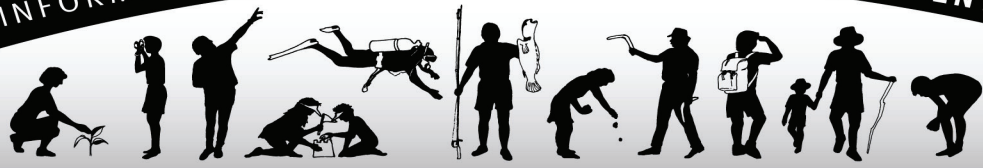


TROPICAL TOPICS

AN INFORMATIVE NEWSLETTER ABOUT THE ENVIRONMENT



The regions
glorious high

rainforest draped mountains receive significant rain from the effect called occult precipitation (cloud stripping). Up to 31% of annual rain occurs this way. That is why we enjoy the lovely continually flowing creeks we love to swim in around the region. Oh what a life!

The mean annual rainfall ranges from about 1,200 to over 8000 millimeters (nix 1991). Even in the wettest areas between Tully and Cairns there is a distinctly seasonal precipitation regime with over 60 per cent falling in the summer months (December to March) followed by a relatively dry season in mid-year.

Tropical low pressure cells and cyclones that develop in the monsoonal trough commonly produce more than 250 millimeters of rain in a day during the wet season. Mt Bellenden Ker has recorded 1,140 millimeters of rain and 24-hour period and in 2000 received over 12m of rain.

The combination of extreme rainfall over an extended period of time and many intense cyclones during the same period created unseasonably flooded conditions in the whole of the east coast of Australia, seriously affecting many people from Sydney to Cape York.

Many wet weary locals questioned Queensland calling itself the "sunshine state".

The wild wet season

The green season, as the wet season has been dubbed, is a time of magnificent skyscapes, dramatic torrential rain and vigorous rushing rivers. It is also a time of celebration as summer rain, the life force of the tropics, revitalises plants and animals which have been suffering from the stress of a prolonged dry season.

2010 was the wettest year for Queensland since records were first kept in 1887 (and Australia's fourth wettest recorded year).

The average annual rainfall is 1992mm on an average 154 days. The majority of the region's rainfall occurs during summer between January and March.

Summer rain in the wet tropics comes from a convergence of weather patterns. The monsoon trough is a long band of activity formed where the south-east trade winds (blowing towards the north-west) meet equatorial westerlies (blowing towards the south-east).

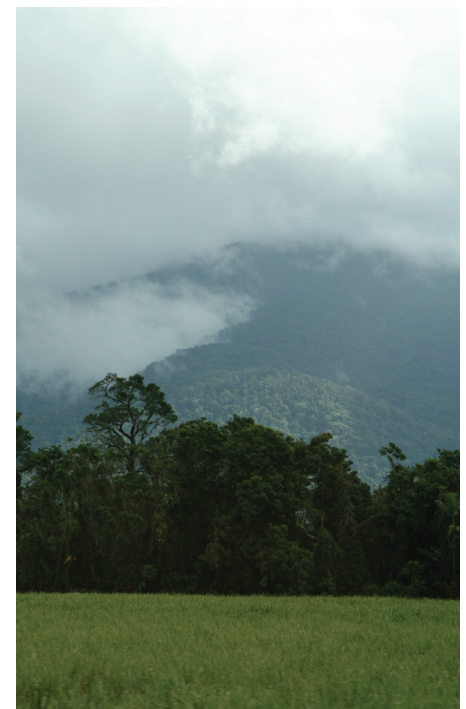
The collision of these two warm, wet, rising air streams results in heavy rain associated with thunderstorms and occasional tropical cyclones, which form over the ocean. The monsoon trough sometimes shows up on satellite images as a solid line of cloud but at other times is scattered and ill-defined. In some years, the monsoon trough does not go far south of Cooktown. In other years it reaches southern Queensland and even New South Wales.

Winter rain comes from south-easterly winds dropping their moisture as they rise up over the mountains of the Great Dividing Range. The annual rainfall total varies, of course, from one year to the next. Sometimes the monsoon trough is more or less active than usual.

