

## FLORA

### BIRD POLLINATOR OBSERVATIONS IN CARNIVOROUS PLANTS

Allen Lowrie

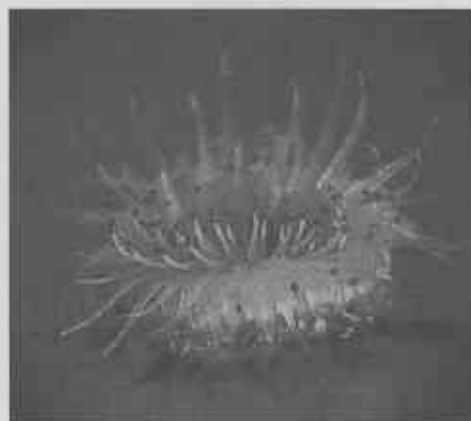
WHILE insects undertake the majority of pollination activity amongst carnivorous plants, some recent observations have shown that this is not always the case, it appears that birds may pollinate some species. A colleague, Alan Burbidge, passed on to me an observation from Cheryl Gole [the WA organiser of Birds Australia's Atlas survey - *Ed*] who had watched a honeyeater feeding on a climbing *Drosera*. From her pressed specimen, I determined the plant to be *Drosera macrantha* subsp. *macrantha*.

Cheryl reported: "On the 7<sup>th</sup> Aug, 1998, between 11.00 am and 12.25 pm, I observed a Brown-headed Honeyeater feeding from the flower of a *Drosera* species. The bird was observed feeding at the flower and did not appear to be taking insects from the leaves of the plant. The bird was perched on one of the dead branches of a fallen shrub and the *Drosera* was twining through the twigs and branches of this."

Although Cheryl's observation that she did not see the bird taking insects from the leaves - ie, insect prey caught by the dewy glands on the leaves - Brown-headed Honeyeaters do take insects as part of their diet. Perhaps the bird may have been taking the small, free-roaming *Drosera* bugs which are always present on *Drosera* species throughout Australia (see Lowrie 1998, pp34-36).

On the other hand, the bird may indeed have been taking nectar from the flowers. The anthers of this species are long and erect, as are its branching stigmas. A honeyeater taking nectar from around the base of the ovary would certainly have its facial feathers dusted with pollen. In the process of nectar-gathering, pollen would be transferred from the anthers to the stigmas, from one flower to the next, as the bird went about its feeding activity.

The climbing species of *Drosera* have certainly evolved to provide the perfect conditions for birds to



*Drosera macrantha* subsp. *macrantha*

visit their flowers. By growing up through the branches of low shrubs they have not only managed to display their flowers well above the supporting vegetation, but have also provided many strong host-plant perches for the birds to gain access to the flowers. These quite delicate climbing *Drosera* species would not stand up to birds climbing along their length. It makes sense to provide strong nearby perches for your pollinator visitor.

There are a number of climbing *Drosera* species in south-west WA with one *D. macrantha* subsp.

*planchonii* extending to the eastern states of Australia. Species such as *D. pallida*, *D. subhirtella* and *D. erythrogyne* to name a few, may also be pollinated by honeyeaters. It is interesting to note that all of these species climb up their supporting host shrub by cementing some of their alternate leaves, especially the longer ones, onto various parts of its supporting host. It always amazes me that these climbing species, using only a small number of leaves for attachment, always manage to openly display their flowers above or to the side of their anchor host.

The cementing process of the leaves to their anchorage post is also an amazing adaptation. The long glands around the rim of the lamina not only catch insect prey but when needed can also be used by the plant as support on nearby branches of shrubs. When glands come into contact with a suitable anchorage position a number of glands somehow cement the back of their glands onto the support host. The adhesion is so complete that the glands will break from the rim of the lamina before they will part company with the host branch.

I have often wondered what strange insect could be the pollinator of another carnivorous plant, *Utricularia menziesii*, a common species found north of Perth to east of Esperance. This species captures and digests prey with bladder-like traps which are positioned on and in the wet soil amongst, as well as below, its compact clump of basal leaves. The nectary spur of this species is huge and is generally about three times longer than the lower lip of the flower. It is not only long but thick and wide as well. It contains a large amount of nectar. I have often thought the insect pollinator would have to be one strange insect, to have a proboscis of similar length to the nectary spur of *U. menziesii*!

My thoughts on what insect may be this species' pollinator reminds me of the story of Charles Darwin who received an orchid *Angraecum*

