

Classification of plants that require the same specific treatment

Plants that contain a cyanogenic glycoside

- 1) Arrowgrass *Triglochin maritima*, found in gardens but imported from the USA.
- 2) Bird's foot trefoil *Lotus corniculatus*, commonly found in cleared woodland.
- 3) Chinese photinia *Photinia fraseri*, found in gardens but imported from China.
- 4) Chinese sacred bamboo *Nandina domestica*, found in gardens but imported from China.
- 5) Laurel *Laurus spp.* Large amounts need to be ingested so poisoning is very rare, except in pet animals given access to the dried leaves on rubbish dumps.
- 6) Wild cherry *Prunus sp.*, found in gardens and woodland.

Specific treatment is 20mg per kg sodium thiosulphate given intravenously, together with 1 gram per 20kg by mouth to detoxicate the remaining HCN in the rumen, or C1 in SACs. This can be repeated in an hour.



Plants that contain oxalic acid

- 1) Fat hen *Chenopodium album*, commonly found on waste ground and in cultivated areas between fruit trees. Large amounts are required so poisoning is very rare except in tethered animals.
- 2) Ice plants *Mesembryanthemum spp.*, only found in gardens, originated in South Africa.
- 3) Rhubarb *Rheum rhabonticum*, found in vegetable gardens but poisoning is normally from leaves thrown to camelids.
- 4) Soft roly-poly *Salsola kali*, a weed found in open areas of woodland.
- 5) Sorrel *Rumex acetosa*, a weed found in certain pastures, a relative of sheep sorrel *R. Acetosella*. Poisoning is very rare.
- 6) Sugar beet *Beta vulgaris*, (only causes problems if animals are suddenly fed large quantities.

Specific treatment is vitamin B preparations and 20% calcium borogluconate, both given slowly intravenously. The dose of the 20% calcium borogluconate is 30ml for a small sheep or pygmy goat, 60ml for a normal-sized sheep or goat and 80ml for a SAC.



Image sources: **1)** http://img.ggdht.com/237Bt56ggg1UBRkZuj59k1AAAAA4AFHk2HGMI_AXIQMWHl1%252520SPinact%252520%252520%252520Chenopodium%252520album%252520_web_thumb%25252520%252520.jpg?imgmax=800 **2)** https://apps.rhs.org.uk/plantselectorimages/detail/WSY004816_2840.jpg **3)** https://upload.wikimedia.org/wikipedia/commons/8/8e/Photinia_fraseri_B.JPG **4)** https://apps.rhs.org.uk/plantselectorimages/detail/WSY0036699_5112.jpg **5)** https://apps.rhs.org.uk/plantselectorimages/detail/WSY003342_4322.jpg **6)** https://apps.rhs.org.uk/plantselectorimages/detail/WSY0041942_14593.jpg

Plants that contain hyoscamine and/or atropine and solanine

- 1) Black nightshade *Solanum nigrum*, found in gardens is not as toxic as deadly nightshade.
- 2) Deadly nightshade *Atropa belladonna*, found in hedgerows. Normally animals will not touch this very toxic plant, except when it is in hay.
- 3) Henbane *Hyoscyamus niger* (a very toxic ubiquitous garden plant).
- 4) Pheasant's eye *Adonis microcarpa*, originally from Australia but now commonly found in gardens.
- 5) Thorn apple *Datura stramonium*, a very toxic woodland plant.
- 6) Woody nightshade *Solanum dulcamara*, a trailing woodland plant not normally eaten.

Specific treatment is neostigmine. This should be given at 0.01mg/kg, subcutaneously. Flunixin is useful to control the ileus.



Image sources: **1)** <http://news.s3.amazonaws.com/taxon-images-1000s/1000/Solanaceae/solanum-phycanthum-fl-sal.jpg> **2)** <http://images.rapgenius.com/131ee6bdc0a8677c266d1e010a38339d500a375x1.jpg> **3)** <http://mthow.org/herb-rose-flower-01.jpg> **4)** <http://dailyflower.yakohi.com/de/pop.php?pid=1364> **5)** https://apps.rhs.org.uk/Advice/ACEImages/Datura-stramonium_465575.jpg **6)** http://www.thepoisonergarden.co.uk/images/solanum_dulcamara_220909.jpg Courtesy of thepoisonergarden.co.uk

Plants that contain nitrate/nitrite

- 1) Maize *Zea mays*, a cultivated crop that is highly palatable and can easily be eaten to excess.
- 2) Variegated thistle *Silybum marianum*, originated in Australia but is now a garden plant. Purple flower-heads with spiny bracts, in the second year.