Cyclones, which usually bring a large amount of rain in a short period, can greatly affect the total; some years no

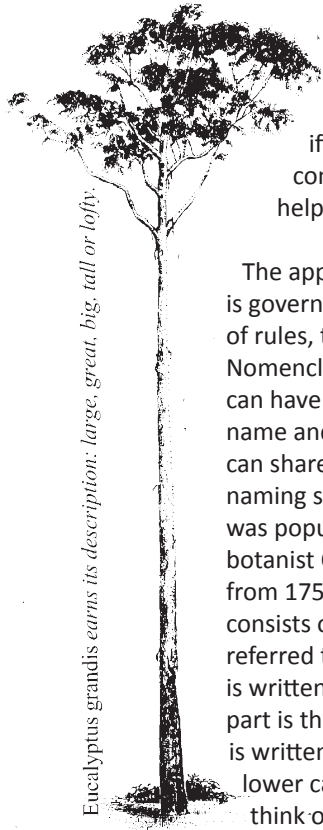
cyclones reach the east coast, while in other years we may receive rain from three or four. In El Niño years, the south-easterly trade winds tend to break down.

Essentially, rain patterns in the wet tropics are variable. Older residents talk about the wet seasons of the past, but they are remembering years when rainfall, for a number of reasons, was above average. There really is no typical wet season. Australia as a whole is subject to long, irregular climate patterns and the wet tropics is no exception. By the end of the wet season, our dams could well be full and overflowing again.



It's all in the name

Cooper's wood, humbug, leather jacket, red almond, red ash, red tweedie, mountain ash, sarsparilla, soapbush, soapwood and foam bark. These are the common names for not several plants but just one, the rainforest pioneer tree *Alphitonia excelsa*. At least half of these names are also used for the other four species of *Alphitonia* found in north Queensland.



Eucalyptus grandis earns its description: large, great, big, tall or lofty.

So, as we see here, not only are several common names often used for the same plant but sometimes the same common name can refer to several different plants. This can lead to great confusion. The use of scientific names can help avoid this.

The application of scientific names to plants is governed by an internationally accepted set of rules, the International Code of Botanical Nomenclature. Under this system one plant species can have no more than one name and no two plant species can share the same name. The naming system we use today was popularised by the Swedish botanist Carl Linnaeus and dates from 1753. A scientific name consists of two parts and is referred to as a binomial. The first part, the genus, is written with an initial capital letter. The second part is the species name (or specific epithet) and is written entirely in lower case. You can think of the genus as

a noun and the species as an adjective, describing the noun. For example, there are black cows and there are brown cows. Similarly you can have black horses or brown horses. Cows and horses can be likened to the genus and the colour to the species.

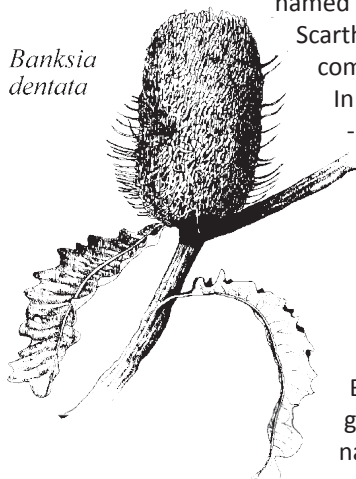
A plant can be named after the person who discovered it, a noteworthy person, a patron, friend, lover, wife, husband or partner. These names end in -ii if the person is a man or -iae if the person is a woman, although the initial i is sometimes dropped for various reasons. *Miliusa traceyi*, a tree from several rainforest types on Cape York Peninsula, is named after the

botanist Geoff Tracey. *Argophyllum verae* is named after the botanical illustrator, Vera Scarth Johnson. The species name can commemorate more than one person.

In this case, the name will end in -iorum or -iarum although, again, the ii is sometimes omitted. *Cupaniopsis cooperorum* is named after artist and authors Bill and Wendy Cooper.

