Onderstepoort Journal of Veterinary Science and Animal Industry, Volume 4, Number 2, April, 1935.

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

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(Continued from *Onderstepoort Journal of Veterinary Science and Animal Industry*, Volume 3, No. 1, 1934.)

AMARYLLIDACEAE.

Agave americana L. (O.P. No. 7721; 6.11.33).

Common Name.—English: American aloe, agave, Century plant. Afrikaans: Garingboom.

Origin.—Ixopo, Natal.

State and Stage of Development.—Fresh leaves.

It is stated that stock develop paralysis and die if they are extensively fed on the leaves.

Sheep 37073 (4-tooth; 28 Kg.).—Received 36·5 Kg. of fresh leaves per stomach tube in the course of twenty-seven days.

Result.—Apart from a pronounced loss in weight (25 per cent. of original weight) no symptoms of poisoning were discernable.

Sheep 37984 (6-tooth, 26 Kg.).—Received 2 Kg. of fresh leaves in two doses on 6.11.33.

7.11.34.—Apparently normal. 2 Kg. of fresh leaves in two days.

About half an hour after the second dose the animal was found lying down. It made several unsuccessful attempts to rise. There were pronounced tympany, general cyanosis, dyspnoea and an accelerated and strong pulse. The animal died gasping for breath one and a quarter hours after the second dose. The cause of death apparently was hoven.

Post-mortem Appearances.—General cyanosis; rumen markedly distended with gas; slight tumor splenis; hyperaemia of the kidneys.

Sheep 38185 (6-tooth, 30 Kg.).—This animal resented the introduction of the stomach tube and vomited as soon as the plant material entered the rumen. When liberated the animal leaped about, retching and vomiting until practically all the plant material drenched had been expelled from the rumen. The animal was discharged after two more attempts at drenching had yielded similar results.

A few hundred sheep have been drenched in the course of the last few years and this is the first animal to behave in this manner.

Sheep 38878 (6-tooth, 35 Kg.).—Received 2·6 Kg. of the dry plant in the course of nine days, without suffering any ill effects.

Geigeria aspera Harv. (O.P. No. 11648; 13.3.34).

Common Name.—Afrikaans: vermeerbossie; English: vomiting bush.

Origin.—Skaapplaas (Vereniging Estates), P.O. Wolwehoek, Orange Free State.

State and Stage of Development.—Fairly fresh and in late flowering and seeding stage.

Rabbit (2·1 Kg.).—Received 40 gm. of fresh plant in the course of three days.

Rabbit (1·9 Kg.).—Received 120 gm. of fresh plant in the course of three days.

Sheep 33096 (30 Kg.).—Received 1,000 gm. of fresh plant in the course of three days.

Result.—None of the above animals developed symptoms of poisoning.

It should be mentioned that a single dose of 300 gm. of the fresh plant in the pre-flowering stage collected on a farm in the Kroonstad District sufficed to kill a full-grown sheep.

Geigeria Zeyheri (O.P. No. 10161; 6.2.34).

Common Name.—Afrikaans, vermeerbossie; English, vomiting bush.

Origin.—Pretoria North, Transvaal.

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

Sheep 36801 (35 Kg.) was drenched with 1,000 gm. of the fresh plant (given in two doses) on 6.2.34.

7.2.34.—No ill effects noticeable; another 1,000 gm. of fresh plant. Hoven was present two hours after drenching.

8.2.34, 8 a.m.—Listlessness, general cyanosis, fever, dyspnoea, accelerated pulse and hoven were present. 500 gm. of fresh plant at 10 a.m. 4 p.m.: Animal appears in distress, pulse weak and accelerated, pronounced laboured respiration, general cyanosis, hoven. 9 p.m.: Condition worse.

9.2.34, 8 a.m.—Died previous night.

Post Mortem Appearances.—Intense general cyanosis; subendocardial haemorrhages in left ventricle; pronounced hyperaemia of lungs; patchy hyperaemia of abomasal mucosa; contents of big intestine very fluid.

The remaining plant material was then dried in the sun and *sheep* 38836 (±30 Kg.) drenched as follows:—

21.2.34.—600 gm. of dry plant (±1,000 gm. fresh plant) in two doses.

22.2.34.—600 gm. of dry plant. Hoven and apathy.

