

Recent Investigations into the Toxicity of Plants, etc., XIII.

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AMARYLLIDACEAE.

Haemanthus magnificus Herb.

Registered number.—O.P.H. No. 20716; 30.3.42.

Common name.—Blood flower, seeroogblom.

Origin.—Queenstown, Cape Province.

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

Sheep 50431 (4-tooth; 29.6 Kg.) was given* 1.2 Kg. of the fresh bulbs and stems in the course of 6 hours.

Result.—Negative.

CAPPARIDACEAE.

Boscia foetida Schinz.

(See Fig. 1, page 222.)

Registered number.—O.P.H. No. 16153; 7.1.42. and 17599; 6.2.42.

Common name.—Noeniebossie, stinkbossie, oumiedbos.

Origin.—Upington, Cape Province.

State and stage of development.—The first consignment of the plant (O.P.H. No. 16153; 7.1.42.) was in the dry state and flowering stage whilst the second consignment* (O.P.H. No. 17599; 6.2.42) was in the dry state and in the late flowering and early seeding stages.

Sheep.—59042 (4-tooth; 56.9 Kg.) was given 400 gm. of the leaves and flowers of the first consignment of the plant in the course of 6 hours.

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

Post-mortem appearances.—Slight post-mortem changes; general cyanosis; hydrothorax; hydropericardium; ascites; subepicardial and subendocardial ecchymoses; regressive changes in the myocardium; hyperaemia and oedema of the lungs; tumor splenis; hyperaemia of,

* Except where otherwise stated, all the animals were drenched per stomach tube.

and regressive changes in, the liver; hyperaemia of the kidneys; tympanites of the rumen; severe hyperaemia of the mucous membrane of the rumen, reticulum, abomasum and duodenum; slight hyperaemia of the mucous membrane of the rest of the small intestine, caecum and colon.

Histology.—Moderate oedema and hyperaemia and vacuolar and nuclear degeneration of the liver; slight acute cholangitis; hypertrophy of the smooth muscle fibres of the spleen; hyperaemia and parenchymatous degeneration of the myocardium; hyperaemia and oedema of the lungs; hyperaemia of the kidney.

Sheep 54150 (6-tooth; 42·8 Kg.) was given 900 gm. of the leaves, flowers and immature fruit of the second consignment of the plant in the course of 24 hours.

Symptoms.—Apathy; anorexia; tympanites; inactivity of the rumen; dyspnoea; accelerated pulse; haemorrhagic diarrhoea. The sheep died two days after the commencement of dosing.

Post-mortem appearances.—General cyanosis; hydropericardium; ascites; pronounced hydrothorax; subendocardial ecchymoses; regressive changes in the myocardium; severe hyperaemia and oedema of the lungs; severe hyperaemia of, and regressive changes in, the liver; hyperaemia of the kidneys; calculi in the pelvis of the left kidney; hydronephrosis with calculi in the pelvis of the right kidney; hyperaemia of the mucous membrane of the reticulum; severe hyperaemia and slight oedema of the mucous membrane of the abomasum; severe hyperaemia of the mucous membrane of the small intestine and caecum; extensive haemorrhages in the mucous membrane of the caecum; hyperaemia of the mucous membrane of the rest of the large intestine.

Histology.—Severe hyperaemia, alveolar emphysema and atelectasis of the lungs; severe hyperaemia and parenchymatous degeneration of the myocardium; severe hyperaemia of the kidney; severe hyperaemia, fatty infiltration and necrobiosis of the liver; pronounced acute catarrhal typhlitis.

It is possible that uraemia was a contributory factor in causing death in sheep 54150.

Cadaba juncea (Linn.) B. and H.

Registered number.—O.P.H. No. 4904; 30.6.42.

Common name.—Swartstorm.

Origin.—Carnarvon, Cape Province.

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

Sheep 59763 (2-tooth; 34·1 Kg.) was given 800 gm. of the plant in the course of 7 hours.

Symptoms.—Tympanites; severe dyspnoea; accelerated pulse; frothing at the mouth. The animal died 12 hours after receiving the first dose.

