

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

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### AIZOACEAE.

*Drosanthemum* sp. probably *D. hispidum* (L.) Schwantes.

Registered number: O.P.H. No. 29519 B; 29.12.37.

Common name: Vygie.

Origin: Bethulie, Orange Free State.

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

Rabbit No. 1 (1.9 Kg.) received 15 gm. of the dry plant.

*Symptoms.*—Slight apathy; decreased appetite;  
head held with nose pointing upwards; pulse and  
respiration hardly affected. The rabbit died 3 days  
after drenching.

*Post-mortem appearances.*—Marked post-mortem  
changes; heart in diastole; lungs markedly  
emphysematous; hyperaemia of the stomach.

Using the method of Rimington and Steyn (1933) the oxalate  
content of this plant, calculated as oxalic acid on the dry weight  
basis, was found to be 26.6 per cent. The moisture content equalled  
64.23 per cent.

*Hymenocylus smithii* L. Bol., probably = *H. nelii*, Schwantes.

Registered number: O.P.H. No. 29519 A; 29.12.37.

Common name: Vygie.

Origin: Bethulie, Orange Free State.

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



Fig. 1.—*Drosanthemum* sp. probably *D. hispidum* (L.) Schwantes.



Fig. 2.—*Hymenocylus smithii* L. Bol., probably *H. nebi* Schwantes.

Sheep 48018 (6 tooth; 32.25 Kg.) received 720 gms. of the fresh plant.

*Symptoms.*—Respiration accelerated and deep; pulse extremely rapid and weak; conjunctivae dirty brown in colour; lying down; slight tympanites. The sheep died 8 hours after drenching.

*Post-mortem appearances.*—Very marked post-mortem changes; general cyanosis; hydropericardium; petechiae epi- and endocardium; heart in diastole; hyperaemia and oedema of both lungs; marked tympanites of the rumen; slight hyperaemia of the abomasum.

Using the same method as for the previous plant this plant was found to contain 12.16 per cent. oxalates calculated as oxalic acid on the dry weight basis. The moisture content equalled 94.15 per cent.

#### APOCYNACEAE.

##### *Landolphia capensis* Oliv.

*Registered number:* O.P.H. No. 8448; 29.6.38.

*Common names:* Wild fig, wild apricot, wilde perske.

*Origin:* Hexkrantz, Rustenburg.

*State and stage of development:* Fresh runners with no flowers or fruit.

Sheep 52733 (30 Kg., 2-tooth wether); received 2.1 Kg. of fresh leaves on four consecutive days per stomach tube.

*Result:* Negative.

#### ASCLEPIADACEAE.

##### *Cynanchum obtusifolium* L.f.

*Registered number:* 9920; 10.8.37.

*Common name:* Klimop.

*Origin:* Hermanus.

*State and stage of development:* In late seeding stage. Plant was dried in the sun.

The following animals were drenched with the dry plant by means of a stomach tube:—

Rabbit A (2.1 Kg.): 5.0 gm. at 9.45 a.m. on 7.9.37.

*Result:* Negative.

Rabbit B (2.04 Kg.): 10.0 gm. at 9.50 a.m. on 7.9.37.

8.9.37—8 a.m.: Very paretic, unable to sit up, not feeding, laboured respiration (abdominal), apathetic, accelerated heart action, very excitable.

9.9.37: Slight improvement, not feeding, apathetic, slight laboured respiration, heart action normal.

10.9.37: Feeding fairly well, condition much improved.

11.9.37: Signs of slight constipation, otherwise normal.

12.9.37: Apparently normal.

Rabbit C (2.31 Kg.): 15.0 gm. at 9.55 a.m. on 7.9.37.

8.9.37.—8 a.m.: Apathetic, sitting huddled up, slight attacks of clonic spasms of the whole body at intervals of a few minutes, laboured respiration (60 p.m.), accelerated heart action, very excitable, not feeding.

9.9.37: Slight improvement in condition.

10.9.37: Feeding fairly well, progressive improvement.

11.9.37: Faeces hard, otherwise normal.

12.9.37: Recovered.

Rabbit D (1.65 Kg.): 20 gm. in two doses on 13.9.37.

14.9.37.—8 a.m.: General paralysis (prostrate), unable to rise, clonic spasms of the whole body at intervals of a few minutes, tremors of hindlegs, laboured respiration (deep and accelerated), accelerated and strong heart action, very apathetic, eyes dull, excitable, normal sensitivity to pinpricks.

15.9.37: Symptoms as on 14.9.37; slow and deep respiration (costoabdominal), pronounced loss in condition.

16.9.37: Animal found dead.

*Post-mortem appearances.*—Cachexia, anaemia, hyperaemia of the liver and kidneys, pronounced hyperaemia of the lungs, heart in systole both ventricles containing dark-red coagulated blood, large quantity of very thick greenish mucus, pronounced stasis in colon.

Rabbit E (2.05 Kg.): 30 gm. in two doses on 13.9.37.

14.9.37: Very apathetic, not feeding.

15.9.37: Unable to sit up in the normal position, paretic, apathetic, not feeding, accelerated and strong pulse, accelerated and deep (costoabdominal) respiration, fairly pronounced clonic spasms of the body muscles at intervals of a few minutes.

16.9.37: As on 15.9.37, losing in condition.

17.9.37: Improving.

The animal appeared to be normal again on 20.9.37.

*Pentarrhinum insipidum* E. May.

Registered number: O.P.H. No. 36905; 17.2.38.

Origin: Kimberley, Cape Province.

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

Sheep 47501 (2-tooth; 28.5 Kg.) received 2.55 Kg. of the fresh plant in the course of 2 days.

Result: Negative.

*Pergularia* sp.

Registered number: O.P.H. No. 1093; 24.4.37.

Origin: Monte Christo, Waterberg, Transvaal.

State and stage of development: The plant was in the fresh state and in the seeding stage.

Sheep 46991 (6-tooth; 38.0 Kg.) received 2.13 Kg. of the fresh plant in the course of 24 hours.

Result: Negative.

*Sarcostemma viminalis* R.Br.

Registered number: O.P.H. No. 23; 2.4.37.

Common name: Spantou Melkbos.

Origin: Glen Connor, Uitenhage, Cape Province.

State and stage of development: The plant which was in the fresh state and in the post flowering stage, was dried in the sun for 6 weeks and then finely ground.

Steyn (1937) proved the plant to be toxic. Sheep, drenched with material obtained from South-West Africa, developed spasms similar to those seen in strychnine poisoning and died soon afterwards. Post-mortem examination revealed nothing of importance.

Sheep 48838 (4-tooth; 41.0 Kg.) received 600 gm. of the dried plant in the course of 5 hours on 18.5.37.

*Symptoms.*—On 19.5.37 the sheep was found in the standing position with all the muscles of the body showing rapidly repeated rhythmic spasms. The animal had difficulty in maintaining its balance, frequently moving about in a jerky fashion.

Soon afterwards the sheep went down, lying flat on its side and although unable to support itself when lifted, made frequent but unsuccessful attempts to rise.

In the recumbent position the spasms of the muscles of the limbs were the most prominent.