23.2.34.—Pronounced hoven, fever, apathy, dyspnoea, loss of appetite and accelerated pulse. Not dosed.

24.2.34.—Condition improved. 300 gm. of dry plant given.

25.2.34.—Condition improving.

26.2.34.—Animal apparently normal, slight fever. 500 gm. of dry plant in two doses.

27.2.34.—Animal apparently normal, slight fever. 500 gm. of dry plant in two doses.

28.2.34.—Normal.

Result.—Drying the plant in sun appeared to have decreased its toxicity unless we assume that the latter animal developed a tolerance to the plant or was more resistant than the former sheep.

Hertia pallens (DC) O. Kuntze. (O.P. No. 8070; 23.11.33)
(= *Othonna pallens* D C).

Common Name.—Afrikaans: springbokbossie, ou-ooibossie, armoedbossie.

Origin.—Riversmead, Norvalspont, C.P.

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

Sheep 35512 (6-tooth, 26 Kg.).—Received 200 gm. of above dry leaves and stems on each of two consecutive days. The following symptoms appeared from the sixth hour after administration of the second dose: Pronounced dyspnoea (costal breathing), temperature 104° F., cyanosis, and an accelerated and strong pulse, which became progressively weaker. Death occurred about thirty hours after administration of the second dose.

Post Mortem Appearances.—Intense general cyanosis; pronounced distension of the subcutaneous blood vessels; numerous subepicardial and subendocardial haemorrhages; slight hydroperitoneum; pronounced hydrothorax; slight hydropericardium; pronounced oedema of the lungs; pronounced fatty degeneration of the liver; tumor splenis (gelatinous consistence and glassy appearance); pronounced acute catarrhal enteritis with numerous haemorrhages in duodenal mucosa; caecal contents slightly bloodstained.

Histology.—Tumor splenis. No specific changes were discernible in the other organs.

Sheep 38168 (full mouth, 30 Kg.).—Received 600 gm. of the dry leaves and stems in two doses within seven hours.

Symptoms very similar to those described above set in in three hours after the second dose. Temperature 104·2° F. Death occurred the following night.

Post Mortem Appearances.—Very similar to those described above.

Histology.—Liver: venous stasis and pressure atrophy, severe fatty degeneration, neutrophilia present; slight tumour splenis; haemorrhages in myocard.

Sheep 36937 (full mouth, 28 Kg.).—Received 50 gm. of dry leaves and stems daily from 27.11.33 to 1.12.33.

2.12.33.—Apathetic, groaning on expiration, accelerated and strong pulse, slight cyanosis, grinding the teeth, slight fever.

3.12.33.—Condition worse. Severe laboured respiration (costal), weak and accelerated heart beat, groaning on expiration, fever (104° F.).

4.12.33.—Condition worse.

5.12.33.—Died previous night.

Post Mortem Appearances.—Intense general cyanosis; hydroperitoneum, hydrothorax, hydropericardium, pronounced emphysema of the subcutaneous tissues on ventral aspect of the neck and of the intermandibulary region; oedema of the lungs.

Sheep 36451 (full mouth, 29 Kg.).—Received 100 gm. of the dry leaves and stems daily from 27.11.33 to 1.12.33.

Symptoms of poisoning closely resembling those described in sheep 36937 appeared on the 2.12.33. Temperature varied from 101·4° F. to 104° F. Death occurred on the 4.12.33.

Post Mortem Appearances.—Intense general cyanosis; pronounced emphysema of the subcutaneous tissues of the intermandibulary region; pronounced hyperaemia and oedema of the lungs; pronounced hyperaemia of, and haemorrhages in the mucosa of the main bronchi and trachea; hyperaemia of the duodenal mucosa; fatty degeneration of the liver; degeneration of the myocard.

Senecio glaberrimus D C (O.P. No. 9396; 17.1.34; N.H. No. 15918).

Common Name.—Ragwort.

Origin.—Haenertsburg, Transvaal.

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

Sheep 38841 (35 Kg.).—Received 500 gm. fresh leaves and flowers at 3 p.m. on 17.1.34.

18.1.34.—Nothing unusual. 2,000 gm. in two doses. An hour after the second dose the pulse was very much accelerated and weak, the respiration laboured and the faeces soft and covered with partly coagulated blood. The temperature was 107° F. and the urine blood-tinged (haematuria). Froth appeared at the mouth and the visible mucous membranes and conjuntivae were cyanotic. The animal died in a comatose state at 8 p.m.

