

**THE ODONATA COLLECTION
OF THE NATIONAL MUSEUM OF NATURAL HISTORY,
WASHINGTON, U.S.A.**

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It is estimated that there are around 75,000 specimens in the collection housed in 13 herbarium cabinets for the enveloped material and 302 insect drawers for the pinned material. 190 genera and 1131 species of Zygoptera, and 234 and 1269 species of Anisoptera are represented in total. In all, 424 genera and 2400 species. Using the total numbers of species listed in 1984-85 by D. A. L. DAVIES and P. TOBIN (*Soc. int. odonatol. rapid Comm. (Suppl.)* 3 and 5) these counts translate into exactly 49% of the Zygoptera and 50% of the Anisoptera species. Primary types of 96 species are preserved, of which 42 are Zygoptera and 54 are Anisoptera.

INTRODUCTION

The National Entomological Collection was initiated in 1881 when C. V. RILEY, chief entomologist of the USDA, was appointed honorary curator and then donated his outstanding insect collection of 150,000 specimens, including Odonata. The first Odonatologist, Rolla P. CURRIE (ably aided by his sister Bertha) served between 1894 and 1904 ; they amassed an excellent collection from the Washington area with scattered representatives from around the world. Over the years valuable materials have been received from BAKER (Philippines), GRAHAM (China), LIEFTINCK (SE Asia), and PINHEY (Africa). The recent gift of the MONTGOMERY-PURDUE and GIBBS collections, although strongest in North American species, have added many exotic forms. Ongoing collecting activity by the current museum staff in the Neotropics has greatly increased coverage from this region. The Odonata collection, now estimated at 75,000 specimens, is housed in 13 herbarium cabinets (material in plastic envelopes) and 302 insect drawers (pinned specimens). Examples of approximately 424 genera and 2400 species are present. The 96 primary types in the collection are listed below.

ESTABLISHMENT OF THE MUSEUM

A National Museum was established by the U.S. Government in 1842, four years before the founding in 1846 of the Smithsonian Institution, which soon absorbed the National Museum. Entomological work in agriculture for the Government was carried on in the Patent Office prior to the establishment in 1862 of the Department of Agriculture wherein a position of Entomologist was specified (WARD, 1976). C. V. RILEY and J. H. COMSTOCK served as early heads of Entomology in Agriculture and developed the first national insect collections. In 1881 RILEY was appointed Honorary (i.e. unpaid) Curator of Insects at the National Museum. He took this position very seriously and worked to establish a salaried position of Assistant Curator. As soon as he was successful he turned over his personal collection of some 150,000 insects (20,000 species) to the Museum and arranged the transfer of the Agriculture collection to the Museum. To RILEY, who served as Honorary Curator till his death in 1895, we owe a great debt for establishing a single national insect collection (under the ownership of the Smithsonian Institution), for his oversight of the collection during its first 14 years, and for continual efforts to obtain adequate support. Between 1897 and 1940 the Museum had only 2 positions in Entomology, a curator and his aid, but since then we have grown to 11 curators and 30 support personnel.

ODONATOLOGISTS AT THE MUSEUM

In 1894 the first Museum Aid appointed in the Museum was Rolla P. CURRIE. He was a "Neuropterist" with a strong interest in Odonata. He, with his sister Bertha P. CURRIE, amassed an unsurpassed collection of Odonata from Washington and began to form a collection of international scope. He and Bertha published six papers dealing with dragonflies from Maryland, Arizona, British Columbia, Alaska and the Galapagos Islands (EDMUNDS & MUESEBECK, 1961).

Between 1904 and 1916 Nathan BANKS served as research taxonomist on insects and arachnids for the Department of Agriculture. He is especially well known as a classical "Neuropterist" and did some work with the Odonata while in Washington. Although his personal collection all went to Harvard University, there are many old specimens with BANK'S determination labels in the Museum collection (CARPENTER & DARLINGTON, 1954).

Dr. Jerry A. LOUTON served as my assistant between 1982 and 1984 when he became the computer specialist in the Department. He is primarily interested in the Gomphidae, especially their immature stages and phylogeny. Currently I am assisted by Nancy E. ADAMS who has been very active in producing a computerized inventory of our holdings and in general care of the collection.