People can also be commemorated in generic names. For example, *Banksia* is named after Sir Joseph Banks. *Gossia*, a recently described genus related to *Austromyrtus*, is named after former Queensland premier, Wayne Goss. The genus can

Banksia dentata

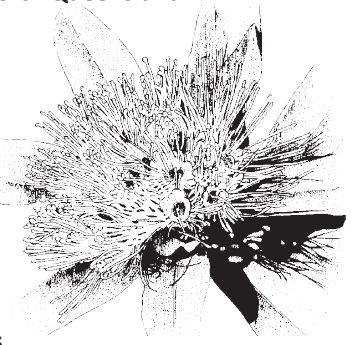


People are sometimes reluctant to use scientific names but may do so unawares. Did you know that *Chrysanthemum* is a scientific name?

There are no rules for how plant names are formed but they generally adhere to the rules of common sense and public acceptability. They can be drawn from all manner of sources but, regardless of their origin, the names are treated as Latin. Hence, grammatically, they have gender, number and case. This explains why the endings of specific names can differ slightly between genera. For example, *angustifolia* means narrowleaved but we have *Callicarpa angustifolia*, *Stenocarpus angustifolius* and *Canthium angustifolium* because *Callicarpa* is feminine, *Stenocarpus* is masculine and *Canthium* is neuter.

combine both the first and second name as in *Lenbrassia*, which was named after Len Brass, a Toowoomba-born botanist noted for his work in many tropical parts of the world.

Names describing features of a plant usually have Latin or Greek roots. ***Xanthostemon chrysanthus***, golden penda, the attractive yellow-flowered tree and floral emblem of Cairns, gets its name from the Greek *xantho-* meaning 'yellow' and *-stemon*, 'stamen', the male parts of the flower. *Chrysanthus* is another Greek word meaning 'golden-flowered'. *Eucalyptus grandis*, the flooded gum or rose gum, gets its species name from the Latin adjective *grandis* which means 'large, great, big, tall or lofty', all perfect descriptions of this gum tree.



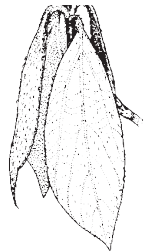
Xanthostemon chrysanthus

Sometimes a name indicates the country of origin, for example, *australiensis* meaning 'from Australia' (not to be confused with *australis*, which means 'southern') and *novoguineensis*, 'from New Guinea'. Notice these all end in -ensis, the Latin suffix indicating a country or place of origin.

The name could also indicate something about the place where the plant is commonly found. For example, in *monticola* the Latin ending -cola means 'dweller', so plants with this species name are mountain dwellers, from the Latin *mons*, 'a mountain'. Another way of indicating habitat is to use the ending -arius, indicating

a connection. For example *arenarius* means 'pertaining to sand' (*arena*); *Xanthostemon arenarius* is a tree (with yellow stamens) from the sand dunes at Cape Flattery.

An existing name may be modified. This is commonly used for generic names where a prefix such as *neo-*, 'new', or *pseudo-*, 'false', is added to an existing name, hence *Neolitsea* from *Litsea* and *Pseudopogonatherum* from *pogonatherum*. Alternatively a suffix can be used, for example, -astrum added to *Malva* to form *Malvastrum* indicating 'an incomplete likeness'.



Neolitsea dealbata

When inter-generic crosses have been created, names may be compounded. This commonly happens with orchids. For example, when *Epidendrum* was crossed with *Cattleya* the offspring became *Epicattleya*. Sometimes anagrams are formed by rearranging the letters of an existing name. Hence the name *Romnalda*, a grass-like plant from Mount Lewis, was coined by rearranging the letters of *Lomandra*, a plant which looks quite similar.

Acknowledgements to John Clarkson, QPWS



Creature feature: Blind snakes

Blind snakes (*Ramphotyphlops* spp) are small, worm-like, non-venomous snakes with small eyes which feed mainly on ants and termites. There are about 30 species in various parts of Australia and perhaps eight in the wet tropics. The larger species of blind snakes can grow to 40cm in length. All have smooth bodies with thick skin which is thought to protect them from the stings of ants, a useful characteristic since they specialise in invading ant nests and eating their eggs and larvae.