Post-mortem Appearances.—(Interim—½ hour). Pronounced general cyanosis; blood tarry and intensely darkened; subcutaneous blood vessels markedly dilated; hydroperitoneum; hydrothorax; heart in systole; subendocardial haemorrhages in both centricles; hyperaemia of the lungs; numerous petechiae in mucosa of abomasum, the folds of which were slightly swollen; contents of small intestine blood-stained; hyperaemia of and numerous haemorrhages in mucosa of small intestine and colon; pronounced tumor splenis; acute parenchymatous hepatitis; haemorrhages in the wall of the gall-bladder.

Histology.—Spleen: Congestion; large amount of haemosiderine. Liver: Acute parenchymatous hepatitis (hyperaemia, haemorrhages, peripheral fatty degeneration, etc.).

Sheep 33836 (2-tooth, 25 Kg.).—10 gm. of the dry plant daily (except Sundays) from 29.1.34 to 8.4.34 (inclusive).

From the 3.3.34 there was a continuous elevation of temperature up to 105° F., which continued up to the time of death. From the 20.2.34 there was laboured respiration, progressive loss in condition and loss of appetite. The animal was apathetic and its pulse accelerated and strong. Diarrhoea was present at intervals. There was continuous fever (104-106·4° F.) from 5.3.34 up to the time of death.

9.4.34, 8 a.m.—Animal found pressing head into corner of enclosure and appears semi-conscious. Accelerated and very irregular respiration; accelerated and weak pulse.

9 a.m.—Prostrate; semi-conscious; slow and deep respiration; heart-beat 180 per minute and very weak; slight general icterus.

10.4.34, 7.30 a.m.—The condition of the animal is worse than at 9 a.m. on previous day. An occasional clonic spasm of the left hind leg was seen (animal was lying on right side). Death occurred at 8 a.m.

Post Mortem Appearances.—Emaciation; slight general icterus; hydroperitoneum; degenerative changes in adrenals and kidneys; liver—pronounced pigmentation (yellow), firm consistence, and degenerative changes; slight hydrothorax and hydropericardium; ecchymoses in endocard of left heart ventricle; oedema of mediastinal and retropharyngeal lymph glands; bilirubinuria; oedema of abomasal folds; pigmentation [green (bile)] of kidneys; hyperaemia and oedema of the lungs.

Sheep 34686 (2-tooth, 27 Kg.).—Received 30 gm. of dry plant daily (except Sundays) from 29.1.34 to 28.2.34 (inclusive).

5.2.34.—Apathetic; very hard balls of faeces covered with mucus. Fever was present from 1.2.34 to 25.2.34.

17.2.34.—Progressive loss in condition; diarrhoea; loss of appetite.

18.2.34.—Progressive loss in condition; diarrhoea; loss of appetite.

19.2.34-24.2.34.—No diarrhoea present; loss of appetite.

25.2.34-28.2.34.—Poor condition; pronounced weakness in hind quarters; profuse diarrhoea (faeces mixed with partly coagulated blood); slight general icterus.

1.3.34, 8 a.m.—When standing animal sways from side to side; temperature 101·6° F.; swaying gait; pronounced weakness in hind quarters; conjunctiva, buccal mucous membrane and unwoolled parts of skin of a deep orange yellow colour; laboured respiration; accelerated and weak pulse; emaciation. Death occurred at 2 p.m.

Post Mortem Appearances.—Emaciation; intense general icterus; subepicardial haemorrhages; degenerative changes in myocard; oedema and slight oedema of lungs; pronounced distention of the gall-bladder with 400 c.c. of a dirty greenish-brown bile; liver—dark yellowish in colour, consistence firm; abomasal folds not oedematous; haemorrhages in duodenal mucosa, which is swollen; haematoma (3 by 5 cm.) in spleen; pronounced pigmentation (dark green) of kidneys; bilirubinuria; nodular oesophagostomiasis.

Histology.—Liver: Fatty degeneration and bile stasis (there is no increase in connective tissue). Fatty degeneration of myocard and kidneys. Cortical cells of adrenals contain slightly more fat than normal.

