

THE POISONOUS, SUSPECTED, AND MEDICINAL PLANTS OF NEW ZEALAND.

(Continued.)

B. C. ASTON,

F.I.C., F.N.Z.Inst., Chemist to the Department

COMPOSITAE—continued.

BEFORE leaving the subject of the rangiora (*Brachyglottis rapanda*) some additional evidence as to the poisonous nature of this species may be given. Mr. D. Sinclair, of Terrace End, Palmerston North, wrote on 5th April, 1915, that he had a saddle-horse become tipsy, or almost unable to stand up, from having eaten some rangiora. From Mangamaire, Upper Wairarapa, a correspondent wrote on 22nd December, 1914, that he had just lost three cows, and the only thing that could possibly have hurt them was one rangiora-tree in full flower which the cows had been eating. Another cow in the same paddock was drunk from the same cause, and could only just walk. The owner stated that he had seen a horse affected in just the same way as was this cow after eating rangiora, but had never experienced having cattle poisoned by it before.

A Taihape farmer, in August, 1914, sent to this Laboratory the stomach-contents of a yearling heifer calf. He had lost two within a few weeks, although the stock were in good condition and had plenty of pasture and hay. The owner was at a loss as to the cause of the deaths, the symptoms being, according to his description, that the calves seemed to lie about as if sleepy, and then die without a struggle. There was, he added, a little tutu and rangiora growing on the place. Upon examination in the laboratory the stomach-contents were found to consist largely of fragments of the leaves of rangiora.

A Wanganui settler, in August, 1900, informed the writer that rangiora was most poisonous to horses in winter. He had known a few to die, but the majority recovered, the symptoms being staggering as if drunk, and swelling of the head and legs. Those which recovered were always "groggy on their pins" for a few weeks.

Mr. Elsdon Best, in September, 1900, reported from Ruatahuna that horses sometimes die of eating wharangi, blood-letting and violent exercise being the native cures. His own horse, shortly before writing, was "wharangied," and had to be taken for a three-mile sharp canter as a cure.

A correspondent on the Wanganui River, in February, 1906, wrote that rangiora is better known as the "paper-leaf," and that he had seen a good many horses drunk from eating it, but did not know of a single instance of a horse dying from it. In fact, the packhorses in many places lived and thrived on it, and got very fond of it. As soon as an affected animal was worked so as to get heated and to sweat, the effects wore off. This correspondent also related a case of poisoning by honey on 20th November, when the rangiora would be in flower. Three bushmen were poisoned, but gradually recovered. He stated that the Maoris never take the wild honey when the rangiora is in blossom.

Centipeda orbicularis (*Cotula minuta* Forst.), a small native weed usually found in swampy places in the North Island, is stated by Lauder Lindsay to be possessed, under certain circumstances, of pungent, irritant, or sternutatory properties, causing sneezing when bruised under the nose.

Celmisia sp. is the native "cotton-plant" or "horse-daisy" of the New Zealand mountains. In Otago one or more of the species is dried and smoked as tobacco. Neil (1889), ("N.Z. Herb Doctor," p. 495), states that it relieves asthma.

THE POISONOUS, SUSPECTED, AND MEDICINAL PLANTS OF NEW ZEALAND.

NEW ZEALAND JOURNAL OF
AGRICULTURE, VOLUME XXVI,
ISSUE 3, 20 MARCH 1923, PAGE
149

Using This Item

Stuff Ltd is the copyright owner for the New Zealand Journal of Agriculture. You can reproduce in-copyright material from this journal for non-commercial use under a [Creative Commons BY-NC-SA 4.0 International license](https://creativecommons.org/licenses/by-nc-sa/4.0/). This journal is not available for commercial use without the consent of Stuff Ltd. For advice on reproduction of out-of-copyright material from this journal, please refer to the [Copyright guide](#).

APOCYANACEAE.

A great many plants of this family are physiologically active, and some of them intensely poisonous. The New Zealand representatives are small climbing shrubs of the genus *Parsonsia*, with yellowish-white or pink flowers produced in great profusion. There are two species—*P. heterophylla* and *P. capsularis*. They probably contain saponins, and from the fact that they belong to such a poisonous family are worthy of chemical investigation.

GENTIANEAE.

