

Recent Investigations into the Toxicity of Plants, Etc. in the Union of South Africa.

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ASCLEPIADACEAE.

Pentarrhinum insipidum. E. Mey.

Registered number.—O.P.H. No. 3085-86; 12.5.43.

Origin.—Zeerust, Transvaal.

State and stage of development.—The plant was in the dry state and in the early seeding stage.

Sheep 53987 (6-tooth; 30.5 Kg.) was given* 3.25 Kg. of the plant in the course of 9 days.

Result.—Negative.

COMPOSITAE.

Berkheyopsis pechuellii (O.K.) O. Hoffm.

Registered number.—O.P.H. No. 3024-26; 11.5.43.

Origin.—Tsumeb, South West Africa.

State and stage of development.—The plant was in the dry state and in the flowering stage.

Sheep 66461 (full-mouth; 30.5 Kg.) was given 7.5 Kg. of the plant in the course of 22 days.

Result.—Negative.

Helichrysum argyrosphaerum DC.

Registered number.—O.P.H. No. 12919; 12.11.42.

Origin.—Windhoek, South West Africa.

State and stage of development.—The plant was in the dry state and in the flowering stage.

* Except where otherwise stated all the animals were drenched by means of a stomach tube.

Sheep 62032 (2-tooth; 27·3 Kg.) was given 3·3 Kg. of the plant in the course of 12 days.

Result.—Negative.

Relhania trinervia Thb.

Registered number.—O.P.H. No. 1324; 19.4.43.

Origin.—Dohne, Cape Province.

State and stage of development.—The plant was in the dry state and in the flowering stage.

Sheep 65103 (6-tooth; 29·6 Kg.) was given 2·8 Kg. of the plant in the course of 10 days.

Result.—Negative.

Senecio isatideus DC.

Registered number.—O.P.H. No. 3515; 20.5.43.

Common name.—Dan's cabbage.

Origin.—Piet Retief, Transvaal.

State and stage of development.—The plant was in the fresh state and in the pre-flowering stage.

Sheep 63707 (4-tooth; 29·6 Kg.) was given 2·25 Kg. of the plant in the course of 22 hours.

Symptoms.—Listlessness; conjunctivae pale; epistaxis; tympanites; rumen inactive; severe dyspnoea; accelerated, strong pulse; soft faeces consisting practically of pure blood. Shortly before death the sheep developed ataxia and collapsed. The sheep died 28 hours after being given the first dose of the plant.

Post-mortem appearances.—Slight general icterus; ascites; hydrothorax; hydropericardium; subepicardial petechiae; subendocardial petechiae and suggilations; emphysema of the lungs; severe regressive changes in the liver; pigmentation of the kidneys; tremendous number of submucosal petechiae in the abomasum, small and large intestine; contents of the large intestine practically pure blood.

CYCADACEAE.

Encephalartos horridus Lehm.

Registered number.—O.P.H. 17019; 29.1.43.

Origin.—Pretoria, Transvaal.

The ripe fruit of the plant was tested. The stones were removed from the fruit in order to test the stones and flesh separately. The shells were removed from the stones.

Rabbit A (2·5 Kg.) was given 315 gm. of the flesh of the fruit in the course of 11 days.

Result.—Negative.

Rabbit B (2.5 Kg.) was given 30 gm. of the kernels in the course of 6 hours.

Symptoms.—The rabbit died overnight on the day of drenching. Previously nothing abnormal had been observed.

Post-mortem appearances.—Advanced post-mortem changes; hyperaemia, oedema and emphysema of the lungs.

Rabbit C (2.7 Kg.) was given 15 gm. of the kernels in one dose at 4 p.m.

Symptoms.—The rabbit died overnight on the day of drenching without anything abnormal having been observed previously.

Post-mortem appearances.—Hyperaemia and severe emphysema of the lungs; hyperaemia of, and regressive changes in, the liver and kidneys; tumour splenis; slight hyperaemia of the mucosa of the stomach and small intestine.

Rabbit D (3.5 Kg.) was given 35 gm. of the kernels in the course of 3 days.

Symptoms.—The rabbit died suddenly $4\frac{1}{2}$ days after having received the first dose.

Post-mortem appearances.—As for Rabbit B.

Rabbit E (2.7 Kg.) was given 70 gm. of the kernels in the course of 3 days.

Symptoms.—Listlessness; anorexia; severe dyspnoea; very little defecation. The rabbit died $3\frac{1}{2}$ days after having received the first dose.

