

Mordellidae (Coleoptera): catching, preparing and mounting

R. Batten

Abstract

Techniques of catching, preparing and mounting of mordellid beetles are described, particularly with respect to facilitate their identification.

Introduction

After the author in 1970 had started to identify Mordellidae and Anaspidae (groups traditionally studied jointly by coleopterists) of the Rijksmuseum van Natuurlijke Historie at Leiden he felt compelled to catch, prepare and mount them himself. Only in this way a collection of a usually neglected, taxonomically difficult beetle group can be turned into a scientifically useful instrument, while at the same time biological data regarding the species may be obtained. This paper describes some of the techniques employed, these being rather specialized compared to those usually described in beetle books. The author was encouraged by the curator of Coleoptera of the Leiden museum to record the technical aspects of his study of the Mordellidae for the benefit of other workers.

Equipment & chemicals

The following essential items are indispensable to the proper study of Mordellidae:

- Two sweeping nets, one with a bag of white lace curtain, the other of heavier, more fine-meshed cloth.
- An aspirator ("pooter").
- Killing bottles and small glass vials with soft paper.
- Ethyl acetate.
- Relaxing liquid: diluted acetic acid (ca 25%).
- Glue: pulver tragacanth and arabic gum in small vial, add distilled water, shake the vial, wait one day, and check then whether the viscosity is adequate (Joy's adhesive, 1932). Do not mix it with ethanol.
- KOH 50% is used to remove any tissue from the genitalia.
- Stereo microscope with modern glass fiber illumination.
- Two dissecting needles mounted in a match or in a brush shaft. The tip of one needle should be bent to form a hook.

Phenology, diurnal activity, sites

The forays of the author extended to various southern European countries (see Table 1), usually during early summer (middle of June to middle of July). Clearly the months of May through July are outstanding for collecting mordellid and anaspid beetles. The phenology for western Europe is illustrated in the table given in a review of the Dutch mordellids (Batten, 1976: 35). Temperature apparently is the dominant factor, and here, of course, geography comes in: the more south the collecting station, the earlier the appearance of the adults. However, certain *Mordellistena* may be encountered as early as March, and *Mordella* as late as August-September. The diurnal activity is strongly dependent on sunshine and absence of wind: whereas in the Netherlands the activity is mainly between 10 00 and 14 00 hrs, it is almost the entire day (08 00 to 20 00 hrs) in the southern countries. In the evening, after sunset, mordellids may occasionally be found "sleeping" between the petals of flowering plants and are then easily caught.

Mordellids are typically beetles of open habitats, the best collecting sites being south-exposed, sunny slopes rich in flowers (e.g. land lying fallow). There mordellids may be abundant on various species of umbelliferous plants (mostly *Achillea*, *Hieracium*, *Daucus*, *Ferula*), as well as *Chrysanthemum*, *Artemisia*, *Helianthemum*, *Euphorbia*, *Jasione*, *Santolina*, *Sedum*, *Sorbus*, *Crataegus*, and sometimes thistles. They especially visit flowers profusely producing pollen, which is taken by the beetles with their galeae. Certain rare species are found on shrubs only. *Mordellochroa abdominalis* (F.) is found on *Sorbus* and the *Mordellistena* group on *Crataegus*.

Catching techniques

Mordellidae are caught with the sweeping net, or directly with the aspirator. The aspirator is used only when the temperature is not too high, the beetle being sucked from the flower directly. The advantage of this method is that damage to the delicate specimens can be kept to a minimum. After sweeping with the net in the usual way the catch is transferred to the killing bottle

with the aid of the aspirator. The bottle is filled with pieces of soft, absorbent paper, moistened with a few drops (not too much) of ethyl acetate. Absolutely no other chemical should be used, as the beetles will then get into thanatosis, becoming rigid and subsequently impossible to mount properly.

The author usually sorted out his catches inside his car, and with good advantage. The front of the car is positioned in the sunshine, the back in the shade, windows of the front doors closed, those of the back doors opened to prevent an unbearable rise of the temperature inside. Most of the escaping mordellids could thus be picked up from the front wind shield. When very small species are involved (*Mordellistena*, *Pseudomordellina*, certain anaspids) a sweeping net with finer meshes should be used.

A separate bottle should be used for every new collecting station, and labelled properly. At the end of the day transfer the contents to tightly closed vials or whatever small container. Every two or three days (depending on their temperature) add a drop of ethyl acetate to the vials to keep their contents moist and supple. At home storage in a refrigerator keeps the material in good condition for mounting over a long period of time. Table 1 reviews the collecting results of the author in southern Europe.

