

# **A visit to the entomological collections of the Iziko South African Museum (Cape Town, South Africa)**

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## **Abstract**

A short summary of my visit to the entomological collections of the Iziko South African Museum (Cape Town) is presented.

## **Résumé**

Un petit résumé de ma visite des collections entomologiques du Musée Sud-Africain Iziko (Cape Town) est présenté ici.

In January 2014, with the assistance of my friend and colleague Pascal Rousse, I had the opportunity to respond to the invitation from Dr Simon van Noort to visit and to work in the entomological collection of the Iziko South African Museum for a period of three weeks.

The Iziko South African Museum is a South African national museum which is located in Cape Town. The museum was founded in 1825, the first in the country. It has been on its present site in the Company's Garden, a nice and friendly park, since 1897. The museum houses important African zoology, palaeontology and archaeology collections (www1). The Entomology collections house over a million dry insect specimens, nearly 25 000 bottled Insecta, Arachnida, Myriapoda, Onychophora, Acarina and about 2,600 microscope slides. There are nearly 19,048 type specimens, 7,034 of which represent primary type material. While the collection is relatively small by world standards, it is a very valuable collection in that it is rich in type material and is representative of the threatened and unique Fynbos biome (COCHRANE, 2006). During the years 1980-2000, the Iziko South African Museum received several collections and undertook several major reorganisations especially in the entomological collections. The collection is housed in around 5,028 drawers in 115 cabinets (COCHRANE, 2006) and currently faces a severe space problem, which is being addressed through a major renovation project which will expand the collection facilities three-fold (VAN NOORT & ROBERTSON, 2012).

The last inventory revealed that all entomological collections hold 270,354 catalogued series that had been digitised onto the Specify 6 database (VAN NOORT & ROBERTSON, 2012). Currently (as at June 2014) this figure is standing at 329,739 catalogue records representing 600,853 specimens (van Noort pers. comm.). These specimens include 19,048 types; and represent 2,996 families; 16,269 genera and 47,765 species (Table 1). There are a further estimated 5-10 million uncurated and uncatalogued specimens stored in ethanol in the wet collection.

The collection is of international significance being the best representative collection of invertebrates associated with two global biodiversity hotspots: the Fynbos biome and the Succulent Karoo biome, as well as significant representation of invertebrates from the rest of South Africa and further afield into Africa. The digitized records represent 329,739 catalogue records (=600,853 specimens) for 52,001 localities from 161 countries. 46% of the records are geo-referenced (as at June 2014) (van Noort pers. comm.). Due to the inventory surveys conducted over the last 20 years and the research focus on this order, the Hymenoptera have reached over 300,000 curated specimens, with at least an estimated 5 million further specimens that are currently stored in ethanol waiting processing. The collection also contains one of the most important curated representations of African Platygastroidea and Cynipoidea parasitoid wasps in the world and once the remaining Hymenopteran groups are curated from the ethanol samples, Iziko will hold one of the best global collections of

African Hymenoptera (wasps, ants and bees) (VAN NOORT & ROBERTSON, 2012). But the other groups are also well represented (Table 1), such as the Coleoptera which has over 3,000 type specimens, mainly the result of the work by Louis Peringuey. In size (curated specimens) it is the third largest collection in South Africa after Transvaal Museum and National Collection of Insects, but in terms of types it probably still surpasses these other two collections (VAN NOORT & ROBERTSON, 2012).

Table 1. Number of specimens databased in the entomological collections as at June 2014. Data extracted from Specify database (van Noort pers. comm.). These figures exclude mounted unidentified specimens and the backlog of an estimated 5 million uncurated specimens preserved in ethanol.

