

NOTES ON GEOGRAPHIC DISTRIBUTION

Insecta, Hymenoptera, Bethylidae: range extension and filling gaps in Australia

C. O. Azevedo

Universidade Federal do Espírito Santo, Departamento de Biologia, Avenida Marechal Campos 1468, Maruípe, 29.040-090 Vitória, ES, Brazil. E-mail: bethylidae@gmail.com

The world fauna of Bethylidae (Hymenoptera, Chrysidoidea) is represented by 2,216 species distributed in 97 genera of seven subfamilies. Gordh & Móczár (1990) listed 48 species for Australia, 43 being endemic. Subsequently Gordh (1990) and Azevedo (2005) each described one more species from Queensland, bringing the total recorded species to 50, almost 90% of which are endemic.

The material studied in this contribution was provided by the Australian Museum (AMSA), Australian National Insect Collection (ANIC), New Zealand Arthropod Collection (NZAC) and Canadian National Collection of Insects (CNCI). The identification of the genera was based on the key by Terayama (2003).

A total of 7,128 specimens of Bethylidae were analysed, mostly from ANIC. Nineteen genera were recognized (Table 1), 14 of which were already recorded from Australia. Five genera are recorded here for the first time from Australia: *Chilepyris* Evans, *Prorops* Waterston, *Dissomphalus* Ashmead, *Parascleroderma* Kieffer and *Pseudisobrachium* Kieffer, with the last four genera recorded for the first time from Australian region. *Dissomphalus*, *Parascleroderma* and *Pseudisobrachium* are now known from all zoogeographical regions of the world. *Rhabdepyris*, *Goniozus*, *Sierola* Cameron, *Apenesia* Westwood and *Holepyris* Kieffer were found in large series of specimens, especially *Rhabdepyris*, which is the most speciose genus in Australia. The other four genera have at most seven species recorded from this country. This demonstrates the great potential diversity of Bethylidae in this area.

The small genus *Chilepyris* has a disjunct distribution, with *C. herbsti* Evans, 1964 from

Chile and *C. platythelys* Sorg & Walker, 1988 from New Zealand. Now, two specimens of *C. platythelys* from New South Wales, [label data: Ashfield, 16.VIII.1980, D. Doolan col. (AMSA)], are recorded for the first time from Australia. These specimens were compared with the holotype from Northcote, New Zealand (NZAC). They are very similar to the type, except they lack the stub of Cu vein in the fore wing.

The newly recorded occurrence of *Allobethylus* by Azevedo (2005) and current recorded occurrence *Chilepyris* in Australia emphasizes the association between the Australian and Neotropical bethylid faunas. *Allobethylus* was previously recorded from Americas (four species including one in Hawaii), Japan and Papua New Guinea. Azevedo (1999) has previously pointed out this association through Chile, including *Bethylopsis* Fouts, 1930. *Dissomphalus* and *Pseudisobrachium* are both large genera, and their new record from Australia emphasizes their cosmopolitan distribution. *Parascleroderma* is a holarctic genus with few Afro- and Neotropical species. This new Australian record expands its distribution in the southern hemisphere. *Prorops* is a small genus with two American species and the Afrotropical *Prorops nasuta* Waterson, 1923, which has been exported into many countries for the biocontrol of the coffee borer. This new generic record from Australia might be due to accidental transport through stored grain pests.

Only five of the species that occur in Australia are not endemic. Four of them, *Cephalonomia waterstoni*, *C. tarsalis*, *Holepyris sylvanidis* and *Plastanoxus westwoodi* are cosmopolitan, and they were probably introduced into Australia, since they are known to attack stored grain pests. The fifth non-endemic species is *Chilepyris platythelys*, which also occurs in New Zealand. Berry (1998) records three bethylid species that were introduced into New Zealand under one name; furthermore not all the three species are known to have established, and there is no suggestion that *C. platythelys* was one of these species. This demonstrates that the natural bethylid fauna of Australia is strongly endemic and has remained isolated from the other regions of the world for a long period.

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Table 1. Number of specimens (by genus) examined during this study. Number of species in the world and Australia before the present study.

Subfamily	Genus	World species	Australian species	Number of specimens examined	
Bethylinae	<i>Eupsenella</i>	4	3	95	
	<i>Goniozus</i>	160	7	1,114	
	<i>Odontepyris</i>	27	4	1	
	<i>Sierola</i>	194	3	1,213	
Epyrinae	<i>Allobethylus</i>	7	1	7	
	<i>Cephalonomia</i>	35	2	59	
	<i>Chilepyris</i>	2	0	2	
	<i>Epyris</i>	221	3	448	
	<i>Glenosema</i>	14	1	8	
	<i>Holepyris</i>	107	2	814	
	<i>Lepidosternopsis</i>	7	2	49	
	<i>Plastanoxus</i>	8	1	40	
	<i>Prorops</i>	3	0	2	
	<i>Rhabdepyris</i>	125	18	1,984	
	<i>Sclerodermus</i>	73	1	125	
	Pristocerinae	<i>Apenesia</i>	166	2	1,000
		<i>Dissomphalus</i>	223	0	128
<i>Parascleroderma</i>		27	0	16	
<i>Pseudisobrachium</i>		155	0	10	

Most of species of Bethylinidae that occur in Australia are known only from one state (80%). The only widespread species in Australia are some cosmopolitan species associated with stored grain pests and native species ranging between adjacent states. Most of the Australian species of Bethylinidae are known from eastern areas, that is, Queensland, Victoria, New South Wales.

Finally, the fact that 19 genera of Bethylinidae were found in two museums, and five of them were first records from Australia demonstrates the large gap of knowledge of this family of parasitic wasps in this country and the necessity of more samplings. This conclusion can certainly be extended to other areas of the planet.

Acknowledgements

To M. Murphy, J. Cardale, J. Berry and J. Huber for their kind help during my visit to AMSA, ANIC, NZAC and CNCI respectively. To Albert Ditchfield (UFES) who revised the English version. My trip to Australia and New Zealand was supported by CAPES, grant #AEX1505/98-0, and to Canada by CanaColl grant #194/2002.

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Received February 2006

Accepted May 2006

Published online May 2006