Plant Poisoning of Birds

Ross A Perry[1]

This paper reports 2 cases of poisoning of birds, one by *Begonia* sp., the second by *Cestrum parqui*. It also compiles some of the literature about plant poisoning of birds.

Suspected Plant Poisoning with *Begonia* sp. (var. sylvia) in a Galah (*Cacatua roseicapilla*)

A 3 year old male galah was presented on 12 January 95 very distressed with apparent marked salivation and some saliva-like material dried on both sides of the face, suggesting that the bird had been vomiting. No plaques or lesions were detected in the mouth or involving the tongue. The galah's droppings showed a bulky green cylindrical faecal component and white urates. The galah's body condition appeared normal in terms of convex pectoral mass and concave abdomen. Plumage and powder downs appeared to be normal.

Smears were prepared directly from the mouth and then a crop wash and aspirate was performed using sterile water. This produced mostly blood tinged otherwise clear tenaceous fluid with some grossly visible blood clots and fragments of plant material. A direct smear of this confirmed the presence of intact avian erythrocytes and plagues of flat leaf material. Similar plant material was seen in direct faecal smears. The bird had been fed an all seed diet and kept confined to its cage. The plant material seen in the faecal smears did not correspond to any normally associated with an all seed diet. However the owner reported that a succulent indoor plant was hanging beside the cage and one torn leaf was found beside the cage. The leaf was large, succulent and burgundy coloured and was subsequently identified as belonging to *Begonia* sp var. sylvia.

Gram-stained smears from the mouth crop and faeces showed Gram positive cocci in the mouth but not in the crop or faecal smears which appeared to be almost devoid of bacteria.

A tentative diagnosis of plant (*Begonia*) poisoning was made and the galah was given 2 doses of 7 ml of Apex Gastroenteritis Mixture at 12 hour intervals by crop tube as well as a few drops by mouth on each occasion. On the morning of the 13th January the bird was much more alert, the excess salivation had stopped, and there was no visible blood in the faeces which had become pale and formed. The bird was discharged from hospital.

Fatal Green Cestrum (*Cestrum parqui*) poisoning in a King Parrot called "Budgie"

The author was unable to save the life of a pet King Parrot that was allowed to perch in a Green Cestrum (*Cestrum parqui*) in the owner's garden and seen to eat some of its flowers and berries. Although McBarron reports *Cestrum parqui* is poisonous to cattle, poultry, sheep, horses, humans and rarely pigs, this is the first report of poisoning of a king parrot by it. The shrub is native to Chile, has lance-shaped leaves and yellowish-green trumpet shaped flowers 2.0-2.5 cm long. The fruit is a small green and later black globular berry. The poisonous

[1] Homebush Animal Hospital, 195 Parramatta Road, Homebush 2140

principle is probably a solanine-type alkaloid. All parts of the plant are poisonous but the berries are especially so. The bird presented with acute depression and some regurgitation and had profuse diarrhoea which looked like weak tea but was slimy.. Crop and faecal wet direct and Gram stained smears revealed no obvious pathogens. The faeces had a very reduced bacterial count but was a very watery sample. Apart from *Cestrum* poisoning the differential diagnoses included heavy metal poisoning, viral disease and chlamydia. The bird was treated initially with 3 ml Apex gastroenteritis mix and 5 ml Roudybush handraising parrot formula via a crop tube. The bird was hospitalised and kept warm and passed much more mucoid loose faeces overnight but refused to eat. The next morning blood was collected and a differential count showed 88% heterophils, 15 monocytes, 85 lymphocytes. A microhaematocrit showed very jaundiced plasma., a high PCV and a high estimated white cell count. The bird was given 0.25 ml Colvasone (Dexamethasone 2 mg/ml) but continued to deteriorate. It was not helped by Emergency Bushflower Essences and Herbal drops. It was given 8 ml warm Hartmans under isoflurane but stopped breathing. It was revived several times and kept on oxygen for about 1 hour before it died.

(There may be an uncited report of *Cestrum* Poisoning in poultry by Newton 1955).

McBarron suggests the following for treatment of solanine –type alkaloid poisoning of sheep and cattle. Restrict water intake. Combat circulatory and respiratory depression by giving injections of atropine sulphate. Activated charcoal. Many of the solanine-type alkaloids are bowel irritants and in large amounts cause vomiting in those animals capable of vomiting. Lesser amounts do not induce vomiting and are thus absorbed from the digestive tract.

