Identification of *Orthosia* moths

External and internal morphology together with DNA barcoding

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Orthosia incerta

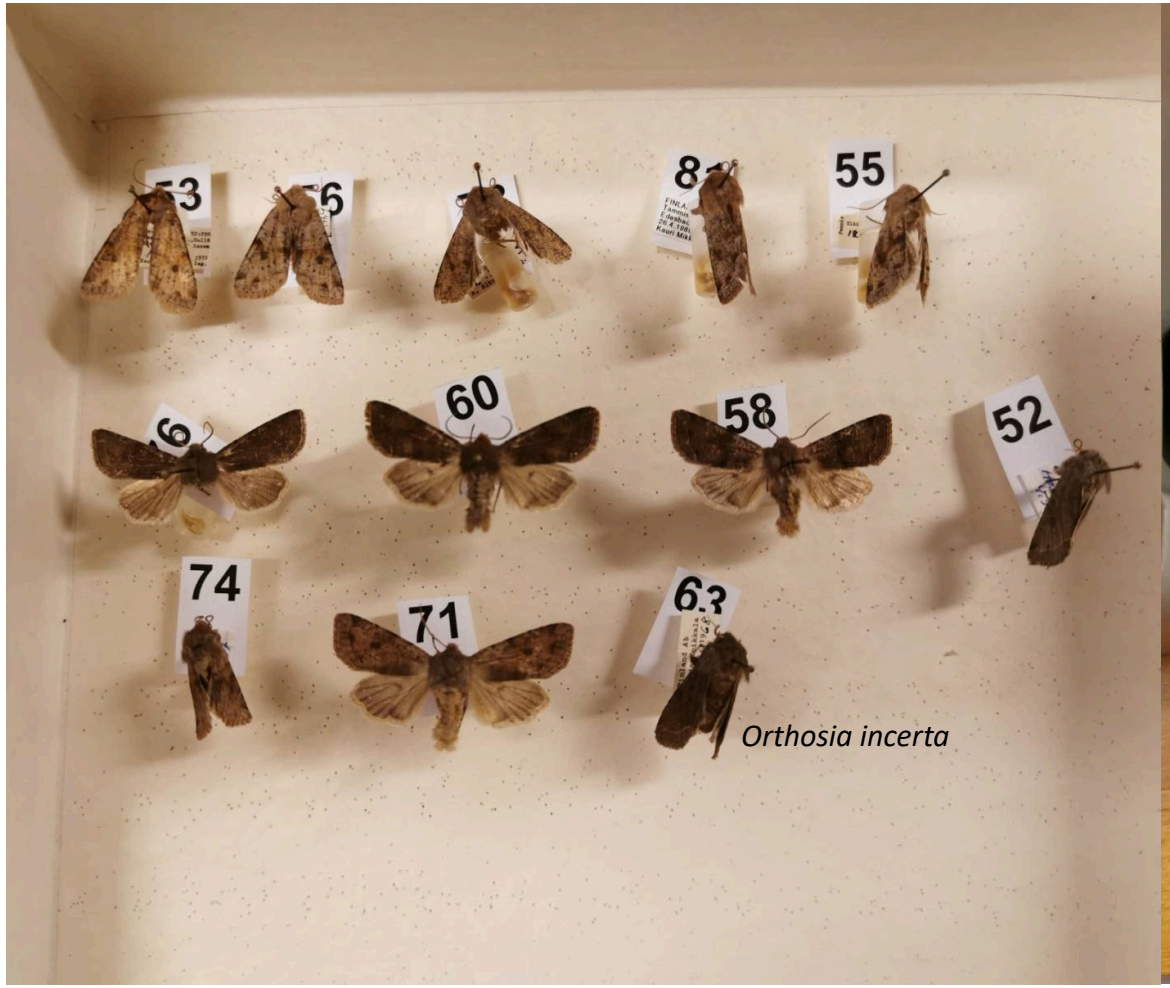
Orthosia moths

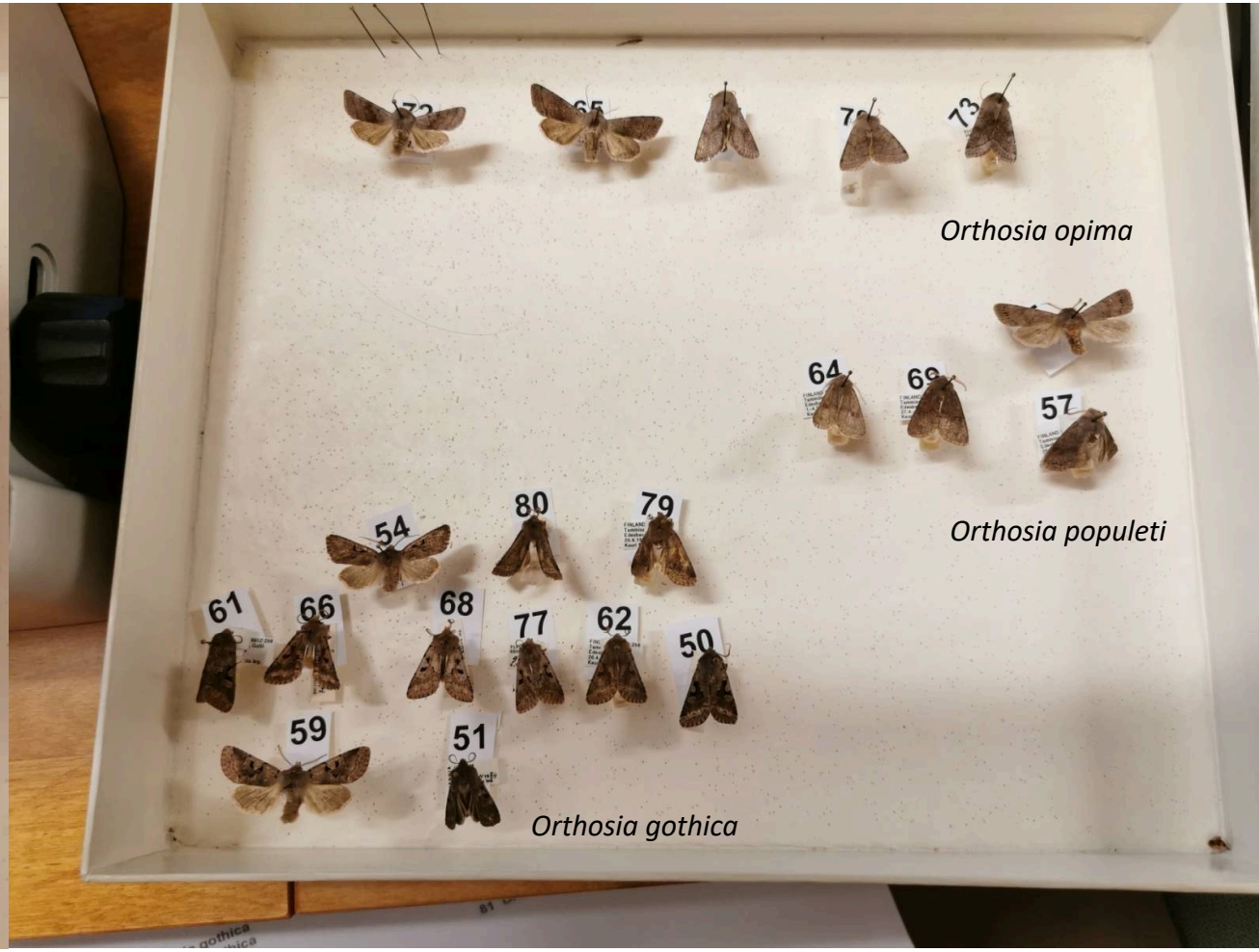
- Family: Noctuidea
- Owlet moths
- 8 species in Finland, 5 of them are common
- All of them can be identified using external characters or general appearance

Identification based on external features

- Wings: pattern, colour, size
- Antennas: structure
- Legs: absence or presence of hairtuffs, number of spurs and thorns

