



## New and little known *Coleophora* Hübner, 1822 species from Morocco. Part I. (Lepidoptera, Coleophoridae)

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### Abstract

Altogether, 64 *Coleophora* (Lepidoptera: Coleophoridae) species from Morocco are reported, based on recent collecting expeditions. Twelve new species are described: *C. retusa* Tabell, **sp. nov.**, *C. afrofrischella* Tabell, **sp. nov.**, *C. olei* Tabell, **sp. nov.**, *C. carsteni* Tabell, **sp. nov.**, *C. ifranensis* Tabell & Kullberg, **sp. nov.**, *C. jaskai* Tabell, **sp. nov.**, *C. submendica* Tabell, **sp. nov.**, *C. adipella* Tabell, **sp. nov.**, *C. antiatlasella* Tabell, **sp. nov.**, *C. dikeratella* Tabell & Kullberg, **sp. nov.**, *C. afrodranthi* Tabell, **sp. nov.** and *C. knudi* Tabell, **sp. nov.** Of the previously described species, 20 are collected for the first time from Morocco, of which nine are also new to Africa. Adult males and females and their genitalia are illustrated. DNA barcodes of the presented species, if existing, are compared with those of all other Coleophoridae available on the BOLD database. Each of the barcoded new species has a unique BIN (Barcode Index Number). The female genitalia of *C. arefactella* Staudinger, 1859, *C. stenidella* Toll, 1952 and *C. griseomixta* Toll, 1960 are illustrated for the first time.

**Key words:** Descriptions, North Africa, genitalia, DNA barcoding, BIN

### Introduction

The genus *Coleophora* (Lepidoptera: Coleophoridae) is among the most species-rich lineages of moths. Currently, 1455 species are considered valid (Baldizzone 2019), and the genus is particularly species-rich in the Nearctic and Palearctic regions (e.g. Pohl *et al.* 2016; Karsholt & Razowski 1996). Typically, *Coleophora* caterpillars initially feed on the seeds, flowers or inside the leaves of the host plants, but when larger, they switch to feed externally and construct distinctive protective silken cases, often incorporating plant material. The cases are often diagnostic on species level, and they give these moths their vernacular name: (seed) case-bearers.

The Coleophoridae fauna of Morocco remains insufficiently studied. The summary in *Catalogue raisonné des Lépidoptères du Maroc* (Rungs 1981) provided a basis, which has been gradually refined with new information. Results on collecting expeditions by Walsingham in 1901–1902, the Zoological Museum of Copenhagen in 1989 and the expedition of Bassi, Olmi and Scaramozzino in 1990 to Morocco were presented by Baldizzone (2003, 1995, 1997), respectively. In these papers, 42 different *Coleophora* species were observed from Morocco, of which five taxa were described as new. A few additional *Coleophora* species have been reported from Morocco during recent years (e.g. Tabell *et al.* 2018).

Recently, short excursions to Morocco by the first author, the Danish expedition (Carsten Hviid, Ole Karsholt, Knud Larsen and Danny Nilsson) and Jaakko and Anssi Kullberg, Zdravko Kolev and Zdenko Tokár with Lubomír Srnka in 2010–2017 produced rich material of Coleophoridae.

Our aim is to present the results of those collectings in two papers, concerning Coleophoridae. A few records have been added to the current manuscript by Giorgio Baldizzone. In the present paper, we cover 64 different species, of which 12 are described as new to science, and give notes on several poorly known species. In addition, we report 20 additional species as new to Morocco and nine new to Africa.

## Material and methods

### Abbreviations

NHMUK = Natural History Museum, London, United Kingdom

MZH = Finnish Museum of Natural History, Helsinki, Finland

ZMUC = Zoological Museum of Copenhagen, Denmark

TAB = Research collection of Jukka Tabell, Hartola, Finland

TOK = Research collection of Zdenko Tokár, Slovakia

SRN = Research collection of Ľubomír Srnka, Slovakia

Bldz = Giorgio Baldizzone

IgR = Ignác Richter

JT = Jukka Tabell

ZT = Zdenko Tokár

det. = determined

ex. – exx. = specimen, specimens

leg. = collected by

GP = genitalia preparation

The distributional data of each species are based mainly on the catalogue by Baldizzone *et al.* (2006). This source is not mentioned separately in the Distribution chapter of each species. The source of additional distributional information is given.

Photos of adult specimens were taken with a Canon EOS 7D, MP-E 65mm f/2.8 Macro & EF 100mm f/2.8 L IS USM Macro. Focus stacking was done with Cognisys StackShot and Helicon Focus 6.7.1, and final image editing with Adobe Photoshop CS5.1. The genitalia preparations were made following standard techniques (Robinson 1976), but the male genitalia were not stained. The genitalia were photographed in ventral view with a Leica DM1000 microscope and integrated Leica DF295 digital camera. Some taxa were photographed in 2–6 images of different depth of focus and combined into single images using image-stacking software as implemented in Photoshop CS6.0. Final plates were compiled with CorelDraw 2017.

The holotype specimens of newly described species are deposited in the public collections of MZH and ZMUC, and the paratype specimens in the private research collection of TAB. The holotypes, which are deposited in MZH, have been digitized and have a unique QR identifier, following the open access policy of the museum. URL web addresses for these holotypes are provided in the article. Coordinates of these digitized specimens are given using WGS84 and ETRS89, decimal degrees coordinate system. Tissues of at least of two samples of each species, when available, were sent to the Canadian Centre for DNA Barcoding (CCDB) to obtain molecular data of the 658 bp fragment of the mitochondrial COI gene (DNA barcode). The DNA barcodes of the species presented here were compared with those of all Coleophoridae available to us on the BOLD database ([www.boldsystems.org](http://www.boldsystems.org)). The results are discussed under the *Molecular data* section of each species. The barcodes used in this study are publicly available through the BOLD dataset DS-COLMOR at [dx.doi.org/10.5883/DS-COLMOR](https://dx.doi.org/10.5883/DS-COLMOR). The specimens have been identified by the first author unless otherwise stated.

## Taxonomy

In the current paper we treat 64 Moroccan *Coleophora* species and 12 of those are described as new to science. These 64 species include 20 species as new to Morocco, which have been reported outside Morocco earlier. Nine of the included species are also first records from Africa.

Species are listed in the order based on the species groups presented by Toll (1953).

### *Coleophora parthenica* Meyrick, 1891

Barcode Index Number: BOLD:AEQ9994

Material studied. 4 ♂, 8 ♀ (DNA sample 24750 Lepid Phyl [barcoding failed]) Souss-Massa-Draa, Ouarzazate, 30°50′: -6°49′, 1140 m, 11.V.2011, J. & A. Kullberg; 3 ♂ (DNA sample 27449 Lepid Phyl), 3 ♀ Zagora, Tagounite, wgs84: 30°50′: -5°32′, 19.V.2011, J. & A. Kullberg leg. (all coll. MZH).

Molecular data. The barcodes of *C. parthenica* comprise several different BINs with a 5.41 % maximum divergence (n=85), which may indicate cryptic diversity. The barcode of the Moroccan specimen diverges 2.66 % from the nearest *C. parthenica* BIN (from Kazakhstan to China, United States).

Distribution. From Morocco to China, introduced to U.S.A. Reported for the first time from Morocco by Baldizzone (1995).

### *Coleophora albidorsella* Toll, 1942

Barcode Index Number: BOLD:ACS9919

Material studied. 1 ♂ (DNA sample 21836 Lepid Phyl) High Atlas, Taroudant 27 km NW, 670 m, 29.IV.2013, J. Tabell leg.; 2 ♂ (DNA sample 27451 Lepid Phyl) Agadir Prov., Agadir 8 km NNW, 140 m, 11.IV.2015, J. Tabell leg.; 1 ♀ Anti-Atlas, Tiznit Prov., Tafraout 24 km SW, 1125 m, 13.IV.2015, J. Tabell leg. (all coll. TAB); 1 ♂ (GP 11983 ZT) Guelmim 10 km NE, 500 m, 10.–11.IV.2013; 1 ♀ (GP 11991 ZT), 1 ex., Anti Atlas Mts., Adar vill. 4 km NE, 1800 m, 13.–14.IV.2013, Z. Tokár leg. (all coll. TOK); 1 ♂ (GP 21870 IgR) Taliouine 8 km NW, 1100 m, 12.IV.2013; 1 ♂ (GP 21863 IgR) Jbel Rhart Mts., Zaona-Tafetchna 5 km SW, 1200 m, 15.IV.2013; 1 ♂ (GP 21851 IgR) Middle Atlas Mts., 1900 m, 32°35.96′ N 04°30.29′ W 17.IV.2013, L. Srnka leg., I. Richter det. (all coll. SRN).

Molecular data. The nearest neighbour is the Nearctic *C. ramitella* Landry, 1994, with an 8.02 % divergence. The barcodes of *C. albidorsella* exhibit 0.64 % maximum intraspecific variation (n=2).

Distribution: Iran, Israel, United Arab Emirates, Canary Islands: Fuerteventura, La Palma (van der Wolf, 2009), Morocco. **New to Africa and Morocco.**

### *Coleophora retusa* Tabell, sp. nov.

Barcode Index Number: BOLD:ACR0106

Figs. 1, 2, 18, 30, 31, 53

**Type material.** Holotype ♂ (GP 5533 J. Tabell, DNA sample 24951 Lepid Phyl [barcoding failed]: Morocco, High Atlas, Ljoukak 18 km SW, N 30°55′34″ W 8°16′31″, 2.VI.2015, 1300–1500 m, C. Hviid, O. Karsholt & K. Larsen [leg.] (coll. ZMUC). Paratypes: 1 ♂ (DNA sample 24952 Lepid Phyl) same collecting data as holotype; 1 ♀ (GP 6149 J. Tabell, DNA sample 27123 Lepid Phyl) Morocco, Anti-Atlas: Souss-Massa-Drâa, Idikl 16 km E Tafraoute, 29°44′00″ N 08°50′40″ W, 8.–10.III.2017, 1580 m, C. Hviid, O. Karsholt, K. Larsen, D. Nilsson. [leg.] (all coll. TAB); 1 ♂ [paratype of *C. eilatrica*] Morocco, Tinerhir area 1400–2000 m, 12.IV.1989, Zool. Mus. Copenagh. Exp. (coll. ZMUC); 1 ♂ [paratype of *C. eilatrica*] Morocco, Exp. Bassi-Olmi-Scaramozzino, 10–19.IV.1990, Prov. Agadir, Taghazout (coll. Baldizzone).

Diagnosis. The male genitalia are similar to those of *C. eilatrica* Baldizzone, 1994, but they can be distinguished by broader tegumen and more rounded apex of sacculus (acute-shaped in *C. eilatrica*). The female genitalia of *C. eilatrica*, illustrated by Baldizzone (2007), are not similar to those of *C. retusa*, and can readily be distinguished by shorter apophyses and sterigma.

Molecular data. Two samples were sequenced successfully, resulting in 654 bp and 637 bp barcodes. The nearest neighbour is an unnamed Saudi-Arabic species, with a 2.04 % divergence. The barcodes of *C. retusa* exhibit 0.16 % maximum intraspecific variation (n=2). Male and female specimens are considered conspecific based on the DNA information and similar abdominal structures.

Description. Adult. Wingspan 11–11.5 mm. Antenna white, annulated with brown. Scape dirty white, weakly tufted. Labial palp white mixed with pale brown, second article 1.5x longer than third article. Postocular scales white. Head, thorax and tegula white mixed with pale brown. Forewing white with scattered pale brown scales,

distinct pale brown stripes along main veins. Dorsal fringe cilia pale brown. Hindwing pale grey, fringe cilia pale brown. Female darker, head and thorax brown, forewing covered with brown scales.

Abdominal structures. Sternal bar short, well sclerotized. Tergal latero-posterior bar straight or slightly curved outward, 0.5x as long as anterior one. Transverse bar straight, in female slightly curved, narrow, parallel-sided, distal edge medially less sclerotized in male. Tergal sclerite 3.5x as long as wide, covered with about 35–40 conical spines (on T3).

Male genitalia. Gnathos knob transversely oval. Tegumen parallel-sided, moderately broad, pedunculum short, bulged outward, upper half covered with several nodules. Transtilla small, wedge-shaped. Valvula membranous. Cucullus club-shaped, slightly tapered basally. Sacculus narrow; ventral margin slightly convex, oblique, terminating in a rounded apex; dorsal margin straight, slightly oblique. Phallosome a conical tube, broadly sclerotized dorsally. Vesica broad, membranous, with a long, arched chain of numerous small spiniform cornuti.

Female genitalia. Papilla analis elongate, densely covered with bristles of different length. Anterior apophysis 0.6x as long as sterigma, posterior apophysis 3.3x as long as anterior one. Sterigma trapezoidal, 1.6x as wide as long, proximal margin medially deeply concave, distal margin rounded, distal  $\frac{1}{4}$  sparsely covered with bristles, medial excavation deep, drop-shaped. Ostium wide, situated at proximal margin of sterigma. Colliculum funnel-shaped, shorter than sterigma, with darker medial lamina. Spinose part of ductus bursae longer than sterigma, straight, with two lateral bands and a medial lamina, lamina reaching the posterior section of ductus bursae, which is membranous, surfaced with small flecks, anterior section narrow. Corpus bursae with a large leaf-shaped signum, spine straight and narrow.

Biology. Unknown.

Distribution. Morocco, known from the High Atlas and Anti-Atlas Mountains.

Etymology. Latin *retusum* = blunt, refers to the blunt apex of sacculus.

Note. Moroccan paratypes of *C. eilatica* belong to *C. retusa*. The female genitalia of *C. eilatica* were described by Baldizzone (2007), based on specimens collected simultaneously (2 ♂, 2 ♀) from Yemen in 1996.

### ***Coleophora arefactella* Staudinger, 1859**

Barcode Index Number: BOLD:ABV9529

Figs. 32, 54

Material studied. 11 ♂ Middle Atlas, Ifrane Prov., Azrou 2.5 km NW, 1215 m, 17.IV.2015, J. Tabell leg.; 2 ♂ Ifrane Prov., Azrou 3 km NNW, 1210 m, 14.V.2016, J. Tabell leg.; 3 ♂ (DNA sample 27452 Lepid Phyl [barcoding failed]), 1 ♀ (GP 5797 J. Tabell, DNA sample 25788 Lepid Phyl) same collecting data, but 16.V.2016 (all coll. TAB); 1 ♀ (GP 13017 ZT) Rissani 15 km W, 800 m, 16.IV.2013, Z. Tokár leg. (coll. TOK).

A series of both sexes enables us to describe the female genitalia.

Molecular data. The nearest neighbour is a Nearctic so far unnamed *Coleophora* species, with a 5.66 % divergence. The barcodes of *C. arefactella* exhibit 0.31 % maximum intraspecific variation (n=2).

Abdominal structures. Sternal bar long, well sclerotized. Tergal latero-posterior bar arched, 0.4x as long as anterior one. Transverse bar slightly curved, narrow, parallel-sided, both edges sclerotized. Tergal sclerite about 2x as long as wide, covered with about 60 conical spines (on T3).

Female genitalia. Papilla analis oval, covered with long bristles. Anterior apophysis as long as sterigma, curved posteriorly, posterior apophysis almost 2x as long as anterior one. Sterigma transversely trapezoidal, 1.7x as wide as long, distal third covered with short bristles, proximal margin convex, medial excavation broad and deep, sack-shaped. Ostium U-shaped, situated at  $\frac{1}{3}$  on sterigma. Colliculum chalice, posterior part strongly sclerotized, crescent-shaped, anterior part membranous, narrow, with a sclerotized median band. Ductus bursae membranous, almost parallel-sided; spinose section short, with two short laminae; posterior section densely covered with small granules. Corpus bursae oval, signum cross-shaped, very small, strongly sclerotized.