Their small eyes are little more than lightsensitive spots below the body scales; more developed eyes would probably be vulnerable to ant attack and be at risk of abrasion as the snake wriggles through underground burrows.

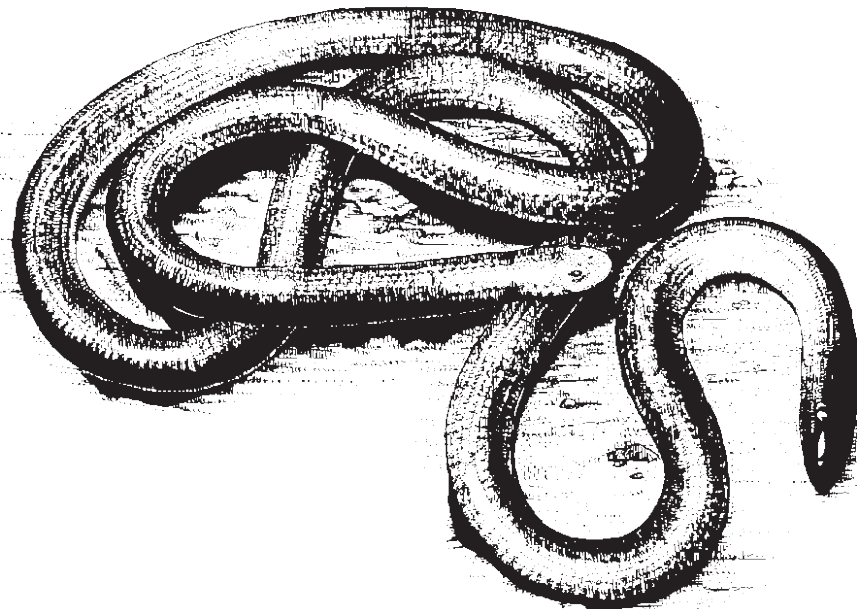
Curiously, however, embryonic blind snakes have normalised eyes, which suggests that their eyes became smaller as they evolved a burrowing lifestyle. Blind snakes spend most of their time below the ground or in leaf litter, though some maintain permanent tunnels in ant or termite nests. When moving forward through burrows they use a small spine on the end of the tail as an anchorage point.

Blind snakes sometimes emerge into the open at night to cross hard surfaces or when the earth is saturated by rain. They have even been observed swimming in clear water and some have been found quite high up in trees.

Studies of the feeding habits of blind snakes indicate that they follow the scent trails of ants which live in colonies. These ants leave pheromone markers as a guide for other individuals in the group. Blind snakes were observed placing their snouts on the trails and flicking their forked tongues as they followed them. They ignored trails of ants which are solitary foragers and therefore rarely leave a scent as a guide to their fellows. They also ignored trails of earthworms and termites. Some large blind snake species, protected by their thick scales, feed in the nests of ferocious stinging bulldog ants.

Small ones, however, can be stung and die as a result. Blind snakes live in all types of habitats from deserts to tropical rainforests. Some are restricted to very limited locations. Harmless, non-venomous and largely defenceless, they fall prey to bandicoots, birds, cats and other snakes, notably the black and white striped bandy bandy which is believed to feed exclusively on blind snakes.

In north America, screech owls carry local blind snakes to their nests where they are employed to feed on insect larvae which would otherwise parasitise the chicks.



Facts and stats on Orchids

The word 'orchid' comes from the Greek word 'orchis' which means testicle, a reference to the paired tubers of the plants from which



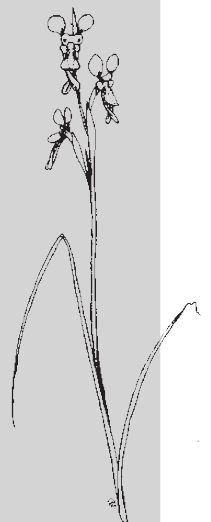
the group got its name, about 2300 years ago. This is one of the largest of flowering plant families with at least 230 species found in the wet tropics. They grow in a wide variety of situations, some of them on the ground and some as epiphytes on trees or on rocks (lithophytes).

