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SKAPHION
The Weekly Newsletter of the Platygastroidea Planetary Biodiversity Inventory

The maritime platygastrid *Echthrodesis lamorali* Masner

by Simon van Noort (Iziko Museums of Cape Town)

Fig. 1. Echthrodesis lamorali lateral habitus.

In July this year I finally relented to leaving my surfboard on top of the car and instead of ripping the cooking winter Cape Town swell went foraging in the inter-tidal zone for what must be one of the most remarkable platygastrids there is. *Echthrodesis lamorali* hangs out with crustaceans, molluscs and other sea creatures in crevices and under rocks in the boulder-strewn marine inter-tidal environment, becoming completely submersed by sea water and exposed to intensive wave action at each high tide. Fairly brave for a creature not much more than 1 mm in length. The species has evolved coping strategies including morphological adaptations, such as a coating of dense setae, hypothesized by Lubo Masner to trap air, for its regular dunking every twelve hours, and wing loss to make sure it remains hanging out with the inter-tidal community rather than with the pelagic sea birds. *Echthrodesis* females are apterous and males have vestigial wings that are reduced to stubs.

Fig. 2. Type locality habitat.

Only a handful of insects occur in the inter-tidal zone, but in the case of *Echthrodesis* there is good reason for the hardship of a marine life. This maritime wasp is a parasitoid of the bountiful egg supply of spiders that themselves have adapted to a salty sea-dog existence. *Desis formidibalis* (Desidae) and *Amaurobioides africanus* (Anyphaenidae) commonly commandeer old limpet shells and secure these to rocks or other shells trapped in the inter-tidal zone. *Desis formidibalis* is appropriately named with fearsome mandibles that are designed to capture their favored crustacean prey item – the Spike-backed isopod *Parisocladus peforatus*. The mandible structure is unusual in that the closure mechanism is a forty-five degree dorso-lateral action, zapping unsuspecting isopods in a secure grasp. The spiders live inside the limpet shells, sometimes communally, emerging at nocturnal low tide to forage for prey. Air is trapped within these shells, probably in sufficient quantity to see through the submersion period of a couple of hours, but the spiders themselves have also evolved gills to enable breathing under water. Eggs are laid within a silken compartmentalized wedge that lines the inside edge of the shell. Each compartment comprises a purse-like structure that is sealed from other compartments, but not all contain eggs – cool red herring there, spider.




Fig. 3. *Desis_formidibalis* in limpet shell; Fig. 4. *Desis_formidibalis*, mandibles; Fig. 5. *Desis_formidibalis* feeding on isopod; Fig. 6. *Echthrodesis lamorali* emerging from host eggs.

When the wasps emerge from their host egg they are protected within the egg sac and occupied shell, but to find new eggs to parasitize they need to disperse across open areas, which, if they have any sense, they do at low tide. The spider populations are localized, but occur in reasonably high density such that a dispersal event may only require circumventing tens of centimeters or even tens of millimeters if it is within a shell. Wing loss is clearly a functional adaptation to weathering the Cape of Storms, but probably also facilitates gaining entry into, or escaping out of the silken egg sac.

Fig. 7. Echthrodesis lamorali ovipositing

I have been privileged to observe and record the biology of *E. lamorali*, details of which I will not go into here as they have been included in a paper due for submission to African Natural History. So far I have only managed to rear *E. lamorali* from *D. formidibalis* eggs collected at the type locality "The Island" at Kommetjie, south of Cape Town on the west side of the Cape Peninsula. Possibly this is because the spiders, with the help of the sharp eyes of a few hot surfer babes and the even sharper eyes of my offspring, are relatively easy to find in their limpet-shell hideaways, whereas on the False Bay coast, limpet-shells are virtually absent (result of competition with the introduced European mussel?). The host spiders occur on both the east and west coasts of South Africa, and as such *E. lamorali* would be expected to be more widespread than currently recorded. Who knows, maybe further up the sub-tropical east coast of South Africa there is another species of maritime wasp to be discovered. If the surfs not up you may find me groveling among the flotsam and jetsam enraptured by another world few appreciate. Ja may bru it's a kiff spot to be, ekse!