Cestrum spp. (Family *Solanaceae*) are also listed by the Health Commission of New South Wales in the booklet "Play Safe in the Garden (Poisonous Plants)". All parts are noted as poisonous and in poisoned humans symptoms include dilation of pupils, nausea, muscular weakness, delirium, coma.

Some plants reported to be potentially poisonous to birds.

The following is a list of some plants that are potentially poisonous to pet birds, gamefowl and waterfowl based on a compilation of clinical reports or toxins reported as poisonous to birds. (Jerry LaBonde in Diseases of Cage and Aviary Birds. Third Edition. Walter Rosskopf and Richard Woerpel. Chapter 39. Toxic Disorders and G. Dumonceaux and GJ Harrison in Avian Medicine. Principles and Application. Chapter 37.Ritchie Harrison and Harrison.

Avocado (*Persea americana*)

Agitation, feather pulling, lethargy, anorexia, dyspnoea, death from fruit in budgerigar with pulmonary congestion, non-suppurative inflammation of liver, kidney, pancras skin and proventriculus and subcutaneous oedema and hydropericardium. (Also death within 1-2 hours of ingestion of fruit of dark rough skinned variety by Cockatiel . R.P. unpublished data). In canaries and budgerigars may see cessation of perching, anorexia, fluffed feathers, increased respiration rate, outstretched wings and death.

Bishop's Weed (*Ammi majus*)

Black Locust (*Rabina pseudoacacia*)

Depression, dyspnoea, coughing, sneezing, chewing, vomiting by budgerigar from leaves due to Robitin toxin.

Blue-Green Algae (*Microcystis aeruginosa*)

(Associated with muscle tremors, convulsions, inco-ordination, paralysis, prostration and death by Arnall and Keymer. F.T. Jordan in Poultry Diseases notes Anacystis cyanea (Microcystis aeruginosa) is highly toxic, causing hyperexciteability followed by paralysis and death in chickens and ducks. At necropsy there is general cyanosis of the carcase.)

Burdock (*Artium minus*)

Camel Bush (*Trichodesma incanum*)

Castor Bean (*Ricinus communis*)

Jordan in Poultry Diseases notes that the toxic principle, ricin, is relatively less toxic for ducks and hens than many other domestic animals but can nevertheless be lethal. The signs are progressive paralysis, indistinguishable from botulism with the exception of blood in the droppings. The lesions include fatty liver, catarrhal enteritis, swelling of the spleen, widespread petechiae and larger haemorrhages and congestion of the lungs. Look for seeds in the alimentary canal.

Clematis (*Montana rubens*): regurgitation by budgerigar from leaves.

Coffee Bean (*Sesbania drumundii*)

Jordan in Poultry Diseases under Coffee bean seed notes "The seed of Cassia occidentalis causes profuse diarrhoea, fall in egg production, reduced egg shell strength, palor of the yolk and death. At necropsy the sternal muscles are pale and oedematous."

Crown Vetch ( ) has been associated with tremors, opisthotonus, seizures and death in budgerigars, cockatiels, and lovebirds.

Diffenbachia (*Diffenbachia* sp.)

Reported highly toxic to canaries. Diffenbachia is sometimes spelt Dieffenbachia and the plant is also known as dumb cane, family Araceae.. The plant contains calcium oxalate crystals.

Elephant's Ear (*Colocasia* or *Alocasia* sp.) (This contains calcium oxalate.)

Ergot (*Claviceps purpurea*)

This is not a plant but a fungus which grows on a variety of plants, especially the seed heads of paspallum. Ingestion of this has been linked to distal extremity necrosis in budgerigars (and ? other birds)(?Harry Cooper, pers. Com) attributed to ergotamines causing peripheral vascular constriction.

Foxglove (*Digitalis purpurea*): reported highly toxic to canaries.

Lily of the Valley (*Convallaria* sp.)

Lethargy, weakness, diarrhoea, regurgitation by budgerigar from leaves due to cardiac glycoside. Reported poisonous to pigeons.

Locoweed (*Astragalus emoryanus*)

Lupine: reported highly toxic to canaries.

Maternity Plant (*Klanchoe* sp.)

Milkweed (*Asclepias* sp.)

Nightshade (*Solanum* sp.)

Jordan in Poultry Diseases notes that the active toxic principles in both black nightshade and the potato are solanine and solanidine. In the black nightshade the fruit are of greatest significance and in the potato the sprouts are most poisonous. The signs of poisoning are incoordination, prostration, paralysis and death.

Oak (*Quercus* sp.)