Distribution. Spain, Morocco. Reported for the first time from Morocco and Africa by Baldizzone (1997).

### ***Coleophora aliena* Baldizzone, 1987**

Barcode Index Number: BOLD:ADD2986

Material studied. 1 ♂ (GP 5534 J. Tabell, DNA sample 24950 Lepid Phyl) High Atlas, Ouirgane 6 km NW, 850 m, 30.V.2015, C. Hviid, O. Karsholt & K. Larsen leg.; 2 ♂ (DNA sample 24953 Lepid Phyl; DNA sample 24954 Lepid Phyl) High Atlas, Ouirgane 10 km NW, 1050 m, 30.V.–3.VI.2015, C. Hviid, O. Karsholt & K. Larsen leg. (all coll. TAB).

Molecular data. The nearest neighbour is a Nearctic so far unnamed *Coleophora* species, with a 6.94 % divergence. The barcodes of *C. aliena* exhibit 0.16 % maximum intraspecific variation (n=3).

Distribution. Spain, Morocco. **New to Africa and Morocco.**

### ***Coleophora perplexella* Toll, 1960**

Barcode Index Number: BOLD:AEF9109

Material studied. 27 ♂ (GP 5070 J. Tabell, DNA sample 21968 Lepid Phyl; DNA sample 21967 Lepid Phyl [barcoding failed]), 1 ♀ (GP 5088 J. Tabell) Middle Atlas, Azrou 3 km NW, 1240 m, 7.V.2013 at 7–7.30 am, J. Tabell leg., G. Baldizzone det. (coll. TAB); 3 ♂ Meknès-Tafilalet, Azrou, 33°28'14'': -5°14'43'', 1260 m, 5.V.2011, J. & A. Kullberg leg. (coll. MZH).

Molecular data. The nearest neighbour is *C. fretella* Zeller, 1847 with an 8.08 % divergence. There exists a 1.6 % barcode gap between the Spanish and Moroccan specimens, which may indicate cryptic diversity.

Distribution. Algeria, France, Morocco, Portugal, Sardinia, Spain, Tunisia (Tautel & Nel 2009). Reported for the first time from Morocco by Baldizzone *et al.* (2006).

Note. Males collected by JT were swarming in the morning between 7:00–7:30 (summer time), the female was detected in copula. Not a single adult was captured at night by light.

### ***Coleophora microxantha* Walsingham, 1907**

Barcode Index Number: BOLD:-

Material studied. 1 ♂ (GP 11947 ZT, DNA sample 27430 Lepid Phyl [barcoding failed]), 1 ♀ (GP 11988 ZT), specimens in copulation, Anti Atlas Mts., Adar vill. 4 km NE, 1800 m, 30°08.571'N, 08°20.859'W, 13.–14.IV.2013, Z. Tokár leg. & det. (coll. TOK).

Molecular data. In BOLD there exist no barcodes for *C. microxantha*.

Distribution. Algeria, Morocco. **New to Morocco.**

Note. Both specimens were found in copulation on the flowers of an unknown plant in the morning.

### ***Coleophora hadrocerella* Toll, 1952**

Barcode Index Number: BOLD:AAS0357

Material studied. 3 ♂ (DNA sample 24939 Lepid Phyl; DNA sample 24940 Lepid Phyl), 5 ♀ Tiznit Prov., Mirleft 3.2 km SSW, 10 m, 12.IV.2015, J. Tabell leg.; 1 ♀ (GP 5451 J. Tabell, DNA sample 24938 Lepid Phyl) Anti-Atlas, Tiznit Prov., Tafraout 24 km SW, 1125 m, 13.IV.2015, J. Tabell leg.; 1 ♂ Souss-Massa-Drâa, Legzira 9 km N, Sidi Ifni, 5.–7.III.2017, C. Hviid, O. Karsholt, K. Larsen & D. Nilsson leg. (all coll. TAB).

Molecular data. The nearest neighbour is the Nearctic *C. simulans* McDunnough, 1961, with a 7.97 % divergence. The barcodes of *C. hadrocerella* exhibit 0.33 % maximum intraspecific variation (n=4).

Distribution. North Africa. Reported for the first time from Morocco by Baldizzone (1997).

### ***Coleophora mirleftensis* Tabell, 2018**

Barcode Index Number: BOLD:ACT4659

Material studied. Holotype ♂ Mirleft 5 km SSW, N29.53821 W10.05780, 20 m, 28.IV.2013, J. Tabell leg. (coll. MZH). Paratypes: 2 ♂ (GP 5063 J. Tabell, DNA sample 21834 Lepid Phyl; DNA sample 21835 Lepid Phyl) same collecting data as holotype; 4 ♂, 4 ♀ (GP 5467 J. Tabell, DNA sample 24598 Lepid Phyl) Mirleft 5 km SW, N29.541 W10.065, 5 m, e. l. 2015, *Salsola* sp. 12.IV.2015, J. Tabell leg. (all coll. TAB).

Molecular data. The nearest neighbour is *C. poecilella* Walsingham, 1907, with a 4.97 % divergence. The barcodes of *C. mirleftensis* exhibit no intraspecific variation (n=3).

Distribution. Morocco.

Note: The species was recently described from the specimens listed above (Tabell *et al.* 2018).

### ***Coleophora aegyptiacae* Walsingham, 1907**

Barcode Index Number: BOLD:AAS0356

Material studied. 1 ♂ (DNA sample 21846 Lepid Phyl) High Atlas, Taroudant 27 km NW, 670 m, 29.IV.2013, J. Tabell leg.; 2 ♂ (GP 5062 J. Tabell, DNA sample 21847 Lepid Phyl) High Atlas, Ouled Berhil 19 km NNE, 1000 m, 2.V.2013, J. Tabell leg.; 1 ♂, 3 ♀ High Atlas, Taroudant Prov., Tafingoult 5 km N, 1130 m, 15.IV.2015, J. Tabell leg.; 3 ♂ High Atlas, Ljoukak 18 km SW, 1300–1500 m, 2.VI.2015, C. Hviid, O. Karsholt & K. Larsen leg.; 1 ♂ High Atlas, Ouirgane 7 km S, 950 m, 4.VI.2015, C. Hviid, O. Karsholt & K. Larsen leg.; 1 ♂ High Atlas, 6 km NW Ouirgane, road to Amizmiz, 1050 m, 1.–2.V.2016, C. Hviid, K. Larsen & D. Nilsson leg.; 1 ♂ Settat Prov. Sidi Said Maachou 2.5 km E, 100 m, 18.V.2016, J. Tabell leg.; 9 ♂ Anti-Atlas: Souss-Massa-Drâa, Idikl 16 km E Tafraoute, 1580 m, 8.–10.III.2017, C. Hviid, O. Karsholt, K. Larsen & D. Nilsson leg. (all coll. TAB); 7 ♂ (GP 11949-51, 11981, 13034, 13995, 13996 ZT) + 55 exx., Guelmim 10 km NE, 500 m, 10.–11.IV.2013, Z. Tokár leg. & det. (all coll. TOK); 4 ♂ (GP 21871-2 IgR, GP 14224-5 ZT) + 11 exx., High Atlas Mts., Taliouine 8 km NW, 1100 m, 12.IV.2013, E. Srnka leg., I. Richter det. (all coll. SRN).

Molecular data. The nearest neighbour is *C. obtectella* Zeller, 1849, with an 8.73 % divergence. The barcodes of *C. aegyptiacae* exhibit 0.16 % maximum intraspecific variation (n=3).

Distribution. Canary Islands, North Africa, Palestine, Saudi Arabia, Iran. Reported for the first time from Morocco by Baldizzone (1995).

### ***Coleophora santolinella* Constant, 1890**

Barcode Index Number: BOLD:AAS0304

Material studied. 1 ♂ (GP 5650 J. Tabell) High Atlas, Ljoukak 23 km SW, 1600 m, 2.VI.2015, C. Hviid, O. Karsholt & K. Larsen leg.; 2 ♂ Al Haouz Prov., Imlil, 1680 m, 30.VI.2016, J. Tabell leg. (all coll. TAB); 1 ♂ (GP 11987 ZT) High Atlas Mts., Taliouine 8 km NW, 1100 m, 12.IV.2013, Z. Tokár leg., I. Richter det. (coll. TOK).

Molecular data. Moroccan *C. santolinella* specimens have not been barcoded. According to Spanish and French specimens the nearest neighbour is *C. ptarmicia* Walsingham, 1910, with a 7.6 % divergence. The barcodes of *C. santolinella* exhibit 2.47 % maximum intraspecific variation (n=3), which may indicate cryptic diversity.

Distribution. France, Spain, Corsica, Sardinia, Morocco. **New for Morocco and Africa.**

### ***Coleophora conyzae* Zeller, 1868**

Barcode Index Number: BOLD:AAF3753

Material studied. 1 ♀ Settat Prov., Sidi Said Maachou 2.5 km E, 100 m, 18.V.2016, J. Tabell leg.; 1 ♂ (DNA sample 27468 Lepid Phyl) Al Haouz Prov., Imlil, 1680 m, 30.VI.2016, J. Tabell leg. (all coll. TAB).

Molecular data. The nearest neighbour is *C. jerusalemella* Toll, 1942, with an 8.45 % divergence. The barcodes of *C. conyzae* exhibit 0.77 % maximum intraspecific variation (n=11).

Distribution. Europe, North Africa, Turkey, Turkmenistan.

***Coleophora retifera* Meyrick, 1922**

Barcode Index Number: BOLD:ABV9514

Material studied. 1 ♂ (DNA sample 27136 Lepid Phyl [barcoding failed] Meknès-Tafilalet, Ifrane, 33°27'20'': -5°2'18'', 1920 m, 5.–9.V.2011, J. & A. Kullberg leg. (coll. MZH).

Molecular data. The nearest neighbour is *C. parthenica*, with a 3.11 % divergence.

Distribution. Spain, North Africa, Israel.

***Coleophora near calycotomella* Stainton, 1867**

Barcode Index Number: BOLD:AAO1946

Material studied. 11 exx. (DNA sample 24542 Lepid Phyl; DNA sample 24543 Lepid Phyl) Anti-Atlas, Tiznit Prov., Tafraout 24 km SW, 1125 m, 13.IV.2015, J. Tabell leg.; 1 ♀ Anti-Atlas, Tafraout 19.5 km SW, 1010 m, 14.IV.2015, J. Tabell leg.; 5 exx. High Atlas, Asni 10 km E, 1600 m, 1.–3.VI.2015, C. Hviid, O. Karsholt & K. Larsen (all coll. TAB).

Molecular data. The barcodes of *C. calycotomella* comprise several BINs with over 5 % divergences, which may indicate cryptic diversity (n=7). The barcodes of the Moroccan specimens exhibit no intraspecific variation, and they diverge 4.27 % from the second BIN of *C. calycotomella*.

Distribution. Mediterranean region, Germany, The Netherlands.

***Coleophora tanyleuca* (Meyrick, 1936)**

Barcode Index Number: BOLD:ADL3372

Material studied. 11 ♂ (GP 5662 J. Tabell, DNA sample 25787 Lepid Phyl), 3 ♀ Middle Atlas 1900 m, Ifrane Prov., Michlifen resort, volcano crater & mixed for., 7.–9.V.2010 ad luc., J. Kullberg & Z. Kolev leg.; 1 ♂, 1 ♀ (GP 5659 J. Tabell, DNA sample 25786 Lepid Phyl) Middle Atlas 1900 m, Ifrane Prov., Michlifen, road side meadow, 9.–10.V.2010, J. Kullberg & Z. Kolev leg.; 1 ♀ Meknès-Tafilalet, Azrou, 33°28'14'': -5°14'43'', 1260 m, 4.V.2011, J. & A. Kullberg leg.; 1 ♂ Meknès-Tafilalet, Ifrane, 33°27'20'': -5°2'18'', 1920 m, 5.–9.V.2011, J. & A. Kullberg leg. (all colls. MZH and TAB).

Molecular data. The nearest neighbour is Nearctic *C. cratipennella* Clemens, 1864, with a 7.87 % divergence. The barcodes of *C. tanyleuca* exhibit 1.29 % maximum intraspecific variation (n=2).

Distribution. Tunisia, Morocco.

***Coleophora amethystinella* Ragonot, 1886**

Barcode Index Number: BOLD:ADD1883

Material studied. 1 ♂ (DNA sample 25378 Lepid Phyl) Middle Atlas, El Hajeb Prov., El Hajeb 3 km S, 1125 m, 18.IV. 2015, J. Tabell leg.; 1 ♂ Ifrane Prov., Azrou 3 km NNW, 1210 m, 16.V. 2016, J. Tabell leg.; 1 ♂ (GP 6153 J. Tabell) High Atlas, 6 km NW Ouirgane, road to Amizmiz, 1050 m, 1.–2.V.2016, C. Hviid, K. Larsen & D. Nilsson leg. (all coll. TAB).

Molecular data. The nearest neighbour is the morphologically distinct *C. canariipennella* Toll, 1959, with a 5.72 % divergence. The barcodes of *C. amethystinella* exhibit 0.64 % maximum intraspecific variation (n=2).

Distribution. Portugal, Spain, France, Great Britain, Greece, Macedonia, Croatia, Bulgaria, Turkey, Morocco (Stübner 2007; Richter & Pastorális 2015), Italy (Baldizzone 2019)

***Coleophora hieronella* Zeller, 1849**

Barcode Index Number: BOLD:AAI9225

Material studied. 11 ♂ (GP 5085 J. Tabell), 17 ♀ (GP 5068 J. Tabell, DNA sample 21843 Lepid Phyl) High Atlas, Afourer 3 km S, 1200 m, 5.V.2013, J. Tabell leg.; 5 ♂ High Atlas, Afourer 6 km S, 1340 m, 5.V.2013, J. Tabell leg.;

2 ♂, 2 ♀ Middle Atlas, Azrou 3 km NW, 1240 m, 6.V.2013, J. Tabell leg.; 1 ♂, 1 ♀ Middle Atlas, El-Hajeb 2 km W, 820 m, 7.V.2013, J. Tabell leg.; 1 ♂ Settat Prov., Oulad Abbou 8 km W, 180 m, 10.IV. 2015, J. Tabell leg.; 1 ♂ High Atlas, Al Haouz Prov., Ourika 3 km SE, 960 m, 16.IV.2015, J. Tabell leg.; 1 ♀ Middle Atlas, El Hajeb Prov., El Hajeb 3 km S, 1125 m, 18.IV.2015, J. Tabell leg.; 1 ♂ High Atlas, 6 km NW Ouirgane, road to Amizmiz, 1050 m, 1.–2.V.2016, C. Hviid, K. Larsen & D. Nilsson leg. (all coll. TAB).

Molecular data. The nearest neighbour is *C. variicornis* Toll, 1952, with a 2.49 % divergence. The barcodes of *C. hieronella* exhibit 1.55 % maximum intraspecific variation (n=10).

Distribution. South Europe, Austria, North Africa.

Note. Most specimens were netted from *Trifolium stellatum* L.