Senecio sp. (O.P. No. 9171; 29.12.33; N.H. No. 15771).

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

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

Sheep 37698 (27 Kg.).—Received 1,000 gm. of fresh leaves and flowers on 29.12.33.

30.12.33.—Diarrhoea, apathetic. Another 260 gm. of fresh leaves and flowers.

31.12.33.—Animal appears normal.

Vernonia kraussii Sch. Bif. (O.P. No. 4754; 22.5.34).

Common Names.—Suto-mofefabana.

Origin.—Collected by Mr. C. A. Smith, botanist, and the author on the farm Kaalplaats, near Onderstepoort.

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

Each of *sheep* 38878 (6-tooth, 25 Kg.) *and* 38899 (6-tooth, 30 Kg.) received 1,600 gm. of the fresh plant and 750 gm. of the dry plant in the course of thirteen days with negative results.

CUCURBITACEAE.

Cephalaria sessilifolia Sond. (O.P. No. 11922; 19.3.34).

Origin.—Bosplaas, Pienaars Rivier, Transvaal.

State and Stage of Development.—Fresh, almost mature fruit.

Rabbit (2 Kg.).—Received 80 gm. of the fresh fruit.

Result.—Negative.

Cucumis sp. (O.P. No. 8317; 30.11.33).

Common Name.—English: vegetable marrow.

Origin.—A portion of a marrow with an intense bitter taste was submitted by the Medical Officer of Health, Pretoria, for investigation.

Rabbit (2 Kg.).—Received 10 gm. of above fresh marrow with negative results.

Rabbit (1·9 Kg.).—50 gm. of the above fresh marrow induced pronounced laboured respiration, and restlessness within one hour after administration. Death occurred with symptoms of asphyxia and paralysis about eight hours after drenching.

Post Mortem Appearances.—Pronounced general cyanosis; heart-ventricles dilated; hyperaemia of the lungs; intense hyperaemia of the gastric mucosa.

GRAMINEAE.

Paspalum distichum Linn (O.P. No. 12786; 6.4.34).

Origin.—Inhlavini, Ixopo District, Natal.

State and Stage of Development.—Dry and in seeding stage. The ears showed a fairly heavy infection (±20 per cent.) with ergot.

In the area concerned cattle were affected with a disease the symptoms of which closely resembled those of poisoning with ergot present on species of *Paspalum*.

Bovine 5152 (2 years) ingested 15·5 kg. of the dry grass in the course of four days without suffering any ill effects.

Lolium temulentum L.

Common Names.—Afrikaans: drabok, dronkgras; English: darnel, bearded darnel, cheat.

Origin.—The seed was sorted from wheat which was grown in the Riversdale District, Cape Province.

Kornfeld (1933) describes the following test for the presence of darnel in wheaten meal: Alcohol is poured over the meal to be tested and stirred until of a porridgy consistence. If darnel is present the " porridge " is of a greenish colour and has a nauseating alkaline flavour.

The author submitted the above ground darnel, which showed a 100 per cent. fungus-infection * to the test described by Kornfeld. Furthermore, specimens of wheaten meal and oaten meal alone and mixed with varying quantities of darnel " meal " were submitted to Kornfeld's test. The test was found to be useless as all the specimens of pure darnel " meal ", pure wheaten meal, wheaten meal with varying quantities of darnel meal added to it, oaten meal, and oaten meal plus varying quantities of darnel meal, developed a greenish yellow colour when mixed with 96 per cent., or less concentrated, alcohol. Also the taste was not found to be specific in the case of wheaten and oaten meal mixed with darnel meal.

After the above-mentioned specimens had been moistened with alcohol a few drops of concentrated sulphuric, nitric and hydrochloric acid, or caustic potash were added to it. Colours ranging from light pink to dark red were produced but the results proved to be of no value in the detection of darnel in wheaten and oaten meal.

Sorghum sudanense Stapf. (O.P. No. 11551; 9.3.34).

Common Name.—Afrikaans: Sudangras. English: Sudan grass.

Origin.—Petronella Siding, Transvaal.

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

Hydrocyanic Acid Test (Picrate Paper Test).

(1) Fresh leaves: Negative after twenty-four hours.

(2) Fresh leaves + chloroform: Negative after twenty-four hours.

