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## NOTES ON THE TAXONOMY OF *HAKEA EPIGLOTTIS* LABILL.

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The genus *Hakea* Shrad. is represented by about 130 species, only a few of which occur in Tasmania where *H. epiglottis* and *H. megadenia* are endemic. *H. megadenia* has been recently described in a review currently being undertaken by Mrs R.M.Barker at the The Botanic Gardens of Adelaide and State Herbarium (Barker, 1991).

My observations of *H. epiglottis* and *H. megadenia* are summarised in figure 1.

Flower colour is quite distinct in both species and there are no intermediate shades. There is never any red in the flowers of *H. epiglottis*. The red illustrated in the flowers in Curtis and Stones (1978) is not true of fresh flowers. I speculate that this is caused by the colour changing as the flowers wilt. This is noticeable in the related garden plant *H. laurina*.

I differ with Barker (1991) about fruit sizes. Barker claims that fruit sizes overlap in the two species, with a maximum length of 28mm for *H. epiglottis*. This may be due to earlier confusion in herbaria collections of *H. epiglottis*, which in Tasmania have been known under the names *H. rugosa* and *H. rostrata*. Neither of these species is now thought to grow naturally in Tasmania.

There is some variation in the populations of *H. epiglottis* between the lowland form at Margate and the highland form at Wombat Moor. The leaves of the Wombat Moor population of *H. epiglottis* are much more appressed and the shrubs are more compact and have a decidedly different appearance. I speculate that there are two ecotypes: one alpine and one coastal. Opposed to this view is the fact that I have not seen any intermediate populations. In fact the common species at middle altitudes in *H. lissosperma*. More work is required to establish

Character	<i>H. epiglottis</i>	<i>H. megadenia</i>
Fruit Size	14–19mm	20–29mm
Flowering Time	October – December	April – May; male trees flower more prolifically
Flower Colour	Bright lemon-yellow	White to cream or pale greenish-white
Habit	Bushy, compact; nothing higher than two metres observed	Upright and up to five metres high
Lignotubers	None noticed but stem crooked from ground up	None noticed; stem goes straight up
Reproductive habit	Dioecious, although one or two mostly male trees supported a single small fruit	Dioecious

**Figure 1.** *H. epiglottis* from Wombat Moor, Mt Field National Park, and near Margate. (Note: The *H. epiglottis* illustrated in Curtis (1978) from Wombat Moor and Breona is presumed to be an alpine species. The material collected close to Margate tallies in most respects with the alpine type but I have some reservations until it can be seen in flower.) *H. megadenia* from the end of Van Morey Rd., Margate, Orford and Cherry Tree Hill near Cranbrook. (Note: Fruit from the Cranbrook location was noticeably smoother than from other locations.)

whether these two forms are different enough to warrant the recognition of two species. Perhaps photographs attached to herbarium collections would help with this decision.

An omission from the distribution maps in Barker (1991) is *H. megadenia* from south of Hobart. Mrs Hansson's records show that a population exists on Snug Tiers, close to the only overlapping populations of bi-sexual and uni-sexual populations of *H. epiglottis*.

#### ACKNOWLEDGEMENT

Mrs Betty Hansson of Margate provided local information that simplified both observation and data collection in that area.

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## CONSERVATION ISSUES AT ORIELTON LAGOON AND PITTWATER

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The National Parks and Wildlife Service proposed a nature reserve for this area, some 15 Km. north-east of Hobart, in 1981. In a leaflet outlining the proposal six special features justifying reserve status were given:

1. *The area is of world importance as migratory birds from as far as the Arctic Tundra stop at Pittwater, their major summer feeding ground in Tasmania. It is one of the most important wader habitats in Tasmania particularly for Eastern Curlew and Lesser Golden Plover. It has been estimated that the proposed reserve area holds about 15% of the non-breeding wading birds that spend the northern hemisphere winter in this state.*

2. *This Reserve will greatly improve the protection afforded saltmarsh plants and the communities in which they live. At present only 3% of Tasmania's saltmarsh vegetation is reserved. One plant, the beautiful silky wilsonia (*Wilsonia humilis*) is uncommon except near the mouth of the Coal River.*

