

THE TOXIC SPECIES OF THE GENERA GASTROLOBIUM AND OXYLOBIUM

Recognition and identification

Some of the characteristics one should look for when seeking to differentiate toxic species of the genera *Gastrolobium* and *Oxylobium* from non-toxic species, are:

1. LEAVES: Leaves are entire, that is, they are not compound and do not consist of a number of leaflets, as in vetch, cassia, lupin etc. The arrangement of the leaves on the stem is strictly opposite or in whorls of three, four or more, arising from the same level. They are not alternate or irregularly arranged. (Some exceptions exist where certain forms of toxic species may have leaves that are irregularly arranged). Several non-toxic plants also possess leaves that are arranged opposite to each other.
2. STIPULES: Stipules or hair-like structures are present; one on either side of the leaf-stalk or base of the leaf. These can fall early, particularly in rock poison, so that when looking for them, young branches should be closely examined. Stipules may also be present on non-toxic plants, including those possessing leaves that are arranged in opposites.
3. FLOWERS: Flowers are yellow, yellow suffused with red, or occasionally red. They are never blue or violet.
4. INFLORESCENCES: The inflorescences are many-flowered racemes which are terminal on the branches or arise from the upper leaf axils. Close inspection of these will reveal leaves that are irregularly (not strictly) whorled, stipules that are absent, inflorescences that are not racemes, or flowers that are of a different colour.

Toxicity

The characterisation or identification of the toxic principle of a poison plant is a necessary prerequisite to other studies on poison plants. The first unsuccessful attempt to isolate the toxic principle in toxic members of the genera *Gastrolobium* and *Oxylobium* was made in 1896. It was not until 1964 that the toxic substance mono-fluoroacetic acid was eventually isolated, independently and almost simultaneously, from the Northern Australian wall-flower poison and from box poison and rock poison of south-western Australia.

On the basis of the botanical relationship of poison plants, and the characteristic poisoning syndrome displayed by affected stock, there can be little doubt that the main toxic radical for all members of the group is mono-fluoroacetic acid.

This substance, which has been isolated from the South African gifblaar (*Dichapetalum cymosum*) and other *Dichapetalum* species and from the gidgee (*Acacia georginae*) of Queensland and the Northern Territory, is better known as its sodium salt "1080", the poison widely used in rabbit control. Toxicity of poison plants can be expressed in terms of "1080" equivalent.

Poison plants are most toxic when actively growing, for example, with the appearance of new shoots or suckers, or when in the flowering or fruiting stage although other factors have a bearing on the amount of poison present in the plant.

Control

The usual method of killing poison plants is by a programme of ploughing, cropping and burning. The burning not only destroys a proportion of the plants, but stimulates the germination of dormant seeds, which otherwise would remain in the soil in a viable condition for many years.

Following the initial burning and ploughing, a cereal crop will provide straw for a second fire.

With heavily infested areas it is usual to sow two cereal crops along with a ploughing each time. Pasture species can be sown with the second crop and in this way no time is lost in developing the land.

With poison plants that sucker freely from the root system, such as cluster, York Road, thick-leaf, breclya, sand plain, Champion Bay, Hutt River, box and rigid-leaf poison, it is advisable to repeat the cropping and burning process until the density is sufficiently reduced for spot spraying to be practicable.

Isolated patches of suckering plants and areas which cannot be handled by cropping and burning, such as rocky outcrops and along fence lines, can be controlled by spraying with a solution containing 2,4,5-T. A suitable mixture is made by dissolving one fluid ounce of 40 per cent 2,4,5-T in one gallon of water. This solution should be applied as a high volume spray to both the leaves and stems.

Best results are obtained if the spraying is undertaken just before the flowering stage, which is usually towards the end of August.

The addition of a small quantity of wetting agent to the solution helps the chemical stick to the leaf. 2,4,5-T is not harmful to animals but it should be remembered that the poison plants remain toxic after they are killed.

The spray treatment is usually too costly for large areas and should only be considered where it is not possible to apply other control measures.

2,4,5-T is available from firms which distribute agricultural chemicals.

YORK ROAD POISON

(*Gastrolobium calycinum* Benth.)

YORK ROAD POISON derives its common name from the fact that in the early years of settlement many stock died from eating this plant while being driven along the road from Perth to York. Stock losses due to accidental grazing of this species are still not uncommon and the presence of even a single bush in a paddock can cause heavy stock losses.

The three main forms of York Road poison are the typical form, the broad-leaved form and the narrow-leaved form.

THE TYPICAL FORM, present in the Darling Range and extending southward to Katanning and beyond is found on heavy soils and usually associated with wandoo woodland. It is an erect shrub up to six feet high, with yellowish branches and grey-green leaves.

The leaves are in opposite pairs or in threes, lance-shaped or broader and have a sharp point. The base of the leaf is indented like the apex of a heart. The leaves are from one to three inches long, leathery, rigid, net-veined and usually slightly curved outwards.

The flowers, which are borne on elongated flowering stalks (racemes) terminate the branchlets or arise from the upper leaf axils. They are relatively large, few in number and arranged in twos or threes along the stalk.

The calyx (cup-like structure in which the petals are carried) composed of the five fused sepals, is hairless and serves to distinguish this species from other toxic plants which possess hairs on the calyces. The botanical name, derived from the Latin, *calycinus*, meaning belonging to the calyx, is in allusion to the large calyx of this species.

The thin almost transparent bracts which hide the flower buds are the largest of any of the species of *Gastrolobium* and may be up to half an inch long.

The stipules (the hair-like structures arising from either side of the base of the leaf stalks) are firm, spine-like and spreading, and are present even when the leaves are mature.

THE BROAD-LEAVED FORM of York Road poison is found to the north of the distribution range of the typical form in the general area bounded by Gunyidi, Kalannie, Ballidu and Wannamal. In sandplain country it is usually associated with gravelly soils, whilst to the south-west of its range, near Mogumber and Wannamal, it is found in granite soil, usually among rocks.

The leaves of the broad-leaved form are almost circular in outline, and abruptly narrowed into a fine point.

The calyx, woolly white while in the bud stage, becomes hairless with age.

The leaves are indented at the base as in the typical form, and on older plants narrower leaves may be present.

THE NARROW-LEAVED FORM, found in the Cunderdin, Quairading and Greenhills, districts, is associated with granitic and gravelly soils. It was at one time treated as a separate species, under the name of *Gastrolobium sagittulatum* S. Moore, but intermediate forms suggest that it is only a form of York Road poison.

This form has narrow, very acute leaves, with a sharp point, and with the base of the leaf usually expanded.

Seedlings of all forms of York Road poison produce broad, almost round leaves and it is only in mature plants that the forms described may be recognised

All forms of York Road poison sucker from the rootstock when the plant is cut at ground level. An exception to this is a subform of the typical form which is found to the south and west of Northam. This sub-form, which is similar in all respects to the typical form, has a single upright stem and grows to five or six feet high. It is sometimes known as tree poison.

