Tropical Topics

An interpretive newsletter for the tourism industry

Wet Tropic Webs II Vol 1 No. 17 December 1993

Notes from the Editor

Tourists poisoned in rainforest

This may be a newspaper headline in the not too distant future. In fact some tourists recently fell violently ill for 36 hours after sampling seeds which their tour guide had told them had a pleasant taste and were used by Aborigines as a cure for constipation. The guide didn't know the name of the tree and was, presumably, unaware of its strong purgative properties.

Many foods eaten by Aborigines are first processed to remove poisons. Others are never touched. Although bitterness can be a guide to toxicity it is not a sure sign; one local botanist and bush tucker enthusiast was rushed to hospital after sampling an extremely small piece of a pleasant-tasting kernel.

The diversity of rainforest plants has not only led to a huge range of toxins (many with useful medicinal properties) but also makes plant identification very difficult. Given the potential for mistakes there is a need to treat the fashion for bush tucker with extreme caution.

This *Tropical Topics* follows on from the Wet Tropic Webs issue, number 13, looking at yet more intriguing plant/animal relationships which bind together elements in the ecosystem.

A tale of toxic birdwings

Plants cannot flee when attacked by predators but they have one strong defensive tactic up their sleeves - poison. The rainforest is full of toxic plants - but not all animals are equally affected. Birds can be seen feasting on fruit which poison humans. Green possums munch happily on stinging tree leaves which other possums (and wise humans) avoid. It seems that in the course of evolution different animal species have developed particular methods for dealing with certain toxins - abilities which determine the diet of each species.

The female birdwing butterfly (of both Australian species) lays her eggs on the leaves of *Aristolochia* vines. She manages to locate the correct plants by 'tasting' various leaves with chemical receptors in her forelegs, searching for chemical cues. She also uses sense organs at the end of her abdomen to find tender young leaves suitable for caterpillar food.

Aristolochia vines are poisonous. For many newly-hatched caterpillars the toxins would be deadly but the birdwing can not only cope with them but also uses them for its own protection. The caterpillars store the toxins in their bodies and in prominent fleshy orange-red spines on their backs. Should a bird ignore the obvious warning these represent, it is unlikely to repeat its mistake.

But that is not the end of the toxic tale. *Aristolochia* vines have intriguing flowers which have earned them their common name, Dutchman's pipe. (See *Tropical Topics* 13 for their interesting pollination story.) A South American species, *Aristolochia elegans*, produces particularly large and attractive flowers and has been introduced to Australia as an ornamental plant. Unfortunately the female birdwing butterfly receives the correct chemical cues and is fooled into laying her eggs on it - but her caterpillars are eventually poisoned by the toxins of this particular vine. Sadly this plant is spreading from gardens into the natural environment and, along with habitat destruction, is endangering the future of the beautiful birdwings.

Illustration courtesy Queensland Museum

WET TROPICS
WORLD HERITAGE AREA

Spreading the seeds

Two of the most intriguing and important interactions to have evolved between plants and animals are pollination (dealt with in *Tropical Topics* 13) and seed dispersal.

Mechanical means of seed dispersal (such as winged seeds or exploding pods) have a limited success in closed forests so fruit-eating animals are the main distribution agents. These include many birds and mammals, such as possums and bats, as well as some reptiles and fish.

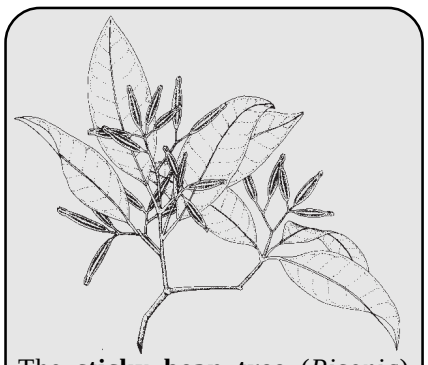
There are two main fruit-eaters - those which depend entirely on fruit for food and those which also eat insects and/or leaves. Plants tend to target either type of fruit-eater.

Some plants, like the lilly pillies (*Syzygium* species), produce large crops of small fruits high in water and sugars. Cheap to produce in large quantities these appeal to the large opportunistic market, including many birds. The fruits are likely to be well distributed but these plants run a few risks. If the consumer is also an insect-eater the seed may be destroyed in the grinding gizzard. If there is an alternative source of fruit or insects the tree may find its fruit is ignored and left to rot.

The rotting-meat smell of the **bridal veil fungi** is one of the less pleasant aspects of the forest. Flies find it irresistible - and then fly off carrying a load of fungi spores for dispersal.

Other plants aim to attract the more stable but more discriminating specialist market. Animals which eat nothing but fruit are rarer but are more reliable, visiting a suitable fruiting tree repeatedly until the crop is finished. Eating nothing else, they require fruit which provide a balanced diet - one including oil, protein and fat. High quality fruits are 'expensive' for the plant to produce and are therefore not grown in abundant quantities. However, the risks are fewer, since specialist fruit-eaters (such as the cassowary) generally do not have grinding stomachs and the large seeds pass through unharmed to be deposited some distance from the parent tree in a convenient pile of compost. Alternatively the seed is regurgitated (for example, by bats). If well packaged in firm flesh, which takes time to consume, the seed will be carried some distance before it is discarded.