### ***Coleophora afrofrischella* Tabell, sp. nov.**

Barcode Index Number: BOLD:ACT4013

Figs. 3, 4, 19, 33, 34, 55

**Type material.** Holotype ♀ (GP 5087 J. Tabell, DNA sample 21845 Lepid Phyl): Morocco, Middle Atlas, Azrou 3 km NW, 1240 m, [33.4734 N 5.2481 W] 6.V.2013, J. Tabell leg. (coll. MZH) <http://id.luomus.fi/GBT.14> Paratypes: 1 ♂ (GP 5086 J. Tabell, DNA sample 21844 Lepid Phyl) same collecting data as holotype, but 7.V.2013 at 7–7.30 am; 1 ♂ same collecting data as holotype, but 14.V.2016; 1 ♀ same collecting data as holotype, but 16.V.2016 (all coll. TAB); 1 ♂ Morocco, Meknès-Tafilalet, Ifrane, 33°27'20": -5°2'18", 1920 m, 5.–9.V.2011, J. & A. Kullberg leg. (coll. MZH); 1 ♂ (GP Bldz 10584) Morocco, Chefchaouén, 600 m, 22.IV.1989, Zool. Mus. Copenhagh. Exp. (coll. ZMUC); 1 ♂ same collecting data (coll. Baldizzone); 1 ♂ (GP Bldz 10855) Morocco, Str. Meknès-Azrou, 1000 m, 1.V.1990, Exp. Bassi, Olmi & Scaramozzino (coll. Bassi); 1 ♂ (GP NHMUK 28961) Morocco, Tangier, 19.IV.1902 Wlsm. 88113 (coll. NHMUK).

Diagnosis. Externally *C. afrofrischella* is indistinguishable from *C. alcyonipennella* (Kollar, 1832) and *C. frischella* (Linnaeus, 1758). The genitalia resemble those of *C. frischella*, but in male the cucullus is smaller, the sacculus slightly longer and the bundle of cornuti narrower. In the female genitalia, the main distinguishing characters are the shape of sterigma (trapezoidal in *C. afrofrischella*, rectangular in *C. frischella*), shorter apophysis anterioris and markedly shorter spinulate section of ductus bursae.

Molecular data. Two specimens of *C. afrofrischella* were sequenced, resulting in 633 bp barcodes for both of them. The nearest neighbour to *C. afrofrischella* is *C. alcyonipennella*, with a 3.59 % divergence. The barcodes of *C. afrofrischella* exhibit no intraspecific variation. The minimum divergence between *C. afrofrischella* and *C. frischella* is 4.26 %.

Description. Adult. Wingspan of male 13.5–14 mm, female 10.5–12 mm. Head and thorax brassy green, in female with violet sheen. Labial palpus brassy green, second segment 1.5x as long as third segment. Antenna uniformly dark brown, apical fifth dirty white, scape not tufted. Forewing brassy green, apically more or less widely covered with purple sheen. Cilia grey. Hindwing and cilia grey.

Abdominal structures. Sternal bar long, well sclerotized. No tergal latero-posterior bar. Transverse bar curved, broad, parallel-sided, proximal edge sclerotized only medially, distal edge broadly sclerotized. Tergal sclerite well sclerotized, about 5x (in female 3x) as long as wide, covered with about 30 (in female 40) conical spines (on T3).

Male genitalia. Gnathos knob narrow, oval. Tegumen constricted medially, dorsoanterior margin strongly sclerotized, cone-shaped, pedunculum slightly dilated, moderately broad. Transtilla wedge-shaped. Valvula large. Cucullus club-shaped, slightly tapered basally. Sacculus well sclerotized; ventral margin convex, evenly curved, terminating in a triangular tooth pointing inwards; dorsal margin straight, slightly oblique, edged by a sclerotized ridge. Phallosome a conical tube, with a dorsal unarmed ridge. Vesica broad, with a narrow bundle of about five spiniform cornuti.

Female genitalia. Papilla analis oval, densely covered with small nodules and short bristles. Apophyses darkly sclerotized, thick and straight; anterior apophysis 1.5x as long as sterigma, posterior apophysis almost 2x as long as anterior one. Sterigma trapezoidal, as wide as long, proximal margin slightly sinuous, distal margin edged by short spines; medial excavation deep, drop-shaped. Tergum 8 T-shaped, long. Ostium U-shaped, situated near proximal margin. Colliculum chalice, sclerotized, with a sclerotized dark median band. Spinose section of ductus bursae straight, 1.5x as long as sterigma; posterior section with a sclerotized lamina; anterior section densely covered with small dark granules and spines. Corpus bursae small, round, with a large leaf-shaped signum.



Biology. Biology unknown. In Azrou the specimens were netted in the morning between 7:00–7:30 (summer time) and in the afternoon on a hill meadow, pastured by cows.

Distribution. So far known from two closely situated localities in the Middle Atlas Mountains at an elevation of 1240 m and 1920 m.

Etymology. The specific epithet refers to an African relative of *C. frischella*.

### ***Coleophora festivella* Toll, 1952**

Barcode Index Number: BOLD:ABV7915

Material studied. 2 ♂ (DNA sample 21971 Lepid Phyl), 1 ♀ High Atlas, Ouled Berhil 26 km NNE, 1760 m, ex larva V.2013, *Lotus* sp. 2.V.2013, J. Tabell leg. (coll. TAB).

Molecular data. The nearest neighbour is a Tunisian so far unnamed *Coleophora* species, with a 6.38 % divergence.

Distribution. Algeria, Tunisia, Spain, Morocco. **New to Morocco.**

### ***Coleophora liriophorella* Baldizzone, 1982**

Barcode Index Number: BOLD:ACS9281

Material studied. 2 ♂ (DNA sample 21975 Lepid Phyl), 3 ♀ (DNA sample 21976 Lepid Phyl) High Atlas, Ourika 13 km S, 1560 m, e.l. V.2013, *Genista* sp. 3.V.2013, J. Tabell leg.; 3 ♂ Al Haouz Prov., Oukaimden 1 km SE, 2660 m, 2.VII.2016, J. Tabell leg.; 1 ♂ Ouarzazate Prov., Aguelmouss 1 km ESE, 2150 m, 3.VII.2016, J. Tabell leg. (all coll. TAB).

Molecular data. The nearest neighbour is the Nearctic *C. accordella* Walsingham, 1882, with a 6.33 % divergence. In the Palearctic region, the nearest neighbour is *C. kahaourella* Toll, 1956, with a 7.18 % divergence. The barcodes of *C. liriophorella* exhibit 2.09 % maximum intraspecific variation (n=2).

Distribution. Morocco, endemic to the High Atlas Mountains.

### ***Coleophora olei* Tabell, sp. nov.**

Barcode Index Number: BOLD:ADL4165

Figs. 5, 20, 35

**Type material.** Holotype ♂ (GP 5516 J. Tabell, DNA sample 25784 Lepid Phyl): Morocco, High Atlas, Ouirgane 7 km S, 950 m, 4.VI.2015, C. Hviid, O. Karsholt & K. Larsen [leg]. (coll. MZUC).

Diagnosis. Externally *C. olei* is similar to several members of the *C. onobrychiella* species group. Male genitalia are characteristic, and no similar species are known. Female of *C. olei* is unknown.

Molecular data. The single sample resulted in a 658 bp barcode. The nearest neighbour to *C. olei* is *C. alacanta* Tabell, 2013, with a 6.06 % divergence. Distance to *C. ravillella* Toll, 1961 is 6.27 %.

Description. Adult. Wingspan 13 mm. Antenna white, annulated with ochreous brown, apical ¼ with brown, basal ¼ covered by pale ochre scales. Scape pale ochre, below covered by long scales. Labial palp pale ochre mixed with white, second article 1.5x longer than third article. Head and thorax pale ochre mixed with white, tegula pale ochre. Forewing ochreous brown, basally and dorsally paler; costal stripe white, from base to ¾. Costal fringe cilia white, apically ochre, dorsal fringe cilia ochreous brown. Hindwing pale grey, fringe cilia pale ochreous brown.

Abdominal structures. Tergal latero-posterior bar 0.5x as long as anterior one. Transverse bar slightly curved, narrow, medially expanded, proximal edge sclerotized, distal edge less sclerotized. Tergal sclerite about 2x as long as wide, weakly sclerotized, covered with about 50 conical spines (on T3).

Male genitalia. Gnathos knob transversely oval. Tegumen long, parallel-sided, pedunculum short, arched. Transtilla moderately broad, apically upcurved. Costa sinuous. Valvula large, weakly delineated. Cucullus long, very narrow, slightly tapered basally. Sacculus well sclerotized, long and narrow; ventral margin slightly convex, covered with long bristles, apical third lined by small nodules; lateral margin short, dorsocaudal angle rounded, dorsal margin slightly concave. Phallosome a conical tube. Vesica long, with five long separate spiniform cornuti.

Female genitalia. Unknown.

Biology. Early stages unknown.

Distribution. Morocco, known only from the type locality.

Etymology. The species is named in honour of Ole Karsholt, who was a participant of the Danish collecting expedition to Morocco.

### ***Coleophora carsteni* Tabell, sp. nov.**

Barcode Index Number: BOLD:ADL3575

Figs. 6, 21, 36

**Type material.** Holotype ♂ (GP 6155 J. Tabell): Morocco, Anti-Atlas, Tiznit Prov., Tafraout 24 km SW, 1125 m, 29.5805 N 9.1726 W, 13.IV.2015, J. Tabell leg. <http://id.luomus.fi/GBT.15> (coll. MZH). Paratypes: 1 ♂ (GP 5514 J. Tabell, DNA sample 25785 Lepid Phyl) Morocco, High Atlas, Ljoukak 23 km SW, 1600 m, 2.VI.2015, C. Hviid, O. Karsholt & K. Larsen leg.; 1 ♂ (DNA sample 27507 Lepid Phyl) Anti-Atlas: Souss-Massa-Drâa, Idikl 16 km E Tafraoute, 1580 m, 8.–10.III.2017, C. Hviid, O. Karsholt, K. Larsen, D. Nilsson leg. (all coll. TAB)

Diagnosis. Externally *C. carsteni* is similar to several members of the *C. onobrychiella* species group. By male genitalia, it resembles *C. sisteronica* Toll, 1961 and *C. hipponae* Baldizzone, 1993. In the male genitalia, longer sacculus and its shorter apex and unevenly curved ventral margin distinguish *C. carsteni* from these species. Furthermore, the cucullus is shorter in *C. hipponae* and the abdominal structures different (transverse bar parallel-sided in *C. hipponae*, medially expanded in *C. carsteni* and *C. sisteronica*). The female of *C. carsteni* is unknown.

Molecular data. Two specimens of *C. carsteni* were sequenced, resulting in 633 bp and 674 bp barcodes. The nearest neighbour to *C. carsteni* is *C. sisteronica*, with a 7.6 % minimum divergence. The barcodes of *C. carsteni* exhibit 0.46 % intraspecific variation.

In BOLD there are no barcodes for *C. hipponae*.

Description. Adult. Wingspan 13.5–14 mm. Antenna white, indistinctly annulated with pale grey. Scape white, below ochre and tufted. Labial palp pale ochre mixed with white, second article 1.5x longer than third article. Head and thorax white with a pale ochre median line, tegula white mixed with pale ochre. Forewing ochreous brown, dorsal half slightly paler; costal stripe white, from base to  $\frac{3}{4}$ , slightly expanded apically; dorsal stripe distinct only at base. Costal fringe cilia ochreous brown, apically darker, dorsal fringe cilia ochreous brown. Hindwing pale grey, fringe cilia pale brown.

Abdominal structures. No tergal latero-posterior bar. Transverse bar broad, curved, proximal edge medially straight and sclerotized, distal edge strongly arched, sclerotized. Tergal sclerite about 4x as long as wide, weakly sclerotized, covered with 20 conical spines (on T3).

Male genitalia. Gnathos knob round. Tegumen constricted medially, pedunculum short, arched. Transtilla short, triangular. Valvula large, weakly delineated. Cucullus long, very narrow, club-shaped. Sacculus well sclerotized, elongated; ventral margin slightly sinuous, convex, apical half with long bristles, ending in sharp point; dorsal margin slightly concave. Phallosome a conical tube. Vesica long, with several spiniform cornuti grouped into a tight curved bundle.

Female genitalia. Unknown.

Biology. Early stages unknown.

Distribution. Morocco, known from a few localities in the High and Anti-Atlas Mountains.

Etymology. The species is named in honour of Carsten Hviid, who was a participant of the Danish collecting expedition to Morocco.

### ***Coleophora ifranensis* Tabell & Kullberg, sp. nov.**

Barcode Index Number: BOLD:AEK8083

Figs. 7, 22, 37

**Type material.** Holotype ♂ (GP 6209 J. Tabell, DNA sample 27140 Lepid Phyl): Morocco, Meknès-Tafilalet, [33.4556 N 5.0383 W], Ifrane 1920 m, 9.V.2011, J. & A. Kullberg leg. <http://id.luomus.fi/GBT.16> (coll. MZH).

Diagnosis. Externally *C. ifranensis* is similar to several members of the *C. onobrychiella* species group, such as *C. sisteronica*, *C. carsteni* and *C. hipponae*. Darkly ringed antenna distinguishes *C. ifranensis* from *C. carsteni* and *C. hipponae*; discrimination from *C. sisteronica* requires the study of genitalia. In the male genitalia, the cucullus is slightly broader, the sacculus is longer and its dorsal margin straighter, the valvula is larger and the cornuti are fewer and longer than in *C. sisteronica*. The female of *C. ifranensis* is unknown.

Molecular data. The single sample resulted in a 654 bp barcode. The nearest neighbour is *C. carsteni*, with a 5.46 % divergence.

Description. Adult. Wingspan 13 mm. Antenna white, annulated with dark brown. Scape pale ochre, tufted below. Labial palp pale ochre mixed with white, second article as long as third article. Head white, thorax and tegula white with a pale ochre tinge. Forewing yellowish ochre, basally and dorsally slightly paler; costal stripe white, from base to  $\frac{3}{4}$ , at basal half edged by brown scales. Costal fringe cilia pale ochre, dorsal fringe cilia pale brown. Hindwing pale grey, fringe cilia pale brown.

Abdominal structures. No tergal latero-posterior bar. Transverse bar slightly curved, proximal edge weakly sclerotized, distal edge slightly arched, sclerotized medially. Tergal sclerite very narrow, about 8x as long as wide, covered with 16–17 conical spines (on T3).

Male genitalia. Gnathos knob round. Tegumen long, parallel-sided, pedunculum short. Transtilla narrow, wedge-shaped. Valvula large, weakly delineated. Cucullus long, very narrow, club-shaped. Sacculus well sclerotized, elongated; ventral margin evenly rounded, apical third lined with bristles, ending in sharp, narrow point; dorsal margin slightly concave, oblique. Phallosome elongated, tubular. Vesica with several spiniform cornuti grouped into a tight curved bundle.

Female genitalia. Unknown.

Biology. Unknown.

Distribution. Morocco, known only from the type locality.

Etymology. The specific epithet refers to the collecting region.

### ***Coleophora alacanta* Tabell, 2013**

Barcode Index Number: BOLD:AAZ0938

Material studied. 1 ♂ (GP 11952 ZT) Guelmim, 10 km NE, 500 m, 10.–11.IV.2013, Z. Tokár leg. & det. (coll. TOK); 1 ♂ (GP 21859 IgR) Tifnit 2 km S, 50 m, 9.IV.2013, L. Srnka leg., Z. Tokár det. (coll. SRN); 1 ♂ (GP 13958 ZT) Middle Atlas Mts., 1900 m, 32°35.960'N, 04°30.290'W, 17.IV.2013, Z. Tokár leg. & det. (coll. TOK).

Molecular data. Moroccan *C. alacanta* specimens have not been barcoded. According to Spanish specimens the nearest neighbour is a Turkish so far unnamed species close to *C. congeriella* Staudinger, 1859 (Barcode Index Number: BOLD:AAY9863), with a 2.98 % divergence. The barcodes of *C. alacanta* exhibit 0.31 % maximum intraspecific variation (n=4).