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

Histology.—Acute severe central necrotising hepatitis; parenchymatous degeneration of, and slight fatty changes in, the kidney; marked fatty degeneration and hyperaemia of the myocardium; hyperaemia and acute alveolar emphysema of the lungs.

Sheep 65304 (4-tooth; 29.1 Kg.) was given 400 gm. of the plant in one dose.

Symptoms.—Apathy; anorexia; tympanites; accelerated pulse; dyspnoea; bloodstained mucus in the nostrils. The animal died 30 hours after drenching.

Post-mortem appearances.—Advanced post-mortem changes; general cyanosis; ascites; hydrothorax; hydropericardium; subendocardial petechiae; hyperaemia, emphysema and oedema of the lungs; tympanites of the rumen; oedema of the omentum and mesenterium; slight hyperaemia of the mucous membrane of the abomasum and caecum.

Sheep 60632 (full-mouth; 27.8 Kg.) was given 600 gm. of the plant in the course of 28 hours.

Result.—Negative.

COMPOSITAE.

Berkheyopsis echinus (Less.) O. Hoffm. and *B. bechuanensis* S. Moore.

Registered number.—O.P.H. No. 15834; 31.12.41. and 17695; 10.2.42.

Origin.—Baltimore, Transvaal.

State and stage of development.—The plant material was in the dry state and in the flowering stage. A specimen from the first consignment of the plant was identified as *B. echinus* whilst a specimen from the second consignment of the plant was identified as *B. bechuanensis*. Since both consignments were derived from the same farm it is probable that they consisted of a mixture of the two plants.

Sheep 59696 (2-tooth; 43.7 Kg.) was given 2.0 Kg. of the first consignment of the plant in the course of 30 hours.

Symptoms.—Apathy; anorexia; dyspnoea; accelerated pulse; rumen inactive; diarrhoea. The animal died 36 hours after the commencement of dosing.

Post-mortem appearances.—Advanced post-mortem changes; general cyanosis; hydrothorax; hydropericardium; subepicardial and subendocardial haemorrhages; hyperaemia and oedema of the lungs; severe hyperaemia of the trachea; severe tympanites of the rumen; slight hyperaemia of the mucosa of the small intestine; fluid material in the large intestine.

Sheep 50431 (full-mouth; 35.5 Kg.) was given 3.0 Kg. of the second consignment of the plant in the course of 5 days.

Result.—Negative.

Epaltes alata Steetz.

Registered number.—O.P.H. No. 18362 B-C; 27.2.42 and 18410; 2.3.42.

Origin.—Vredefort, Orange Free State.

State and stage of development.—The first consignment of the plant (O.P.H. No. 18362 B-C; 27.2.42) was fresh and in the flowering stage whereas the second consignment (O.P.H. No. 18410; 2.3.42) was almost dry and in the flowering stage.

Rabbit A (1.9 Kg.) was given 49 gm. of the first consignment of the plant in the course of 4 hours.

Result.—Negative.

Sheep 53396 (6-tooth; 49.1 Kg.) was given 1.2 Kg. of the second consignment of the plant in the course of 30 hours.

Symptoms.—Apathy; anorexia; icterus; enlarged abdomen; rumen inactive; dyspnoea; accelerated, weak pulse; constipation. The animal died 3½ days after the commencement of dosing.

Post-mortem appearances.—Advanced post-mortem changes; icterus; a tremendous number of petechiae throughout the body; hyperaemia and oedema of the lungs; hyperaemia of the mucous membrane of the caecum; stasis of the contents of the caecum and colon.

Othonna cluytiaefolia O.K.

(See Fig. 2, page 223.)

Registered number.—O.P.H. No. 7315; 7.8.42.

Common name.—Ertjebos.

Origin.—Carnarvon, Cape Province.

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

Sheep 53407 (4-tooth; 65.0 Kg.) was given 1.5 Kg. of the plant in the course of 24 hours.

Symptoms.—Apathy; anorexia; tympanites; dyspnoea; accelerated pulse. The animal died 36 hours after the commencement of dosing.

