Suspected *Cryptostegia grandiflora* (rubber vine) poisoning in horses

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*Cryptostegia grandiflora* (rubber vine) is a native of Madagascar, but it is distributed throughout the tropics. It is common in tropical Queensland, growing as an unsupported shrub or as a rampant climber. Its toxic principle is suspected to be a cardiac glycoside (Everist 1981). The above-ground parts of the plant contain 5 cytotoxic cardenolides (Dokshitz et al 1972) and when tested in a radioimmunoassay for digoxin, *C. grandiflora* gives a mild positive reaction (Radford et al 1986). Feeding tests have shown the leaves to be toxic to cattle, horses, sheep and goats. Horses are particularly susceptible. A horse dosed with a minced leaf suspension at the rate of 0.03% body weight died in 2 h (Everist 1981). Clinical signs consistently seen in horses are dyspnoea, colic, profuse sweating, muscle twitching and muscle weakness (MD McGavin and LG Newton, unpublished report, Queensland Department of Primary Industries). Severe cardiac arrhythmias have been described in poisoning of ruminants by plants containing cardiac glycosides. Necropsy findings include evidence of congestive heart failure, epicardial and endocardial haemorrhages and, where animals have lived for several days after ingestion of toxic plants, focal myocardial necrosis with mononuclear inflammatory cell infiltrates and evidence of early fibroplasia (Newsholme and Coetzer 1984). Myocardial degeneration and necrosis have not been reported. The plant is eaten by cattle when dense growth surrounds water courses, when fresh regrowth is present following a fire, or when other feed is unavailable. Sudden death of cattle due to cardiac insufficiency and collapse has been described by McGavin (1969). Poisoning has occurred in horses introduced to areas where *C. grandiflora* is flourishing (MD McGavin and LG Newton, unpublished report, Queensland Department of Primary Industries).

We report here the poisoning of 4 horses suspected of inadvertently consuming dried *C. grandiflora* leaves.

Twenty-six circus horses were tethered mid-morning in parkland on the bank of the Fitzroy River at Rockhampton. All were individually fed lucerne hay on the ground. Five horses (No. 1 to 5) were in the vicinity of an *Acacia nilotica* tree (prickly acacia) overgrown with rubber vine. The ground was littered with dried *C. grandiflora* leaves. At 5.00 p.m. on the same day, horse 1 was dull, with laboured breathing. It had a normal temperature and muffled heart sounds. Serum creatine phosphokinase (CPK) activity was increased (1517 U/l). The following morning horses 1, 2 and 3 showed progressive weakness, dyspnoea and cyanosis before collapse and death at 11.30 am. Horses 4 and 5 were rethethered in another location. The next day horse 4 was dull, with loss of appetite. On auscultation, heart rate and sounds seemed normal. Serum CPK activity was slightly elevated (433 U/litre). Horse 5 appeared normal, as did the other 21 horses in the group. Necropsy findings on the 3 horses that died were similar. There were ecchymotic haemorrhages in the myocardium and under the epicardium and endocardium, the latter being the most severe, and a marked increase in pericardial fluid. In horses 1 and 2, multiple, pale, friable lesions up to 1 cm diameter were present on the ventricular endocardium. The intestinal mucosa was hyperaemic and the contents were blood stained. There were multiple, dark, raised areas, up to 0.5 cm diameter, on the spleen. The liver, kidney and lungs were congested. Horse 3 had a 3 cm diameter, raised, haemorrhagic area on 1 kidney. Histologically, the hearts of the 3 horses had extensive subendoocardial haemorrhage, mild, localised haemorrhage throughout the remainder of the myocardium. There were widespread myocardial changes, ranging from increased eosinophilia of the sarcoplasm, with some loss of striations in myofibrils, to focal areas of coagulative necrosis, with pyknosis and karyorrhexis of nuclei and fragmentation of the sarcolemma and sarcoplasm. Horse 3 had early calcification in some necrotic areas. A few neutrophils, lymphocytes and macrophages were associated with the myocardial necrosis. Marked endocardial thickening due to haemorrhage and oedema was present and horse 2 had generalised interstitial oedema. The ventricular endocardial lesions grossly evident in horses 1 and 2 were plaques composed of proteinaceous material and cellular debris, which overlaid intact endocardium. Common findings in the 3 animals were congestion of the liver, kidney, spleen and lungs, subcapsular haemorrhages in the spleen and liver and mild hyperaemia of the gastric and intestinal mucosa. The kidney of horse 3 had a circumscribed area of coagulation necrosis, with little surrounding cellular inflammatory response, suggestive of acute infarction.

No virus or aerobic bacterium was isolated from brain, heart, pericardial fluid, lung, liver or endocardial plaques. Examination of stomach contents did not identify any *C. grandiflora* leaves. No lucerne hay remained for examination.

The history, clinical and pathological findings suggest *C. grandiflora* intoxication, although consumption of dried leaves was not confirmed. The brittle nature of the dried leaves and the small lethal dose required may have precluded such an identification. The toxicity of dried *C. grandiflora* leaves is unknown. However, some other plants containing cardiac glycosides, namely, *Nerium oleander* and *Thevetia peruviana* (Seawright 1989), *Asclepias subverticillata* (Marsh et al 1920) and *Hormeria* spp (Naude and Potgieter 1971), are known to retain their toxicity in the dried form.

Plants containing cardiac glycosides are all unpalatable to livestock (Seawright 1989), with the exception of *C. grandiflora* which, although normally unpalatable to cattle, will occasionally be eaten extensively (McGavin 1969). As horses will voluntarily consume chaffed *C. grandiflora* leaves offered experimentally (Everist 1981), it possibly may also be eaten under field conditions and *C. grandiflora* intoxication may not be limited to inadvertent consumption, as seems to have happened in this case.

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References


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