Coast live oak (*Quercus agrifola*) ingestion by a cassowary was associated with anorexia, ataxia, diarrhoea, severe polydypsia and death with diffuse serosal hyperemia, ulcers and haemorrhage in the small intestine and high levels of tannins in the liver and gastric contents.

Oleander (*Nerium oleander*)

Lethargy, diarrhoea, weakness, tetanic spasms, salivation, vomiting, with gastroenteritis, subcutaneous haemorrhage, CV haemorrhage and death of budgerigar from leaves due to Oleandroside toxin. Reported highly toxic to canaries.

Parsley (*Petroselinum sativum*)

Associated with photosensitisation and skin lesions in ostriches and ducks.

Philodendron (*Philodendron scandens*)

Choking, regurgitation, diarrhoea with inflammation of the crop and small intestine in budgerigar from leaves due to histamine reaction and gastrointestinal irritations. Ingestion of split leaf Philodendron by 2 Amazon parrots was associated with transient lethargy and vomiting over 2 hours. (All the Philodendrons contain calcium oxalate and symptoms in humans are those for *Dieffenbachia*.)

Poinsettia (*Euphorbia pulcheriama*)

Red stained faeces and diarrhoea with gastroenteritis and hepatic necrosis in budgerigar from bracts and green leaves due to resin.

Pokeweed (*Phytolacca americana*)

Precatory Bean (*Abrus precatoius*)

Rhododendron (*Rhododendron simsii*)

Lethargy, weakness, regurgitation, diarrhoea in budgerigar from leaves due to Andromedotoxin .

Tobacco (*Nicotiana* sp.)

Virginia Creeper (*Parthenocissus quinquefolio*)

Depression and regurgitation from leaves in budgerigar

Yew (*Taxus media*)

Ataxia, regurgitation, dyspnoea, death from fruit and leaves in budgerigar. Reported highly toxic to canaries. Clinical poisoning in pheasants.

Note different species sensitivities and tolerances. Budgies appear to be about 20 times more resistant to cardiac glycocides than mammals.

Plants listed as toxic in pet birds and fowl with little or non-existent documentation

Prunus species such as chokeberry, peach, almond (*Prunus amygdalus*), apricot, contain cyanogenic glycocides in the kernels of the seeds.

Laurels.

The pepper tree (*Capsicum annuum*) is toxic to mammals but its fruit appear to be safely eaten by Cedar Waxwings and House Finches.

Dr JT Lumeij reports in Ritchie, Harrison and Harrison (1994) that many plants are known to be hepatotoxic in some birds including

Rapeseed (*Brassica napus*) (to which canaries appear resistant). Jordan in Poultry Diseases notes that rapeseed poisoning in chickens may be associated with poor growth, lowered egg production, taint of eggs and meat and liver degeneration, resulting in some cases in fatal haemorrhage. Cirrhosis of the liver occurs in turkeys whereas hydropericardium and ascites occurs in ducks with rapeseed poisoning.)

Rattlepod (*Crotalaria* spp.)

Jordan in Poultry Diseases notes that the toxic principle of these plants in the dried or fresh form, but especially in the seeds, is monocrotaline. Chickens fed with Crotalaria spectabilis may show acute signs , with marked depression, and death, or more chronic signs or reduced appetitie, ruffled feathers, ascites, a duck-like walk, palor of the comb and wattles, and reduced egg production. In turkey poults the urates in the droppings are bright yellow-green. Lesions are influenced by the dose of toxin and the age of the bird and whether the condition is chronic or acute. The lesions may include one or more of the following: anasarca and ascites, hydropericardium, oedema of the lungs, initially a mottled swollen liver (it later becomes cirrhotic and shrunken and may rupture) and splenomegaly. Petechial haemorrhages my be present on serous surfaces.

***Daubentonia* sp seed**

Cotton seed (*Gossypium* spp.)

FTW Jordan in Poultry Diseases notes that the toxic principle in cottonseed meal is gossypol and this can cause loss of weight, anorexia, lowered egg production and discoloured yolks in chickens, and death with the most obvious lesion being enteritis.

Arnall and Keymer in Bird Diseases (1975) have a section on plant toxins from which the following information is compiled.

The following may be sources of atropine and related susbstances to which birds are very sensitive.

