Classification of plants that require the same specific treatment

**Plants that contain a cyanogenic glycoside**
- Fat hen (Chenopodium album)
- Deadly nightshade (Solanum nigrum)
- Henbane (Hyoscyamus niger)
- Solanum dulcamara
- Nerium oleander
- Silybum marianum
- Lantana camara
- Sambucus nigra
- Peris/Wite Rim (Solanum pseudocapsicum)
- Lantana spp

**Specific treatment**
- In the case of cyanogenic compounds the recommended treatment is an emergency tracheotomy with immediate endotracheal intubation and ventilation, followed by large volumes of 0.5% w/v atropine sulphate solution followed by 20% calcium borogluconate. The dose of the 20% calcium borogluconate is 30ml for a small sheep or pygmy goat, diluted for a normal-sized sheep or goat and diluted for a SAC.

**Plants that contain nitrate/nitrite**
- Sugar beet
- Caltrop
- Triglochin maritima
- Trifolium pratense
- Alliaria petiolata
- Elsholtzia argophylla
- Trifolium repens

**Specific treatment**
- Intravenous injection of 10ml/kg 10% calcium borogluconate (see specific treatment for cyanogenic glycosides).

**Plants that contain oxalic acid**
- Sheep sorrel
- Dandelion
- Stinging nettle
- Oak leaf lettuce
- Wild chervil

**Specific treatment**
- Bilious emesis followed by 20% calcium borogluconate (see specific treatment for cyanogenic glycosides).

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**Plants that cause gastric distress**
- Azolila rhododendron, found in gardens and ornamental woods. Animals may come in contact with the berries or swallow the leaves.
- Kalmia californica, a common flowering plant found in gardens. Flowers late spring.
- Kalmia latifolia, a flowering shrub found in gardens. Flowers late spring.
- Pink or White Rim Paspalum, a common grass plant from Japan. U-shaped flowers borne in panicles in spring.
- Rhus radicans, a member of the sumac family, this shrub originated in Australia but now commonly found in gardens.
- Thunbergia alata, a very toxic woodland plant.

**Plants that contain tannic acid**
- Chinese bamboo
- St John's wort
- Paterson's curse
- Ragwort

**Specific treatment**
- In the case of tannic acid poisoning the recommended treatment is large volumes of 0.5% w/v atropine sulphate solution followed by 20% calcium borogluconate. The dose of the 20% calcium borogluconate is 30ml for a small sheep or pygmy goat, diluted for a normal-sized sheep or goat and diluted for a SAC.

**Plants that cause liver toxicity**
- Alpaca Morrissey,又称Acanthophyllum rigidum, found in inland lakes e.g. the Norfolk Broads.
- Blue heliotrope (Heliophyllum amorphum), a common flower commonly found in gardens. Bog seedling North American indigenous, found on moorland ground. The main danger is when it is cut.
- Catnip, a species of catmint, may cause death with yellow flowers.
- Common heliotrope (Heliophyllum cuneatum), a common herb with white flowers.
- Crotalaria gigantea, large herb with purple flowers. Large amounts are required for toxic symptoms.
- Lantana camara, common in the wild as well as in gardens.
- Flowers throughout spring, summer and autumn.
- Panicum coloratum, a common fiddler grass. Large quantities required.
- Rumex laxus, a common fiddler plant found in gardens with blue flowers.
- Raphanus raphanistrum, a common annual with yellow flowers. Found in large quantity on roadsides and waste places.
- St John's wort (Hypericum perforatum), a common woodland plant. Flowers in summer.

**Specific treatment**
- Intravenous injection of 10ml/kg 10% calcium borogluconate (see specific treatment for cyanogenic glycosides).

**Plant Poisons**

Plant poisoning is liable to occur under a variety of circumstances. If camels are allowed to escape they are not only in danger of being hit on the road but also of gaining access to toxic plants. Camels will not eat plants that they are not used to even if they are very toxic. Camels should be controlled in their 'hour of need'. The vet practitioner needs to make a careful diagnosis before proceeding to treatment. If there is no help for the animals that could possibly survive. Camels are also at risk from access to garden rubbish which may have toxic plants mixed in with it or chips which may contain toxic material or foreign material which can cause compaction in the gut due to the abnormal grazing behaviour. These may be presented as less commonly fed by farmers 'nasty sprays! It is hoped that this forward classification will aid owners and clinicians in their "hour of need".

**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 forward classification will aid owners and clinicians in their "hour of need".

**References**


**Diagnosis**

Diagnosis is relatively easy by inspection and by clinical signs of anorexia, colic and a change in the faecal output. EDTA is high in all cases and should be present in the faeces if the camel has had access to an identified toxic plant.

**Specific treatment**

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

**Teatment**

In many cases it is possible to prevent poisoning by feeding less inedible plants to the camel. In reality it may be that you have not looked at the animals closely for a length of time.