Dr. Robert H. GIBBS served many years as a curator of Ichthyology in the Department of Vertebrate Zoology in the Museum, but had an abiding interest in odonates and developed a large collection and library on these insects which he donated to Entomology (SPRINGER & COLLETTE, 1989).

I was hired in 1961 as "Neuropterist" at the National Museum, and although my primary research interest is in the Trichoptera (caddisflies) and Megaloptera (fishflies), I am very interested in dragonflies and damselflies. I spend much time and effort collecting odonates on my field trips, now nearly 40, and mostly to Latin America but with some to Europe and Sri Lanka. I am constantly seeking specialists to identify material and working to improve the curation of the collection. I have been fortunate to have had large quantities of material identified by many world specialists: ASAHINA, DONNELLY, GARRISON, LIEFTINCK, PAULSON, PINHEY and WESTFALL, to name but a few.

THE COLLECTION

Most of the following section is devoted to the adult collection which is either pinned or in clear plastic envelopes. Unfortunately our collection of immatures is very poor. Most of what we have are unidentified and unsorted. We do have some identified exuviae from the Western United States (from KENNEDY) and Indonesia (from LIEFTINCK). Recently LOUTON has donated his collection which is especially strong in the immature stages of North American Gomphidae.

Our older pinned material is housed in standard, National Museum insect drawers housed in steel cabinets. The material in clear, plastic envelopes is housed in cardboard boxes with telescoping tops, each with 5 smaller inner boxes, and stored in slightly modified herbarium cabinets holding 52 to 72 boxes (Fig. 1).

NEARCTIC REGION

This is the collection that was first developed by the Curries. It contains historic material from the Mississippi Valley Pearl Mussel Investigation that resulted in papers by C. B. WILSON, and the material used by KENNEDY in his early western studies. Much of this old material is still mounted on pins and stored in standard insect drawers.

The most valuable collection of Odonata we have received came from B. Elwood MONTGOMERY in 1968. This collection was especially strong in North American species, but also contained important synoptic materials obtained from correspondents in other parts of the world (FRASER in India, and several workers in Europe and Finland come to mind). This collection increased specific coverage from all parts of the world and added series and new localities

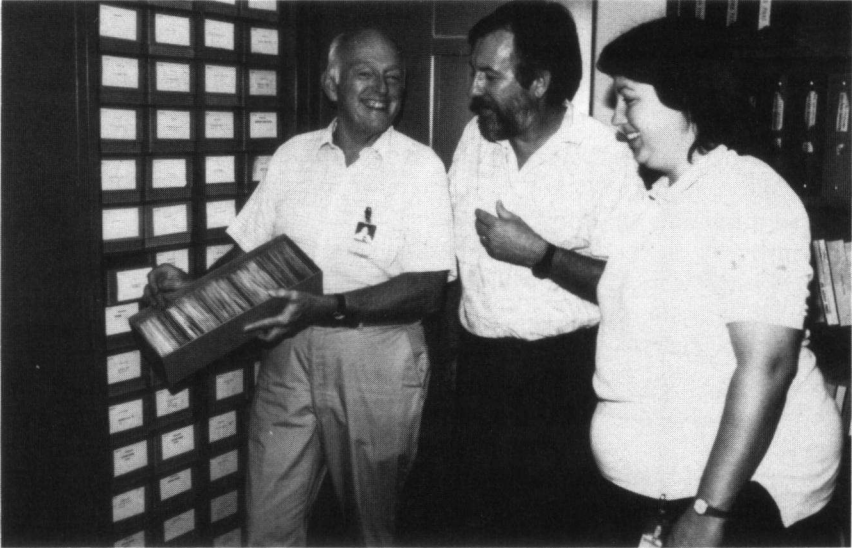


Fig. 1. Current custodians of the Odonata Collection, from left to right, Oliver FLINT, Jerry LOUTON and Nancy ADAMS, with a box containing envelopes of dragonflies held in front of a modified herbarium cabinet filled with such boxes.

to our North American holdings. He also donated his library at the same time. This has been kept intact and is housed in 3 bookcase sections occupying approximately 32 linear feet. His collection now has been transferred to clear, plastic envelopes and incorporated into the Museum collection. All material from this source have the data cards bearing a line reading "Montgomery-Purdue Collection".

