

ChalcIS-D: Information System Chalcidoidea Germany (Hymenoptera)

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Project aims

- Clarifying the depositories of primary types of Chalcidoidea in German museums and insect collections.
- Creating a web-served database of primary types of Chalcidoidea.
- Establishing a database of corresponding literature references.
- Creating digital images of all primary type labels.
- Linking the data to GBIF International via the SysTax database system to make the taxonomic data freely and universally available.



Cooperating institutions: depositories of primary types of Chalcidoidea in Germany (abbreviations: see Introduction).

Project terms

April 2003 – December 2004

Introduction



Chalcidoidea is a very large group of parasitic wasps which is well represented in all parts of the world, except the antarctic region. As many as 400,000 species may exist worldwide [3], but only about 22,000 species have been described [4]. Chalcids are small to minute wasps, ranging from 0.11–45 mm, but usually averaging 2–4 mm in body length. The group includes the world's smallest winged insect which is only 0.11mm long. Chalcid wasps exhibit amazingly diverse life histories and profoundly influence all types of ecosystems. Many of them are important biological control agents in sustainable agricultural systems of agricultural pests, with over 800 species associated with biocontrol programs throughout the world. On the other hand, more than 80 species are known as pests themselves [2].

The Chalcidoidea taxonomy is still highly problematic because original descriptions are poor and often not diagnostic, and identification keys are available for only a few groups. It is estimated that fewer than 5% of the described species can be named without comparison to the type specimen [1], and this demonstrates the critical importance of accessible type information, which in this group is probably more important than in any other group of insects.



Based on a preliminary search of literature, primary type specimens of 200–400 chalcid species were expected to be deposited in insect collections of German institutions. These institutions are:

- Biologische Reichsanstalt für Land- und Forstwirtschaft, Naumburg (BRNG)
- Deutsches Entomologisches Institut, Müncheberg (DEI)
- Institut für Forstzoologie der Universität Göttingen (IFUG)
- Museum für Naturkunde, Humboldt-Universität, Berlin (ZMHB)
- Senckenberg Museum, Forschungsinstitut Senckenberg, Frankfurt (SMUF)
- Staatliches Museum für Naturkunde Stuttgart (SMNS)
- Staatliches Museum für Tierkunde Dresden (SMTD)
- Zoologisches Institut und Zoologisches Museum, Universität Hamburg (ZFMH)
- Zoologisches Institut der Universität Köln (IUKG)
- Zoologische Staatssammlung München (ZSM)

Results

The search for type specimens in museums and natural history collections in Germany revealed the presence of 778 primary type specimens of 484 Chalcidoidea species. Major depositories of primary types of Chalcidoidea in Germany are given in the table below.

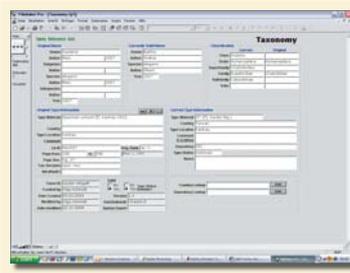
Institution	ZMHB	DEI	ZSM	IFUG	SMUF
Number of specimens	409	237	46	25	8

The database

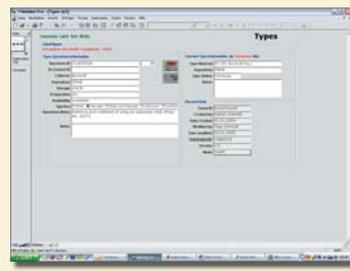
The Chalcidoidea database was created using Filemaker® with the field structure according to the field definition standard of the SysTax system [5]. Each primary type specimen was assigned a unique ID and the type information was entered into the database. The taxonomic database includes the following information:

- Presence of type, sex, type status, and condition of type
- Original and currently valid name
- Notes on original and current classification
- Original type information based on the original description
- Current type information, including the depository
- Photographic documentation of all specimen labels
- Facsimile of the original description (if copyright-cleared)
- Literature reference

