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PLANTS IN CARDIOLOGY

Veratrum alkaloids

The *Veratrum* species (Liliaceae) contain over 20 alkaloids with important cardiovascular, neuromuscular, and respiratory actions. They lower the blood pressure by an unusual mechanism first elucidated in 1867 by A von Bezold. Stimulation of vagal afferent fibres in the left ventricle causes the vasomotor centre to reset homeostatic control at a lower level and

to reduce the peripheral vascular resistance through the sympathetic nervous system. When pure alkaloids became available they were shown by A E Doyle and F H Smirk (*British Heart Journal* 1953;15:439-49) and by others to reduce considerably the blood pressure in hypertensive patients. But toxicity, especially nausea and vomiting also caused by vagal action, made treatment difficult and their use stopped despite their attractive vasodilator mode of action. *Veratrum* was used in eclampsia before its pharmacology was studied. It had been given for mania and epilepsy early in the nineteenth century and prompted Dr P de L Baker of Eufala, Alabama, to prescribe *Veratrum viride*, the American or green hellebore, with success in 1859 for a lady with eclamptic fits. This was well before the association between eclampsia and hypertension was recognised. The plant and its alkaloids were used with good effect in toxæmia of pregnancy and eclampsia for the next 100 years.

The *Veratrum* species are handsome perennial plants with large pleated leaves and tall spikes of flowers—well worth growing in the garden. The two European species, *V album* and *V nigrum*, are common on alpine meadows. There are 43 other species, the best known being *V viride* and *V sabadilla*. The alkaloids come from the rhizome and root, or occasionally from the seed. Their common name, from antiquity, is hellebore but they are quite different from the genus *Helleborus*—the Christmas and Lenten roses. *Veratrum* has always been known as a highly poisonous plant causing vomiting, substernal constriction, faintness with a weak pulse, convulsions, and death. In 1985 a Frenchman made wine from it, believing it to be gentian, and developed complete atrioventricular block. It is also known as a strong teratogen; ewes that eat it can have lambs with a central eye.

Other medicinal members of the Lily family include those that contain cardiac glycosides, such as squill (*Drimys maritima*) and lily of the valley (*Convallaria majalis*). Colchicine is found in the meadow saffron ("autumn crocus") *Colchicum autumnale* while sisal *Agave sisalana* provides the starting material for steroid synthesis.

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