Deadly nightshade (*Atropa belladonna*)

Henbane (*Hyoscyamus niger*)

Thorn-apple (*Datura stramonium*)

As reported by R Dowling and H Kleinschmidt 1987 in Toxic Plants and Animals. A Guide for Australia. Angel's Trumpet (*Datura brugmansia x candida*) is a common garden plant in Australia all parts of which are poisonous, at least to people, in whom poisoning is associated with intense thirst, hallucinations, delerium, dilation of the pupils, convulsions, coma and sometimes death. Datura ferox is another type of poisonous Thorn-apple associated with symptoms of tropane alkaloid poisoning, mainly scoplamine and hyoscyamine, and include intense thirst, disturbance of vision, flushed skin, delerium, weak and rapid heart beats and death. Other plants in this family which possibly contain the same harmful compounds in their green parts as well as flowers and fruits include Browallia, Petunia, Franciscia, Salpiglossis, Orange Browallia or Streptosolen and Blue Potato Bush.

Some other garden trees and shrubs known to be poisonous in humans which are likely to be poisonous to some birds include Scarlet Rhus (*Toxicodendron succedaeum*) although the author has seasonally watched some birds, starlings from childhood memory, eat the very ripe dry seeds direct from the tree)

Woody nighshade (*Solanum dulcamara*)

Black or Garden nightshade (*Solanum nigrum*): (see above)

Egg-plant (*Solanum melongena*)

Affected birds may exhibit increased pulse and respiration rate, pupillary dilation (is this correct, isn't the control of pupillary muscle the opposite to mammals?), blindness, staggering, restlessness, tremors, convulsions, respiratory depression with shallow fluttering breathing. Arnall and Keymer suggested the use of stimulants of the central nervous system such aminophylline and amphetamines as part of treatment of this poisoning. They noted species variations in sensitivity. Hens can eat up to 15 g of Stramonium seed without illness.

Pyrrolizidine alkaloids are sourced in plants such as:

Rattlepods (*Crotolaria* spp.), ragworts, fireweeds and groundsel (*Senecio* spp.), *Heliotropium* spp., iron weeds (*Amsinckia* spp.), Patterson's curse (*Echium* spp.) and Camel Bush

(*Trichodesma* spp.) (Bob Doneley in Vade Mecum Series A, No. 21. Control and Therapy of Diseases of Birds. 1996. University of Sydney Post Graduate Foundation in Veterinary Science and A. Gallagher, 1994, AAVAC Annual Proceedings re Pyrrolizidine Alkaloid Toxicity, pp. 135-140.) Pyrrolizidine associated pathology in affected birds included nephrosis, chronic toxic hepatitis and acute renal tubular nephrosis with renal gout.

Additional pathology can sometimes be found in lung, cerebrum, pancreatic acinar cells, gastrointesintal tract and vascular degeneration of panreas and mesenteries. Some pyrrolizidine alkaloids are carcinogenic, teratogenic and mutagenic.

The following plants may be sources of glycocides and cyanogenetic glycosides:

Cherry stones, *Prunus* spp., *Pyrus* spp., *Sorghum* spp., *Panicum* spp., *Eucalyptus* spp., *Linum* spp.

There are many more that contain dangerous levels of hydrocyanic acid. Poisoning with these plants may be associated with excitement, convulsions, head pulled back and tail vertical, jerkey eyeball movement, deep rapid breathing, death within one hour, possibly without earlier signs, congestion of blood vessels, suffusion of skin and appendages. Arnall and Keymer suggest as treatment 1% sodium nitrate per 25mg/kg body wt iv followed by sodium thiosulphate 25% per 1.24 g/kg body wt. Vitamin B12a (hydrococobalamin) will reverse the toxicity in mice. Chlorpromazine neutralises cyanide effects in pigeons.

The following plants may be sources of nicotine and nictotine-like toxins:

Tobacco plant (*Nicotiana tabacum*), Wild tobacco (*Nicotiana glauca*), *Duboisia hopwoodii* (an Australian native shrub).

Yellow jessamine (*Gelsemine sempervirens*) is a source of the alkaloid gelsemine.

Hemlock (*Conium maculatum*) is a source of the alkaloid coniine.

Arnall and Keymer report the alkaloids can be absorbed through intact skin and can be associated with excitement, rapid respiration and diarrhoea, inco-ordination , increased heart rate, decreased respiratory rate, shallow respiration, leading to general flaccid paralysis, coma and death from respiratory paralysis. As treatment they suggested trying to give caffeine subcutaneously, tea orally. They suggested that a strychnine tonic in minute doses might help in early stages only. Morphine is stated to be an antidote for Gelsemine poisoning.

The following plants may be a source of resins that affect the C.N.S., liver, kidneys and heart:

Boxwood (*Buxus sempervirens*), Oleander (*Nerium oleander*), Yew (*Taxus baccata*), Azalea (*Rhododendron* spp.), Juniper (*Juniperus* spp.), *Daphne* spp.