Specific treatment is methylene blue. This should be given at 10mg/kg, very slowly, intravenously.



Plants that cause acute gastritis

- 1) Azalea *Rhododendron occidentale*, found in gardens and ornamental woods. Animals show marked salivation and projectile vomiting. Flowers spring/early summer
- 2) Kalmia *Kalmia spp.*, a common flowering plant found in gardens. Flowers late spring.
- 3) Oleander *Nerium oleander*, a pink flowering garden plant from Morocco. Eaten when cut.
- 4) Peris/White Rim *Pieris japonica variegata*, a common garden plant from Japan. Urn-shaped flowers borne in panicles in spring.
- 5) Rhododendron *Rhododendron ponticum*, this shrub originated in Nepal; it is very common in gardens and woodlands. It is particularly dangerous as it is readily ingested by sheep, goats and SACs.
- 6) Viburnum *Viburnum spp.*, there are many different species of this genus, which can be shrubs, bushes or small trees. They are readily eaten.



Specific treatment is 1ml twice daily of a 5% wt/vol solution of morphine sulphate and 1ml twice daily of a 0.5% wt/vol solution of atropine sulphate. The dose should be halved for pygmy goats and doubled for camelids.

Image sources: **1)** https://apps.rhs.org.uk/plantselectorimages/detail/RHS_RHS-0004478_3974.JPG **2)** https://apps.rhs.org.uk/plantselectorimages/detail/RHS_WSY0041701_6836.JPG **3)** https://apps.rhs.org.uk/plantselectorimages/detail/WSY0015882_4016.jpg **4)** https://apps.rhs.org.uk/plantselectorimages/detail/WSY0040313_9633.jpg **5)** https://apps.rhs.org.uk/Advice/ACEImages/PUR0009074_223013.jpg **6)** https://apps.rhs.org.uk/plantselectorimages/detail/WSY0003443_5767.jpg

Plants that cause liver toxicity

- 1) Algae *Microcystis spp.*, *Anabena spp* and *Aphanizomenon spp.*, found in inland lakes e.g. The Norfolk Broads.
- 2) Blue heliotrope *Heliotropium amplexicaule*, an annual flower commonly found in gardens.
- 3) Bog asphodel *Narthecium ossifragum*, found on marshy ground. The main danger is when it is cut in hay.
- 4) Caltrop *Tribulus terrestris*, creeping herb with yellow flowers.
- 5) Common heliotrope *Heliotropium europaeum*, annual herb with white flowers.
- 6) Goats rue *Galega officinalis*, large herb with purple flowers. Large amounts are required for toxic symptoms.
- 7) Lantana *Lantana camara*, found in the wild as well as in gardens. Flowers throughout spring, summer and autumn
- 8) Panicum *Panicum spp.*, grown as a fodder crop. Large quantities required.
- 9) Paterson's curse *Echium plantagineum*, an annual garden herb with blue flowers.
- 10) Ragwort *Senecio jacobea*, an annual plant with yellow flowers. Found in large quantities on wayside verges and horse pastures.
- 11) St John's wort *Hypericum perforatum*, a common marshland plant. Flowers in summer.

Specific treatment is high doses of Vitamin B and a low protein diet.



