

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.



1) Cape tulip

2) Christmas rose

3) Foxglove

4) Purple sesbane

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/15420/65/60/78/everystockphoto-856078-e.jpg>
 3) https://apps.rhs.org.uk/plantselector/images/detail/WSY0035479_4400.jpg
 4) USDA, NRPCS. 2009. The PLANTS Database (<http://plants.usda.gov>, 24 June 2009). National Plant Data Center, Baton Rouge, LA 70874-4490 USA. Photo by Panrazio Campaigna.

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) Rushes *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.



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13) Marsh mallow

14) Poison morning glory

15) Rushes

16) Rye grass

17) Tobacco

18) Water dropwort

19) Water hemlock

Specific treatment is symptomatic to control the neurological signs.

Image sources: 1) http://www.thepoisoning.com.uk/images/aconium_napellus_bee_1_090706.jpg Courtesy of thepoisoning.com.uk
 2) http://www.stridwall.se/flowers/album/Stypandra/778_14.jpg
 3) https://apps.rhs.org.uk/plantselector/images/detail/WSY0035329_4127.jpg
 4) <https://angelb.files.wordpress.com/2010/09/pteridium-divaricata.jpg>
 5) https://upload.wikimedia.org/wikipedia/commons/6/69/Aethusa_cynapium_002.JPG
 6) https://apps.rhs.org.uk/plantselector/images/detail/WSY0035709_1846.jpg
 7) http://www.aphotofora.com/images/aphotofora/contum_maculatum_hemlock_flower_spike_22-06-10_1.jpg Courtesy of www.aphotofora.com
 8) http://www.walesonline.co.uk/incoming/article8812628.ece/ALTERNATES/s615/SJP_ECH_090315gard_0119393.JPG.jpg
 9) https://apps.rhs.org.uk/plantselector/images/detail/WSY0041720_14540.jpg
 10) https://apps.rhs.org.uk/plantselector/images/detail/WSY0034767_3973.jpg
 11) https://www.icmag.com/icomag_picture.php?albumid=1384&pictureid=42455
 12) https://apps.rhs.org.uk/Advice/ACEimages/PU00005746_775513.jpg
 13) https://upload.wikimedia.org/wikipedia/commons/4/42/Starr_080609-7930_Malva_parviflora.jpg
 14) http://41.media.tumblr.com/cbb617b06a1120e4adb488216c/tumblr_mu148dCW1qjw89g1_1280.jpg
 15) https://upload.wikimedia.org/wikipedia/commons/0/0c/Juncus_effusus.jpg
 16) http://www.weedatogue.com/nygrass/pr_01.jpg
 17) https://apps.rhs.org.uk/plantselector/images/detail/WSY0005491_11234.jpg
 18) http://www.rspb.org.uk/community/cfs-file.ashx/_key/communityserver-blogs-components-weblog/files/00-00-00-48-526470.Hemlock-Water_2000_Dropwort-Leaf.JPG
 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



1) Sweet Clover

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.



1) Black Bryony

2) Poke weed

3) White Bryony

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%4%81_\(Phytolacca_americanus\).jpg](https://upload.wikimedia.org/wikipedia/commons/6/6a/%C5%9Eekercboyas%4%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, trocristation and/or suphactants.



1) Clover

2) Onions

Image sources: 1) https://apps.rhs.org.uk/Advice/ACEimages/clover%20in%20lawn_781286.jpg
 2) https://apps.rhs.org.uk/Advice/ACEimages/RHS_ADU0000336_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.



1) Yew

Image sources: 1) https://apps.rhs.org.uk/plantselector/images/detail/WSY0024056_12129.jpg

Plants that cause irritation of the oral mucous membranes

- 1) Spurge *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.org.uk/scotplant/images/Euphorbia%20helioscopia.JPG>



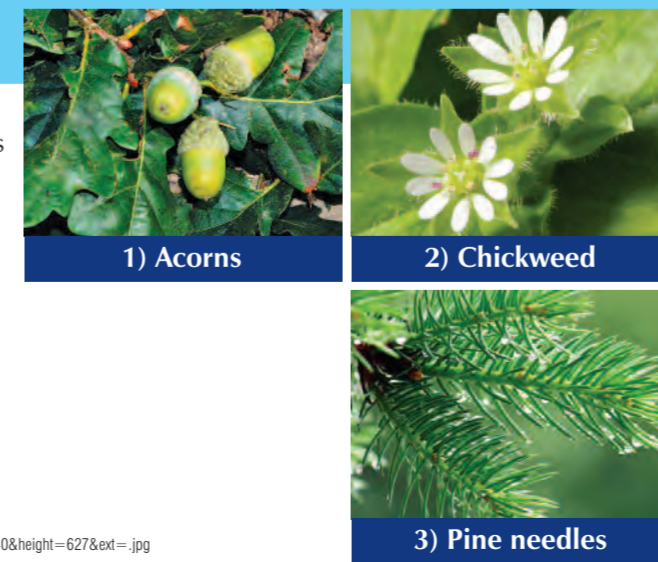
1) Spurge

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-63d14e9d488/Quercus-roburall940x627.jpg?width=940&height=627&ext=.jpg>
 2) https://upload.wikimedia.org/wikipedia/commons/0/05/Kaldari_Stellaria_media_01.jpg
 3) <http://www.gaiiahealthblog.com/wp-content/uploads/2014/01/pine-2012-12-5-PineNeedles1.jpg>