Accounts of stock mortalities due to what was almost certainly York Road poison date back to 1837 when stock were lost while being driven along the road from Perth to York.

This species has over the years been considered highly toxic to stock.

Samples of air-dried plant material of York Road poison have been shown to contain up to 400 parts per million of "1080" equivalent.

CLUSTER POISON

(*Gastrolobium bennettsianum* C.A. Gardn.)

CLUSTER POISON, described in 1942, was named after H.W. Bennetts, a veterinary pathologist, who collaborated with the author of the species, botanist C.A. Gardner, in toxic plant investigations. This plant had in the past been confused with Champion Bay poison and sandplain poison.

Cluster poison is a thickly branched shrub, from four to six feet high and also about four to six feet wide, when growing in thickets on gravelly soils. In open sandplain country the plant is much smaller, with broader, blue-green leaves, rather than narrow, yellow-green leaves. It is associated with sandplain vegetation and more particularly with tamma, wodjil and native cypress pine. Cluster poison is found from Arrino eastwards to Wialki, Merredin and Carrabin. At the southern part of its range, it extends from Kukerin eastwards to Holt Rock.

The leaves of cluster poison are usually borne on the stem in whorls of three. They are erect, longitudinally folded and keeled, broadest above the middle and abruptly taper into a rigid point at the apex. The leaf is somewhat turned outwards in the shape of a bow. The length of the leaf can vary quite considerably. Plants with shorter leaves are found at the southern end of the distribution range. The stipules are small and bristle-like and usually break off.

The flowers are arranged in threes in dense terminal racemes which extend beyond the leaves. The common name cluster poison refers to these terminal clusters of flowers. The axis of the raceme and the pedicels are clothed with short, smooth, downy hairs. The calyx is almost hairless. The lobes of the calyx are short and broad, with the upper two being more united than the lower three. The ovary and the young seed pod are densely silky-hairy. The flower buds are concealed by chestnut coloured hairless bracts which closely overlap.

A highly toxic species, cluster poison has been shown to contain 1,300 parts per million of "1080" equivalent.

GILBERNINE POISON

(*Gastrolobium rotundifolium* Meissn.)

GILBERNINE POISON is an erect bushy shrub one to two feet high with many erect branches arising from a thick woody stock. In the past this species has been confused with Champion Bay poison. Gilbernine poison is usually found on heavy clay soils from near Mingenew southwards to Wagin. It is normally associated with wandoo woodland.

The branches and young leaves of gilbernine poison are usually hairy. The mature leaves are dark green and shiny above, paler underneath. The leaves are oval shaped and end in a fine sharp point at the apex. The typical form has leaves that are flat or undulate. A narrower-leaved form, the variety *angustifolium*, found in the Miling district, possess leaves that have their margins rolled inwards underneath. The leaves in this form are longer and due to the inrolling of the margins appear to be very much narrower than the typical form. The stipules are erect, long and pointed with broad membranous margins towards the base. The specific name, derived from the Latin, means round leaf and refers to the outline of the leaf of the typical form.

The flowers are borne in a relatively dense raceme. The axis of the raceme the pedicels and the calyces are clothed with white hairs. The ovary is also densely hairy. The bracts which persist until the flowers open are large, and chestnut-brown in colour.

Gilbernine poison, at one time confused with other toxic species contains 150 parts per million of "1080" equivalent.

MALLET POISON

(*Gastrolobium densifolium* C.A. Gardn.)

MALLET POISON, so named because it is usually associated with the lowland brown mallet, but sometimes also with wandoo and salmon gum, is a shrub up to two feet in height, with rather thick stems and branches which in the larger shrubs, especially in open areas, spread outwards from the base before becoming erect. The stems are marked by the persistent remains of the leaf bases and the bases of the stipules. Mallet poison is found from Dudinin southwards to Kukerin and eastwards to Lake Grace.

The leaves of mallet poison are lance-shaped with a sharp, prickly point, half to three-quarters of an inch long, curved outwards in the shape of a bow and crowded on the branchlets. The Lake Grace form has leaves that appear to be much narrower due to the inrolling of the margins towards the underside. The stipules are fine, broad at the base, but with thread-like points, one-third the length of the leaves, and with the base more or less fused to the leaf stalk or petiole. The botanical name of the mallet poison derived from the Latin *densus*, close or dense, and *folium*, a leaf, is in allusion to the somewhat crowded leaves.

The flowers of mallet poison are borne in dense, terminal racemes. The calyx and ovary are covered with long, silky hairs. The pointed calyx lobes are all equal in length, the upper two united almost to the middle. The corolla is yellow and purple. The bracts persist until the flowers open.

Gardner in 1926 reported on the toxicity of mallet poison. However "1080" tests have given negative results to date.

WODJIL POISON

(*Gastrolobium floribundum* S. Moore)

WODJIL POISON derives its common name from its association with wodjil, *Acacia* spp. and other sandplain vegetation. It normally occurs on gravelly soils which may be overlain with yellow sand. Wodjil poison is a shrub, from two to three feet in height or exceptionally up to four or five feet tall, with usually yellowish, erect branches. It is found from Perenjori southwards and eastwards to Southern Cross.

The leaves of wodjil poison are in opposite pairs at intervals only slightly less than the length of the leaves which are from one and a half to two and a half inches long. The leaves are narrow, on short stalks which briefly continue down the stem, typically parallel-side and blunt at the apex, folded or concave, above straight or slightly curved inwards (never curved outwards as in cluster poison) and pale yellowish-green in colour. There is a form of wodjil poison, found east of Naremben, which has broader, shorter leaves. The erect, black and rigid stipules are broken off above the basal portion.

The botanical name derived from the Latin *floris*, flower, and *abundus*, abounding in, is in reference to the large number of flowers which are borne in elongated racemes, usually about as long as the leaves, and which are both terminal and in the axils of the upper-most leaves. The axis of the racemes, the pedicels and the calyces are covered with short spreading hairs. The flowers are borne in pairs along the axis of the raceme. The calyx teeth are very short, the upper two being more united than the lower three. The petals are pale yellow suffused with red. The ovary and young pod are densely hairy.

In 1926 Carne, Gardner and Bennetts included wodjil poison in their list of poisonous plants. Gardner in 1937 described wodjil poison as an extremely virulent species.

Wodjil poison has been shown to contain 1,350 parts per million of "1080" equivalent.

BREELYA OR KITE-LEAF POISON

(*Gastrolobium laytonii* J. White)

BREELYA or KITE-LEAF POISON is a shrub which, in sheltered locations, attains a height of 18 feet. It is more commonly from four to 10 feet in height. Breelya is usually associated with granite rocks and more particularly in sheltered declivities with a southern aspect. To the west of its range, in the agricultural area, it may be seen on gravelly rises as a small shrub. Breelya is found in the Weld Range, north-west, of Cue, to the breakaway country eastwards from Meekatharra and Lawlers, westwards to the Ninghan Hills, near Paynes Find, and to Perenjori.