Privet (*Ligustrum vulgare*) (Ripe privet berries are commonly eaten by currawongs and the seeds spread about the suburbs of Sydney without recognised signs of poisoning. R. Perry personal observation.)

Other evergreens: Anall and Keymer reported poisoning with these may be associated with

excitement to depression and panting and suggested symptomatic treatment. They noted that yew leaves are poisonous to gallinaceous and probably other birds and that all parts, especially the seeds, are toxic.

The following legumes can be toxic:

Rosary peas (*Abrus precatorius*), Black locust (*Robinias* spp.), Wistaria (*Wistaria chinensis*), Locoweed (*Oxytropis* spp.), Java beans (*Phaseolus* spp.), Horsebeans (*Phaseolus* spp.), Rattlepods (*Crotolaria* spp.), Laburnum (*Laburnum anagyroides*). (See also Crown Vetch, Vetch, *Lathyrus* spp.) (Note common garden variety "sweet peas" are *Lathyrus* sp.)

Arnall and Keymer reported that poisoning may be associated with severe gastroenteritis, cardiac and nervous depression, damage to liver, carcinogenesis. *Crotolaria* seeds are toxic to quail, doves and chickens. Arnall and Keymer had not found any treatment of value.

Strychnos nux vomica and other members of the Loganiaceae can be sources of the alkaloid strychnine. Poisoning may be associated with apprehension, restlessness, twitches, throwing back the head, extended stiff limbs, voiding of droppings after abdominal contraction, spasms of several seconds triggered by sounds, vibration, handling or spontaneously. Respiration becomes difficult, with cyanosis and death following in a few minutes to 1 hour. Awareness of pain and anxiety appear greatly increased. Arnall and Keymer suggested as treatment oral potassium permanganate to oxidise, or tannic acid to precipitate strychnine. In later stages anaesthesia or for convulsions pentobarbitone in repeated doses is sufficient to relax muscular spasms and ease respirations but may take several hours. They reported that strychnine is eliminated from the body fairly rapidly.

Arnall and Keymer reported that some species of Blue-Green Algae e.g. *Microcystis aeruginosa*, can be associated with muscle tremors, convulsions, incoordination, paralysis, prostration and death. They knew of no effective treatment and noted that the diagnosis of affected birds can easily be confused with botulism.

Yellow Oleander (*Thevetia peruviana*) is very toxic to all animals including man. All parts of the plant are toxic and the kernels or seeds are especially poisonous to mammals. At lest a dozen toxic compounds are known to be contained in the tissues of yellow oleander including heart toxins thevetin A, and thevetin B, nerifolin, thevetoxin, peruvoside, ruvoside, fixed oils, gums and rubber. The effects of the heart toxins ressemble those of digitalis and typically occur sever hours after ingestion . If poisoning occurs the heart slows, arrythmias develop, and the heart dysfunction progresses to ventricular fibrillation. (John Pearn, Oleander poisoning. In Toxic Plants and Animals. A Guide For Australia. Qld Museum. 1987.)

Lathyrus odoratus and several other species of *Lathyrus* legumes can cause a fall in egg production and qulaity in hens through the toxic principle, aminopropionitrile. Eggs are mis-shapen and larger than normal because of the increased albumin of lower than normal viscosity, according to Jordan in Poultry Diseases.

Vetch (*Vicia sativa*) is toxic for chickens and poults, causing muscular incoordination , dyspnoea, hyperexcitability, convulsions and death according to FTW Jordan in Poultry Diseases.

Cacao products. FTW Jordan in Poultry Diseases notes that poisoning from these products is now a rare event but ordinary household cocoa powder contains sufficient theobromine to be harmful to poultry. Signs may include hyperexciteability or depression with decreased

appetite and egg production, and death. Undecorticated cocoa cake is toxic when included in laying meal at the rate of 10-30%. Repeated small doses can have an accumulative effect.

Corn cockle seed. FTW Jordan in Poultry Diseases notes that the seed is very unpalatable to poultry but may be eaten in corn or mash and can give rise to diarrhoea, reduced respiratory rate, and hydropericardium with myocardial petechiae, oedema of the intestinal wall and caseous exudate in the oropharynx and crop.

Cabbage and related brassicas are likely to be of nutritional value in moderation for many birds but have the potential to be goitrogenic.

Russian Comfrey and avocadoes have been reported to be poisonous especially for African Lovebirds and canaries (noted by J. Gill, 1996, in The Basics of Avian Medicine, Proc 2789, PGCVSc Uni of Sydney, p 58.)