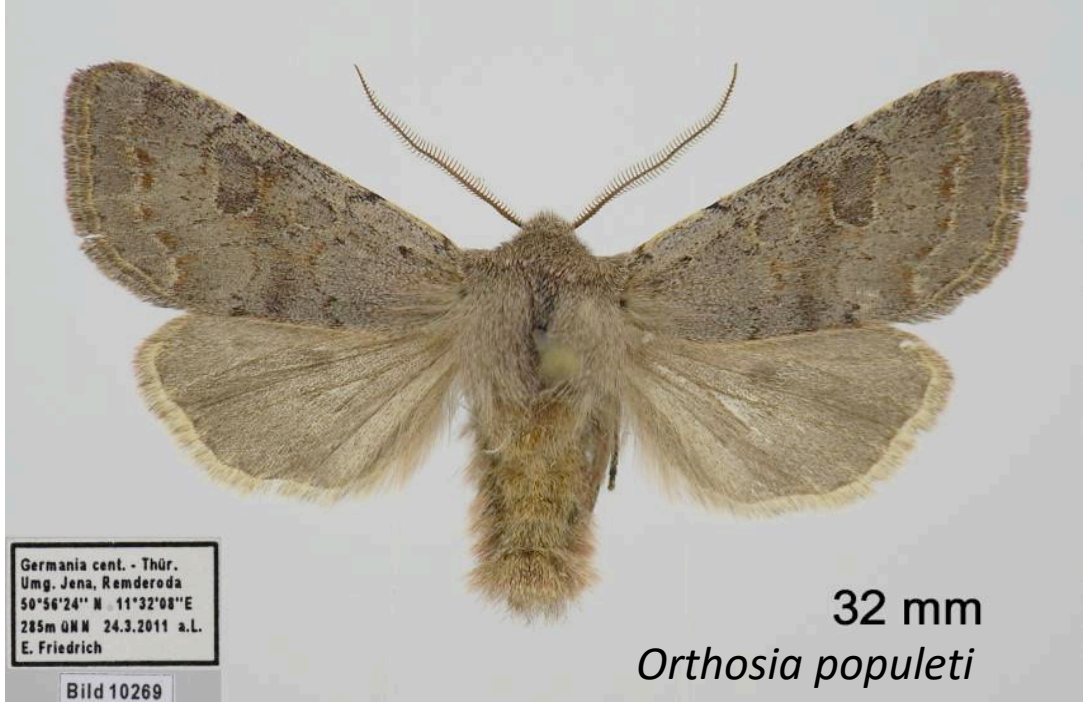
External features



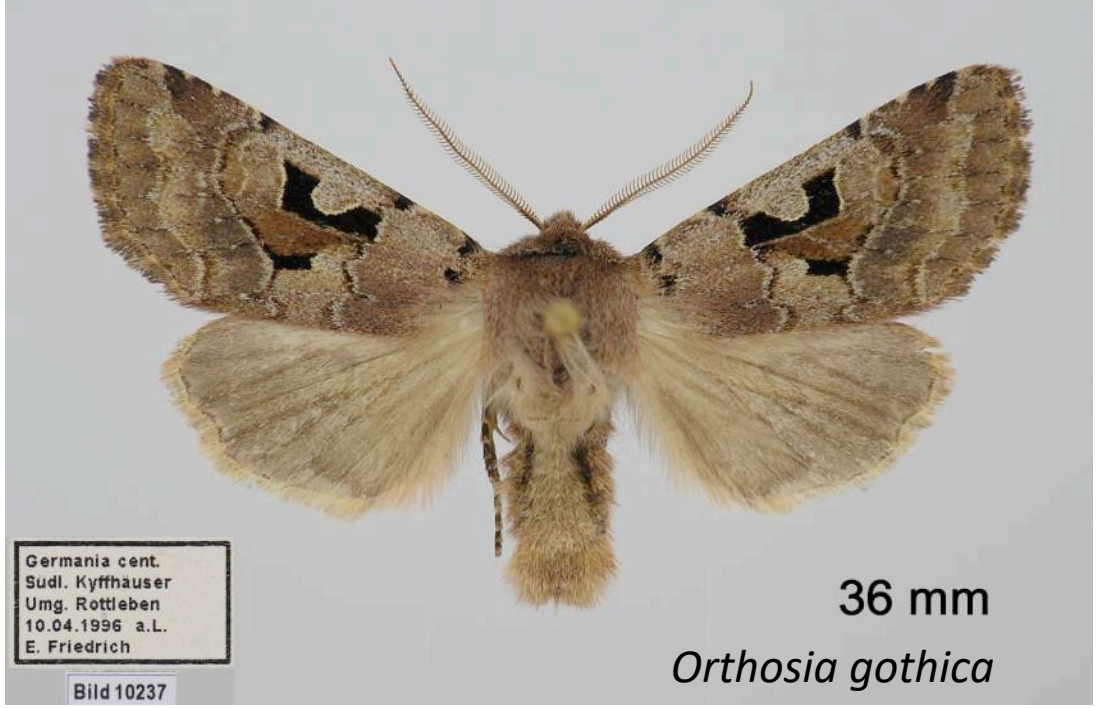


36 mm
Orthosia opima

39 mm
Orthosia incerta



32 mm
Orthosia populeti



36 mm
Orthosia gothica

32 mm
Orthosia cerasi

37 mm
Orthosia gracilis

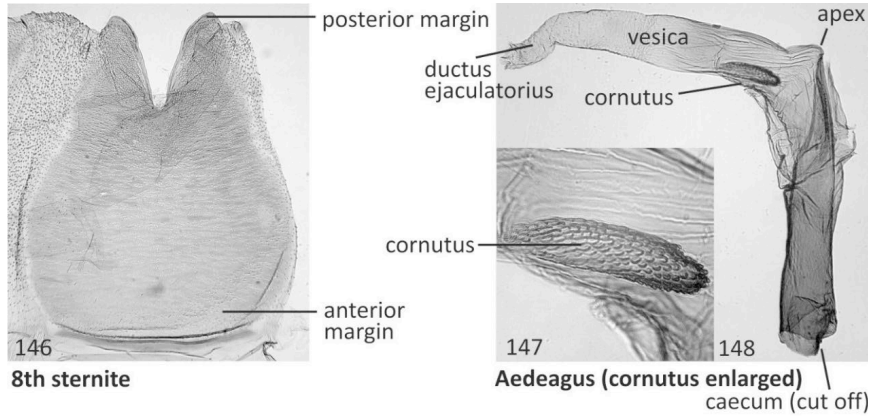
