Biodiversity

"Ironically, it is often not the big and beautiful creatures but the ugly and less dramatic ones we need the most."

Douglas Adams,
Novelist

Nature's drugs

A quick look in any bathroom cabinet will reveal many medicines that rely on biodiversity. Everything from aspirins to antibiotics to Eucalyptus oil were originally derived from living organisms.

Biodiversity not only keeps our ecosystems – and us – healthy, it also provides an extraordinary range of useful substances for fighting human diseases. Aspirin, for example, is based on a chemical from the willow tree. Morphine comes from opium poppies. Quinine, used for 300 years for treating malaria, is made from the bark of the yellow cinchona plant.

Over 21,000 plants around the world have reported medical uses. World-wide sales from drugs derived from plants are worth about US$40 billion a year.

The future of healing

Australian researchers are today working on a huge range of potential medicines based on native plants and animals. While the future market for some of Australia's traditional exports looks doubtful, there is great potential for a multi-million dollar industry based on our biodiversity:

- Anti-fungal and anti-bacterial drugs are among our most important and frequently used medicines. In an intriguing new lead, researchers at Macquarie University in Sydney have discovered that secretions from glands of a bulldog ant (*Myrmecia*) have the power to fight fungal and bacterial infections.
- Seasickness is another common ailment that could be treated with chemicals derived from two Australian species of corkwood (*Duboisia*).

keeps us healthy

- Lymphoid leukaemia once killed 90 per cent of its child victims within six months. Now the disease is being effectively treated with tylocrebrin. This drug is derived from an Australian native vine, *Tylophora*.
- Kangaroo apple (*Solanum aviculare* and *S. laciniatum)* found in Australia and New Zealand contains a remarkable chemical with healing properties. Salasodine, used to make steroids, helps the body adapt to stress and balance fluids. It also helps control inflammations and promotes tissue regeneration.
- Even the treatment of AIDS has been given a potential boost by an Australian plant. The Moreton Bay chestnut (also called black bean) contains chemicals useful in fighting the disease.

Sadly for some species it is probably too late. The remarkable gastric brooding frog is able to give birth through the mouth thanks to a chemical in its stomach which protects the young. This chemical, Prostoglandin E2, was found to be useful in treating gastric ulcers. However, the gastric brooding frog, like some others, has not been seen for over a decade.

People making a difference

Who would have thought that millions of women can now control their family planning, thanks to a humble yam? In India, researchers who explored the pharmaceutical potential of the wild yam (*Dioscorea deltoidea*) several decades ago have caused no less than a social revolution. They found high concentrations of diosgenin, a cortico-steroid, in the tubers of the yam. Eventually this chemical was used to form the basis of contraceptive pills to control ovulation. However, overharvesting in recent years is threatening the future of wild populations of this useful plant and the gene bank they contain.