

More than any other kind of collection, insect collections (and invertebrate collections more generally) are the primary source of data on the known distributions of species in space and time. Unlike, say, birds or plants, most insect species cannot currently be reliably identified in the field. Therefore, entomologists have a longstanding tradition of capturing specimens (i.e., whole insects, either dry or preserved in ethanol) and incorporating them into collections for immediate and/or future study. Each captured specimen represents a unique record of the presence of that species at a particular place at a particular time. For all but the best studied insect species (e.g., those that are agricultural pests or disease vectors), the only reliable information available is embodied in the specimens of those species deposited in collections or in publications based on study of specimens in collections (unlike plants or birds for which "sightings" in the field can represent reliable records, in the absence of voucher specimens). This is because insects are so diverse and numerous, and entomologists relatively few. Until relatively recently, most entomologists not conducting research on insect pests focused their efforts on attempting to discover as many species as possible in as little time as possible. Thus, rather than carefully observing each species in the field to document its behavior, life history, and associations with other species, entomologists have commonly employed various traps or other mass sampling methods that capture large numbers of specimens and document their spatiotemporal occurrences only, sacrificing depth of knowledge of individual species for breadth of coverage. Most specimens currently housed in insect collections are a legacy of such efforts. Data labels associated with individual specimens in collections usually provide only very basic information, including the place and time of collection, the name of the collector and, more rarely, the collecting method used and/or abbreviated information about the microhabitat where the specimen was found (e.g., "under log in evergreen forest"). Compounding this problem is the fact that in order to obtain even these limited available data on the vast majority of known insect species, entomologists must have direct access to the specimens because the data are not available elsewhere. Each collection has certain strengths, including more extensive coverage of certain geographical areas and/or particular insect groups. For example, the Illinois Natural History Survey, as one might expect, has very good coverage of the upper Midwestern USA. It also has particularly strong, and more globally comprehensive, holdings of certain groups of beetles, bees, flies, and leafhoppers because current or former INHS staff specialized on these groups. Collections at other institutions have different, mostly complementary strengths. Thus, a researcher interested in conducting a comprehensive study of any large insect group needs access to specimens housed in multiple institutional collections.

Collections serve as both archives and lending libraries that support various kinds of biological research. Unfortunately, most of the data embodied in specimens deposited in insect collections is now obtainable only by physically examining the specimens. Over the past few decades, many collections have begun to capture and incorporate certain kinds of specimen data into databases, and some of these databases are now available online, but only a tiny fraction of the total holdings have been thus rendered more accessible to the global research community. Therefore, for many basic research projects involving insects, it is still usually necessary for researchers to borrow specimens from multiple institutions and/or visit those institutions' collections in order to conduct their research.