

# CYANOGENESIS IN PLANTS AND ITS ROLE IN HERBIVORE DEFENSE

## Summary

Cyanogenesis is the process by which hydrogen cyanide is released from endogenous cyanide containing compounds, mainly cyanogenic glycosides. Cyanogenic glycosides are phytoanticipins known to be present in more than 2600 species. They are considered to have an important role in plant defense against herbivores due to bitter taste and release of toxic hydrogen cyanide as the result of tissue disruption. However, some specialized herbivores, especially insects, preferentially feed on cyanogenic plants. Such herbivores have acquired the ability to metabolize cyanogenic glycosides or to sequester them for use against their own predator defense. Indeed, in some cases, the produced plant cyanide actually acts as a phagostimulant rather than an inhibitor. This has led to a certain degree of scepticism regarding the role of cyanogenic glycosides as defense compounds. In this review the author argues that the ef-

fectiveness of cyanogenesis in deterring herbivores depends not only on morphology, physiology, and behavior of the herbivores, but also on the concentration of cyanogenic glycosides in the host plant, and the amount of toxic hydrogen cyanide, which can be released per unit time.

Many plants used for human nutrition contain cyanogenic glycosides (e.g. cassava, sorghum, lima bean), so cyanide poisoning by such a food is an important problem, especially in some regions of the world. The last part of this review describes briefly the human ability to detoxify cyanide, and processing methods leading to remove cyanogens during food preparation. The consequences for human nutrition and for plant-herbivore interaction of established transgenic cyanogen-free plants or plants with induced accelerated cyanogenesis are also discussed.