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#### TECHNIQUE FOR SPECIFIC DETERMINATIONS OF DEAD PUPAE OF *EUPITHECIA* (GEOMETRIDAE)

Pupae of *Eupithecia* die even when reared under what seem to be optimal conditions. In many cases considerable time is spent on descriptions of larvae with the expectation of rearing adults to enable one to determine the species. When the specimen dies in the pupal stage this time may be lost unless one can determine the species from the pupa. Sometimes pupal development is such that adult features can be seen within the pupal case.

**Method.** To determine if the genitalia have developed sufficiently, sever the pupa between the fourth and fifth abdominal segments. If the internal organs have not developed sufficiently the abdomen will appear empty and it is of little use to proceed further. If such is the case, place the two halves of the pupal case in a gelatin capsule of suitable size and replace in the collection for future study. A shrivelled abdomen may, however, still be satisfactory for further work. About three-quarters of the specimens examined have had the genitalia developed sufficiently for one to make specific determinations. If the specimen seems developed enough, the entire severed abdomen is immersed in a 10 percent solution of potassium hydroxide for approximately 16-20 hrs. Do not attempt to forcibly remove the abdomen from the pupal case before immersion in KOH solution, unless it is already loose, otherwise both may be damaged. After removal from the caustic, place in a solution of 30 percent alcohol and the abdomen will separate very easily from the pupal case without damage. The empty portion of the pupal case should be placed out to dry and later put in a gelatin capsule along with the remainder of the pupal case. The cremaster and other important diagnostic characters can still be used for study. Process the abdomen as suggested by Hardwick (1950, Can. Entomol. 83: 231-235). Extreme care should be taken, however, during the dissection as the material is usually much more fragile than in a fully mature adult. One should also keep in mind that the pupal case may contain a parasite which has died before emerging. These are often quite large and can be mistaken for a moth before dissection.

This technique has proved useful for the determination of species in several other genera of Geometridae besides *Eupithecia*. Among these are the genera *Deilinia* Hbn., *Rheumaptera* Hbn., *Hydriomena* Hbn., *Drepanulatrix* Gump., *Semiothisa* Hbn., and *Itame* Hbn. This technique could very well prove useful in other families of Lepidoptera as well.

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