Image sources: **1)** www.bbc.co.uk/staticarchive/28a1c1460cd95b76acb811985de295cb6d2878.jpg **2)** [https://upload.wikimedia.org/wikipedia/commons/1/17/Bog_Asphodel_\(Narthecium_ossifragum\)_-_geograph.org.uk_-_215538.jpg](https://upload.wikimedia.org/wikipedia/commons/1/17/Bog_Asphodel_(Narthecium_ossifragum)_-_geograph.org.uk_-_215538.jpg) **3)** [https://upload.wikimedia.org/wikipedia/commons/1/17/Bog_Asphodel_\(Narthecium_ossifragum\)_-_geograph.org.uk_-_215538.jpg](https://upload.wikimedia.org/wikipedia/commons/1/17/Bog_Asphodel_(Narthecium_ossifragum)_-_geograph.org.uk_-_215538.jpg) **4)** [https://upload.wikimedia.org/wikipedia/commons/1/17/Bog_Asphodel_\(Narthecium_ossifragum\)_-_geograph.org.uk_-_215538.jpg](https://upload.wikimedia.org/wikipedia/commons/1/17/Bog_Asphodel_(Narthecium_ossifragum)_-_geograph.org.uk_-_215538.jpg) **5)** https://www.crocus.co.uk/images/products/2PL20/00/01/19/PL2000011923_card.jpg **6)** https://apps.rhs.org.uk/plantselectorimages/detail/WSY0034627_5243.jpg **7)** http://commons.hortipedia.com/images/8/88/Lantana_camara_photo_ille_PDB_548b.jpg **8)** http://commons.hortipedia.com/images/8/88/Lantana_camara_photo_ille_PDB_548b.jpg **9)** https://upload.wikimedia.org/wikipedia/commons/4/45/%D%A2%BD%79%8B%D7%A0%D7%90%D7%99_%D7%A0%D7%90%D7%9A_Echium_plantagineum.JPG **10)** [http://wearehouse1.mindia.com.uk/upload/Ragwort_%20Senecio%20jacobea%20B4669%205P%204676%2019092009%20\(taken%2021.6.2007\).JPG](http://wearehouse1.mindia.com.uk/upload/Ragwort_%20Senecio%20jacobea%20B4669%205P%204676%2019092009%20(taken%2021.6.2007).JPG)

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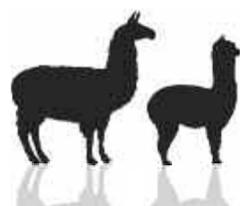
The first effort must be to try to prevent further absorption of the toxin. Should you carry out a rumenotomy? If the animal is very ill and a specific treatment is not being given, the practitioner has very little to lose. A general anaesthetic is not going to be given because a local block is going to be used. A rumenotomy may well enable a diagnosis by the discovery of the plant in the rumen. It is advisable to stitch the rumen animals to sleep and concentrate on treating the animals that could possibly survive. Remember to take notes because poisoning cases often lead to litigation or to insurance claims. It is likely that any animals that have even the roots to help identification. Also remember to remove any other animals from the toxic plant or substance. If the small camelid is seriously ill your vet should carry out a full clinical examination. If there are no helpful diagnostic signs and the poison is unknown, your vet will consider setting up a drip of normal isotonic saline with a 16 gage catheter. **Vet please note:** Remember the saline must be warm. It is recommended to ensure that the animal itself is warmed by being in a warm place and having hot water bottles around it for a length of time. You, as the owner, may be convinced that it has been sudden but in reality it may be that you have not looked at the animals closely.

Guidance for Vet Practitioners

Treatment

Plant Poisons

Plant poisoning is liable to occur under a variety of circumstances. If camelids are allowed to escape they are not only in danger of being hit on the road but also of gaining access to toxic plants. Camelids' enclosures must be stock-proof. Camelids are at risk if they are allowed to escape into woods or gardens. Tethered camelids are at risk if they are short of food and only have access to a plant that they normally would not eat, but which is toxic. Camelids are at risk when they are trekking and come across plants that they have never encountered before. Camelids are also at risk from access to garden rubbish which may have toxic plants mixed in with them or clippings which may contain toxic material or fermenting material which can cause compaction in the gut due to the abnormal grazing behaviour. These may be presented as browse or dried in hay or haylage. Camelids will find it particularly difficult to reject plants in silage. It is very important to remember that it is a complete myth that camelids will not eat plants that are bad for them.



Conclusion

Many owners and vet practitioners who are unfamiliar with plants are understandably stressed when faced with a potential poisoning case. In many instances there is little in the literature or on the Internet for guidance. Most of these cases are extremely urgent and so long-winded referencing is difficult. It is hoped that this more straight forward classification will aid owners and clinicians in their 'hour of need'.