At this stage the pulse was accelerated, weak and laboured whilst the respiration was rapid and shallow. The sensitivity to various stimuli was decreased.

Weakness gradually increased so that later the efforts to rise consisted of a repeated lifting of the head on to the flank and dropping it to the floor after a few seconds.

The sheep frequently performed galloping movements, kicking the bedding away and jerking the whole body to and fro so that the head moved to and fro in an arc over the floor.

As weakness increased the sheep later only lifted its head for a second or two off the floor in an attempt to rise. Eventually no more attempts were made to rise, the sheep lying flat on its side with the head and neck at the usual angle and the limbs straight out and a little forward. The spasms gave the impression that the sheep was shivering from cold.

At times a tonic spasm, lasting a few seconds, of all the body muscles was observed. The head was then pulled forwards or backwards, the back arched and the limbs stretched out horizontally and a little backwards. The digits were however never flexed backwards. Such spasms occurred immediately before, during or after the galloping movements described above but also at other times. These spasms did not occur very frequently. At times such a spasm and/or galloping movements could be elicited by disturbing the sheep.

During these tonic spasms the muscles were not as rigid as in a convulsion of strychnine poisoning for the limbs could be moved with ease.

The galloping movements however occurred at frequent intervals, were often accompanied by groaning and resulted in the horny covering of the hooves and horn being shaven off.

Gradually the galloping movements decreased in frequency and in intensity until on the 6th day after dosing, the animal only lifted its upper limbs into a horizontal position when disturbed. Similarly the spasms were barely perceptible in the fore limbs, neck and trunk and imperceptible in the hind limbs on the 8th day after dosing. From the 6th day after dosing tonic spasms were no longer observed.

Finally decubitus had set in, the one horn having become detached from its matrix.

The respiration and pulse rate gradually decreased and the pulse became increasingly weaker.

The rumen remained active throughout although anorexia was present from the beginning. Water was taken when offered.

In the earlier stages defaecation and urination remained normal but decreased during the later stages, the faeces consisting of small hard pellets.

Consciousness was retained throughout but the sensitivity to various stimuli was decreased. The corneal reflex remained unchanged.

A slight temperature reaction was observed during the last five days.

The sheep was killed on 26.5.37.

*Post-mortem appearances.*—Slight hydropericardium; slight hydrothorax; slight hydroperitoneum; subcutaneous oedema, haemorrhages and decubitus over prominent bony parts of the body; slight tumor splenis; necrotic inflammation of the matrix of the right horn; horn partially shaved off the lateral aspect of the claws; small amount of ingesta in the gastro-intestinal tract; stasis of ingesta in the caecum and colon; slight hyperaemia of the small intestine; congestion and regressive changes of the liver and kidneys; slight oedema and emphysema of both lungs; haemorrhages left lung; atelectasis right lung; slight hyperaemia of the urinary bladder; fat necrosis; slight regressive changes of the myocard; slight increase of cerebro-spinal fluid in the cerebral ventricles and subdural space of the spinal cord; congestion of the meninges of the brain and cord.

Sheep 48690 (4-tooth; 41.0 Kg.): received 600 gm. of the dried plant in the course of 2 days.

*Symptoms.*—This sheep developed symptoms after having received 0.45 Kg. of the dried plant and was seen in a somewhat earlier stage of poisoning than the previous sheep.

19.5.37: At 2.30 p.m. the animal was found standing with the back arched and the head lowered. The sheep was very excitable running around in the enclosure when approached and struggling when handled.

When standing quietly, rapid rhythmic spasms of a very slight intensity involving all the muscles of the body were observed. The spasms were most distinct in the muscles of the trunk and gave the impression that the sheep was shivering from cold.

Gradually the spasms increased in intensity but the sheep could still move about with ease.

At this stage the sheep, in standing, placed the hind limbs forward under the body and the fore limbs out in front. The sheep apparently wanted to go down behind and in order to maintain its balance would quickly move backwards and after a moment forwards again to repeat the performance.

This weakness of the hindquarters was also evident when turning, for by this time the sheep had become restless, moving about in a jerky fashion.

At about 5 p.m. the sheep, after moving backwards and forwards as described above, would at times go down on to its knees with the hind limbs well forward under the body.

At 10.30 p.m. the sheep had gone down.

For the rest similar symptoms were observed as in the previous sheep with the exception that sheep 48690 when down made no efforts to rise.

An intravenous injection of 2.5 gm. chloral hydrate in 10 per cent. solution at 3 p.m. on 20.5.37 had no marked effect on the spasms.

*Post-mortem appearances.*—As for sheep 48838 with the exception that the musculature was very dark in colour.

The discrepancy between the above symptoms and those described by Steyn may be due to a difference in the amount of active principle(s) received by the sheep.

#### COMPOSITAE.

*Asaemia arillaris* (Thumb.) Harr.

*Registered number:* O.P.H. No. 7083, 17.6.38.

*Common name:* Vuursiektebos.

*Origin:* Kenhardt.

*State and stage of development:* Dry plant (very thorny) and in the flowering and seeding stages.



Sheep 51915 (30 Kg. 4-tooth): received 2.4 Kg. of the dry plant by means of a stomach tube from 29.6.38 to 5.7.38.

*Result:* Nothing unusual was noticed until 5.7.38 when the animal was apathetic and showed slight laboured respiration.

6.7.38: Animal not ruminating.

7.7.38: Improving, ruminating.

8.7.38: Apparently normal.

At no time was there an elevation of the temperature of the animal.

Sheep 52419 (31 Kg. 4-tooth): Received 3.6 Kg. of the dry plant by means of a stomach tube from 29.6.38 to 5.7.38.

*Result:* 5.7.38: Very apathetic, foaming at the mouth, pulse weak and accelerated (100 p.m.), laboured respiration (accelerated costoabdominal), slight groan on expiration, losing in condition, constipated.

6.7.38: Above symptoms more pronounced than on 5.7.38. Respiration 160 p.m., pulse—weak and 120 p.m.; animal thin and weak.

7.7.38: Found dead at 8 a.m.

The animal showed no fever.

*Post-mortem appearances.*—Pronounced general cyanosis, slight hydroperitoneum, hydrothorax and hydropericardium, pronounced oedema of the lungs, pronounced degenerative changes in the liver with pigmentation (yellowish), slight oedema of submucosa of the pharynx and of a number of the folds of the abomasum, very hard and dry mucus-covered balls of faeces in the caecum and colon (stasis).

*Histology.*—There were no significant changes in the kidneys, spleen and myocard. The liver showed peripheral fatty changes and bile stasis.

A number of stock-owners in the North-Western Cape suspect this plant of being one of the causes of "geeldikkop" (photosensitisation with general icterus). According to the effects of the plant on sheep 52419, viz., degeneration and pigmentation of the liver and pronounced stasis in the caecum and colon, it appears very probable that it may cause symptoms similar to those seen in geeldikkop (*Tribulus* and *Panicum* photosensitisation). Unfortunately the weather was very cool and the sky overcast at the time the above experiment was conducted, and these conditions were most probably responsible for the absence of photosensitisation. Further experiments will be conducted during the summer months.