(3) Fresh leaves + emulsion: Slightly positive after one hour.

It therefore appears that the cyanogenetic glucoside was present whilst the enzyme necessary for its decomposition was absent.

Specimens of Sudan grass in the same state and stage of development, growing at Onderstepoort, were then examined for the presence of hydrocyanic acid.

(1) Fresh leaves: Strongly positive after twenty-five minutes.

(2) Fresh leaves and chloroform: Strongly positive after fifteen minutes.

(3) Fresh leaves and emulsion: Strongly positive after ten minutes.

* Dr. A. C. Leemann of the Division of Plant Industry, Pretoria, kindly examined the darnel.

IRIDACEAE.

Ferraria welwitchii Baker. (O.P. No. 10088; 6.2.34.)

Common Names.—Afrikaans: tulp; English, tulip.

Origin.—Kormutsetla, Vryburg, Cape Province.

State and Stage of Development.—Fresh and in flowering and seeding stage. The bulbs were cut up and dried in the sun.

Rabbit (3·2 Kg.).—Received 50 gm. of the dried bulb on the 6.2.34.

7.2.34.—Apathy, accelerated respiration, strong and accelerated heartbeat, pronounced greenish diarrhoea and anorexia.

8.2.34.—Died previous night.

Post Mortem Appearances.—General cyanosis; hyperaemia of lungs; heart ventricles dilated and distended with coagulated blood; pronounced acute catarrhal gastroenteritis with haemorrhages in the mucosa of the stomach and colon.

LEGUMINOSAE.

Acacia arabica Willd. (O.P. No. 12536; 27.3.34.)

Common Names.—Afrikaans: doringboom; English: thorn tree, mimosa.

Origin.—Mtubatuba, Zululand.

State and Stage of Development.—In seeding stage; leaves dry, immature pods fresh.

Hydrocyanic Acid Test (Picrate Paper).*

Dry Leaves.—(A very small amount available.) Dry leaves moistened + emulsion—negative.

Fresh Immature Pods.

(1) Fresh pods: Negative.

(2) Fresh pods + chloroform: Negative.

(3) Fresh pods + emulsion: Negative.

Acacia giraffae Willd (O.P. No. 694; 14.4.34).

Common Names.—Afrikaans: doringboom, kameeldoringboom, grootdoorn; English: thorn tree, mimosa.

Origin.—" Leeds ", P.O. Vetfontein, Zoutpansberg, Transvaal.

State and Stage of Development.—Fresh leaves and pods. The pods were suspected of having caused death in cattle.

* 10 gm. of dry plant and 20 gm. of fresh plant are used in all tests for hydrocyanic acid.

Hydrocyanic Acid Test (Picrate Paper).

Fresh Immature Pods.

(1) Fresh immature pods: Strongly positive within 30 minutes.

(2) Fresh immature pods + emulsion: Strongly positive within 10 minutes.

Fresh Leaves.

(1) Fresh leaves: Strongly positive within 20 minutes.

(2) Fresh leaves + emulsion: Strongly positive within 5 minutes.

Acacia giraffae Willd (O.P. No. 6867; 12.6.34).

Common Names.—Afrikaans: kameeldoring, kameelboom, grootdoorn; English: camelthorn.

Origin.—Agricultural College, Glen, Orange Free State.

State and Stage of Development.—Dry mature pods. Both the shells and the seeds contain fair amounts of the cyanogenetic glucoside*, but very little enzyme.

Acacia karoo Hayne (O.P. No. 9802; 27.1.34).
(O.P. No. 9803; 27.1.34).
(O.P. No. 9804; 27.1.34).
(O.P. No. 10430; 2.3.34).

Common Names.—Afrikaans: doringboom; English: thorn tree, mimosa.

Origin.—Broederstroom Estates, Pietersburg and other parts of the Pietersburg District, Transvaal.

State and Stage of Development.—Fresh flowering branches.

Hydrocyanic Acid Test.

(1) Fresh leaves: Negative.

(2) Fresh leaves + chloroform: Negative.

(3) Fresh leaves + emulsion: Negative.

A large number of specimens of fresh leaves, flowers and immature and mature pods collected from trees growing at Onderstepoort did not reveal the presence of hydrocyanic acid.

Acacia lasiopetala Oliv. (O.P. No. 10399; 19.2.34).