References

- Stevenson, M.J. (2010). Apparent low toxicity of yew in grazing animals. Vet. Rec.166 page 307.
- Swarbrick, O. (2010). Apparent low toxicity of yew in grazing animals. Vet. Rec.166 page 307

Whilst every effort has been made to ensure the information in this pamphlet is correct, it is a guide only, and you should ensure your own research is conducted with regards toxic plants that your animals may have access to.



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The first problem with poisoning cases is establishing a diagnosis. If the poison is definitely known, that is obviously very helpful. However, owners are often very keen to blame farmers' nasty sprays! Because of this, any history needs to be taken with caution. If there has definitely been a split chemical, make sure you tell your vet immediately so that they can obtain any antidote while you are bringing in the patient. Equally, if a plant has been eaten, make sure you tell your vet the name so they can look up the toxic principle and treatment as you are coming in. If a plant has definitely been eaten but you do not know what it is, make sure you bring some of the plant in with you. Your vet may stress that they require the leaves, the fruit and maybe even the roots to help identification. Also remember to remove any other animals from the toxic plant or substance.

Remember to take notes because poisoning cases often lead to litigation or to insurance claims. It is likely that any animals that have even the roots to help identification. Also remember to remove any other animals from the toxic plant or substance. If the small camelid is seriously ill your vet should carry out a full clinical examination. If there are no helpful diagnostic signs and the poison is unknown, your vet will consider setting up a drip of normal isotonic saline with a 16 gage catheter. **Vet please note:** Remember the saline must be warm. It is recommended to ensure that the animal itself is warmed by being in a warm place and having hot water bottles around it for a length of time. You, as the owner, may be convinced that it has been sudden but in reality it may be that you have not looked at the animals closely.

Diagnosis

Identifying and treating plant poisoning in South American Camelids (SACs) in the UK

A guide for UK camelid owners

Also includes images of a wide range of toxic plants categorised by those that have the same type of treatment, and those that require no specific treatment



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Based on information provided in *Veterinary Treatment of Llamas and Alpacas*
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Identifying and treating plant poisoning in South American Camelids (SACs) in the UK

Classification of plants that require no specific treatment

Plants that contain cardiac glycosides & therefore cause vasodilation with signs of acute shock

- 1) Cape tulip *Hemeria* spp, both the one leaf and two leaf varieties are toxic.
- 2) Christmas rose *Helleborus niger*, common garden flower. Very bitter so only a danger when cut.
- 3) Foxglove *Digitalis purpurea*, an erect herb with purple flowers. Flowers in summer
- 4) Purple sesbane *Daubentonia punicea*, the orange flowering type are the ones seen in gardens.



Symptomatic treatment should be given for shock.

Image sources: 1) <https://www.agric.wa.gov.au/sites/gateway/files/Cape%20tulip2.jpg>
 2) <http://s3.amazonaws.com/everystockphoto/psd/156/60/78/everystockphoto-856078-e.jpg> 3) https://apps.rhs.org.uk/plantselector/images/detail/W5Y0035479_4400.jpg
 4) USDA, NRCIS. 2009. The PLANTS Database (<http://plants.usda.gov>, 24 June 2009). National Plant Data Center, Baton Rouge, LA 70874-4490 USA. Photo by Panrazio Campagna.