*Dimorphotheca caulescens* Harv.

*Registered number*: O.P.H. No. 24999; 17.11.37.

*Common name*: Daisy.

*Origin*: Nelspruit, Transvaal.

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

The symptoms described by Watt and Breyer-Brandwyk (1932), as caused by this plant resemble those seen in prussic acid poisoning.

Using the Guignard test the plant was found to be strongly cyanogenetic.

*Senecio retrorsus* D.C.

*Registered number*: O.P.H. No. 41061; 25.3.38.

*Common name*: Dan's cabbage, ragwort.

*Origin*: Lady Grey, Cape Province.

*State and stage of development*: The plant was in the pre-flowering stage and dry state.

Equine 21819 (18 months old; 191.5 Kg.) received 1.2 Kg. of the dry plant in the course of 7 days.

The filly died 8 days after having received the first dose.

The symptoms, post-mortem appearances and histology were typical of acute *Senecio*-poisoning (Steyn, 1934).

*Aster filifolius* Auct non-vent. (*Diplopappus filifolius* D.C.)

*Registered number*: O.P.H. No. 23981; 6.11.37.

*Common name*: Draaibos.

*Origin*: Doornrivier, Cradock, Cape Province.

*State and stage of development*: The plant was in the dry state without flowers or fruit.

Sheep 49573 (4-tooth; 44.0 Kg.) received 7.1 Kg. of the dry plant in the course of 9 days.

Sheep 49484 (4-tooth; 39.3 Kg.) received 1.6 Kg. of the dry plant in the course of 2 days.

Sheep 48835 (4-tooth; 36.3 Kg.) received 5.4 Kg. of the dry plant in the course of 10 days.

*Result*: Negative.

*Senecio* sp. ab. Kraamwinkel, Settlers, July, 1937.

Registered number: O.P.H. No. 6636, 9.7.37; 10586, 13.8.37 and 16507, 16.9.37; N.H. No. 23312.

Origin: Leeuwdoorns, P.O. Settlers, Transvaal and Warmbaths, Transvaal.

State and stage of development: The plant was in the fresh state and in the flowering and seeding stages. The plant material became dry during the course of the experiment.

Sheep 49070 (4-tooth; 38.5 Kg.) and sheep 50224 (4-tooth; 32.5 Kg.) received 36.0 Kg. of the fresh and dry plant in the course of 144 days.

Both sheep were killed 329 days after having received the first dose.

Clinical, post-mortem and microscopical examination revealed that the plant had no effect on the sheep.

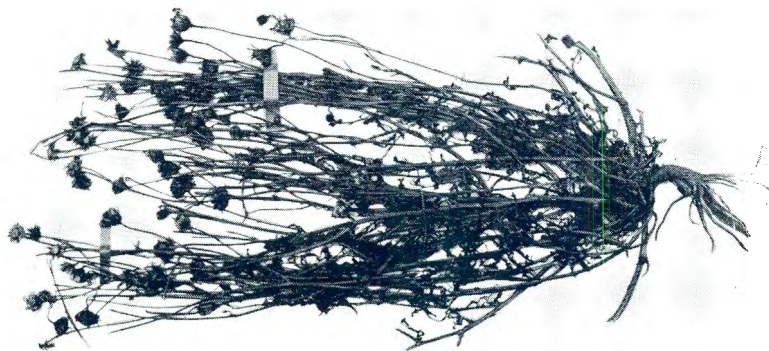


Fig. 3.—*Senecio* sp. ab. Kraamwinkel, Settlers, July, 1937.

Equine 21562 (8 months old; 159.0 Kg.) received 15.6 Kg. of the fresh and dry plant in the course of 111 days.

The animal started to show acute symptoms 225 days after receiving the first dose and died 2 days later. The symptoms, post-mortem appearances and histology were typical of chronic *Senecio*-poisoning (Dunsiekte) (Steyn, 1934).

Equine 21563 (8 months old; 150·0 Kg.) also received 15·6 Kg. of the fresh and dry plant in the course of 111 days.

The animal started to show symptoms of a far milder degree than equine 21562 233 days after having received the first dose. The animal was killed 42 days later.

The symptoms, post-mortem appearances and histology were typical of chronic Senecio-poisoning (Dunsikete) (Steyn, 1934).

CRASSULACEAE.

*Cotyledon campanulata* Marl.

*Registered number*: O.P.H. 4657 A; 19.5.38.

*Common name*: Skilpadkos.

*Origin*: Uitenhage, Cape Province.

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

The minced plant to which either chloroform or emulsin was added gave a very strong positive Guignard test for hydrocyanic acid.

*Cotyledon coruscans* Harv.

*Registered number*: O.P.H. 3612; 11.5.38.

*Common name*: Plakkies.

*Origin*: Grahamstown, Cape Province.

*State and stage of development*: The plant was in the fresh state and had no flowers or fruit.

Sheep 47501 (2-tooth; 41·5 Kg.) received 3·4 Kg. of the plant in the course of 5 hours on 16.5.38.

16.5.38: Diuresis developed in the course of the afternoon.

17.5.38: Anorexia; diuresis; voided soft faeces during the afternoon.

18.5.38: Apathy; anorexia; accelerated and weak pulse; accelerated respiration; profuse slimy diarrhoea; ruminal movements in abeyance. On being chased around in the camp no tremors were observed but the sheep soon became exhausted and refused to move.

19.5.38: As on the previous day except that the sheep did not defecate and that fever set in.

20.5.38: As on the previous day, except that respiration was laboured and that a small amount of fluid faeces was passed.

21.5.38: No defaecation; pulse weaker and respirations more laboured; further as on the previous day.

22.5.38: Went down but still able to rise with ease; passed a small amount of fluid faeces; pulse very weak and respiration very laboured.

23.5.38: As on previous day, except that the pulse was extremely weak; expiration was double and accompanied by a grunt or groan.

24.5.38: The sheep died the previous night.

*Post-mortem appearances.*—Very marked post-mortem changes; congestion of lungs and kidneys; pronounced hyperaemia and swelling of the mucous membrane of the abomasum and small intestine.

Subsequently further experiments were conducted with the fresh plant (O.P.H. No. 6089; 15.6.38) in the post-flowering stage and received from the same source. No hydrocyanic acid was detectable in the fresh leaves.

Sheep 5022 (2-tooth, 40 Kg.): received a total of 3.0 Kg. of the fresh leaves on 15.6.38 and 16.6.38.

16.6.38.—8 a.m.: Pronounced laboured respiration (deep, costoabdominal and double expiration). It was impossible to examine the nature of the pulse as the animal struggled continuously. 4 p.m.: Animal much worse, lying down, temperature 103.6° F., very apathetic, general cyanosis, pulse accelerated, weak, and thready (138 p.m.), respiration very laboured, groaning on expiration. Owing to the laboured breathing it was impossible to record the ruminal movements.

17.6.38: Conditions similar to but worse than that described on 16.6.38. Animal died at 6 p.m.