Post-mortem appearances.—General icterus; severe hydrothorax; slight emphysema and severe hyperaemia and oedema of the lungs; regressive changes in the myocardium and kidneys; very severe regressive changes in the liver; orange-coloured urine.

Histology.—Fatty degeneration of the myocardium with initial focal myocarditis and a few intramyocardial haemorrhages; severe hyperaemia and early catarrh of the lungs; perilobular interstitial hepatitis as well as lytic-necrobiotic hepatitis of central and sublobular distribution; desquamating reticulo-endothelial reaction and severe hyperaemia of the spleen; fatty degeneration of the renal epithelium of the proximal convoluted tubules and to a lesser extent of the distal convoluted tubules.

EBENACEAE.

Royena decidua Burch. (= *R. pallens* Thb.)

Registered number.—O.P.II. No. 6837; 16.7.43.

Common name. Bloubos.

Origin.—Middelburg, Cape Province.

The fresh ripe berries were used.

Rabbit A (3.1 Kg.) was given 90 gm. of the berries in the course of 24 hours.

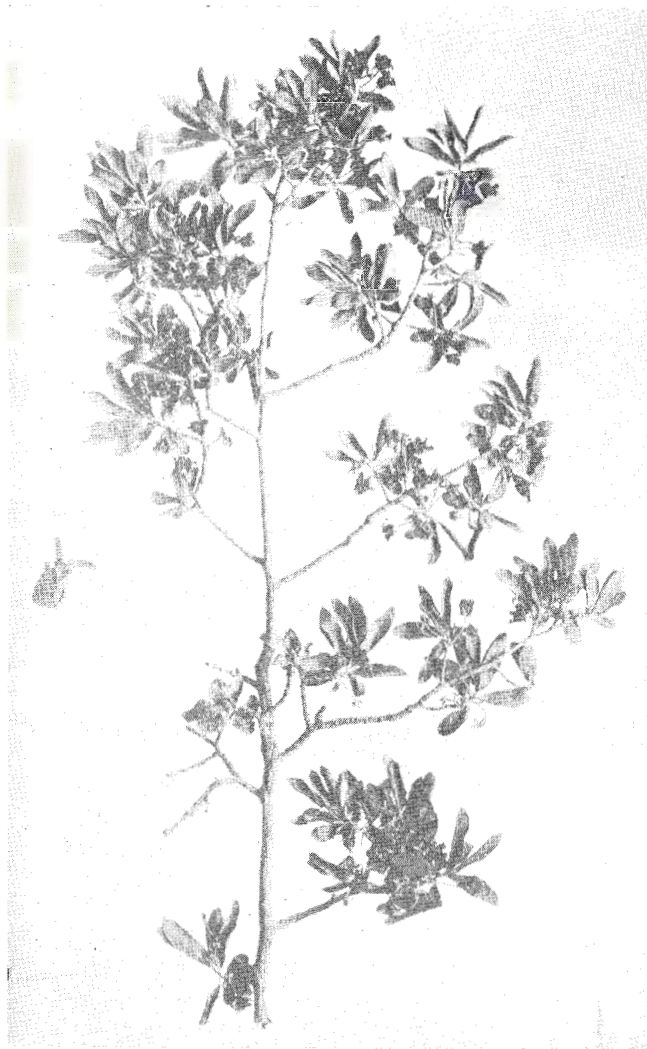
Symptoms.—Anorexia; dyspnoea; accelerated pulse; severe foetid diarrhoea. The rabbit became ill 5 hours after the administration of the first dose and died 20 hours later.

Post-mortem appearances.—General cyanosis; severe emphysema and hyperaemia of the lungs; dilatation of the stomach; hyperaemia of the mucosa of the stomach and small intestine; fluid ingesta in the large intestine; regressive changes in the liver.

Rabbit B (3.6 Kg.) was given 90 gm. of the berries in the course of 24 hours.

Symptoms.—As for rabbit A. In addition general paresis was observed. The symptoms developed 5 hours after the administration of the first dose and the animal was killed *in extremis* 25 hours later.

Post-mortem appearances.—As for rabbit A with the exception that the mucosa of the large intestine was hyperaemic and that the mucosa covering the folds had become necrotic.



Royena decidua Burch.

Subsequently the leaves of a second consignment of the plant (O.P.H. No. 15313; 15.11.43), which was in the pre-flowering stage, were tested.

Sheep 66691 (full-mouth; 41.0 Kg.) was given 1.7 Kg. of the fresh leaves in the course of 54 hours.