The leaves of breelya are wedge-shaped, terminating in a triangular apex, and is more or less in the shape of a kite. Its alternative common name kite-leaf poison alludes to the shape of the leaf. The leaf shape varies from the conventional kite-shaped to oblong, but the apex remains triangular or very rarely truncated.

The relatively small flowers are borne in racemes which are long and loose. The botanical name commemorates Layton, whose identity is unknown.

Breelya was first recorded as a toxic plant in the Murchison district in 1854 by Robert Austin.

It contains 500 parts per million of "1080" equivalent.

WALL-FLOWER POISON

(*Gastrolobium grandiflorum* F. Muell)

WALL-FLOWER POISON is a shrub of varying height, but usually from three to five feet tall, found along the Yule, Sherlock and Oakover Rivers in the Hamersley Range; in rough sandstone country bordering the Prince Regent, Drysdale and Carson Rivers, in the Precipice and the King Leopold Ranges, and at Tableland and Karunjie Station in the Kimberley region; and in the Rawlinson and Carnegie Ranges in the Eastern Division.

Wall-flower poison is the only toxic species of *Gastrolobium* found outside Western Australia, being present in the Northern Territory and Queensland. It is usually associated with rocks or with watercourses in sandy areas.

The leaves of wall-flower poison are usually in opposite pairs, sometimes alternate, oval or elliptical in outline, one and a half to three inches long and from half to one and a quarter inches across, blunt at the apex and tapering towards the base.

The flowers are large and borne in racemes which arise terminally or from the axils of the upper leaves. The botanical name derived from the Latin *grandis*, large, and *floris*, flower, is in allusion to the large flowers. The young branchlets, the axis of the racemes and the calyces are clothed with short, dense, downy-silky hairs. The petals which may be up to one inch across, are red to brownish-red and yellow in colour. The common name wall-flower poison refers to the colour of the flowers on this plant. The ovary is silky-hairy and carried on a long stalk. The ripe pod, which is up to half an inch in length, is covered with spreading hairs or is hairless and borne on a stalk which is longer than the calyx.

Chippendale in 1963 referred to a report of the death of some 600 sheep by an Arthur Giles at Davenport Range near the Devil's Marbles in the Northern Territory in the year 1872. A similar loss was incurred by a Ralph Miller in 1870 at the same locality. Giles sent a specimen of the plant to Baron Ferdinand von Mueller, the noted botanist who stated that it was "the deadly poison, common in Western Australia, and known as *Gastrolobium grandiflorum*". Wall-flower poison has been reported as a poisonous plant in Queensland, the Northern Territory and Western Australia.

In 1964 McEwan isolated and identified the toxic principle of wall-flower poison as mono-fluoroacetic acid. He found that air-dried plant material contained as much as 185 parts per million of this toxic compound.

CRINKLE-LEAF POISON

(*Gastrolobium villosum* Benth.)

CRINKLE-LEAF POISON is a prostrate shrub when young, but later assumes an upright habit. It has a spread of three feet and normally attains a height of two feet, although the southern forms may grow to three feet high.

Crinkle-leaf poison derives its common name from the undulate or crinkled margins of the leaf. These leaves, borne in opposite pairs, are dark green on the upper surface and paler and hairy beneath. Hairless forms are found but these always have the characteristic crinkled margin. The shape of the leaf varies with location. The common form seen in the Darling Range possesses leaves that are longer than broad, almost oblong in shape, with a densely hairy underside. Farther to the south the leaves become smaller and almost circular in outline.

The stipules at the base of the leaves are long, broad at the base and tapering to a fine point. They are much longer than the leaf stalk.

The bracts, present on the flowering stalks before the flowers open, are large, pointed, concave, hairless or loosely hairy and reddish coloured.

The red or orange-red flowers are borne on elongated racemes. The axis of the raceme and the calyces of the flowers are loosely hairy with long spreading hairs. The calyx lobes are acute. The seed pods are broadly egg-shaped or globular. The seeds and the pods fall off the plant as soon as they ripen.

The specific name *villosum* is derived from the Latin *villosus*, meaning bearing villi or long, weak hairs

The common form of crinkle-leaf poison, found on sandy or clayey gravelly soils, and near to granite rocks, may be seen at Bindoon, eastwards to Toodyay and southwards to the Dale River. The roundleaf form of this plant is found to the south of the range of the common form from Bridgetown and Manjimup eastwards to Darkan.

Incriminated in 1900 as a toxic species by Morrison, crinkle-leaf poison is considered to be less toxic than other species.

"1080" has been detected in crinkle-leaf poison.

RUNNER POISON

(*Gastrolobium ovalifolium* Henfr.)

RUNNER POISON, as its common name suggests, is a prostrate shrub with stems that radiate from a central rootstock to a diameter of six to eight feet. It does not grow much more than a few inches high.

Runner poison is somewhat similar to crinkle-leaf poison. The main points of difference are the close, thick, net-veining on the flat leaves, the broad, cottony stipules, and the colour of the flowers, which are yellow tinged with red or purple.

The specific name, derived from the Latin *ovalis*, broadly elliptical or egg-shape, and *folium*, a leaf, refers to the oval or almost rounded outline of the leaf. These measure from half to three quarters of an inch across and are borne in opposite pairs. The colour of the upper surface is a dark green, while the lower surface, with the spaces between the prominent veins appearing as pits, is a paler colour.

The smaller branches and branchlets are covered with cottony "wool".

The stipules, often clothed with cottony wool, are broad and erect, with basal parts persisting on the stem.

The yellow and purple flowers are borne on elongated, terminal racemes which stand erect. The axis of the racemes, the individual flower stalks or pedicels, and calyces of the flowers are velvety hairy. The calyces lobes are acute and almost equal in length.

Runner poison, which is usually associated with gravel hills and with *Eucalyptus astringens* (brown mallet), is found in the Narrogin and Williams districts and southwards to Kojonups.

Runner poison was listed by Morrison in 1910 as a poison plant. "1080" has not yet been detected in runner poison.

WOOLLY POISON

(*Gastrolobium tomentosum* C.A. Gardn.)

WOOLLY POISON, is a low compact shrub with stiff stems and branches. Both its common name and its specific name, which is derived from the Latin *tomentosus*, covered with thick, soft hairs, refer to the woolly under surface of the leaves.

Woolly poison possesses a leaf which is almost round to ovate in outline. These leaves are roughly three quarters of an inch across, dark green and smooth above, white felted or woolly on the underside. They are arranged in opposite pairs. The stipulates are small and fall early.

The flowers are borne on racemes which exceed the stem leaves. The axis of the raceme, the pedicels and the calyces of flowers are densely clothed with fine silky hairs. The petals are yellow and red and only slightly exceed the calyx lobes.

Woolly poison is associated with wandoo woodland and is found on gravelly clay soils in the West Arthur district.