Plants that cause neurological signs

- 1) Aconite Monkshood *Aconitum napellus*, a small flower found in gardens.
- 2) Blind grass *Stypandra glauca*, not a grass but a small blue flowering perennial.
- 3) Bracken *Pteridium aquilinum*, a very common plant found on hills and common throughout the UK. It is not toxic in small amounts.
- 4) Branched onion weed *Trachyandra divaricata*, originally from south-western Australia. A perennial plant with a white flower and a rhizome.
- 5) Fools parsley *Aethusa cynapium*, a herbaceous plant with white flowers found as a weed in gardens.
- 6) Golden rod *Haplopappus heterophyllus*, this garden flower affects suckling offspring.
- 7) Hemlock *Conium maculatum*, plant with a white flower found in ditches. A danger after ditch clearance.
- 8) Laburnum *Laburnum anagyroides*, a very toxic tree with yellow hanging flowers.
- 9) Lupines *Lupinus* spp, found in gardens and hedgerows. The seed-pods are toxic.
- 10) Male fern *Dryopteris filix-mas*, unlikely to be consumed in sufficient quantity. The roots are very toxic.
- 11) Marijuana *Cannabis sativa*, a problem with escaping animals.
- 12) Mare's tail *Equisetum* spp, a very common pasture plant. Only eaten if starving.
- 13) Marsh mallow *Malva parviflora*, a common wasteland plant that only causes problems to suckling young.
- 14) Poison morning glory *Ipomoea muelleri*, a vine in gardens with pink trumpet flowers.
- 15) Ruses *Juncus* spp, a marshland plant only eaten if starving.
- 16) Rye grass *Lolium* spp, poisoning caused by two saprophytic fungi living on the rye grass.
- 17) Tobacco *Nicotiana tabacum*, not normally eaten as a plant but as cigarettes.
- 18) Water dropwort *Oenanthe crocata*, the roots are very poisonous and are eaten after ditch dredging.
- 19) Water hemlock *Cicuta virosa*, the roots are very poisonous and are eaten after ditch dredging.



Specific treatment is symptomatic to control the neurological signs.

Image sources: 1) http://www.thepoisoning.com.uk/images/aconitum_napellus_bee_1_090706.jpg Courtesy of thepoisoning.com.uk
 2) http://www.stridwall.se/flowers/albume/Stypandra/778_14.jpg
 3) https://apps.rhs.org.uk/plantselector/images/detail/W5Y0035329_4127.jpg
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 5) https://upload.wikimedia.org/wikipedia/commons/6/69/Aethusa_cynapium_002.JPG
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 8) http://14.walesonline.com.uk/incoming/article8812628.ecce/ALTERNATES/615/SJIP_ECH_090315gard_0119393.JPG.jpg
 9) https://apps.rhs.org.uk/plantselector/images/detail/W5Y0041720_14540.jpg
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 12) https://apps.rhs.org.uk/Advice/ACEImages/PU08005746_775513.jpg
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 19) http://commons.wikimedia.org/wikipedia/commons/1/18/Cicuta_virosa_photo_file_PDB_103KB.jpg



Plants that cause blood clotting deficiency

- 1) Sweet clover *Melilotus officinalis*, only causes poisoning when crushed i.e. spoiled or made into hay.

Specific treatment is vitamin K by injection.

Image sources: 1) https://upload.wikimedia.org/wikipedia/commons/e/ed/Melilotus_officialis_bgju.jpg



Plants that cause colic

- 1) Black Bryony *Tamus communis* a common hedge-climbing plant with white-green flowers. Only the berries are toxic.
- 2) Poke weed *Phytolacca Americana*, originally from the USA but now common in gardens in the UK.
- 3) White Bryony *Bryonia dioica*, a hedge-climbing weed that is very toxic.



Treatment is symptomatic to control the colic signs.

Image sources: 1) <https://s-media-cache-ak0.pinimg.com/236x/2e/38/49/2e3849dce9be357d2b132d768cc6b565.jpg>
 2) [https://upload.wikimedia.org/wikipedia/commons/6/6a/%C5%9Eekercboyas%C4%81_\(Phytolacca_americanus\).jpg](https://upload.wikimedia.org/wikipedia/commons/6/6a/%C5%9Eekercboyas%C4%81_(Phytolacca_americanus).jpg)
 3) https://upload.wikimedia.org/wikipedia/commons/6/63/Bryonia_dioica_001.JPG

Plants that cause bloat

- 1) Clover *Trifolium* spp, an excess in pastures causes problems.
- 2) Onions *Allium* spp, large quantities need to be ingested.

Treatment is symptomatic to control the bloat, trocarisation and/or suphactants.



Image sources: 1) https://apps.rhs.org.uk/Advice/ACEImages/clover%20in%20lawn_781286.jpg
 2) https://apps.rhs.org.uk/Advice/ACEImages/RHS_ADV0000336_997330.jpg

Plants that contain taxine

- 1) Yew *Taxus baccata*, a very common evergreen tree found in churchyards and as hedges in gardens.