Post-mortem appearances.—A tremendous number of petechiae and ecchymoses throughout the body; hyperaemia and oedema of the lungs; regressive changes in the myocardium; advanced fatty degeneration of the liver; regressive changes in the kidneys; tumor splenis; haemorrhagic lymphadenitis of all the lymphatic glands; haemorrhagic abomasitis, enteritis, typhlitis and colitis.

Sheep 60331 (2-tooth; 19.6 Kg.) was given 500 gm. of the plant in the course of 7 hours.

Symptoms.—Apathy; anorexia; general weakness; tympanites; rumen inactive; weak pulse. The sheep died 28 hours after the commencement of dosing.

Post-mortem appearances.—General cyanosis, ascites; hydrothorax; hydropericardium; ecchymoses throughout the subcutis, salivary glands, peritracheal tissues, thymus and in the mucosa of the trachea; haemorrhagic lymphadenitis of all the lymphatic glands; subepicardial petechiae; regressive changes in the myocardium; "nutmeg" liver; severe regressive changes in the kidneys; severe hyperaemia and oedema of the lungs; tympanites of the rumen; slight hyperaemia of, and haemorrhages in, the mucous membrane of the abomasum; fairly marked hyperaemia of the mucous membrane of the small and large intestine.

Sheep 61269 (full-mouth; 31.0 Kg.) was given 1.5 Kg. of the plant in the course of 16 days.

Symptoms.—Apathy; anorexia; slight tympanites; rumen inactive; accelerated, weak pulse; dyspnoea. The symptoms developed from the eighth day after the commencement of dosing. The animal died 8 days later.

Post-mortem appearances.—Slight post-mortem changes; general cyanosis; ascites; hydrothorax; hydropericardium; generalized fat necrosis; a slight degree of icterus; severe hyperaemia and oedema of the lungs; slight regressive changes in the myocardium; pronounced enlargement and fatty degeneration of the liver; regressive changes in the kidneys; stasis of ingesta in the caecum and colon; slight hyperaemia of the mucosa of the colon.

Histology.—Liver.—If it was not for the presence of the portal tracts it would be difficult to identify the organ as liver. Microscopically it strongly resembles adipose tissue. There is practically no cellular reaction.

Lung.—Severe hyperaemia; agonal emphysema and extensive fat phagocytosis.

Kidney.—The cells, especially of the proximal convoluted tubules, contain numerous fat droplets of varying size and show necrobiotic changes. The cytoplasm of an occasional one of these cells has become finely granular and stains a bright eosinophilic colour. Even the cells of the collecting tubules contain fat droplets. There is a moderate hyperaemia of the kidney.

Adrenal.—There is an increased lipid content of the cells of the adrenal cortex. The even distribution and size of these cells are, however, not indicative of degenerative changes. Fat laden phagocytes are absent. A number of cells do not contain fat, but a number of vacuoles without any indication of cellular degeneration.

Spleen.—The spleen contains numerous macrophages laden with fat.

Myocardium.—A slight degree of chronic interstitial myocarditis was observed.

Othonna pallens. D.C.

Registered number.—O.P.H. No. 3177; 29.5.41.

Common name.—Springbokbos.

Origin.—Bestersput, Orange Free State.

State and stage of development.—The plant was dry and in the post-seeding stage. In the following experiments only the leaves and tops of the plants were used.

Sheep 51158 (6-tooth; 45.0 Kg.) was given 200 gm. of the dry plant in the course of 30 hours.

Symptoms.—Apathy; anorexia; accelerated pulse; dyspnoea; rumen inactive. The animal died 4 days after the commencement of dosing.

Post-mortem appearances.—Cyanosis, hyperaemia and oedema of the lungs; subepicardial haemorrhages; fatty degeneration of the liver; fairly marked hyperaemia of the mucosa of the abomasum; stasis of the ingesta in the caecum and colon.

Histology.—Moderate peripheral fatty changes of the liver with considerable round cell infiltration of Glisson's capsule; haemosiderosis of the spleen; slight fatty changes of some tubules in the cortex of the kidney.

Sheep 54222 (8-tooth; 48.0 Kg.) was given 400 gm. of the plant in the course of 7 hours.

Symptoms.—The symptoms observed were similar to those of sheep 51158. The sheep died 60 hours after receiving the first dose.