Symptoms.—Slight apathy; anorexia; slight dyspnoea; pulse somewhat accelerated; rumen inactive; slight tympanites; severe diarrhoea. The sheep recovered.

Sheep 66684 (6-tooth; 34.1 Kg.) was given 900 gm. of the dry leaves in the course of 24 hours.

Symptoms.—As for sheep 66691. The sheep recovered.

LEGUMINOSAE.

Glycine javanica L.

Registered number.—O.P.H. No. 3290; 17.5.43.

Origin.—Pretoria, Transvaal.

State and stage of development.—The plant was fresh and in the seeding stage. In the course of the experiment the plant became dry. While fresh the sheep consumed the plant readily but when the plant dried it had to be ground and administered per stomach tube.

Sheep 64119 (4-tooth; 39.1 Kg.) and *Sheep* 65103 (6-tooth; 29.6 Kg.) were given 13.65 Kg. and 11.75 Kg. of the plant in the course of 17 and 15 days respectively.

Result.—Negative.

Medicago sativa L.

Registered number.—O.P.H. No. 12275; 30.10.42.

Common name.—Lusern, lucerne.

Origin.—Port Shepstone, Natal.

The lucerne hay was infected with the following fungi:—*Macrosporium* sp., *Aspergillus* sp., *Penicilium* sp., and *Mucor* sp. The hay was fed to a sheep.

Sheep 61388 (6-tooth; 34.1 Kg.) consumed 6.4 Kg. of the lucerne hay in the course of 5 days.

Result.—Negative.

Stizolobium aterrimum Pip. and Tr.

Registered number.—O.P.H. No. 3287; 17.5.43.

Common name.—Somerset Velvet Bean.

Origin.—Pretoria, Transvaal.

State and stage of development.—The plant was fresh and in the seeding stage. The plant became dry in the course of the experiment. The sheep readily consumed the plant while it was fresh but when it had become dry the plant had to be ground and administered to the sheep per stomach tube.

Sheep 65014 (6-tooth; 26.4 Kg.) and *Sheep* 65076 (6-tooth; 27.3 Kg.) were given 15.55 Kg. and 22.25 Kg. respectively of the plant in the course of 25 days.

Result.—Negative.

Vigna hirta Hook.

Registered number.—O.P.H. No. 3288-39; 17.5.43.

Origin.—Pretoria, Transvaal.

State and stage of development.—The plant was fresh and in the seeding stage. The plant became dry in the course of the experiment. While fresh the sheep readily consumed the plant but after it had become dry the plant had to be ground and administered to the sheep per stomach tube.

Sheep 63775 (6-tooth; 24.1 Kg.) and *Sheep* 64899 (full-mouth; 41.9 Kg.) were given 11.1 Kg. and 13.5 Kg. of the plant in the course of 21 and 29 days respectively.

Result.—Negative.

LILIACEAE.

Agapanthus africanus (L.) Hoffm.

Registered number.—O.P.H. No. 4633; 20.6.41.

Origin.—Grahamstown, Cape Province.

State and stage of development.—The plant was in the fresh state and without flowers or fruit.

Bovine 8535 (18 months) was given 670 gm. of the plant (bulbs and leaves) in one dose.

Result.—Negative.

Dipcadi viride Moench.

Registered number.—O.P.H. No. 12423; 4.11.42.

Origin.—Port Shepstone, Natal.

State and stage of development.—The plant was in the fresh state and in the flowering and seeding stages.

Sheep 61141 (full-mouth; 29.1 Kg.) was given 1.0 Kg. of the plant in one dose.

Result.—Negative.

Drimiopsis maculata Lindl.

Registered number.—O.P.H. 11844A; 26.10.42.

Origin.—Port Shepstone, Natal.

State and stage of development.—The plant was in the fresh state and in the flowering and seeding stages.

Sheep 61249 (4-tooth; 30·0 Kg.) was given 7·34 Kg. of the plant in the course of 4 days.

Result.—Negative.

Eucomis undulata Ait.

Registered number.—O.P.H. No. 4985; 7.6.43.

Origin.—Vryburg, Cape Province.



Eucomis undulata Ait.

State and stage of development.—The plant was in the fresh state and in the flowering stage.

Sheep 62136 (6-tooth; 30·5 Kg.) was given 2·0 Kg. of the bulbs of the plant in one dose.

Symptoms.—Listlessness; anorexia; severe tympanites; foaming at the mouth; severe dyspnoea; strong pulse; rumen inactive. The sheep died overnight on the day of drenching.