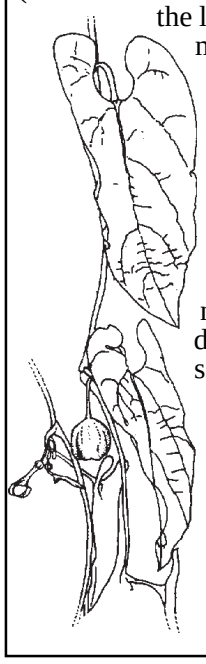
Mistletoe plants and mistletoe birds have an interesting relationship. The bird eats insects so has a grinding gizzard but is able, when consuming a mistletoe berry, to close the gizzard and shunt the soft (and quite toxic) seed quickly through its digestive tract. Within 25 minutes the sticky seed is voided and if deposited on a suitable tree can germinate.



The **sticky bean tree** (*Pisonia*) employs rather heavy-handed methods to persuade animals to disperse its seeds mechanically. This small shrubby tree is a common species on coral cays and islands, such as Heron Island. To get there - and to eventually move its species on further - it relies on noddies, seabirds which nest in trees. *Pisonia* seeds are covered with a sticky gum which adheres readily to the plumage of the nesting birds. While a few seeds would not affect the bird too badly, often they become so entangled in seeds they cannot fly and fall to the ground to starve. It has been suggested that the dead bird provides a useful source of fertiliser for the germinating seedlings. Gruesome as the system seems it is an important part of the revegetation of cays and islands - and the noddies in turn rely heavily on the *Pisonia* for nest sites.

Helping the birdwings

If you want to help the birdwing butterflies, try planting *Aristolochia tagala* or *Pararistolochia deltantha*, between Cooktown and Mackay (for the Cairns birdwing) or *A. praevenosa* in the Brisbane area (for the local Richmond birdwing). Your reward may be the marvellous sight of their mating flights.



Two caterpillar-killing vines to avoid, or pull out of your garden, are *Aristolochia elegans* and *A. ringens*. The latter vine has appeared in the Wet Tropics more recently. You can tell these South American species from the native ones by their heart-shaped leaves which are as wide, or wider, than they are long. Their flowers are much bigger and more rounded than the native ones. Those of *A. elegans* reach 5cm in diameter while those of *A. ringens* grow to 14cm. Their seed pods are long and thin with straight parallel sides.

In contrast to these exotic vines, the native *A. tagala* (left) has more elongated leaves, much smaller flowers and rounded fruits.

Aristolochia *illustration courtesy Queensland Museum*

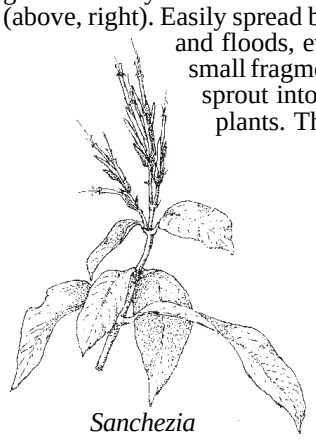
Bad relations

A weed is a plant which grows where it is not wanted - and all too often one person's garden glory is another person's headache - particularly when the latter is a national park manager.

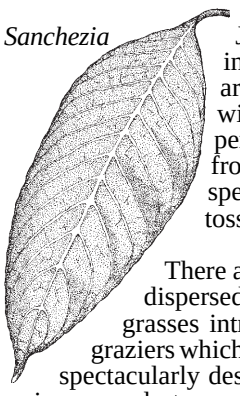
On the page one we saw how the introduction of a South American vine is threatening one of our most spectacular butterflies. Plants can also turn nasty on each other. A notorious example is the rubber vine, introduced from Madagascar in the 1870s for its pretty flower, which has invaded some 350 000ha of Queensland, totally smothering native vegetation in moister sites.

A similarly aggressive vine is *Thunbergia grandiflora*. Illustrated with glossy pictures of gorgeous blooms in many gardening books, 'escapees' are doing enormous damage to rainforest in the Cairns area. It is very difficult to destroy.

Then there is *Sanchezia* (below), grown for its yellow-veined leaves (above, right). Easily spread by rivers and floods, even small fragments can sprout into new plants. The banks



Sanchezia



Sanchezia

of the North Johnstone River in the Palmerston area were choked with *Sanchezia* - perhaps originating from one garden specimen carelessly tossed in upstream.

There are coffee plants, dispersed by birds, and grasses introduced by graziers which, while less spectacularly destructive than the vines, can destroy an ecosystem just as thoroughly. The catalogue of weeds is extensive.

Back home, in their native environment, these plants have natural checks such as insects and diseases. Freed from these restraints they can rapidly invade new areas.

The balance of powers in an ecosystem, particularly in a rainforest, has been finely tuned over a long period of evolution. The introduction of an exotic plant or a feral animal can cause an imbalance which has far-reaching consequences for the whole system; meddle with some of the strands and a whole web may collapse. We hear much of the destruction wrought by feral pigs and cane toads but exotic plants may actually be one of the greatest threats facing rainforests.