| Phylum             | Class             | Order                  | Catalogue records   | Specimens        |               |          |
|--------------------|-------------------|------------------------|---------------------|------------------|---------------|----------|
| <b>Arthropoda</b>  | <b>Insecta</b>    | Blattodea              | 734                 | 1090             |               |          |
|                    |                   | Coleoptera             | 76402               | 148354           |               |          |
|                    |                   | Dermaptera             | 328                 | 549              |               |          |
|                    |                   | Diptera                | 15120               | 40288            |               |          |
|                    |                   | Embiodea               | 14                  | 28               |               |          |
|                    |                   | Ephemeroptera          | 159                 | 294              |               |          |
|                    |                   | Hemiptera              | 9662                | 17965            |               |          |
|                    |                   | Hymenoptera            | 159682              | 301894           |               |          |
|                    |                   | Isoptera               | 6                   | 8                |               |          |
|                    |                   | Lepidoptera            | 34364               | 48604            |               |          |
|                    |                   | Mantodea               | Not databased       | Not databased    |               |          |
|                    |                   | Mantophasmatodea       | 21                  | 43               |               |          |
|                    |                   | Mecoptera              | 60                  | 117              |               |          |
|                    |                   | Megaloptera            | 78                  | 137              |               |          |
|                    |                   | Neuroptera             | 1499                | 2209             |               |          |
|                    |                   | Odonata                | 1476                | 2732             |               |          |
|                    |                   | Orthoptera             | 5230                | 8698             |               |          |
|                    |                   | Phasmatodea            | 229                 | 304              |               |          |
|                    |                   | Pthiraptera            | 1                   | 75               |               |          |
|                    |                   | Plecoptera             | 181                 | 245              |               |          |
|                    |                   | Psocoptera             | 1                   | 7                |               |          |
|                    |                   | Strepsiptera           | 3                   | 3                |               |          |
|                    |                   | Thysanoptera           | 1                   | 1                |               |          |
|                    |                   | Thysanura              | 1                   | 1                |               |          |
|                    |                   | Trichoptera            | 214                 | 412              |               |          |
|                    |                   | <b>Insecta total</b>   |                     | <b>305466</b>    | <b>574058</b> |          |
|                    |                   |                        | <b>Archaegnatha</b> |                  | <b>2</b>      | <b>2</b> |
|                    |                   |                        | <b>Arachnida</b>    | Acarina          | 1053          | 1346     |
|                    |                   |                        |                     | Amblypygi        | 110           | 110      |
|                    |                   |                        |                     | Araneae          | 13864         | 14334    |
|                    |                   |                        |                     | Opiliones        | 704           | 733      |
|                    |                   |                        |                     | Palpigradi       | 3             | 3        |
|                    |                   |                        |                     | Pseudoscorpiones | 343           | 644      |
|                    |                   | Scorpiones             | 4788                | 5215             |               |          |
|                    |                   | Solifugae              | 656                 | 660              |               |          |
|                    |                   | <b>Arachnida total</b> | <b>21521</b>        | <b>23045</b>     |               |          |
|                    | <b>Chilopoda</b>  |                        | 1304                | 1331             |               |          |
|                    | <b>Collembola</b> |                        | 31                  | 71               |               |          |
|                    | <b>Diplopoda</b>  |                        | 1039                | 1100             |               |          |
|                    | <b>Entognatha</b> | Diplura                | 1                   | 1                |               |          |
|                    | <b>Symphyla</b>   |                        | 21                  | 21               |               |          |
| <b>Onychophora</b> |                   |                        | <b>355</b>          | <b>1225</b>      |               |          |
| <b>TOTAL</b>       |                   |                        | <b>329739</b>       | <b>600853</b>    |               |          |

On my arrival, I was greeted in temporary offices of the entomological team. Indeed, all their old rooms (offices and collections) were under reconstruction as a result of a major renovation project. Nevertheless the greeting was friendly and I have started to share the work timing of the team.

Even if the cabinets were not in their normal rooms, all the collections (dry and wet) look very nice, well managed and labelled. It was easy to find all the material needed.

During my visit, my main goal was to sort the Braconidae to subfamily level with the main focus on the ethanol preserved material and undetermined specimens of the dry collections. I had also planned to sort specimens for my ongoing research (with a focus on the subfamilies Orgilinae, Doryctinae, Cheloninae and few other taxa).

After three weeks of work, the following was achieved:

1) in the wet collection, the Braconidae have been sorted to subfamily level for :

- all the Uganda material of 2008;
- around one third of the CAR material (I have nevertheless had a look at the other material, but no time to sort it);
- around 1/4 to 1/3 of all South African material.