Post-mortem appearances.—General cyanosis; severe ascites; hydrothorax; hydropericardium; hyperaemia of the mucous membrane of the trachea; hyperaemia, oedema and emphysema of the lungs; subendocardial petechiae; regressive changes in the myocardium; tumor splenis; hyperaemia of, and regressive changes in, the liver; regressive changes in the kidneys; tympanites of the rumen; slight hyperaemia of the mucous membrane of the small intestine.

Sheep 65259 (2-tooth; 26.4 Kg.) was given 1.0 Kg. of the bulbs of the plant in one dose.

Symptoms.—As for sheep 62136 except that the tympanites was less severe. The sheep died overnight on the day of drenching.

Post-mortem appearances.—Advanced post-mortem changes; general cyanosis; ascites; hydrothorax; hydropericardium; subendocardial petechiae; hyperaemia of the mucous membrane of the trachea; hyperaemia, oedema and emphysema of the lungs; hyperaemia of the liver and kidneys; tympanites of the rumen; slight hyperaemia of the mucous membrane of the abomasum and small intestine.

Scilla rigidifolia Kunth.

Registered number.—O.P.H. No. 13178; 18.II.42.

Origin.—Steynspruit, Orange Free State.

State and stage of development.—The plant was in the fresh state and without flowers or fruit.

Sheep 61388 (6-tooth; 34.1 Kg.) was given 1.0 Kg. of the bulbs of the plant in the course of 6 hours.

Symptoms.—Listlessness; anorexia; moderate tympanites; rumen inactive; dyspnoea accompanied by groaning; weak pulse; general weakness. The sheep died overnight on the day of drenching.

Post-mortem appearances.—Slight post-mortem changes; general cyanosis; slight ascites and hydropericardium; severe hyperaemia of the mucous membrane of the trachea; hyperaemia, oedema and emphysema of the lungs; subendocardial petechiae and ecchymoses; regressive changes in the liver and kidneys; hyperaemia of the mucous membrane of the duodenum; fluid material in the large intestine.

Histology.—Marked hyperaemia of the myocardium and lungs; moderate oedema of the lungs; moderate hyperaemia of the liver, kidney and adrenal; acute nephrosis; marked hyaline droplet, vacuolar and fatty degeneration of the liver.

DOWICIDE P.

Dowicide is a fungicide used in the control of sap stain and mould in wood. The wood is treated by immersing it in a solution of Dowicide P.

Sheep 60512 (full-mouth; 34.6 Kg.) was given 10 gm. of Dowicide P. in 400 c.c. of water in one dose.

Result.—Negative.

Sheep 57029 (full-mouth; 34.1 Kg.) was given 100 gm. of Dovicide P. in the course of 6 days.

Symptoms.—Listlessness; anorexia; dyspnoea; emaciation. Diarrhoea developed on the day preceding death. The sheep died 6 days after the commencement of dosing.

Post-mortem appearances.—Advanced post-mortem changes; subepicardial petechiae; severe hyperaemia, oedema and slight emphysema of the lungs; stasis of the ingesta in the fore-stomachs; slight hyperaemia of the mucous membrane of the caecum and urinary bladder; fluid material in the colon.

Sheep 63769 (6-tooth; 32.8 Kg.) was given 30 gm. of Dovicide P in 1.2 litres of water in one dose.

Symptoms.—Apathy; severe dyspnoea; pulse accelerated and strong; rumen inactive. The symptoms developed 10 minutes after dosing, the animal dying 2 hours later.

Post-mortem appearances.—General cyanosis; hydropericardium; subepicardial petechiae; petechiae in the lungs; hyperaemia, oedema and emphysema of the lungs; hyperaemia of, and regressive changes in, the liver; hyperaemia of the kidneys.

Sheep 64167 (4-tooth; 31.4 Kg.) was given 50 gm. of Dovicide P in 2.0 litres of water in one dose.

Symptoms.—The sheep was found dead one hour after dosing.

Post-mortem appearances.—General cyanosis; slight hydropericardium; hydrothorax; severe emphysema of the lungs; subepicardial petechiae; severe hyperaemia of, and regressive changes in, the liver; hyperaemia of the kidneys.

SUMMARY AND CONCLUSIONS.

The toxicity of 16 plants was investigated. Of these the following four were, according to the literature available to the author, for the first time proved to be poisonous:—

Encephalartos horridus Lehm.

Royena decidua Burch.

Eucomis undulata Ait.

Scilla rigidifolia Kunth.

The toxicity of Dovicide P was determined.

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