Poisonous plants, which if ingested have been associated with inflammation of the crop and vomiting or regurgitation include various ivies, lilies, indoor plants, Angel's Trumpet (*Datura* sp.) and oleander. (Schlutz, DJ (1981) P.G.C.V.Sc. Uni. of Sydney Proc. 55:548).

Cottoneaster berries that had become very ripe while growing in a finch aviary were suspected by Furneaux RW and Perry RA to be associated with acute deaths and a haemorrhagic enteritis of approximately 40 finches (Unpublished data) in Sydney whereas personal observation by Perry reveals that some wild parrots especially Crimson Rosellas and some other species appear to gorge themselves on ripe and ripening cottaneaster berries with no discerned ill-effect. Many captive parrots have been provided with branches of ripe berries to eat without discernable ill-effect. It appears that as with so many plants, toxicity can vary from year to year, as well as with part of plant, strain or variety, seasonal conditions and other factors.

Euphorbia spp. including petty spurge, have highly irritant white sap and contain various poisons. I have regarded petty spurge as poisonous to birds but have not located a reference to this.

The common vine with white sap which grows as a weed around Sydney and produces small apple sized pods which open out to release hundreds of dark seeds attached to windblown filaments from memory is poisonous to fowl and probably other birds. Its name escapes me but it is being investigated as a fibre crop for inland Australia.

Mexican poppy is mentioned as toxic to birds by TG Hungerford in Hungerfords Diseases of Livestock, 9th Edition, Tomato stems and leaves are reported toxic to animals. Hungerford provides many pages of notes on an extensive list of plants known to be poisonous to Cattle, sheep, horses, goats, dogs and cats and this reference is likely to be found useful for guiding people as to the likely suitability of various plants for aviaries, perches, anti-boredom distracters etc. Whittet (1968) has written a section on poisonous plants

Major Poisonous Plants

Weeds

Aconitum napellus Monk's hood. Roots, leaves, flowers, seeds.

Agrstemma githago Corn cockle. Seeds.

Anagallis arvensis Scarlet pimpernel. Leaves, stems, seeds.

Anemone nemorosa Woods anemone. Leaves.

Anemone pulsatilla Pasque flower. Leaves.

Argenome ochrleuca Mexican poppy. Seeds.

Atropa belladonna Deadly nightshade. Roots, leaves, seeds.

Bulbine bulbosa Native leek. Leaves.

Cheilanthes tenuifolia Rock fern. Fronds.

Colchicum autumnale Meadow saffron. Bulbs, leaves, seeds.

Conium maculatum Hemlock. Roots, leaves, seeds.

Cucumis myriocarpus Prickly paddy melon. Fruits.

Datura stramonium Common thornapple. Leaves, stems, seeds.

Delphinium spp. Larkspurs. Roots, leaves, stems, seeds.

Digitalis purpurea Foxglove. Leaves, stems, seeds.

Euphorbia drummondii Caustic weed. Leaves and stems.

Euphorbia helioscopia Sun spurge. Leaves, stem.

Euphorbia lathyrus Caper spurge. Fruits, seeds

Heliotropium europeaum Common heliotrope. Leaves, stems.

Helleborus foetidus Stinking hellebore. Roots, leaves, seeds.

Hypericum perforatum, var. *augustifolium* St. John’s Wort. Leaves, stems.

Hyoscyamus niger Black hen bane. Roots, leaves, seeds.

Indigofera australis Australian indigo. Leaves, stems.

Jussiaea repens Water primrose. Eaves, floating stems.

Lotus australis Australian lotus. Leaves, stems, seeds.

Macrozamia communis Burrawang. Leaves, nuts, kernels.

Malva parviflora Small flowed mallow.leaves, stem, seeds.

Marsdenia rostrata Milk vine. Leaves and stems.

Mercurialis annua Annual mercury. Roots, leaves, stems.

Passiflora subpettata Wild passion vine Leaves and young stems.

Pteridium esculentum Bracken fern. Green fronds.

Phytolacca americana Pigeon berry.Roots leaves stems and berries.

Phytolacca octandra Inkweed. Roots, leaves, stems and berries.

Ricinus communis. Castor oil. Seeds.

Salvia reflexa Mint weed. Leaves and stems.

Saponaria officinalis Soapwort. Roots and leaves

Sarcostemma australe Caustic vine. Branches and minute leaf scales.

Scleroblitum atriplicinum Purple goosefoot. Young leaves.

Senecio jacobea Ragwort. Leaves and stems.

