Onderstepoort Journal of Veterinary Science and Animal Industry, Volume 21, Number 1, March, 1946.

Printed in the Union of South Africa by the Government Printer, Pretoria.

Recent Investigations into the Toxicity of Plants, Etc., No. XV.

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APOCYNACEAE.

Vinca major L.

Registered number.—O.P.H. 13236; 11.10.43.

Common name.—Periwinkle.

Origin.—Pretoria, Transvaal.

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

Sheep 67438 (6-tooth; 36·4 Kg.) was given* 3·7 Kg. of the plant in the course of 4 days (12.10.43-16.10.43).

Symptoms.—Every time after being drenched the sheep developed tympanites. On 14.10.43 such a severe tympanites had developed after the sheep was drenched in the morning that it was considered inadvisable to drench the animal in the afternoon. On 15.10.43 the following was observed: anorexia; apathy; no defaecation; dyspnoea; accelerated strong pulse; fair degree of tympanites. On 16.10.43 the condition of the animal was unchanged. The animal died overnight on 16.10.43.

Post-mortem appearances.—Too decomposed for examination.

Sheep 67550 (6-tooth; 34·1 Kg.) was given 6·0 Kg. of the plant in the course of 11 days.

Result.—Negative.

From the above it would appear that sheep 67438 died of digestive disturbances as a result of being drenched with the plant material.

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

AIZOACEAE.

Tetragonia Schenkii Schinz. (Fig. 1.)

Registered number.—O.P.H. No. 3666; 22.5.43.

Common name.—Koibos.

Origin.—Windhoek, South West Africa.

FIG. 1.—*Tetragonia Schenkii* Schinz.

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

Sheep 66463 (4-tooth; 26·9 Kg.) was given 500 gm. of the plant in the course of 7 hours.

Symptoms.—The animal died overnight on the day of drenching.

Post-mortem appearances.—Slight post-mortem changes; general cyanosis; ascites; hydropericardium; subepicardial petechiae; hyperaemia, oedema and emphysema of the lungs; regressive changes in the liver; tympanites of the rumen; slight hyperaemia of the mucosa of the abomasum, jejunum and colon.

Sheep 66304 (6-tooth; 31·9 Kg.) was given 250 gm. of the plant in one dose.

Symptoms.—Listlessness; general weakness; anorexia; rumen inactive; slight tympanites; dyspnoea; weak pulse. The animal died overnight on the day of drenching.

Post-mortem appearances.—Severe general cyanosis; abdomen distended; ascites; subepicardial haemorrhages; a large amount of froth in the air passages; severe hyperaemia and oedema of the lungs; hydronephrosis of, and urinary calculi in, both kidneys; tympanites of the rumen.

Chenopodiaceae.

Beta vulgaris L.

Registered number.—O.P.H. 11422-25; 16.9.43 and 11540; 16.9.43.

Common name.—Mangels.

Origin.—Kokstad, Cape Province.

The roots of the plant, which were quite fresh, were tested.

Sheep 64549 (6-tooth; 31·9 Kg.) was given 2·4 Kg. of the first consignment of the roots (11422-25; 16.9.43) in the course of 7 hours.

Symptoms.—The animal died overnight on the day of drenching.

Post-mortem appearances.—Slight post-mortem changes; general cyanosis; slight hydrothorax; severe hydropericardium; hyperaemia of the mucosa of the trachea and bronchi; severe hyperaemia, oedema and emphysema of the lungs; subepicardial petechiae; slight regressive changes in the myocardium; severe regressive changes in the liver and kidneys; haemorrhagic lymphadenitis; slight hyperaemia of the mucosa of the abomasum, small and large intestine with submucosal haemorrhages in the small intestine; stasis of the ingesta in the large intestine.

Histology.—Liver.—The sinusoids are distended with a large quantity of blood. The hepatic cells show parenchymatous degeneration.

Kidney.—Hyperaemia accompanied by haemorrhages whilst the proximal convoluted tubules show severe degenerative changes. The nuclei of the epithelial cells of these tubules show pyknosis and karyolysis.