3. *The area is an extensive and diverse wetland with abundant birdlife close to Hobart, and thus is ideal for education and research, for which it is already used by many people.*

4. *The area is scenically important from the point of view of travellers on the Arthur Highway and is of aesthetic value to people living around the area, for example, at Penna and Midway Point.*

5. *Around the rocky shores of Pittwater is the largest known concentration of the small Tasmanian-endemic seastar *Patiriella vivipara*.*

6. *Orielton Lagoon often contains large populations of waterfowl and is considered to be a significant refuge in times of drought. The Grey Teal and Hoary-headed Grebe are nomadic species which are sometimes almost absent from Tasmania. Following periods of mainland drought subsequent to good breeding conditions, flocks numbering hundreds of these species have been noted on Orielton Lagoon. The lagoon also is the only place in the Hobart area where the mountain Duck and Great Crested Grebe are regularly seen.*

Subsequent studies have indicated the importance of Orielton Lagoon as a migratory wader habitat (see Appendix A), and Prof J. Kirkpatrick has reported that Railway Point is the most important area of saltmarsh at Pittwater and as such is worthy of inclusion in the proposed reserve.

Now ten years later, the reserve has still not been declared, even with a much reduced proposal. At the time of the original proposal the Airport Authority successfully lobbied for the exclusion of Barilla Bay and the Sorell Council refused to allow the area across Sorell and Iron Creeks (near Sorell township) to be included. The latter area, especially at the mouth of Sorell Creek, is the main feeding area for larger waders; Eastern Curlews and Godwits.

Some members of the Bird Observers Association of Tasmania have been striving for twenty years for the protection afforded by a nature reserve. The area is already on the register of the National Estate (1982) and when Australia signed the Convention on Wetlands of International Importance (the RAMSAR treaty of 1972) Pittwater-Orielton Lagoon was one of the areas Australia listed.

None of this gives the bird life protection against activities such as horse-riding, trail-bikes, off-road vehicles and dogs not on a leash. These are all factors associated with increasing urbanisation, notably at Midway Point and around the shores of Orielton. The worst effect of urbanisation has been that all of Midway Point's sewage has been deposited into Orielton Lagoon since 1969. Sewage ponds are a favourite habitat for waders and waterfowl so in the short term the birds may have benefited at Orielton. It is the remedies proposed to deal with problem of odours caused by decomposing algae, however, that immediately threaten the birdlife.

In 1990 the Sorell Council's consulting engineers produced a report recommending bulldozing of a 20 metre wide section of shoreline and infilling of the very bay in the north west corner of the lagoon that the waders use. The algal blooms stem from high nutrient levels caused by sewage and run-off from agricultural land where fertilizers have been used. Nutrient-rich water is retained in the lagoon by virtual impoundment of what was originally a shallow bay; first by the construction of the causeway and bridges, then replacement of the bridge with culverts and finally in 1962 weirs were placed on the culverts.

The history of the lagoon and its biological processes is well documented (Buttermoore, 1977) in the only significant scientific paper on Orielton Lagoon.

Establishing a Nature Reserve for Pittwater-Orielton will ensure that the area and its birdlife get automatic consideration when any plans or action to modify the habitat are proposed. There are at least 9 state government departments or authorities and municipal councils that have control over some aspect of Orielton and any one of them is likely to take action without informing the other.

The present State government was first approached by the Bird Observers Association in September 1989, and while the Department of Parks, Wildlife and Heritage supports the proposal, no decision has been made. Clearly, more widespread support for the reserve is needed. Tasmanian Field Naturalists are therefore urged to write to the Minister for Parks, Wildlife and Heritage, Harry

Holgate, requesting this. Like so many wetlands it has been subjected to human abuse but it is not yet beyond redemption.

## APPENDIX A - WADER COUNTS AT ORIELTON/SORELL

The Bird Observers Association of Tasmania conducts annual summer and winter wader counts at several locations in the Derwent River Region of southern Tasmania. The following table provides estimates of summer wader numbers at Orielton/Sorell (labelled O-S) compared with totals for the region based on estimated numbers at seven regional sites. Details are contained in Bulman 1988, 1989, 1990.