29 mm
Orthosia cruda

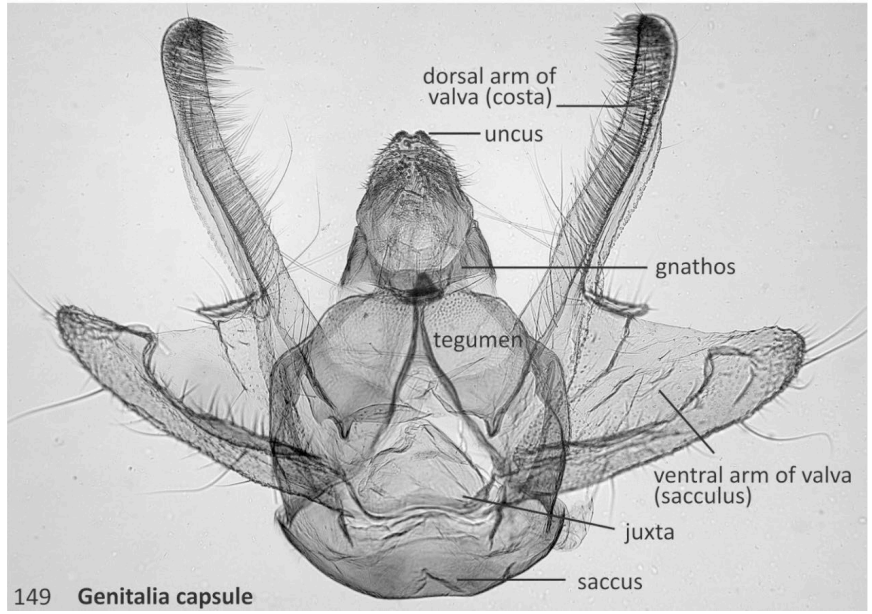
31 mm
Orthosia miniosa

Identification based on internal morphogy: Genitalia

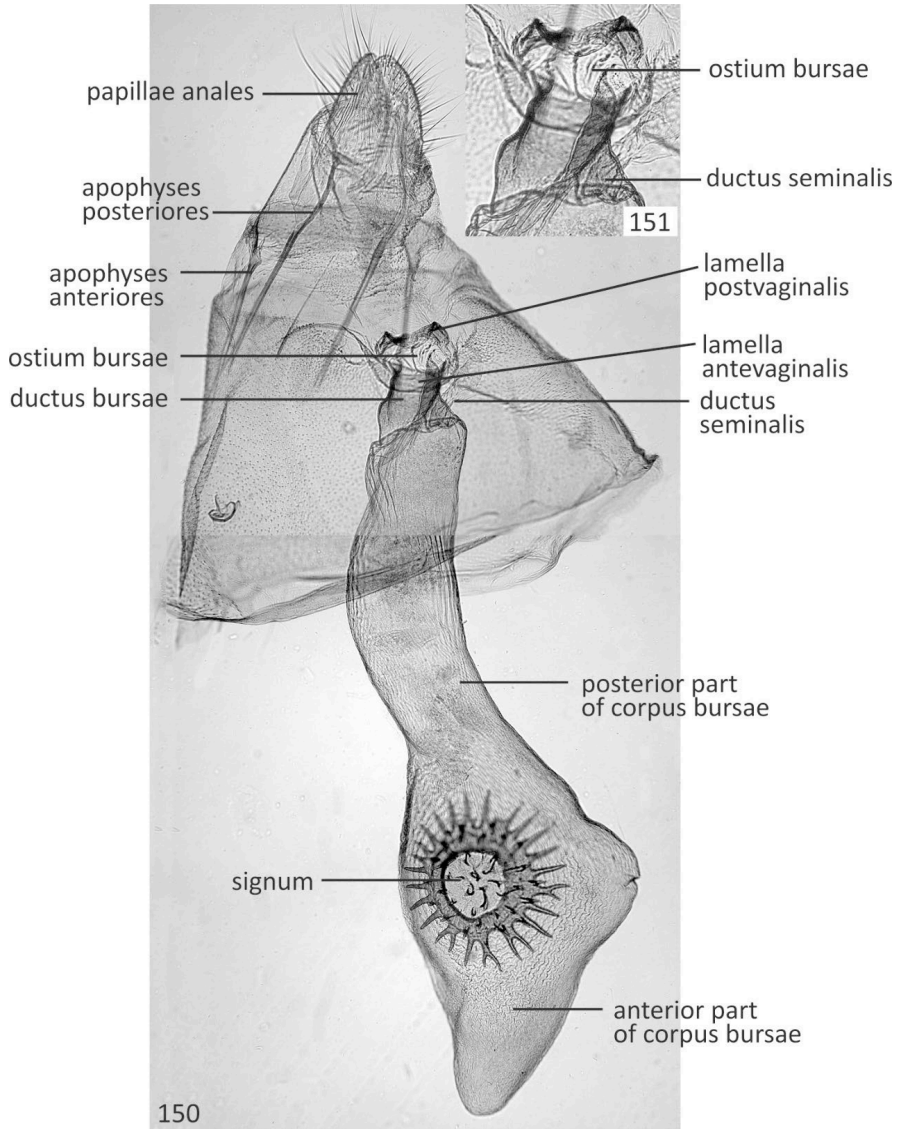
- Genital capsule can be used for identification
- Penis can have hooks
- it is usually detached for examination

