WESTERN AUSTRALIAN INSECT STUDY SOCIETY

NEWSLETTER

DECEMBER 2012

WESTERN AUSTRALIAN INSECT STUDY SOCIETY INC.

COMMITTEE OF MANAGEMENT 2012 - 2013

President: Peter Langlands (0438 940 386, peter.langlands@grs.uwa.edu.au)

Secretary: Brian Heterick (w/hrs 9266 3598, B.Heterick@Curtin.edu.au).

Treasurer: Kylie Webster (0439 968 556, crazylynx@hotmail.com)

Councillors: Eric McCrum (9295 3344)

Peter Ray (9298 8145)

Jonica Foss (92719601)

Suzie Travers (0419 919 637, suzey_travers@hotmail.com)

Membership: All enquiries regarding membership and any subscriptions should be forwarded to the Secretary, Brian Heterick, w/hrs 9266 3598, B.Heterick@Curtin.edu.au).

Newsletter: All contributions and enquiries should be directed to the editor, Terry Houston (w/hrs 9212 3742, Terry.Houston@museum.wa.gov.au)

Web-site: http://www.insectsocietywa.org.au

****

Contributions to the Newsletter by members are welcome
Tell us about your entomological activities, observations, or concerns

****

The Society gratefully acknowledges the support
of the Western Australian Museum

Cover illustration: a hawk moth, *Daphnis moorei* (Sphingidae) photographed at Kununurra, WA, by Joe Froudist. The identification was provided by hawk moth expert Max Moulds who noted that *D. moorei* (first described in a different genus in 1866) was restored to full species rank in 2010, having been treated as a subspecies of *D. hypothous,* a species found through Indonesia and Papua New Guinea. Although, currently, there are no records of *D. moorei* from WA in the literature, Max has recorded the moth as far west as Derby.

Coming Events

NEXT MEETING
Wednesday 12 December, 2012

*****Pre-meeting picnic*****

Members are invited to join the WAISS Committee from 6.30 pm onwards for a BYO picnic on the lawns near the Kings Park Administration Centre. Look for the butterfly on a pole.

The general meeting will commence as usual at 7.30 pm in the Administration Centre.

Main feature:

Members' Night

Members are invited to bring along specimens, images and stories concerning insects to share with others. As a guide, members should limit their presentations to about 10-15 minutes.

Report on the October Meeting

Main feature:

A 'post-Wet' snapshot of the macro-invertebrates of Northern Territory monsoon vine thickets and their faunal relationships with similar Kimberley habitats

David Knowles was our speaker and the following summary and illustrations are his:

"In April of 2012, a colleague and I undertook a trip to the 'Top End' of the Northern Territory with the objective of focused macro-invertebrate sampling of monsoon vine thickets at three localities to the south and south-west of Darwin. Both Berry Springs and Litchfield National Park habitats are inland, whereas Dundee Beach is a coastal locality. Monsoon vine thickets tend to be concentrated around springs (e.g. Berry Springs), riparian systems associated with subcoastal ranges (Litchfield NP) and immediately behind the coastal dunes (Dundee Beach). Vine thickets may grade quickly into wetlands, tea-tree (*Melaleuca*) swamp, and typical northern savannah woodlands. Habitats and ecotones of this type extend across northern Australia from Queensland to the Kimberley and are linear by nature. Requirements include a high water table and a good wet season to survive the hot extended dry season. Thickets also have a large deciduous component in their flora with floral and faunal influences from south-east Asia and New Guinea.

A moth, *Xanthanomis fuscifrons*, from Berry Springs.

The month of April was selected because it marks the end of 'The Wet' which translates into the peak of flowering and leaf growth with the flow-on effect into the fauna. From a practical sampling point of view the rivers and swamps are below peak and the chances of a devastating cyclone are reduced allowing access to habitat via roads that are normally closed during The Wet.

The northern wet season can begin in late October and extend to early May. Many of the substantial vine thickets are virtually inaccessible for much of the most rewarding time to sample for macro-invertebrates. Unless you have lots of money and can afford a helicopter or a large boat, the maximum harvest won't be available to you. As a result there is a sampling skew in favour of the relatively impoverished dry season faunas with marginal penetration into the beginning and end of the wet season.
One of the most rewarding sampling tools for terrestrial and adult flying stage aquatic macro-

invertebrates is the light trap. Using a combination of insect attracting light sources placed adjacent to white sheets of various configurations, and set during prime collecting conditions in the right place at the right time, a bewildering array of local fauna can be recorded.

