

## Plantas tóxicas do Brasil

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This book, written in Portuguese, on the plants toxic to livestock in Brazil, is a major contribution to the knowledge of toxicology and toxic plants and will probably not be superseded as a definitive textbook on the subject in Brazil and other South American countries for many years to come, even though the latter are Spanish speaking. It will prove useful to certain other Portuguese-speaking countries outside South America, such as Angola and Mozambique.

Its contents have been accumulated over the course of many years of painstaking field investigative trips and observations, coupled with meticulous research and clinical and pathological studies (a large number of which have been published in Portuguese) by the authors who have dedicated themselves to the advance of veterinary science in Brazil. Several of the plants (e.g. *Lantana camara* and *Cestrum laevigatum*) discussed occur as problematic alien invaders of considerable toxicological significance in South Africa.

The book is divided into 3 main parts: general, specific intoxications and appendix. The general part includes subjects such as the definition of a toxic plant, toxic factors, conditions under which intoxications occur, diagnosis and methods of investigation of outbreaks and their prevention.

The 2nd part, which constitutes the bulk of the book, is divided into 3 main sections: important toxic plants that have caused cases or outbreaks of poisoning in livestock in the field, plants that have proved to be toxic experimentally and whose importance to livestock is uncertain, and plants that are toxic but are of no importance to livestock.

In the 1st section, the subject is approached on the basis either of the organ system of an animal that is primarily affected by the toxic principle of the plant or, in some cases, the effect of the plant on the animal as a whole, e.g. systematic calcinosis, haemolytic anaemia. Each of the important plants is discussed in detail under a general discussion followed by its distribution (which is depicted in a map of Brazil) and habitat, animal species affected, conditions under which intoxication occurs, parts of the plant which are toxic, clinical signs, macro- and microscopic pathology, diagnosis and differential diagnosis, toxic principle of the plant, treatment and prophylaxis, and, finally, a reference list is given. Each of the more important plants is illustrated in a colour photograph(s) and/or line-drawing(s) as are the significant clinical signs and pathology.

The 1st chapter in this section concerns plants that affect the heart, and commences with those causing 'sudden death' in livestock, a subject with which South African veterinarians are all too familiar. Of special interest is *Palicourea marcgravii* (Rubiaceae), whose toxic principle (like that of gifblaar, or 'poison leaf'. *Dichapetalum cymosum*, Dichapetalaceae) is monofluoro-

acetate. *Palicourea marcgravii* is widely distributed in Brazil and is responsible for many outbreaks of intoxication. It is regarded as the most important toxic plant that causes sudden death in Brazil. Other plants in this category of 'sudden death' are 3 other species of the genus *Palicourea*, whose active principles have not yet been determined as well as plants of the Bignoniaceae and Malpighiaceae families. Despite the estimate that cardiac glycoside poisoning is the most important plant poisoning of South Africa (responsible for about 37 % of all mortalities caused by plant poisonings and mycotoxicoses here) only 1 Brazilian plant is listed in this category, namely *Arrabidaea bilabiata* (Bignoniaceae).

Under the heading 'Plants causing subacute to chronic cardiac failure' are *Tetrapteryx acutifolia* (Malpighiaceae) and *Ateleia glazioviana* (Fabaceae (= Leguminosae) Papilionoideae). These 2 plants cause myocardial lesions similar to those occurring in the South African gousiekte ('quick disease') syndrome caused by certain members of the genera *Pachystigma*, *Pavetta* and *Fadogia* (Rubiaceae). In gousiekte, however, death is usually sudden, although myocarditis is generally relatively chronic, because in experimental disease the latent period is 6–8 weeks. Subacute, but fatal, cases of gousiekte have, however, been described. A most interesting comparison of the Brazilian, Australian and South African poisonings in this category is given, and the possibility that many more plants in Brazil might contain fluoroacetate, cardiac glycosides or even the polyamines responsible for gousiekte should be considered for investigation.

In the 2nd chapter in this section, 5 plants in 4 families, namely Asteraceae (= Compositae), Fabaceae (= Leguminosae) Mimosoideae, Iridaceae or Euphorbiaceae affecting the gastrointestinal tract are dealt with. In addition, there is a short account of those plants that cause ruminal tympany.

The 3rd chapter concerns hepatotoxic plants of 3 families, Solanaceae (*Cestrum* spp. and *Sessea brasiliensis*), Asteraceae (*Vernonia*, *Xanthium* and *Senecio* spp.) and Boraginaceae (*Echium* sp.).

Nephrotoxic plants comprising *Thiloa glaucocarpa* (Combretaceae) and members of the genus *Amaranthus* (Amaranthaceae) are discussed in the 4th chapter.