Male genitalia





Female genitalia structures



Preparation of male genitalia

1. Abdomen is removed with forceps

2. KOH-treatment (about 10min in 92°C or over night in room temperature) to soften the structures

3. KOH-treated abdomen is transferred to water where KOH is diluted in water

https://laji.fi/taxon/MX.62967/images

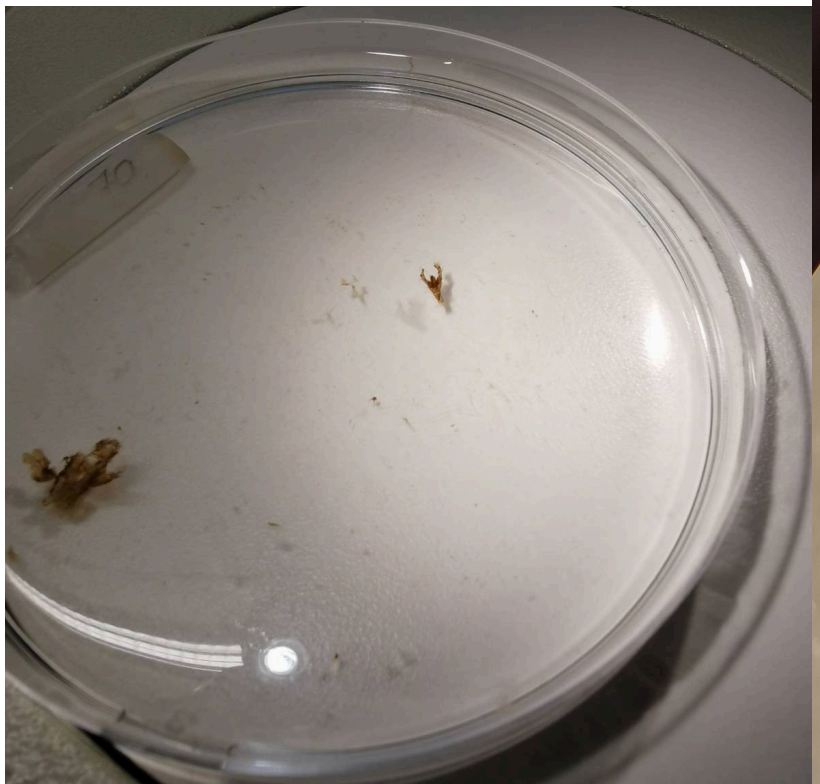
Preparation of male genitalia

4.Genitalia capsule is detached with forceps

5.Cleaning in water and removing soft tissues and scales

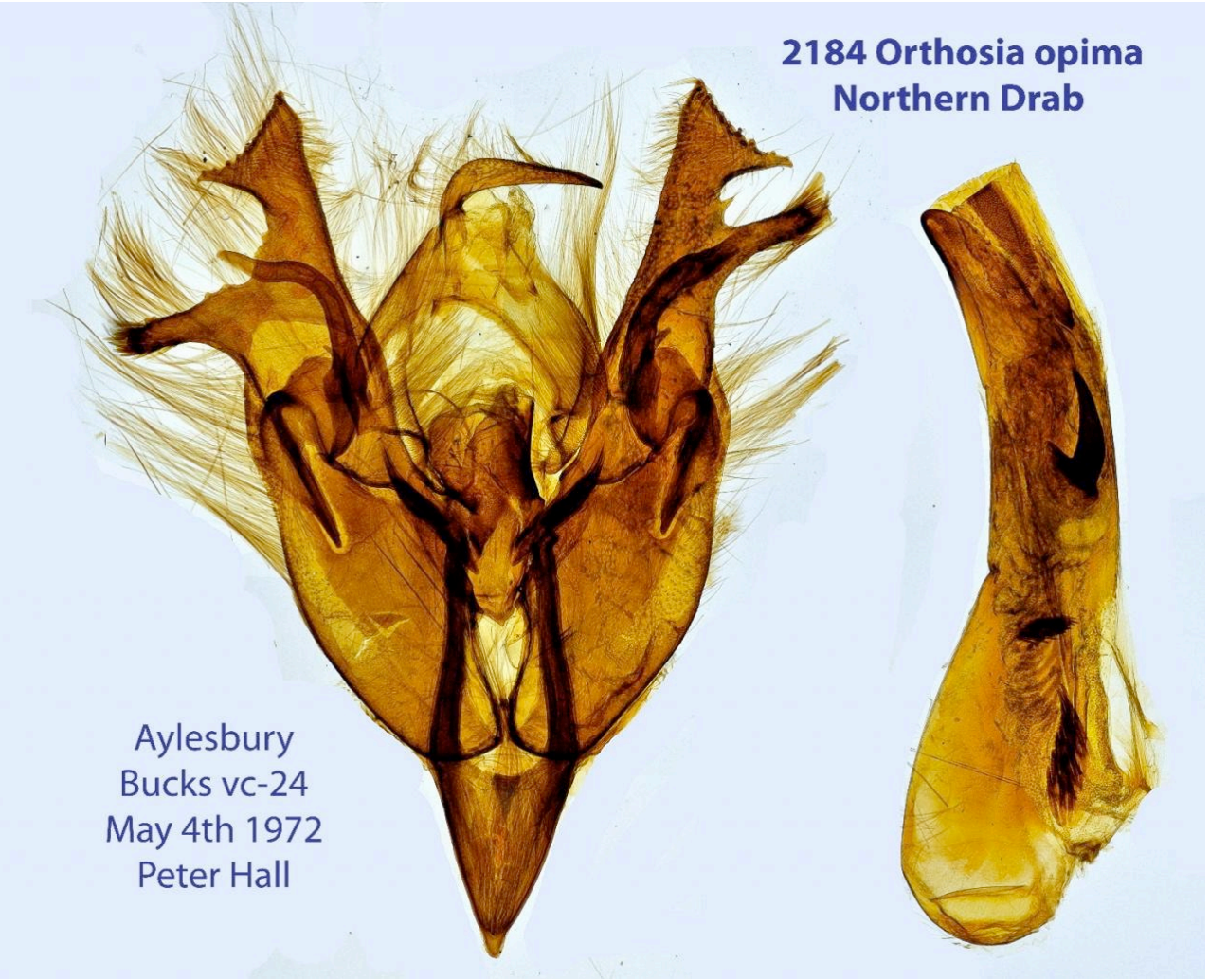
6.Identification

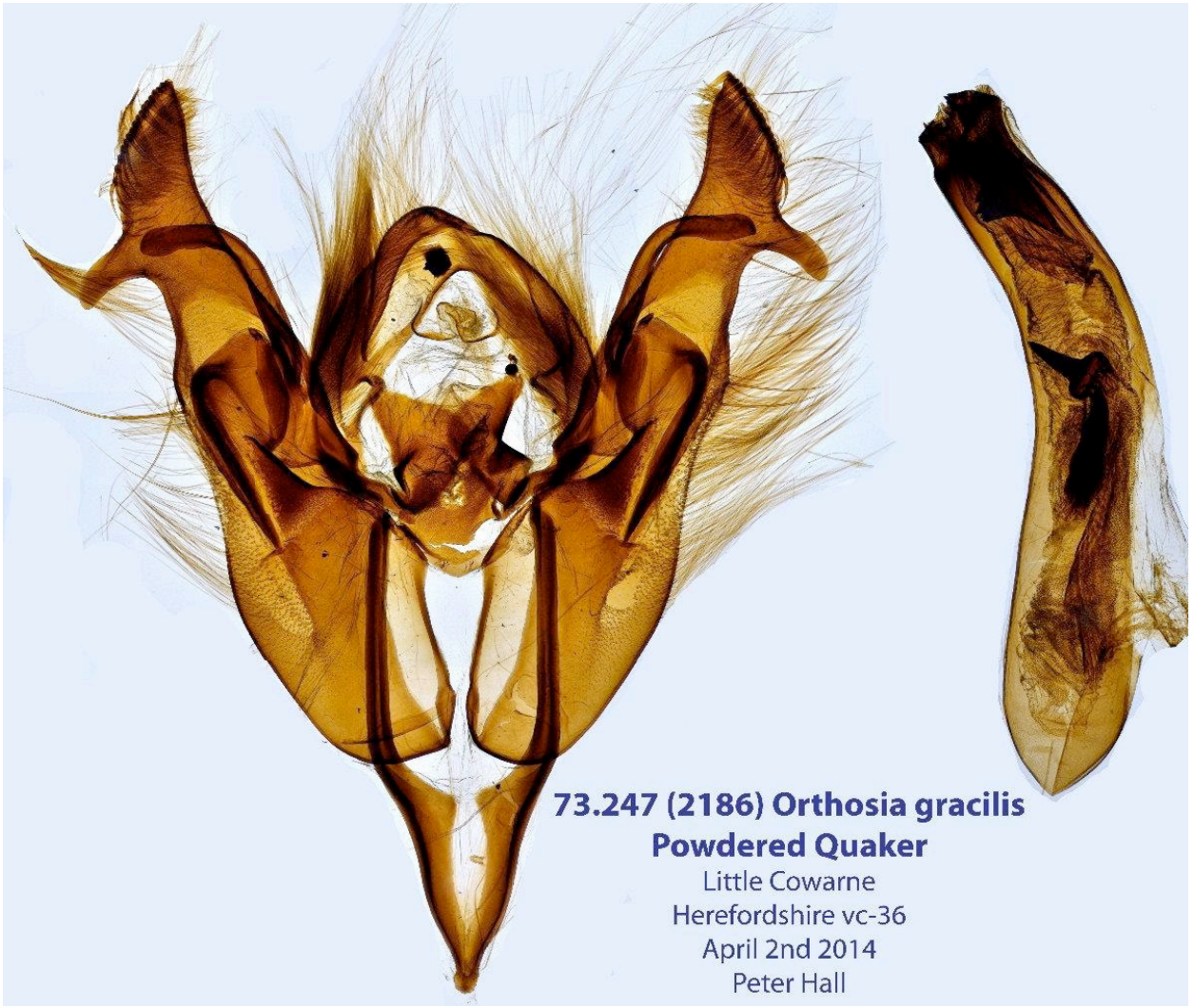
7. Storaging:Plastic strip, Cardboard or glyserol