The genus *Gentiana*, which includes the beautiful gentians of our New Zealand mountains, is remarkable for the bitter principle which every member contains. Possibly some of the larger species might be made to yield a gentian root or gentian bitter similar to the well-known imported tonic.

CONVOLVACEAE.

Calystegia sepium—the pohue of the Maori and the bindweed of the settler—is a widely spread weed, and one which in the Northern Hemisphere is undoubtedly poisonous. Long remarks that the two species *C. sepium* and *C. arvensis*, when eaten in considerable quantity, appear to be cathartic and purgative, causing symptoms similar to those due to jalap. Colenso ("Essay," p. 31) remarks that the roots of *C. sepium* were cooked and eaten by the Maoris. Lauder Lindsay remarks that the large tuberous rhizomes, although eaten by the Natives, are in Europe regarded as poisonous, and yield a resin resembling scammony, which is a general characteristic of the *Convolvaceae*, although there are marked exceptions, such as *C. batatas*, the sweet-potato. Dr. Hooker very justly remarked that the properties of the same species may vary eminently in various localities. This is notoriously the case in many medicinal plants which are of violent action in one climate and innocuous in another. It is not to be thought, however, that because the roots are edible when cooked by the Maori they are non-poisonous when raw.

SOLANACEAE.

This is a family containing many poisonous and many useful plants, but in New Zealand there are only two native representatives—*Solanum nigrum*, the "garden nightshade," and *S. aviculare*, the poroporo of the Maori. *S. nigrum* is widespread throughout the world. Cases of poisoning in stock, calves, sheep, goats, and pigs are recorded in other countries. Long remarks that though it must always be regarded as poisonous, the plant varies considerably in toxicity according to soil, climate, and general conditions of growth. The symptoms of poisoning

are apparently much the same in man and animals—stupefaction; staggering; loss of speech, feeling, and consciousness; cramps; and sometimes convulsions. The pupil is generally dilated. The writer has come across one case in New Zealand in which lambs confined to a paddock on which was a large aftermath growth of *S. nigrum* went off in condition and a number died.

SCROPHULARINEAE.

Veronica is the only New Zealand genus of this large family (which derives its name from the supposed virtues of some of its members in curing scrofula) of which anything can be said. There are many medicinal plants belonging to the family, perhaps the best known now being the *Digitalis* (foxglove), which will be discussed later in this series of articles.

The leaves of some of the hundred or so species of *Veronica*, or koromiko, which are so abundant throughout New Zealand, have a great reputation as a cure for diarrhoea, both among the settlers and the Natives. There is some doubt if the young leaves, which are the part used as a medicine, yield their virtue to the patient by any other means save that obtained through the chewing of the leaves. Dr. Bell (*N.Z. Medical Journal*, April, 1900, p. 135) notes that it is stated that when koromiko is prepared as a tincture or infusion it is not so effectual. Dr. Bell tried large doses of both these preparations without their having the slightest effect on diarrhoea. Neither did he notice any marked astringent effect in a fresh decoction. The leaves themselves are so easily obtained from bush or garden, where they are generally grown as ornamental shrubs, that there would seem to be no reason for making them into a preparation if the mere chewing of the leaves would accomplish the desired result. The leaves of all the species appear to have a similar astringent taste.

MYOPORINEAE.

Myoporum laetum—the ngaio, a common tree throughout New Zealand, especially in coastal situations—is undoubtedly a cattle-poison. Cases of poisoning usually occur in winter, when the grass is short and when branches of the ngaio or the trees themselves are blown down by gales. In the 1900 Annual Report of the Department of Agriculture, p. 127, the writer has recorded that the oil extracted from the leaves (by steam distillation) was non-toxic to guinea-pigs in 6 milligram doses.