A jumping spider, *Cosmophasis micarioides*, from Berry Springs. Body length ca. 6 mm.

A cuckoo bee, *Thyreus nitidulus*.

During the daylight hours we would scour tree trunks, low vegetation and flowers, use nets for beating and targeting flying insects, and turn ground debris. Superimposed over the general skewed sampling history of these habitats there are only a small number of people who habitually light-trap these remote areas, and most of these people (like the author) are non-residents.

In one week of sampling these three localities, we encountered hundreds of species. This forced a selective photographic response as there were only so many minutes in a long (often sweaty) day.

The following early trends were evident in this brief snapshot and are compared with snapshots taken in similar habitats and at similar times to the west in the Kimberley region of WA and to the east in the wet tropics of Queensland.

- There is a floral and faunal component that spans northern Australia across a broad range of habitats including monsoon vine thickets.
- During wetter times in the geological history, monsoon vine thickets were far more extensive across northern Australia connecting the biota of the eastern and western extremities of the continent. In this dry period they are now strongly contracted to drainage systems.
- Within this 'panboreal' (across the north) zone there are pockets of endemism in those bioregions (see http://www.environment.gov.au/parks/nrs/science/bioregion-framework/ibra/maps.html) that still retain monsoon vine thickets (e.g. the 'wet' Kimberley of WA, north-western NT, Arnhemland and the wet tropics of Queensland).
- As moths were strongly represented in this sample (including day-flying forms), the following trending comments refer to this biodiverse group.
- Many of the moth species recorded by me in the NT are recorded only from Queensland on some moth web-sites. This trend was also noted following my 1996 Kimberley trip and reflects the dearth of sampling in the NT.
- Another subset of the sample was shared with the Kimberley snapshot and not the Queensland snapshot.
- A minority of species were unique to the Kimberley and western NT. Undoubtedly an intensive complete 'Wet' sampling of the Kimberley and western NT would raise the level of endemism considerably.
- The wet tropics of northern Queensland are relatively well surveyed for their moth fauna and other groups across the board. This high sampling rate is clearly related to higher population levels and better access to habitat during all stages of the northern 'Wet'.

- It was not possible to visit the Northern Territory Museum due to time constraints and, therefore, I was unable to easily identify a proportion of our sample.

Above: a leaf beetle (Chrysomelidae) from Berry Springs.
Below: a plant bug (Pentatomidae) from Dundee Beach.
(Both unidentified)

In conclusion, for those seeking entomological adventure that combines the capacity to discover new species, poorly known species, rare species, threatened species, and reveal major range extensions, the remote Kimberley and western NT offer many opportunities. Make sure you take a light trap and dress for mosquitos and sandflies; and remember - near waterways you could become crocodile prey!"

ooOoo

Member in Focus:

Joe Froudist

Joe informed us that he originally qualified as a zoologist but subsequently became interested in microbiology. The latter subject became the focus of his career for nearly thirty years. Later still, he switched to horticulture and landscaping and currently does some eco-tour guiding and land development consulting.

Joe Froudist

Joe has had a passion for the natural world all his life. Other passions include travel and photography. Fortunately for WAISS members, Joe has taken an interest in "the little things that matter". He screened photos of various arthropods (and a couple of molluscs) from some of his travels. We saw insects from places such as the Galapagos, Amazon rain forest, the mountains of Colorado, various places in Australia, Madagascar and other areas. Photos included the famous giraffe beetle (actually a weevil) from Madagascar, a huge stick insect from the southern Kimberley, some amazing caterpillars, dragonflies, grasshoppers and other insects from all over the world. Also featured was a beautiful hawk moth photographed in Kununurra [see cover]. Additionally, we enjoyed a good array of Joe's spider photos which included a range of *Argiope* species from various parts of Australia and *Nephila* spiders from places such as South Africa, Mauritius, Madagascar and northern Australia.

Margaret Owen and the editor

A female giraffe beetle, *Trachelophorus giraffa*, from Madagascar. The male has a much longer 'neck'.

Larva of a hawk moth from Madagascar.

A huntsman spider found at Kununurra, WA.
All three photos above: Joe Froudist.