*African tulip tree (*Spathodea campanulata*) is grown widely for its attractive scarlet flowers (above) but this tree's windblown seeds are rapidly spreading the species throughout the wet tropics.*

Good relations

In your garden, especially if you are involved with accommodation for tourists, consider the advantages of growing **local** native plants. While avoiding introducing weeds which may endanger the very resource which is the basis of the tourism industry of the region, you can attract native birds and butterflies to your property.

Tourists attracted by the natural attributes of the area are almost certain to be more interested in unusual local species than in the hibiscus, bougainvillaea, etc., which are the humdrum hallmark of every tropical resort the world over.

Croc nesting season

With the onset of the wet season humidity will rise and there will be less fluctuation in ambient temperatures - conditions which will encourage estuarine crocodiles to nest.

The process of egg-production begins up to five months beforehand, depending on various factors - the female croc's age, the amount of physical stress she experienced in the previous nesting season and food availability since then. It is even thought that she has some ability to predict the weather - but croc behaviour is not a reliable indicator of the degree of wet season.

Mating occurs in the water about two months prior to laying. Nests are constructed of grass and dirt raked with the legs into a mound about half a metre in height to avoid flooding. It is usually situated within 30m of water.

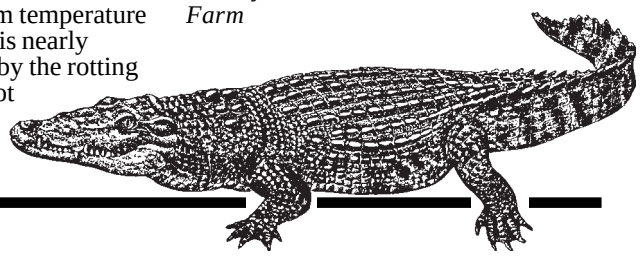
Humidity of over 95 percent is required for optimal embryo development so laying often occurs with the approach or onset of wet weather. Because of this many females will actually lay on or close to the same day. The eggs are surrounded with a transparent gel which inhibits development of the embryos until the eggs have been laid. It also acts as a shock absorber when they are dropped into the nest chamber but then evaporates from the egg shells allowing the embryos to commence growth. This gel is important because when the embryo starts to develop it attaches itself to the top of the egg. If the egg is then turned the embryo drowns. It is therefore vital that development is delayed until the eggs are safely settled in the nest.

Each egg is about the size of a goose egg. The clutch, numbering 50 on average, is deposited in a chamber at the top of the mound. Research indicates that the optimum temperature for embryo development is nearly 32°C. This is maintained by the rotting vegetation in the nest (not by the female adjusting the nesting material or urinating on the nest).

Sex is determined, in the egg, by the nest temperature, 32°C producing over 80% male hatchlings, higher and lower temperatures resulting in females.

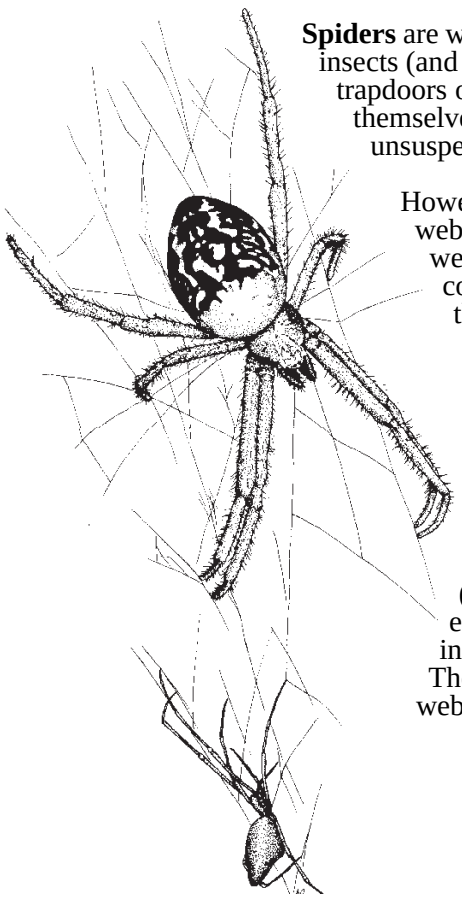
During incubation the mother stays in the vicinity of the nest to protect the eggs. (It is therefore particularly important to avoid potential nesting sites at this time.) If some eggs begin to rot the smell may attract goannas but otherwise should not be obvious to predators. The greatest danger is from flooding which destroys 30-50% of all nests. At the optimum 32°C eggs hatch in 80-84 days.