Gardner described this species in 1955.

Woolly poison contains detectable amounts of "1080".

THICK-LEAF POISON

(*Gastrolobium crassifolium* Benth.)

THICK-LEAF POISON, the botanical name of which is derived from the Latin *crassus*, thick, and *folium*, leaf, has an appropriate common name. In the past it was referred to as narrow-leaf poison and many farmers still refer to this species by this name. Thick-leaf poison is an erect, branched shrub, two to four feet in height, with dark olivaceous angled stems. It commonly forms thickets on gravelly soils from Narrogin southwards to Albany and eastwards to the Munghlinup River, between Ravensthorpe and Esperance.

The leaves of thick-leaf poison are usually borne in whorls of three along the stem, rarely in whorls of four and more rarely in opposite pairs. The shape of the leaves vary from narrow-oblong to broadly oblong-elliptical. They are thick, typically concave on the upper side or occasionally flat. The short stalk continued as ribs along the stem. The apex of the leaves may be blunt or rounded with a minute rigid point, or it may be abruptly acute with a longer, stout, rigid point. It does not taper gradually nor is it notched at the apex as in Stirling Range poison, which is found in the same general area. The leaves vary from grey-green, blue-green to yellow-green. The stipules are fine, short, and dark and usually break off as the leaves mature.

The racemes are terminal, with the flowers clustered three to a whorl along the axis. The axis of the raceme and the pedicels or flower-stalks are downy hairy. The calyx is hairless or with a few hairs lying flat to the surface, less than a quarter of an inch in length, with short rounded lobes, the two uppermost being united almost to the top. The petals are yellow and purple and are about twice the length of the calyx. The chestnut brown bracts are boat-shaped and fall away after the buds have developed.

In 1910 Morrison made reference to a narrow-leaf form of box poison which could have been thick-leaf poison. Thick-leaf poison was considered by Herbert in 1921 to be dangerous at all times, but more so when flowering or in fruit. Carne, Gardner and Bennetts in 1926 also considered thick-leaf poison to be dangerous. However there could have been some confusion between this species and wodjil poison, found to the north of its distribution range.

Thick-leaf has been shown to contain 150 parts per million of "1080" equivalent in air-dried material.

ROUND-LEAF POISON

(*Gastrolobium pycnostachyum* Benth.)

ROUND-LEAF POISON is a low shrub two feet in height with rigid, spreading branches. The younger parts of the plant are covered with white hairs which lie flat to the surface of the stem. Round-leaf poison has only been collected at East Mount Barren and at Mount Ragged in the Russell Range near Israelite Bay. It was once known as "Mt. Ragged poison" because of the sheep losses it caused in that region many years ago.

The leaves of round-leaf poison are borne in opposite pairs along the stems. The leaf stalk or petiole is short and the leaves, as the common name implies, are broadly elliptical to circular in outline. They are up to three quarters of an inch long, flat, thick, rigid, slightly notched or lobed at the base and rounded or lobed at the apex. The upper surface is dark green and the undersurface is paler, both with prominent netted veins. The small erect stipules soon break off.

The flowers, orange-red with a purple keel, are borne on short, dense, spike-like racemes. The pedicels are long and like the calyces are silky-hairy. The seed pod is sparsely silky-hairy and oval almost globular.

Round-leaf poison was listed as a suspected poisonous plant by Carne, Gardner and Bennetts in 1926.

It has been shown to contain 175 parts per million of "1080" equivalent.

NARROW-LEAF POISON

(*Gastrolobium stenophyllum* Turcz.)

NARROW-LEAF POISON, which derives its botanical name from the Greek *stenos*, narrow, and *phylon*, leaf, also has an appropriate common name. At one time it was referred to as "Phillips River poison" after the only locality from which it had then been found.

Three forms of this species are recognised. The form found in the Fitzgerald River area is a shrub six to eight feet high with pale green, crowded leaves and long racemes of pale yellow flowers. The form seen along the Phillips River has broader, dark green leaves and condensed racemes of flowers. The third form found from Shackleton eastwards to Narembeen and Southern Cross is a low spreading shrub with grey green leaves which have a distinct, sharp point and with rather larger, deep yellow flowers borne in loose racemes.

Narrow-leaf poison may be distinguished from the other toxic species of the genus *Gastrolobium* by its crowded, narrow leaves, which are deeply concave above or folded lengthwise, with a rather blunt apex which terminates in a fine, sometimes prickly point. The leaves while mainly opposite are somewhat crowded and with many arranged alternately. The racemes vary from short and dense, elongated and rather dense to elongated and loose.

Carne, Gardner and Bennetts in 1926 reported the probable toxicity of narrow-leaf poison. In 1937 Gardner stated it was definitely toxic.

The Fitzgerald River form has been shown to contain 90 parts per million of "1080" equivalent.

PRICKLY POISON

(*Gastrolobium spinosum* Benth.)

PRICKLY POISON is one of the most widely distributed and one of the most variable of species of the genus *Gastrolobium*.

It derives its common name from the fact that in the typical form of the fact that in the typical form of this species the leaves have prickles along the margins and at the apex. Its botanical name, derived from the Latin *spinosus*, means spiny.

Prickly poison, found practically all through the South-Western Vegetation Province, extends partly into the Ereman Vegetation Province.

Four varieties of prickly poison, *spinosum*, *trilobum*, *triangulare* and *grandiflorum*, are recognised as occurring in Western Australia. These four varieties provide the basis for our present classification of forms within this species.

The variety *spinosum*, which is the most widely distributed and variable variety, occurs in several forms. These forms often merge one into the other so that clearcut distinctions are often difficult to make. Four main forms of this variety are broadly recognised.

Forma *typica*, the common prickly poison or tree poison, found from Northampton southwards to Harvey and eastwards to around Kellerberrin, is probably most readily seen in the jarrah and wandoo associations of the Darling Range. This form has broad, stalkless, prickly margined leaves. The spines are more than three, or if only three, are present in the upper part of the leaf and not at right angles to the mid-rib. The stipules at the leaf-base are small. The racemes are short and are often axillary as well as terminal.

The calyx is usually hairless, while the ovary and later the seed-pod, is borne on a long stalk.

Forma *crassifolium*, found in the region between Brookton and Cranbrook, has thick, rigid, blue-grey leaves, with both prickly margined as well as entire leaves usually occurring on the same shrub. The flowers in this form are small. The corolla is yellow and purple, and the calyx is less than $\frac{1}{4}$ in. long. This form occurs on gravelly sandplain soils and is locally referred to as "bloom poison" or sometimes "bullock poison."

Forma *inermis*, the most distinct form of which is found between Narrogin and Katanning, is a shrub, 2 to 4 feet high. It has narrow entire leaves. Further to the south and to the east the leaves possess prickles, from the base upwards. The prickly poison of the Great Southern and the Esperance regions, which possesses prickled margins, is normally included in this form, although it has also been referred to as separate form, the forma *angustum*, described by Pritzel (1904).