Common Names.—Afrikaans: Natalse kameeldoringboom; English: Natal camel thorn tree.

Origin.—" Amberley ", P.O. Matiwane Station, Natal.

* See article " The Occurrence of Cyanogenetic Glucosides in South African Species of Acacia, Part I ", published in *Onderstepoort Jour. of Vet. Sci. and Animal Ind.*, Vol 3, No. 2, 1934.

Hydrocyanic Acid Test.

Fresh Immature Pods.

(1) Fresh pods: Strongly positive within 6 minutes.
(2) Fresh pods + chloroform: Strongly positive within 4 minutes.
(3) Fresh pods + emulsion: Strongly positive within 1 minute.

Ripe Seed (Free from Shells).

(1) Seed: Positive within 2 hours.
(2) Seed + chloroform: Positive within 30 minutes.
(3) Seed + emulsion: Positive within 12 minutes.

Acacia litakunensis Burch. (O.P. No. A; 20.7.33).

Common Name.—Afrikaans: haak-en-steek.

Origin.—Brits, Transvaal.

Hydrocyanic Acid Test.

Dry Mature Shells (No Seed Present).

(1) Shells: Negative.
(2) Shells + chloroform: Negative.
(3) Shells + emulsion: Negative.

Mature Seed (Free from Shells).

(1) Seed: Traces of hydrocyanic acid.
(2) Seed + chloroform: Traces of hydrocyanic acid.
(3) Seed + emulsion: Traces of hydrocyanic acid.

Acacia permixta Burtt-Davy (O.P. 10431; 2.3.34).

Common Names.—Afrikaans: doringboom; English, thorn tree.

Origin.—Pietersburg, Transvaal.

State and Stage of Development.—Two small dry flowering branches.

Hydrocyanic Acid Test.

(1) Dry leaves: – Negative.
(2) Dry leaves + emulsion: – Negative.

Crotalaria distans Benth. (O.P. No. 11595; 9.3.34).

Origin.—Brits, Transvaal.

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

Sheep 37771 (55 Kg.).—Received 4,440 gm. of the dry plant in the course of seventeen days.

Result.—Negative.

Tephrosia vogelii Hook (O.P. No. 7893; 19.4.34).

Common Name.—English: fish bean.

Origin.—The seed was obtained from Mr. P. J. Greenway, Botanist, East African Agricultural Research Station, Amani, Tanganyika, and the plant grown at Onderstepoort.

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

Sheep 33096 (35 Kg. full mouth).—300 gm. of fresh plant on 19.4.34 and 200 gm. on each of 20.4.34 and 21.4.34.

Result.—On each occasion the animal developed severe hoven soon after having been drenched. Had it not been for the development and persistence of hoven the animal could easily have received 600 gm. of the fresh plant in one dose.

LILIACEAE.

Ornithogalum longebracteaum Jacq. (O.P. No. 11367; 6.3.34).

Origin.—Grahamstown.

State and Stage of Development.—Fresh bulbs (no leaves, flowers or fruit present).

Rabbit (2 Kg).—Received 110 gm. of fresh bulbs on two consecutive days without suffering any ill effects.

Ornithogalum Pretoriense Bhr. (O.P. No. 8094; 22.11.33).

Origin.—Irene, Transvaal (sent in by Dr. I. B. Pole-Evans, Chief of the Division of Plant Industry, Pretoria).

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

Rabbit (2 Kg.).—Received 15 gm. of the fresh bulb and leaves in one dose without suffering any ill effects.

Rabbit (2·1 Kg.).—30 gm. of the fresh bulb and leaves administered in one dose had no discernible effect on the animal.

Sheep 38167 (4-tooth; 28 Kg.).—Received 700 gm. of fresh bulbs, leaves and flowers in one dose without developing any symptoms of ill-health.

Urginea altissima (L.f.) Baker (O.P. No. 6684; 12.6.34).

Common Name.—Afrikaans: maerman.

Origin.—Humansdorp, Cape Province.

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

Rabbit (1·8 Kg.).—Received 10 gm. of the fresh bulb on 19.6.34. Symptoms of poisoning very similar to those described

below set in forty minutes after drenching. The convulsions were less severe and paralysis more pronounced. Death occurred one and a half hours after drenching.

