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Permanent mounts of dissected Lepidoptera with water-soluble varnish

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Abstract

A method of permanent mounts of dissected Lepidoptera genitalia in water-soluble varnish is presented. It is an economic preparation technique for faunistic purpose or for determination routine which requires saving of time combined with a high quality standard.

Zusammenfassung

Eine neue Einbettungsmethode von Lepidopteren-Genitalien mittels wasserlöslichem Lack wird vorgestellt. Die Präparationstechnik wird als zeitsparende Einbettungsmethode vor allem für faunistische Reihenuntersuchungen oder für Routinedeterminationen mit gehobenem Präparationsniveau empfohlen.

Key words: genitalia preparation, Lepidoptera, microscopic techniques, permanent mounts, watersoluble varnish.

Introduction

A new method for genitalia preparation is presented.

The preparation of the genitalia of both sexes is standard in Lepidopterology. Normally permanent mounts on microscopic slides are used for groups which exhibit spreadable valves. Genitalia which have a striking "3d-effect" or have valves which are not spreadable are often preserved in liquid in small vials. The investigation possibilities in the latter case are quite good, the possibilities for proper illustrations are limited, handling of the samples bears the risk of damage and the refractive index of most preserving liquids is poor. An advantage of permanent mounts on slides is the outstanding refractive index which modern embedding mediums have and the circumstance that the genitalia are prohibited from being damaged.



Figs. 1-5 Zekelita antiqualis (HÜBNER, 1809) (Lebanon, E of Saida, NHMW), & -genitalia, gen. praep. M. Lödl no. 667. - Embedded in watersoluble varnish "Tiger Neu Email Acryllack" in 1997:

Fig. 1: Genitalia corpus. Scale = 0.5 mm.- Fig. 2: Uncus. Scale = 0.1 mm.- Fig. 3: Aedeagus. Scale = 0.5 mm.- Fig. 4: Cornutus. Scale = 0.1 mm.- Fig. 5: Left valve. Scale = 0.1 mm.

Modern mounting techniques are based on the embedding mediums Eukitt and Euparal. These mediums require proper dehydration of the samples. Eukitt seems to have the best refractive index but needs a preparation procedure which is a little bit more complicated than in Euparal. The following punctation gives a short survey of the steps of preparation:

Eukitt

- Mazeration in KOH.
- Cleaning procedure in destilled water (best with a detergent added).
- Staining (e.g. with Chlorazol Black in destilled water).
- Spreading of the genitalia and dehydration on a slide with 96% ethanol.
- Brightening up with oil of cloves.
- Last dehydration step with xylol.
- Eukitt as embedding medium.

The drying period is very short (some hours, ready for transport after some days).

Euparal

- Mazeration in KOH.
- Cleaning procedure in destilled water (best with a detergent added).
- Staining (e.g. with Chlorazol Black in destilled water).
- Spreading of the genitalia and dehydration on a slide with fresh 96% (better 99%) ethanol.
- Euparal as embedding medium.

The drying period is exorbitantly long (days for a first handling, weeks for transport).

The new embedding medium: water-soluble varnish

Aim of this paper is to present a new method for permanent mounts. A series of preparations was made in 1997 with a water soluble varnish ("Tiger Neu Email wasserlöslicher Acryllack"). The varnish, provided for household purpose, was just bought at a supermarket. The genitalia have been cleaned and stained and then simply embedded in the water-soluble varnish. The microscopic slide is drying out within hours. Transport after some days is possible. The following punctation sketches the preparation steps:

- Mazeration in KOH.
- Cleaning procedure in destilled water (best with a detergent added).
- Staining (e.g. with Chlorazol Black in destilled water).
- Tiger Neu Email as embedding medium.

Discussion

After two years the microscopic slides with water-soluble varnish as an embedding medium are in best condition. Figs. 1-5 show the male genitalia of *Zekelita antiqualis* (HÜBNER, 1809) (Noctuidae: Hypeninae), figs. 6-9 show details of the head capsule of *Hypena proboscidalis* (LINNAEUS, 1758). The illustration (especially the higher magnifications - figs. 2, 4-5, 7-9) show the excellent refractive index of the varnish. After the first two years of experience with the new medium the following advantages and disadvantages can be summarized:

Advantages:

1. Easy and time-saving handling. The preparation process is not discontinued by dehydration procedures. The prepared genitalia are embedded immediately.



Figs. 6-9 *Hypena proboscidalis* (LINNAEUS, 1758) (Austria inferior, NHMW), head capsule, not numbered microscopic slide.- Embedded in watersoluble varnish "Tiger Neu Email Acryllack" in 1997:

Fig. 6: Head capsule. Scale = 0.5 mm.- **Fig. 7**: Flagellum. Scale = 0.1 mm.- **Fig. 8**: Scape and pedicel. Scale = 0.1 mm.- **Fig. 9**: Area of bristles on the base of scape. Scale = 0.05 mm.

2. Water-soluble varnish exhibits an excellent refractive index which seems to be of the same quality of Euparal.

- 3. The slides are permanent and without quality change (at least within two years).
- 4. The drying period is short (a few hours !).
- 5. The price of the water-soluble varnish is extraordinary low.

Disadvantages:

1. The varnish is milky and not really transparent while fresh. So the embedding process is hindered by uncomfortable refractive conditions. The medium becomes fully transparent while drying.

2. The medium seems to be suitable for thin preparations only. For embedding bulky parts like head capsules or other thick structures it is not ideal. If the medium is too thick it does not become fully transparent and tends to soak air bubbles. However, if embedded very carefully the result can be reasonable (figs. 6-9).

3. If dried out, the mounting medium is really permanent and cannot be loosened anymore by water. However the author has no testing experience with other solvents.

4. The testing period now is two years. This is not long enough to support the medium for permanent use for type material in museum collections.

According to the previous analysis the new method can be recommended for faunistic purpose or for determination routine which requires saving of time combined with a high quality standard. This can be necessary when numbers of specimens of sibling species are investigated. In this case a simple but highly qualified method with good results is required. The testing period will be extended and in some years the results about long term use will be available. It is most likely that the new water-soluble varnishes for houshold purpose will be of similar quality as the investigated "Tiger Neu Email Acryllack" is.

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