Fig. 8. *Ecthrodesis_lamorali* in limpet shell.

References

Lamoral, B.H. 1968. On the ecology and habitat adaptations of two intertidal spiders, *Desis formidabilis* (O P- Cambridge) and *Amaurobioides africanus* Hewitt, at The Island (Kommetjie, Cape Peninsula), with notes on the occurrence of two other spiders. **Annals of the Natal Museum 20: 151–193**.

Masner, L. 1968. A new scelionid wasp from the intertidal zone of South Africa (Hymenoptera: Scelionidae). **Annals of the Natal Museum 20: 195–198.**

Credits: All images by Simon van Noort.

Send your news and suggestions to Skaphion!

Calendar of Events for 2009-2010:

- **3rd International Barcode of Life Conference, 07-12 November, 2009, Mexico City, Mexico**
  www.dnabarcodes2009.org
- **TDWG Conference 2009, 09-13 November, 2009, Montpellier, France**
- **Annual Meeting of the Entomological Collections Network, 12-13 December, 2009, Indianapolis, Indiana.**
- **Annual Meeting of the Entomological Society of America, 13-16 December, 2009, Indianapolis, Indiana.**
- **7th International Congress of Hymenopterists, 20-26 June, 2010, Köszeg, Hungary**
  http://www.hymenopterists.org/hungary.html
- **Society for Systematic Biologists, 25-29 June, 2010, Portland State University Portland,Oregon**

Global Biodiversity Calendar of Events – list of upcoming Biodiversity-related meetings
http://www.cbd.int/events/

Skaphion is the weekly newsletter of the **Platygastroidea Planetary Biodiversity Inventory Project (*PlatyPBI*)**. The term ***skaphion*** *[Gr. skaphion: a small bowl or basin; a bowl shaped like a boat; a hemispherical vase*], refers to an anterior subdivision of the mesoscutum which is unique to the Scelionidae.

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The 3 broad objectives of the project are:

- **species description**,
- **collecting** in areas where fauna of Platygastroidea is poorly known,
- and **phylogenetic analysis** of a monophiletic group.

PlatyPBI Collaborators, Students, Associates & Staff:

AUSTRALIA - Andrew Austin, John Jennings, Sally Thompson (*University of Adelaide*); Marc Dowton (*The University of Wollongong*); **BRAZIL -** Alexandre Aguiar (*UFES*); Beatriz Coelho (*INPA*); **CANADA -** Lubomir Masner (*Canadian National Collection of Insects*); Chris Darling, Antonia Guidotti (*Royal Ontario Museum*); **ENGLAND -** Andrew Polaszek (*Natural History Museum London*); **HUNGARY -** István Mikó (now at North Carolina State University); **INDIA -** Rajmohana K. (*Zoological Survey of India*); **ITALY -** Ferdinando Bin, Eric Conti, Roberto Romani, Giancarlo Salerno (*University of Perugia*); **NEW ZEALAND -** John Early (*Auckland Museum*); **SOUTH AFRICA -** Simon van Noort, Aisha Mayekiso, Beryl Goci (*Iziko Museums of Cape Town*); **USA -** Norman Johnson, Hans Klompen, Luciana Musetti, Alejandro Valerio, Matt Yoder, Elijah Talamas, Charuwat Taekul, Joe Cora, Sara Hemly, Alpana Chaudhuri, Thomas Silver, Marietta Belfanti, Brian Crenshaw, Kyle Kendall, Matt Schneider, Eliza Allyn, Laura Shaffer (*The Ohio State University*); Matt Buffington (*Systematic Entomology Laboratory, USDA*); Hans Clebsch (*Cleveland Museum*).

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