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Studies on Crambidae VII – *Lingulabotys* gen. nov. from Africa (Pyraloidea, Crambidae, Spilomelinae).

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Abstract: *Lingulabotys* **gen. nov.** is erected to group two described species: *Pilocrocis nubilinea* Bethune-Baker, 1909 and *Nacoleia haesitans* Meyrick, 1934; both described from the African mainland. Illustrations of the adults and their genitalia are given with remarks on the systematic placement of the genus.

Key words: Descriptions, distribution, *Lingulabotys haesitans* (Meyrick, 1934) **comb. nov.**; *Lingulabotys nubilinea* (Bethune-Baker, 1909) **comb. nov.**; systematic placement.

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Peer reviewed

INTRODUCTION

While sorting out the identities of African crambids, type species were systematically studied and dissected to compare with non-identified accessions. As stated earlier (Maes, 1996; 2024), it is often difficult to correctly place the species from this continent since most were described before dissections (and now DNA barcoding) were available. Those authors placed their new species mostly in existing genera that were initially erected from other zoogeographical regions. A lot of African species belong to genera with an Old World distribution, even some with a global distribution and more rarely a Neotropical-African distribution. To place the African species correctly, at least the type-species of known genera on a world level must be studied and documented. I have been doing this over the last forty years and most genera have been covered and entered in a flexible relational World Crambidae database which allows one to group species based on different characters. A global approach to the different genera is necessary to avoid, as much as possible, the creation of what later may be identified as synonyms. The types were studied in the Natural History Museum (London, UK) and the Royal Museum for Central Africa (Tervuren, Belgium) and additional material was included from ABSRC and RMCA. A new genus, *Lingulabotys* **gen. nov.**, is created to group two described species: *Nacoleia haesitans* Meyrick, 1934 (DRC) and *Pilocrocis nubilinea* Bethune-Baker, 1909 (DRC). Externally both species resemble *Patania* species, in particular *Patania balteata* (Fabricus, 1798) but the male and female genitalia have a different ground plan.

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METHODS AND MATERIALS

Genitalia dissection:

Genitalia were dissected following Maes (1985); a modification and extension of Robinson (1976) and specific for the Pyraloidea; except that the abdomen is opened laterally to better show the characters of the sternites and tergites.

Wing venation:

The wings were cleared and stained following the method described by Zimmerman (1978).

Digital processing of images:

Images of the adults were taken with a Canon Eos 5D Mark IV with a Macro lens EF 100mm 1:2.8 using Helicon remote (ver. 3.9.12M) and the stacking of images with Helicon focus (ver.8.2.7). The genitalia were photographed with a Canon Eos 5D Mark IV on a Leitz Laborlux S.

Abbreviations

ABSRC: AgroBioSys Intl. Reference Collection, Wetteren, Belgium
DRC: Democratic Republic of Congo
RMCA: The Royal Museum for Central Africa, Tervuren, Belgium.

RESULTS

Crambidae Latreille, 1810
Spilomelinae Guenée, 1854

Descriptions:

Lingulabotys **gen. nov.**
urn:lsid:zoobank.org:act:0340FEA6-29B6-44CE-BE1C-FF2C60756B70

Gender: female
Type species: *Nacoleia nubilinea* Bethune-Baker, 1909

Diagnosis:
Male genitalia with a characteristic, rather elongated, tongue-shaped fibula originating near the base of the costa. Female genitalia with a simple signum on the round corpus bursae. Middle part of ductus bursae with minute spines.

