Poison plants of Western Australia - Cabbage poison (Velleia discophora F. Muell.)

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CABBAGE POISON

(Velleia discophora F. Muell.)
CABBAGE poison is a plant of bitter and disagreeable taste, not readily eaten by stock, but field evidence suggests that on occasions it may be responsible for mortalities, particularly of sheep. It was first tested and found to be toxic in 1939, with material obtained from the Koorda-Mollerin district.

The plant has a strong deep taproot, from the stock of which arise a number of erect or spreading, characteristically blue-green leaves like those of a wilted cabbage. Usually they are serrated on the margin like those in the illustration accompanying this article, but in some forms, notably when occurring in depressions, the leaves may be larger and deeply lobed like those of the wild radish, and more green than blue. The midrib of the leaf is strong and usually pink or purplish in colour. The average leaf is about 5 to 8in in length. These radical or basal leaves are the only leaves found on the plant.

From within this leaf rosette, one or more stout or wiry purplish flowering stems arise which may reach a height of 3ft., but are usually shorter. They are provided at intervals with a number of modified leaves or bracts which are round in outline, shallowly cup-shaped, and usually one to 2in. in diameter. At times (especially in the morning) these cups have an erect margin, and may contain water, following heavy dew or rain; at other times (especially in the afternoon) the cup is deflexed. This character is illustrated in the accompanying plate. Branching of the flower stems always takes place within these cups.

The flowers are arranged in a loose panicle, each branch of the inflorescence being subtended by a cup. The margin of the cup is smooth (entire) or may be lobed or toothed. The flower is typical of many of the Leschenaultia family (Goodeniaceae), to which cabbage poison belongs. The sepals are united into a deeply five-lobed cup, and the corolla is also deeply five-lobed, two lobes forming an upper lip, the other three a lower lip. Each corolla lobe is broadly winged by a delicate pale yellow limb. The flowers are succeeded by egg-shaped, brown capsules opening by two valves, and containing a few brown, yellow-winged round seeds.

The name *Velleia*, given by Robert Brown in honour of Thomas Velley, a British botanist who made a special study of seaweeds, was first published in 1810. The name *discophora* (disc-bearing) was given by Mueller, in reference to the cup-shaped bracts, which in pressed specimens sometimes appear flat and round.

Cabbage poison is restricted in its occurrence to Western Australia. It inhabits yellow sandy soil, with or without gravel, but sometimes also occurs in soils which are predominantly gravelly. It favours open spaces, and is not found growing among dense scrub. Although it possesses a strong tap-root and is thus
a perennial, it does not appear to live for more than a few years, after which it disappears, only to reappear after the country is burnt, or after clearing and cultivation.

It is typically a plant of the Eastern Goldfields, being common on the open sandplains between Burra Coppin and Coolgardie, and northwards to Lake Moore and Mount Jackson. It also extends to the south around Higginsville and Norseman, thence to Lake Hope and Salmon Gums, but in the south it is a smaller plant with smaller leaves. Its eastern limits are near Victoria Springs. The plant is also found in the eastern portions of the wheat belt. Its western limits, as far as we know being Wubin, Marchagee, Dalwallinu and Wongan Hills. Koorda, Yorkrakine, Wyola, Bruce Rock, and thence to Salmon Gums.

The plant may easily be recognised by its peculiar blue-green almost fleshy foliage, and its cup-like bracts under each branch or group of branches along the elongated flowering stems.

**TOXICITY**

The poisonous properties of *V. discophora* were confirmed in a test carried out in Perth in 1939. An aqueous extract of finely minced flowers and leaves of the plant was administered by drenching to two sheep. One which received extract from 12oz. of plant showed signs of poisoning some four hours later and died within 18 hours; the other received a smaller dose equivalent to 3oz. of plant material and died within 24 hours.

**SYMPTOMS**

Both subjects showed extreme dullness and disinclination to move; when standing, the head was depressed. Respiration and heart rates were accelerated. The urine was dark and turbid. Finally the animals remained lying down and became comatose; the first died quietly without a struggle; the second, within half an hour of death showed a spasm of the muscles of the hind legs which were rigidly extended.

**POST-MORTEM APPEARANCES**

The sheep receiving the larger amount of extract showed gastro-enteritis but the stomach and intestines of the other subject were relatively normal. In both the kidneys were markedly congested and the heart showed haemorrhages (subendocardial.)

**TOXIC PRINCIPLE**

Bottomley and White (1953) isolated, from the plant, a new glucoside which they named vellein. This may be the principle responsible for poisoning.

**PREVENTION OF EVAPORATION FROM WATER STORAGES**

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Early in 1953 the C.S.I.R.O. Division of Industrial Chemistry commenced work on films which are only one molecule thick. Although such films are less effective than thick oil films in preventing evaporation, they are much more stable. One chemical tested—cetyl alcohol—shows considerable promise. Under ideal laboratory conditions it reduces evaporation by 80 per cent.

Small-scale out-of-door tests using cetyl alcohol films have now been in progress in Victoria for about 18 months. The results show an average of 50 per cent. reduction in evaporation.

A larger-scale test was conducted last summer on a town reservoir at Woomerlang, Victoria. Two acres of water were treated and although the results were complicated by seepage it seems likely that evaporation was reduced by 30 per cent.

Further large-scale tests are to be made during the present summer. In Victoria 19 sites have been chosen ranging from one to 60 acres in area; in New South Wales six sites ranging up to 350 acres in area; and in Queensland seven sites all of about 1/4 acre. One site is already under test in Western Australia.

Until these tests have been completed it is not possible to make practical recommendations for using this technique. It seems that about 1 lb. of cetyl alcohol will be required per acre and that this treatment may last several years. Cost may be about 0.1 pence per 1000 gallons of water saved.

Cetyl alcohol now comes mostly from sperm oil from whales and total production is relatively small. However, synthetic material can readily be produced.
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