Orthosia opima genitalia

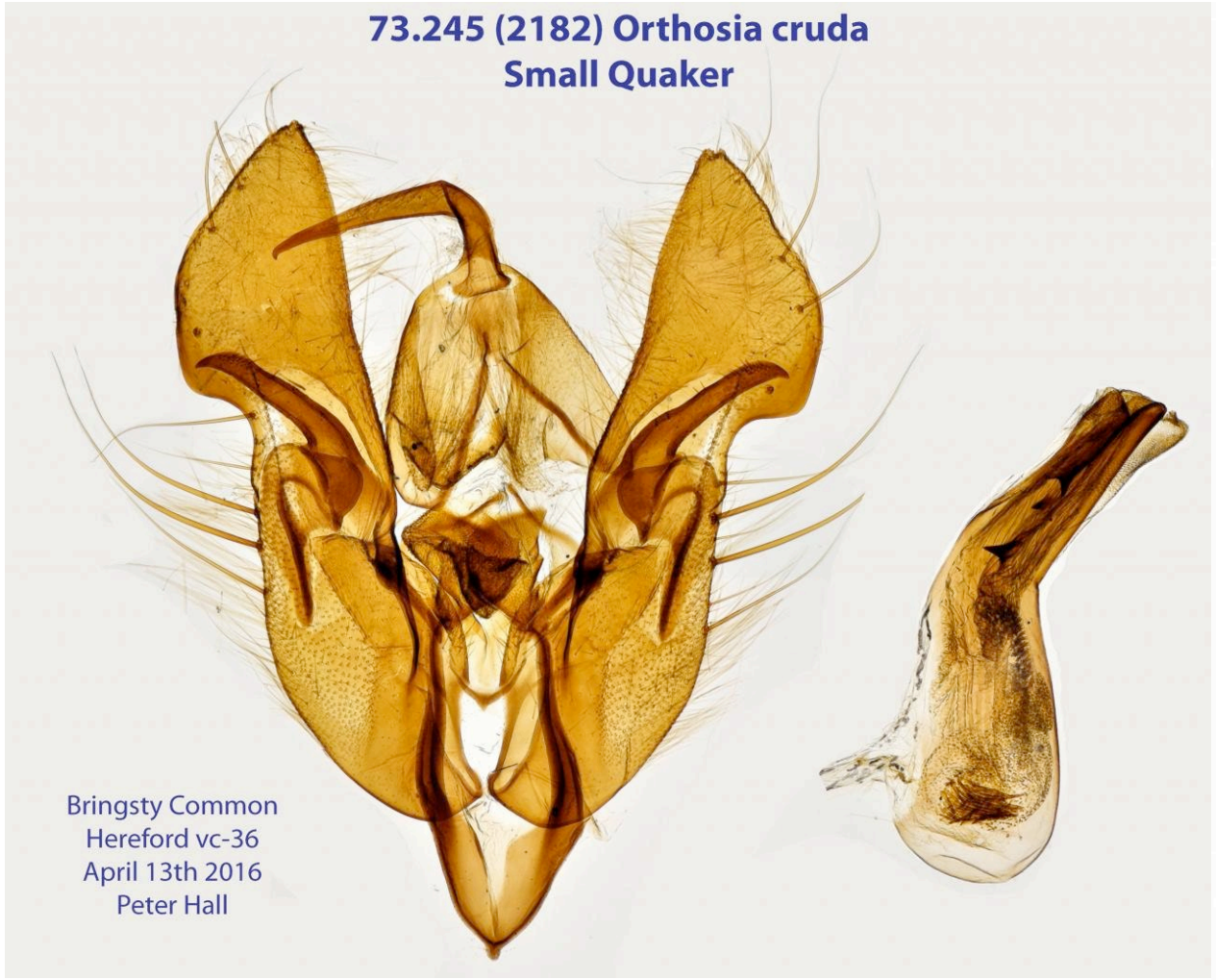
Male genitalia of *Orthosia* moths

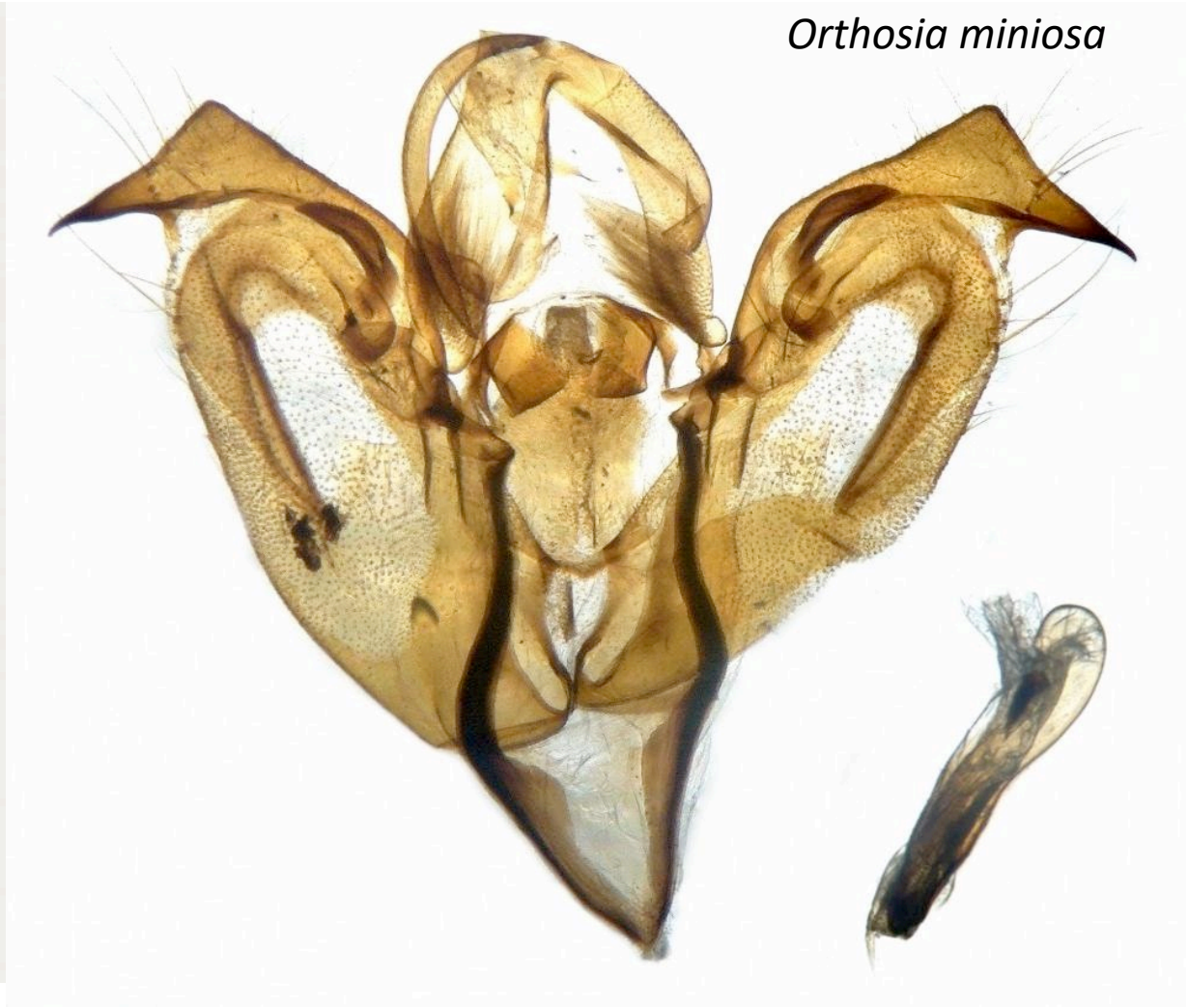




source: https://mothdissection.co.uk

Male genitalia of *Orthosia* moths





