

ART. XVIII.—Notes on a Poisonous Species of *Homeria*
(*H. collina*, Vent.—var. *miniata*), found at Pascoe
Vale, causing death in cattle and other animals
feeding upon it.

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INTRODUCTORY.

The sudden death of a number of cattle at Pascoe Vale, a suburb of Melbourne, about the middle of September, attracted a good deal of attention, and from various accompanying circumstances, there were grounds for believing that the herbage had something to do with it. Specimens of the supposed poisonous weed were sent to Baron von Mueller, Government Botanist, and he determined it to be a species of *Homeria*, a native of South Africa. He remarked that "in their native country occasionally pasture animals have suffered from these kinds of plants, but no poison cases have hitherto come under my own notice."

Veterinary surgeons also took the matter up, and they decided the deaths to be due to anthrax, the sudden illness of the animals and the subsequent deaths of many of them giving colour to this supposition; but it does not appear that the anthrax bacillus (*Bacillus anthracis*, Cohn) was found in the spleen of the dead animals, which is always considerably swollen and full of enormous quantities of these bacilli, when death is due to that cause. But skilled veterinary surgeons may be wrong, and the plain, common sense farmer may be right in some instances, even where the death of cattle is concerned, and here was evidently a case where further investigation was desirable. Since the *Homeria* plant, which was known to be eaten by the cows which died, was growing luxuriantly in patches extending

over several acres where the cattle was feeding, and since it belonged to a genus of plants well known to have poisonous properties, it became a matter of great importance to determine whether this particular plant was poisonous or not when grown in this Colony, so we decided to submit it to the test of experiment.

HISTORY OF OUTBREAK OF DISEASE.

A local dairyman brought ninety-five head of cattle from paddocks a short distance to the north of Pascoe Vale, and put them on the land overgrown with *Homeria*. Next morning, about twelve head were found either sick or dying. Another dairyman brought four head from Caulfield, putting them on the same land, and next morning two were dead and two sick. Several others lost cattle in the same paddock, and it is reported that more than twenty have died altogether. It is worthy of note that the cattle reared in the locality have escaped, and are in excellent health, while only those fresh to the district have succumbed. The plant has now died down, and no more sickness is reported, but in the season, when the fresh, green, tall leaves of the *Homeria* were fully developed, it looked quite a tempting green food. The owner of one of the cows which was treated and recovered assured us that it would not now eat the plant, although it had eaten freely of it before.

As regards the presence of the *Homeria* in the locality, it may have been originally a garden escape, since these flowers are cultivated for their beauty, but although several gardens in the neighbourhood were visited, no trace of it could be found. It has also been suggested that the plant may have been introduced along with the oats formerly sown in the paddock, for it may be multiplied by means of small bulbils which it produces in great abundance, and which might easily get mixed up with other seed.

REFERENCES TO HOMERIA BEING POISONOUS.

As to the poisonous nature of this genus of plants, there are references in various standard works, such as Le Maout and Decaisne's "System of Botany," and Redwood's "Supplement to the Pharmacopœia;" but we shall content ourselves

with quoting from such a well-known work as Bentley's "Manual of Botany," 5th Ed., 1887. At page 703, he says:—"Moraea (*Homeria*). Some species of this genus, more especially that of *M. collina*, and of other iridaceous plants known under the name of "Tulp" at the Cape, have poisonous properties, and have been the cause of fatal results to cattle which have chanced to eat it. "Tulp" is also poisonous to human beings." Redwood refers to *Homeria collina* as Cape Tulip, and as a plant well known to almost every child in the Colony (Cape of Good Hope).

REASONS FOR INVESTIGATION.

Apart altogether from the practical importance of the subject, there were two main reasons which induced us to enter upon the investigation.

