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

(Continued.)

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LEGUMINOSAE.

THE flora of New Zealand is remarkable in containing so few genera, species, and individuals of that great family *Leguminosae*—the pea or pod-bearers—although it is the second largest family of flowering-plants, containing over four thousand genera and seven thousand species. Cheeseman (1906), indeed, considered ("Manual," p. 107) the paucity of legumes to be one of the most remarkable peculiarities of the flora. There are practically no native plants analogous to the clovers on the main islands of this Dominion, the alpine *Swainsonia*—the only approach to a herbaceous legume—being so rare as to be negligible. The family is represented by a comparatively small number of leafless broom-like shrubs, the well-known kowhai (*Sophora tetraptera*), and the kaka-beak *Clianthus puniceus*).

The kowhai is the one instance in the native flora of a suspected poisonous legume. Its affinities in other countries are certainly suspected—namely, *Sophora sericea* and *S. secundiflora* in America. The former is supposed to be one of the plants which cause "locoism" in horses. It may here be remarked that a number of poisonous plants in the wild pastures of America are termed "loco" weeds, the symptoms they occasion being termed "locoism." Regarding the New Zealand species of *Sophora*, which will probably be split up by future systematic botanists into a number of species, the only evidence the writer has as to the poisonous nature of the tree is that two persons were made very ill by eating food with a spoon made of kowhai wood. Lauder Lindsay, in his paper on the "Toot Plant," mentions it as suspicious.* Colenso (1868) states ("Essay," p. 38) that it was used as a purgative medicine by the Maoris. Wounds were dressed with the bark, which had been steeped in water. He notes that the bark is intensely bitter. Goldie (1904) states that the inner bark of the kowhai was used for pakipaki (itch) by the Maoris.

ROSACEAE.

The piripiri (*Acaena* sp.), which by its clinging burrs annually causes such trouble in lowering the value of wool, is the only plant of which anything can be said of those species belonging to this large family. The latter, however, is but poorly represented in the Southern Hemisphere. The leaves of *Acaena sanguisorbae* are used as a substitute for tea, according to Maiden ("Useful Plants," p. 4), by Australian settlers. An infusion of the plant has been found useful in preventing scour in

*Dr. Hulme (Provincial Surgeon of Otago) informed Lindsay that he suspected the wood and seeds of poisonous properties (*Brit. and Foreign Med. and Chir. Rev.*, July, 1865).

calves by settlers in the Strathmore district of Taranaki. According to Hooker ("Handbook"), it has been used medicinally by the South Island settlers, while the Maoris used it medicinally in various ways (Goldie).

SAXIFRAGEAE.

The bark of *Weinmannia racemosa* and *W. sylvicola*, the kamahi or tawhero of the Maori, contains much tannin. Up to 20 per cent. has been found to be present by modern methods of analysis in the Chemical Laboratory of this Department. The bark was very largely used by the early settlers for tanning leather. Goldie states that the bark was used medicinally by the Maoris.

MYRTACEAE.

Leptospermum scoparium, the manuka or tea-tree of the settler, is a common plant throughout New Zealand. The leaves have been used as a substitute for tea. *Metrosideros* is the genus to which the ratas and pohutakawa belong. The bark of these trees, although thin, contains a large percentage of tannin, and was used medicinally by the Maoris for various disorders (Goldie).

PASSIFLOREAE.

The fruit of the native passion-flower, *Passiflora tetrandra*, is very much relished by rats, and contains a large amount of an easily expressed oil, which is worth chemical investigation. The Maoris used the oil medicinally (Goldie).

UMBELLIFERAE.

Hydrocotyle asiatica must be regarded as a suspicious plant. Grandpré found that in small doses it is an energetic stimulant, and in large doses a narcotic producing stupor, headache, and, in some persons, vertigo with a tendency to coma. Mr. R. H. Meade, Government Veterinarian at Palmerston North, reported in May, 1922, a case of suspected poisoning in sheep by this plant at Akitio, on the Wellington east coast. The symptoms he noticed were vertigo, stupor, and falling down and struggling at times, the animals remaining in this state for about a fortnight before death. On post-mortem the livers were found creamy-looking and atrophied, and the kidneys diseased, but the carcase fat and well nourished.