Distribution. Spain, Morocco. **New to Morocco and Africa.**

### ***Coleophora flaviella* Mann, 1857**

Barcode Index Number: BOLD:AAJ6626

Material studied. 4 ♂ (GP 11994, 11995, 13011, 13010 ZT), 2 ♀ (GP 11989, 11992 ZT) Anti Atlas Mts., Adar vill. 4 km NE, 1800 m, 13.–14.IV.2013, Z. Tokár leg. & coll., det. J. Tabell & Z. Tokár.; 1 ♂ (GP 21858 IgR) Tifnit 2 km S, 50 m, 9.IV.2013, L. Srnka leg., I. Richter det. (coll. SRN); 1 ♀ (DNA sample 27508 Lepid Phyl) Anti-Atlas, Tiznit Prov., Tafraout 24 km SW, 1125 m, 13.IV.2015, J. Tabell leg.; 1 ♀ (GP 6154 J. Tabell, DNA sample 27124 Lepid Phyl) High Atlas, 6 km NW Ouirgane, road to Amizmiz, 1050 m, 1.–2.V.2016, C. Hviid, K. Larsen & D. Nilsson leg. (all coll. TAB).

Molecular data. The barcodes of Moroccan *C. flaviella* exhibit 0.93 % maximum intraspecific variation (n=2). The minimum divergence from the barcodes of the European (Austria, Greece, Italy, Spain) specimens is 1.56 %, which may indicate cryptic diversity. In southern Europe, the barcodes of *C. flaviella* (n = 6) exhibit 1.08 % maximum intraspecific variation.

Distribution. Southern and Central Europe, Libya, Turkey, Iran, Morocco. **New to Morocco.**

### *Coleophora agnatella* Toll, 1960

Barcode Index Number: BOLD:ACT1981

Material studied. 1 ♂ Meknès-Tafilalet, Ifrane, 1900 m, 5.–9.V.2011, J. & A. Kullberg leg. (coll. MZH); 3 ♂ (GP 11941, 13033, 13035 ZT) + 8 exx., Anti Atlas Mts., Adar vill. 4 km NE, 1800 m, 13.–14.IV.2013, Z. Tokár leg. (coll. TOK); 2 ♂ (GP 21851 IgR) Middle Atlas Mts., 1900 m, 32°35.96' N 04°30.29' W 17.IV.2013, L. Srnka leg., Z. Tokár det. (coll. SRN).

Molecular data. Moroccan *C. agnatella* specimens have not been sequenced. The nearest neighbour of Spanish specimens is a Georgian so far unnamed *Coleophora* species, with a 3.41 % divergence. The barcodes of *C. agnatella* exhibit 0.16 % maximum intraspecific variation (n=2).

Distribution. Spain, Morocco, Tunisia, Libya, Iraq. Reported for the first time from Morocco by Baldizzone (1995).

### *Coleophora praecipua* Walsingham, 1907

Barcode Index Number: BOLD:-

Material studied. 2 ♂ (GP 11998 ZT, DNA sample 27431 Lepid Phyl [barcoding failed]; GP 13042 ZT), 4 ♀ (GP 11997, 13012, 13040, 13041, 13994 ZT), + 5 exx. Rissani 15 km W, 800 m, 31°16.083'N, 04°28.457'W, 16.IV.2013, Z. Tokár leg. & det. (coll. TOK); 1 ♂ (GP 21867 IgR), 4 ♀ (GP 21866 IgR), the same locality and data, L. Srnka leg., det. I. Richter; High Atlas Mts., 1 ♂ (GP 14027 ZT), 5 ♀ (GP 14047 ZT), Taliouine 8 km NW, 1100 m, 12.4.2013, L. Srnka leg., Z. Tokár det. (all coll. SRN).

Molecular data. In BOLD there are no barcodes for *C. praecipua*.

Distribution. Algeria, Tunisia, Morocco, Libya, Saudi Arabia, Iraq, Iran. **New to Morocco.**

### *Coleophora honestella* Toll, 1952

Barcode Index Number: BOLD:-

Material studied. 1 ♂ (GP 5428 J. Tabell) Souss-Massa-Drâa, Quarzazate, 1140 m, 11.V.2011, J. & A. Kullberg leg. (coll. MZH).

Molecular data. There is no genetic information on northern African specimens in BOLD. Asian specimens determined as *C. honestella* in BOLD (Barcode Index Number: BOLD:ACB1346) probably represent a new species.

Distribution. Morocco, Tunisia, Libya.

### *Coleophora helichrysiella* Krone, 1909

Barcode Index Number: BOLD:AAE1422

Material studied. 1 ♂ (GP 13961 ZT, DNA sample 27434 Lepid Phyl) Middle Atlas Mts., 1900 m, 32°35.960'N, 04°30.290'W, 17.IV.2013, Z. Tokár leg. & det. (coll. TOK).

Molecular data. The nearest neighbour is *C. quadristraminella* Toll, 1961, with an 8.77 % divergence. The barcodes of *C. helichrysiella* represent four different BINs, with an 8.46 % maximum divergence, indicating plausible cryptic diversity. The barcode of the Moroccan specimen is identical with those of Spanish and French specimens.

Distribution. Mediterranean region. **New to Morocco and Africa.**

### *Coleophora berlandella* Toll, 1956

Barcode Index Number: BOLD:ADD3241

Material studied. 1 ♀ High Atlas, Ouirgane 6 km NW, 850 m, 30.V.2015, C. Hviid, O. Karsholt & K. Larsen leg; 1 ♀ (DNA sample 24955 Lepid Phyl) High Atlas, Ouirgane 9 km NW, 970 m, 30.V.–3.VI.2015, C. Hviid, O. Karsholt &

K. Larsen leg.; 2 ♂ (DNA sample 25464 Lepid Phyl) High Atlas, Ljoukak 23 km SW, 1600 m, 2.VI.2015, C. Hviid, O. Karsholt & K. Larsen leg. (all coll. TAB).

Molecular data. The nearest neighbour is *C. jaskai* sp. nov., with a 2.03 % divergence. The barcodes of *C. berlandella* exhibit no intraspecific variation (n=2).

Distribution. North Africa, Spain, Caucasus, Turkmenistan, Kazakhstan, Kyrgyzstan.

### ***Coleophora jaskai* Tabell, sp. nov.**

Barcode Index Number: BOLD:AEL6876

Figs. 8, 38, 56

**Type material.** Holotype ♀ (DNA sample 27138 Lepid Phyl): Morocco, Zagora: Tagounite, wgs84: 30°50′: -5°32′ [30.5000 N 5.3200 W], 19.V.2011, J. & A. Kullberg leg. <http://id.luomus.fi/GBT.17> (coll. MZH). Paratype: 2 ♀ (GP 6144 J. Tabell, DNA sample 27139 Lepid Phyl [barcoding failed]; DNA sample 27145 Lepid Phyl [barcoding failed]) same data as holotype (colls. MZH and TAB).

Diagnosis. Characterized by yellow forewing with broad white stripes. In *C. berlandella* Toll, 1956 the forewing is more ochreous. The female genitalia are similar to those of *C. berlandella*, but the posterior part of ductus bursae is narrower and the median band is more sclerotized. Tergal sclerites are broader and spines are more numerous than in *C. berlandella*. Male of *C. jaskai* is unknown.

Molecular data. One sample was sequenced successfully, resulting in a 651 bp barcode. The nearest neighbour is *C. berlandella*, with a 2.03 % divergence.

Description. Adult. Wingspan 18.5–19 mm. Antenna white. Scape white, with a long tuft. Labial palp white, second article 1.5x longer than third article. Head, thorax and tegula white with a pale yellow tinge. Forewing yellow with four white stripes; costal stripe from 1/5 to 4/5, slightly tapering towards apex; median stripe straight, from base to mid-wing; dorsal stripe narrow, basally broader; apical stripe triangular, dorsal margin straight. Costal fringe cilia white to pale ochre, dorsal fringe cilia yellow. Hindwing pale grey, fringe cilia white to pale ochre.

Abdominal structures. Sternal bar long, tergal latero-posterior bar short. Transverse bar straight, proximal edge slightly arched, sclerotized, distal edge medially unsclerotized. Tergal sclerite narrow, about 3x as long as wide, covered with about 25 conical spines (on T3).

Male genitalia. Unknown.

Female genitalia. Papilla analis oval, covered with bristles of different length. Anterior apophysis longer than sterigma, posterior apophysis twice as long as anterior one. Sterigma trapezoidal, 2x wider than long, distally tapered, proximal margin concave, distal margin rounded, lined by short bristles, medial excavation narrow and deep. Colliculum weakly sclerotized, elongated. Ductus bursae membranous, broad, posterior third with a sclerotized median lamina and a short dark band, anterior third broader, coiled twice. Corpus bursae suborbicular, with one leaf-shaped signum.

Biology. Unknown.

Distribution. Morocco, known only from the type locality.

Etymology. The species is named in honour of Jaakko "Jaska" Kullberg, who is one of the collectors of the type specimens.

Note. In this species group the females of *C. parapredotella* Toll & Amsel, 1967 and *C. kondarensis* (Reznik, 1976) are still unknown, but their forewing maculation is different from that of *C. jaskai*, and therefore the description of a new species is justified.

### ***Coleophora eupreta* Walsingham, 1907**

Barcode Index Number: BOLD:AAV7988

Material studied. 1 ♂ High Atlas, Ouled Berhil 19 km NNE, 1000 m, 2.V.2013, J. Tabell leg.; 1 ♂ High Atlas, Ouled Berhil 22 km NNE, 1340 m, 1.V.2013, J. Tabell leg. (coll. TAB); 2 ♂ (GP 21860 IgR) Tifnit 2 km S, 50 m, 9.IV.2013; 1 ♀ (GP 21862 IgR) Anti Atlas Mts., Adar vill. 4 km NE, 1800 m, 13.-14.IV.2013, L. Srnka leg., I. Richter det.; 1 ♀ (GP 14031 ZT, DNA sample 27437 Lepid Phyl [barcoding failed]) High Atlas Mts., Taliouine 8 km NW, 1100 m, 12.IV.2013, L. Srnka leg., Z. Tokár & G. Baldizzone det. (all coll. SRN).

Molecular data. The nearest neighbour is the morphologically distinct Nearctic *C. simulans* McDunnough, 1961, with a 7.16 % divergence. The barcodes of *C. eupreta* exhibit 2.03 % maximum intraspecific variation (n=8). So far Moroccan specimens have not been sequenced.

Distribution. Portugal, Spain, France, Italy, Austria, Bosnia, Macedonia, North Africa, Turkey, Iran (Baldizzone, 2019). Reported for the first time from Morocco by Baldizzone (1997).

### ***Coleophora cyrniella* Rebel, 1926**

Barcode Index Number: BOLD:AAV9378

Material studied. 1 ♂ (DNA sample 21992 Lepid Phyl) High Atlas, Ouled Berhil 19 km NNE, 1000 m, 2.V.2013, J. Tabell leg.; 1 ♂ High Atlas, Ljoukak 23 km SW, 1600 m, 2.VI.2015, C. Hviid, O. Karsholt & K. Larsen leg; 1 ♂ High Atlas, Ouirgane 11 km S, 1200 m, 4.VI.2015, C. Hviid, O. Karsholt & K. Larsen leg. (all coll. TAB).

Molecular data. The nearest neighbour is *C. bilineella* Herrich-Schäffer, 1854, with a 6.25 % divergence. The barcodes of *C. cyrniella* exhibit 1.12 % maximum intraspecific variation (n=3). So far Moroccan specimens have not been sequenced.

Distribution. France, Spain, Corsica, Sardinia, Italy, Macedonia, Romania, Greece, Morocco, Libya, Palestine, Saudi Arabia (Baldizzone, 2019).

### ***Coleophora bilineella* Herrich-Schäffer, 1854**

Barcode Index Number: BOLD:AEC2828

Material studied. 2 ♂ (DNA sample 21993 Lepid Phyl), 2 ♀ Anti-Atlas, Tafraout 24 km SW, 1200 m, ex larva 2013, *Helianthemum* sp. 28.IV.2013, J. Tabell leg. (coll. TAB).

Molecular data. The nearest neighbour is *C. cyrniella*, with a 6.25 % divergence. The barcodes of *C. bilineella* exhibit 2.03 % maximum intraspecific variation (n=8)

Distribution. Portugal, Spain, Southern France, Corsica, Sardinia, Italy, Switzerland, Austria, Hungary, Croatia, Romania, Bulgaria, Greece, Crete, Cyprus, Turkey, Northern Africa (Baldizzone, 2019).

### ***Coleophora afrohispana* Baldizzone, 1982**

Barcode Index Number: BOLD:AAZ9407

Material studied. 1 ♂ (DNA sample 27537 Lepid Phyl) Taourirt Prov., Debdou 3 km NNE, 880 m, 11.V.2016, J. Tabell leg. (coll. TAB).

Molecular data. The nearest neighbour is *C. hartigi* Toll, 1944, with a 4.28 % divergence. The minimum divergence between Moroccan and Spanish specimens is 1.13 % (n=3).

Distribution. North Africa, Spain, Portugal.

### ***Coleophora vulnerariae* Zeller, 1839**

Barcode Index Number: BOLD:AAO1943

Material studied. 2 ♀ Middle Atlas 1950 m, Ifrane Prov., Michlifen W steppe slope & Quercus for., 5.–9.V.2010, J. Kullberg & Z. Kolev leg.; 3 ♂ Middle Atlas 1900 m, Ifrane Prov., Michlifen resort, volcano crater & mixed for., 7.–9.V.2010 ad luc., J. Kullberg & Z. Kolev leg.; 1 ♂ Middle Atlas 1920 m, Ifrane Prov., 11 km SE Ifrane, steppe hill nr. road pass, 8.V.2010, J. Kullberg & Z. Kolev leg.; 3 ♂, 1 ♀ Middle Atlas 1900 m, Ifrane Prov., Michlifen, road side meadow, 9.–10.V.2010, J. Kullberg & Z. Kolev leg.; 3 ♂ Meknès-Tafilalet, Ifrane, 1930 m, 6.–7.V.2011, J. & A. Kullberg leg.; 1 ♂ (GP 4959 J. Tabell, DNA sample 27538 Lepid Phyl [barcoding failed]) Meknès-Tafilalet, Ifrane 1920 m, 9.V.2011, J. & A. Kullberg leg. (all coll. MZH).

Molecular data. The nearest neighbour is *C. rudella* Toll, 1944, with a 5.41 % divergence. The barcodes of

*C. vulnerariae* exhibit 0.77 % maximum intraspecific variation (n=7). There are no barcodes for Moroccan specimens.

Distribution. Europe, Morocco (Baldizzone, 2019).

### ***Coleophora semicinerea* Staudinger, 1859**

Barcode Index Number: BOLD:AAZ9514

Material studied. 1 ♂ Mirleft 5 km SSW, 20 m, 28.IV.2013, J. Tabell leg.; 1 ♂, 1 ♀ High Atlas, Taroudant 27 km NW, 670 m, 29.IV.2013, J. Tabell leg.; 1 ♂ (GP 5066 J. Tabell) High Atlas, Argana 10 km S, 1420 m, 30.IV.2013, J. Tabell leg.; 2 ♀ Tiznit Prov., Mirleft 3.2 km SSW, 10 m, 12.IV.2015, J. Tabell leg.; 2 ♀ High Atlas, Al Haouz Prov., Ourika 3 km SE, 960 m, 16.IV.2015, J. Tabell leg.; 1 ♀ Middle Atlas, El Hajeb Prov., El Hajeb 2.5 km W, 820 m, 18.IV.2015, J. Tabell leg. (all coll. TAB); 2 ♂ (GP 11982, 11993 ZT) Guelmim 10 km NE, 500 m, 10.–11.IV.2013, Z. Tokár leg. & det. (coll. TOK).