First, the poisonous plants introduced into Victoria have not yet been carefully recorded, and therefore any one to which suspicion attached was worthy of being enquired into, and its poisonous properties, if present, determined. In Queensland, a work has been prepared by F. M. Bailey, F.L.S., Colonial Botanist, and P. R. Gordon, Chief Inspector of Stock, entitled "Plants Reputed Poisonous and Injurious to Stock," but there is no mention in it of this one, nor even of the natural order to which it belongs. Also in New South Wales, the Botanist to the Department of Agriculture, Mr. Turner, has a paper on "The Supposed Poisonous Plants of New South Wales (both Indigenous and Exotic)," in *Ag. Gaz.* Vol. II, Part 3, 1891, but there is no reference to this plant or its order. Hence, a possible new poison plant, as far as these Colonies are concerned, deserved to be satisfactorily determined, in order to prevent its further distribution. Such a determination is a necessary preliminary step to its eradication, just as in Western Australia, where certain poisoned land, as it is called, can only be obtained on conditions of exterminating the poison plant, which is only dangerous at certain seasons of the year.

Second, as the cows which died at Pascoe Vale were said by skilled veterinary surgeons to have died from anthrax, and not from any supposed poisonous weed, this became a strong additional reason for sifting the matter to the bottom, and seeing if, after all, the reputed poisonous weed was simply an imagination of the cattle owners.

WHAT IS A POISON PLANT?

A poison plant being one that poisons, the first thing to do was to settle that point, and then have the plant analysed, in order to determine the poisonous principle or alkaloid. Mr. P. Wilkinson, of the Government Analyst's Department, has made an extract from the plant, but found no alkaloid present. It is attempted to settle the former point in this paper, and in order to be clear as to what constitutes a poison, we shall take the definition as given in Guy and Ferrier's "Forensic Medicine," 6th Ed., 1888:—"A poison is any substance or matter (solid, liquid, or gaseous) which, when applied to the body outwardly or in any way introduced into it, can destroy life by its own inherent qualities without acting mechanically." And Dr. Neild's definition is:—"A poison is a substance which, taken into the body, is fitted to injure health." So if this plant can be proved to cause the death of animals feeding upon it, it will deserve the name of a poison plant, irrespective of the symptoms which it produces.

EXPERIMENTS ON RABBITS.

Knowing from the experiments of Professor Halford and others, that such drugs as opium and belladonna can be given in very large doses to dogs with comparatively little effect, the first difficulty was to decide upon and obtain suitable animals for experiment. After due consideration, we resolved to try the effects of the herb upon herbivorous animals such as rabbits, which Mr. Wyatt, of Woodlands Station, very kindly procured and sent to us. Three rabbits arrived on Saturday, 1st October, and were kept for a week on ordinary diet. They were all in good health and lively.

On Saturday, 8th October, at 4 p.m., two were placed in a separate cage and fed upon the *Homeria* plant, the other being reserved for future experiment. Fresh plants were brought from Pascoe Vale, and the portion growing above ground, similar to that eaten by the cattle, was moistened and given to the two rabbits. Nothing else was in the cage, and we saw them eat freely of the plant.

On Monday morning, 10th October, both were dead, and not expecting such a sudden effect, we did not watch symptoms very closely. However, the question of symptoms was a secondary one at this stage, the primary object being

to determine whether feeding upon this plant would cause death. On making the post-mortem, we found the mucous membrane of the stomach and intestines congested. The rabbit kept for control was lively and well as usual.

On Saturday, 15th October, the third rabbit which had been fed during the week on green food and was quite lively, was placed upon the same diet. About 6 p.m. it was given the freshly cut *Homeria* plant, which it readily ate. On Sunday morning it was drowsy, eyes half-closed and distinctly ill. Towards evening, there were distinct traces of scouring in the cage. At 11 p.m. it was still alive, but on Monday morning, 17th October, it died at 7 o'clock.