Post-mortem appearances.—Advanced post-mortem changes; icterus; severe hyperaemia, oedema and emphysema of the lungs; emphysema of the subcutaneous tissues of the neck; pronounced regressive changes in the liver; stasis of ingesta in the caecum and colon.

Histology.—Well-marked, mainly central, fatty changes of the liver.

Each of *sheep* 54581 (6-tooth; 42.0 Kg.) and *sheep* 54150 (6-tooth; 45.0 Kg.) received 100 gm. of dry plant in one dose.

Symptoms.—Apathy; anorexia; accelerated, weak pulse, dyspnoea; rumen inactive; constipation. The animals appeared normal again on the ninth day after dosing.

Rabbit A (2.5 Kg.) was given 60 gm. of the plant in the course of 2 days.

Symptoms.—Listlessness; anorexia; dyspnoea. The rabbit died 3 days after the commencement of dosing.

Post-mortem appearances.—Cyanosis; severe hyperaemia and oedema and slight emphysema of the lungs; severe regressive changes in the liver; regressive changes in the kidneys; stasis of the ingesta in the colon.

Histology.—Necrosis and cytolysis of the central liver cells with round cell infiltration of this central area; marked fatty changes of the peripheral cells of the liver lobules; lymphocytic glomerulonephritis (early stages) and fatty changes of the epithelial cells of the renal tubules; fatty changes in the myocardium.

Rabbit B (2.1 Kg.) received 5.0 gm. of the dry plant daily from 15.9.41 to 2.10.41. From 22.9.41 the animal ate very little, was depressed, constipated and showed progressive loss of weight. It died on 3.10.41.

Post-mortem appearances.—Pronounced emphysema and slight hyperaemia of the lungs; fatty degeneration of the liver; very little ingesta in stomach and intestines.

Rabbit C (2.4 Kg.) received 10.0 gm. of the dry plant on 15.9.41 and again on 17.9.41. The animal recovered after having shown dyspnoea, anorexia and constipation for about a week after the second dose.

Rabbit D (2.45 Kg.) received 15.0 gm. of the dry plant on 15.9.41 and again on 17.9.41. The result was similar to that described in the case of Rabbit C.

Rabbit E (2.5 Kg.) received 20.0 gm. of the dry plant on 15.9.41 and again on 17.9.41. The animal died on 17.9.41 after having exhibited very severe dyspnoea and apathy.

Post-mortem appearances.—Pronounced general cyanosis; very severe oedema and hyperaemia of the lungs with slight emphysema; very marked fatty degeneration of the liver; stomach distended with ingesta; stasis of ingesta in large intestine; dilatation of both heart ventricles.

Histology.—Necrosis and cytolysis of the central liver cells with round cell infiltration of this area; marked fatty changes of the peripheral cells of the liver; early stages of nephritis and fatty changes in the epithelial cells of the renal tubules; fatty changes in the myocardium.

Platycarpha glomerata Less.

Registered number.—O.P.H. No. 15880; 3.1.42.

Origin.—Grahamstown, Cape Province.

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

Sheep 54150 (full-mouth; 49.1 Kg.) was given 1.0 Kg. of the above plant in the course of 6 hours.

Result.—Negative.

LEGUMINOSAE.

Gliricidia maculata H.B.K.

Registered number.—O.P.H. No. 7932; 13.8.42.

Origin.—Doornkop, Natal.

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

Sheep 61184 (2-tooth; 23.7 Kg.) was given 2.4 Kg. of the leaves in the course of 4 days.

Symptoms.—Anorexia; listlessness; dyspnoea; weak pulse; rumen inactive; tympanites; diarrhoea. These symptoms developed on the second day after the commencement of dosing and persisted for 2 days, after which the sheep made a complete recovery.

Sheep 61388 (4-tooth; 31.4 Kg.) was given 6.6 Kg. of the leaves of the plant in the course of 13 days.

Result.—Negative.

Medicago sativa L.

Registered number.—O.P.H. No. 9459; 11.9.42.

Common name.—Lucerne.

Origin.—Delmas, Transvaal.