Another valuable addition was the Robert H. GIBBS collection. Although this was much smaller than the MONTGOMERY collection and more geographically limited to the northeastern United States, it too, added needed series and new localities. He also had accumulated material from all parts of North America and other areas of the world. This is now prepared and transferred to clear envelopes and incorporated into the main collection. The data cards of this accession bear the notation "Robert H. Gibbs, Jr. Collection". Recently his widow donated his reprint collection, and this has been integrated into our divisional reprint files.

Coverage of North American species is nearly complete (although we can use good material of many species). A quick count gives 115 species of Zygoptera and 294 of Anisoptera. It is housed in 5 large herbarium cabinets holding 334 boxes of identified and 26 boxes of unidentified material. There are some 215 drawers of pinned material in addition. We have holotypes

of 7 Zygoptera and 10 Anisoptera, plus possible syntypes of some WALSH species.

NEOTROPICAL REGION

This collection contains material from Mexico, the West Indies and southwardly. There is some valuable early material deposited here by CALVERT and WILLIAMSON from their studies. Many of these examples are labelled paratype, but they are in reality syntypes until someone selects the lectotype. The possible presence of additional syntypic material in the Museum should be kept in mind by workers whenever the primary series may prove to be damaged or deficient. There are also small collections from early government-sponsored expeditions and donations. However, far more than half of the material has been collected in recent years by me and coworkers in the Museum — Nancy ADAMS, Don DAVIS, Don DUCKWORTH, Jerry LOUTON and Paul SPANGLER. There has been considerable interest by North American systematists in this material; thus, I have been able to get most identified by BELLE, DONNELLY, GARRISON, PAULSON, WESTFALL and others.

Coverage is improving and moderately good now, but many species are lacking from the Amazon Basin and the Andes. Best coverage is from Mexico and Central America, the West Indies, Chile and Argentina. It occupies 3 herbarium cabinets containing 183 boxes of identified odonates and 11 still awaiting study; there are also 33 drawers of pinned material. We have 11 Zygopteran and 14 Anisopteran types, but quite a few additional segregates that appear to be possible new species. We have 394 species of Zygoptera and 398 of Anisoptera.

ORIENTAL REGION

In this category I include India, China, the Pacific Islands, Australia and New Zealand. Our holdings are surprisingly extensive from this area. The most important single collection has been the D. C. GRAHAM material from Tibet and Szechuan, China; this was used by NEEDHAM in his "Manual of the Dragonflies of China" and later studies by CHAO. Another studied collection was made by C. F. BAKER in the Philippines and used by NEEDHAM and GYGER. An excellent synoptic collection was received from LIEFTINCK in the early 1960's. This was primarily southeast Asian in scope, but included species from Sri Lanka, Africa and Europe as well. Many other smaller lots have added species from other parts of the region, resulting in fairly good coverage. A very recent collection of Australian odonates was given us by G. THEISCHINGER. This contains some 80 species, and has added 5 genera and 32 species new to the collection.

The collection fills 3 herbarium cabinets with 158 boxes identified and 47 still unidentified ; there are also 29 drawers of pinned material. More types come from this region than any other : 19 Zygoptera and 25 Anisoptera. There are 463 named species of Zygoptera and 424 of Anisoptera, the largest number of species from any region in the Museum collection.

AFRICAN REGION

This collection contains everything from south of the Mediterranean Sea. It was built primarily through the efforts of E. C. G. PINHEY. He sent us an excellent synoptic collection and identified a great deal of older material as well. We also obtained a synoptic collection from The old Kenya Museum, plus other examples from the MONTGOMERY and the LIEFTINCK Collections.

We have 161 species of Zygoptera and 190 of Anisoptera housed in a single herbarium cabinet. There are 39 boxes of identified and 18 of unidentified material. We have 5 holotypes of the Zygoptera and 5 of Anisoptera from this region.

PALEARCTIC REGION

This is the smallest collection. There is no particularly noteworthy accession, although much came with the MONTGOMERY Collection. It has grown mostly through slow accretion of bits and pieces.

It is all in a single cabinet with 37 boxes of identified and 5 of unnamed odonates. We have 43 species of Zygoptera and 70 of Anisoptera, and no primary types.

LIST OF PRIMARY TYPES

The following list of primary types in the Museum includes all names, many of which have been placed in synonymy in recent years and some actually may be syntypes. They are listed alphabetically by family, and then by species in the family. The generic names given are those of the original combination. The author and year of publication and country or island of origin is also listed.