*Post-mortem appearances.*—Interim—2 hours. General cyanosis, emphysema and pronounced atelectasis of both lungs, heart in diastole and both ventricles distended with coagulated blood, subendocardial haemorrhages in the left ventricle, degenerative changes in the liver (consistence very soft), hyperaemic areas in the ruminal wall, pronounced hyperaemia of abomasal mucosa, very pronounced acute haemorrhagic enteritis affecting the entire small intestine and caecum, haemorrhages in the mucosa of the small intestine, rectum contained normal faeces. The ruminal contents emitted a very pungent acid odour.

*Histology.*—Venous stasis of the liver with atrophy of the hepatic cells, hyperaemia and degenerative changes in the kidneys with albuminuria, localised haemorrhages in the spleen, slight fatty changes in the myocard.

Sheep 50270 (6-tooth, 36 Kg.): Received 1.2 Kg. of fresh leaves of the plant in the early flowering stage at 9 a.m. on 27.7.38.

27.7.38—4 p.m.: Nothing unusual, temperature 101.6° F.

28.7.38—8 a.m.: Very apathetic, slight hoven, general cyanosis, respiration forced, double jerky and accelerated, pulse very weak and too fast to count, normal faeces, temperature 101° F. 4 p.m.—symptoms similar to those described above, unable to rise, groaning, diarrhoea, temperature 101° F.

29.7.38: Died at 7 a.m.

*Post-mortem appearances.* Interim—2 hours. Pronounced general cyanosis, numerous haemorrhages in the subcutaneous tissues on the ventral aspect of the neck and abdomen, subepicardial haemorrhages, degenerative changes in the myocard, very pronounced hyperaemia and slight oedema of the lungs with extensive haemorrhage into the submucosal tissues of the bronchi, trachea, larynx and pharynx, haemorrhages in the retropharyngeal lymph glands, degenerative changes in the renal cortex, hyperaemia of the abomasal mucosa, numerous small (1 m.m. in diameter) ulcerations in the duodenal mucosa, a small number of haemorrhages in the mucosa of the colon.

*Histology.*—Slight parenchymatous degeneration of the renal cortex, blood stasis and slight fatty changes in the liver.

As no symptoms of "krimpsiekte" (cotyledonosis) (Steyn, 1934) were seen in any of the sheep drenched with *Cotyledon coruscans* it was decided to ascertain whether the plant contained *cotyledontoxin*. For this purpose the fresh green leaves were extracted with 96 per cent. alcohol for a period of twenty-four hours. The alcoholic filtrate was evaporated until all traces of alcohol were removed (Steyn, 1932). This evaporated alcoholic extract was injected subcutaneously into guinea-pigs (300-400 gm.). It was found that 150 gm. equivalent of fresh leaves induced only slight symptoms of clonic spasms. If we consider that only a few gram equivalents of fresh leaves of our most poisonous species of *Cotyledon* are sufficient to cause death ("krimpsiekte") in guinea-pigs it is apparent that *Cotyledon coruscans* contains a very small amount of *cotyledontoxin*. The quantity of *cotyledontoxin* present in the plant is, however, insufficient to cause "krimpsiekte" in sheep.

*Cotyledon decussata* Sims.

*Registered number:* O.P.H. 15718; 13.9.37.

*Common name:* Plakkies, krimpsiektebossie.

*Origin:* Postmasburg, Cape Province.

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

285 gm. of the fresh plant were extracted for 24 hours at room temperature with 96 per cent. alcohol, the mixture being shaken at intervals. After filtering twice the yellowish cloudy filtrate was evaporated in a current of air until practically all the alcohol was driven off, leaving a brown oily fluid which became resinous on standing.

The residue dissolved completely in a mixture of 2 c.c. 96 per cent. alcohol and 26 c.c. water. Thus 1 c.c. of the solution represented 10 gm. of the plant.

Guinea pig No. 1 (0.5 Kg.) received 1.0 c.c. of the above solution subcutaneously.

*Symptoms.*—One hour after receiving the above injection spasms in the form of trembling were observed and were most distinct in the head and neck. At times the spasms caused the head to be moved vertically up and down or to and fro when later the head rested on the floor of the cage.

Thirty minutes later the guinea-pig had become paretic and the spasms were hardly perceptible at rest. On disturbing the guinea-pig however the spasms became very distinct again.

The heart beat was very accelerated and respiration which at first was rapid and shallow became slow, deep and laboured.

The animal died 2 hours after the injection, death being preceded by severe spasms accompanied by loud crying. The heart continued to beat after respiration had ceased.

*Post-mortem appearances.*—General cyanosis; congestion, emphysema and haemorrhages of the lungs; congestion of the liver and kidneys.

Guinea-pig No. 2 (0.5 Kg.) received 4.0 c.c. of the above solution subcutaneously.

*Symptoms.*—Fifteen minutes after receiving the above injection severe spasms of the whole body developed. These were accompanied by gaping movements. Five minutes later the animal died. The heart continued to beat after respiration had ceased.

*Post-mortem appearances.*—As for guinea-pig No. 1.

Guinea-pig No. 3 (0.45 Kg.) received 8.0 c.c. of the above solution subcutaneously.

*Symptoms.*—Similar to guinea-pig No. 2. Spasms developed within 10 minutes and the animal died 12 minutes after receiving the injection.

*Post-mortem appearances.*—Similar to guinea-pig No. 1.

Guinea-pig No. 4 (0.53 Kg.) received 15.0 c.c. of the above solution subcutaneously.

*Symptoms.*—Spasms in the form of trembling developed 10 minutes after the injection. They were accompanied by an occasional cry and gradually increased in intensity. 15 minutes after the injection paresis was observed. At this stage occasional weak spasms and gaping movements were observed.

Death occurred 20 minutes after the injection, the heart continuing to beat after the respiration had ceased.

*Post-mortem appearances.*—Similar to guinea-pig No. 1.

EUPHORBIAEAE.

*Synadenium arborescens* Boiss.

*Registered number:* O.P.H. No. 41071; 23.3.38.

*Origin:* Stanger, Natal.

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

Sheep 50132 (4-tooth; 39.0 Kg.) received 2.7 Kg. of the plant in the course of 5 hours on 25.3.38.

26.3.38: Fairly lively; feeding fairly well; rumen not very active; passed a fair quantity of fluid brown faeces; slight degree of diuresis.

27.3.38 and 28.3.38: As on previous day except that the conjunctivae were dirty brownish-red in colour and that the faeces were somewhat soft.

29.3.38: Passed a small quantity of small pellets.

30.3.38: Nothing unusual observed. Discharged.

Since the latex of many species of Euphorbia possesses irritant properties the latex of the above plant was applied to the shaven dorsal aspect of a rabbit's ear at 12 noon on 25.3.38.

25.3.38.—4 p.m.: Oedematous swelling of the area treated. Not very painful.

26.3.38: Relatively painless oedematous swelling of the whole ear.

27.3.38: Exudation on to skin. Swelling subsiding.

28.3.38 and 29.3.38: The exudation resulted in the formation of a light yellow scab over the area treated; swelling disappeared.

30.3.38: The swelling had disappeared.

1.4.38: The scab had loosened leaving the skin perfectly normal.

GENTIANACEAE.

*Chironia baccifera* Linn.

*Registered number:* O.P.H. No. 41291; 30.3.38.