The following are instances of poisoning of stock by ngaio which have come under the writer's notice. In May, 1910, the owner of thirty-five cows at Duvauchelle Bay, Banks Peninsula, found fourteen of them staggering about. Two died in twenty-four hours, and three more in another thirty-six hours. The owner opened one and found a dry solid mass of ngaio leaves and twigs in the rumen. The symptoms were compatible with death from acute constipation. A correspondent from Palmerston, Otago, in May, 1911, reported that several cows had died in the district from eating the leaves and fruit of the ngaio, the symptoms being extreme costiveness and severe pain. A typical case occurred in the Wairarapa in August, 1912, where a farmer lost five out of eighteen two- to three-year-old bullocks turned into a 40-acre

paddock about a week previously. The weather had been cold and stormy, and a very large ngaio-tree had been blown down. Three dead cattle were opened, and the small dark-green buds and leaves of the ngaio were found mixed with grass. Mr. Howard, Government Veterinarian, also visited the farm and reported on three of the dead animals, finding the stomachs filled with ngaio leaves, buds, and twigs, mixed with a small amount of dried grass. There is little doubt, he concluded, that the animals were poisoned as a result of eating their fill of ngaio-leaves when there was little or nothing else in their stomachs. Several farmers lost cows through ngaio poisoning at Moumahaki in May, 1918.

Goldie remarks of the use of the ngaio by the Maoris that the bark is chewed for toothache, the twigs and leaves to medicate the vapour bath, and the juice expressed from the leaves is applied to the skin to prevent mosquito and sandfly bites.

An allied species, *M. deserti* A. Cunn., the ellangowan poison-bush of Queensland, has caused, according to Bailey (1906), ("Weeds and Suspected Poisonous Plants of Queensland"), great losses to travelling flocks of sheep. Other species of this genus have been suspected of poisoning sheep.

VERBENACEAE.

Vitex littoralis is the puriri of the northern portion of the North Island, well known as a most useful hardwood tree, valuable for building-construction in which great strength and durability is required, and for fencing, sleepers, &c. Baber remarks that it may be classed among dangerous plants from the severe inflammation which may be caused by splinters penetrating the skin of hands and feet. The dyeing properties of the wood and the dyeing principles have been isolated and investigated by the well-known colour chemist, A. G. Perkin, F.R.S. (*Trans. Chem. Soc.*, 1898, Pt. 1, p. 1019).

PIPERACEAE.

Piper excelsum—the kawakawa of the Maori—is one of the commoner shrubs of the North Island and the northern part of the South Island. It is a plant which possesses, in common with other species of the *Piper* genus (which includes all the trees furnishing the pepper of commerce), the aromatic and stimulating properties which characterize them. The kawakawa of the Polynesian islands, so well known as furnishing an intoxicating drink which is there so ceremoniously consumed, is *Piper methvsticum*.

Baber says that the effect of the New Zealand *Piper* is stimulating, exciting the salivary glands, the kidneys, and the bowels slightly. It is aphrodisiac. The fruit and seed, ripe or unripe, are much more powerful than the leaves, although the latter are generally used. An extract of the crushed leaves, made by pouring boiling water upon them and allowing it to cool, affords a pleasant drink when the taste is acquired. The writer has found this decoction an efficient remedy for the cure of boils, and has verified all the symptoms mentioned by Baber as following the use of the extract. Hochstetter remarks that an infusion of the leaves when brewed makes a very refreshing beer. Goldie states that this species does not possess the sedative and narcotic properties of kawakawa. It is used by the Maoris for

toothache, dysentery, and for various other medicinal purposes. Dr. Thompson ("Story of New Zealand") remarks that it is singular that New-Zealanders have forgotten the art of extracting an intoxicating beverage from kawa-root, seeing that the plant grows abundantly in the country. Lauder Lindsay, in his "Toot" paper, corrects Dr. Thompson in confusing *Piper methysticum* with *P. excelsum*, but quotes Dr. Dieffenbach (1843), ("Travels in New Zealand," Vol. 1, p. 426), in saying that its leaves form a good and apparently healthy substitute for tea. The active principles of both these species are well worth careful investigation.

MONIMIACEAE.

Laurelia Novae Zelandiae—the pukatea, a forest tree—is certainly one of the medicinal plants of New Zealand. Dr. Goldie states that the inner layer of the bark of this aromatic plant is boiled in water by the Maoris, and the decoction thus prepared is applied externally to tuberculous and chronic ulcers and various cutaneous diseases. A strong solution held in the mouth relieves odontalgia (toothache), and it is also taken internally and applied locally in syphilis. The present writer has isolated three alkaloids from the bark (*Trans. Chem. Soc.*, 1910, p. 1381). The physiological action of the principal alkaloid, puketeine, has been investigated by Professor Malcolm, Otago Medical School, who published in the Annual Report of the Department of Agriculture for 1908, p. 226, a short account of his research (which is being continued). The new alkaloid is like strychnine in its action, but very much milder: 0.3 gram per kilo caused convulsions in a rabbit when given by mouth, but the animal recovered; 0.25 gram given hypodermically caused death in a rabbit in half an hour.