News, Notes & Announcements

New Member

Gasparo Marsala (City Beach; interested in insect breeding and termite ecology)

'Megamouth bee' scientifically named
Members will probably recall reading or hearing about the discovery in 2010 of an unusual new bee species in Forrestdale (Perth). Because of the large head and jaws of the males, it was dubbed the 'megamouth bee'. A formal description of this bee has now been published (*Australian Journal of Entomology* **51**(4): 248-257). Authors Terry Houston and Glynn Maynard named the species *Leioproctus* (*Ottocolletes*) *muelleri* in honour of Mr Otto Mueller who first spotted the bee at the Forrestdale site. The species did not fit any of the existing subgenera of the large genus *Leioproctus* and so the new subgenus *Ottocolletes* was created for it.

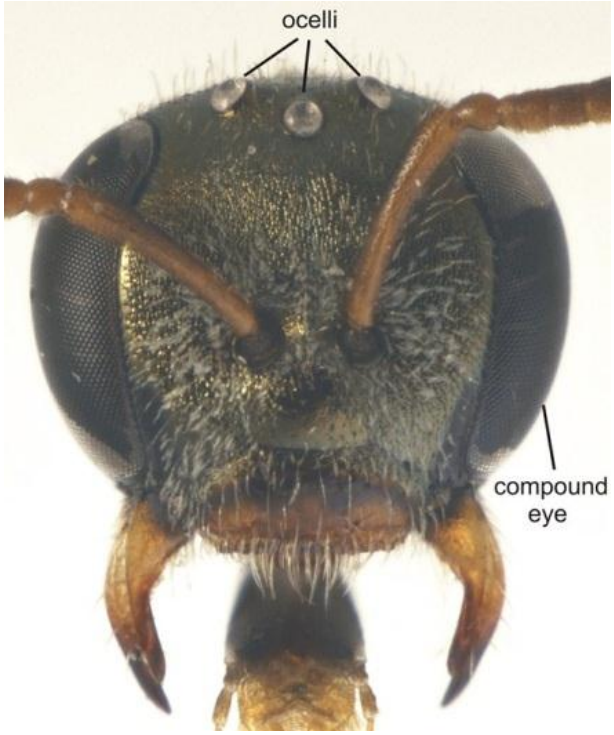
Insect Anatomy

(This is the first in a proposed series of articles intended to cover some basic aspects of insect anatomy, form and function.)

Insect eyes
Here is a quick question and answer:
Q - We all know that spiders have eight eyes but is it true that insects have five eyes?
A - Yes, as a general rule that is correct, although some have fewer. Bees have five eyes and so do cockroaches. The five are made up of a pair of compound eyes and, between them, three simple eyes (see images next page). This is the primitive ground plan for insects, although, in the course of evolution, the ocelli (or at least the lateral pair) have been lost in some insects.

Compound eyes provide insects with vision. The function of the ocelli is not so clear. Each ocellus consists of a transparent lens overlying a group of light-sensitive neurons. However, while they receive light, they do not form images but appear

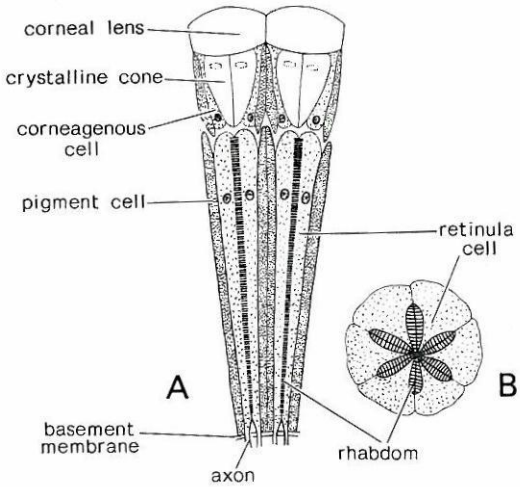
to function more like light-meters and are associated somehow with flight. Insects that have become flightless secondarily usually do not have ocelli. By contrast, some bees that habitually forage at dusk or in the dark of night possess enlarged ocelli, presumably to gather more light (see image below).



Head of a native bee showing the compound eyes on the sides of the head and the simple eyes or ocelli on the crown. Photo: Terry Houston.

Head of a tropical Australian bee (*Meroglossa gemmata*) believed to be nocturnal. Notice the relatively large, glassy ocelli. Photo: Terry Houston.