Contributed by Geoff McClure of Hartley's Creek Crocodile Farm



Mixed relations

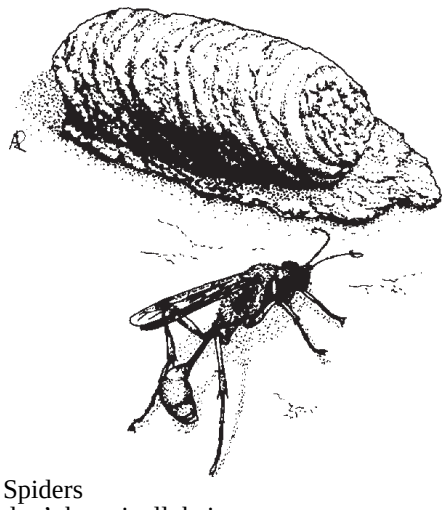
Most plants and animals participate in some sort of interaction with other organisms. Here we look at some of the more curious relationships which contribute to the webs of life in the Wet Tropics.



Spiders are well-known for their ability to prey on insects (and even birds). Some ambush from under trapdoors or burrows. Others camouflage themselves as parts of flowers and leap on unsuspecting prey.

However, spiders are characterised by their webs. Net-throwing spiders spin tiny, elastic webs which they fling over prey which comes close enough. On the other end of the scale golden orb weavers (*Nephila*) construct huge webs between trees and even telegraph poles while 20 to 30 corroboree or community spiders (*Cyrtophora moluccensis*) (left) build their webs together so they form huge sheets.

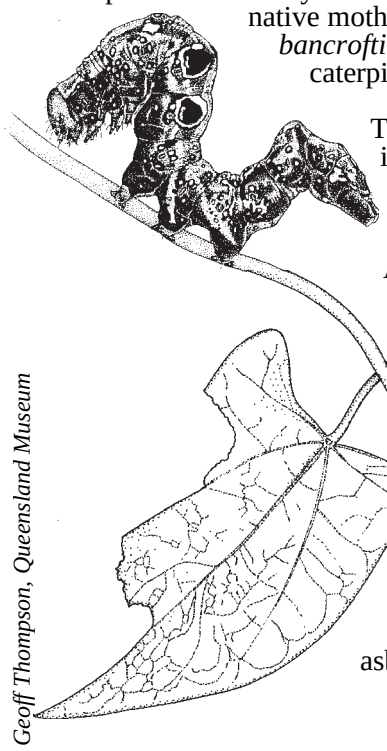
Some spiders obtain their food from others' webs. Tiny **dew drop spiders** (*Argyrodes*) (left, below) live on the edges of the giant webs and feed on insects which are too small for their hosts. The larger spiders benefit by having their webs cleaned up for them.



Spiders don't have it all their own way; some become kindergarten food for the larvae of **mud-dauber wasps**. These wasps build clay cells from damp mud. Before closing each pot the female wasp hunts down a spider, paralyses it and carries or drags it to the nest. After laying an egg on the spider the mother seals the cell and leaves. The larva hatches to find a ready food supply in the form of a fresh, live, but helpless spider.

Some species of wasps, instead of building mud pots, attack funnel-web or trapdoor spiders in their homes, leaving an egg with each paralysed host in a ready-made nest. Another species simply lays an egg on a spider which continues as normal until the developing larva gradually eats it alive!

Fruit-piercing moths are a common sight on the rainforest edge and in orchards where they pierce fruit skins with a 'drill bit' on the end of the proboscis and pulp the interior. Their larvae feed on the vines of the Menispermaceae family. CSIRO scientists were puzzled at the tendency of native moths to lay on certain native vines (*Stephania bancroftii*) in this family which are actually toxic to the caterpillars.

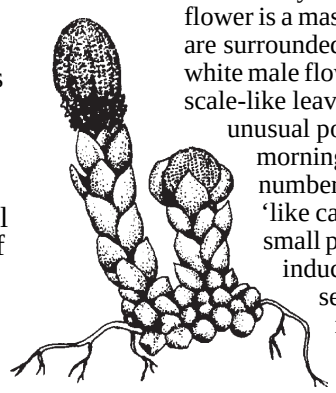


Their research came to the notice of a Chinese immunobiologist who was looking at the medicinal qualities of a similar vine (*S. tetrandra*) used in traditional Chinese medicine for reducing inflammation. It was also discovered that Australian Aborigines traditionally wrap the leaves of another related vine (*Tinospora smilacina* — illustrated here) around swollen joints to reduce inflammation.

By looking at how caterpillars concentrate the alkaloid toxins in their bodies the scientists were able to extract alkaloids with immunosuppressant qualities. It is hoped these, or similar compounds, may be useful in the fight against abnormalities of the immune system such as silicosis, asbestosis, arthritis, cancer and AIDS.

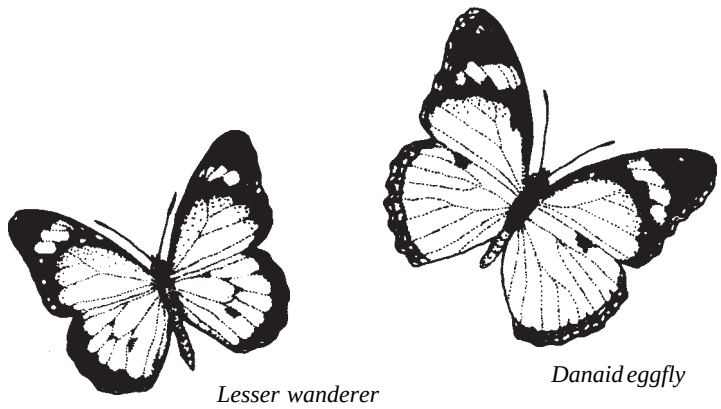
Geoff Thompson, Queensland Museum

Because it produces no chlorophyll the plant, ***Balanophora fungosa,*** is unable to produce its own food from sunlight so it lives as a parasite on certain roots. In winter its strange flowers are a common sight on the rainforest floor as they push, mushroom-like, through the leaf litter. Despite its characteristics and appearance and its common name — fungus root — *Balanophora* is not actually a fungus.