Molecular data. The nearest neighbour is *C. oriolella* Zeller, 1849, with a 6.72 % divergence. The barcodes of *C. semicinerea* exhibit 1.4 % maximum intraspecific variation (n=4). There are no barcodes for Moroccan specimens.

Distribution: Southern Europe, Morocco, Canary Islands: Fuerteventura (van der Wolf, 2009).

### ***Coleophora pennella* ([Denis & Schiffermüller], 1775)**

Barcode Index Number: BOLD:AAO3477

Material studied. 9 exx, Middle Atlas, El-Hajeb 2 km W, 820 m, 7.V.2013, J. Tabell leg.; 1 ♂ Middle Atlas, El Hajeb Prov., El Hajeb 2.5 km W, 820 m, 18.IV.2015, J. Tabell leg.; 1 ♂ El Hajeb Prov., El Hajeb 2.8 km WNW, 860 m, 15.V.2016, J. Tabell leg. (all coll. TAB).

Molecular data. The nearest neighbour is a Kazakh so far unnamed *Coleophora* species, with a 1.93 % divergence. The barcodes of *C. pennella* exhibit 0.48 % maximum intraspecific variation (n=16). There are no barcodes for Moroccan specimens.

Distribution: Western Palearctic, widely distributed. Reported for the first time from Morocco and Africa by Baldizzone (1995).

### ***Coleophora berbera* Baldizzone, 1988**

Barcode Index Number: BOLD:ACB0422

Material studied. 1 ♀ (DNA sample 25416 Lepid Phyl) Anti-Atlas, Tiznit Prov., Tafraout 24 km SW, 1125 m, 13.IV.2015, J. Tabell leg. (coll. TAB).

Molecular data. The nearest neighbour to *C. berbera* is *C. anitella* Baldizzone, 1985, with a 2.92 % divergence. The genetic distance between Moroccan and Spanish populations is 0.32 % (n=2).

Distribution. Tunisia, Spain, Morocco. **New to Morocco.**

### ***Coleophora fulvociliella* Chrétien, 1915**

Material studied. 1 ♂ (GP 14028 ZT, DNA sample 27439 Lepid Phyl [barcoding failed]) High Atlas Mts., Taliouine 8 km NW, 1100 m, 12.IV.2013, L. Srnka leg., G. Baldizzone det. (coll. SRN).

Distribution. Algeria, Libya, Morocco. **New to Morocco.**

### ***Coleophora texanella* Chambers, 1878**

Barcode Index Number: BOLD:AAB7072

Material studied. 1 ♂ Souss-Massa-Drâa, Legzira 9 km N, Sidi Ifni, 5.–7.III.2017, C. Hviid, O. Karsholt, K. Larsen & D. Nilsson leg. (coll. TAB).

Molecular data. The nearest neighbour is a Nearctic so far unnamed *Coleophora* species, with a 3.21 % divergence. The barcodes of *C. texanella* exhibit 1.83 % maximum intraspecific variation (n=194). There are no barcodes for Moroccan specimens.

Distribution. Species introduced from North America, known from Southern France, Spain (Mallorca), Italy, Sicily, Sardinia, Croatia, Macedonia, Bulgaria, Greece (Zakynthos, Peloponnese, Rhodes, Crete) (Baldizzone, 2019). **New to Morocco and Africa.**

### ***Coleophora discomaculella* Toll & Amsel, 1967**

Material studied. 1 ♀ (GP 11918 ZT, DNA sample 27435 Lepid Phyl [barcoding failed]) Rissani 15 km W, 800 m, 16.IV.2013, Z. Tokár leg., G. Baldizzone det. (coll. TOK).

Distribution. Morocco, Afghanistan, Turkmenistan, Iran (Baldizzone et al. 2006), Macedonia (Richter, pers. comm.). Reported for the first time from Morocco by Baldizzone (1995).

### ***Coleophora versurella* Zeller, 1849**

Barcode Index Number: BOLD:AAB3186

Material studied. 1 ♀ High Atlas, Taroudant 27 km NW, 670 m, 29.IV.2013, J. Tabell leg.; 2 ♂ High Atlas, Ouirgane, 925 m, 30.–31.V.2015, C. Hviid, O. Karsholt & K. Larsen leg.; 1 ♂ High Atlas, Ouirgane 7 km S, 950 m, 4.VI.2015, C. Hviid, O. Karsholt & K. Larsen leg. (coll. TAB).

Molecular data. The nearest neighbour is *C. jaernaensis* Björklund & Palmqvist, 2002, with a 2.18 % divergence. The barcodes of *C. versurella* exhibit 1.9 % maximum intraspecific variation (n=58). There are no barcodes for Moroccan specimens.

Distribution. Holarctic, Oriental and Neotropical regions, widely distributed.

### ***Coleophora luteolella* Staudinger, 1880**

Barcode Index Number: BOLD:AAO1948

Material studied. 1 ♀ (DNA sample 23537 Lepid Phyl) Middle Atlas, El-Hajeb 2 km W, 820 m, 7.V.2013, J. Tabell leg.; 1 ♀ High Atlas, 6 km NW Ouirgane, road to Amizmiz, 1050 m, 1.–2.V.2016, C. Hviid, K. Larsen & D. Nilsson leg.; 1 ex. Taourirt Prov., Debdou 3 km NNE, 880 m, 11.V.2016, J. Tabell leg.; 5 exx Ifrane Prov., Azrou 3 km NNW, 1210 m, 16.V.2016, J. Tabell leg.; 2 ♂ Al Haouz Prov., Imlil, 1680 m, 30.VI.2016, J. Tabell leg.; 1 ♀ High Atlas, 6 km NW Ouirgane, road to Amizmiz, 1050 m, 1.–2.V.2016, C. Hviid, K. Larsen & D. Nilsson leg. (all coll. TAB); 1 ♂ Meknès-Tafilalet, Azrou, 33°28'14": -5°14'43", 1260 m, 4.V.2011, J. & A. Kullberg leg. (coll. MZH).

Molecular data. The nearest neighbour is a Nearctic so far unnamed *Coleophora* species, with a 3.64 % divergence. The barcodes exhibit 0.96 % maximum intraspecific variation (n=6).

Distribution: South Europe, Morocco, Turkey, Turkmenistan, Iran, Afghanistan.

### ***Coleophora submendica* Tabell, sp. nov.**

Barcode Index Number: BOLD:ABV9537

Figs. 9, 23, 39, 40, 57

Material studied. Holotype ♂ (GP 6199 J. Tabell, DNA sample 24538 Lepid Phyl): Anti-Atlas, Tiznit Prov., Tafraout 24 km SW, 1125 m, [29.5806 N 9.1727 W], 13.IV.2015, J. Tabell leg. <http://id.luomus.fi/GBT.18> (coll. MZH). Para-



types: 1 ♂ (DNA sample 24539 Lepid Phyl) same data as holotype; 2 ♂, 3 ♀ (GP 5808 J. Tabell, DNA sample 27132 Lepid Phyl) Anti-Atlas, Souss-Massa-Drâa, Idikl 16 km E Tafraoute, 1580 m, 8.–10.III.2017, C. Hviid, O. Karsholt, K. Larsen, D. Nilsson leg. (all coll. TAB).

Diagnosis. *C. submendica* is similar to *C. feomicrella* Baldizzone, 1988, known from Algeria, and *C. mendica* Baldizzone & van der Wolf, 2000, known from Spain. In the male genitalia, the sacculus is narrower and longer than in *C. feomicrella* and broader than in *C. mendica*. The ventrocaudal angle is rectangular in *C. mendica*, rounded in *C. feomicrella* and obtuse-angled in *C. submendica*. The phallosome rods are unarmed (with two teeth in *C. mendica*) and longer in *C. submendica*, and the cornutus is longer than in *C. feomicrella* and markedly longer than in *C. mendica*. In the female genitalia, the sterigma is longer, the ostium broader, the colliculum narrower and less sclerotized, and the ductus bursae markedly longer than in *C. mendica*. The female genitalia of *C. submendica* are similar to those of *C. feomicrella*, but the corpus bursae is markedly longer.

Molecular data. Three samples were sent for barcoding, resulting in 658 bp (n=2) and 652 bp (n=1) barcodes. The nearest neighbour to *C. submendica* is *C. mendica*, with a 1.4 % minimum divergence. The barcodes of *C. submendica* exhibit 0.15 % maximum intraspecific variation. In BOLD there are no barcodes for *C. feomicrella*.

Description. Adult. Wingspan 9.5–11 mm. Antenna white, annulated with dark brown. Scape pale brown, below brown, not tufted. Labial palp pale brown mixed with white, second article 1.5x longer than third article. Head, thorax and tegula pale brown, mixed with white. Forewing white, covered with pale brown, brown and dark brown scales, at base a narrow blackish brown stripe. Costal stripe white. Costal fringe cilia white, towards apex pale brown, dorsal fringe cilia pale brown. Hindwing pale grey, fringe cilia pale greyish brown.

Abdominal structures. Sternal bar long, no tergal latero-posterior bar. Transverse bar curved, proximal edge evenly and strongly sclerotized, distal edge medially unsclerotized and strongly arched in male. Tergal sclerite narrow, about 7x as long as wide (in female 4x), covered with about 20 (in female 35) conical spines (on T3).

Male genitalia. Gnathos knob oval. Tegumen constricted medially, reinforced by a sclerotized "Y", pedunculum broad, crescent-shaped. Transtilla upcurved, parallel-sided. Valvula markedly broader than cucullus, short, ventral margin evenly rounded, sclerotized. Cucullus moderately broad, ear-shaped, slightly tapered basally. Ventral margin of sacculus evenly curved, ventrocaudal angle obtuse, lateral margin straight, short, dorsocaudal angle rounded. Phallosome with two narrow, evenly arched rods, exceeding the outer margin of sacculus. In vesica one very long, narrow, curved cornutus.

Female genitalia. Papilla analis narrow, covered with bristles of different length. Anterior apophysis as long as sterigma, posterior apophysis 2.5x as long as anterior one. Sterigma 1.8x wider than long, distally slightly tapered, proximal margin slightly convex, distal margin rounded, distal 1/5 covered with long bristles, medial excavation U-shaped. Ostium situated at upper half on sterigma. Colliculum weakly sclerotized, tubular. Ductus bursae membranous, narrow, very long, close to corpus bursae more sclerotized and expanded, coiled twice. Corpus bursae bag-shaped, narrow, without signum.

Biology. Unknown.

Distribution. Morocco, known from the Anti-Atlas Mountains.

Etymology. The specific epithet refers to a close affinity with *C. mendica*.

### ***Coleophora microalbella* Amsel, 1935**

Barcode Index Number: BOLD:ABV9538

Material studied. 1 ♂ (GP 5065 J. Tabell, DNA sample 25793 Lepid Phyl), 2 ♀ (DNA sample 25794 Lepid Phyl) Mirleft 5 km SSW, 20 m, 28.IV.2013, J. Tabell leg.; 2 ♀ (GP 5788 J. Tabell, DNA sample 24540 Lepid Phyl) Tiznit Prov., Mirleft 3.2 km SSW, 10 m, 12.IV.2015, J. Tabell leg. (all coll. TAB).

Molecular data. The nearest neighbour is a Spanish so far undescribed species with a 2.97 % divergence. The barcodes of *C. microalbella* exhibit 0.46 % maximum intraspecific variation (n=5).

Distribution: Israel, Oman, Tunisia, Algeria, Canary Islands: Fuerteventura, Morocco. **New to Morocco.**

### *Coleophora griseomixta* Toll, 1960

Barcode Index Number: BOLD:ADD4090

Figs. 41, 42, 58

Material studied. 1 ♀ (GP 6198 J. Tabell, DNA sample 27135 Lepid Phyl) Al Haouz, Oukaimeden, 2550 m, 15.V.2011, J. & A. Kullberg leg. (coll. MZH); 1 ♂ (GP 5176 J. Tabell, DNA sample 25414 Lepid Phyl) Spain, Andalusia, Granada, Baza 10 km NE, 8.IV.2014, J. Tabell leg.; 2 ♂ (GP 6206 J. Tabell; DNA sample 25777 Lepid Phyl) ibidem, 9.IV.2014 at 8:30–9:30 am (coll. TAB).

Molecular data. The nearest neighbour to *C. griseomixta* is *C. sarehma* Toll, 1957, with a 3.29 % divergence. Three sequenced specimens, 658 bp (n = 2) and 653 bp (n = 1) barcodes, exhibit 0.46 % maximum intraspecific variation. Male and female specimens are considered conspecific based on the DNA information.

Abdominal structures. No tergal latero-posterior bar. Transverse bar straight, narrow, proximal edge evenly sclerotized, medially slightly curved, distal edge medially unsclerotized. Tergal sclerite 3.5x as long as wide (in male 6x), covered with about 30 conical spines (on T3).

Female genitalia. Papilla analis elongate, narrow, covered with short bristles. Anterior apophysis as long as sterigma, posterior apophysis 2.4x as long as anterior one. Sterigma trapezoidal, slightly wider than long, strongly attenuated towards apex, proximal margin sinuous, distal margin rounded, covered with bristles of different length, medial excavation deep. Ostium U-shaped, situated at proximal half of sterigma. Colliculum tubular, 2x as long as sterigma, well sclerotized, twisted once, slightly curved, anteriorly tapered, medial lamina absent, anterior part membranous, slightly expanded. Ductus bursae very long, narrow, membranous, near corpus bursae more sclerotized and coiled; spinose part shorter than colliculum, slightly curved, with two lateral bands. Corpus bursae round, small, with a leaf-shaped signum.

Distribution: Spain, Morocco. **New to Africa and Morocco.**

### *Coleophora sarehma* Toll, 1957

Barcode Index Number: BOLD:ABX6789

Material studied. 1 ♂ (GP 5092 J. Tabell, DNA sample 21789) High Atlas, Taroudant 27 km NW, 670 m, 29.IV.2013, J. Tabell leg. (coll. TAB).

Molecular data. Nearest neighbours are *C. scabrida* Toll, 1959 (1.66 % divergence) and a Spanish still undescribed species (1.66 % divergence). The barcodes of *C. sarehma* exhibit 0.33 % maximum divergence (n=3).

Distribution: North Africa, Iran, Saudi Arabia, Turkey, Canary Islands. Reported for the first time from Morocco by Baldizzone (1995).

### *Coleophora adipella* Tabell, sp. nov.

Barcode Index Number: BOLD:ACY6523

Figs. 10, 11, 24, 43, 44, 59

**Type material.** Holotype ♀ (GP 5436 J. Tabell, DNA sample 24527 Lepid Phyl): Morocco, Tiznit Prov., Mirleft 3.2 km SSW, 10 m, [29.5370 N 10.0595 W], 12.IV.2015, J. Tabell leg. <http://id.luomus.fi/GBT.19> (coll. MZH). Paratypes: 7 ♂ (GP 5570 J. Tabell, DNA sample 24529), 32 ♀ (DNA sample 24530 Lepid Phyl) same collecting data as holotype (coll. TAB).

Diagnosis. *C. adipella* is most close to *C. antiatlasella* sp. n. Distinguishing features in the male genitalia are broader sacculus and its straight outer margin (slightly bulged in *C. antiatlasella*), smaller cucullus, broader appendix of juxta and shorter bundle of cornuti. In the female genitalia, longer anterior apophysis and colliculum, and distally more tapered sterigma distinguish *C. adipella* from *C. antiatlasella*. In *C. sarehma*, the spinulate section of ductus bursae is markedly longer than in *C. adipella*.

Molecular data. Three samples were sent for barcoding, resulting in 658 bp barcodes. The nearest neighbour to *C. adipella* is *C. antiatlasella*, with a 1.86 % minimum divergence. The barcodes of *C. adipella* exhibit no intraspecific variation.