Compound eyes are composed of hundreds or thousands of individual units called ommatidia. Each ommatidium has a complex structure as shown in the diagram below.



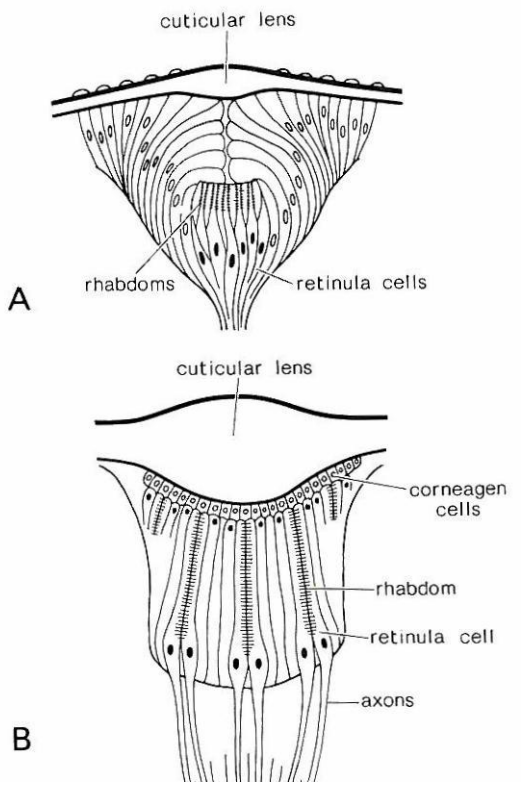
Longitudinal sections of two ommatidia (A) and transverse section of a retinula cell (B) (from *The Insects of Australia*, CSIRO, 1991).

Individual ommatidia register just the light falling on their facet but, collectively, they provide the insect with an image. While it is popularly believed that insects must see only coarse patterns of spots, watch flies, bees or wasps chasing one another at high speed among the branches of trees and shrubs without colliding with anything and you will be left in no doubt that these insects have a very effective visual system.

While compound eyes, unlike those of humans, are fixed, they are capable of adapting to changes in light levels. Our eyes adapt by changes in the diameter of our pupils. Insect eyes adapt by the movement of pigment within each individual ommatidium. Sometimes, insects appear to have pupils (or at least a dark spot in each compound eye) which appears to move to follow the observer. However, this is just an optical effect, the ‘dark spot’ occurring where we look straight down the ommatidia.

Compound eyes are found in both nymphal and adult stages of insects that develop gradually without pronounced metamorphosis (e.g. cockroaches, grasshoppers and bugs) but they are not found in larvae of those insects with complete metamorphosis (e.g. flies, moths and butterflies,

ants, wasps and bees, and beetles). Of course, larvae that live in dark environments such as in the soil, wood or other plant tissue or in constructed brood cells have no need of vision. Larvae that live freely - such as moth caterpillars and some beetle larvae - possess clusters of one to six simple eyes on each side of the head. Called 'stemmata', these have the structure of ocelli in some insects but, in others, they are more like the ommatidia of compound eyes.



Sections of ocelli: (A) of a water beetle and (B) of a dragonfly. Notice how much simpler in structure they are compared with ommatidia. (From *The Insects of Australia*, CSIRO, 1991).

Bug-Eye

(Observations of insects in the field.
Members' contributions welcomed)

Larvae of the smoke-bush sawfly

Thanks to WAISS member Sian Mawson, a tiny but remarkable sawfly, *Trichorhachus* sp. (Argidae), featured on the cover of the October issue of this newsletter and was the subject of a brief article on page 7. On 13 October, Sian revisited the site in Welshpool where she had earlier observed adults of this species flying about or settled on the flowers of the common smoke-bush. Closely inspecting the flowers once more, she succeeded in finding the sawfly larvae and succeeded in photographing them for the benefit of newsletter readers.

Above: A tiny larva of the sawfly, *Trichorhachus* sp., is dwarfed by Sian's fingers. **Below:** the larva in closer view. Its pale colouring helps it to blend in among the flowers. Photos: Sian Mawson.

The caterpillar-like larvae are herbivorous and feed on the flowers of the smoke-bush.

Argid sawflies are related to the larger sawflies of the family Pergidae, the larvae of which are usually gregarious, feed on eucalypts and are known as 'spitfires'.