State and stage of development.—The lucerne hay was infected with the following fungi: *Mucor* sp., *Penicilium* sp., *Helminthosporium* sp., and a *Fusarium* sp. probably *F. scirpi*.

Sheep 62032 (2-tooth; 18.7 Kg.) consumed 27.3 Kg. of the above hay in the course of 16 days.

Result.—Negative.

Phaseolus vulgaris L.

Registered number.—O.P.H. No. 7305; 5.8.42.

Common name.—van Zyl sugar bean; van Zyl suikerboontjie.

Origin.—Derby, Transvaal.

State and stage of development.—The material fed to two experimental horses was the same as that ingested by the affected horses, namely, very finely ground and fairly dusty hay mixed with a small percentage of the mature beans and shells of the pods. The hay was heavily infected with a *Macrosporium* sp. and *Fusarium moniliforme*, and to a lesser degree, with a *Mucor* sp., a *Penicilium* sp. and a *Cephalothecium* sp.*

Equine 63 (1 year) consumed 107.8 Kg. of the hay in the course of 32 days. The symptoms which developed were undoubtedly due to the fact that the animal consumed insufficient food to maintain life.

Symptoms.—The animal became emaciated and progressively weaker. Finally the eyelids and left hind limb became swollen. The fetlock of the right hind limb was also swollen and the animal was lame in this limb. The animal was discharged and placed on the usual laboratory diet; this resulted in rapid recovery.

Equine 22504 (3½ years) and equine 22502 (3½ years) consumed 364.0 Kg. of the hay in the course of 73 days, and 182.0 Kg. of the hay in the course of 30 days respectively. They developed no symptoms of illhealth. In spite of this negative result the sugar bean is still suspected as the circumstantial evidence incriminating it is very strong. Further investigations will be conducted as soon as the occasion arises.

* The examination for the presence of fungi in the hay was kindly done by Mr. E. E. Schaefer, of the Division of Botany and Plant Pathology, Pretoria.

The above experiments were conducted as a result of a disease which broke out in horses in the Derby area and which was investigated by one of us (D. G. S.). The disease which had never been encountered previously, occurred in horses fed large quantities of the above hay. In previous years horses had not been extensively fed on this hay.

The following is a description of this disease, which can be divided into acute and chronic stages.

Symptoms: Acute stage.—Without any prodromal symptoms the horses develop acute brain symptoms. They usually stagger backwards until they assume a sitting position. They then jump up, look around in a wild manner and charge away through fences, bushes and over kraal walls. When they finally stop, completely exhausted, they walk in circles or up and down along fences in a dazed condition. At this stage repeated attacks of clonic convulsions shake the whole body, the eyes have a wild expression whilst the teeth are repeatedly bared as a result of clonic spasms of the lips. The conjunctivae are oedematous, icteric and show petechiae. The acute stage usually only lasts a few days.

Chronic stage.—The horses become emaciated and walk about in a state of semi-consciousness bumping into any object in their way. In standing, abnormal attitudes are assumed and food is often seen protruding from the mouth. Respiration is slow with a forced expiratory effort. The pulse is weak and slow and the animals are constipated. This stage of the disease resembles "dunsiekte" (Chronic Senecio poisoning) in horses.

Post-mortem appearances.—The following were observed in one animal (an eighteen-months-old horse) which was killed after having been affected for six weeks: Hydroperitoneum; dilatation of the stomach; cirrhosis of the liver; slight chronic catarrh of the distal portion of the small intestine; stasis in the colon; hyperaemia and oedema of the cerebral meninges.

Specimens of this young horse were collected for histological examination and these were kindly examined by Dr. G. de Kock, head of the Section of Pathology, and Dr. C. Jackson, head of the Section of Anatomy, Onderstepoort Laboratories. We quote hereunder their respective reports for which we thank them:—

(1) Dr. G. de Kock.—"*Liver:* Midzonal fatty changes, no evidence of much interference in the arrangements of the columns of liver cells with staining of the cells not quite clear, but no necrobiotic changes, their cytoplasm somewhat granular. Here and there in the periphery there is slight cellular proliferation. No undue proliferation of connective tissue.