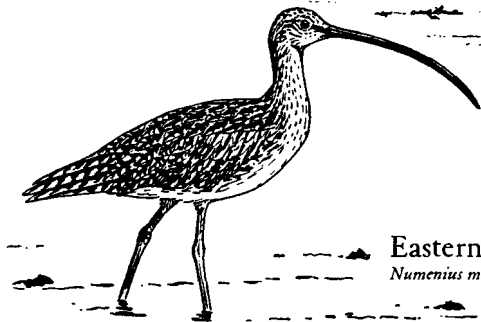
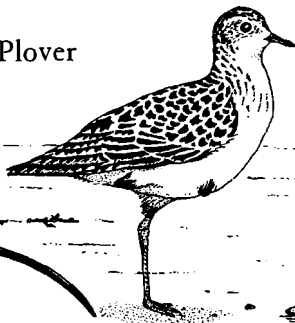
Of particular note are the high proportions, compared to regional totals, of Lesser Golden Plover and Eastern Curlew numbers at Orielton/Sorell.

	1989		1988		1987	
	O-S	Total	O-S	Total	O-S	Total
Pied Oystercatcher	120	430	31	378	78	439
Sooty Oystercatcher	0	14	0	3	0	6
Masked Lapwing	183	330	31	280	95	198
Lesser Golden Plover	52	57	233	319	101	168
Hooded Plover	0	4	0	9	0	4
Mongolian Plover	1	1	0	0	1	1
Double-banded Plover	3	4	0	10	0	0
Red-capped Plover	15	52	16	93	13	88
Black-fronted Plover	0	0	0	0	0	0
Eastern Curlew	114	120	107	116	106	133
Whimbrel	2	2	1	1	2	2
Greenshank	29	46	54	79	34	43
Bar-tailed Godwit	104	104	96	99	76	76
Red Knot	7	7	4	4	2	3
Pectoral Sandpiper	2	2	0	1	0	0
Sharp-tailed Sandpiper	19	19	19	44	38	50
Red-necked Stint	195	1065	80	1973	254	2679
Curlew Sandpiper	300	750	250	1345	120	1425

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## Lesser Golden Plover

*Pluvialis dominica*

## Eastern Curlew

*Numenius madagascariensis*

Illustrations from *The Atlas of Australian Birds*, Melbourne University Press, 1984, courtesy of RAOU.

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## BOOK REVIEW

### Insects as Predators

by T. R. New

New South Wales University Press, 1990

Reviewed by Peter McQuillan

Predatory insects, such as ladybirds, are those which hunt and kill other insects for food. This engaging book by Tim New, a reputed insect ecologist, is about their biology and diversity and makes accessible a large amount of information gleaned from the vast literature on this topic. Predation is a key process in the functioning and regulation of most ecosystems and has been subject to considerable study, much of which is summarised in this book.

Within Tasmania it is possible to observe both bizarre and familiar examples. Dragonflies, which feed on aquatic animals when nymphs, leave the water to become an good example of an efficient solitary predator: alert, manoeuvrable, with excellent vision, legs modified for capturing prey in the air and strong mandibles. Ants, on the other hand, are social, hunt co-operatively and hence find and subdue a wider range of prey. But ants themselves can fall victim to the voracious ant-lion, the larva of a delicate lacewing which excavates treacherous steep-sided funnels in sand beneath which it lurks awaiting a victim which it sucks dry. Worthy of special note is the cave-dwelling Tasmanian glow-worm, *Arachnocampa tasmaniensis*, the larva of a fungus-gnat, which attracts small insects to its brightly lit body to become entangled in sticky threads hanging from the cave roof.

Chapters 1-3 introduce the topic of predation and reviews the various types of insects which make their living as predators. Chapters 4-7 discuss aspects of the ecology of predators and the predation process including foraging strategies, selection and capture of prey, and cannibalism which is widespread. Since predators are so common and efficient the need to avoid being eaten is of paramount importance to many insects. Chapter 8 reviews some interesting defence strategies employed by potential prey to outwit their predators. The book concludes with a chapter on *applied predation* highlighting the use of predatory insects in biological control programmes which help offset the need for pesticides.