The creamy-brown knob at the tip of the flower is a mass of female flowers. These are surrounded, at the base, by a ring of white male flowers. Below these are a few scale-like leaves. Although they are unusual pollinators, early in the morning ants can be seen in large numbers around the female head — 'like cattle at a pond' — feeding on small pools of liquid, their inducement for pollination services. It is thought that native rats, which eat the male flowers, may also carry pollen.

Some **moths** are distasteful and advertise this fact with a warning coloration. After dark, however, when this visual signal is useless they emit ultrasonic clicks which can be picked up by insectivorous bats. This may simply warn the bats of the moths' unsuitability as dinner or may even serve to jam the bats' sonar system.

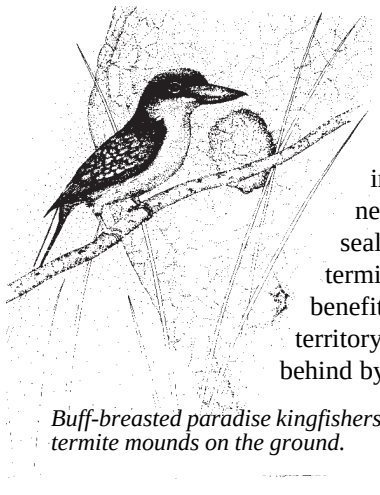


Lesser wanderer *Danaid eggfly*

Red for danger is a common signal in the animal world. Bold combinations of red, yellow, orange, black and white frequently indicate that an animal is distasteful or poisonous. This is the case with the orange, black and white **lesser wanderer butterfly** (*Danaus chrysippus*). The female of the **danaid eggfly** (*Hypolimnas misippus*) looks almost identical — but it is an imposter. Unlike the wanderer it would make a tasty meal for a bird but undoubtedly benefits from its similar appearance when the predator is reminded of a previous unpleasant experience.

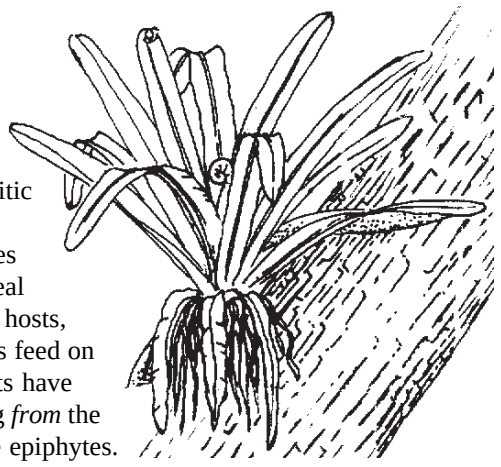
Mimicry such as this, when a harmless species mimics a harmful one, is common in the insect world. Beetles, flies and other insects mimic stinging wasps, even flicking their wings in the same way. Mimicry can also disguise a predator.

Termite mounds, on the ground and in trees, make good nesting spots and are used for this purpose by many species of kingfishers and some parrots.



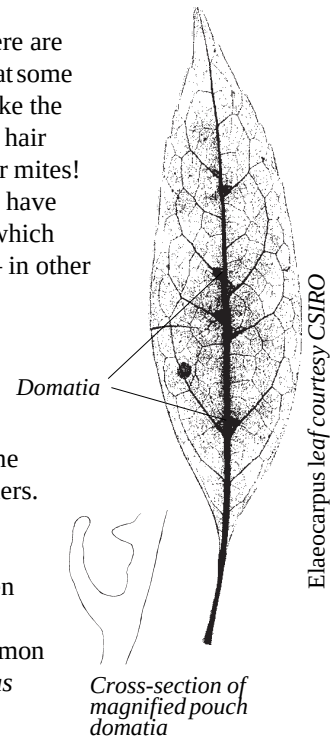
Kingfishers begin their excavations by flying at the mounds, missile style, with their beaks held out straight ahead (and sometimes die from the impact). They then peck out a nesting chamber which is later sealed off on the inside by the termites. (The termites may eventually benefit from this invasion of their territory by feeding on nutrients left behind by nesting birds.)

Buff-breasted paradise kingfishers nest in termite mounds on the ground.



Epiphytic ferns are a common feature of rainforests. While, unlike parasitic plants such as mistletoes, epiphytes perch but do not steal nutrients from their hosts, sometimes the hosts feed on the epiphytes! Roots have been found growing *from* the tree branch *into* the epiphytes. This is similar to the marcotting process, used to propagate trees by covering a treated branch with moss and plastic until a root system develops.