Silybum marianum Variegated thistle. Leaves and stems.

Sinapis arvensis Charlock. Seeds.

Sium latifolium Water parsnip. Roots.

Swainsona spp. Darling peas. Leaves, stems and seeds.

Tribulus terrestris Caltrops or yellow vine. Leaves and stems.

Vaccaria pyramidata Bladder soapwort. Leaves and seeds.

Verbesina enceliodes Crownbeard. Leaves and stems.

Xanthium chinense Noogora burr. Seeds and seedling plants.

Zygadeus venenosus Death chamomile. Bilbs and leaves.

Grasses

Cynodon incompletus Blue couch. Young leaves and stems.

Lolium temlentum Darnel. Seeds.

Sorghum halepense Johnson grass. Young leaves and stems.

Sorghum sudanense Sudan grass. Young leaves and stems.

Sorghum vulgare Sorghum. Yound leaves and stems.

Shrubs and Woody Climbers.

Arauja hortorum Moth plant. Seeds.

Asclepias fruticosa Narrow leafed cotton bush. Leaves and twigs.

Cestrum spp. Cestrum. Leaves, twigs and fruits.

Cycas media Zamia palm. Nuts.

Eremophila maculata Native fuchsia. Leaves.

Myopoum acminatum Boobialla Leaves and twigs.

Myoporum desertii Turkey bush. Leaves, twigs and fruit.

Nicotiana glauca Tree tobacco. Leaves.

Nicotiana suaveolens Native tobacco. Leaves.

Nerium oleander. Oleander. Leaves and twigs.

Pimelea pauciflora. Poison pimelea. Leaves and twigs.

Rhododendron spp. Rhododendrons and Azaleas. Leaves and twigs.

Trees

Acacia glaucescens Coastal myall. Leaves.

Alstonia constricta Bitter bark. Leaves, twigs and fruit.

Castranospermum australe Black bean. Green pods and seeds.

Duboisia hopwoodii. Pituri. Leaves and twigs.

Duboisia myoporoides Corkwood. Leaves and twigs.

Eucalyptus cladocalyx Sugar gum. Leaves.

Heterodendrum oleifolium Rosewood. Leaves and twigs.

Melia azedarach White cedar. Fruits.

Quercus sppp. Oaks. Acorns, leaves and young shoots.

Strychnos nux vomica, Strychnine. Leaves, stems and seeds.

Taxus baccata Yew. Leaves and seeds.

Trema aspera Peach-leaved poison bush. Leaves and twigs.

Suspected poisonous species.

Weeds

Acetosella vulgaris Sorrel. Leaves seeds stems.

Adonis annua Pheasant's eye Leaves and stems.

Astragalus hamosus Hook podded milk-vetch Seeds.

Baccharis halimifolia Groundsel bush. Leaves and stems.

Calystegia sepium A bindweed. Roots leaves stems seeds.

Centella asiatica Indian pennywort Leaves and stems.

Chenopodium ambrosioides Mexican tea. Leaves and stems.

Chenopodium carinatum. Keeled goosefoot. Leaves and stems.

Convolvulus arvensis. Field bindweed. Roots, leaves, stems, seeds.

Cryptostemma calendula. Capeweed. Leaves and unexpanded flower buds.

Cuscuta australis Australian dodder. Leaves and stems.

Dichondra repens. Kidney weed. Leaves and stems.

Echium plantagineum Paterson's curse. Leaves and stems.

Euphorbia peplus Petty spurge Leaves and stems.

Homeria breyniana One-leaved cape tulip. Leaves, stems and corms.

Homeria miniata. Two-leaved cape tulip. Leaves, stems and corms.

Hydrocotyle laxiflora Stinking pennywort Leaves and stems.

Hydrocotyle vulgaris. Common pennywort. Leaves and stems.

Inula graveolens Stinkwort. Leaves, stems, flowers.

Lactuca serriola Prickly lettuce. Leaves and stems.

Lamium amplexicaule Deadnettle. Leaves and stems.

Lantana spp. Lantana. Young shoots and seeds.

Lycium feroscissimum African boxthorn. Berries.

Marsilea drummondii Nardoo. Leaves.

Modiola caroliniana Red-Flowed mallow. Leaves and stems.

Oxalis acetosella Wood sorrell. Leaves.

Oxalis corniculata Yellow wood sorrel. Leaves.

Oxalis pes-caprae Yellow-flowered oxalis. Leaves.

Papaver hybridum. Rough-headed poppy. Leaves, seed capsules and seeds.

Plantago varia. Small plantain. Leaves.