AESCHNIDAE

dugesi (*Aeschna*) Calvert, 1905 ; Mexico. — *flinti* (*Periaeschna*) Asahina, 1978 ; China. — *galapagoensis* (*Aeschna*) Currie, 1901 ; Galapagos Islands. — *obversa* (*Cephalaeschna*) Needham, 1930 ; China. — *piraticus* (*Anax*) Kennedy, 1934 ; Guam Island. — *rileyi* (*Aeschna*) Calvert, 1892 ; Tanzania.

— *secreta* (*Coryphaeschna*) Calvert, 1952; Cuba. — *sinensis* (*Boyeria*) Asahina, 1978; China. — *walkeri* (*Aeschna*) Kennedy, 1917; United States.

CALOPTERYGIDAE

californicum (*Agrion aequabile*) Kennedy, 1917; United States. — *grahami* (*Agrion*) Needham, 1930; China.

CHLOROCYPHIDAE

katharina (*Rhinocypha*) Needham, 1930; China. — *sharpae* (*Chlorocypha*) Pinhey, 1972; Liberia.

COENAGRIONIDAE

aerides (*Teinobasis*) Lieftinck, 1962; Ponape Island. — *alberta* (*Argia*) Kennedy, 1918; United States. — *angustirami* (*Agriocnemis*) Pinhey, 1974; Liberia. — *ariel* (*Teinobasis*) Lieftinck, 1962; Ponape Island. — *barberi* (*Ischnura*) Currie, 1903; United States. — *bovilla* (*Metaleptobasis*) Calvert, 1907; Nicaragua. — *carolinensis* (*Teinobasis*) Lieftinck, 1962; Wena (Moen) Island. — *cyathiforme* (*Pseudagrion*) Pinhey, 1973; Liberia. — *emma* (*Argia*) Kennedy, 1915; United States. — *fortis* (*Teinobasis*) Lieftinck, 1962; Ponape Island. — *fosteri* (*Argia*) Calvert, 1909; Paraguay. — *gemina* (*Celaenura*) Kennedy, 1917; United States. — *gurneyi* (*Papuagrion*) Lieftinck, 1949; Bougainville Island. — *impar* (*Coenagrion*) Needham, 1930; China. — *inarmata* (*Ischnura*) Calvert, 1898; India. — *iralai* (*Argia*) Calvert, 1909; Paraguay. — *johannella* (*Argia*) Calvert, 1907; Costa Rica. — *kellicotti* (*Ischnura*) Williamson, 1898; United States. — *malagasoides* (*Pseudagrion*) Pinhey, 1973; Liberia. — *melanogaster* (*Diceratobasis*) Garrison, 1986; Dominican Republic. — *nigrolutea* (*Teinobasis*) Lieftinck, 1962; Ponape Island. — *oryzae* (*Agriocnemis femina*) Lieftinck, 1962; Okinawa. — *palauensis* (*Teinobasis*) Lieftinck, 1962; Koror Island. — *ponapensis* (*Teinobasis*) Lieftinck, 1962; Ponape Island. — *thelmae* (*Ischnura*) Lieftinck, 1966; Rapa Island. — *utahensis* (*Ischnura*) Muttkowski, 1910; United States.

CORDULIIDAE

dido (*Somatochlora*) Needham, 1930; China. — *moroensis* (*Procordulia*) Lieftinck, 1977; Mindanao Island.

EUPHAEIDAE

forcipata (*Bayadera*) Needham, 1930; China.