*Origin:* Humansdorp, Cape Province.

*State and stage of development:* The plant was in the dry state and in the flowering and early seeding stages.



Sheep 48265 (8-tooth; 43.0 Kg.) received 1.0 Kg. of the dry plant in the course of 4 hours.

*Symptoms.*—Apathy, respiration fairly slow and deep with a double expiratory effort accompanied by a groan; diarrhoea; pronounced tympanites leaving the animal pot-bellied when relieved.

The sheep died 14 hours after receiving the first dose.

*Post-mortem appearances.*—General cyanosis; hydrothorax; hydropericardium; hydroperitoneum; petechiae epi- and endocardium; congestion of the liver and kidneys; hyperaemia; oedema, emphysema and haemorrhages in the lungs; tympanites of the rumen; hyperaemia of and haemorrhages in the mucosa of the abomasum and small intestine; very slight hyperaemia of the mucosa of the colon; fluid ingesta present throughout the intestinal tract; regressive changes, if any were present, of the organs were masked by the post-mortem changes.

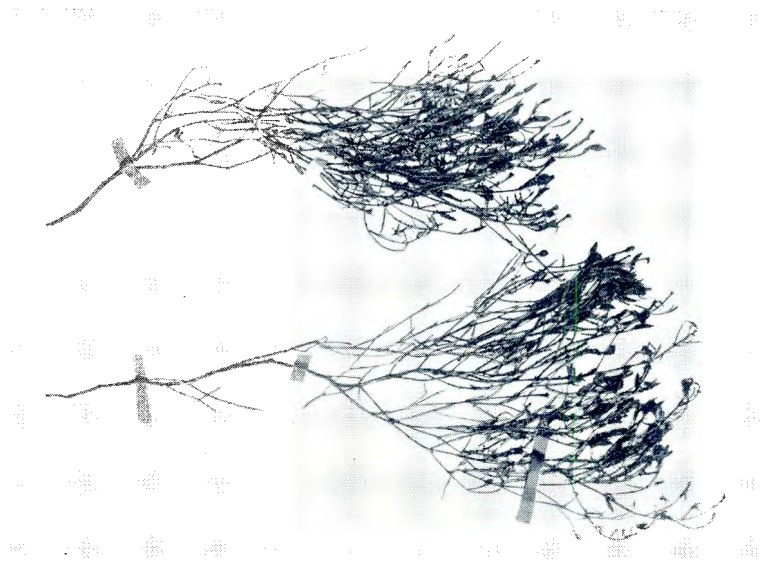


Fig. 4.—*Chironia baccifera* Linn.

*Histology.*—Stasis, oedema and vacuolar degeneration of the liver; congestion of the spleen; minor haemorrhages and probably initial parenchymatous changes in the adrenal cortex; early interstitial myocarditis with congestion of the myocardium; hyperaemia and oedema as well as emphysema and complementary atelectasis of the lungs.

Sheep 48248 (4-tooth; 40.5 Kg.) received 1.0 Kg. of the dry plant in the course of 4 hours.

*Symptoms and post-mortem appearances.*—

Similar to sheep 48265 with the exception that no diarrhoea was observed.

The sheep died 10 hours after receiving the first dose.

Sheep 48462 (6-tooth; 44.5 Kg.) received 1.0 Kg. in the course of 7 hours.

*Symptoms.*— In addition to the symptoms described for sheep 48248 the following was observed: when standing the respiration was extremely rapid, shallow and laboured but as soon as the sheep went down the respiration became slow and deep with a rapid inspiratory and a slow double expiratory effort accompanied by a loud sharp groan. The pulse was hardly accelerated and fairly strong.

The animal died 16 hours after receiving the first dose.

*Post-mortem appearances.*—As for sheep 48265 except that the bronchial, mediastinal and parapharyngeal lymphatic glands were in a haemorrhagic state and that regressive changes were observed in the liver, adrenals and myocardium. The cerebral and spinal meninges were congested.

*Histology.*—Stasis, oedema and hyaline droplet degeneration of the liver; congestion of the spleen; slight hyperaemia of the kidneys; congestion and parenchymatous degeneration of the myocardium; hyperaemia, oedema, emphysema and complementary atelectasis of the lungs; slight hyperaemia and degeneration of the adrenals; congestion of the brain with minor haemorrhages in the central grey matter around the Sylvian aqueduct.

Sheep 46422 (6-tooth; 42.0 Kg.) received 600 gm. of the dry plant in two doses at 9 a.m. and 4.10 p.m. on 30.3.38.

*Symptoms.*—30.3.38, 4 p.m.—Ruminal movements in abeyance; very slight tympanites.

30.3.38.—10 p.m.—Markedly pot-bellied with very slight tympanites; anorexia; apathy.

31.3.38: Respiration rapid, shallow and laboured; pulse very rapid and weak; temperature subnormal; apathy; lying down and refusing to rise but when lifted supported itself with ease; restless; pot-bellied; no tympanites; no defaecation; anorexia; ruminal movements in abeyance.

1.4.38: Found dead at 8.30 a.m.; had not defaecated.

*Post-mortem appearances.*—As for sheep 48462 except for the following: slight hyperaemia of the omasum; marked hyperaemia of the abomasum (with oedema and haemorrhages) and duodenum; slight hyperaemia of the rest of the small intestine, the caecum and the colon; marked hyperaemia of and blood in the air passages; haemorrhages under the capsule of the liver and the spleen.

*Histology.*—As for sheep 48265 except for the following: capsular haemorrhage with necrobiotic changes in the Malpighian corpuscles of the spleen; moderate congestion and pigmentation of the kidney; congestion and parenchymatous degeneration of the myocardium; swelling and congestion of the tracheal mucosa; congestion of the cerebrum, thalamus medulla oblongata and cerebellum with multiple minor haemorrhages in the medulla oblongata and outer layer of the cerebellar cortex.

Sheep 48904 (6-tooth; 39.0 Kg.) received 300 gm. of the dry plant.

*Symptoms.*—Five hours after drenching the ruminal movements were in abeyance. Anorexia, diarrhoea and a very slight degree of tympanites was also observed.

The sheep died 21 hours after being drenched.

*Post-mortem appearances.*—As for sheep 48462 except for the following: slight tympanites and hyperaemia of the rumen; fair hyperaemia of the reticulum; slight hyperaemia of the omasum; marked hyperaemia and petechiae of the abomasum, duodenum and proximal part of the jejunum; fair hyperaemia and petechiae of the rest of the small intestine, caecum and proximal part of the colon; slight hyperaemia distal part of the colon.

*Histology.*—As for sheep 48265 except for the following: congestion and degenerative changes of the myocardial musculature; vacuolar degeneration minor haemorrhages of the adrenal; moderate congestion of the brain; pigmentation and moderate congestion of the kidneys.

Sheep 43639 (6-tooth; 43.5 Kg.) received 300 gm. of the dry plant at 11 a.m. on 4.4.38.

*Symptoms.*—5.4.38: Respiration hardly affected; pulse accelerated and weak; anorexia; ruminal movements in abeyance; very slight tympanites; very little defaecation.