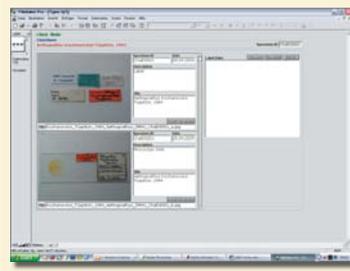
Screenshots of selected parts of the Chalcidoidea database:



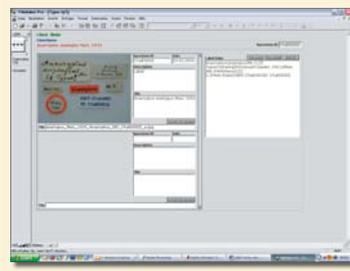
Taxonomy



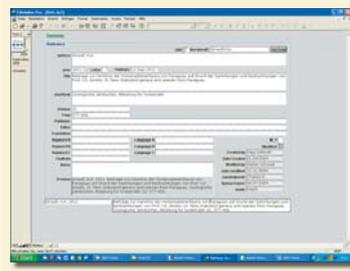
Types



Media



Labels



References

Insect collections

A well maintained and curated insect collection is an irreplaceable scientific resource. Insect collections represent the most important basis for systematic and biodiversity investigations and provide research opportunities for a broad range of entomological studies.



Arrangement of the type material of Chalcidoidea in ZSM.



Chalcidoidea specimens, including a holotype in ZSM.



Holotype of *Leucospis pictipygae* Bouček, 1974 with type label of the ZSM Hymenoptera section.



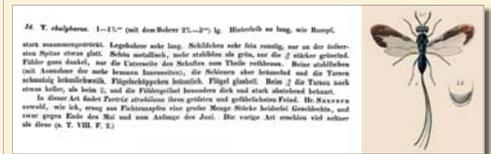
Above: Holotype of *Puklina dilleriae* Doğanlar, 1993 (ZSM, specimen on left, labels on right).
Below: Microscopic slide of a chalcid wasp made by Kryger in 1906 (ZMHB).

Taxonomists

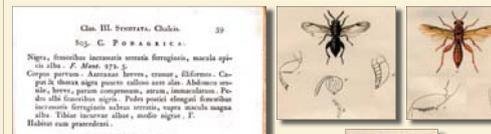
The five most important authors of Chalcidoidea species with types deposited in German insect collections are given in the table below.

Author	A.A. Girault	L. Masi	E. Strand	J.T.C. Ratzeburg	A. Förster
Number of described species	68	52	50	48	44

Original descriptions



Facsimile of the original description of *Torymus chalybeus* Ratzeburg, 1844 with original illustration.



Above: Illustrations of *Leucospis cayennensis*, *L. surinamensis*, and *L. klugii* taken from the original descriptions by Westwood, 1839.

Left: Facsimile of the oldest original descriptions of chalcid wasps (Rossius, 1790) of which types are deposited in Germany.

References

- [1] LaSalle, J. & Gauld, I.D. (1993) Hymenoptera: their diversity, and their impact on the diversity of other organisms, pp. 1–26 in: J. LaSalle & Gauld, I.D. (eds), Hymenoptera and Biodiversity. C.A.B. International: Wallingford.
- [2] Noyes, J. N. (1978) On the numbers of genera and species of Chalcidoidea (Hymenoptera) in the world. Ent. Gaz. 29: 163–164.
- [3] Noyes, J.S. (2000) Encyrtidae of Costa Rica (Hymenoptera: Chalcidoidea), 1. The subfamily Tetracneminae, parasitoids of mealybugs (Homoptera: Pseudococcidae). Mem. Amer. Ent. Inst. 62: 355 pp.
- [4] Noyes, J.S. (2002) Interactive Catalogue of World Chalcidoidea, 2nd edn. Taxapad and the Natural History Museum, London.
- [5] SysTax - a Database System for Systematics and Taxonomy. <http://www.biologie.uni-ulm.de/systax/>



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