There is no realistic treatment. However, recent observations (Stevenson 2010) and (Swarbrick 2010) indicate that although yew is extremely toxic to cattle it may not be so toxic to small ruminants.



Image sources: 1) https://apps.rhs.org.uk/plantselector/images/detail/W5Y0024056_12129.jpg

Plants that cause irritation of the oral mucous membranes

- 1) Spurges *Euphorbia* spp, found as hedges or on wasteland.

Treatment is symptomatic and it requires copious flushing with water.

Image sources: 1) <http://rbg-web2.rbg.gov.uk/scotplant/images/Euphorbia%20helioscopia.JPG>



Plants that cause gastro-enteric signs with constipation

- 1) Acorns *Quercus* spp, acorns are much more toxic than oak leaves, which are often browsed by camelids. Problems occur in dry autumns when there are high winds when the acorns are green. Individual animals seem to get a craving for them.
- 2) Chickweed *Stellaria media*, a small white flowering plant, traditionally grown to be fed to hens.
- 3) Pine needles *Pinus* spp, various trees found throughout the country.

Treatment is symptomatic and includes liquid paraffin and NSAIDs to treat the pain and toxicity.

Image sources: 1) <https://www.rhs.org.uk/getmedia/0630c9bc-b94d-4803-9c4f-63d1e49d488/Quercus-roburall940x627.jpg?width=940&height=627&ext=.jpg>
 2) https://upload.wikimedia.org/wikipedia/commons/0/05/Kaldari_Stellaria_media_01.jpg
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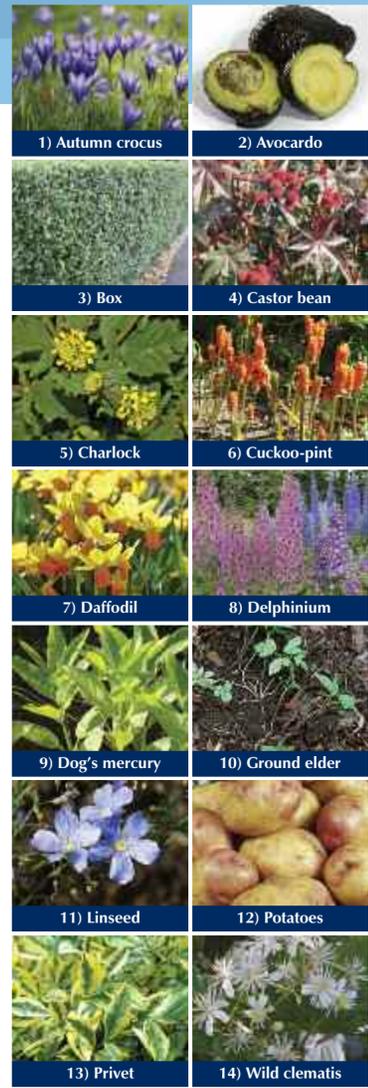


Plants that cause gastro-enteric signs with diarrhoea

- 1) Autumn crocus *Colchicum autumnale*, mainly in crias because the toxin colchicine is excreted in the milk. Also called Meadow saffron.
- 2) Avocado *Persea Americana*, the skins are often consumed from compost heaps. The toxin persin affects the udder and causes mastitis.
- 3) Box *Buxus sempervirens* a common evergreen hedge plant in gardens. Not touched when growing but toxicity occurs when animals are fed trimmings.
- 4) Castor bean *Ricinus communis*, often included in animal feed. Only a problem in large quantities.
- 5) Charlock *Sinapis arvensis*, a common weed with yellow flowers seen in cornfields. A brassica.
- 6) Cuckoo-pint *Arum maculatum*, very bitter but young animals attracted to the very toxic red berries. Also called 'Lords and ladies'.
- 7) Daffodil *Narcissus* spp, bulbs are mildly toxic.
- 8) Delphinium *Delphinium* spp, not eaten except when cut and dried.
- 9) Dog's mercury *Mercurialis perennis*, only mildly toxic.
- 10) Ground elder *Sambucus ebulus*, a common garden weed, only mildly toxic.
- 11) Linseed *Linum* spp, often included in animal feed. Purgative in large quantities.
- 12) Potatoes *Solanum tuberosum*, only a problem when fed to excess.
- 13) Privet *Ligustrum* spp, a common hedge plant in gardens. Large quantities will cause mild toxic signs.
- 14) Wild clematis *Clematis vitalba*, also called 'Old man's beard'. Very irritant, rarely eaten.