Diagnosis.—Slight fatty changes.

Spleen.—Follicles and secondary follicles very prominent. In the red pulpa there is a fair amount of a brown granular pigment in the phagocytes. Here and there evidence of small haemorrhages."

(2) Dr. Jackson.—"*Embedded sections of brain:* Definite lesions are present only in the cerebrum. Here in the outer cell lamina there are extensive areas characterised by inflammatory softening, i.e., perivascular oedema, slight perivascular lymphocytic infiltration, necrosis of ganglion cells, multiplication and mobilisation of the glia cells; neuronophagia is demonstrable.

In the cerebellum there is diffuse degeneration of Purkinje cells without apparent reaction. No inclusions are seen; this implies also to the hippocampus.

Diagnosis.—Acute non-purulent encephalitis.

Remarks.—The detailed histological picture would be very atypical of Borna disease and no inclusions are found. Further, the distribution of the lesions as far as is seen from the sections available is not typical. While it is not possible to exclude Borna disease on findings like this in a single case; that diagnosis appears most unlikely.”

LILIACEAE.

Dipcadi sp. aff. D. viride Moench. and D. elatum Baker.

Registered number.—O.P.H. No. 17120; 27.1.42.

Origin.—Mafeking, Cape Province.

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

Sheep 54150 (6-tooth; 43·7 Kg.) was given 2·3 Kg. of the plant in the course of 30 hours.

Result.—Negative.

Dipcadi sp. probably D. viride Moench.

Registered number.—O.P.H. No. 21703; 30.3.42.

Origin.—Deben, Cape Province.

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

Sheep 60237 (4-tooth; 29·1 Kg) was given 1·4 Kg. of the bulbs in the course of 6 hours.

Result.—Negative.

Drimia alta R. A. Dyer, Nom. nov. (Drimia altissima Hook.)

Registered number.—O.P.H. No. 17040; 24.1.42.

Origin.—Pietermaritzburg, Natal.

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

Rabbit A (2·0 Kg.) was given 50 gm. of fresh bulbs in one dose.

Symptoms.—Dyspnoea; accelerated and strong pulse which subsequently became weak and irregular; paresis. The rabbit died 2 hours after drenching.

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

Rabbit B (2.0 Kg.) was given 25.0 gm. of fresh bulbs in one dose.

Symptoms.—As in the case of rabbit A. The rabbit died one hour after drenching.

Post-mortem appearances.—As in rabbit A.

Rabbits C (2.1 Kg.) and *D* (1.95 Kg.) received 50 gm. and 25 gm. of the fresh leaves respectively in one dose.

Symptoms and post-mortem appearances.—As in rabbit A.

Drimiopsis maculata Lindl.

Registered number.—O.P.H. No. 11844 A; 26.10.42.

Origin.—Port Shepstone, Natal.

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

Sheep 61249 (4-tooth; 30.0 Kg.) was given 7.34 Kg. of the fresh plant in the course of 4 days.

Result.—Negative.

Scilla natalensis Planch.

Registered number.—O.P.H. No. 13726; 2.4.41.

Origin.—Estcourt, Natal.

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

Sheep 53394 (8-tooth; 65.5 Kg.) was given 1.2 Kg. of the fresh bulbs in one dose.

Symptoms.—Apathy; tympanites; severe dyspnoea; accelerated and weak pulse. Death occurred about twelve hours after drenching.

Post-mortem appearances.—Advanced post-mortem changes; general cyanosis; tympanites of the rumen; hyperaemia and oedema of the lungs.

Urginea macrocentra Baker.

Registered number.—O.P.H. No. 18263-64; 24.2.42.

Common name.—Natal slangkop.

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

Rabbit A (1.5 Kg.) was given 50 gm. of the fresh bulbs in one dose.

Symptoms.—The animal was found dead three hours after drenching.

Post-mortem appearances.—General cyanosis; hyperaemia and severe emphysema of the lungs; hyperaemia of, and regressive changes in, the liver and kidneys; hyperaemia of the mucous membrane of the stomach and small intestine.

OLEACEAE.

Jasminium angulare Vahl.

(See Fig. 3, page 224.)