Forma *parviflorum*, more commonly seen on gravelly sandplain soils in the central wheat-belt region, stands 5-6 feet high, and possesses small, prickly margined leaves (somewhat like a miniature forma *typica*) and small flowers. Further to the north, in the Perenjori and Dalwallinu districts there is what could well be another but similar form with slightly larger and less prickly margined leaves and with larger flowers.

The variety *trilobum*, found in the north central wheatbelt region from Wongan Hills eastwards, is a low spreading shrub rarely more than two feet in height and much exceeding this in breadth. It is usually confined to white clay soils associated with morrel and ribbon-barked mallee. This variety can be readily distinguished by its triangular, three-spined, grey-blue, small and rigid leaves.

The variety *triangulare*, which is restricted to the Northampton-Geraldton region and commonly seen on the hills in that area, is geographically isolated from the variety *trilobum*. This variety can be distinguished by its broadly triangular, prominently net-veined, rather thin, green leaves which are obtuse at the corners, each of which terminates in a slender but rigid spine.

The variety *grandiflorum*, which grows on open sandplain country from Mingenew south-eastwards to Beacon is a low shrub with widely spreading almost horizontal branches, and large orange-red flowers. The leaf is almost kidney-shaped or broadly heart-shaped, deeply indented at the base, not very thick but rigid, pale green in colour and with the apex somewhat abruptly narrowed into a long, slender, rigid spine. The flowers are almost twice the size of those of the other varieties of prickly poison.

One sample of the variety *grandiflorum* of prickly poison has been shown to contain 400 parts per million of "1080" equivalent, on an air-dry basis. At this level of toxicity, approximately 6 oz of fresh, green leaves would be sufficient to kill a 110 lb sheep.

A sample of the forma *inermis* of the variety *spinosum* has been shown to contain 100 parts per million of "1080" equivalent.

Samples of the forma *typica* of the variety *spinosum* of prickly poison have usually given negative tests for "1080". However on one occasion, young shoots of prickly poison have a strong positive result for quantitatively, but it does indicate that the time of sampling can be very important in determining the toxic levels that may be reached by prickly poison.

Prickly poison was first identified as the cause of stock losses at Katanning by Morrison in 1901.

The variety *grandiflorum* of prickly poison is the most toxic form of this species. The variety *triangulare*, and the formas *crassifolium* and *parviflorum* of the variety *spinosum* are also toxic, while forma *typica* of the variety *spinosum* is the least toxic of all.

BULLOCK POISON

(*Gastrolobium trilobum* Benth.)

BULLOCK POISON, which resembles the variety *trilobum* of prickly poison, has a specific name derived from the Greek *treis*, three, lobes, a division and alludes to the shape of the leaf which is of three-cleft formation.

This species differs from prickly poison in that the bases of the leaves are wedge-shaped or rounded and are not indented or heart-shaped. The flowers of bullock poison are arranged in short racemes in the leaf axils and are never in terminal racemes as in prickly poison.

Bullock poison, which is more commonly associated with wandoo woodlands, is found in a relatively narrow belt of country from Miling southwards to Katanning.

Bullock poison was first listed as a poison by Herbert in 1921.

Bullock poison has given negative results for "1080" to date, although it is still regarded as being a poison plant. It is rarely incriminated in stock losses.

BERRY POISON

(*Gastrolobium parvifolium* Benth.)

BERRY POISON, which has a berry like, globular pod about the size of a pea, is a shrub about two feet high. The branches are erect, and the upper ones are often clustered. The leaves are somewhat crowded, overlapping, and usually in whorls of three, but sometimes irregularly arranged. The young branches are clothed with dense, short, white, spreading hairs.

Berry poison is found from York and in the Dale River eastwards to Kellerberrin, Bruce Rock and Corrigin. It is associated with wandoo woodland in the Darling Range and with sandplain formations at the eastern end of its distribution range. It is usually found on gravelly-clay soils.

The leaves of berry poison are oblong to elliptical, short stalked, and either blunt at the apex or with minute, but sharp point. They are blue-green, with conspicuous net veins, and rarely exceed a quarter of an inch in length. The botanical name derived from the Latin *parvus*, small, and *folium*, a leaf, is in allusion to the small leaf found on berry poison. The brown, spreading stipules disappear as the leaves mature.

The flowers of berry poison are borne in terminal racemes, which are usually about one and a half inches in length - much longer than the uppermost leaves. The axis of the raceme and the flower stalks are covered with dense, minute, spreading, white hairs. The calyx is hairless except for the lobes which are fringed with minute, woolly hairs. The two upper calyx lobes are united almost to the top.

The petals are yellow or orange-yellow suffused with purple and are about twice as long as the calyx. The ovary is covered densely with silky hairs. The pod which is borne on a stalk, is hairless and globular with a fine point formed from the base of the style.

Morrison in 1910 first listed berry poison as a poison plant. It has been shown to contain 300 parts per million of "1080" equivalent.

SANDPLAIN POISON

(*Gastrolobium microcarpum* Meissn.)

SANDPLAIN POISON, which in the past has been confused with Champion Bay poison, is an erect shrub some three to four feet high with stiff spreading erect branches. Despite its common name, this plant is generally associated with wandoo woodland in the eastern part of the Darling Range. It is found from Wannamal in the north, to Narrogin in the south. It is extremely prevalent in the State Forests to the north-west of Narrogin, in the vicinity of Dryandra.

The leaves of sandplain poison are borne in whorls of three along the stem and are spread at a wide, almost horizontal angle. They are flat or undulate, often curved backwards, elliptical, and tapering towards both ends. The apex tapers into a sharp point. The upper surface of the leaf blade is olive green, the under surface is paler with a few silky hairs particularly on the midrib.

The flowers are borne in threes on long racemes that arise terminally or from the upper leaf axils. The inflorescence stalk, the pedicels or individual flower stalks and the calyces are clothed with silky spreading hairs. The flowers are much smaller than those of Champion Bay poison.

The specific name, *microcarpum*, is derived from the Greek and means "small fruit"; the fruit is small in comparison with other species of the genus *Gastrolobium*.

Originally composed with several other species, sandplain poison was definitely considered to be toxic by Gardner and Bennetts in 1956.

Sandplain poison has been shown to contain 600 parts per million of "1080" equivalent.

BOX POISON

(*Oxylobium parviflorum* Benth.)

BOX POISON, one of the most widely distributed poison plants in the agricultural areas of Western Australia, is also one of the most toxic. Stock deaths due to grazing this species are still quite common and losses of 200 sheep or more at a time have been recorded.

One farmer in an affected district recently estimated that poison plants killed 4,000 sheep and 100 head of cattle in one year. Most of these losses were thought to have been caused by box poison.

Four main forms of box poison may be recognised.

THE TYPICAL FORM, found over a wide area from Arrino in the North to Katanning in the south, and as far east as Merredin, is a compact shrub some six feet high with numerous erect branches.