Description:
Head: frons rounded, maxillary palps close to base of labial palps, upturned, terminal segment of lighter colour; labial palps upturned, light yellow with some black scaling near the apex of the second labial palp; third segment small; antenna filiform.
Wings: forewing triangular with a simple wing pattern consisting of an ante- and postmedian line and an 8-shaped reniform spot. Sc parellel to Radial stem; base R1 parallel to base Cu2; R2 and R3+4 separated at the base, forming the upper angle of the median cell, R2 parallel with R3+4 over most of its length; R3+4 separating near the apex of the forewing, R3 before the apex, R4 terminating at the apex; R5 originating near the lower part of the upper angle of the cell; M1 at some distance beneath R5; M2 and M3 close at the base, forming the lower angle of the cell together with CuA1; CuA2 from the lower stem of the cell; 1A+2A well developed from thorax towards lower angle of the forewing; 3A forming a loop near the base of the wing. Hindwing with Sc+R1 fused with the R stem beyond the upper angle of the cell; M1 from upper angle of the cell; M2, M3, CuA1 forming the lower angle of the cell, but all separated at their base; CuA2 originating at about two thirds of the length of the cell. Retinaculum simple in male, double in female.
Abdomen: yellow or brown, as the ground colour of the species.
Tympanal organs: praecinctorium bilobed, tympanal organs invaginated, fornix tympani wide, slightly protruding beyond the venula prima; bulla tympani slightly oval, almost round; saccus tympani present, devoid of scales, distally rounded, with a clear, well sclerotized venula secunda on the sternite; tympanal organs in both species very similar.
Male genitalia: uncus broad, rounded; tegumen broad, with long pedunculi; saccus well developed, U-shaped; transtilla well developed, triangular; a patch with long hair-like setae on the membranous part of the tuba analis (Fig. 6); valvae rounded, oval, ear-shaped without the usual fibula but instead with a long spoon-shaped, slightly inwards curved sclerotized arm originating from the base of the costa; aedeagus tubular: proximal part membranous, apical part slightly sclerotized with a blunted terminal process; cornutus consisting of several strongly sclerotized spines, present as a bundle of different lengths.
Female genitalia: Papillae anales membranous with short and long setae; apophyses posteriores and anteriores of about equal length; sinus vaginalis membranous; ductus seminalis quite large and broad; antrum not present as a distinct sclerotized zone; ductus bursae tubular with some minute sclerotizations; corpus bursae ovoid with a single ovoid signum; appendix bursae lacking.
Etymology: The name refers to the tongue (Latin: lingula) shaped extension found on the base of the costa in the male genitalia and the old name *Botys* used by the authors in the 19th century to refer to a "Pyraloid" moth.
Foodplant: unknown
Distribution: African mainland.

Systematic position and remarks: The genus with its species is placed in the Spilomelinae, Agroteriini because of the form of the valva, more specifically, the place of origin of the tongue-shaped fibula. Externally the adult moth resembles the more common *Patania balteata* Fabricius, 1798 but differs in the large 8-shaped reniform spot on the forewing present in this genus but only a rectangular or oval reniform spot on the transverse vein of the forewing in most *Patania* species.

They are clearly also different based on the structure of the male genitalia: *Patania* species have a fibula and a sclerotized median structure on the transtilla; members of this new genus have a characteristic long spoon-shaped arm near the base of the costa on the valva. The form of this extension and its place of origin on the valva is unique in the Crambidae.

Lingulabotys nubilinea (Bethune-Baker,1909) **comb. nov.**
Annals and Magazine of Natural History (8)3: 436 *(Pilocrocis)*
Figs 1–10

Material examined: 1♂: CAMEROON, Centre Region, Savannah-Rainforest edge, near Magong, SE of Yoko, 05°23'38.5" N, 012°30'48.4" E, 732 m, Black/MV lights, 4 to 11.vi.2019, K. Maes/ ABSRC1001188; 1♀: CAMEROON, Centre Region, Savannah-Rainforest edge, near Magong, SE of Yoko, 05°23'38.5" N, 012°30'48.4" E, 732 m, Black/MV lights, 4 to 11.vi.2019, K. Maes./ K. Maes Gen.Prep.nr.♀2242/ ABSRC1001234; 1♂: CAMEROON, Centre Nkongmeyos (Yaoundé), 750 m, 25.vii.92, K. Maes/ K. Maes Gen.Prep.nr.♂2241/ ABSRC1002851; 1♂: CAMEROON, Yaoundé Nkolbisson Nonveiller i.1970/ K. Maes Gen.Prep.nr.♂2271 Wings/ ABSRC1002852; 1♂: CAMEROON, Centre Nkongmeyos (Yaoundé), 750 m, 21.vii.92, K. Maes/ ABSRC1002853; 1♂: CAMEROON, Centre Nkongmeyos, 750 m (Yaoundé), 29.xi.91, K. Maes/ ABSRC1002854; 1♂: CAMEROON, Sud Province, near Ebogo village, fresh clearing near edge of secondary forest, 03°24'31.9" N, 11°29'30.2" E, 670 m, MV Light. 14 to 15.xii.2014, K. Maes/ K. Maes Gen.Prep.nr.♂2270/ ABSRC1002855; 1♂: [DRC] Lusambo 21.iii.1958, Dr.M.Fontaine/ RMCA ENT 000008133.