6.4.38: As for the previous day except that fever had set in.

7.4.38: As for the previous day. The pulse, however, was a little slower and stronger.

8.4.38 and 9.4.38: As for 7.4.38.

10.4.38: As for previous day except that the rumen was fairly active and that balls of small hard pellets were voided.

11.4.38: The tympanites had passed off and the pulse was fairly slow and strong; no further defaecation.

12.4.38 and 13.4.38: As for previous day.

14.4.38: As for previous day except that the animal started to feed again.

15.4.38: Voided small hard masses of faeces. For the rest the animal was more or less normal.

16.4.38: Discharged.

The following rabbits were also drenched with the same plant material as the above sheep:—

Rabbit No. 1 (1·8 Kg. received 15 gm. of the dry plant in the course of 24 hours.

*Result:* Negative.

Rabbit No. 2 (2·0 Kg.) received 30 gm. of the dry plant in the course of 24 hours.

*Result:* Negative.

Rabbit No. 3 (1·9 Kg.) received 45 gm. of the dry plant in the course of 24 hours on 4.4.38 and 5.4.38.

*Symptoms.*—5.4.38—4 p.m.: Respiration accelerated and laboured; anorexia.

6.4.38: As for previous day except that the heart-beat was accelerated and weak and that soft faeces were voided. Anorexia was also observed.

7.4.38: Apathy; no defaecation; conjunctivae pale; head held with the nose in the air. Found dead at 12.30 p.m.

*Post-mortem appearances.*—General cyanosis; hydropericardium; heart very flabby; marked emphysema with foci of purulent pneumonia of both lungs; stomach very much enlarged the ingesta being firm and the mucous membrane somewhat reddened; slight hyperaemia of the small intestine; for a distance of 2 inches on either side of the ileo-caecal orifice the mucous membrane of the caecum and colon was hyperaemic, haemorrhagic and necrotic with numerous ulcers on but also between the folds of mucous membrane; hyperaemia of the rest of the caecum and colon; congestion and regressive changes of the liver and kidneys.

Rabbit No. 4 (2.1 Kg.) received 90 gm. of the dry plant in the course of 24 hours on 4.4.38 and 5.4.38.

*Symptoms.*—5.4.38: Respiration hardly affected; pulse very rapid and weak; apathy; no defaecation; anorexia.

6.4.38: Diarrhoea; respiration laboured; pulse extremely rapid and weak; conjunctivae pale; struggling; crying. Died at 4 p.m. on 6.4.38, the respiration outlasting the heartbeat.

*Post-mortem appearances.*—As for Rabbit No. 3 except that hydro-peritoneum was also observed and that the changes in the caecum and colon were more extensive and severe, some of the ulcers being haemorrhagic. The rest of the mucous membrane of the caecum and greater portion of the colon was very haemorrhagic. Slight tumour splenis and a slight hyperaemia of the urinary bladder was also observed.

In the case of sheep 48265, 48248 and 48462 tympanites probably mechanically played an important rôle in causing the death of the animals. The results obtained with the other animals, however, prove the presence in the plant of a poisonous principle(s) causing mainly paresis or paralysis of the stomach with a marked irritating effect on the gastro-intestinal tract. For the rest the plant acts mainly on the respiration and heart.

#### IRIDACEAE.

*Moraea spathulata* (L.f.) Klatt.

( = *Moraea spathacea* Ker.)

*Registered number:* O.P.H. No. 31455; 11.1.38.

*Common name:* Yellow tulip.

*Origin:* Umtata, Cape Province.

*State and stage of development:* The leaves of the plant were dry but the bulbs were still quite fresh. The plant had no flowers or fruit.

Sheep 49974 (6-tooth; 37.25 Kg.) received 500 gm. of the dry leaves in the course of 4 hours.

*Result:* Negative.

Sheep 48057 (6-tooth; 31.0 Kg.) received 900 gm. of the fresh bulbs of the plant in the course of 4 hours on 18.6.38.

*Symptoms.*—18.1.38— 4 p.m.: Respiration rapid and shallow; pulse accelerated and fairly strong; ruminal movements weak.

18.1.38—11 p.m.: Respiration laboured and somewhat accelerated; groaning; pulse extremely rapid and weak; ruminal movements in abeyance; tympanites; restlessness; fever; diuresis; anorexia; paresis; convulsions; cyanosis; gasping respiration.

The sheep died at 11.30 p.m. on 18.1.38, the respiration outlasting the pulse.

*Post-mortem appearances.*—Marked post-mortem changes; general cyanosis; hydrothorax; hydropericardium; hydroperitoneum; petechiae epi- and endocardium; subcutaneous haemorrhages; marked emphysema of the lungs; marked tympanites.

LEGUMINOSAE.

*Acacia giraffae* Burch.

*Registered number:* O.P.II. No. 19626; 12.10.37.

*Common name:* Kameeldoring, Camelthorn.

*Origin:* Western Orange Free State.

A sample of finely ground dry ripe pods was found to yield 0.018 per cent. HCN. The highest yield was obtained by allowing a sample to stand for 24 hours after moistening with water and adding emulsin.

*Crotalaria distans* Benth.

*Registered number:* O.P.H. No. 972; 14.4.38.

*Origin:* Wintershoek, Hoopstad, Orange Free State.

*State and stage of development:* The plant was in the dry state and in the late seeding stage.

Bovine 7315 (3 year-old; 266.0 Kg.) received 6.8 Kg. of the plant in the course of 4 days.

*Result:* Negative.

*Dichrostachys nyassana* Taub.

*Registered number:* O.P.H. No. 11398; 20.7.38.

*Common name:* Sekelbos.

*Origin:* Tropical.

Nelspruit, Transvaal.

*State and stage of development:* Semi-dry mature pods.

The entire pods were ground up and submitted to the picrate paper test as follows:—

- (1) 25 gm. (moistened with tap water): fairly strongly positive after 24 hours.

(2) 25 gm. + emulsin: slightly positive after 24 hours.

(3) 25 gm. + chloroform: slightly positive after 24 hours.

The test tubes containing the plant were incubated for 24 hours at 40° C.

The phenomenon that plant specimens containing cyanogenetic glucosides yield less marked positive results with picrate paper when either chloroform or emulsin are added than with the plant alone has also been noticed on previous occasions when tests were conducted with other plants.



Fig. 5. *Dichrostachys nyassana* Taub.

*Indigofera patens* E & Z.

Registered number: O.P.H. No. 373; B.4.37.

Origin: Kimberley, Cape Province.

State and stage of development: The plant was in the dry state and in the late seedling stage.

Sheep 45906 (6-tooth; 50.5 Kg.) received 1.6 Kg. of the plant in the course of 2 days.

The sheep died as a result of tympanites shortly after receiving the last dose.

Sheep 41957 (6-tooth; 55.0 Kg.) received 7.6 Kg. of the plant in the course of 12 days.

At intervals the sheep developed tympanites.

TOXICITY OF KNOWN AND UNKNOWN POISONOUS PLANTS.

Sheep 41913 (6-tooth; 44·0 Kg.) received 5·6 Kg. of the plant in the course of 17 days. At intervals the sheep developed tympanites.