Description. Adult. Wingspan 11–13 mm. Antenna white, annulated with brown. Scape white, below brown, not tufted. Labial palp white, apex brown, second article dirty white. Head, thorax and tegula brown, mixed with white. Forewing ochre with scattered blackish brown scales, white scales forming three narrow stripes. Costal stripe from base to ½. Costal fringe cilia pale ochre, apically brown, dorsal fringe cilia brownish grey. Hindwing pale grey, fringe cilia pale brownish grey. Abdomen light grey, slightly lustrous. In female antenna is darker annulated, and dark scales form a short medial stripe.

Abdominal structures. Sternal bar moderately short, no tergal latero-posterior bar. Transverse bar straight or slightly curved, both edges sclerotized. Tergal sclerite well sclerotized, 5x (in female 3x) as long as wide, covered with about 20 (in female 45) conical spines (on T3).

Male genitalia. Gnathos knob oval. Tegumen constricted medially, reinforced by a sclerotized "Y", pedunculum broad, crescent-shaped. Transtilla ropelike, slightly upcurved. Valvula broader than cucullus, weakly delineated, ventral margin rounded. Cucullus ear-shaped, almost parallel-sided. Sacculus well sclerotized; ventral margin slightly convex, oblique, ventrocaudal angle obtuse, rounded; lateral margin slightly concave, strongly sclerotized; dorsocaudal angle with a robust hook-shaped protuberance pointing inwards, apex dilated, at base close to dorsal margin a small tooth. Phallosome very long, apex swollen, membranous, rods partially fused, narrow, with a small apical tooth. Vesica broad, with three spiniform cornuti forming a short bundle.

Female genitalia. Papilla analis elongate, narrow, covered with short bristles. Anterior apophysis 1.3x as long as sterigma, posterior apophysis 2x as long as anterior one. Sterigma trapezoidal, 1.6x as wide as long, strongly attenuated towards apex, proximal margin straight, distal margin rounded, covered with short bristles, medial excavation wide and deep. Ostium broadly U-shaped, situated medially on sterigma. Colliculum tubular, parallel-sided, 2x as long as sterigma, well sclerotized. Spinose part of ductus bursae shorter than colliculum, straight, with two lateral bands, posterior section of ductus bursae sclerotized, broad, tapered anteriorly, coiled, anterior section membranous, narrow, coiled. Corpus bursae round, with a leaf-shaped signum.

Biology. Early stages unknown.

Distribution. Morocco.

Etymology. Latin *adeps*, *adipes* = grease. The abdomina of almost all type specimens became greasy after a few weeks of collecting.

### ***Coleophora antiatlasella* Tabell, sp. nov.**

Barcode Index Number: BOLD:ACY6522

Figs. 12, 13, 25, 45, 46, 60

**Type material.** Holotype ♀ (GP 5438 J. Tabell, DNA sample 24532 Lepid Phyl): Morocco, Anti-Atlas, Tiznit Prov., Taфраout 24 km SW, 1125 m, [29.5806 N 9.1727 W] 13.IV.2015, J. Tabell leg. <http://id.luomus.fi/GBT.20> (coll. MZH). Paratype: 1 ♂ (GP 5457 J. Tabell, DNA sample 24528 Lepid Phyl) Morocco, Tiznit Prov., Mirleft 3.2 km SSW, 10 m, 12.IV.2015, J. Tabell leg. (coll. TAB).

Diagnosis. *C. antiatlasella* is close to *C. scabrida* Toll, 1959, *C. adipella* sp. n., and *C. antiqua* Baldizzone, 2020. Male genitalia can be distinguished by the shape of sacculus (dorsocaudal protuberance markedly broader in *C. antiqua*), cucullus (narrower in *C. antiqua*, shorter in *C. scabrida*) and phallosome (shorter in *C. antiqua* and *C. scabrida*). Female genitalia are similar to those of *C. adipella*, but the anterior apophysis and the colliculum are shorter, and *C. sarehma*, but the spinulate section of ductus bursae is markedly shorter.

Molecular data. Both type specimens were sequenced successfully, resulting in 658 bp barcodes. The nearest neighbour to *C. antiatlasella* is *C. adipella*, with a 1.86 % minimum divergence. The barcodes of *C. antiatlasella* exhibit 0.15 % maximum intraspecific variation. Male and female specimens are considered conspecific based on the DNA information.

Description. Adult. Wingspan 10.5 mm. Antenna white, annulated with brown, first segments covered by ochreous white scales. Scape ochreous white, below brown, not tufted. Labial palp dirty white, below pale brown, second article 2x longer than third article. Head, thorax and tegula pale ochreous brown, mixed with white. Forewing pale ochreous brown with scattered dark brown scales and white scales. Costal stripe from base to ½, distinctly edged, then expanded to near apex, no distinct lower margin. Costal fringe cilia pale ochreous white to pale ochre, dorsal fringe cilia brownish grey. Hindwing pale grey, fringe cilia pale brownish grey, apically paler. Abdomen light grey, slightly lustrous. In female dark scales are blackish brown and form short stripes.

Abdominal structures. No tergal latero-posterior bar. Transverse bar slightly curved, slightly tapered medially, proximal edge broadly sclerotized, distal edge unsclerotized medially. Tergal sclerite 3–3.5x as long as wide, covered with 30 conical spines (on T3).

Male genitalia. Gnathos knob suborbicular. Tegumen constricted medially, pedunculum slightly dilated. Transstilla narrow, apically expanded. Valvula thimble-shaped, moderately narrow. Cucullus ear-shaped, slightly tapered basally. Sacculus well sclerotized; ventral margin slightly convex, oblique, ventrocaudal angle rounded, with a sclerotized ridge; dorsocaudal angle with a robust hook-shaped protuberance pointing inwards; dorsal margin with a small roundish tooth. Phallosome very long, apex swollen, membranous, rods partially fused, narrow, with a small triangular apical tooth. Vesica broad, with a bundle of four spiniform cornuti.

Female genitalia. Papilla analis elongate, narrow, covered with short bristles. Anterior apophysis as long as sterigma, posterior apophysis 2.3x as long as anterior one. Sterigma trapezoidal, 1.3x as wide as long, proximal margin straight, distal margin rounded, covered with short bristles, medial excavation wide and deep. Ostium broadly U-shaped, situated medially on sterigma. Colliculum tubular, 1.35x as long as sterigma, slightly tapered anteriorly, well sclerotized, surfaced with fine horizontal ridges. Spinose part of ductus bursae as long as colliculum, straight, with two lateral bands, posterior section of ductus bursae sclerotized, coiled, anterior section membranous, narrow, coiled. Corpus bursae ovoid, with a leaf-shaped signum.

Biology. Early stages unknown.

Distribution. Morocco, known from two localities.

Etymology. The specific name refers to the collecting area of the paratype specimen.

### ***Coleophora haloxylonella* Chrétien, 1915**

Barcode Index Number: BOLD:-

Material studied. 2 ♂, 1 ♀ (DNA sample 27459 Lepid Phyl [barcoding failed]) Middle Atlas 1900 m, 33°26'07''N, 5°03'35''W, Ifrane Prov., Michlifan, road side meadow, 9.–10.V.2010, J. Kullberg & Z. Kolev leg.; 3 ♂ (DNA sample 27458 Lepid Phyl [barcoding failed]) Anti-Atlas 1330 m, 32°47'42''N, 6°45'34''W, Ouarzazate Prov., semidesert, 13.5 km NW Ait Saoun, 13.V.2010, J. Kullberg & Z. Kolev leg. (colls. MZH and TAB); 3 ♂ (GP 13029, 13036, 13037 ZT), 3 ♀ (GP 13028, 13967, 13984 ZT) Jbel Rhart Mts., Zaona-Tafetchna 5 km SW, 1200 m, 15.IV.2013, Z. Tokár leg. & det. (coll. TOK).

Molecular data. In BOLD there are no barcodes for *C. haloxylonella*, barcoding attempt of two specimens failed.

Distribution. Morocco, Algeria, Tunisia, Libya. Reported for the first time from Morocco by Baldizzone (1995).

### ***Coleophora korbi* Baldizzone, 1998**

Barcode Index Number: BOLD:AAP5430

Material studied. 1 ♂ (GP 5091 J. Tabell) Middle Atlas, Azrou 3 km NW, 1240 m, 7.V.2013 at 7–7.30 am, J. Tabell leg.; 1 ♂ (DNA sample 24535 Lepid Phyl) High Atlas, Al Haouz Prov., Oukaimden 6 km NE, 2100 m, 17.IV.2015, J. Tabell leg.; 1 ♂ High Atlas, 6 km NW Ouirgane, road to Amizmiz, 1050 m, 1.–2.V.2016, C. Hviid, K. Larsen & D. Nilsson leg. (all coll. TAB); 1 ♂ Meknès-Tafilalet, Ifrane, 33°27'20'': -5°2'18'', 1920 m, 5.–9.V.2011, J. & A. Kullberg leg. (coll. MZH).

Molecular data. The nearest neighbours are *C. artemisicolella* Bruand, [1855] and *C. stenidella* Toll, 1952, with 4.22 % and 4.27 % divergences, respectively. The barcodes of *C. korbi* exhibit 0.46 % maximum intraspecific variation (n=4).

Distribution: Spain, Morocco. **New to Africa and Morocco.**

### *Coleophora maghrebina* Baldizzone, 1982

Barcode Index Number: BOLD:ABV9534

Material studied. 5 ♂ (DNA sample 25650 Lepid Phyl; DNA sample 25651 Lepid Phyl) Al Haouz Prov., Oukaimden 1.5 km SE, 2660 m, 2.VII.2016, J. Tabell leg. (coll. TAB).

Molecular data. The nearest neighbour is a Nearctic so far unnamed *Coleophora* species, with a 5.08 % divergence. The barcodes of *C. maghrebina* exhibit no intraspecific variation (n=2).

Distribution. Morocco, endemic to the High Atlas Mountains.

### *Coleophora vivesella* Baldizzone, 1987

Barcode Index Number: BOLD:ABV8288

Material studied. 1 ♂ (DNA sample 24949 Lepid Phyl) High Atlas, Ljoukak 18 km SW, 1300–1500 m, 2.VI.2015, C. Hviid, O. Karsholt & K. Larsen leg.; 1 ♂, 1 ♀ (GP 5784 J. Tabell) Taourirt Prov., Debdou 3 km NNE, 880 m, 11.V.2016, J. Tabell leg.; 1 ♀ (GP 5734 J. Tabell, DNA sample 25642 Lepid Phyl) Al Haouz Prov., Imlil, 1680 m, 30.VI.2016, J. Tabell leg.; 1 ♂ Ouarzazate Prov., Aguelmous 1 km ESE, 2150 m, 3.VII.2016, J. Tabell leg.; 1 ♂ (DNA sample 25645 Lepid Phyl) Ouarzazate Prov., Aguelmous 1 km ESE, 2150 m, 3.VII.2016, J. Tabell leg. (all coll. TAB); 1 ♂ (GP 13031 ZT) Anti Atlas Mts., Adar village 4 km NE, 1800 m, 13.–14.IV.2013, Z. Tokár leg. (coll. TOK); 1 ♂ (GP 21865 IgR) the same locality and data, L. Srnka leg., Z. Tokár det. (coll. SRN).

Molecular data. The nearest neighbour is *C. bucovinella* Nemeş, 1968, with a 5.74 % divergence. The barcodes of *C. vivesella* exhibit 0.61 % maximum intraspecific variation (n=4).

Distribution. Spain, Morocco. **New to Africa and Morocco.**

### *Coleophora stenidella* Toll, 1952

Barcode Index Number: BOLD:ACY5645

Figs. 26, 47, 48, 61

Material studied. 1 ♂ (GP 5449 J. Tabell, DNA sample 25396), 2 ♀ (GP 5437 J. Tabell, DNA sample 24533 Lepid Phyl; DNA sample 24534 Lepid Phyl) Anti-Atlas, Tiznit Prov., Tafraout 24 km SW, 1125 m, 13.IV.2015, J. Tabell leg. (coll. TAB); 1 ♂ (GP 14228 ZT), 3 ♀ (GP 11946, 14226-7 ZT) + 17 exx., Anti Atlas Mts., Adar vill. 4 km NE, 1800 m, 13.–14.IV.2013, Z. Tokár leg., J. Tabell & Z. Tokár det. (coll. TOK); 1 ♀ (GP 21864 IgR) Jbel Rhart Mts., Zaona-Tafetchna 5 km SW, 1200 m, 15.IV.2013; 5 ♀ (GP 21853-57 IgR) Middle Atlas Mts., 1900 m, 32°35.96' N 04°30.29' W, 17.IV.2013, L. Srnka leg., Z. Tokár det. (coll. SRN).

A small series of both sexes enables us to describe the female genitalia. The DNA results confirm that the male and female specimens are conspecific.

Molecular data. The nearest neighbour is *C. narbonensis* Baldizzone, 1990, with a 2.98 % divergence. The barcodes of *C. stenidella* exhibit 0.31 % maximum intraspecific variation (n=3).

Abdominal structures. No tergal latero-posterior bar. Transverse bar slightly curved, both edges sclerotized. Tergal sclerite 4x as long as wide, covered with 17–20 conical spines (on T3).

Female genitalia. Papilla analis oval, narrow, covered with long bristles. Anterior apophysis slightly longer than sterigma, straight, posterior apophysis 2x as long as anterior one. Sterigma trapezoidal, proximally as wide as long, distally markedly tapered, distal fifth covered with short bristles, medial excavation narrow and small, oval, distal half edged by spines. Ostium deeply U-shaped, situated at 2/3 on sterigma. Colliculum sack-shaped, elongate, as long as sterigma, evenly expanded anteriorly. Ductus bursae membranous, narrow and long; spinose section slightly longer than sterigma, slightly tapered anteriorly, with two laminae. Corpus bursae round, signum leaf-shaped.

Distribution. Algeria, Morocco. **New to Morocco.**

Note. In the original illustration by Toll the valvula is markedly different; it is larger and situated differently. However, this is an artefact, and the photo of the holotype, sent to us by G. Baldizzone, corresponds well with the specimen illustrated here.

### ***Coleophora strophingella* Baldizzone, 1994**

Barcode Index Number: BOLD:ADI4394

Material studied. 1 ♂ (GP 5785 J. Tabell) Midelt Prov., Midelt 6 km SW, 1590 m, 14.V.2016, J. Tabell leg.; 4 ♂ (GP 5733 J. Tabell, DNA sample 25644 Lepid Phyl; DNA sample 25643 Lepid Phyl) (all coll. TAB).

Molecular data. The nearest neighbour is *C. treskaensis* Toll & Amsel, 1967, with a 4.24 % divergence. The barcodes of *C. strophingella* exhibit no intraspecific variation (n=2).

Distribution. Iran, Algeria, Morocco. **New to Morocco.**

### ***Coleophora gypsella* Baldizzone, 1982**

Barcode Index Number: BOLD:ADI3086

Material studied. 10 ♂ (DNA sample 25648 Lepid Phyl; DNA sample 24649 Lepid Phyl) Al Haouz Prov., Oukaimeden 1.5 km SE, 2660 m, 2.VII.2016, J. Tabell leg. (coll. TAB).

Molecular data. The nearest neighbour is *C. hyssopi* Toll, 1961, with a 4.24 % divergence. The barcodes of *C. gypsella* exhibit no intraspecific variation (n=2).

Distribution. Morocco, endemic to the High Atlas Mountains.

Note. The biology is unknown. At the collecting locality *Dianthus* sp. is abundant, and presumably it is the host plant of the species.