Diagnosis: Ground colour dark brown with a light brown costa (Fig. 1); male genitalia with the uncus broadly rounded and the valva narrower at the base than near the middle; female genitalia with the ductus bursae carrying very small sclerotizations, straight and slightly bent near the middle, not folded; corpus bursae ovoid.

Description:
Head: frons rounded, with a narrow yellow line lateral of the eye; maxillary palps short yellow; labial palps upturned, yellow brown, with some darker, even black scaling near the apical part of the second segment; antennae filiform (Fig. 2).
Wings: forewings triangular, ground colour: brown suffused with some diffuse yellow patches; costa light brown-yellow beyond the antemedian line up to the termen; antemedian and postmedian line dark brown; orbicular stigma round, brown; reniform stigma with a brown outer line, medially yellow; parting from the base

and following the M vein up to the Cu veins more brown than yellow; hindwing mainly brown with some yellow scaling near the outer edge around the M and Cu veins.
Wingspan: 22–25 mm.
Abdomen: dorsally and ventrally ground colour: brown suffused with some yellow scaling.
Tympanal organs: as for the genus (Fig. 3).
Male genitalia: general structure as for the genus (Fig. 4), but this species, as compared with *haesitans*, has the uncus (Fig. 5) broad and apically rounded; the distal part of the valva is also slightly more rounded; the tongue-shaped protrusion (Fig. 6) originating from the base of the costa is more curved and the aedeagus (Fig. 7) has a clear sclerotized plate with a blunted protrusion, a large single spine shaped cornutus and a shorter second cornutus composed of multiple fused spines.
Female genitalia: as for the genus (Fig. 8); this species has a straight, slightly sclerotized ductus bursae covered for most part with minute scobinations (Fig. 9); corpus bursae (Fig. 10) with a small ovoid signum.
Foodplant: unknown.
Distribution: Cameroon, Democratic Republic of Congo.

Lingulabotys haesitans (Meyrick,1934) **comb. nov.**
Exotic Microlepidoptera 4: 502 (*Nacoleia*)
Figs. 11–18.

Type material examined: Holotype ♀: [DRC] Yumbi 28.xii.1920, Dr. H. Schouteden/ K. Maes Gen.Prep.nr.♀14322/ RMCA ENT 000007467.
Additional material examined: 1♂: NAMIBIA Kavango Popa Falls, 9.xi.2007, LF leg. V. Richter/ K. Maes Gen.Prep.nr.♂1457/ ABSRC1002748; CAMEROON Center, Yaoundé, Mt. Phébé, 1070 m, vii.1993/ ABSRC1002746; KENYA, Rift Valley, Samburu Nat. Res. near Uaso Nyiro river, Intrepid Camp, 0°34’34.8” N, 37°39’36” E, 910 m, Black/MV lights, 13 to 14.xii.2002, K. Maes/ ABSRC1002747.

Diagnosis: Ground colour yellow with some brown markings as ante-, postmedian and terminal lines; male genitalia with the valva almost as broad over most of its surface; uncus rounded but slightly protruding apically; female genitalia with middle part of ductus bursae carrying minute sclerotizations, folded (not bent) near the ovoid corpus bursae (Fig. 11).

Description:
Head: frons rounded, yellow; maxillary palps short, yellow; labial palps upturned, yellow brown, with some sparse darker and a few black scales near the apical part of the second segment; antennae filiform (Fig. 12).
Wings: forewing triangular, ground colour: yellow with some diffuse brown patches; costa yellow over its whole length; antemedian and postmedian lines brown; orbicular stigma small, round, brown; reniform stigma with a brown outer line, medially yellow; parting from the base and following the M vein up to the Cu veins, diffuse brown; hindwing yellow as forewing brown with some brown scaling forming the antemedian and postmedian lines, which are incomplete. A small brown diffuse patch stretching from the termen up the M veins in the postmedian field.
Wingspan: 23−26 mm.
Abdomen: dorsally and ventrally ground colour of wings, yellow.
Tympanal organs: as for the genus (Fig. 13).
Male genitalia: general structure as for the genus (Fig. 14), but this species, as compared with *nubilinea*, has the uncus broad and apically more triangular; the distal part of the valva is also slightly more rectangular; the tongue-shaped protrusion originating from the base of the costa is only slightly curved and the aedeagus (Fig. 15) has fewer spines in the second shorter cornutus as in *L. nubilinea*.
Female genitalia: as for the genus (Fig. 16); sclerotized ductus bursae (Fig. 17) covered for most part with minute scobinations but less than in the previous species, folded at about two thirds of its length near the corpus bursae (Fig. 18); corpus bursae with an ovoid signum, slightly larger than in the previous species.
Foodplants: unknown
Distribution: Cameroon, Democratic Republic of Congo, Kenya, Namibia.