Registered number.—O.P.H. No. 8219; 19.8.42.

Origin.—Elandskraal, Helpmekaar district, Natal.

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

In the course of an investigation in the Helpmekaar district the plant was suspected of having caused serious mortality on quite a number of farms.

Sheep 62227 (4-tooth; 25·0 Kg.) was given 800 gm. of the fairly fresh leaves in the course of 4 hours.

Symptoms.—Apathy; general weakness; slight tympanites; accelerated pulse; dyspnoea. The sheep died 7 hours after receiving the first dose.

Post-mortem appearances.—General cyanosis; slight oedema and severe emphysema of the lungs; chronic intestinal catarrh.

Sheep 62077 (4-tooth; 28·8 Kg.) was given 1·2 Kg. of the dry leaves of the plant in the course of 24 hours.

Symptoms.—Apathy; slight tympanites; dyspnoea; accelerated pulse; diarrhoea. The animal died 25 hours after receiving the first dose.

Post-mortem appearances.—General cyanosis; slight hydropericardium, hydrothorax and ascites; hyperaemia and severe emphysema of the lungs; hyperaemia of, and regressive changes in, the liver; hyperaemia of the kidneys; intestinal catarrh; fluid material present in the large intestine.

Histology.—Severe hyperaemia of the lungs accompanied by acute alveolar emphysema and atelectasis; severe regressive changes of the liver accompanied by hyperaemia, oedema and bile pigmentation; moderate hyperaemia of the kidney; hyperaemia of the suprarenal cortex.

Bovine 9142 (1½ years) was given 3·0 Kg. of the fresh leaves of the plant in the course of 4 hours.

Symptoms.—Twelve hours after receiving the first dose the animal developed apathy, weakness in the hindquarters and dyspnoea. Twelve hours later the animal had recovered.

SANTALACEAE.

Thesium lineatum L.

Registered number.—O.P.H. No. 4905; 30.6.42.

Common name.—Vaalstorm, witstorm.

Origin.—Carnarvon, Cape Province.

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

Sheep 64513 (4-tooth; 30.5 Kg.) was given 6.4 Kg. of the dry plant in the course of 9 days.

Result.—Negative.

SOLANACEAE.

Datura arborea L.

Registered number.—O.P.H. No. 17694; 9.2.42.

Origin.—Bonnefoi, Transvaal.

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

Rabbit A (1.85 Kg.) was given 10 gm. of the dry leaves in one dose.

Symptoms.—After drenching the rabbit vomited and developed severe dyspnoea. The rabbit died overnight on the day of drenching.

Post-mortem appearances.—The post-mortem changes were too far advanced to allow of the detection of any lesions that may have been present.

Rabbit B (1.6 Kg.) was given 15 gm. of the dry leaves in the course of 24 hours.

Result.—Negative.

THYMELEACEAE.

Gnidia caffra Meisn. forma *pulchra* (B. Davy). M. Moss, M.S.

Registered number.—O.P.H. No. 11701; 21.10.42.

Origin.—Nelspruit, Transvaal.

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

Sheep 62032 (2-tooth; 30.5 Kg.) was given 2.6 Kg. of the fresh leaves and flowers in the course of 9 days.

Result.—Negative.

INSECTS.

Laphygma exempta Walker.

The larvae of this insect are commonly termed kommandowurms or army worms. Reports have repeatedly been received from stock-owners that cattle grazing on pastures heavily infested with the army worm developed gastrointestinal disturbances (diarrhoea, anorexia). Larvae, which were dead but not decomposed, were minced and given to rabbits as follows:—

Rabbit A (2.1 Kg.)* was given 90 gm. of the larvae in one dose.

Symptoms.—Apathy; distended abdomen; dyspnoea; accelerated pulse; general paresis and death in convulsions. The rabbit died 4½ hours after drenching.

Post-mortem appearances.—General cyanosis; severe emphysema and hyperaemia of the lungs; hyperaemia of, and regressive changes in, the liver and kidneys; dilatation of the stomach; slight hyperaemia of the mucous membrane of the stomach and small intestine; tympanites of the caecum and colon.