Post Mortem Appearances.—As described below; there also was slight hyperaemia of the gastric mucosa.

Rabbit (2·0 Kg.).—Received 100 gm. of the fresh bulb on 19.6.34. Within twenty minutes after drenching laboured respiration and restlessness set in. The heartbeat, which was slowed and strong in the beginning, became progressively weaker and was very much accelerated before death. There was profuse urination. Paralysis, which set in in the neck and front quarters, progressed until the animal was completely paralysed. There were continuous clonic spasms of different groups of muscles and at times violent convulsions of the whole body. Complete unconsciousness (no cornea reflex) followed. The animal was breathing through the mouth, marked dyspnoea being present. Death occurred fifty minutes after drenching.

Post Mortem Appearances.—Very pronounced dilatation of both heart ventricles; petechiae in, and hyperaemia of, the lungs. *N.B.*—No hyperaemia of the gastrointestinal mucosa.

MALVACEAE.

Hibiscus trionum L. (O.P. No. 10192; 9.2.34).

Common Name.—English: black-eyed Susan.

Origin.—Onderstepoort Laboratories.

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

Rabbit (2 Kg).—Received 90 gm. of the fresh plant on one day without developing any symptoms of poisoning.

NYCTAGINACEAE.

Bougainvillea spectabilis Willd. (O.P. No. 9398; 18.1.34).

Origin.—Horticultural Research Station, Nelspruit, Transvaal.

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

Sheep 34724 (35 Kg.).—Received 900 gm. of fresh leaves on two consecutive days without suffering any ill-effects.

PHYTOLACCACEAE.

Phytolacca dioica L. (O.P. No. 4788; 22.5.34).
(N.H. No. 16452.)

Common Names.—English: Belhambre tree, Belombra tree.

Origin.—Umtata.

State and Stage of Development.—Fresh immature and mature fruit.

Sheep 34724 (full mouth, 32 Kg.).—Received 800 gm. of fresh fruit on 22.5.34.

23.5.34.—Diarrhoea, otherwise normal; another 800 gm. fresh fruit at 9 a.m.

4 p.m.—Severe dyspnoea; accelerated and strong pulse, temperature 105·4° F.

24.5.34.—Condition slightly improved; not dosed.

25.5.34, 8 a.m.—Dyspnoea; temperature 107° F.; pulse 120 per minute and strong; hoven; another 800 gm. of fairly fresh fruit. Died a few hours after drenching. Cause of death apparently was hoven.

Post Mortem Appearances.—Intense general cyanosis; rumen and reticulum markedly distended with gas.

Sheep 38865 (4-tooth, 27 Kg.).—Received 800 gm. of fairly fresh fruit at 2 p.m. on 28.5.34.

29.5.34, 7.30 a.m.—Apparently normal; another 800 gm. of fruit. Symptoms as described above appeared a few hours after drenching. There was pronounced frothing at the mouth. Death occurred at 2 p.m., apparently from hoven.

Post Mortem Appearances.—General cyanosis; pronounced distension of rumen and reticulum with gas; subendocardial haemorrhages in left ventricle; haemorrhages in, and hyperaemia and oedema of, the lungs.

Histology.—No specific changes were discernible in the organs.

Sheep 34170 (full mouth, 30 Kg.).—Received 200 gm. of dry leaves daily (except Sundays) from 20.6.34 to 7.7.34 without developing any symptoms of poisoning.

Reichert (1929) isolated four *saponins* from the dry leaves. Sopena (Watt and Breyer—Brandwyk, 1932) investigated the *saponins* pharmacologically, but details of the work could not be found.

Rubiaceae.

Pentanisia variabilis Harv. (O.P. No. 9046; 22.12.33).

Origin.—Groenkloof farm, Pretoria District.

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

Sheep 37019 (28 Kg.).—Received the following amounts of the dry plant: 22.12.33, 200 gm.; 27.12.33, 300 gm.; 28.12.33, 300 gm.; temperature 104° F.; groaning, accelerated pulse and respiration; 29.11.33, 150 gm. Animal appears normal again.

Santaliaceae.

Thesium namaquense Schlecht (O.P. No. 8334; 6.12.30; N.H. No. 15764).

Common Name.—Afrikaans: gifbossie.

Origin.—Middelburg, Cape Province.