2) in the dry collection, the Braconidae have been sorted to subfamily level for :

- all the undetermined material of Gabon;
- all the undetermined material of CAR;
- all the undetermined material of Tanzania;
- all the undetermined material of South Africa.

The total amount of all sorted specimens raised, at least 5,200 specimens from the wet collection and around 4400 specimens from the dry collection. All these specimens are now being digitized into the museum's Specify database by the assistant collections manager, Aisha Mayekiso.

During my research visit, several interesting points were noted:

- The most common subfamilies are the Microgastrinae, the Alysiinae, the Opiinae. There are rather few Cheloninae and Braconinae. The Doryctinae are frequent, but not common. There are very few specimens of large sizes (more than 1 cm) especially in the Braconinae and the Doryctinae. Which is rather surprising based on my experience in French Guiana.

- Among the Doryctinae (from all the localities), the most common genus (70-80% of all Doryctinae) seen is the genus *Spathius* Nees, 1819, followed by the *Rhaconotus* Ruthe, 1854. With the total amount of *Spathius* specimens, this genus could probably be subject to a large revisionary work. I have also sorted around 20 specimens showing frontal protuberances. These specimens probably represent a new genus or genera and have been sent to Dr Sergey Belokobylskij to be included in his revisionary work of this group of taxa. Some specimens (+/- 10) of the rare *Schlettereriella* Szépligeti, 1904 have also been found. I have also seen several specimens of the genus *Neoheterospilus* Belokobylskij, 2006 (mainly in the material of Central Africa). This rare taxa could also be subject to one revision because it is a recently described taxon. Finally, I have sorted only one specimen of the genus *Leptorhaconotus* Granger, 1949, collected in South Africa, which is probably a new species. The genus *Leptorhaconotus* is endemic to Madagascar, with only one other species described from South Africa very recently.

- Among the Cheloninae (from all the localities), the main taxa is the genus *Chelonus* Panzer, 1806 followed by the genus *Ascogaster* Wesmael, 1935. But two specimens from Tanzania + 2 specimens from South Africa of the rare genus *Odontosphaeropyx* Cameron, 1910 have been found. The Tanzanian specimens belong to a new species (BRAET *et al.*, 2014). The 2 specimens from South Africa are *Odontosphaeropyx ruficeps* Cameron, 1910. Including the Holotype, there are only 3 known specimens of this species.

- Among the Orgilinae, a small and infrequently collected subfamily, the most common genus is *Orgilus* Haliday, 1830. Some *Stantiona* Ashmead, 1904 and *Origilonia* van Achterberg, 1987 were also found.

In addition to these subfamilies, I have also noted:

- The presence of a new subfamily from Africa, the Ecnomiinae collected in Mkomazi Game Reserve, Tanzania. The material is described in a companion paper in this issue.

- The rare genera *Philoplitis* Nixon, 1965 (one specimen) and *Fornicia* Brullé, 1846 (two specimens) of the subfamily Microgastrinae have also been found and are now under study.

- The presence of several specimens (from CAR) of the monotypic genus *Thoracoplites* Fischer, 1961. Until now only one species was known in this genus and only a few specimens were available. But in the material sorted and borrowed, I have observed some variations that could be related to the presence of a new second species. In all cases, this material will allow a better assessment of the variation in this genus and between the sexes.

- The presence of several specimens of the small subfamilies Miracinae, Ichneutinae (with mainly the genus *Hebichneutes* Sharkey & Wharton, 1994). The number of specimens of the two subfamilies could also be subject to a revisionary work because of the low number of species known from Africa.

- The presence of the Euphorinae with mainly the genera *Leiophron* Nees, 1819, *Peristenus* Förster, 1862, *Centistes* Haliday, 1835 and *Streblocera*. The rare genus *Streblocera* Westwood, 1833 could also be a future subject for revision, because the type material is easy to find in international collections, and the number of existing species is rather low.

In conclusion, the material available in entomological collections of the Iziko South African Museum is very interesting for large revisions at generic, tribe or subfamily level. I hope my assessment of these holdings will help future loans and analyses of these subfamilies by other researchers.

### References

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