Sheep 66631 (6-tooth; 34·1 Kg. was given 7·2 Kg. of the first consignment of the roots (11422-25; 16.9.43) in the course of 4 days.

Result.—Negative.

Sheep 66692 (6-tooth; 31·9 Kg.) was given 13·2 Kg. of the second consignment of the roots (11540; 16.9.43) in the course of 5 days.

Result.—Negative.

The roots were submitted for investigation in view of the fact that some of the animals feeding on the roots died rather suddenly. The results obtained in the case of sheep 66631 and 66692 indicate that the roots are non-toxic. It is considered that sheep 64549 died as the result of digestive disturbances following on the administration of relatively very large quantities of the roots.

Compositae.

Arctotis staechadifolia Berg.

Registered number.—O.P.H. 6896-97; 6.12.43.

Origin.—Vryburg, Cape Province.

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

Sheep 68687 (full-mouth; 40·5 Kg.) was given 5·7 Kg. of the plant in the course of 11 days.

Result.—Negative.

Senecio glutinosus Thb.

Registered number.—O.P.H. 7239; 21.7.43.

Origin.—Pretoria, Transvaal.

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

Sheep 64546 (6-tooth; 32·3 Kg.) was given 4·6 Kg. of the plant in the course of 6 days.

Result.—Negative.

Cycadaceae.

Encephalartos Lehmanii (E. & Z.) Lehm. (Fig. 2.)

Registered number.—O.P.H. No. 16422; 1.12.43.

Origin.—Division of Botany, Pretoria, Transvaal.

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

Rabbit A (1·75 Kg.) was given 195 gm. of the flesh of the fruit in the course of 7 days.

Result.—Negative.

Rabbit B (1·6 Kg.) was given 30 gm. of the kernels in the course of 6 hours.

Symptoms.—The rabbit died overnight on the day of drenching.

Post-mortem appearances.—Severe oedema, emphysema and slight hyperaemia of the lungs; hyperaemia of, and regressive changes in, the liver; submucosal haemorrhages in the stomach; hyperaemia of the mucosa of some parts of the small intestine.

Rabbit C (1·85 Kg.) was given 35 gm. of the kernels in the course of 3 days.

Symptoms.—Listlessness; anorexia; dyspnoea; strong rapid pulse. The symptoms developed on the third day after the commencement of drenching and the rabbit died the same night.

Post-mortem appearances.—Hyperaemia; oedema and emphysema of the lungs; general icterus; severe ascites; severe regressive changes in the liver; regressive changes in the kidneys; hyperaemia of the mucosa of parts of the small intestine; fluid material in the colon.

FIG. 2.—*Encephalartos Lehmanii* (E. & Z.) Lehm.

DICHAPETALACEAE.

Dichapetalum venenatum Engl. & Gilg.

Registered number.—O.P.H. No. 810; 19.4.44.

Common name.—Blaargif, Makou.

Origin.—Grootfontein, South West Africa.

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

Rabbit A (2·3 Kg.) was given 10 gm. of the plant in the course of 6 hours.

Result.—Negative

Rabbit B (2·3 Kg.) was given 20 gm. of the plant in the course of 6 hours.

Symptoms.—The animal died overnight on the day of drenching.

Post-mortem appearances.—General cyanosis; severe hyperaemia of the lungs; hyperaemia of the liver and kidneys; slight hyperaemia of the mucosa of the stomach.

Ebenaceae.

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

Registered number.—O.P.H. 15313; 15.11.43.

Common name.—Bloubos.

Origin.—Middelburg, Cape Province.

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

Sheep 66691 (full-mouth; 41·0 Kg.) was given 1·7 Kg. of the *fresh* leaves of the plant in the course of 54 hours.

Symptoms.—Apathy; anorexia; slight dyspnoea; pulse somewhat accelerated; slight tympanites; rumen inactive; very severe diarrhoea. The animal recovered.

Sheep 66684 (6-tooth; 34·1 Kg.) was given 900 gm. of the *dry* leaves of the plant in the course of 24 hours.

Symptoms.—As for the previous sheep. The animal recovered.

Iridaceae.

Moraea trita var. *foliata* N.E. Br.