Polygonum aviculare Wireweed. Leaves and stems.

Polygonum convolvulus Black bindweed. Seeds.

Polygonum hydropiper Smartweed. Leaves and stems.

Polygonuym persicaria Persicaria. Leaves and stems.

Pratia concolor. Pratia poison. Leaves and stems.

Pratia purpuascens white-rooted lobelia. Leaves and stems.

Ranunculus muricatus Rough seeded buttercup. Leaves and flowers.

Ranunculus sceleratus Celery-leaf buttercup. Leaves and flowers.

Raphanus raphanistrum Wild raddish. Leaves and seeds.

Rumex conglomeratus clustered dock. Leaves, stems and seeds

Rumex crispus curled dock. Leaves, stems, seeds.

Senecio quadridentatus Cotton fireweed. Leaves and stems.

Sesbania bispinosa Sesbania pea. Leaves.

Solanum cinereum Narrawa burr. Leaves and fruits.

Solanum esuriale Quena. Leaves and fruits.

Solanum nigrum Black-berried nightshade. Leaves and fruits.

Solanum pseudocapsicum Madeira winter cherry. Leaves and fruits.

Solanum sturtianum Sturt’s nightshade. Berries.

Stachys avensis Stagger weed. Leaves stems and seeds.

Stypandra glauca Nodding blue lily. Leaves and stems.

Verbascum spp. Mulleins Leaves.

Wedelia asperrima Yellow daisy Leaves and stems.

Xanthorrhoea spp. Grass trees. Leaves and flower parts.

Zornia diphylla Zornia. Leaves.

Grasses.

Chloris distichophylla Evergreen chloris. Leaves and stems.

Cynodon plectostachyum. Star grass. Young leaves and stems.

Eleusine indica. Crowsfoot or crab grass. Young leaves and stems and seeds.

Panicum effusum Hairy panic Leaves.

Sorghum almum Columbus grass. Leaves and stems.

Shrubs and woody climbers.

Acacia georginae Georgina gidgea Seed pods.

Anredera cordifolia Lamb's tail. Leaves.

Daphne laureola Spurge laurel. Leaves, twigs and beries.

Daphne mezereum Mezereon Leaves, twigs and berries.

Gastrolobium grandiflorum Desert poison bush. Leaves.

Goodia lotifolia Clover tree or Golden tip. Leaves.

Hibbertia spp. Guinea flowers. Leaves, twigs and berries.

Ligustrum spp. Large and small-leaved privets. Berries and leaves.

Pimelea linifolia Slender rice-flower. Leaves and twigs.

Pimelea microcephala Scrub kurrajong. Leaves and twigs.

Trees.

Ailanthus altissima Tree of heaven. Leaves and bark.

Atalaya hemiglauca Whitewood. Leaves and twigs.

Some guidelines towards treatment.

1. Prevent further access to poison

2. Remove ingested poison if practical e.g. via crop incision.

3. Oral or upper gastrointestinal irritation may require soft diets, intestinal protectants such as activated charcoal or mineral oil or ?Probucol.

4. Cathartics may be indicated to speed the passage of toxins.

5. Supportive fluid therapy should be considered.

Some commonly fed and grown aviary plants as promoted in aviculture

Low growing plants: Chickweed, Clover, Couch, Dandelion, Dock, Green Panic, Groundsel, Johnson Grass, Kikuyu, Milk Thistle, Rye Grass, Shepherd's purse, Spinifex, Summer Grass, Winter Grass,

Shrubs and Trees: Callistemons, Kunzeas, Grevilleas, Bromophila, Melaleuca, Thryptomene, Acacia,

Hardenbergia, Kennedias, Baecheas, Chorezemas, Beaufortias, Banksias, Cassias, Clematis, Correas, Carwinias, Hibbertias, Pimelas, Solyas, Westringias, *Lingustrum* (Privet), Hibiscus, Conifers, Cotoneasters, Honeysuckles, Maiden Hair creeper, Jasmine, Calendulars, Zinnias, Marigolds, Roses, Tomatoes.

Most of these may be suitable for planted aviaries housing finches but some are likely to be potentially poisonous to species which eat them. Most parrots destroy if not swallow most green vegetation placed in aviaries and would therefore be at risk. Some of the above mentioned plants which can be toxic at least to other animals include some varieties or species of acacia, jasmine, hibiscus, pimelia.

One is reminded that each species of bird differs from other species in metabolic pathways as well as in anatomical structure and appearances. It is likely that more and more species differences will be discovered in terms of "safe" and poisonous aviary plants.

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