

Studies on the Photosensitisation of Animals in South Africa.

V. The Toxicity of *Lippia Rehmanni* (Pears) and *Lippia pretoriensis* (Pears).

By J. I. QUIN, D.V.Sc., Veterinary Research Officer, Onderstepoort.

INTRODUCTION.

IN an attempt to produce experimental cases of photosensitisation in sheep, especially with the object of throwing further light on the problem of geeldikkop (*Tribulosis*), various plants were collected and drenched to sheep, and amongst which the abovementioned two *Lippia* species were included. Both species were collected round about Pretoria with the kind help of Mr. C. A. Smith. Most of the plants were in the late flowering or fruiting stage. The fresh material was not readily eaten by experimental sheep, probably on account of the strong characteristic verbenaceous odour. Consequently the plants were dried, pulverized and after mixing in water, drenched to sheep through a stomach tube. Young Merino sheep were used in the experiment. They were closely shorn and kept exposed in sunlight.

A. Experiments with *Lippia Rehmanni* (Pears)

The following table indicates the results obtained with the above plant:—

Sheep No.	Period of Dosing.	Total Amount Dosed.	Symptoms Shown.	Post-mortem Findings.	General Remarks.
32598	2 days	400 gm.	Third day: Animal ill, jerking of body, frequently lies down. Fifth day: Purging, condition aggravated, marked icterus, high temperature. Eighth day: Sensitive to sunlight, not feeding. Ninth day: Very ill, marked clinical icterus. Died same day.	Intense icterus, pulmonary oedema. Marked pigmentation and degeneration of kidneys and liver, rumen very dry. Catarrhal enteritis with haemorrhages in large bowel.	Photosensitisation slight, icterus intense.
29454	6 days	600 gm.	Third day: Scratching head and licking lips. Fourth day: Marked flinching in sun, very restless (see photos Nos. 1 and 2). Fifth day: Very sensitive, also clinical icterus. Eighth day: Animal purging, very dull. Fourteenth day: Animal dead.	Intense generalised icterus, pulmonary oedema. Bile stasis, pigmentation liver and kidneys, enlargement of the spleen.	Photosensitisation well marked. Icterus intense.
No number	6 days	600 gm.	Second day: Very restless, scratching head. Fifth day: Marked flinching, licking lips, slight clinical icterus. Seventh day: Still sensitive, icterus more marked, condition falling off. Thirteenth day: Animal dead.	Cachexia and general atrophy, intense generalised icterus, pigmentation liver and kidneys. Bile stasis, enlargement spleen, obstruction in large intestine.	Photosensitisation well marked. Icterus intense.
33001	7 days	600 gm.	Third day: Very sensitive to sunlight, ears swollen. Sixth day: Still very sensitive, yellowish exudate from base of horns. Tenth day: Skin on lips, ears, and back hardening. Twenty-fourth day: Necrosed skin peeling off from head, ears, and back. Animal discharged.	Animal recovered and discharged.	Marked photosensitisation and swelling of head and ears, followed by sloughing of affected skin.
33054	3 days	Alcoholic extract from 600 gm.	Fourth day: Definite photosensitisation. Fifth day: Very sensitive, flinching, restless, lying down and rising. Eighth day: Little sensitive, slight swelling of face and ears. Slight icterus of conjunctivae and base of horns. Serum very yellow, strong direct v.d.B. Tenth day: Swelling subsided, sixteenth day animal discharged.	Animal recovered and discharged.	Marked photosensitisation, with swellings of head and ears. Recovered without sloughing of skin.

From the above table it is clear that the powdered *Lippia Rehmanni* (Pears) when dosed to sheep provokes definite photosensitisation even from the second or third day. There is an accompanying clinical icterus which is strongly marked in the blood serum. In some cases there is swelling of the head and ears which may result in the sloughing of the affected skin, and subsequent complete recovery of the animal. This toxic agent present in the powdered plant can be extracted with 75 per cent. alcohol which when dosed



Fig. 1.—Animal flinching in sunlight after being dosed with *Lippia Rehmanni*.

to a sheep produces typical symptoms of photosensitisation. In general, the symptoms produced by drenching this plant, are very similar to those noted in cases of geeldikkop, except that in the latter condition the symptoms are more grave, e.g. the skin of the head and ears frequently shows extensive black dry necrosis, accompanied by rupture of the eyeballs and blindness and hardening and cracking



Fig. 2. Animal flinching in sunlight after being dosed with *Lippia Rehmanni*.

of the lips. The icterus, too, is usually far more severe. Thus it would appear that *Lippia Rehmanni* (Pears) contains a toxic principle (perhaps more than one) capable of causing some derangement in the normal function of the liver leading to an obstructive jaundice as shown by a strongly positive direct Van den Bergh reaction of the blood serum. Accompanying this icterus, there is a well-marked photosensitisation with subsequent sloughing of the necrosed skin.

B. Experiments with *Lippia pretoriensis* (Pears) N.H. No. 15175.

This species of *Lippia* was also collected round about Pretoria. It grows in much taller bushes with a large amount of tough woody branches, sparsely covered with small leaves mostly at the top. As in the previous experiments, the material was also dried and then pulverized before drenching to sheep. The following results were obtained:—One Merino sheep was dosed 1,400 gm. dried powder during a period of 14 days. On the third day the animal first showed photosensitisation, e.g. scratching the ears, flinching, pawing the ground and very restless. In spite of continuous daily drenching, these symptoms only lasted four days and then completely disappeared. The animal was discharged on the 15th day in an apparently normal state of health.

Another sheep drenched with 800 gm. powder in 8 days, only showed slight arching of the back on the 6th day, and nothing further.

From these experiments it may thus be concluded that, although the same general type of symptoms are produced by *Lippia pretoriensis* (Pears) it is far less toxic than *Lippia Rehmanni* (Pears), e.g. 1,400 gm. of the first plant caused little effect on a sheep, while 400 gm. of the second species resulted in the death of a sheep on the 9th day.

The symptoms produced by drenching these two species of *Lippia*, although not so marked as those seen in true geeldikkop caused by the genus *Tribulus*, are essentially of the same nature, i.e. photosensitisation accompanied by icterus.

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