On the undersides of many leaves there are little growths called **domatia**. Visible at some junctions of major veins, these can take the form of tiny pits, pouches, pockets or hair tufts — and provide perfect homes for mites! Studies of the mites found in domatia have shown that they are usually species which feed on fungi and on leaf parasites — in other words, mites which benefit the plant.

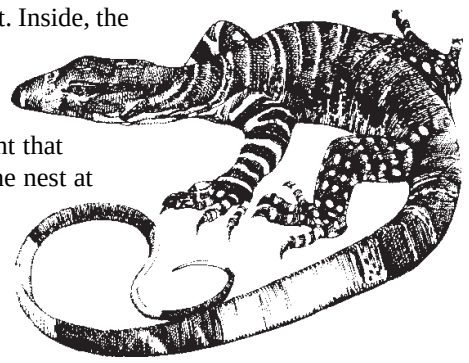


Elaeocarpus *leaf courtesy CSIRO*

Cross-section of magnified pouch domatia

It seems that the plant provides the domatia as havens where the mites can shelter and reproduce, while the mites pay rent by keeping the leaf surface clear of destructive invaders. This beneficial mite-plant association appears to be ancient, 40-million-year-old fossils having been found in New South Wales and in Victoria. Domatia are particularly common on leaves of quandongs (*Elaeocarpus* species).

Lace monitors nest in termite mounds in trees. In this case the termites fill the hole made by the mother, cementing in the eggs and repairing the mound so that there is almost no trace of the lizard's nest. Inside, the constant temperature maintained by the termites helps the eggs to incubate. It is thought that the mother returns to the nest at the time of hatching.



Questions & Answers

Q How do shells get their shapes and how do they grow?

A The shell shape is determined by the species of mollusc to which it belongs. It is an external skeleton, created from calcium carbonate taken from seawater and secreted by membranous tissue called the mantle. This is a smooth lining which covers the internal organs, inside the shell, and is sometimes seen extended outside, covering the exterior of shells such as cowries.

The shell first forms during the development of the egg or the first larval stage. It then grows in one direction only, being continually added to as the animal grows. Most **gastropod** (snail) shells are coiled and the embryonic shell is usually visible as the first few whorls at the top of the shell. Growth occurs around the opening of the shell, which forms a coil, wrapping continually around the existing shell (as in cowries and cone shells) or below it (as in volutes and tritons). This process can be appreciated by comparing sections of shells (a good thing to show to tourists). In **bivalves** (oysters, clams, mussels, etc.) new material is simply added around the perimeter of each valve. In many species secondary growth occurs also over the inner surface of the shell. When iridescent this is commonly known as mother-of-pearl or nacre. The mantle may also expand and deposit over the existing shell. Many are able to repair small holes or cracks in the shell.

Illustration courtesy Queensland Museum

The growth of the shell is not a continuous process. Slow periods of growth are visible as thick ridges and, sometimes, dark bands. The ornaments, such as knobs, are formed by the mantle dividing into branches, or by an increased rate of shell formation.

Q What are the dark hairy caterpillars seen on the ground in the rainforest moving in line, head to tail, and also bunched up in a web on tree trunks? Are they a pest and damage trees?

A They are the larvae of the bagmoth or boree moth, sometimes called processionary caterpillars. From time to time they leave the tree they are on - perhaps when it has become defoliated or when they wish to pupate on another tree. They then follow each other along a trail of silk laid by the leader. Gregarious, they feed and pupate together. The caterpillars are covered with hairs which can be very irritating to human skin. They pupate within the bags casting off their larval skins so disturbing these bags can release a cloud of irritating hairs. Even people camping under trees where they are present may be affected. They are not a particular pest although they can defoliate trees to some extent.

Tourist talk

ENGLISH	GERMAN	JAPANESE	
butterfly	Schmetterling	cho	蝶
spider	Spinne	kumo	クモ
wasp	Wespe	suzume bachi	すずめ蜂
insect	Insekt	konchu	昆虫
weed	Unkraut	za so	雑草
toxin	Gift	doku so	毒素
vine	Kletterpslanze	tsuru	つる
fruit	Frucht	kajutsu	果実
seed	Samen	ta ne	種
termite mound	Termitenhügel	shiro ari no tsuka	白ありの塚

Facts and stats

on relationships

Lichens consist of two separate plants — an alga and a fungus, whose filamentous roots are woven in a tough skin surrounding the alga. The fungus draws up water and minerals while the alga uses its chlorophyll (green matter) to manufacture food. The fungus also produces an acid which eats into bare rock, providing a foothold (it can produce 1cm of topsoil in about 2000 years!).

Acacias have small nectar-producing glands, (extra-floral nectaries) on their branches. These attract ants which serve to protect the trees from insect attack.

Different species of parasites live on the skins of different species of animals and can help in identification of their hosts. The discovery of a 100-million-year-old fossil of a type of flea which is today only found on marsupials suggests that marsupials have existed for at least that period of time.