GOMPHIDAE

abbotti (*Gomphidia*) Williamson, 1907 ; Thailand. — *angustifolia* (*Aphylla*) Garrison, 1986 ; Mexico. — *arizonicus* (*Ophiogomphus*) Kennedy, 1917 ; United States. — *californicus* (*Ophiogomphus occidentis*) Kennedy, 1917 ; United States. — *cassiopeia* (*Gomphoides*) Belle, 1975 ; Paraguay. — *descriptus* (*Gomphus*) Banks, 1896 ; United States. — *donneri* (*Gomphus*) Kennedy, 1917 ; United States. — *edenticulatus* (*Neogomphus*) Carle & Cook, 1984 ; Argentina. — *flinti* (*Progomphus*) Belle, 1975 ; Paraguay. — *ganzanus* (*Mitragomphus*) Needham, 1944 ; Brazil. — *gaudens* (*Gomphus*) Chao, 1953 ; China. — *hesperius* (*Gomphus*) Chao, 1953 ; China. — *lampropeltis* (*Erpetogomphus*) Kennedy, 1918 ; United States. — *lautus* (*Gomphus*) Needham, 1931 ; China. — *mexicanus* (*Progomphus*) Belle, 1973 ; Mexico. — *neglectus* (*Gomphus*) Needham, 1930 ; China. — *nevadensis* (*Gomphus olivaceus*) Kennedy, 1917 ; United States. — *nevadensis* (*Ophiogomphus morrisoni*) Kennedy, 1917 ; United States. — *pacatus* (*Gomphus*) Chao, 1953 ; China. — *pallidistylus* (*Diaphlebia* (*Perigomphus*)) Belle, 1972 ; Costa Rica. — *parvidens* (*Gomphus*) Currie, 1917 ; United States. — *reductus* (*Ophiogomphus*) Calvert, 1898 ; India. — *szechuanicus* (*Gomphus*) Chao, 1953 ; China. — *torpens* (*Gomphus*) Needham, 1930 ; China. — *trox* (*Gomphus*) Needham, 1931 ; China. — *vesta* (*Phyllocycla*) Belle, 1972 ; Argentina. — *viridipleuris* (*Gomphoides*) Calvert, 1909 ; Paraguay.

LESTIDAE

neblina (*Archilestes*) Garrison, 1982 ; Costa Rica.

LIBELLULIDAE

abbotti (*Orthetrum*) Calvert, 1892 ; Tanzania. — *archboldi* (*Scapanea*) Donnelly, 1970 ; Dominica Island. — *boharti* (*Tapeinothemis*) Lieftinck, 1950 ; Little Florida Island. — *capensis* (*Libellula* (*Orthetrum*)) Calvert, 1894 ; South Africa. — *cardinalis* (*Agrionoptera*) Lieftinck, 1962 ; Babelthuap Island. — *dilatata* (*Diplax*) Calvert, 1892 ; St. Helena Island. — *fumipennis* (*Cannacria*) Currie, 1901 ; Galapagos Islands. — *gravidia* (*Lepthemis*) Calvert, 1890 ; United States. — *puella* (*Potamarcha*) Needham, 1930 ; China. — *pusilla* (*Agrionoptera sanguinolenta*) Lieftinck, 1962 ; Wena (Moen) Island. — *ruptum* (*Sympetrum*) Needham, 1930 ; China. — *sanguinolenta* (*Agrionoptera*) Lieftinck, 1962 ; Ponape Island. — *truncatum* (*Orthetrum*) Calvert, 1892 ; Tanzania. — *yapensis* (*Agrionoptera insignis*) Lieftinck, 1962 ; Yap Island.

MACROMIIDAE

flinti (*Macromia*) Lieftinck, 1977 ; Sri Lanka. — *kelloggi* (*Macromidia*) Asahina, 1978 ; China.

MEGALESTIDAE

heros (*Megalestes*) Needham, 1930 ; China. — *micans* (*Megalestes*) Needham, 1930 ; China.

MEGAPODAGRIONIDAE

abrogata (*Paraphlebia*) Calvert, 1907 ; Guatemala. — *augusti* (*Philogenia*) Calvert, 1924 ; Panama. — *sucra* (*Philogenia*) Dunkle, 1986 ; Colombia. — *yachowensis* (*Mesopodagrion*) Chao, 1953 ; China.

PLATYSTICTIDAE

aeneoviridis (*Peristicta*) Calvert, 1909 ; Paraguay. — *palauensis* (*Drepanosticta*) Lieftinck, 1962 ; Babelthuap Island.

POLYTHORIDAE

inlactea (*Euthore fasciata*) Calvert, 1909 ; Peru.

PROTONEURIDAE

abbotti (*Disparoneura*) Calvert, 1892 ; Tanzania.

CONCLUSION

There is still much unidentified material and older material that needs reidentification in light of recent studies : I am seeking qualified specialists to work this up for us. We are interested in exchange of species we may have in series for species needed in the collection. Please remember the Museum when the distribution of paratypes or other recently revised material is being considered. In conclusion I would like to urge all systematists to use the Odonatological resources, both specimens and bibliographic, of the National Museum of Natural History.

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