Intoxications caused by 8 plants and the fungus *Claviceps paspali* are described in the chapter concerning the central nervous system. The plants include *Solanum fastigiatum* var. *fastigiatum* which, when eaten by cattle, produces clinical signs and lesions resembling those of *Solanum kwebense*, which occurs in South Africa. Other plants dealt with here are 2 species of *Ipomoea* (Convolvulaceae), 1 of which (*I. fistulosa* = *I. carnea*) has recently proven to be the cause of storage disease produced by glycoside inhibitors in Mozambique, into which country it was introduced; *Ricinus*

*communis* (Euphorbiaceae); *Polygala klotzschii* (Polygalaceae), a genus well-known in South Africa); *Helium brasiliense* (Custaceae); the bracken fern *Pteridium aquilinum*; *Equisetum* spp. (Equisetaceae); and *Prosopis juliflora* (= *P. glandulosa*) (Fabaceae (= Leguminosae) Mimosoideae). The last plant, also known as mesquite, is a declared invader in South Africa, where it is called the 'Suidwes doring' (Southwest thorn). Initially imported as a fodder plant for its pods, it has extensively invaded the southwestern 2/3 of the subcontinent, where it is abundant in some of the drier areas. High intake has recently proved to result in degeneration of the trigeminal nuclei of ruminants and a consequent inability to masticate. The condition has most recently been diagnosed in the Springbok district of the Northern Cape Province of South Africa.

The chapter on degeneration and necrosis of the skeletal musculature describes only *Cassia occidentalis* (Fabaceae (= Leguminosae) Caesalpinoideae) intoxication in cattle, pigs and horses.

In the succeeding chapters, the following intoxications are discussed in detail: primary (*Fagopyrum esculentum* (Polygonaceae) and *Ammi majus* (Umbelliferae)) and secondary (*Lantana camara* (Verbenaceae), *Myoporum* spp. (Myoporaceae) and *Pithomyces chartarum* (a fungus) photosensitivities; the radiomimetic effect and certain other syndromes in cattle (haemorrhagic; enzootic haematuria; and carcinomas of the upper digestive tract) and sheep (bright blindness and neoplasia of the alimentary tract) caused by ingestion of *P. aquilinum* (some of which occur in South Africa), the plants causing systemic calcinosis (*Solanum malacoxylon* (Solanaceae) and *Nierembergia veitchii* (Solanaceae); plants containing oestrogens (*Trifolium* and *Medicago* spp.) and those causing abortion (*Tetrapteryx* spp., *Ateleia glazioviana* (Fabaceae (= Leguminosae) Papilionoideae) and *Stryphnodendron obovatum* (Fabaceae (= Leguminosae) Mimosoideae); the extraordinary mushroom (*Ramaria flavo-brunnescens* (Clavariaceae)), which grows under *Eucalyptus* spp. trees and is associated with the production of skin lesions when ingested; plants responsible for the development of haemolytic anaemia (the grass *Brachiaria radicans*, which is one of the planted pasture grasses used on ranches in Brazil, and the herb *Ditaxis desertorum* (Euphorbiaceae); plants containing hydrocyanic acid, such as *Manihot* spp. (Euphorbiaceae); *Prunus sphaerocarpa* (Rosaceae); *Pitadenia macrocarpa* and *P. viridiflora* (Fabaceae (= Leguminosae) Mimosoideae); a brief account on certain plants in the family Poaceae (= Gramineae) such as *Sorghum vulgare* and *Triglochine* and *Cynodon* spp.; and the plants involved in nitrate and oxalate intoxi-

cations. Recently, poisoning in calves due to *Nierembergia veitchii* was diagnosed at Koppies, Free State, where garden plants had escaped and were eaten)

In the 2nd section, plants that have been demonstrated experimentally to be toxic in Brazil, but whose importance in this respect in the field is uncertain, are discussed. Each of the 20 plants and their associated syndromes in livestock are described and illustrated in a similar manner to those in the main section of the book. One of the plants discussed here is the tree *Leucaena leucocephala* (= *L. glauca*) (Fabaceae (= Leguminosae) Mimosoideae), which is a well-known valuable fodder tree in Brazil and has been introduced into many countries throughout the world, including South Africa where, in the eastern high rainfall areas, it is a declared invader. Its widely-recorded deleterious effects due to the toxic alkaloid mimosine only occur at high intake of this valuable fodder- and firewood-producing species.

The last of the 3 main sections concerns plants that are toxic but are of no importance to livestock in the practical sense.

The Appendix is divided into 3 chapters: plants that were experimentally tested but produced inconclusive results; plants that were tested with negative results; and experiments in which ornamental plants were fed to farm animals.

It appears that very little work has been done on the isolation of active principles of the Brazilian plants that are of veterinary toxicological importance. Where possible, the classification of plant poisonings according to their toxic principles has proved to be of inestimable value to practising veterinarians and pathologists in South Africa, and it is clear that a wealth of fascinating and rewarding work for chemists working in conjunction with veterinarians lies ahead in Brazil in this regard.

Inclusion of vegetation and climatic maps of Brazil is strongly recommended for any further editions, as this would assist the reader to deduce more accurately under which conditions a particular toxic plant could be expected to occur. In addition, an English translation would be of inestimable value to those interested in veterinary toxicology in all English-speaking parts of the world.

The paper used for the production of the book is of the highest quality and the photographs, other illustrations and format are exceptional.

The authors are to be congratulated on producing a book of such high standard.

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