Mammals of the dasyurid (carnivorous marsupial) group — which includes antechinuses, quolls, and others — have a reputation as the meanest on the planet. With cat-like eye teeth and carnivorous appetites if they are attacked by snakes they are just as likely to counterattack. The presence of many dasyurids in Australia has been put forward as a possible explanation for the high number of venomous snakes (19 of the world's top 23). Quick-acting venoms are the snakes' only defence against a prey which is likely to consume them!

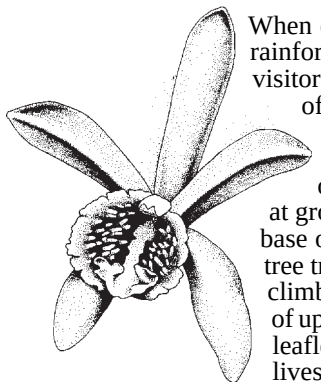
Found in tropical freshwater and mangroves is a fish with dark stripes known as the archer, or more appropriately, the rifle fish. A combination of a ridged tongue and a groove in the roof of its mouth enables it to squirt water above the water surface to bring down resting or flying insects. To do so accurately it is able to compensate for the visual effects caused by the way light bends as it passes from water to air.

A certain fungus, *Cordyceps*, parasitises insects! Spores from the fungus germinate if they come into contact with certain butterfly larvae which live underground. The fungus then invades the caterpillar's body, and digests it.

Nature notes

A diary of natural events creates a pleasing journal which grows richer with the passage of time. Watching for the recurrence of an event after noting it in a previous year, and trying to understand what could have caused changes in timing, is intriguing.

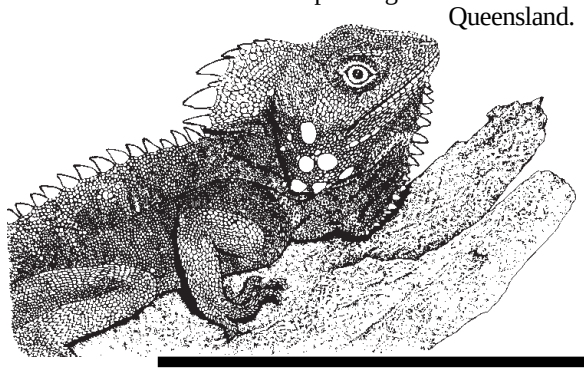
These notes are from the author's own notebook, or were offered by researchers and fellow naturalists. Readers will, inevitably, note variations between their observations and those appearing here. If you do not keep a nature diary perhaps this will inspire you to begin one.



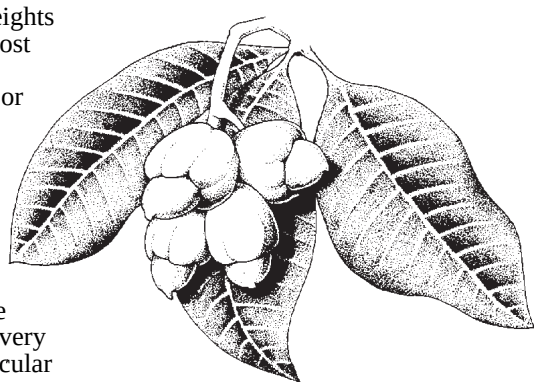
When driving through rainforest this month visitors may catch sight of flowers on the **giant climbing orchid.** This orchid gets started at ground level at the base of a decomposing tree trunk, and can climb rapidly to heights of up to 15m. Almost leafless, it usually lives for only two or three years before dying, often due to the subsidence of the host tree. Thousands of creamy-yellow and pink flowers, each about 3cm in diameter, are carried by this orchid. This plant (*Pseudovanilla (Galeola) foliata*) is said to be the only climbing orchid in Australia, very dependant on dead trees at a particular stage of decomposition.

It is stinger season again, this year's batch of young **box jellyfish** having migrated down from breeding grounds in the estuaries to coastal waters. Irukandji and blue bottles can also be expected.

Stormy weather in December will encourage mating and egg-laying by a rainforest lizard known as **Boyd's forest dragon.** Mating attempts have been observed on the forest floor at Mossman Gorge, with the larger male giving no attention to decorous behaviour. Females scratch a surprisingly shallow hole in soft earth, about 10cm in depth, to deposit three or four eggs. Boyd's dragon belongs to a South-east Asian group of lizards, but our species (*Hypsilurus (Gonocephalus) boydii*) is restricted to the Wet Tropics region of North Queensland.

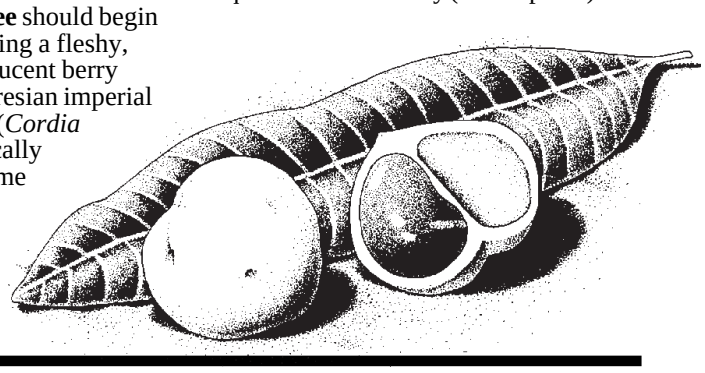


Drivers to Cape Tribulation should keep a look out for young **lace monitor lizards** on the road. These little 30cm cobalt blue and yellow striped 'road gems' have been hatching from their termite nests and have been reported in large numbers basking on the warm road - unfortunately with limited regard for traffic.