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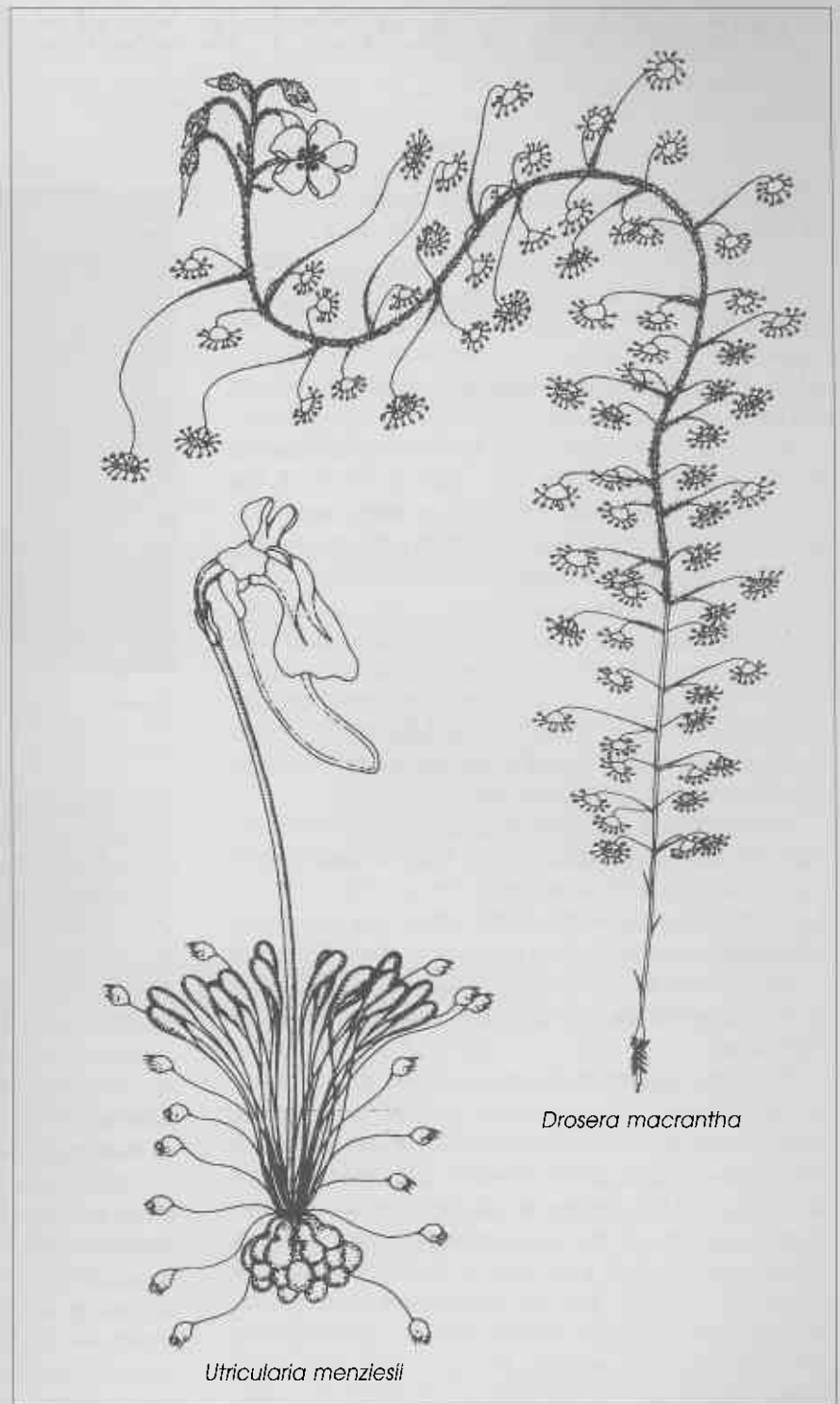
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*sequipedale* from Madagascar with a nectary spur some eleven and a half inches (28.55 cm) long, of which only the lowermost inch and a half (3.75 cm) held nectar. He suggested there must be moth pollinator with an eleven and a half inch long proboscis. Entomologists ridiculed his theory at the time but later Darwin was proved correct when a moth, the pollinator of this orchid, was discovered with an eleven and a half inch long proboscis.

My thoughts of an insect possibly being the pollinator of *U. menziesii* were wrong. It is now known that a bird is the pollinator, in this case a honeyeater. In my discussions with Alan Burbidge regarding Cheryl Gole's observations he told me that another colleague, Greg Keighery, had observed a bird pollinating *U. menziesii* flowers. I contacted Greg and in our discussions he recalled the event he saw.

Greg told me he was botanising on the peaks of the Stirling Range, in particular working on the *Darwinia* species that exist there. The mountain peaks in this region are often within the cloud-line. As the cloud mists were rolling in, Greg observed many flowering *U. menziesii* plants on a nearby moss-covered area. He watched a Western Spinebill hopping along the ground from flower to flower pushing its beak deep into the long nectary spur for its nectar meal, in the process transferring pollen from one flower to the next.

This amazing observation opens up new ideas. When I think about it now, I can see the relationship between *Grevillea* flowers (a common source of nectar for many honeyeaters) and *U. menziesii* flowers. Not only do many species of *Grevillea* have brilliant red flowers like *U. menziesii*, but rather deep nectary tubes as well. Furthermore, many *Grevillea* species display their flowers on and very close to the ground. To Western Spinebills, *U. menziesii* flowers close to the ground are no different



to that of prostrate *Grevillea* inflorescences.

The anther-stigma arrangement of *U. menziesii* is similar to that found in all *Utricularia* species. The stigma is like a hanging tongue, the front of which has the stigmatic surface. At the back of the hanging tongue two anthers are present. As the bird plunges its beak between

the upper and lower lip of the flower to gain access to the nectar deep in the nectary spur, the base of its beak and probably the surrounding facial feathers rub at first against the stigmatic portion of the hanging tongue and as the beak is withdrawn from the spur it pulls pollen from the anthers at the back of the hanging tongue onto the base of its beak.

When the bird visits the next flower, pollen is first placed on the stigmatic portion and fresh load of pollen is deposited when the bird's beak exits the nectary spur.

Both the Greg Keighery and Cheryl Gole observations and interesting discussions with Alan Burbidge have certainly opened a new and interesting area of research on the alliance between birds and carnivorous plants. I hope that this report will stimulate discussion with

others in this area of research. I would be most interested in hearing from anyone of observations they may have seen with regard to the pollination of carnivorous plants either by insects or by birds.

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## **WANT TO KNOW MORE ABOUT CARNIVOROUS PLANTS?**

You should get Allen's three detailed and superbly-illustrated books:

Carnivorous Plants of Australia  
Allen Lowrie

Pub: Uni WA Press

Vol 1 1987

Vol 2 1989

Vol 3 1998