### ***Coleophora neglecta* Baldizzone, 1997**

Barcode Index Number: BOLD:AEC1730

Material studied. 18 ♂ (GP 5061 J. Tabell, DNA sample 25410 Lepid Phyl [barcoding failed]), 2 ♀ (GP 5064 J. Tabell) Mirleft 5 km SSW, 20 m, 28.IV.2013, J. Tabell leg. (DNA sample 25409 Lepid Phyl [barcoding failed]) (coll. TAB).

Molecular data. The nearest neighbour is *C. ciliataephaga* Glaser, 1978, with a 1.71 % divergence.

Distribution. Algeria, Canary Islands: Fuerteventura (van der Wolf, 2009), Morocco. **New to Morocco.**

### ***Coleophora dikeratella* Tabell & Kullberg, sp. nov.**

Barcode Index Number: BOLD:-

Figs. 14, 27, 49

**Type material.** Holotype ♂ (GP 6212 J. Tabell, DNA sample 27460 Lepid Phyl [barcoding failed]): Morocco, Al Haouz, Oukaimeden 2580 m [31.1943 N 7.8545 W], 15.V.2011, J. & A. Kullberg leg. <http://id.luomus.fi/GBT.21> (coll. MZH).

Diagnosis. Similar to many *Coleophora* species which share the same wing pattern, and the study of genitalia is indispensable for correct identification. The male genitalia are somewhat similar to those of *C. neglecta* and *C. hystricella* Toll, 1957. In *C. dikeratella*, the gnathos is narrower, the cucullus is longer, and in the sacculus the ventral process is longer and the dorsal process shorter. Furthermore, the phallosome is narrower and more arched, and the rods are of different lengths (in *C. neglecta* and *C. hystricella* the rods are of same lengths). Female of *C. dikeratella* is unknown.

Molecular data. No data available, sequencing of the holotype failed.

Description. Adult. Wingspan 11.5 mm. Antenna white, annulated with brown. Scape brown mixed white, not tufted. Labial palp white, below brown, second article 1.5x longer than third article. Head and thorax brown, tegula mixed with pale brown. Forewing brown, covered with dark brown and white scales, scales not forming stripes. Costal stripe narrow, from base to 2/3. Costal and dorsal fringe cilia pale greyish brown. Hindwing pale grey, fringe cilia pale greyish brown, apically paler.

Abdominal structures. No tergal latero-posterior bar. Transverse bar slightly curved, proximal edge strongly

sclerotized, distal edge medially unsclerotized, arched. Tergal sclerite 4x as long as wide, covered with 20 conical spines (on T3).

Male genitalia. Gnathos knob oval, narrow, arm short. Tegumen reinforced by a sclerotized "Y". Transtilla long, ropelike. Valvula small, slightly broader than cucullus, ventral margin evenly rounded, outer margin strongly sclerotized, sinuated. Cucullus elongate, club-shaped, slightly tapered basally. Sacculus well sclerotized; ventral margin straight, oblique, ventrocaudal angle with a large horn-shaped protuberance, apex narrow and long; lateral margin straight; dorsocaudal angle with a large horn-shaped protuberance, outer margin lined with small nodules, a small triangular tooth close to dorsal margin. Phallosome with two sclerotized rods of different length, expanded apically, both rods bifurcated, unarmed. Vesica without cornuti.

Female genitalia. Unknown.

Biology. Unknown.

Distribution. Morocco, endemic to the High Atlas Mountains.

Etymology. Greek  $\delta\iota$  = two,  $\kappa\acute{\epsilon}\rho\alpha\tau\omicron$  = protuberance, refers to the shape of sacculus.

### ***Coleophora gymnocarpella* Walsingham, 1907**

Barcode Index Number: BOLD:ADD4089

Material studied. 4 ♀ (DNA sample 25397 Lepid Phyl; DNA sample 25398 Lepid Phyl) Anti-Atlas, Tiznit Prov., Taфраout 24 km SW, 1125 m, 13.IV.2015, J. Tabell leg.; 1 ♀ (GP 11948 ZT) Jbel Rhart Mts., Zeona-Tafetchna 5 km SW, 1170 m, 15.IV.2013, Z. Tokár leg., det. G. Baldizzone (coll. TOK).

Molecular data. The nearest neighbour is *C. sarehma*, with a 5.08 % divergence. The barcodes of *C. gymnocarpella* exhibit 0.15 % maximum intraspecific variation (n=2).

Distribution. North Africa, Iran. Reported for the first time from Morocco by Baldizzone (1995).

### ***Coleophora knudi* Tabell, sp. nov.**

Barcode Index Number: BOLD:AEK8084

Figs. 15, 28, 50

**Type material.** Holotype ♂ (GP 5807 J. Tabell, DNA sample 27131 Lepid Phyl) Morocco, Anti-Atlas: Souss-Massa-Drâa, Idikl 16 km E Taфраoute [29.7298 N 8.8459 W], 1580 m, 8.–10.III.2017, C. Hviid, O. Karsholt, K. Larsen [&] D. Nilsson [leg]. <http://id.luomus.fi/GBT.22> (coll. MZH).

Diagnosis. Similar to many *Coleophora* species, which share the same wing pattern, and the study of genitalia is indispensable for correct identification. Male genitalia are characteristic and no similar species is known. They remotely resemble those of *C. adlecta* Baldizzone, 1994, known from Iran, but the pedunculum, the sacculus and the phallosome are longer and of different shape, the cucullus is markedly smaller and the cornuti are more numerous. Female of *C. knudi* is unknown.

Molecular data. Holotype specimen was sequenced successfully, resulting in a 654 bp barcode. The nearest neighbour to *C. knudi* is *C. stenidella*, with a 3.81 % divergence. Genetic distance to *C. adlecta* is 5.99 %.

Description. Adult. In worn condition. Wing 5.5 mm. Antenna white, annulated with dark brown. Scape brown, not tufted. Labial palp brown, second article dirty white. Head and thorax brown. Forewing brown with scattered dark brown and ochreous scales and white stripes along main veins. Fringe cilia brown, apically paler. Hindwing not visible.

Male genitalia. Gnathos knob oval. Tegumen narrow, constricted medially, reinforced by a sclerotized "I", pedunculum long, arched. Transtilla narrow, wedge-shaped. Valvula broader than cucullus, weakly delineated, ventral margin rounded. Cucullus small, tapered basally. Sacculus long, well sclerotized; ventral margin folded, lateral margin oblique, lined with a few small teeth or nodules, dorsocaudal angle with a small protuberance. Vinculum broad. Phallosome robust; basal part very long, almost parallel-sided; two narrow, sclerotized rods of slightly different length basally fused, apically branched and slightly upcurved; shorter rod blunt, longer rod apically tapered. Vesica with 4–5 small spiniform cornuti, grouped into a tight bundle.

Abdominal structures. Tergal latero-posterior bar short. Transverse bar narrow, slightly curved, proximal edge

evenly sclerotized, distal edge broadly sclerotized. Tergal sclerite 4x as long as wide, covered with 25 conical spines (on T3).

Female genitalia. Unknown.

Biology. Early stages unknown.

Distribution. Morocco, known only from the type locality.

Etymology. The species is named in honour of Knud Larsen, who was a participant of the Danish collecting expedition to Morocco.

### *Coleophora afrodiathi* Tabell, sp. nov.

Barcode Index Number: BOLD:ABX5909

Figs. 16, 17, 29, 51, 52, 62

**Type material.** Holotype ♂ (GP 5718 J. Tabell, DNA sample 25638 Lepid Phyl): Morocco, Al Haouz Prov., Imlil, 1680 m, [31.1429 N 7.9222 W] 30.VI.2016, J. Tabell leg. <http://id.luomus.fi/GBT.23> (coll. MZH). Paratypes: 2 ♀ (GP 5713 J. Tabell, DNA sample 25639 Lepid Phyl), same collecting data as holotype; 2 ♂ (GP 5452 J. Tabell, DNA sample 24537 Lepid Phyl; DNA sample 24536 Lepid Phyl) Morocco, Middle Atlas, Ifrane Prov., Azrou 2.5 km NW, 1215 m, 17.IV.2015, J. Tabell leg. (all coll. TAB); 1 ♂ Morocco, Meknès-Tafilalet, Azrou, 33°28'14": -5°14'43'', 1260 m, 4.V.2011, J. & A. Kullberg leg. (coll. MZH).

**Diagnosis.** Externally *C. afrodiathi* is similar to many *Coleophora* species, which share the same wing pattern, and the study of genitalia is indispensable for correct identification. The genitalia resemble especially those of *C. dianthi* Herrich-Schäffer, [1855] and *C. grotenfelti* Tabell & Kosorin, 2020. In the male genitalia, the main distinguishing characters are the shape of sacculus and phallosome rods. In *C. afrodiathi*, the ventrocaudal angle of sacculus is without a protuberance, or it is small, pointing downwards (in *C. dianthi* the protuberance is markedly longer, pointing sideways), lateral margin of sacculus is slightly convex (straight or slightly concave in *C. dianthi* and *C. grotenfelti*), and both phallosome rods are armed with teeth (untoothed in *C. grotenfelti*). The female genitalia are similar to those of *C. dianthi*, but the sterigma is slightly shorter and the colliculum is markedly shorter.

**Molecular data.** Four specimens were sequenced successfully, resulting in 658 bp barcodes. The nearest neighbour to *C. afrodiathi* is *C. dianthi*, with a 2.18 % divergence. The barcodes of *C. afrodiathi* exhibit 1.24 % maximum intraspecific variation.

**Description.** Adult. Wingspan 14–17 mm. Antenna white, annulated with brown. Scape dirty white, not tufted. Labial palp pale brown mixed with white, second article 3x as long as third article, third article short. Head and thorax pale brown mixed with white. Forewing mottled, pale brown with scattered blackish brown scales and white distinct stripes along main veins. Costal and dorsal fringe cilia pale brown, apically paler. Hindwing pale grey, fringe cilia pale brown, apically paler. Abdomen light grey, slightly lustrous. Female paler.

**Abdominal structures.** Sternal bar thick, no tergal latero-posterior bar. Transverse bar slightly curved, proximal edge with a crescent-shaped sclerotization, distal edge formed of two crescent-shaped sclerotized bands. Tergal sclerite 4–5x as long as wide, covered with 30–40 conical spines (on T3).

**Male genitalia.** Gnathos knob oval. Tegumen constricted medially, reinforced by a sclerotized "Y", pedunculum broad, crescent-shaped. Transtilla narrow, wedge-shaped. Valvula broader than cucullus, ventral margin evenly rounded. Cucullus elongate, club-shaped, slightly tapered basally. Sacculus rectangular, well sclerotized; ventrocaudal angle without a protuberance, or the appendage is small, pointing downwards; lateral margin slightly convex; dorsocaudal angle with a large curved, horn-shaped protuberance. Phallosome with two narrow, parallel-sided sclerotized rods of slightly different length; shorter rod with one apical triangular tooth, longer rod with two apical teeth. Vesica with 2–3 spiniform cornuti of different length, grouped into a tight bundle.

**Female genitalia.** Papilla analis oval, narrow, covered with bristles of different length. Anterior apophysis as long as sterigma, posterior apophysis 2.2x as long as anterior one. Sterigma as wide as long, distally slightly tapered, proximal margin straight, distal margin rounded, densely covered with short bristles, medial excavation wide and deep. Ostium broadly U-shaped, situated at lower half on sterigma. Upper half of colliculum bowl-shaped, sclerotized, lower half membranous, strongly bulged unilaterally. Antrum sclerotized, broad. Ductus bursae membranous, expanded towards corpus bursae. Corpus bursae ovoid, with a leaf-shaped signum with round base and stub thorn.

**Biology.** Early stages remain unknown. In Azrou few bushes of a robust *Dianthus* sp. grow on the collecting locality, which is a probable host plant of the new species.



Distribution. Morocco.

Etymology. The specific epithet refers to an African species close to *C. dianthi*.

### ***Coleophora crepidinella* Zeller, 1847**

Barcode Index Number: BOLD:AAJ0724

Material studied. 4 exx. Middle Atlas, El-Hajeb 2 km W, 820 m, 7.V.2013, J. Tabell leg. (coll. TAB).

Molecular data. The nearest neighbour is a Uzbek so far unnamed *Coleophora* species, with a 5.72 % divergence. The barcodes of *C. crepidinella* exhibit 0.98 % maximum intraspecific variation (n=4). Moroccan *C. crepidinella* specimens have not been sequenced.

Distribution. South Europe, Algeria, Tunisia, Turkey, Israel, Morocco. **New to Morocco.**

### ***Coleophora mausolella* Chrétien, 1908**

Barcode Index Number: BOLD:ABV9536

Material studied. 1 ♀ High Atlas, Taroudant 27 km NW, 670 m, 29.IV.2013, J. Tabell leg.; 1 ♂, 1 ♀ Tiznit Prov., Mirleft 3.2 km SSW, 10 m, 12.IV.2015, J. Tabell leg.; 1 ♀ Anti-Atlas, Tiznit Prov., Taфраout 24 km SW, 1125 m, 13.IV.2015, J. Tabell leg. (all coll. TAB).

Molecular data. The nearest neighbour is *C. orotavensis* Rebel, 1896, with a 4.22 % divergence. The barcodes of *C. mausolella* exhibit 0.17 % maximum intraspecific variation (n=2). Moroccan *C. mausolella* specimens have not been sequenced.

Distribution. Southern Europe, Morocco, Libya, Israel, Turkey, Turkmenistan. Reported for the first time from Morocco by Baldizzone (1997).