1) Acorns

2) Chickweed

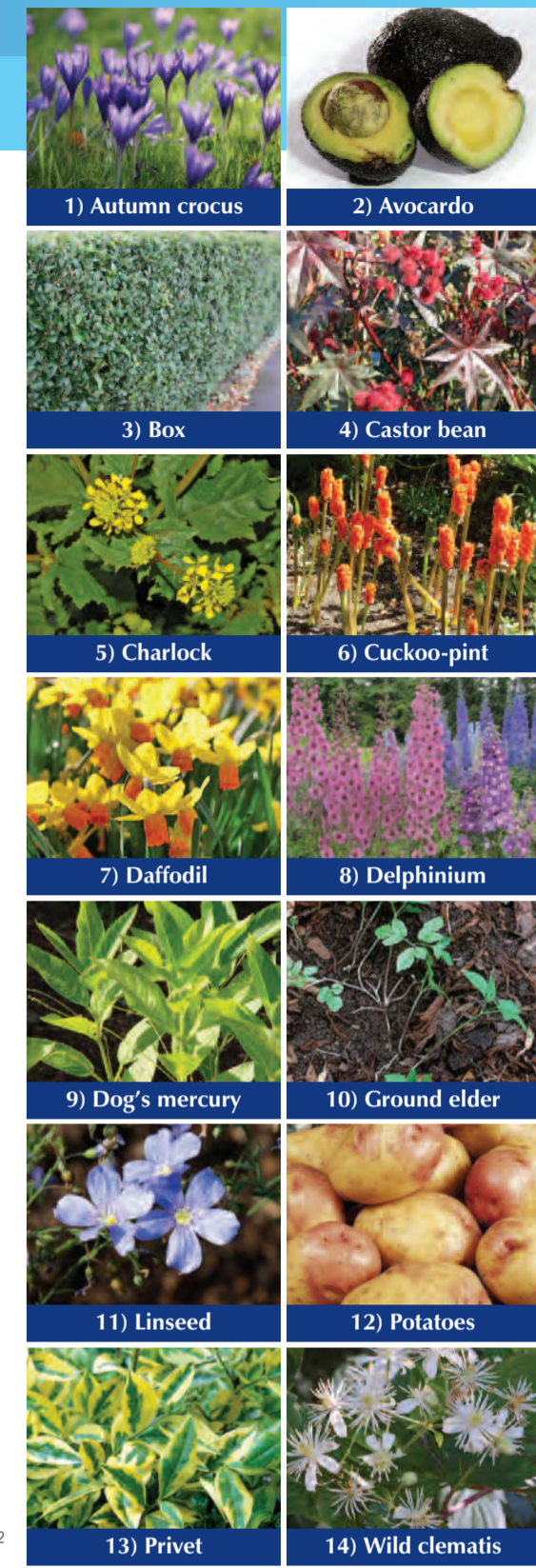
3) Pine needles

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/PL20/00/01/44/PL2000014465_card3.jpg
 4) <http://www.bbc.co.uk/staticarchive/902a331b9ec79a9750355188878146030de1b7.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
 7) https://apps.rhs.org.uk/Advice/ACEimages/NarcissusJeffre_94646.jpg
 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
 10) https://apps.rhs.org.uk/Advice/ACEimages/Ground-Elder_612812.jpg
 11) https://apps.rhs.org.uk/plantselector/images/detail/RHS_HY0000583_7019.JPG
 12) <https://www.rhs.org.uk/getmedia/0700268c-8a80-4364-a81a-73115262626c/KingEdwardCrestMarshalls.jpg?width=364&height=242>
 13) https://apps.rhs.org.uk/plantselector/images/detail/WSY0034416_4664.jpg



1) Autumn crocus

2) Avocado

3) Box

4) Castor bean

5) Charlock

6) Cuckoo-pint

7) Daffodil

8) Delphinium

9) Dog's mercury

10) Ground elder

11) Linseed

12) Potatoes

13) Privet

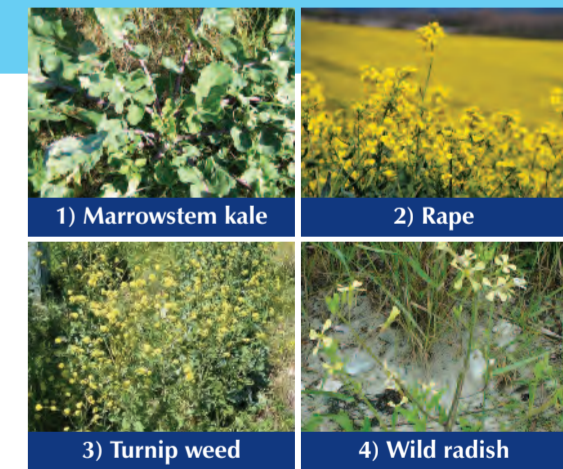
14) Wild clematis

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.jibernard.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



1) Marrowstem kale

2) Rape

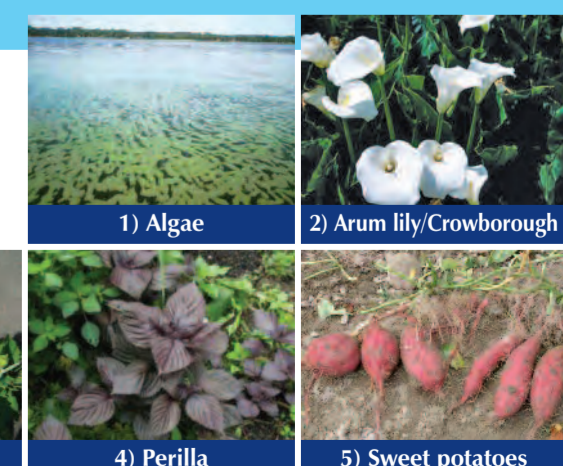
3) Turnip weed

4) Wild radish

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 large 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/WSY0029097_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>



1) Algae

2) Arum lily/Crowborough

3) Crown beard

4) Perilla

5) Sweet potatoes

Specific treatment is symptomatic, steroids and antibiotics.