Registered number.—O.P.H. 12315; 25.9.43.

Common name.—Tulp.

Origin.—Pietersburg, Transvaal.

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

Sheep 66692 (6-tooth; 31 Kg.) was given 1·5 Kg. of the bulbs of the plant in the course of 24 hours.

Symptoms.—Listlessness; dyspnoea; pulse fairly slow and very strong; rumen inactive; anorexia; conjunctivae dark red. The animal died approximately 30 hours after the commencement of drenching.

Post-mortem appearances.—Advanced post-mortem changes; general cyanosis; subendocardial petechiae; hyperaemia of the mucosa of the trachea and bronchi; hyperaemia, oedema and emphysema of the lungs; tympanites of the rumen; fluid material in the large intestine; hyperaemia of certain lymphatic glands.

LEGUMINOSAE.

Bauhinia Galpini N.E. Br.

Registered number.—O.P.H. No. 9294; 18.8.43 and 11762-71; 20.9.43.

Origin.—Barberton, Transvaal.

State and stage of development.—The two consignments of the plant were without flowers or fruit. The first consignment (9294; 18.8.43) was fresh and the second (11672-71; 20.9.43) was dry.

Sheep 66849 (4-tooth; 34·1 Kg.) was given 1·1 Kg. of the fresh leaves of the first consignment of the plant in the course of 6 hours.

Result.—Negative.

Sheep 66558 (2-tooth; 25·0 Kg.) was given 9·25 Kg. of the dry leaves of the second consignment of the plant in the course of 25 days.

Result.—Negative.

Sheep 62924 (4-tooth; 34·0 Kg.) was given 4·5 Kg. of the dry leaves of the second consignment of the plant in the course of 10 days.

Result.—Negative.

Cassia Occidentalis L.

Registered number.—O.P.H. No. 11427-28; 13.9.43.

Origin.—Burao, British Somaliland.

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

Sheep 62924 (6-tooth; 31·9 Kg.) was given 14·0 Kg. of the plant in the course of 17 days.

Symptoms.—Towards the end of the period of drenching the sheep developed digestive disturbances. The rumen became inactive and tympanites developed every time after drenching. Finally a slight diarrhoea developed. The sheep recovered immediately drenching was discontinued.

The symptoms would appear to be simply due to digestive disturbances as a result of being drenched and not due to the plant being toxic.

Medicago sativa L.

Registered number.—O.P.H. No. 8678; 9.8.43.

Common name.—Lusern, lucerne.

Origin.—Port Elizabeth, Cape Province.

The lucerne hay was infected with the following fungi: *Mucor* sp., *Aspergillus* sp., *Penicilium* sp. and *Fusarium moniliforme.*

Sheep 64549 (full-mouth; 31·9 Kg.) was given 1·69 Kg. of the infected hay in the course of 4 days.

Result.—Negative.

Phaseolus vulgaris L.

Registered number.—O.P.H. No. 66491; 18.12.43.

Origin.—Machadodorp, Transvaal.

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

Sheep 66491 (6-tooth; 40·5 Kg.) was given 2·01 Kg. of the corms of the plant in the course of 24 hours.

Symptoms.—The sheep developed a mild diarrhoea which lasted two days after which the animal recovered. The diarrhoea was apparently simply due to derangement of digestion as a result of drenching.

LILIACEAE.

Ornithogalum pretoriense Baker.

Registered number.—O.P.H. No. 14573; 29.10.43.

Origin.—Pretoria, Transvaal.

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

Sheep 67550 (full-mouth; 40·5 Kg.) was given 3·5 Kg. of the bulbs of the plant in the course of 2 days.

Result.—Negative.

Schizocarphus nervosus (Burch.) F. v. d. M. (=*Scilla rigidifolia* Kunth. var. *nervosa* Bak.) (Fig. 3.)

Registered number.—O.P.H. No. 12085; 21.9.43.

Origin.—Rust-der-Winter, Transvaal.

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

Sheep 66461 (6-tooth; 34·1 Kg.) was given 1·0 Kg. of the plant in one dose.