Sheep 48755 (4-tooth; 38·0 Kg.) received 800 gm. of the plant in the course of 5 hours. The sheep died overnight as a result of tympanites.

Sheep 48901 (4-tooth; 38·5 Kg.) received 800 gm. of the plant in the course of 5 hours. The sheep died overnight as a result of tympanites.

Sheep 49201 (6-tooth; 44·0 Kg.) received 6·25 Kg. of the plant in the course of 10 days. At intervals the sheep developed tympanites.

It therefore appears that apart from causing tympanites the plant had no other ill effects on sheep.



Fig. 6.—*Lotononis laxa* E. & Z.



*Lotononis lara* E. & Z.

*Registered number*: O.P.H. No. 36610; 15.2.38.

*Origin*: Wolwepoort, Lady Grey, Cape Province. It appeared as a weed on cultivated lands.

*State and stage of development*: The plant was almost dry and in the late seeding stage.

When received the plant smelt strongly of hydrocyanic acid. The highest yield of HCN, viz., 0.1205 per cent., was obtained by allowing a sample to stand for 24 hours after moistening the shredded plant and adding emulsin.

LILIACEAE.

*Urginea* sp.

*Registered number*: O.P.H. No. 16513 B; 15.9.37; 12268, 18.11.37; N.H. No. 23303.

*Common name*: Berg Tulp.

*Origin*: Suffolk, Lydenburg District, Transvaal.

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

Sheep 48810 (4-tooth; 35.5 Kg.) received 1.6 Kg. of the fresh bulbs in the course of 5 hours on 22.9.37.

*Symptoms*.—22.9.37—4 p.m.: Diuresis, tympanites.

22.9.37—11 p.m.: Anorexia; tympanites; diuresis; fairly marked diarrhoea.

23.9.37—8 a.m.: As on the previous day except that the tympanites had passed off and that the following was observed: marked apathy; groaning; respiration fairly slow and deep; pulse very rapid and weak; mild colic; conjunctivae pale; paresis; convulsions; fever; heart beat outlasted the respiration.

The sheep died at 9 a.m. on 23.9.37.

*Post-mortem appearances*.—General cyanosis; slight hydropericardium; slight hydrothorax; slight hydroperitoneum; slight hyperaemia, oedema and emphysema of the lungs; haemorrhages left lung; petechiae epi- and endocardium; slight regressive changes myocardium; congestion and regressive changes liver and kidneys; hyperaemia of the abomasum and small intestine; very fluid ingesta present throughout the large intestine.

Sheep 48720 (4-tooth; 38.5 Kg.) received 1.2 Kg. of the fresh bulbs in the course of 33 hours.

*Symptoms.*—The sheep passed a small quantity of diarrhoeic faeces and was found dead 36 hours after having received the first dose.

The sheep was found lying with its head in a corner of the stable with the fore limbs bent backwards under the body and the hind limbs stretched straight out behind. Marked tympanites was present, the conjunctivae were very cyanotic.

*Post-mortem appearances.*—Where not masked by post-mortem changes these were very similar to those observed in sheep 48810.

Sheep 47913 (4-tooth; 34.5 Kg.) received 800 gm. of the fresh bulbs at 11.15 a.m. on 27.9.37.

*Symptoms.*—As for sheep 48810 except that from the 33rd to the 77th hour after drenching there was an apparent improvement in the animal's condition for the sheep started to feed, the faeces became more firm, the pulse and respiration improved, apathy decreased and the rumen became active again.

The improvement, however, was only temporary, the sheep dying 7 days after drenching.

*Post-mortem appearances.*—Slight hyperaemia of the rumen, reticulum and omasum; very marked hyperaemia of the abomasum, small and large intestine. For the rest as for sheep 48810.

Sheep 49052 (4-tooth; 28.2 Kg.) received 400 gm. of the fresh bulbs at 11.15 a.m. on 27.9.37.

*Symptoms.*—As for sheep 48810 except that the weakness of the hindquarters was more evident. The animal died 26 hours after having received the first dose.

*Post-mortem appearances.*—As for sheep 48810 except that the hyperaemia of the abomasum and the initial part of the small intestine was more marked and that the small intestine contained cylinders of fibrin.

Sheep 49057 (4-tooth; 32.7 Kg.) received 200 gm. of the fresh bulbs at 3 p.m. on 5.10.37.

*Symptoms.*—As for sheep 48810, but the symptoms were much milder, the sheep remaining lively throughout. From the 6th day after drenching the sheep started to recover.

Rabbit No. 1 (1.9 Kg.) received 300 gm. of the fresh bulbs in the course of 25 hours.

*Symptoms.*—Apathy; anorexia; respiration slow and deep at first but later rapid and laboured; pulse slow, irregular and laboured; at times the pulse

became slower tending to fade, but then the rabbit would struggle causing the pulse to become accelerated and laboured; paresis; diuresis; defaecation normal at first but later defaecation ceased; convulsions, the head being pulled down on to the fore limbs; biting at the fore limbs or any object within reach; crying.

The rabbit died 38 hours after having received the first dose.

*Post-mortem appearances.*—Marked post-mortem changes; general cyanosis, slight hydropericardium; slight hydrothorax; slight hydroperitoneum; congestion and oedema of both lungs; congestion of the liver and kidneys; slight hyperaemia of the small intestine; normal pellets in the colon.

Rabbit No. 2 (2.0 Kg.) received 80 gm. of the fresh leaves.

*Result:* Negative.

The above plant has a red bulb very similar to that of *Urginea burkei* Baker (Transvaal Slangkop), but the two plants can easily be distinguished since the former plant has long, slender terete leaves. The inflorescences of the two plants are also very dissimilar.

*Urginea sp.*

*Registered number:* O.P.H. No. 16513 A; 15.9.37.

*Origin:* Suffolk, Lydenburg District, Transvaal.

*State and stage of development:* The plant material consisted of fresh bulbs without leaves or inflorescences.

Rabbit No. 1 (2.1 Kg.) received 240 gm. of the fresh bulbs in the course of 2 days.

*Result:* Negative.

Rabbit No. 2 (3.25 Kg.) received 480 gm. of the fresh bulbs in the course of 2 days.

*Result:* Negative.

RHAMNACEAE.

*Noltea africana* Reicht. f.

*Registered number:* O.P.H. No. 22792; 29.10.37.

*Common name:* Seepbossie.

*Origin:* Oudtshoorn, Cape Province.

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

TOXICITY OF KNOWN AND UNKNOWN POISONOUS PLANTS.

Sheep 48668 (6-tooth; 37·0 Kg.) received 3·46 Kg. of the dried plant in the course of 5 days.

The name Seepbossie (Soap bush) is very appropriate for the finely ground plant material foamed excessively when shaken with water. When moistened and applied to the skin it caused a burning sensation.

It was consequently not surprising when the sheep developed a fairly marked degree of tympanites which persisted throughout the period of drenching. The tympanites disappeared soon after the last dose had been administered.

No other ill effects were observed.

SANTALACEAE.

*Thesium lineatum* L.

*Registered number*: O.P.H. No. 25258; 22.11.37.