The leaves, which are oblong to narrow-oblong, slightly wedge-shaped and frequently notched at the apex, are about one inch long and a quarter of an inch across. They are leathery in texture, dark green, shining and hairless on top, and paler and minutely and densely silky-haired underneath, with the margins somewhat rolled inwards on the underside. They are usually borne in opposite pairs along the stems or branchlets, but are sometimes so numerous that the regular arrangement is not obvious.

The flowers are smaller than those of most of the other toxic species. The specific name, derived from the Latin, *parvus*, small, and *floris*, a flower refers to the small flowers, which are orange-yellow, coloured with purple and red. They are borne in racemes which terminate the branchlets or arise from the axils of the upper leaves.

The stipules, unlike those of York Road poison, are small, while the calyx, also unlike that of York Road poison, is hairy and small in comparison.

The ovary contains four ovules.

THE SECOND FORM OF BOX POISON, found on the northern edge of the Esperance sand plain region has stems that are more ascending than erect, leaves rather broader than the typical form but with more revolute margins, and elongated racemes.

THE THIRD FORM, found in the Ravensthorpe district and westwards to the Fitzgerald River, has leaves somewhat narrower than the typical form and with the margins so inrolled that the whole leaf appears almost to be a tube. The ovary contains six to eight ovules, and the pod is narrow. This form has been referred to as the variety *stenocarpum*, from the Greek, *stenos*, narrow, and *karpos*, fruit.

THE FOURTH FORM found in red loamy soils from Moorine Rock, southwards to Hyden and Lake King and eastwards to Salmon Gums and Grass Patch, has leaves that are very narrow and so inrolled that only the hairy midrib is evident on the underside. The upper surface has a curious wrinkled pattern. The axis of the racemes and the calyxes are densely hairy with spreading hairs. This form, sometimes referred to as Marlock poison, was at one time treated as a distinct species under the name of *Oxylobium revolutum* C.A. Gardn. and is at present known as the variety *revolutum*.

Box poison is usually associated with loamy clay, gravelly clay or sandy gravel, often on granite or quartzite ridges, slopes of ridges or on "breakaway" slopes, and on "crabhole" soils north of the Esperance sandplain region.

The type of vegetation with which box poison may be associated varies with the geographic location of the stand and includes wandoo, she-oak, mallet, wodjil, tamma and the various mallees.

Box poison was listed as a poison plant in 1842 and has over the years been considered highly toxic to stock.

Box poison has been shown to contain up to 2,500 parts per million of "1080" equivalent.

The amount of mono-fluoroacetic acid present in box poison varies from season to season, from locality to locality or even from plant to plant within the one locality.

Samples of box poison collected from several districts contained from 100-2,500 parts per million of "1080" equivalent. Within the one locality, in an area of one square chain, samples taken from 16 plots of box poison contained from 1,000-2,500 parts per million of the toxic substance.

NET-LEAF POISON

(*Oxylobium racemosum* (Turcz.) C.A. Gardn.)

NET-LEAF POISON derives its name from the prominent net-veining on the leaves. It is an erect shrub about six feet high, and is found from the Gairdner River eastwards to Ravensthorpe.

The leaves of net-leaf poison are borne on short leaf stalks, in opposite pairs along the stem. The leathery leaves are flat with thick prominent veins. They are erect, one and a half to two inches long, narrow-elliptical or oblong, rounded at the base and blunt at the apex. The whole plant lacks hairs except for a woolly fringe on the margins of the calyx lobes.

The botanical name from the Latin *racemosus*, refers to the elongated racemes, much longer than the leaves, in which the orange-red flowers are borne. The pedicel or flower-stalk is about as long as the calyx. The calyx, which is hairless apart from the woolly fringe on the margins of the lobes, has the two uppermost lobes united to form a lip. The seed pod is hard, dark purple or black and contains six to eight seeds.

In 1937 Gardner listed net-leaf poison as a poison plant. Net-leaf poison proved a hazard in the Land Settlement area at Jerramungup when it was first opened up.

Net-leaf poison has been shown to contain 1,500 parts per million of "1080" equivalent.

BROTHER-BROTHER

(*Oxylobium tetragonophyllum* E. Pritzel)

BROTHER-BROTHER, the supposed aboriginal name for this species, is a low shrub rarely exceeding 18 inches in height. It is found from Jerramungup eastwards to Esperance.

The botanical name, of Greek origin, refers to the square-sided leaves of brother-brother, which are usually borne in opposite pairs along the stem, and are reflexed or angled downwards. The leaves are square to oblong, less than half an inch long, and indented or lobed at both ends. They are deep green above with a channelled midrib, inrolled towards a densely hairy undersurface and practically stalkless. The stipules are long, fine and spreading or angled downwards.

The flowers of brother-brother are borne in short, dense racemes. The calyx has short lobes with the two uppermost lobes united into a lip. The almost globular seed pod contains three to four seeds.

There is another shrub, *Mirbelia ovata*, which resembles brother-brother and is found in the same general area. However, the leaves of *M. ovata* are invariably in threes (rarely so in brother-brother) while the calyx lobes are acute and deeply divided (brother-brother having short lobes).

In 1927 Bennetts reported that the flowers and buds of brother-brother were very toxic to sheep.

Brother-brother has been shown to contain 750 parts per million of "1080" equivalent.

HOOK-POINT POISON

(*Gastrolobium hamulosum* Meissn.)

HOOK-POINT POISON is found from north of Moora southwards to Calingiri and Wongan Hills. It is a shrub rarely more than 18 inches high with branchlets covered with short dense, white, spreading hairs. It is found on gravelly soils, sometimes overlain with sand, and on quartzite ridges.

The leaves of hook-point poison are borne in whorls of three and occur at well spaced intervals. They are less than half an inch long, and elliptical in outline, with a hooked point at the apex. Hence the botanical name derived from the Latin *hamulosus*, which means beset with small hooks.

The flowers are larger than the leaves, and are borne in whorls of three racemes at the ends of the branches. The calyx is silky hairy with long hairs. The calyx lobes are deeply divided, tapering into fine points.

Hook-point poison was listed by Herbert in 1921 as a poison plant.

Hook-point poison has been shown to contain 100 parts per million of "1080" equivalent.

SCALE-LEAF POISON

(*Gastrolobium appressum* C.A. Gardn.)

SCALE-LEAF POISON is a plant of limited distribution, being found on gravelly hillocks in the Gunyidi district north of Watheroo. It is a densely branched shrub, little more than 12 inches high, with the younger branches densely clothed with white hairs.

The leaves of scale-leaf poison are borne in whorls of three, with one whorl alternate to and overlapping the next whorl like the scales of a fish. (Hence the name scale-leaf poison). The overlapped leaves are closely pressed against the stem. The short stalked, leathery leaves are roughly lance-shaped, and the pointed apex ends in a fine sometimes slightly hooked spine. The leaves are about a quarter of an inch long, concave above, prominently net veined, devoid of hairs and pale in colour. There are no stipules.