Symptoms.—Severe tympanites; rumen inactive; dyspnoea; accelerated, strong pulse; apathy; anorexia. The sheep died overnight on the day of drenching.

Post-mortem appearances.—The cadaver was too decomposed for examination.

Sheep 64607 (full-mouth; 26·0 Kg.) was given 500 gm. of the plant in one dose.

Symptoms.—General weakness; apathy; fair degree of tympanites; rumen inactive; anorexia; dyspnoea; pulse very slow, strong and irregular.

Post-mortem appearances.—General cyanosis; hydropericardium; hydrothorax; ascites; subendocardial and subepicardial petechiae; slight regressive changes in the myocardium; hyperaemia and oedema of the lungs; regressive changes in the liver; tympanites of the rumen; slight hyperaemia of the mucosa of the abomasum.

FIG. 3.—*Schizocarphus nervosus* (Burch.) F.v.d.M.

Scilla inquinata C. A. Sm.

Registered number.—O.P.H. No. 12084; 21.9.43.

Origin.—Rust-der-Winter, Transvaal.

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

Sheep 66866 (4-tooth; 27·3 Kg.) was given 1·8 Kg. of the plant in the course of 19 hours.

Symptoms.—Following on the first dose the sheep developed a severe tympanites. At the time the second dose was given the sheep had apparently recovered. Very shortly after being drenched for the second time the animal again developed a very severe tympanites dying 4 hours after the administration of the second dose.

Post-mortem appearances.—General cyanosis; ascites; hydrothorax; hydropericardium; hyperaemia of the mucosa of the trachea and bronchi; severe hyperaemia, oedema and emphysema of the lungs; slight recessive changes in the myocardium; hyperaemia of, and regressive changes in, the liver and kidneys; severe tympanites of the rumen.

From the above it would appear that digestive disturbances, as a result of the animal being drenched, was the cause of death.

PAPAVERACEAE.

Papaver aculeatum Thunb.

Registered number.—O.P.H. No. 16824-25; 4.12.43.

Origin.—Pretoria, Transvaal.

State and stage of development.—The plant was fairly dry and in the flowering and seeding stages.

Sheep 66786 (6-tooth; 35·5 Kg.) was given 2·85 Kg. of the plant in the course of 8 days.

Result.—Negative

SOLANACEAE.

Solanum tuberosum L.

Registered number.—O.P.H. No. 16991; 9.12.43.

Common name.—Aartappel, potato.

Origin.—Vaaltakkie, Transvaal.

State and stage of development.—The potato-tops tested, were in the fresh state and in the pre-flowering stage. At first the potato-tops were fed to the animals but later, as they became drier, were minced and drenched to the animals.

Sheep 66521 (6-tooth; 30·5 Kg.) and *sheep* 68617 (2-tooth; 31·9 Kg.) were given 2·8 Kg. and 3·85 respectively of the potato-tops in the course of 9 days.

Result.—Negative.

Melasina circophora Meyr.

The pupae of this insect, commonly known as "grashuisies", were suspected to be poisonous. After removal of the pupal cases the pupae were minced and administered to a rabbit per stomach tube.

Rabbit A (1·5 Kg.) was given 30 gm. of the pupae in the course of 6 hours.

Result.—Negative.

Summary and Conclusions.

Of the 18 plants investigated the following four plants were, according to the literature available to the authors, for the first time proved to be toxic: *Tetragonia Schenkii* Schinz., *Encephalartos Lehmanii* (E. & L.) Lehm., *Moraea trita* var. *foliata* N.E. Br., and *Schizocarphus nervosus* (Burch.) F. v. d. M.

The toxicity of the pupae of *Melasina circophora* Meyr. was also investigated.

Acknowledgments.

We wish to thank Dr. E. P. Phillips, late Chief, Division of Botany and Plant Pathology, and the botanists in his Division for the identification of plant specimens. To Drs. H. P. A. de Boom and W. Malherbe of the Section of Pathology we are indebted for the histological examination of animal organs. Finally we wish to thank Messrs P. A. Swanepoel and M. G. van Niekerk, Technical Assistants in the Section of Pharmacology and Toxicology, for assistance rendered in the course of the experiments.