Many orchids are pollinated by insects which are provided with special 'landing platforms' on the flowers. The labellum (lip), as this is called, is actually part of the top of the flower but, in most species, the flower twists round during development so that the labellum is more conveniently situated for visiting insects.

Some orchids use sexual deception to trick male insects into visiting them. They mimic the shape and scent of female insects and deposit packets of pollen on males which are fooled into trying to mate with them. Presumably they are slow to learn, because they then carry this to the next flower, performing sexual services for the orchid instead.

One seed capsule may contain as many as four million tiny seeds, as fine as dust. Unlike the seeds of other plants they do not contain any nutrients for the germinating plant. Instead, the seed must meet up with a mycorrhizal fungus. The two set up a mutually beneficial relationship without which the orchid seed would not germinate and grow. Only a small proportion of the seeds gets lucky.

Epiphytic orchids have roots with an outer spongy layer of cells, up to 18 layers thick, which can rapidly absorb water. Mycorrhizal fungi may also reside there. Swollen stems, and some leaves, store water and food reserves.



Revitalising Rain



By the end of the dry season, our wet tropics is the not-so-wet and rather brown tropics. Suddenly, thanks to the rain, the area is green again and flourishing.

River levels are at their lowest at the end of the dry season. Pools are stagnant, oxygen levels are low and accumulated organic material is making the water increasingly acidic. When the rains start, volumes of water come rushing through the creeks, flushing them out and clearing channels. As waters spread beyond the banks, they carry the

organic material and sediment, enriching the floodplain.

Life in tropical waterways has evolved with water pulses – times of low levels and times of flood. Many animals are sensitive to this and time their breeding accordingly. Nutrients, washed into waterholes by the first storms, fuel an increase in growth of algae and small invertebrates, a valuable source of food for the young of many species. Early rains, therefore, are a trigger for many animals to breed.

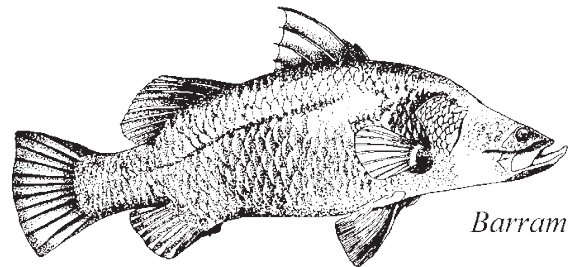
Rain stimulates **frogs** to breed. The males call as a reflex when rain falls and this attracts females, which may carefully choose the best singers for mating. Frogs have suffered particularly badly in the past few years due to poor wet seasons.



Those which did try to reproduce had difficulty in finding suitable watery breeding sites and, if successful, often lost their progeny when puddles dried up. Some females carried their eggs so long they were no longer viable when laid. In addition, lack of insect food led to malnutrition and many frogs died from diseases. The onset of rain brings

frogs out in the open as they optimistically make for the nearest water in the hope of mating. Most male frogs have an inflatable vocal sac below the lower jaw. When calling, the frog inflates this sac through holes or slits on either side of the tongue. Acting as a resonance chamber, the sac amplifies the frog's call; a small group of calling frogs can be heard up to a kilometre away. Although most frogs' vocal sacs inflate externally, in some species it inflates internally so the entire body of the frog swells up. Some male frogs do not have vocal sacs. These frogs tend to live in noisy, fast-flowing streams. Instead of attempting to compete with the background roar, they may signal their intentions by simply waving to prospective partners. Many fish, particularly those in lagoons, breed after the

first storms. Some, such as sooty grunter and certain catfish, make their way upstream seeking flowing water which they need for breeding. Other fish, such as barramundi, ox-eye herring and jungle perch, move in the opposite direction swimming downstream as soon as the rivers begin to flow well. They must breed in salt or brackish water; their sperm, eggs and/or larvae cannot survive in fresh water. Although some young barramundi will spend their lives in estuaries, most move upstream within their first two months and remain in fresh water until they are mature and ready to breed themselves. Wet season floods facilitate their journeys. Early in 2003, fishers noticed serious delays in barramundi mating and spawning, presumably due to the extended dry season, and were concerned that future barra stocks would suffer as a result.