Specific treatment is symptomatic and includes demulcents, NSAIDs to treat the pain and antibiotics to treat any secondary bacteria.

Image sources: 1) http://www.crocus.co.uk/images/products2/PL10/00/00/03/PL100000368_card.jpg
 2) https://upload.wikimedia.org/wikipedia/commons/1/1a/Avocado_Whole_and_Crossed.jpg
 3) http://www.rhsplants.org.uk/images/products2/PL20/00/01/04/PL2000014465_card3.jpg
 4) <http://www.bbc.co.uk/staticarchive/902a331b9ec7e9750355188878146030de1b7.jpg>
 5) [https://en.wikipedia.org/wiki/Sinapis_arvensis#/media/File:Brassicaceae_-_Sinapis_arvensis_\(3\).JPG](https://en.wikipedia.org/wiki/Sinapis_arvensis#/media/File:Brassicaceae_-_Sinapis_arvensis_(3).JPG)
 6) https://namethelplant.files.wordpress.com/2010/11/watermark_151.jpg
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 8) <http://www.delphinium-society.co.uk/images/delphiniumgroup.jpg>
 9) http://www.thepoisoning.com.uk/images/mercurialis_perennis_300606.jpg Courtesy of thepoisoning.com.uk
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 11) https://apps.rhs.org.uk/plantselector/images/detail/RHS_HY0000583_7019.JPG
 12) <https://www.rhs.org.uk/getmedia/07000268-ab80-4364-a81a-7311526262c/KingEdwardCredMarshalls.jpg?width=364&height=242>
 13) https://apps.rhs.org.uk/plantselector/images/detail/W5Y0034416_4664.jpg



Plants that cause haematuria (blood in the urine)

- 1) Marrowstem kale *Brassica oleracea*, a worldwide fodder crop often eaten to excess.
- 2) Rape *Brassica napus*, another brassica field crop.
- 3) Turnip weed *Rapistrum rugosum*, this herb is not very palatable but requires only small amounts to cause toxicity. It contains S methylcysteine sulphoxide SMCO.
- 4) Wild radish *Raphanus raphanistrum*, found in all temperate climates and contains SMCO.

There is no realistic treatment except to remove the animals from the plants.

Image sources: 1) https://upload.wikimedia.org/wikipedia/commons/1/11/Brassica_oleracea0.jpg
 2) <http://blog.lisacondesigns.co.uk/wp-content/uploads/2014/04/Oil-seed-rape-field-Lisa-Cox-Garden-Designs.jpg>
 3) <http://david.jbennard.com/wp-content/gallery/cruciferae-mustard/355TurnipWeed.jpg>
 4) http://www.gardenista.com/files/styles/733_0s/public/imgs/sub/img/10-2012/700_wild-radish-3.jpg



Plants that cause acute respiratory signs

- 1) Algae *Microcystis* spp, *Anabena* spp and *Aphanizomenon* spp, found in inland lakes and ponds.
- 2) Arum lily/Crowborough *Zantedeschia aethiops*, found in gardens and actually causes laryngeal oedema with frothing at the mouth. The condition soon subsides.
- 3) Golden Crown beard *Verbesina encelioides*, common herb with yellow daisy-like flowers.
- 4) Perilla mint/curly perilla *Perilla frutescens*, found in gardens. Normally not eaten on account of unpleasant smell.
- 5) Sweet potatoes *Ipomoea batatas*, large quantities required. Usually fed by mistake.

Image sources: 1) John Burns (Cyanobacteria), Mark Schaefer (Wichita State University), and Cyanosite (www.cyanosite.bio.purdue.edu)
 2) https://apps.rhs.org.uk/plantselector/images/detail/W5Y0029097_3346.jpg
 3) <https://upload.wikimedia.org/wikipedia/commons/1/10/Verbesina-encelioides-20080403.JPG>
 4) <http://www.horseadvice.com/horse/messages/4/405758.jpg>



Specific treatment is symptomatic, steroids and antibiotics.