The pukatea alkaloids exist in comparatively large quantities in the bark of the tree, amounts of the order of 1 or 2 per cent. of the weight of bark being present. There would therefore be no difficulty in obtaining sufficient of the alkaloid for a thorough investigation. It is noteworthy that two of the alkaloids differ in chemical formula by C_2H_4 , puketeine being $C_{17}H_{17}NO_3$, and laureline $C_{19}H_{21}NO_3$. A more recent investigator, Pyman (1914), (*Trans. Chem. Soc.*, Vol. 105, p. 1679), working on an allied tree from Queensland (*Daphnandra micrantha*, family *Monimiaceae*), isolated alkaloids as follows: Daphnandrine, $C_{36}H_{38}N_2O_6$; daphnoline, $C_{34}H_{34}N_2O_6$; micranthine, $C_{36}H_{32}N_2O_6$. The bark of this tree was found to be remarkably rich in total alkaloids, 6 per cent. being found. The physiological action of these alkaloids appears to resemble somewhat the action of puketeine, and when the formula of the daphnandra alkaloids is halved there appears to be some chemical relation between the alkaloids from the two trees. Thus daphnandrine becomes $C_{18}H_{19}NO_3$, daphnoline $C_{17}H_{17}NO_3$, and micranthine $C_{18}H_{16}NO_3$.

THYMELAEACEAE.

Pimelia is a widely spread genus in New Zealand, the commonest species being known in the North Island as the "Strathmore weed" (*P. laevigata*). One or other of the species may be found at all elevations. The common daphne found in many gardens belongs to this family, and has the same poisonous qualities as the *Pimelia*. The bark

of every one of the New Zealand pimelias has the same physiological action when chewed—it produces after a few minutes an intense burning sensation in the mouth. Of the *Daphne mezereum* and *D. laureola*, Long remarks that all parts of these plants are acrid and poisonous, especially the bark and berries. The active principle of the daphne is supposed by Emil Pott to be or be contained in an acrid resin, although a vesicating oil is said by Van Rijn to be present. Drying does not destroy the poisonous property. The symptoms of daphne poisoning are severe purging, burning of the mouth and throat, and in severe cases narcotic effects giving rise to convulsions. Lauder (“Veterinary Toxicology,” 1912, p. 259) records poisoning of horses after the consumption of daphne, the symptoms being intense colic, constipation, followed by dysentery and copious evacuation of faeces streaked with mucus, blood, and intestinal epithelium. Post-mortem examination showed stomach and intestines and colon much inflamed.

The symptoms of poisoning by daphne are given fully here in order that those interested in the closely allied pimelias of this country may have better opportunity of detecting poisoning by this plant, which, it is highly probable, has a similar action. In September, 1908, several draught horses died in the Wairarapa district, it was supposed, by poisoning from the *Pimelia* (see *Dominion* of 4th September). Leaflet for Farmers No. 55, issued by this Department, gives an illustration of one of the commonest New Zealand species of *Pimelia*. Experiments in this laboratory have shown that 0.82 gram of resinous dry alcoholic extract of bark was poisonous to a guinea-pig (Annual Report, 1900, p. 127). Bailey records that several of the Queensland species of *Pimelia* are suspected of poisoning stock, particularly sheep. In New Zealand, horses are the only animals which *Pimelia* has been suspected of poisoning, so far as the writer is aware. The recent bark of daphne applied to the skin produces inflammation followed by vesication, and the dried bark is the *Mezerei cortex* of pharmacy, used as a blistering agent or for the making of an irritant ointment. The New Zealand species of *Pimelia* might furnish similar preparations. There are about fifteen New Zealand species, some of them growing to a height of 5 ft., and quite worthy of cultivation in gardens as flowering-shrubs.

LORANTHACEAE.