The flowers are borne in racemes at the ends of the branchlets. The flower-stalks are silky hairs. The calyx is devoid of hairs, and about a quarter of an inch long, with the three lower lobes lance-shaped and pointed at the apex. The petals are orange-yellow and purple in colour. The silky hairy ovary is borne on a stalk.

Scale-leaf poison was described as a poison plant in 1964.

It has not been tested for mono-fluoroacetic acid.

SPIKE POISON

(*Gastrolobium glaucum* C.A. Gardn.)

SPIKE POISON, which like scale-leaf poison has a limited distribution, is found on gravelly rises in the Wongan Hills district and is associated with sandplain scrub formations. It is a compact shrub with many stems arising from a woody stock.

The botanical name is derived from the Greek *glaukos*, becoming sea-green or bluish-green, and refers to the blue-green or almost grey colour of the leaves which are erect and borne in whorls of three. The leaves are less than half an inch long, and roughly circular. They are flat, rather thick and rigid and blunt at the apex, but with a fine, rigid point. The stipules are small and black.

The common name, spike poison, refers to the long, compact, spike-like racemes which terminate the branchlets and protrude well above the foliage. The flowers are rather small. The pedicel, calyx and ovary are silky hairy. The stalk of the ovary is long, thick and devoid of hairs.

Spike poison was described as a poison plant in 1942.

It has been shown to contain 200 parts per million of "1080" equivalent.

HEART-LEAF POISON

(*Gastrolobium bilobum* R.Br.).

HEART-LEAF POISON, found in the lower south-west region from the Helena River near Perth, eastwards to Wagin, and southwards along the coast to as far east as Cape Le Grand near Esperance, occurs typically in association with granite rocks or on the banks of water-courses.

Heart-leaf poison is a shrub or small tree, according to locality. The smaller forms are more commonly seen on granite hills, while the larger forms, which may grow up to 20 ft. high, usually occur along the banks of water courses.

The branches and branchlets of heart-leaf poison are angled, with the ribs proceeding from the leaf stalks.

The leaves, arranged in whorls of three or four, are oblong in shape, notched at the apex, and gradually tapering into a narrow base. They are dark green and shiny above, and pale and finely hairy underneath, with a prominent midrib. The fine, erect, slender stipules are longer than the short leaf-stalks.

The botanical name of heart-leaf poison is derived from the Latin, bilobus, having two lobes, and alludes to the two-lobed leaf apex, which is shaped more or less like a heart. The common name, also in reference to the apex of the leaf, has been in use for more than 100 years.

The inflorescence (the arrangement of the flowers on the flowering stalk), in heart-leaf poison, unlike that in most of the other toxic species of the genus *Gastrolobium*, is a condensed raceme, with each individual flower-stalk or pedicel longer than the calyx. The racemes are borne at the ends of the branchlets.

The flowers are yellow, coloured with red. The calyx-lobes are acture, with the two lobes behind the standard (the large petal) broader, and more united than the lower three lobes. The seed pods are egg-shaped, pointed at the top, and borne on stalks.

Heart-leaf poison was first discovered to be toxic to goats and other animals at King George Sound in the early days of sttlement. Bentham in 1864 reported it as being "the worst of the poison plants".

Heart-leaf poison has been shown to contain up to 2,650 parts per million of "1080" equivalent.

RIVER POISON

(*Gastrolobium forrestii* A.J. Ewart.).

RIVER POISON, as its name implies, is usually found on the banks of rivers or streams, or in low-lying areas close to watercourses. It occurs from the Preston River near Bunbury, to the Hay River near Albany, and inland almost to Mt. Barker.

River poison is a shrub from 4 to 5 feet high, but sometimes growing up to 12 feet high. It has erect, slender, angled (usually four-ribbed) branchlets.

The leaves are arranged in whorls of four or rarely five, with each whorl fairly widely spaced one from the other along the stem. They are deep green above and somewhat paler underneath, very narrow to almost linear in shape, 1 to 2 in. long, and borne on a short stalk. The bases of the leaves are

rounded, while the apices are usually notched with a long slender point in the notch. The midrib is prominent on the undersurface while the margins are slightly rolled-in underneath. The stipules are slender and longer than the leaf-stalks.

The flowers are borne on erect, elongated racemes 5 to 6 in. long, in distant whorls of about four flowers. The individual flower-stalks or pedicels are about as long as the calyx. Both the pedicels and the calyces are hairy with close, scarcely spreading hairs. The two upper lobes of the calyx are united almost to the top while the three lobes are acute, with slender points. The corolla is yellow, coloured with purple. The black seed pods are much longer than the calyx and borne on distinct stalks.

River poison bears a superficial resemblance to heart-leaf poison. It may be distinguished from heart-leaf poison by its narrower leaves which do not taper towards the base, its elongated racemes, and its relatively short pedicels. The botanical name of river poison commemorates Lord John Forrest, who first collected the species on the Blackwood River.

In 1926 Carne; Gardner and Bennetts included River poison in their list of suspected toxic species, while Gardner in 1937 first reported that this species definitely was toxic to sheep, cattle and horses.

STIRLING RANGE POISON

(*Gastrolobium velutinum* Lindl.)

STIRLING RANGE POISON, found from Tenterden and Mt. Barker eastwards to the Phillips River and to near Lake King, derives its common name from its association with the Stirling Range.

Stirling Range poison is a shrub 2 to 4 ft. high. In its typical form the leaves are somewhat wedge-shaped, with the margins slightly in-rolled underneath. Broader-leaved forms, found in the Mt. Barker district, have leaves that are relatively flat and hairless beneath. The extremely narrow-leaved form, found at Burkett Rocks in the Lake King district, possess in-rolled margins similar to the variety *revolutum* of box poison and with densely velvety hairs on the undersurface.

The racemes of Stirling Range poison are borne at the ends of the branchlets and are much longer than the leaves. The axis of the raceme and the flower stalks or pedicels are downy-hairy. The calyx varies from downy-hairy to almost hairless. The two upper lobes of the calyx are united almost to the top.

The botanical name is derived from the Latin *velutinus*, meaning velvety, and refers to the downy hairs found on some forms of this species.

In 1921 Herbert first reported Stirling Range poison as being a toxic species. Stirling Range poison has been shown to contain 300 parts per million of "1080" equivalent.

HUTT RIVER POISON

(*Gastrolobium propinquum* C.A. Gardn.)

HUTT RIVER POISON, named after the locality where it is commonly found, was described in 1955. Before this it had been confused with Champion Bay poison which it closely resembles when not in flower. Its specific name is derived from the Latin *propinquus*, which means near or closely connected with. This referred to its close affinity with Champion Bay poison.