DISCUSSION

The genus with its species is placed in the Spilomelinae, Agroteriini because of upturned labial palps, and the place of origin of the tongue-shaped fibula near the base of the costa.

Externally the adult moths resemble the more common *Patania balteata* Fabricius, 1798 but differ externally in the large 8-shaped reniform spot on the forewing. Only a rectangular or oval reniform spot on the transverse vein of the forewing is seen in most Patania species found in Africa.

The distribution of *Lingulabotys* is restricted to Africa south of the Sahara.

ACKNOWLEDGEMENTS

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Figure 1 – *Lingulabotys nubilinea* adult ♀2242.

Figure 2 – *Lingulabotys nubilinea* ABSRC10027482852 Lateral view head.

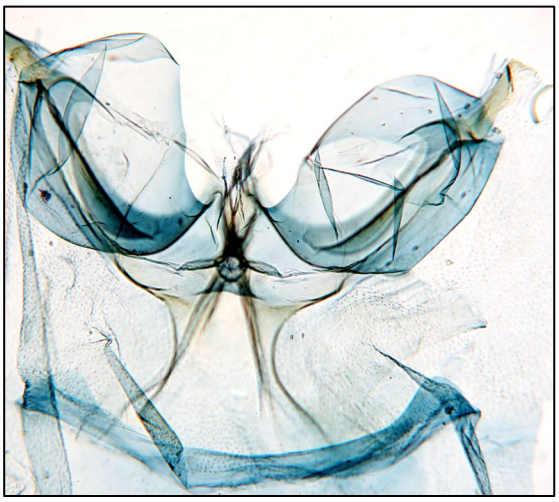

Figure 3 – *Lingulabotys nubilinea* tymp GPKM♂2243.

Figure 4 – *Lingulabotys nubilinea* GPKM♂2243.

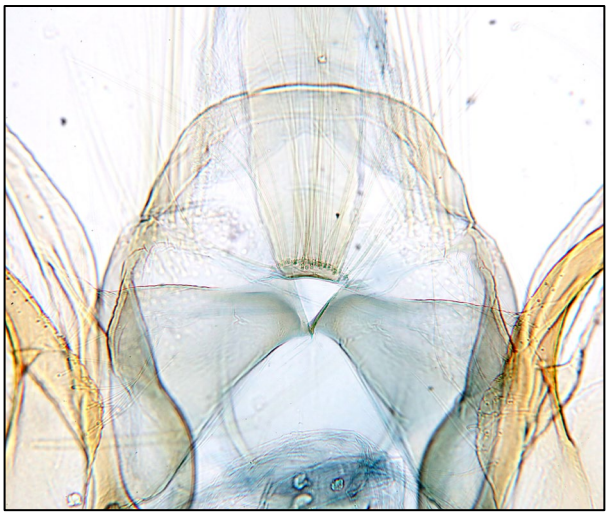

Figure 5 – *Lingulabotys nubilinea* uncus GPKM♂2243.

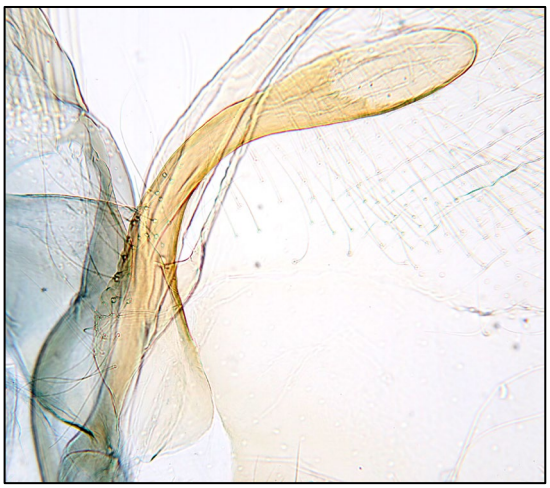

Figure 6 – *Lingulabotys nubilinea* fibula GPKM♂2243.