Post-mortem.—Externally marked evidence of scouring action on tail, &c. The liver congested, kidneys slightly congested. Bladder full, which was also observed in the other two rabbits. Before opening the stomach, little spots like ulcers could be seen in the wall, and on opening it was found to contain a quantity of the herb and some mucus. The contents were moister than in the other two rabbits, and marked corrosion was visible. The mucous membrane was completely charred in places, similar in fact to what would have been expected if strong sulphuric acid had been administered. When these black spots were removed, round patches of inflammation were visible, and on holding the stomach up to the light, these patches were very conspicuous, looking like little ulcers. The entire intestinal tract was congested.

Several more rabbits were obtained from the same quarter, and on Thursday, 20th October, two were again selected for feeding on the *Homeria* plant. This was given to them about 5 p.m., along with water, and next morning, 21st October, one had died. On examination, the stomach was full and congested. The second rabbit was found dead on Saturday morning, 22nd October, and the appearance of the stomach was similar to the first, only the peeling off of the mucous membrane was more marked. More of the plant had been eaten in the latter case.

In these experiments five healthy and lively rabbits were taken, and so sure as they were fed upon the *Homeria* plant, so surely did they die, within two days at the most, while other rabbits similarly kept, but fed on ordinary food, remained alive, and as fresh as when first received. Precautions were taken to exclude all disturbing elements, so

that the one point of difference was, that one set of rabbits were fed in the usual way and lived, while another set were fed on the *Homeria* plant and died.

It seems, therefore, reasonable to conclude that the eating of this plant was the cause of death, and that it is possessed of poisonous properties of an irritant nature.

EXPERIMENTS ON COWS.

It was considered quite satisfactory to test the effects of eating the *Homeria* plant upon rabbits, but in order to settle the matter even for cows, the Hon. the Minister of Agriculture (Mr. Graham) allowed two cows to be purchased for the purpose, one to be fed upon the plant, and the other to be fed, in the first instance, in the usual way, so as to show by way of contrast the effects of the different feeding. The two cows were placed in separate loose-boxes, and on the evening of October 14, about 6 p.m., one was given half a bag of the freshly cut *Homeria* plant and water, while the other had a good supply of hay and straw. She ate greedily of the plant (although not specially starved for the occasion) while we were present, along with Mr. W. H. Stephen, Acting Chief Inspector of Stock, and Mr. E. Rivett, M.R.C.V.S. On the following day, the cow feeding upon the *Homeria* plant was found to have eaten about half the quantity given her, and refused to have any more. On the 16th she was lying down sick, and on the 17th the same; then on the forenoon of the 18th the cow was killed, and a post-mortem made by Mr. Rivett. This cow was three days and a half under treatment, and the eating of the plant had produced a scouring action, along with general weakness, and a very perceptible trembling at the loins.

The second cow, which was also placed in a loose-box on the evening of the 14th October, was well fed on the 15th and 16th. She was made to fast on the 17th, in order to ensure active feeding, and on the 18th, about 1 p.m., was supplied with about a quarter of a bag of *Homeria*, together with drinking water. She ate very greedily of the plant, and seemed to relish it. On the 19th she was found lying down, unable to rise, and died that night. The examination of the animal was made about mid-day on Thursday, October 20, by Mr. Stephen, in the presence of both of us. The four stomachs were carefully examined, and in the rumen or

paunch, there was marked congestion at the cardiac end, while the mucous membrane peeled off, and was distinctly inflamed. There was also considerable scouring of the animal before death. The stomachs of both cows were found to contain a fair amount of food.

The evidence derived from experimenting upon the cows, supplements that obtained from the feeding of the rabbits.

CONCLUSIONS.

To sum up, as far as these experiments go, there are decided indications that the *Homeria* plant has poisonous properties, capable of causing the death of cattle and other animals, and this conclusion is based upon the following grounds:—

(1) This plant is stated to be poisonous to cattle at the Cape, its native habitat, by Professor MacOwan, Government Botanist there, and the probabilities are, that it is so in Victoria.

(2) Several healthy and lively rabbits were fed upon this plant, and with abundance of material they invariably died, while rabbits fed in the usual way remained quite healthy.