Hutt River poison is a taller shrub than Champion Bay poison, up to 4 feet high, branched, and with smaller and more numerous flowers. It is found along the Hutt River, at White Peak and Isseka and to the southeast of Geraldton, east of Walkaway. The leaves vary from bluish green to olive green. Another plant found in rough country to the north of Mullewa, has longer olive green leaves which do not taper towards the base and grows into a much larger shrub than the true Hutt River poison. It has been placed in the same species as Hutt River poison.

Hutt River poison is a shrub with whorled, erect or spreading branches and a dark coloured bark. The branchlets are angled, the angles being formed by the continuance of the leaf-stalk along the stem. The leaves are mostly in whorls of three. They are from one and a half to two inches long, narrowly lanceolate, and folded along their length. The leaves gradually taper towards both shoot and apex, with a fine sharp point at the apex. The leaves are often curved backwards in the shape of a bow as in cluster poison and sandplain poison. The plant found north of Mullewa has leaves which are more flattened, two to two and a half inches long and rounded rather than tapering at the base. The stipules are fine and black, but disappear as the leaf matures. The colour of the leaves vary from blue-green to olive-green.

The flowers of Hutt River poison, which are smaller than those of Champion Bay poison, are borne on long slender racemes, much longer than the leaves, which are mostly terminal although also present in the upper leaf axis. The calyx is sparsely hairy with white, appressed hairs. The corolla is orange-yellow in colour. The acute, entire, chestnut-brown bracts which conceal the flower buds are larger than those on Champion Bay poison.

Hutt River poison has given negative results for "1080" to date.

CHAMPION BAY POISON

(*Gastrolobium oxylobioides* Benth.)

CHAMPION BAY POISON is found on gravelly soils and red loams from the Murchison River, through the West Midlands area, to the foothills of the Darling Range near Kalamunda. In the West Midlands area it is commonly associated with sandplain vegetation on gravelly rises and with patches of wandoo woodland.

Champion Bay poison is a small shrub rarely more than two feet high, with several stems arising from a short woody stock. The leaves, usually arranged in whorls of three, are narrow-elliptical to narrow-lanceolate with a fine rigid point at the apex.

The leaves taper somewhat abruptly at the apex and more gradually towards the base. The thick conspicuous midrib and the slender leaf-stalk often continue down the stem for a short distance below the point of attachment giving the stem at the point of attachment of the leaf an angular outline when cut in transverse section. The leaf is concave above or rarely flat, the blade or lamina is prominently and closely veined and is pale green or grey-green both on the upper and lower surfaces. The stipules are long and hair-like.

The few flowers are borne in clusters of three, on an elongated raceme. They are relatively large. The corolla is yellow, tinged with red. The calyx is attached to the axis of the raceme by a short pedicel or stalk. Both the pedicel and the calyx are covered by a whitish, silky, flattened coating of hairs. The ovary bears dense, silky hair and is borne on a stalk.

The plant resembles the genus *Oxylobium*, as the specific name implies.

In the West Midlands is found one of the so called "mock poisons", *Gastrolobium obovatum* Benth., which closely resembles Champion Bay poison but is not toxic to stock. Mock poison has its flowers arranged in clusters in the axils of the leaves whereas Champion Bay poison has its flowers borne in racemes which arise terminally.

In the absence of flowers mock poison may be identified by its leaves, which are more often borne in pairs (sometimes in threes) as against Champion Bay poison which normally has its leaves in whorls of three.

The stems of mock poison are normally circular in transverse section throughout its length, whereas the stems of Champion Bay poison are usually triangular in transverse section just below each leaf whorl, due to the continuance of the leaf stalk along the stem. The stems of mock poison often have a velvety covering while the stems of Champion Bay poison are smooth.

Reports of stock losses suffered in the Guildford district in 1837 (or even earlier) could well have been due to Champion Bay poison. In May, 1841, to settle disputes regarding the toxicity of certain leguminous plants, the Agricultural Society decided to conduct official tests at Guildford, in the presence of many local dignitaries. It is almost certain that the plants used in the experiments were Champion Bay poison. Two sheep and a goat were administered macerated plant material. All three animals died within six hours.

Champion Bay poison has been shown to contain over 1,000 parts per million of "1080" equivalent.

ROCK POISON

(*Gastrolobium callistachys* Meissn.)

ROCK POISON, so called because it is commonly found on granitic soils, usually among granite rocks, occurs from the Irwin River, southwards to the Dale River and eastwards to Mount Stirling, south of Kellerberrin.

Rock poison is the only toxic species of *Gastrolobium* in which the leaves are not regularly opposite or whorled.

They are narrow, usually erect, mostly 2 inches long, tapering at the base into a short stalk, and are blunt or notched at the apex with a minute, usually fine point. The stipules, which are small, fall at an early stage and are absent from mature specimens.

The racemes (or flowering spikes) are terminal, erect, and rigid, often 7 to 9 inches long. The specific name *callistachys* is derived from the Greek, *callistos*, very beautiful, and *stachys*, a spike. The stem of the spike is stout, and the individual stalks of the irregularly arranged flowers are about as long as the calyx, which is golden-hairy with close-lying hairs. The two upper calyx lobes are united into a notched upper lip. The pod is egg-shaped and pointed.

The plant is usually 3 to 4 feet high but may grow to 6 to 9 feet.

Rock poison was first discovered to be toxic at York, after an animal had eaten the plant from a vase that had overturned. It was one of the four toxic plants that were recorded by Drummond in 1842, and in 1864 it was listed in the second volume of Bentham's "Flora Australiensis" as one of the Swan River poison plants.

Rock poison has been shown to contain 1,000 parts per million of "1080" equivalent.

HORNED POISON and HILL RIVER POISON

(*Gastrolobium polystachyum* Meissn.)

HORNED POISON is an upright shrub with spreading branches, standing about three feet high.

The common name of the plant describes the leaf, which besides being crinkled and inrolled on the underside, is truncate or cut straight across or is two-horned at the apex. The leaves of this plant are arranged in opposite pairs, the upper surface being a dark green, the lower surface much paler in colour.

The specific name, derived from the Greek *polys*, many, and *stachys*, a spike, refers to the numerous racemes of flowers present on each plant. These racemes are short and only slightly longer than the leaves.

The leaves of horned poison are short and broad, with crinkled or slightly inrolled margins. It is normally associated with wandoo woodland on clayey or gravelly soils in the Moora and Calingiri districts.

HILL RIVER poison, described by Gardner as the variety *revolutum* of *G. polystachyum*, and at one time regarded as a distinct species, *G. bidens*, possesses a narrow leaf, completely inrolled on the underside and with two distinct lobes or horns which exceed the width of the leaf at the apex. The upper surface of the leaf is a darker green than the almost-concealed under surface. Young plants of Hill River poison often possess the broader, truncate leaves of horned poison. Hill River poison, named after the area where it grows in abundance, is found on gravelly rises in open sandplain country from Eneabba southwards to Dandaragan.

Carne, Gardner and Bennetts in 1926 listed horned poison as a poison plant. To date no "1080" has been detected in horned poison.