State and Stage of Development.—Dry plant in the flowering stage.

Rabbit (2 Kg.)—Received 10 gm. of dry plant daily from 6.12.33 to 12.12.33 without suffering any ill effects.

Rabbit (1·9 Kg.).—Received 20 gm. of dry plant daily from 6.12.33 to 12.12.33.

On the 12.12.33 the animal appeared listless and took no food.

14.12.34.—Died previous night.

Post Mortem Appearances.—Pronounced hyperaemia of the lungs.

Solanaceae.

Datura Poisoning.

The South West Africa Administration (Windhoek) submitted a specimen of boermeal for investigation which was suspected of having caused poisoning in human beings. The symptoms described closely resembled those induced by the *atropine* group.

Tests for Atropine Group.

Three hundred grams of the meal was extracted for two hours at 50-60° C. with one liter of 96 per cent. alcohol to which a few grams of tartaric acid had been added. The filtrate was evaporated to almost dryness, the residue taken up in distilled water, and rendered alkaline by the addition of sodium bicarbonate. This alkaline solution was repeatedly shaken out with ether and the ether evaporated. The residue was taken up in a small quantity of distilled water rendered slightly acid by the addition of sulphuric acid. This solution gave precipitations with alkaloidal reagents and three drops in the eye of a dog induced pronounced dilatation of the pupil which persisted for more than twenty-four hours.

The remaining portion of the solution was evaporated and Vitali's test applied. The test was strongly positive.

Solanum giganteum Jacq. (O.P. No. 304; 9.4.34).

Common Name.—Afrikaans: geneesblaren.

Origin.—Magaliesberg, Pretoria North.

State and Stage of Development.—Fresh immature and mature fruit submitted.

Fresh Immature Fruit.

Rabbit (1·9 Kg.).—Received 50 gm. in one dose without suffering any ill effects.

Rabbit (2·1 Kg.).—Received 70 gm. in one dose with negative results.

THYMELAEACEAE.

Gnidia capitata L.f. (O.P. No. 9045; 20.12.33).

Origin.—Groenkloof farm, Pretoria District.

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

Sheep 37698 (full mouth, 27 Kg.).—Received 600 gm. of the fresh plant on each of two consecutive days without suffering any ill effects.

VERBENACEAE.

Lantana salvifolia Jacq. (O.P. No. 9319; 12.1.34; N.H. No. 15847).

Origin.—Wonderboom Suid, Pretoria.

State and Stage of Development.—Fresh immature fruit.

Rabbit (3 Kg.).—Received 60 gm. of fresh immature fruit on 12.1.34 without suffering any ill effects.

VITACEAE.

Cissus quinata Ait. (O.P. No. 10252 A; 13.2.34).

Origin.—Fish River bush veld, Grahamstown.

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

Fresh Leaves.

Rabbit (1·9 Kg.).—Received 160 gm. on two consecutive days with negative results.

Immature Fruit.

Rabbit (1·7 Kg.).—Received 160 gm. on two consecutive days with negative results.

Mature Fruit (Red).

Rabbit (1·9 Kg.).—Received 160 gm. on two consecutive days with negative results.

SUMMARY.

1. Thirty-seven plants were tested biologically.

2. The following plants, of which no records of toxicity could be found in the literature consulted, were found poisonous to animals: *Hertia pallens* (D C) Kuntze; *Ferraria welwitchii* Bkr.; and *Phytolacca dioica* L. The fruit of *Phytolacca dioica* appeared to cause death through hoven, whilst the leaves drenched in the dry state apparently had no ill-effects on sheep.

3. *Acacia giraffae* Willd., *A. lasiopetala* Oliv., and *A. litakunensis* Burch. were found to contain hydrocyanic acid (cyanogenetic glucosides) whilst the tests for this poison in *A. arabica* Willd, *A. karoo* Hayne, and *A. permixta* Burtt-Davy were negative.

4. One of two specimens of *Sorghum sudanense* Stapf. examined contained the cyanogenetic glucoside but not the enzyme necessary for the liberation of hydrocyanic acid.

ACKNOWLEDGMENTS.

I wish to thank Dr. G. de Kock, head of the Department of Pathology, and Dr. A. D. Thomas and Mr. M. Brown, B.V.Sc., both of the Department of Pathology, for the histological examination of organs.

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