(3) A cow fed upon this plant also died, and the symptoms indicated poisoning.

(4) Cows fed in the paddock where this *Homeria* grew died, while those in adjoining paddocks where the plant did not exist, were unaffected.

That the cows ate the plant was shown, not only by the undigested remains found in the stomach, but from the characteristic seed-like bulbils found there, as well as in the droppings.

GOVERNMENT BOTANIST'S DESCRIPTION OF PLANT.

Baron von Mueller, Government Botanist, has kindly supplied a description of the plant, which is as follows:—

Homeria collina, Vent.—var. *miniata*.—A native of South Africa. Bulb almost spherical, covered closely by a coating of interwoven fibres, between the layers of which numerous minute readily sprouting bulbils are concealed. Whole plant to 3 feet high, but usually much less,

variable also in more or less robustness or slenderness, often somewhat branched. Leaves linear to $1\frac{1}{2}$ feet long to $\frac{2}{3}$ inch broad, but frequently of much less size, always channelled and gradually much narrowed upwards; grey-green above, dark green beneath, slightly streaked, small bulbils also formed occasionally in the axils of some leaves. Inflorescence fascicularly compound when well developed. Somewhat paniculate, the supporting lowest floral leaf often much elongated, clasping at the base. Bracts comparatively long, much pointed, the outer green, the inner smaller, gradually colourless, and very tender. Flower stalks to 2 inches long, though often shorter. Some of the stalklets finally to $1\frac{1}{2}$ inches long, all enclosed in longitudinally convolute bracts. Flowers almost horizontally expanding, very tender, stem shrivelling. Tube of the calyx thinly cylindric, pale-green, darker, six streaked, generally about $\frac{3}{4}$ inch long. Lobes of the calyx three (or exceptionally two), petal-like lanceolar-ovate, about $\frac{3}{4}$ inch long, yellowish towards the base, otherwise almost brick-coloured, or nearly orange-coloured. Petals similar to the calyx-lobes, but somewhat narrower, three (or exceptionally two), along with the calyx-lobes twisted after flowering, finally deciduous. Stamens three (seldom two), much shorter than the calyx-lobes and petals. The three anthers erect, seated on the yellowish narrow staminal tube, about $\frac{1}{4}$ inch long, yellow, broad-linear, blunt, at the base minutely bi-lobed, bursting marginally. Style filiform, about as long as the stigmas. These, as well as the anthers opposite to the calyx-lobes, three (or exceptionally two) in number; hardly extending beyond the anthers, yellowish, linear-cuneate, with numerous dilated bi-lobed crenulated and ciliolated summit, and with two small tender inner appendages. Ovary quite connate with the calyx-tube, three-celled (or seldom two-celled), cylindric and somewhat angular. Ovules very numerous, fixed along the axis. Fruit dry, trigonous cylindric, dehiscent, many seeded. The flowers are distinctly smaller than those of *Homeria collina*, their petals and calyx-lobes are more acute and of a lighter red; also less venulated, and the staminal tube is glabrous.

CONCLUSION.

It will be seen from the foregoing description what wonderful powers of propagation this plant possesses by

means of its numerous reproductive seed-like bulbils. It can easily be understood how it has overspread the paddock by this means alone. Its showy and attractive flowers likewise rendered it an object of interest and beauty to the numerous wayfarers, particularly on Sundays, and as handfuls of the plant were taken away, it would thus be spread over a large area, and carried to different districts. It is known in other places besides Pascoe Vale, but now that its poisonous properties are unmasked, it is hoped that this brief notice of it may lead to its being promptly destroyed in any garden or cemetery where it may exist.



McAlpine, Daniel and Farmer, P W. 1893. "Notes on a poisonous species of *Homeria* (*H. collina*, Vent.-var. *miniata*), found at Pascoe Vale, causing death in cattle and other animals feeding upon it." *Proceedings of the Royal Society of Victoria* 5, 209–217.

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