Poison plants of Western Australia—the birdsville indigo

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THE BIRDSVILLE INDIGO

(Indigofera enneaphylla L.)

The Birdsville Indigo is a plant of wide distribution, being common on the plains of India as well as being widely diffused in tropical Australia. In Western Australia, besides being widely distributed in many parts of the Kimberley Division, it is particularly abundant on the plains of the Ashburton district, and extends as far south as Williambury on the Minilya River. Other areas in which it is common are the sandy spots around Derby and Broome, where it appears to be spreading. It is also common in Central Australia around Alice Springs. The plant was included by Dymock in his “Vegetable Materia Medica of India” as an antiscorbutic and diuretic.

The plant is typically a perennial which dies down to the soil level in the dry season, but possesses a strong rooting system with remarkable recuperative powers after suitable rain, when it makes rapid regrowth. It assumes two forms, the common prostrate or diffuse form in which the stems radiate from the root and lie close to the ground, forming rosettes of up to 5ft. in diameter when making vigorous growth, but usually smaller. The other form, only seen near Hall’s Creek, has erect stems up to 18in. high. The accompanying plate illustrates the prostrate or diffuse form.

The features by which this plant can be most easily recognised are its small clusters of brick-red or scarlet pea-shaped flowers situated at the bases of the leaves (blue-flowered forms are exceptional) and its leaf-form. The leaves consist of a number of leaflets which are typically nine in number, hence the name “enneaphylla,” from the Greek ennea—nine, and phyllon, a leaf. These leaflets vary in number from seven to 11, but nine is the usual number.

Of importance, is the fact that they are alternate, i.e. the leaflets along one side of the leaf-axis are alternate with those of the other side. They are clothed with rather short and rigid, somewhat glistening hairs which lie close to the leaf surface, and are not attached at the base, but above the base and frequently about the middle, and pointed at both ends. It is important to remember the arrangement of leaflets, since this character serves to separate it from other plants of similar growth and appearance.

After the flowers have fallen, they are replaced by the small clustered pods which are reddish-brown in colour, somewhat four-angled, sharply pointed, and typically two-seeded. The two seeds are separated by a cellular partition which falls away as the seeds are liberated. Rarely one or three seeds are found in the pods. The seeds are hard, reddish, and somewhat four-ribbed.

The shape of the leaflets shows considerable variation; they vary from narrow and shortly acute to broad and more obtuse, but are usually curved towards the...
points. Figure "B" in the plate shows a fairly typical leaf-shape except that the leaflets have been flattened out (they are usually somewhat longitudinally folded along the middle) and the leaf axis is shorter than in the more typical forms.

The Birdsville Indigo shows a preference for sandy silty soils: In its area of distribution it can usually be looked for in two types of country—the flat red sand with a deep drainage, or the lower lying spots in Spinifex country where water lies for a time after showers. After a long dry period when there is no superficial evidence of the plant, a shower can provide sufficient water to produce rapid growth, but under such conditions the stems are usually short, and flowering takes place soon after the stems and leaves develop. In the rainy summer season the growth is rapid, and a dense mass of stems and foliage is produced. Under such conditions dense stands of Birdsville Indigo can be produced in certain low-lying situations, and the plant appears to be relished by all classes of stock.

**POISONOUS PROPERTIES**

Several species of Indigofera are known or suspected poisonous plants, and of the species found in Australia, *Indigofera enneaphylla*, has been shown definitely to be toxic. It is the cause of a condition in horses known as "Birdsville Disease." The plant is very palatable to stock; sheep and cattle also eat it readily but, apparently, without any harmful results.

For many years conditions variously known as "Walkabout Disease," "Birdsville Disease" and "Kimberley Horse Disease" have caused very serious losses in Northern Australia.

Until recently the cause of these losses was unknown and much confusion existed concerning the distribution and nature of the disease or diseases concerned.

The position was recently much clarified as a result of investigations in Queensland by Moule (1947) and Bell and Everest (1951); in the Northern Territory by Rose, Banks and McConnell (1951), and by a co-operative investigation in the Kimberleys which, as Gardner (1952), reported has incriminated *Crotalaria retusa* as a cause of Kimberley Horse Disease.

It is now evident that there are two quite distinct horse diseases—

(i) Birdsville Disease occurring principally in the Birdsville region of Western Queensland and in Central Australia below the 20th Parallel, in which regions it has caused serious economic losses from deaths and chronic disabilities.

(ii) Kimberley Horse Disease which occurs principally further to the north in the three States of Queensland, Northern Territory and Western Australia.

There is some evidence suggesting that occasional cases of Birdsville Disease may occur in this State but here it is certainly not a source of serious economic loss like Kimberley Horse Disease. We have shown, however, that *Indigofera enneaphylla* growing in the Kimberleys is toxic, as it is in other parts of Australia, and will induce Birdsville Disease, if horses get enough of the plant to eat.

The symptoms of the two diseases may be somewhat similar, but in Birdsville Disease no abnormalities can be seen in any organ of the body on post-mortem examination, whereas in Kimberley Horse Disease pronounced liver damage is the essential feature. This liver damage develops slowly over a period of months or years whereas Birdsville Disease may develop in two or three weeks from the time horses have first had access to the Indigo; the symptoms suggest that the plant affects the nervous system.

**NOTES ON BIRDSVILLE DISEASE**

Typically cases of the disease develop within a few weeks of an effective rainfall, because the strongly-rooted plant regenerates quickly and soon provides a palatable ration for grazing horses.

It has been shown experimentally that the consumption of 10 lb. daily of fresh plant, may induce symptoms of the disease within two weeks. When smaller amounts are eaten the disease takes longer to develop and may take a more chronic course.

Symptoms.—The initial signs of poisoning are dullness followed by incoordination of gait. The animal stands for long periods in one place, as though asleep on
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BIRDSVILLE INDIGO (Indigofera enneaphylla L.)

A—Habit; B—Leaf; C—Flower; D—Cluster of pods; E—Pod; F—Pod in section; G—Seed. (A—natural size, B—slightly enlarged; C, D, E, F and G—enlarged.)

Gogo, Fitzroy River.

—Icon origin.
Its feet. It is disinclined to move. If forced to do so the abnormal gait is evident—the front feet are lifted high and there is a varying degree of absence of control over the hind limbs which tend to drag; there is difficulty in turning or changing direction. Affected horses frequently lie down and find difficulty in struggling to their feet unaided. The animals rapidly lose condition and death results, apparently, from starvation, exhaustion and thirst. (In Kimberley Horse Disease, on the other hand, there is frequently a compulsion to “walkabout” and affected animals are reluctant to lie down.)

In more chronic, non-fatal cases of Birdsville Disease “toe dragging” of hind limbs and a tendency to stumble and fall when ridden or exercised are the salient and persistent features. In these “toe draggers” the points of the toes of the hind feet may be completely worn away. This is a very characteristic feature of Birdsville Disease. Complete recovery of mild cases is fairly common.

The severity or permanence of the disease would appear to be related to the quantity (or degree of toxicity) of the plant eaten. There is experimental evidence the plant may retain its toxicity on drying.

Control.—There is no effective treatment for the disease. Control will depend on preventing horses from having access to quantities of the plant. This may provide a practical solution at least in some affected regions. In the Northern Territory “the fact that the plant seems to grow in profusion in fairly restricted areas, is already providing a key to the solution of the control of horse losses. There is every expectation that with careful survey and appropriate fencing, horses may be denied access to dangerous areas on at least some of the affected leases.”

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