Barramundi

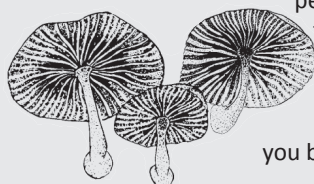
Waterbirds in Australia tend to be nomadic, their movements dictated by rainfall. When the wet season begins they spread out, moving away from the shrunken pools and billabongs which served as a refuge during the long dry season. Flooding provides ideal conditions for many of these birds to breed. Indeed the sexual cycle in some ducks is triggered by an increase in water level. In southern Australia, where most rain falls in winter, this may be spring while in the north it occurs as the wet season sets in.



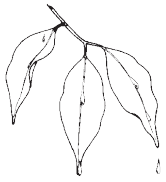
Australian white ibis nest in coastal wetlands. They wait until water reaches at least a metre in depth in their breeding grounds, just to be sure it will not dry up. The male defends his territory aggressively and the pair nests on a platform of vegetation in low bushes. If the adventurous young fall in the water, they are able to swim to safety.

When the rains start, magpie geese feed on young shoots of grass until wild rice seeds provide enough food for them to breed, usually from March to June.

January rains led to an explosion of fungal fruiting. Mushrooms have been popping up in decorative clusters, but a number of

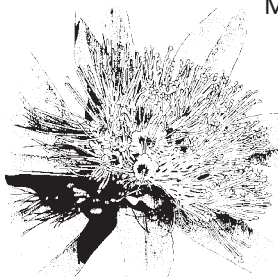


people have been given hospital treatment after eating them. Consuming the wrong mushroom can have fatal results so beware! Eat only what you buy in the shops or grow yourself.



Water soaking into the roots of the plants leads to a flush of growth, the new leaves on many tropical plants glowing pink, red or bronze.

The pigment, anthocyanin, which creates this colourful display, may act as a sunscreen to protect the tender young leaves as they are developing. The leaves of most rainforest plants taper to a point at the end. This 'drip-tip' serves to drain the water quickly off the leaf. Lichens and algae, which would interfere with the leaf's ability to photosynthesise, are less likely to grow on dry leaves. Warm, dry leaves are also able to photosynthesise more efficiently than cold, wet ones.



Golden penda

Many trees flowered prolifically during the dry – a common response to stress – so they are now producing fruit in abundance for birds and other animals. However, tropical plants flower and produce fruit all year round, otherwise fruit- and nectar-dependent animals would not survive to perform their dispersal and pollination duties.

Summer rains, therefore, also instigate flowering. **Golden penda** (*Xanthostemon chrysanthus*) has been observed to flower particularly prolifically five weeks after cyclones, although whether rainfall, wind, air pressure or some other factor is responsible is not clear.

Insects thrive in response to summer warmth, humidity and rain, their rush to breed forming the basis of a flourishing food chain which includes frogs, fish, insectivorous bats, birds and reptiles in its links.

A shower on a humid evening may inspire winged termites to spill out from their nests. Appearing in sudden clouds, most of these sexually active adults have a limited future. Birds wheel and swoop, darting at the winged bonanza. Those termites which escape lose their wings when they fall to the ground but, if they are able to mate, may establish a new colony.

Beetles, their development from larvae accelerated by summery conditions, become suddenly abundant at the beginning of the wet season. The timing of their appearance has led to many being called Christmas beetles, but this title belongs not to one species but to several, each area having its own 'Christmas beetle'.

Flower scarabs are particularly noticeable as they fly by day, buzzing in large numbers around blossoming plants. Having spent years living below ground, **cicada** larvae respond to warm humid weather by climbing up vertical supports and splitting out of their skins as winged adults. Summer days can be dominated by the deafening sound of singing males. They can only perform if the air temperature is high enough and fall silent when it drops below a certain level.