The family includes those plants which are parasitic on other trees and known as mistletoes. Some of the New Zealand species must be ranked among the most beautiful flowering-plants of the world. From one of the species an infusion has been prepared and used by an Otago medical man as a heart-tonic. The English mistletoe, although belonging to a different genus, had repute as a medicinal plant. The fruit of this is said to be poisonous.

EUPHORBIACEAE.

In *Euphorbia glauca*, common on many New Zealand seashores, there is one representative of the poisonous *Euphorbia* genus. Suspicion should be attached to the New Zealand species on account of the poisonous nature of many of its allies, some of which are growing wild as naturalized plants in this country.

URTICACEAE.

This family includes the genus *Urtica*, containing the nettles, of which the only dangerous one is *Urtica ferox*, the ongaonga of the Maori or tree-nettle of the settler, common throughout New Zealand. Instances of dogs and horses having been poisoned by coming into contact with this species are given in the Chemistry Division's annual report for 1909 (Annual Report of Department of Agriculture, p. 180). The Australian *U. gigas* is reported frequently to kill horses, and apparently the ongaonga will do likewise if the horse is badly enough stung.

LILIACEAE.

Dianella intermedia, the turutu of the Maori, usually found growing under manuka scrub, is a tufted grass-like plant with very conspicuously beautiful fruits abundantly produced in autumn. In the *N.Z. Medical Journal* for April, 1891, Dr. Ernest Robertson, of Auckland, gave an account of the poisoning and death of a child, aged one year and nine months, in about eighteen hours after eating a number of berries of this plant. There were no convulsions or twitchings at any time except hiccough and laboured respiration, which were prominent symptoms at the last. No post-mortem was made. Suspicion has again been directed to this plant by a note in the *N.S.W. Agricultural Gazette* of November, 1908, by Mr. Maiden, Government Botanist. Several valuable pigs and some suckers which were just beginning to pick about died after eating the roots of a species of *Dianella*. Dragen-dorff mentions *D. nemorosa* and *D. ensifolia* as medicinal plants, and states that the roots were used in dysuria and other complaints. The former species is used in the Straits Settlements as a rat-poison.

Phormium spp., the well-known New Zealand flax, was, according to Goldie and others, used by the Maoris as a cathartic, the root or portion near the root being the part of the plant used. Dr. E. W. Bell also has an interesting account of its uses in a paper, "Medical Notes on New Zealand" (*N.Z. Medical Journal*, April, 1890, p. 135). Dr. F. A. Monckton, in the *Australian Medical Gazette*, bears witness to the efficacy of a strong decoction of the roots and butts of the leaves. He writes: "Somewhere about the year 1869-70 a letter appeared in the Melbourne *Argus*, signed by myself as Provincial Surgeon of Southland, bearing witness to the extraordinary healing properties of *Phormium tenax*, commonly known as New Zealand flax. From that time to the present I have used it in hundreds of cases, including lacerations and amputations of every description, and I have no hesitation in saying that there is nothing known in the Old Country that can equal it in producing healthy granulations. I use a strong decoction—the stronger the better—made from the roots and the butts of the leaves boiled for twelve hours. At one time I had to make it fresh every second day, as it readily ferments and deteriorates, but since carbolic acid came into vogue I keep it for any length of time by adding about an ounce of equal parts of carbolic acid and glycerine to every quart. I require no other antiseptic precautions, but simply syringe the lesions occasionally with it, and maintain cotton wool and lint soaked in it constantly to the parts affected. If there are no foreign matters to be discharged there will be no discharge." The doctor gives details of two very bad cases of shattered and torn limbs

which had been treated by him with perfect results by means of fresh flax decoction and nothing else. He concludes: "I might adduce proofs by scores of its efficacy, but if owing to these facts being made prominently known medical men can be induced to test the remedy for themselves, it will require no assertion from me to cause *Phormium tenax* to take the premier place as a granulating agent."

Sir A. H. Church (1873) investigated the chemistry of *Phormium tenax*, and isolated a bitter principle which he considered a tonic (*Trans. N.Z. Inst.*, Vol. 6, p. 260). Students of phormium would do well to consult the extensive bibliography prepared by Dr. B. D. Cross (1914) attached to a paper, "Investigations on Phormium" (*Trans. N.Z. Inst.*, Vol. 47, p. 61). The bibliography was not published, but is filed for reference in the Dominion Museum Library.