Table 1. Results of mordellid collecting forays in Europe by Batten, 1973-1979. Seven excursions, each including 10 days in the field, June/July.

year	country	stations	number of specimens	
			min-max/station	total
1973	S France	12	2-237	1149
1974	S France	7	9-131	375
1974	Spain	5	12-101	227
1975	Spain	15	1-140	612
1976	Yugoslavia	6	7- 83	211
1976	Greece	5	5-287	569
1977	Yugoslavia	4	4-182	276
1977	Greece	18	2-211	1252
1978	Greece	22	9-221	1518
1979	Portugal	9	1-245	453

Mounting

Proper mounting facilitates identification considerably (Batten, 1976: 5). First clean the specimen in water, then dry it briefly on absorbent paper. Transfer the specimen to the object table of the microscope, placing it on its left side. Then, exerting a slight pressure with the left fore finger, extract the genitalia with the hooked needle. The genitalia are temporarily deposited on a microscopic slide in a drop of cold water (or 50% KOH, if necessary).

Now put the insect on its back. Stretch, with two fine brushes, the head and all the appendages, paying special attention to the tarsi, antennae, palps, and possibly the galeae. These parts show characters of taxonomic importance.

Now take a bit of glue on a brush and put it transversely on a mounting card. With a moistened brush pick up the beetle by its elytra, and position it with its mesosternum on the glue. Fasten the extremities with some diluted glue, except for the hindlegs. These are to be slightly raised so that spurs and any incisions are easily visible.

Dissect the genitalia with the hooked needle in a drop of water, separating penis, phallobase and parameres. Be careful to maintain the drop of water, otherwise parts are easily lost. The parts are glued onto a card, in such a way that the inner sides of the parameres are visible.

Occasionally dissection is very difficult, particularly in the case of the parameres. If so, place the genitalia in a drop of

cold KOH to soften the tissue. Wash in water, and proceed with the dissection.

Mount the genital elements always in the same fashion, to facilitate comparison. Extract the genitalia of at least one male from every series, in the way just described. Of as many other males and females as possible genitalia are extracted without further dissection. In relatively fresh specimens they are easily extracted without causing any damage.

Male Anaspidae, having special abdominal features, should have their abdomen gently separated from the thorax and glued upside down, with the extracted genitalia (or, if more specimens are available, an entire beetle may be glued onto a card).

Many museums have specimens glued laterally to cards, as advised by Reitter (1911: 372). They need relaxing and re-mounting, to facilitate their study. At first the author used the "expanding liquid" (Quellflüssigkeit) of Scheerpeltz, but later Franciscolo's liquid (1957: 230) was applied, which, however, occasionally affects the colour of the pubescence. The relaxing liquid mentioned above (Equipment & chemicals) gave the best results. It takes 2 to 24 hours to relax the oldest specimens, and even the genitalia are then easily extracted. Less hardened specimens take only one or two hours to become supple. Specimens stored in 70% alcohol can successfully be relaxed.

With some experience the genitalic extraction of newly collected specimens will take from 5 to 10 minutes, depending on the amount of dissection undertaken, older ones take up to 30 minutes.

References

(Including papers by the author on European Mordellidae)

- Batten, R., 1976a. De Nederlandse soorten van de keverfamilie Mordellidae. — Zool. Bijdr., Leiden 19: 1-37.
- Batten, R., 1976b. Mordellidae (Coleoptera) from the South of France and the Pyrenees. — Ent. Ber., Amst. 36: 164-171.
- Batten, R., 1977a. Mordellochroa species of the Western Palaearctic region (Coleoptera Mordellidae). — Ent. Ber. Amst. 37: 21-26.
- Batten, R., 1977b. Mordellistena balazuci Ermisch and M. taurica Csiki, junior synonyms of M. semiferruginea Reitter (Col. Mordellidae). — Ent. Ber. Amst. 37: 117-120.
- Batten, R., 1977c. Two new Mordellidae (Coleoptera) from Southern Europe, and a key to the Mordellistena micans group. — Ent. Ber. Amst. 37: 167.
- Batten, R., 1978. New Mordellidae (Coleoptera) from Greece and Tunisia. — Ent. Ber. Amst. 38: 78-80.
- Batten, R., 1980. Notes on the Mordellistena gemellata group; two new species and a case of synonymy (Coleoptera, Mordellidae). — Ent. Ber. Amst. 40: 41-46.
- Batten, R., 1983. Teratology in the genus Mordellistena (Coleoptera Mordellidae). — Ent. Ber. Amst. 43: 15.
- Batten, R., 1986. A review of the British Mordellidae (Coleoptera). — Entomologist's Gaz. 37: 225-235.
- Ermisch, K., 1976. Familie Mordellidae. — Die Käfer Mitteleuropas 8: 169-196.
- Franciscolo, M.E., 1957. Coleoptera Mordellidae I. — South African Animal Life 4: 230-291.
- Joy, N.H., 1932. A practical handbook of British beetles I-II. — London: Witherby (reprint 1976): i-xxvii, 1-622 (text), 1-194 (plates).
- Reitter, E., 1911. Fauna Germanica. Die Käfer des deutschen Reiches. III. — Stuttgart: Lutz : 1-436, pl. 81-128.