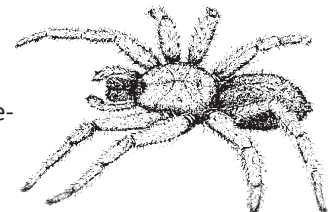
Some birds visit the wet tropics only at this time of year, to breed.



Buff-breasted paradise-kingfishers fly to northern Australia from New Guinea to raise their young on the insects, frogs, lizards and snails which suddenly become bountiful in the wet season.

Heavy rains can cause **subterranean creatures** to make an unexpected appearance above ground. Blind snakes (see p3) and worms slide out of their flooded burrows to avoid drowning. Walkers in upland rainforests may come across the extraordinary Queensland blue worm which can grow to 60cm with a 2cm diameter, although there are reports of some individuals reaching two metres in length. It varies in colour from turquoise to grey-blue.

Whistling spiders are also forced out of their burrows by flooding and may wander into houses to give the occupants a fright. Australia's largest spiders, they normally stay out of sight during the day in metre-deep silk-lined burrows. Although their bite is not considered life-threatening, it can be painful and cause sickness.



Pied Imperial Pigeon image courtesy of Deb Pople

Beautiful white and black **pied imperial pigeons**, with their soothing cooing calls, are a summer feature of our forests and gardens. These birds have a delightful habit of soaring into the sky and then suddenly dropping down again, their white plumage sometimes highlighted against a grey sky. Pied imperial-pigeons disappear at the end of the wet season, having come to Australia from New Guinea to take advantage of fruiting trees and predator-free offshore islands for nesting. The parent birds take it in turns to visit the mainland to feed each day, one staying with the egg or chick. In the evening large flocks can be seen winging their way home. In the past these flocks were truly enormous, but shooting and rainforest clearing have seen a dramatic decline in their numbers with only a few hundred nesting in places where once there were up to 100 000.

Metallic starlings, with black iridescent plumage and prominent red eyes, dash at breakneck speed from fruiting tree to fruiting tree in exuberant flocks, sometimes hurtling low along streets at such speed that pedestrians, cyclists and drivers alike are inclined to duck and cringe, certain they will be hit. These sociable birds build colonies of messy, globular nests, often dangling by the hundred from street trees.

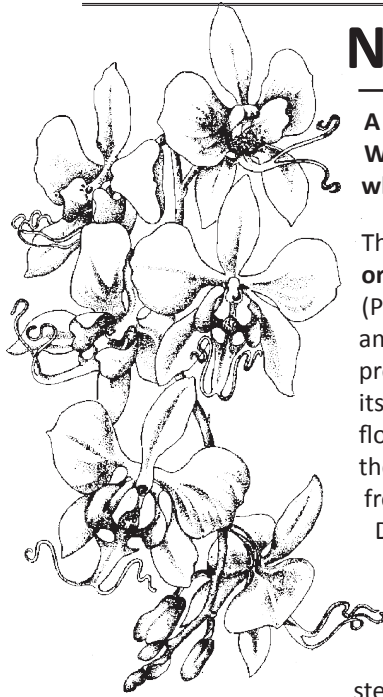


Their lively comings and goings and noisy chattering are a prominent feature of summer in the tropics. Although most starlings return to New Guinea by April, some can be seen in the wet tropics through much of the winter. These may be juvenile birds, or they may be starlings which nest further south and as part of the northwards migration fly only as far as the wet tropics for winter.



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.



The **moth orchid** (*Phalaenopsis amabilis*) produces its beautiful flowers during the wet season, from about December to April. Borne densely on a long, arching stem, each

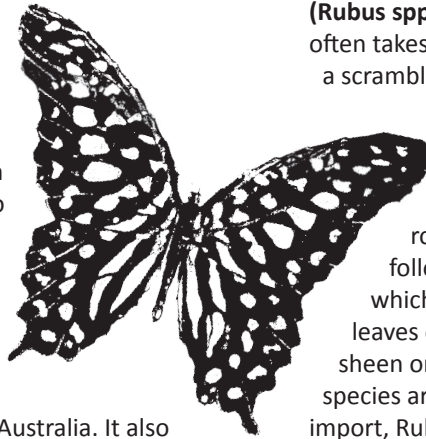
flower measures up to 8cm across. The broad, flat petals, which are thought to resemble a moth's wings, are pure white with a little yellow on the lip. Large, pendulous leaves are fleshy and able to store water and nutrients for the plant.