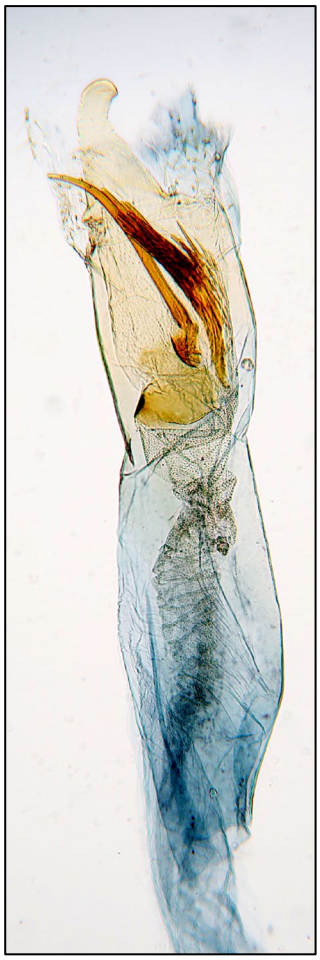

Figure 7 – *Lingulabotys nubilinea* aedeagus GPKM♂2243.

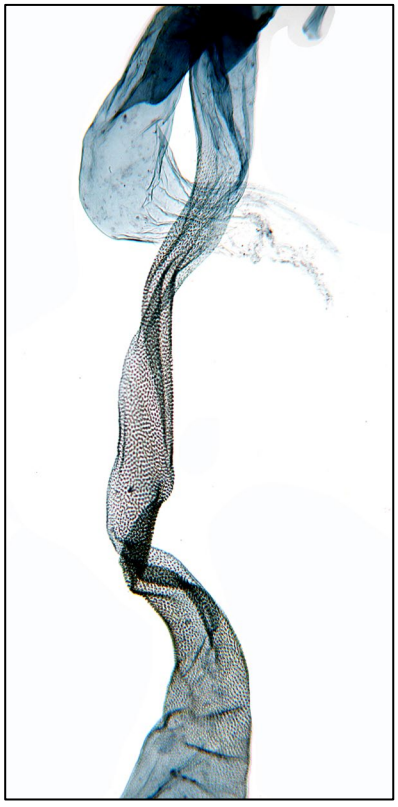

Figure 9 – *Lingulabotys nubilinea* ductus bursae GPKM♀2242.

Figure 8 – *Lingulabotys nubilinea* GPKM♀2242.

Figure 10 – *Lingulabotys nubilinea* corpus bursae GPKM♀2242.

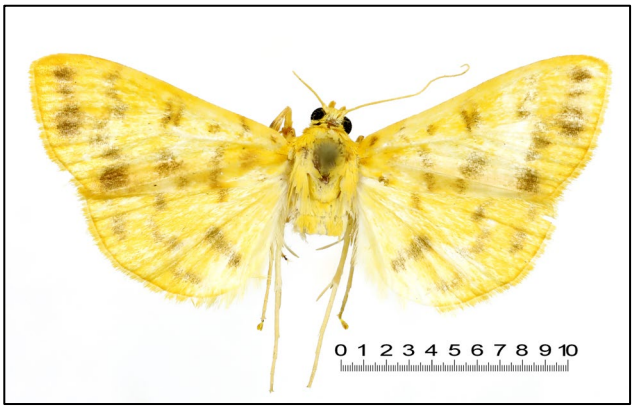

Figure 11 – *Lingulabotys haesitans* adult GPKM♀20932.

Figure 12 – *Lingulabotys haesitans* ABSRC1002748 Lateral view head.

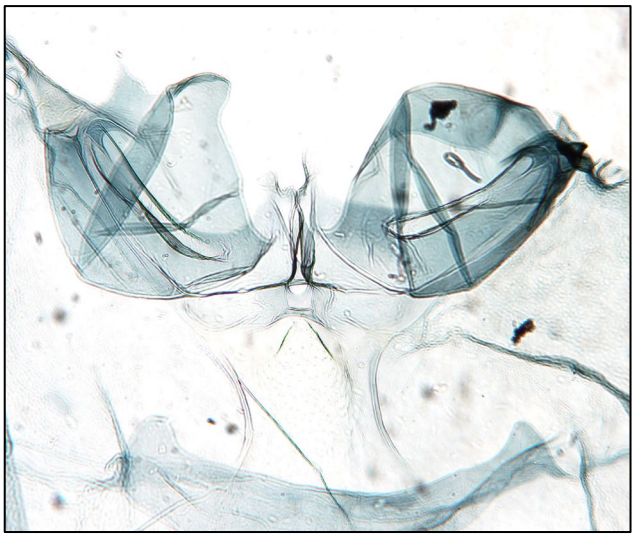

Figure 13 – *Lingulabotys haesitans* tymp GPKM♂1457.

