

Australian Stringhalt

By Dr John Kohnke BVSc RDA

Australian Stringhalt is a term used to describe the involuntary and exaggerated upward flexion or 'puppet-like' action in one or both hind legs as a horse walks, often starting as a slight incoordination in gait and developing into a 'goose-stepping' movement in severe cases, making it difficult for the horse to walk, graze or exercise. Although all breeds of horses can be affected, Thoroughbreds, perhaps because of their numbers in retirement, appear to be more susceptible, with ponies being the least susceptible because they eat less bulk of feed.

Stringhalt is often a seasonal condition that develops in one or more horses in a group grazing sparse, unimproved pastures after the break of the season in Summer or Autumn, usually following a few days of rain and warm, humid weather.

Underlying Causes

Although Stringhalt, as occurs in other countries can be caused by neurological damage to the hind limb nerves by microbial infections and trauma, Australian Stringhalt and its seasonal occurrence is more specific to Australia and New Zealand, especially following drought conditions. Often it affects specific localities or geographical areas due to favourable seasonal conditions. Research in the late 1980's and early 1990's in Australia and New Zealand was carried out to find the possible cause for the damaging effect on the long nerves of the hind limbs and neck. These studies concluded that horses grazing pasture dominated with the weed known as Catsear or Flatweed (*Hypochaeris radicata*) were associated with seasonal outbreaks of Stringhalt. Ingestion of Dandelion (*Taraxacum officinale*) has also been linked to outbreaks of Stringhalt.

The type of nerve damage suggests that a toxin produced by the plant, or possibly by a soil borne fungus or mould toxin ('mycotoxin') that grows on Flatweed, which when ingested specifically affects the long myelinated nerves in the hind limbs and also the long left Recurrent Laryngeal Nerve in the neck. Severe cases develop the characteristic 'goose-stepping' gait and often a 'roaring' like sound when exercised due to collapse of the left laryngeal structure.

Research Update

Researchers at Massey University in New Zealand have published results that suggest the toxin causing Australian Stringhalt might be produced by the Flatweed plant itself, rather than being produced by a fungus or other source. The researchers 'stressed' Flatweed plant material by exposing it to a copper chloride solution. Control plant material not subjected to stress was used as a control. The plant material was incubated with laboratory preparations of nervous tissue. The stressed plant material damaged the nervous tissue significantly more than the unstressed plant material. The degree of damage was dose dependent, that is, the plant material exposed to the highest concentration of stressing agent caused the most damage to nerve cells. The results suggest that flatweed may produce an as yet unidentified neurotoxic chemical in reaction to stress, such as the stress of drought conditions. Identification of this chemical with ongoing research could one day see useful prevention or treatment options for the condition.

Ref: RJ MacKay et al, *Cytotoxic activity of extracts from Hypochaeris radicata* Toxicol 2013 70;194-203

Typical Symptoms

Observations indicate that it takes 7-21 days of grazing Flatweed and possibly Dandelion dominated pastures to cause early symptoms of Stringhalt, with slight incoordination in one or both of the hind limbs when the horse is initially walked off, which improves as the horse 'warms up'. In grazing horses affected by Flatweed, often they can be seen walking around with early symptoms of gait incoordination, which often becomes exaggerated when these horses become excited, chased away from feed or are caught to be ridden or worked. Horses that are thin and hungry are more likely to be affected early in a group of horses. In more severe cases, horses exhibit mild signs when quiet, but develop total incoordination and 'goose-stepping' gait when agitated or excited, especially by the inability to walk properly. Often horses are unable to be backed without severe incoordination and risk of falling over, and may be difficult to unload after travelling.

Management

If both back legs are affected, horses develop a 'bunny-hopping' like gait and cannot be exercised. When stringhalt occurs after the break of the season where pastures contain Flatweed or Dandelion, the horses should be removed from the pasture to a pasture free of any of these weeds, or into a holding area and hand fed hay. Dampened lucerne hay is considered the best roughage as it contains higher energy, protein and minerals than grassy hay, along with a vitamin supplement such as Kohnke's Own **Cell-Vital®** or **Cell-Provide®**.

It is of no use to feed hay to horses left to graze the contaminated pasture as they will continue to eat Flatweed and/or Dandelion.