These orchids are epiphytes, growing in partial shade on the lower branches of rainforest trees and sometimes, as lithophytes, on rocks in areas of high rainfall. They are found in lowland rainforests and on lower slopes in the wet tropics as well as at Iron Range and the McIlwraith Range of Cape York Peninsula and in New Guinea.

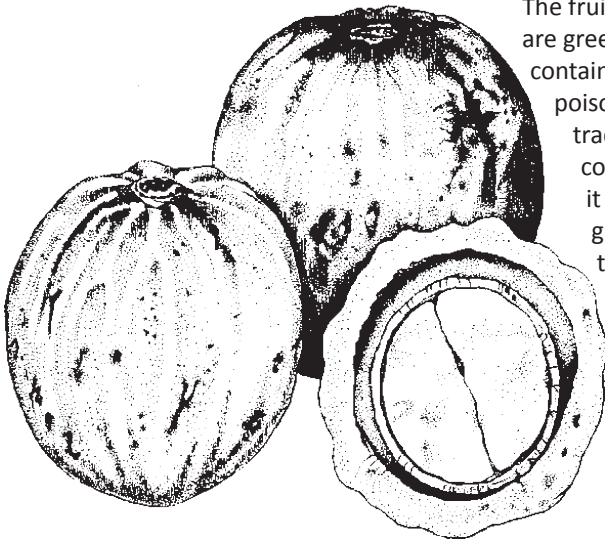
Butterflies become more common during the first part of the year as the flush of plant growth feeds increasing numbers of caterpillars.

Green spotted triangle butterflies are most frequently seen from January to May. This is a tropical butterfly, found only north of Mackay to the



Torres Strait in Australia. It also lives in New Guinea and in south-east Asia, through to India. Living mainly in the rainforest, this butterfly flies with a distinctive rapid, nervous manner, pausing for only a moment to sip nectar from a flower before fluttering off again. Male and female look alike, their black wings heavily marked with bright green. The lower surfaces are duller, with some red spots. Caterpillars feed on a number of plants in the Annonaceae family, notably fairies basket (*Pseuduvaria froggattii*) as well as cultivated custard apple and sour sop trees.

Toxic fruits of **Queensland walnut**, also known as the black walnut (*Endiandra palmerstonii*) ripen between December and April. This large tree, with a spreading canopy, grows in lowland and upland rainforests between Tully and Cairns and produces excellent timber. The fruits, which are about 6cm across, are green to red and ribbed. They contain a large seed which, although poisonous, is an important traditional Aboriginal food. After correct processing and cooking it is said to taste like bread. The ground seeds could also be used to lure brushturkeys for capture.



In spring and summer tasty red fruit can be found on native **raspberry bushes** (*Rubus* spp). This plant often takes the form of a scrambling shrub, its branches



covered with small thorns, and tends to grow in disturbed forests and roadsides. White flowers are followed by the raspberries which are popular with birds. The leaves often have a metallic, bronze sheen on the underside. Several species are native to Australia but one import, *Rubus alceifolius*, from south-east Asia, has been declared a weed due to its aggressive lantana-like growth habit and tendency to choke tracks and rainforest edges.

The call of the **noisy pitta** is seen as heralding rain. Sounding like a questioning 'walk-to-work?', the call is usually repeated twice, pairs using it to keep in contact in the dense forest. This call is the best indication that these lovely birds are around, although they fall silent after the breeding season. In spite of their quite colourful plumage they are very unobtrusive as they fossick around the forest floor in search of invertebrates. Piles of empty snail shells are an indication of pitta presence, the birds bashing them open on favourite stones or pieces of wood. Pairs nest during the early wet season, building a domed construction usually on the ground and often in the buttresses of trees. Sometimes a patch of moist mammal dung, collected by the birds, forms an entrance mat and may serve to disguise the smell of the chicks from predators.