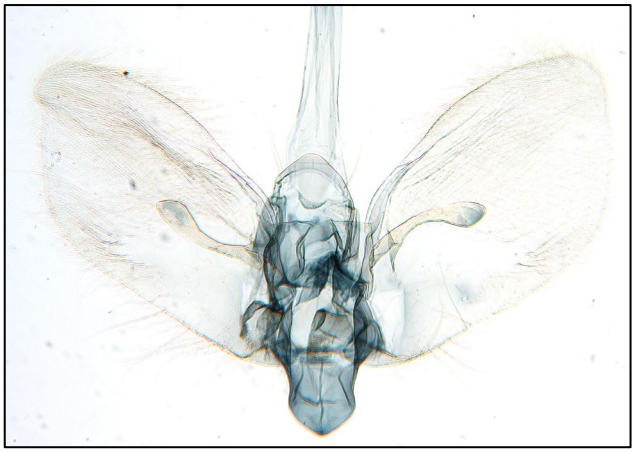

Figure 14 – *Lingulabotys haesitans* GPKM♂1457.

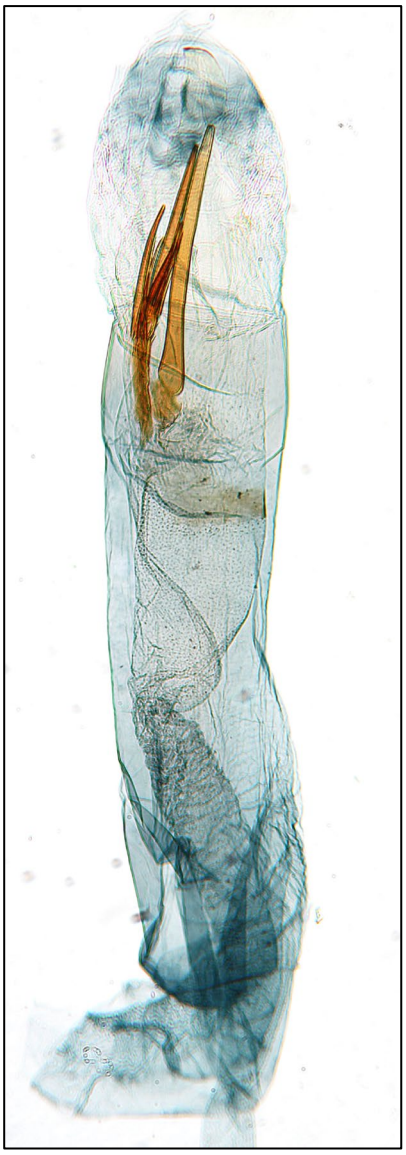

Figure 15 – *Lingulabotys haesitans* aedaeagus GPKM♂1457.

Figure 16 – *Lingulabotys haesitans* GPKM♀14322.

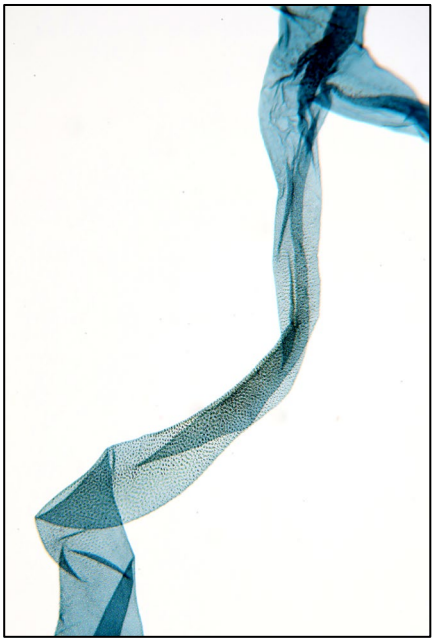

Figure 17 – *Lingulabotys haesitans* ductus bursae GPKM♀14322.

Figure 18 – *Lingulabotys haesitans* corpus bursae signum GPKM♀14322.