**Identification**

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

A guide for UK camel 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

Produced by The British Llama Society

Endorsed by The British Alpaca Society

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

Plants that cause neurological signs

1) Aconite Monboddo Aconitum napellus, a small flower found in gardens.
2) Blind grass Stipa gigantea, not a grass but a small blue flowering perennial.
3) Brookesa Perennipodium, a very common plant found on hills and common throughout the UK. It is not toxic in small amounts.
4) Bracted orchid Anacamptis morio, this orchid affects pollination.
5) Fatsia japonica Fatsia japonica, a herbaceous plant with white flowers found as weeds in gardens.
6) Goldilocks Calendula officinalis, this flower affects suckling offspring.
7) Hornbeam Carpinus betulus, plant with a white flower found in ditches. A danger after drifted chlorine.
8) Laburnum Laburnum anagyroides, a very toxic tree with yellow hanging flowers.
9) Lupines Lupinus spp, found in gardens and hedges. The weed poisons are toxic.
10) Mallow Malva alcea, unfortunately, is not known to be in sufficient quantity. The roots are very toxic.
11) Marigolds Calendula officinalis, a problem with grazing animals.
12) Mars’s tailFLAGELLARIA Immerglutisa, a very common pasture plant. Only eaten if starving.
13) Marsh mallow Malva parviflora, a common wetland plant that only causes problems to suckling young.
14) Poison hemlock Conium maculatum, a vine in gardens with pink trumpet flowers.
15) Potato Tetterwort Haplopappus heterophyllius, a very irritant, rarely eaten.
16) Rye grass Lolium spp, a world wide fodder crop. Not normally eaten as a plant but as grain.
17) Water hemlock Cicuta maculata, the roots are very poisonous and are eaten after drift drogging.
18) Water hemlock Cicuta maculata, the roots are very poisonous and are eaten after drift drogging.

Specific treatment is symptomatic to control the neurological signs.

Plants that cause cardio-glycosides & therefore cause vasodilation with signs of acute shock

1) Cape tulip Hesperantha 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) Fragile Digitalis purpurea, erect herb with purple flowers. Flowers in summer.
4) Purple saxifrage Saxifraga cernua, the orange flowering type are the ones seen in gardens.

Symiptomatic treatment should be given for shock.

Plants that cause blood clotting deficiency

1) Sweet clover Melilotus officinalis, only causes poisoning when crushed i.e. spoilt or made into hay.
Specific treatment is vitamin K by injection.

Plants that cause colic

1) Black Bryony Sambucus nigra, a common hedge plant with white-green flowers. Only the berries are toxic.
2) Pure white Phlox paniculata, originally from the USA but now common in gardens in the UK.
3) White Bryony Bryonia dioica, a hedge-climbing wood that is very toxic.

Treatment is symptomatic to control the colic signs.

Plants that cause bloat

1) Closer Trefoil Lotus uliginosus, an excess in pastures causes problems.
2) Onions Allium spp, large quantities need to be ingested.

Treatment is symptomatic to control bloat, tricurination and/or suphalucretions.

Plants that cause contain taisne

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 (Slocombe 2010) and (Trewick 2010) indicate that although yew is extremely toxic to cattle it may not be so toxic to small ruminants.

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.

Plants that cause gastro-enteric signs with constipation

1) Acorns Quercus spp, acorns are much more toxic that oak leaves, which are often browsed by camels. Problems occur in dry seasons when there are high winds when the acorns are green. Individual animals seem to get a craving for them.
2) Checkweed Chylisone spp, 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 liberal paralax and NSAID to treat the pain and toxicity.

Plants that cause gastro-enteric signs with diarrhoea

1) Autumn crocus Colchicum autumnale, mainly in copa because the toxic colchicine is excreted in the milk. Also called Meedia.
2) Aconitum Perennis Americana, the skins are often consumed from imported crops. The toxic parts affect the salivary and causes matins.
3) Brookesa Perennipodium, a common garden flower with yellow flowers seen in cortlands. A brassica.
4) Cuckoo-pint Arum lily/Crowborough, a very common garden weed, only mildly toxic.
5) Delphinium Delphinium off, not eaten except when cut and dried.
6) Dog’s mercury Mercurialis perennis, only mildly toxic.
7) Ground elder Stellaria media, a very common garden weed, only mildly toxic.
8) Limon (Citrus spp, often included in animal feed. Purpax in large quantities.
9) Potatoes Solanum tuberosum, only a problem when fed to excess.
10) Privet Ligustrum spp, a common hedge plant in gardens. Large quantities will cause mild toxic signs.
11) Wild chervil Chlorophyllum, also called Old mans beards! Very irritant, rarely eaten.

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

Plants that cause haematuria

1) Algae Anabaena spp, Anabaena spp and Anabena spp, found in inland lakes and ponds.
2) Anemone Ramonda spp, another brassica field crop.
3) Tum Tuber Aconitum napellus: this herb is not very palatable but requires only small amounts to cause toxicity. It contains 5 methyl xanthine alkaloids.
4) Yndol nolok Kupurus radians, found in all temperate climates and contains AMC.
5) Zebrasyon Zelagacris zelagacris, found in all temperate climates and contains AMC.
6) Zebrasyon Zelagacris zelagacris, found in all temperate climates and contains AMC.

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

Plants that cause acute respiratory signs

1) Algae Monoroscoy spp, Anabena spp and Anabena spp, found in inland lakes and ponds.
2) Arum Lily/Chelone lilyanthes, found in gardens and actually causes lung damage with frothing at the mouth. The condition soon subsides.
3) Golden Crown head Veratrum album, common herb with yellow clasque-
4) Perilla Perilla spp, found in gardens. Normally not eaten on account of unpleasant smell.
5) Sweet potatoes Ipomoea batatas, large quantities required. Usually fed by mistake.

Specific treatment is symptomatic, steroids and antibiotics.