Rabbit B (1·8 Kg) was given 90 gm. of the larvae in one dose.

Symptoms.—Apathy; dyspnoea; accelerated pulse. The rabbit died 1½ hours after drenching.

Post-mortem appearances.—General cyanosis; hyperaemia, and severe emphysema of the lungs; dilatation of the stomach; slight hyperaemia of the mucous membrane of the stomach; hyperaemia of, and regressive changes in, the liver and kidneys.

Acanthopsyche junodi Heyl.

The pupae of the above insect are termed Wattle bagworms. After removal of the cases (bags), the pupae, some of which were dead, were minced and drenched to a sheep as follows:—

Sheep 53396 (6-tooth; 49·1 Kg.) was given 220 gm. of the pupae in one dose.

Result.—Negative.

The cases of the pupae are spun so that the ingestion of a sufficient number of the pupae will lead to fatal impaction of the rumen in a way similar to that described by Edwards (1935) caused by the ingestion of the pupae of *Gonometa rufobrunnea*.

MINE COMPOUND WASTE.

Outbreaks of serious mortality in animals, fed on waste porridge from compounds, have relatively frequently been encountered. The evidence in such cases clearly indicates that the waste porridge was the cause of the mortality. Since, however, the animals only take ill some time after consuming the porridge, it is usually impossible to obtain some of the suspected porridge for investigation.

In recent outbreaks of this nature, some of the suspected porridge was, however, obtainable and proved to be toxic by means of biological tests as follows:—

Sheep 53411 (4-tooth; 53·7 Kg.) was given 11·5 Kg. of the porridge in the course of 5 days.

Symptoms.—Severe apathy; salivation; anorexia; general weakness; accelerated, weak pulse; dyspnoea, expiration being accompanied by groaning; severe diarrhoea; stiff gait. The sheep died 5 days after the commencement of dosing.

Post-mortem appearances.—General cyanosis; slight regressive changes in the liver; necrotic pharyngitis; catarrhal and ulcerative abomasitis; hyperaemia of the small intestine; fluid material in the large intestine.

Histology: Liver.—Slight fatty changes.

Kidney.—Slight hyperaemia most marked in the glomeruli.

Sheep 54581 (6-tooth; 46.0 Kg) was given 8.5 Kg. of the porridge in the course of 3 days.

Symptoms.—Apathy; salivation; tympanites; inactivity of the rumen; dyspnoea; stiff gait. The sheep died 4 days after the commencement of drenching.

Post-mortem appearances.—Advanced post-mortem changes; general cyanosis; hyperaemia of the mucous membrane of the small intestine.

Rabbit B (4.0 Kg.) was given 180 gm. of the porridge in the course of 4 days.

Symptoms.—Anorexia; severe diarrhoea; paralysis of the hind-quarters. The animal recovered.

Nails, spent carbide, pieces of leather and decomposed fish and meat are frequently found in the porridge. It is obvious that lamsiekte may be caused by the ingestion of such porridge. All the outbreaks reported followed on or during abnormally hot weather which resulted in very severe fermentation, and even decomposition of the waste porridge, which was left standing in the hot sun.

SUMMARY AND CONCLUSIONS.

Of the twenty-two plants investigated, six were, for the first time, proved to be toxic, namely *Boscia foetida* Schinz., *Cadaba juncea* (Linn.) B. & H., *Othonna cluytifolia* O.K., *Drimys alta* R. A. Dyer, *Scilla natalensis* Planch, and *Jasminum angulare* Vahl. The results obtained from experiments with *Berkheyopsis echinus* (Less) O. Hoffm. and *B. bechuanensis* S. Moore, *Gliricida maculata* H.B.K. and *Datura arborea* L. are not considered to be conclusive.

The pupae of *Acanthopsyche junodi* Heyl were found to be non-toxic whereas the larvae of *Laphygma exempta* Walker proved to be poisonous.

Waste porridge from compounds was proved to be the etiological agent in an outbreak of poisoning in cattle.

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Fig. 1.—*Boscia foetida* Schinz.



Fig. 2.—*Othonna cluytiaefolia* O.K.



Fig. 3.—*Jasminium angulare* Vahl.