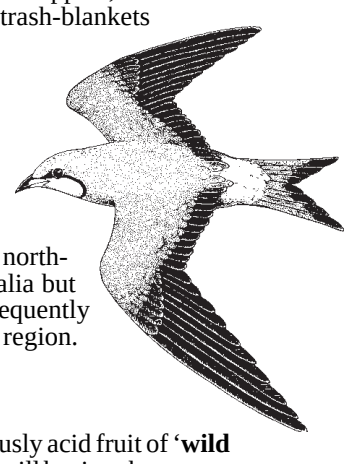


The **tar-tree**, or native cashew, contains potent chemicals to which many people are sensitive. Blistering of the skin has been recorded simply due to brushing against young foliage or stems. The name tar-tree describes the blackening of patches of the trunk wherever the sap exudes due to wounding. Native cashew is quite an accurate name for this tree (*Semecarpus australiensis*) because it does belong in the cashew family, and produces a similar fruit. Fruits were produced in large quantities along the Wangetti coast and in other lowland rainforests last December, and some trees may follow suit this year, too. The fleshy orange section of the fruit is actually a thickened stem, which carries a seed. Both parts are reportedly edible, but only after careful preparation including baking.

Fruit of the **cordia tree** should begin ripening now, producing a fleshy, pinkish, almost translucent berry keenly sought by Torresian imperial pigeons. This cordia (*Cordia dichotoma*) is botanically related to the handsome orange trumpet tree (*Cordia subcordata*) but does not produce a showy flower.



Road-users travelling past recently harvested canefields in coastal North Queensland may catch sight of a handsome migratory bird known as the **oriental pratincole**. A flock of 50 or 60 birds presents a spectacular sight as they pursue insects a metre or so above the ground. Wonderfully streamlined, the brown-winged birds fly with swallow-like grace and speed, wheeling and jinking to snatch insects in the air. Their feeding habits are suited to plains country where short vegetation provides a home for insects such as grasshoppers, and canefields covered in trash-blankets provide a temporary attraction. These Asian-breeders are seasonally common in north-west Australia but are not infrequently seen in our region.



The deliciously acid fruit of '**wild tamarind**' will be ripe about now, tempting those with an adventurous palate. This tree produces a green or yellow skinned fruit which splits to reveal bright orange flesh concealing a black seed. Several rainforest trees are described as native or wild tamarind, one of which is *Diploglottis smithii* discussed here. Leaflets on this tree are distinctive because of numerous close-set lateral veins, about 25 on each side of the midrib. Native 'tamarinds' are members of the same family as lychee, longan and rambutan (Sapindaceae) but are not related to the tamarind of commerce which is in a quite different family (Caesalpinae).

Bookshelf

Weed Assessment in the Wet Tropics World Heritage Area of north Queensland
Stella Humphries and Peter Stanton
CSIRO and DEH (1992)

Plant Invasions
The incidence of environmental weeds in Australia
Kowari 2
ANPWS (1991)

Australian Tropical Rainforests
Science - Values - Meaning
L.J. Webb and J. Kikkawa (eds)
CSIRO (1990)
Chapter 7: *The Biological Web - Plant/animal Interactions in the Rainforest*
R.E. Jones and F. H. Crome

This chapter deals partly with fruit-eaters and distributors.

Toxic Plants and Animals - A Guide for Australia
Jeanette Covacevich, Peter Davie and John Pearn (eds)
Queensland Museum (1987)

The Australian Naturalist Library - Spiders
Barbara York Main
William Collins Pty Ltd, Sydney (1987)

Australian Natural History Vol. 23 No. 11 Summer 1991-92
A pocketful of mites (domatia)
Dennis J. O'Dowd and Mary F. Wilson

Geo Vol. 15 No. 4 Nov. 1993-Jan. 1994
Settling for a sticky solution
(*Pisonia* trees and noddies)
Terence Lindsey and Rod Morris

Australian Tropical Rain Forest Trees
An Interactive Identification System
B.P.M. Hyland and T. Whiffen
CSIRO (1993)

This newly-released package is the ultimate identification system. It consists of a computer-based interactive key for Macintosh or IBM PC (3.5 and 5.25" disks) plus three volumes of descriptions and illustrations of features and species. One of these is the **Leaf Atlas of Australian Tropical Rain Forest Trees** with near life-size illustrations of all species included in the key.

The whole package ($195, or $80 for the Leaf Atlas alone, + p&p) is available from CSIRO Information Services, PO Box 89, East Melbourne, Vic. 3002; Tel: (03) 418 7217
and from CSIRO, PO Box 780, Atherton, Qld. 4883;
Tel: (07) 4091 1755.

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WET TROPICS MANAGEMENT AUTHORITY

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