. 6728; 3.10.33).

Origin.—Stainton, Ixopo, Natal.

State and Stage of Development.—Fresh and in pre-flowering stage.

Rabbit.—40 gm. of fresh leaves and bulbs by stomach tube.

Result.—Sixteen hours after having been drenched the animal appeared listless, took no food and was purging. Death occurred about thirty-six hours after drenching.

Post Mortem Appearances.—Acute catarrhal gastritis with pronounced hyperaemic patches; large amount of fluid in intestine.

PHYTOLACCACEAE.

Giesekia pharnaceoides L. (O.P.H. No. 2710; 13.5.33).

Origin.—Pietersburg, Transvaal.

State and Stage of Development.—Dry and in seeding stage.

Rabbit.—Received 20 gms. of dry plant on each of three consecutive days with negative results.

Oxygonum sinuatum (Hochst.) Dam. (O.P.H. No. 2712; 13.5.33).

Origin.—Pietersburg.

State and Stage of Development.—Dry and in seeding stage.

Rabbit.—Received 20 gm. of dry plant on each of three consecutive days with negative results.

SOLANACEAE.

Cestrum laevigatum Schlecht. (O.P.H. 4485; 27.7.33).

Common Name.—Inkberry.

Origin.—East London.

State and Stage of Development.—Fresh and in flowering and early fruiting stage.

Rabbit.—Received 30 gm. of fresh young shoots, flowers and immature fruit with negative results.

Solanum supinum Dunal (O.P.H. No. 16248; 3.4.33).

Common Name.—Bitterappel; bitter apple.

Origin.—P.O. Middelfontein, Waterberg.

State and Stage of Development.—Dry plant with immature and mature fruit.

Immature Fruit.—Two rabbits received 10 gm. and 120 gm. (in two doses) of fresh immature fruit respectively with negative results.

Mature Fruit.—Two rabbits received 10 gm. and 120 gm. (in two doses) of fresh mature fruit respectively with negative results.

ZYGOPHYLLACEAE.

Zygophyllum foetidum Schrag. (O.P.H. No. 5054; 8.8.33).

Common Name.—Skuimbos.

Origin.—Kruitfontein, Somerset East.

State and Stage of Development.—Wilted and in early flowering stage.

Rabbit.—Received 15 gm. of wilted leaves on each of two consecutive days with negative results.

Rabbit.—Received 60 gm. of wilted leaves in two doses on one day, and 30 gm. on the following day.

Result.—On the fourth day after the last dose the animal was found paralysed and showing continuous clonic spasms of the muscles of the nose, lips and different parts of the body. The legs were moved continuously. The animal appeared unconscious and died after having been in this state for twenty hours.

Post Mortem Appearance.—Heart in systole; hyperaemia of the lungs; urinary bladder markedly distended with urine.

Sheep 37169.—Received 500 gm. of wilted leaves in one dose with negative results.

The experiment had to be discontinued owing to lack of material. The sender of the plant wrote (*a*) that the plant is more poisonous in winter than in summer; (*b*) that stock must be very hungry for the plant to exert its effects; (*c*) that the plant is poisonous only when it grows in the shade; and (*d*) that it is most poisonous in the early morning.

SUMMARY.

The toxicity of fourteen plants were investigated. The symptoms and post mortem appearances caused by three plants, which have previously not been proved poisonous, are described. These three plants are (a) *Epaltes alata* Steetz. (b) *Homeria pura* N.E. Br. and (c) *Albuca* sp. (O.P.H. No. 6726, 3.10.33; N.H.P. No. 15726). According to the results of the experiments conducted no definite opinion as to the toxicity of *Zygophyllum foetidum* Schrag. can be expressed. An acid environment has no effect on the active principle of gifblaar in the course of twenty-four hours.

REFERENCES.

- STEYN, D. G. (1929). Recent Investigations into the Toxicity of known and unknown poisonous plants in the Union of South Africa. *15th Rept. Dir. Vet. Serv., U. of S. Africa*, pp. 777-803.