*Common name*: Vaalstorm.

*Origin*: Montana, Victoria West, Cape Province.

*State and stage of development*: The plant was in the dry state without flowers or fruit.

Sheep 49094 (4-tooth; 31·0 Kg.) received 10·4 Kg. of the plant in the course of 16 days.

*Result*: Negative.

SCROPHULARIACEAE.

*Teedia pubescens* Burch.

*Registered number*: O.P.H. No. 37959; 25.2.38.

*Origin*: Zuurans, Port Elizabeth, Cape Province.

*State and stage of development*: The plant was almost dry and in the seeding stage with unripe fruit.

Sheep 49974 (6-tooth; 41·0 Kg.) received in the course of 2 days 2·0 Kg. of the plant after the fruit had been removed.

*Result*: Negative.

Rabbit No. 1 (2·15 Kg.) received the juice expressed from 100 gm. unripe fruit.

*Result*: Negative.

SOLANACEAE.

*Solanum coccineum* Jacq., *Sensu Fl. Capensis*.

*Registered number*: O.P.H. No. 38117 B; 28.2.38.

*Origin*: Humansdorp, Cape Province.

*State and stage of development*: The plant was almost dry but the ripe and unripe fruit were quite fresh.

Rabbit No. 1 (1.65 Kg.) received the juice expressed from 170 gm. ripe fruit.

*Result: Negative.*

Rabbit No. 2 (2.0 Kg.) received the juice expressed from 72 gm. unripe fruit.

*Result: Negative.*

*Solanum giganteum* Jacq.

*Registered number:* Tox. Lab. No. 260, 9.2.38.

*Common name:* Geneesblare.

*Origin:* Pretoria North, Transvaal.

*State and stage of development:* Fresh immature (green) and mature (red) fruits.

Rabbit A (2.25 Kg.) received 125 gm. of fresh immature fruits by means of a stomach tube on 9.2.38.

*Result: Negative.*

Rabbit B (2.25 Kg.) received 45 gm. of fresh mature fruit per os on 9.2.38.

*Result: Negative.*

Four years ago two rabbits received *per os* 50 gm. and 70 gm. of fresh immature and mature fruits respectively also with negative results.

*Solanum tomentosum* Linn. *Sensu. Fl. Capensis.*

*Registered number:* O.P.II. No. 38117 A; 28.2.38.

*Origin:* Humansdorp, Cape Province.

*State and stage of development:* The plant was almost dry but the ripe and unripe fruit were quite fresh.

Rabbit No. 1 (1.45 Kg.) received the juice expressed from 130 gm. ripe fruit.

*Result: Negative.*

Rabbit No. 2 (1.95 Kg.) received the juice expressed from 180 gm. unripe fruit.

*Result: Negative.*

*Solanum tomentosum* Linn.

*Registered number:* O.P.II. No. 3613; 11.5.38.

*Origin:* Grahamstown, Cape Province.

*State and stage of development:* The ripe and unripe fruit were in the fresh state.

TOXICITY OF KNOWN AND UNKNOWN POISONOUS PLANTS.

Rabbit No. 1 (2·15 Kg.) received the juice expressed from 40 gm. unripe fruit at 12 noon on 18.5.38.

*Symptoms*.—19.5.38: slight apathy; decreased appetite; faeces somewhat soft.

20.5.38: Recovered.

Rabbit No. 2 (2·5 Kg.) received the juice expressed from 130 gm. ripe fruit.

*Result*: Negative.

THYMELEACEAE.

*Lasiosiphon (Gnidia) Burchellii* Meisn.

*Registered number*: O.P.H. No. 12175; 26.7.38.

*Common name*: Reptuisbossie, harpuisbossie.

*Origin*: Ermelo, Transvaal.

*State and stage of development*: Slightly wilted plant in the flowering stage.

*Picrate paper (Guignard) test for hydrocyanic acid*.

(1) 10 gm. slightly wilted plant: Negative after 24 hours.

(2) 10 gm. slightly wilted plant + chloroform: Negative after 24 hours.

(3) 10 gm. slightly wilted plant + emulsin: Negative after 24 hours.

The test tubes containing the plant material were incubated for 24 hours at 40° C.

ZYGOPHYLLACEAE.

*Zygophyllum* sp, probably *Z. Morgsana* L.

*Registered number*: O.P.H. No. 16819; 25.3.37.

*Common name*: Slymbos, leeubos, skildpadbos.

*Origin*: Sappamma, Uitenhage, Cape Province.

*State and stage of development*: The plant which was in the fresh state and post-flowering stage was dried in the shade and finely ground.

Sheep 45910 (6-tooth; 36·0 Kg.) received 1·8 Kg. of the dried plant in the course of 3 days.

Sheep 46756 (6-tooth; 42·0 Kg.) received 900 gm. of the dried plant in the course of 3 days

*Result*: Negative.

*Zygophyllum Morgsana* L.

*Registered number:* O.P.H. No. 8415; 29.7.37.

*Common name:* Skuimbos.

*Origin:* Uitenhage, Cape Province.

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

Sheep 48714 (4-tooth; 33.0 Kg.) received 7.6 Kg. of the fresh plant in the course of 7 days.

*Symptoms.* -A few hours after having received the first dose profuse diarrhoea set in. The sheep went off its feed, became apathetic and developed a slight degree of tympanites.

These symptoms persisted throughout the period of drenching, the sheep gradually falling off in condition. The rumen however remained active throughout.

The sheep did not at any time appear to be very ill.



Fig. 7. *Zygophyllum Morgsana* L.

Sheep 48742 (4-tooth; 30.5 Kg.) received 4.0 Kg. of the fresh plant in the course of 7 days.

*Symptoms.* -As for sheep 48714 with the exception that diarrhoea set in about 40 hours after receiving the first dose and that tympanites was observed only on the second day of drenching.

## SUMMARY.

The toxicity of thirty-three plants was investigated. According to the available literature the following ten plants were proved for the first time to be toxic: *Lotononis lava*, *Cotyledon coruscans*, *Cotyledon campanulata*, *Asaemia avillaris*, *Zygophyllum Morgsana*, *Urginea* sp., *Hymenocylus Smithii*, *Drosanthemum* sp. probably *D. hispidum*, *Chironia baccifera* and *Senecio* sp. ab. Kraamwinkel, Settlers, July, 1937. It was also established that *Dimorphotheca caulescens* and *Dichrostachys nyassana* contain hydrocyanic acid.

It is interesting to note that according to our present knowledge we can divide the poisonous species of cotyledon into three groups according to the symptoms caused by them, viz (A) those species (*C. decussata*, *C. ventricosa*, *C. obovata*, *C. Wallichii*, etc., containing cotyledontoxin), which cause "krimpsiekte" (cotyledonosis), (B) those species (*C. campanulata*) which contain hydrocyanic acid, and (C) those species (*C. coruscans*) which cause pronounced gastrointestinal irritation (haemorrhagic enteritis). The active principle responsible for the severe irritation is unknown. The species of *Cotyledon coruscans* tested by us, however, also contained a small quantity of cotyledontoxin, but not in such quantities as to cause "krimpsiekte".

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