Excitement often exaggerates the 'goose-stepping', puppet-like hind limb incoordination, so it is helpful to keep the horse quiet and avoid working it until the symptoms improve and the horse can walk comfortably.

If the signs are recognised early, often improvement occurs over a 2-3 week period, with recovery in 2-3 months. More severe symptoms will often improve over 6-12 months but some cases take 18 months and some do not fully recover. In the chronic condition, loss of muscle on the outside of the gaskin area and weakness in the fetlock joint on one or both hind limbs can complicate recovery.

Where a horse develops a 'roaring' on inspiration during exercise, it should be scoped to determine the severity of the left vocal cord collapse.

Medical Treatment

Although drug therapy with the anti-convulsant drug phenytoin, can hasten recovery in some horses, long term therapy may be required. Another central acting nerve drug, baclofen, is also effective in some cases, with a noticeable response within 7-10 days of starting therapy. There may be continued improvement after ceasing therapy in some horses, even when symptoms have been present for 12 months in duration. Unfortunately, other

horses show little improvement despite long term therapy. Surgery to remove a tendon from the rear of each hindlimb can help prevent the upward flexion of the limbs as an affected horse walks. However this would only be recommended as a last resort .

Dietary Supplementation

Supplementation with the mineral magnesium has been associated with improvement in early cases of Stringhalt.

However, it appears that not all sources of magnesium, such as in Dolomite, which is poorly absorbed in horses, and Epsom Salts (magnesium sulfate) are effective. Numerous reports suggest that supplementation with Kohnke's Own **Mag-E**, containing large amounts of organic (chelated) magnesium proteinate, combined with natural and synthetic Vitamin E and Vitamin B1, can assist nerve and muscle function in affected horses. Supplementation with 3 scoopsful of **Mag-E** daily for a 500kg horse for an initial 5-7 days, then 2 scoopsful daily for 3-4 weeks, may help in improving signs, combined with rest and removing horses from the Flat Weed dominated

pasture. A longer duration of supplementation may be of benefit in some horses. Many horse owners have observed that providing a daily supplement of Selenium and vitamin E, such as in Kohnke's Own **E-Se Supplets**, is also helpful in selenium deficient areas.

Prevention

The control of Flatweed and Dandelion by pulling up or spot spraying individual plants with selective herbicides will reduce the risk of poisoning. However, establishment of more competitive, vigorous improved pastures for grazing horses is the best long term strategy to reduce the spread of Flatweed and Dandelion. It is best to seek advice from a local Agronomist on a suitable spraying program when the weed is widely spread in horse pastures.

Reference: More details are available in Plants Poisonous to Horses: An Australian Field Guide by Mellisa Offord, published by RIRDC, Publication No 06/048, Canberra, ACT. It is an excellent publication and well worth having with coloured pics as a guide to poisonous plants in Australia.

Flatweed (*Hypochoeris radicata*)

Flatweed is a relatively common plant in unimproved native pastures in higher rainfall areas, especially where pastures have been overstocked and grazed out over a period of time. It grows rapidly after a break in the season, being one of the first succulent plants to appear. Flatweed sprouts from a tap root, providing ground cover which is grazed before more sustainable grass and legume pasture species which are slower to germinate from seeds. In such environmental circumstance when Flatweed dominates a pasture, it can provide the bulk of the grazing intake.

Flatweed often becomes established in patches where hay containing seeds of the plant is spread out to feed horses under dry summer conditions. Flatweed, or Catsear as it is sometimes referred to, has a prostrate base with long flat, 'cat's ear' shaped, olive green, blunt-tipped leaves on solid branching stems which radiate from the central crown. The leaves are hairy & tooth-edged. The plant has a bright yellow daisy flower on a long stem that is up to 80cm in length.

Dandelion has more sharply pointed leaves than Flatweed. The leaves are hairless and Dandelion has a larger daisy flower with a black centre. Dandelion is often present with Flatweed in pastures during late Summer or Autumn after rain. Both are succulent plants that attract hungry horses seeking green pasture after a relatively dry period

It is considered that a fungus may colonise the prostrate leaves of Flatweed and its spread is facilitated by periods of rain with humid weather.



Flatweed rosette growing in pasture.

Photos courtesy M Offord.



Pasture dominated by Flatweed.

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