The genus *Hydrocotyle* is one of world-wide distribution. In America these plants are called "water pennyworts." In England the only indigenous species is *H. vulgaris* ("marsh pennywort"). It is significant that the other trivial names are "sheep-rot" and "white rot," from its supposed poisonous effect on sheep. Long (1917) ("Plants Poisonous to Live-stock," page 93) states that it is reputed to have caused inflammation of the digestive tract and hæmaturia, and to contain a toxic substance, vellarin.

RUBIACEAE.

There are some forty species of *Coprosma* in New Zealand, which range in size from tree-shrubs to herbs. The genus belongs to a family which has given many valuable plants to mankind. In medicines may be mentioned quinine and ipecacuanha; in dyestuffs the madder and other dyes; in foodstuffs the coffee-plant—all of which are obtained from plants of this family.

It has been suggested that the New Zealand species of *Coprosma* should be examined for caffeine; Skey (1869) did so with a negative result (*Trans. N.Z. Inst.*, Vol. 1, p. 152). J. C. Crawford (1876) (*Trans. N.Z. Inst.*, Vol. 9, p. 546) recommended the ground and roasted taupata (*C. Baueri*) seed as a substitute for coffee, stating that it has then a splendid coffee-aroma, and that when made into coffee the result seems thoroughly satisfactory. J. T. Armstrong (1891), "On Economic Plants," states that the leaves of the karamu were used as a substitute for China tea, and that the decoction is a good febrifuge.

There is no doubt as to the excellence of this genus as a source of dyes. Those species which have the inner bark coloured yield with hot water dyeing-solutions which give perfectly fast colours on wool, with and without mordants, and equal in permanence to those given by the madder (see the writer's papers in *N.Z. Journal of Science and Technology*, 1918, Vol. 1, p. 3, and this *Journal*, 1918, p. 363; also Perkin and Everest, "Natural Organic Colouring-matters," 1918, p. 578).

There is no group of New Zealand plants which, from a scientific point of view, offer a more alluring field for investigation to the plant chemist than the genus *Coprosma*. Not only are the species closely allied, but they exist in comparative abundance throughout New Zealand, and there is considerable evidence that different chemical compounds found vary with the species. Hence chemistry might be of value in determining the relationship of the species to one another.

The fruit of several species was eaten by the Maori. Colenso (1868) states that the root of *C. acerosa*—a littoral species—was used as an alterative by the Maoris ("Essay," p. 39). The roots of this species, which is found growing on sand-dunes, are of great length, and could easily be unearthed from the loose sand.

COMPOSITAE.

This, the largest family of all flowering-plants, contains, so far as is known, very few poisonous plants in New Zealand. *Brachyglottis rapanda* (rangiora, wharangi, or pukapuka), a characteristic shrub of the North Island, is no doubt poisonous. Baber (1886) (*Trans. N.Z. Inst.*, Vol. 19, p. 320) states that this shrub is seldom eaten by cattle or sheep, but horses are fond of it. Its effects are staggering of the legs and falling; it is often fatal; after death, the body is much distended. The popular remedy is to keep the animal moving. Skey (1881) (*Trans. N.Z. Inst.*) failed to isolate any active principle to which the poisonous nature could be referred. He made the interesting discovery that the resinous matter which exudes from the trunk and branches of the tree gives with alcohol acidified with hydrochloric acid a rich deep-blue colour—a reaction which has been verified by the present writer.

Colenso (1868) (*Trans. N.Z. Inst.*, Vol. 1, p. 38) states that the leaves, which are large and have a white under-surface, were used by the Maoris as a protection for wounds and old ulcerated sores. The poison of poisonous wild-honey may be due to the fact that the honey has been gathered from *Brachyglottis*, as large quantities of pollen-grains from the plant have been found in poisonous honey (Annual Report of Department of Agriculture, 1908, p. 428).

(To be continued.)