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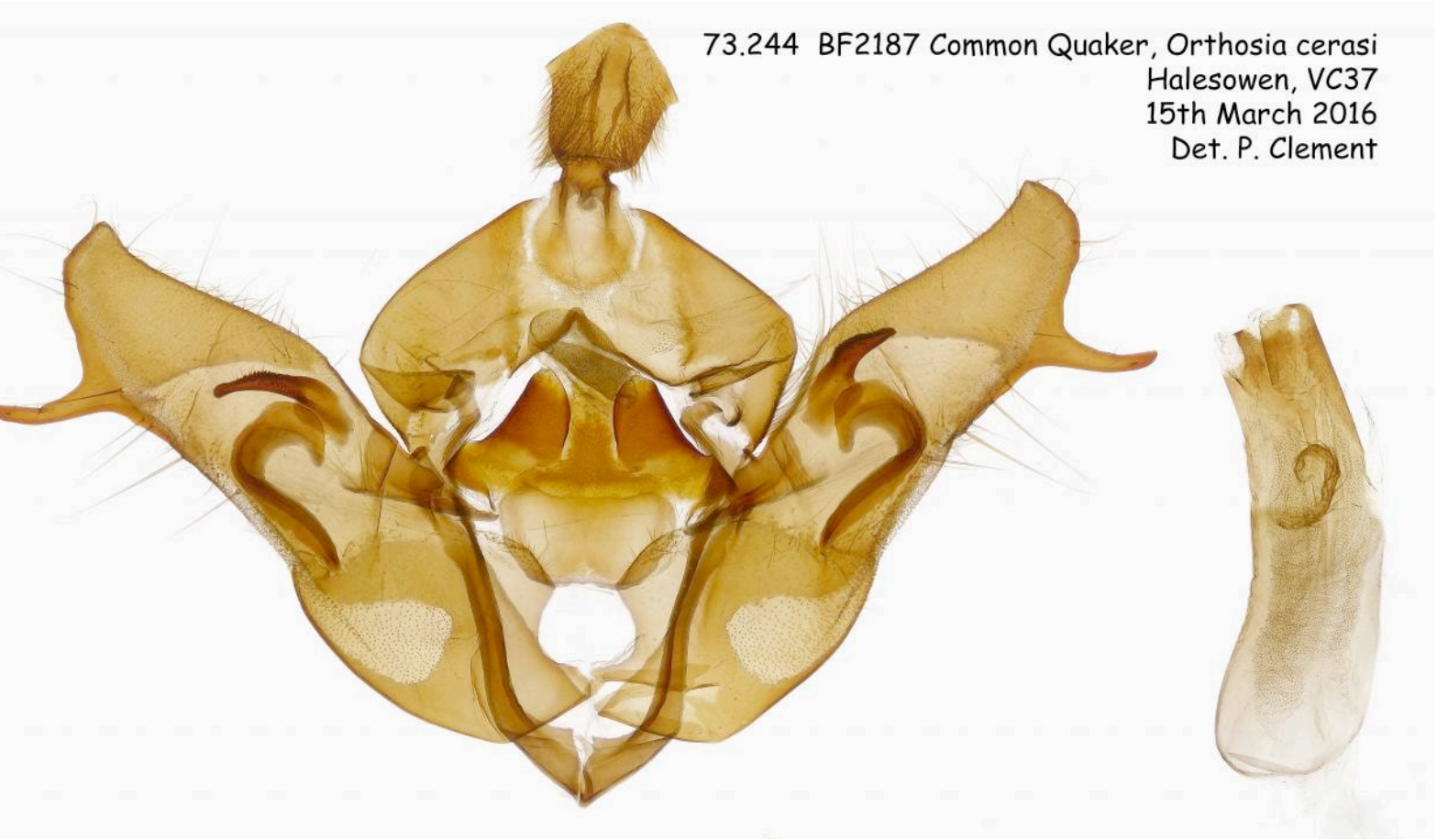
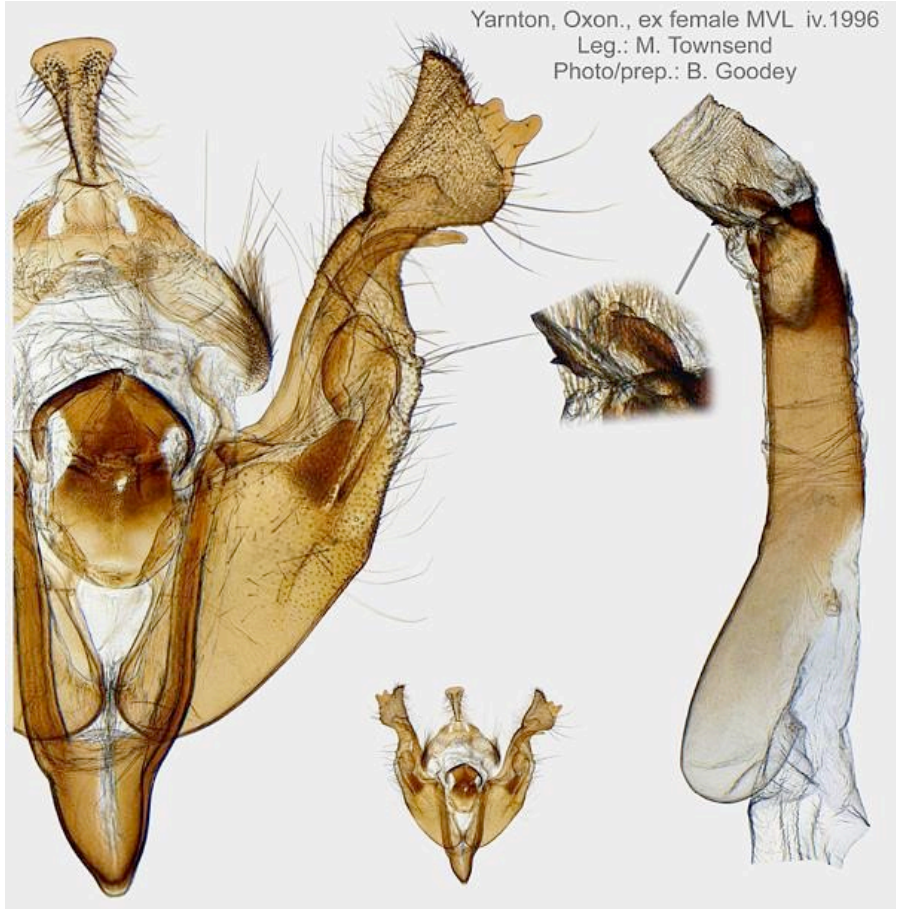
Male genitalia of *Orthosia* moths



Orthosia populeti



DNA barcode

- Dna-based identification
- a short section of DNA from a specific gene or genes
- Can be used to identify different life stages
- Reference library is needed

- https://v4.boldsystems.org/
- Specimen -> tissue sample -> extract DNA ->PCR-> sequence->DNA barcode -> bold database