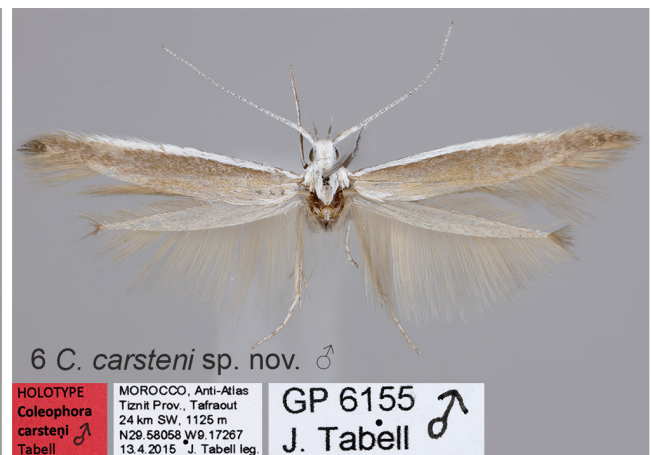
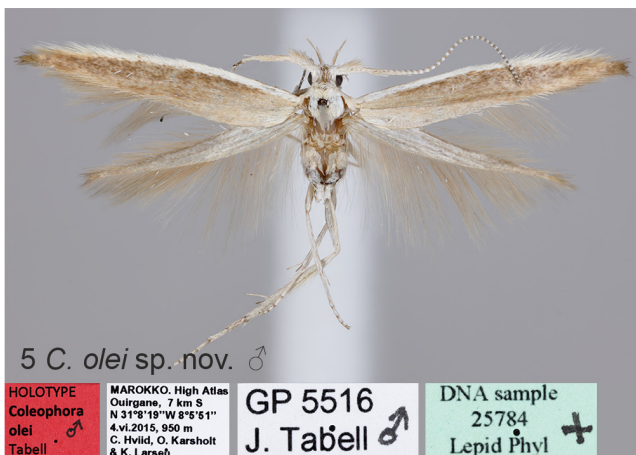
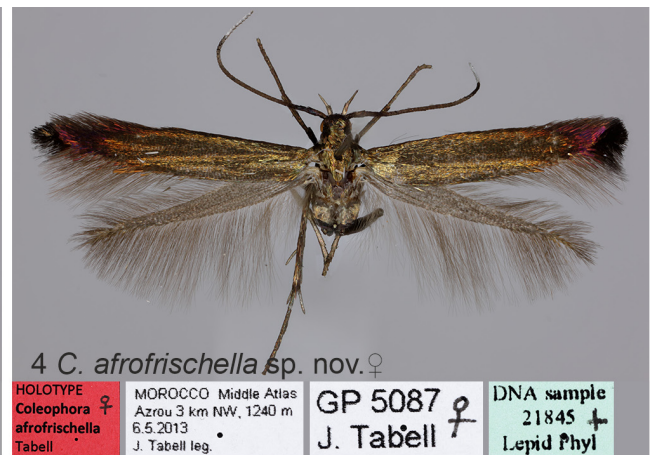
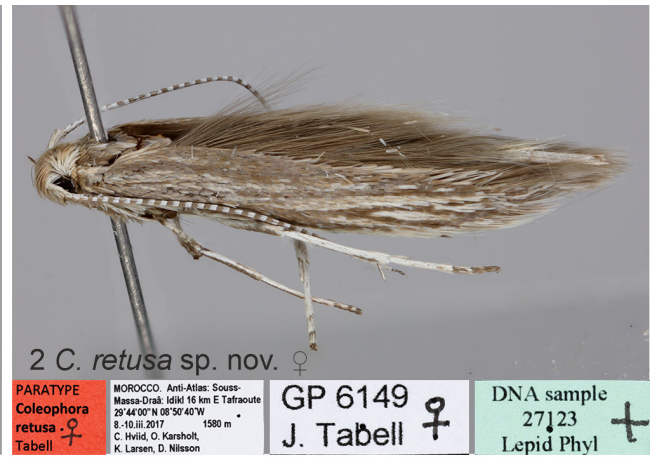
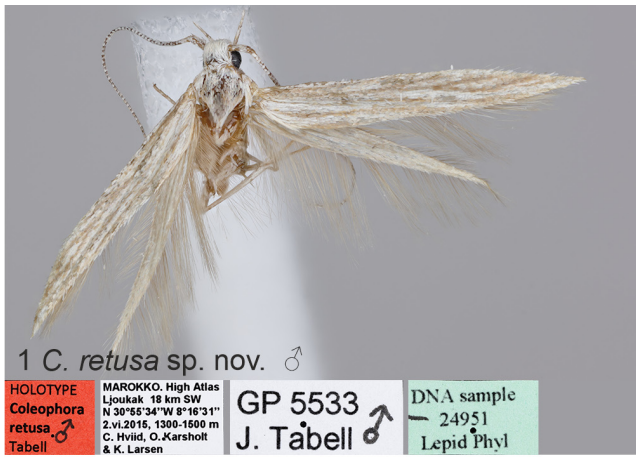
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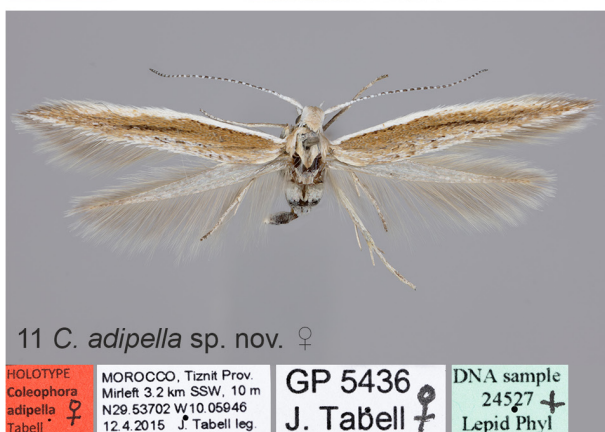
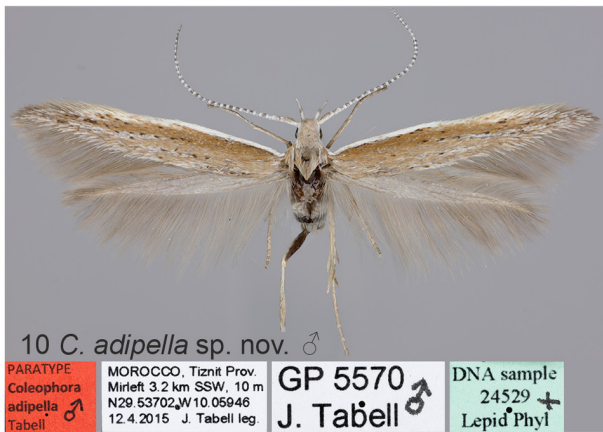
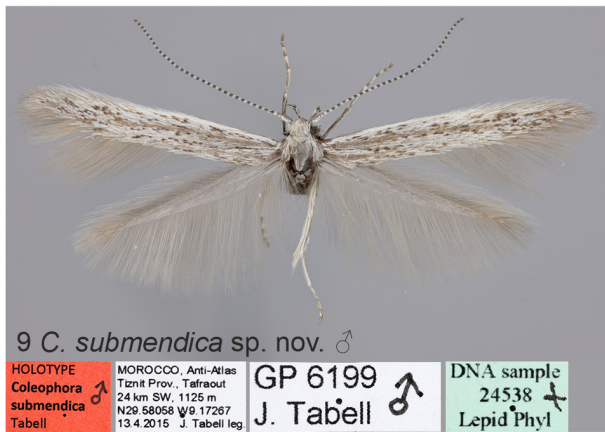
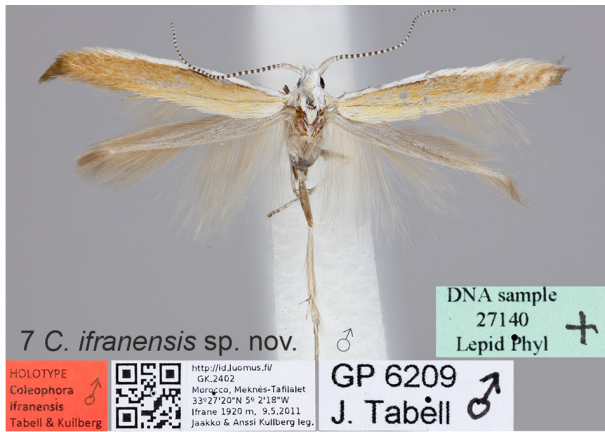
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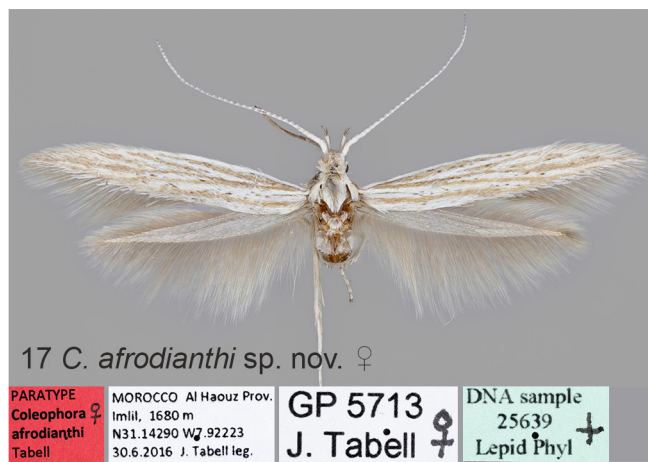
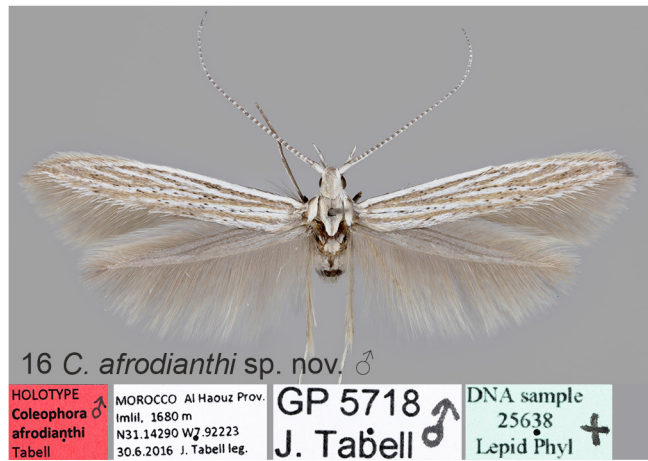
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Adults and labels of *Coleophora* spp. 1–2. *C. retusa* sp. nov., 1. ♂ holotype. 2. ♀ paratype. 3–4. *C. afrofrischella* sp. nov., 3. ♂ paratype. 4. ♀ holotype. 5. *C. olei* sp. nov., ♂ holotype. 6. *C. carsteni* sp. nov., ♂ holotype.

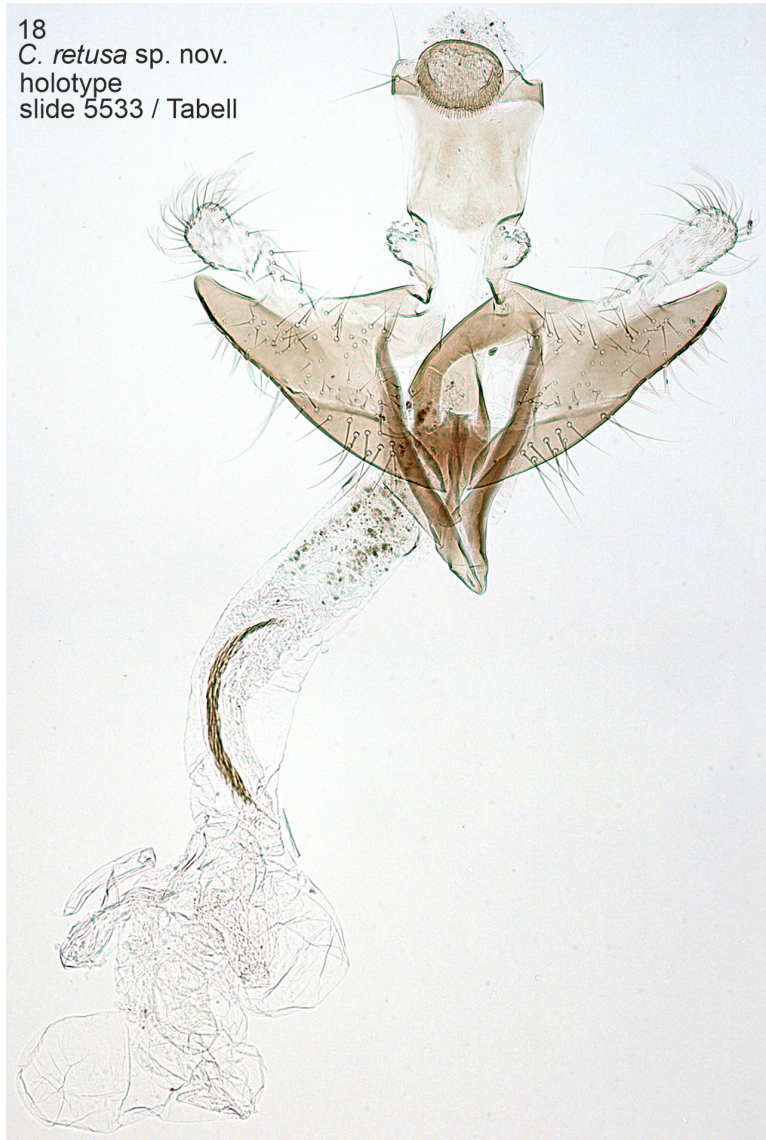


Adults and labels of *Coleophora* spp. 7. *C. ifranensis* sp. nov., ♂ holotype. 8. *C. jaskai* sp. nov., ♀ holotype. 9. *C. submendica* sp. nov., ♂ holotype. 10–11. *C. adipella* sp. nov., 10. ♂ paratype. 11. ♀ holotype. 12–13. *C. antiatlasella* sp. nov., 12. ♂ paratype. 13. ♂ holotype. 14. *C. dikeratella* sp. nov., ♂ holotype.



Adults and labels of *Coleophora* spp. 15. *C. knudi* sp. nov., ♂ holotype. 16–17. *C. afrodiathi* sp. nov., 16. ♂ holotype. 17. ♀ paratype.

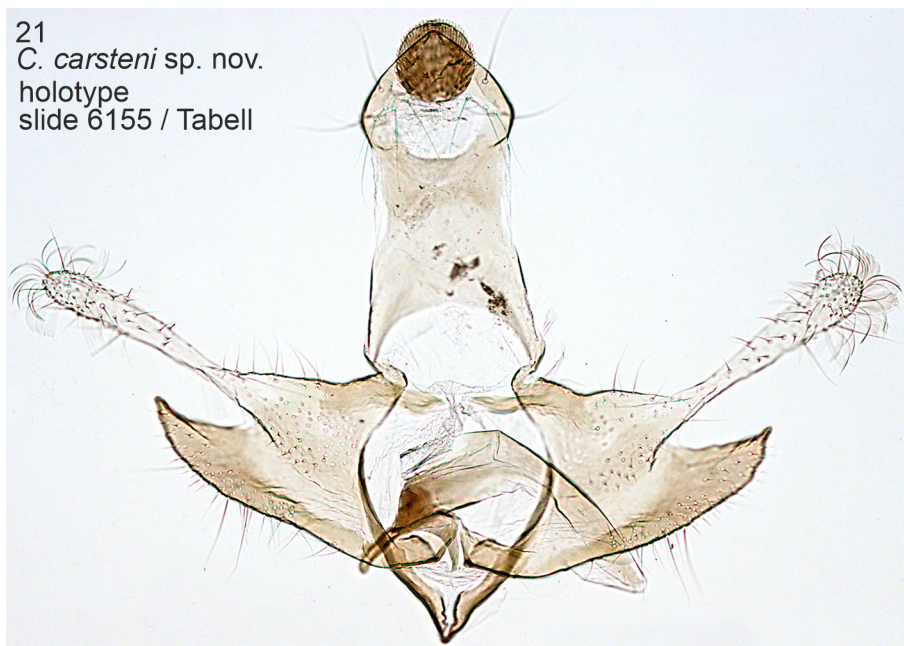
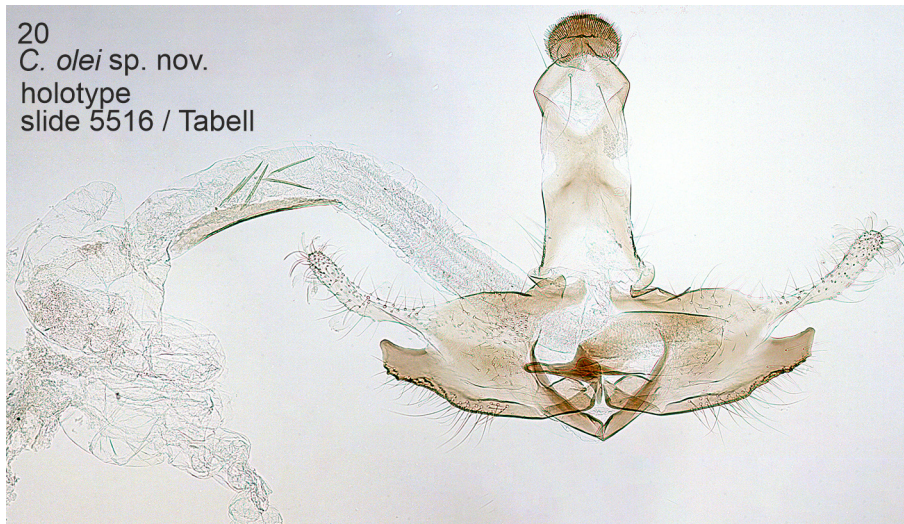
18  
*C. retusa* sp. nov.  
holotype  
slide 5533 / Tabell



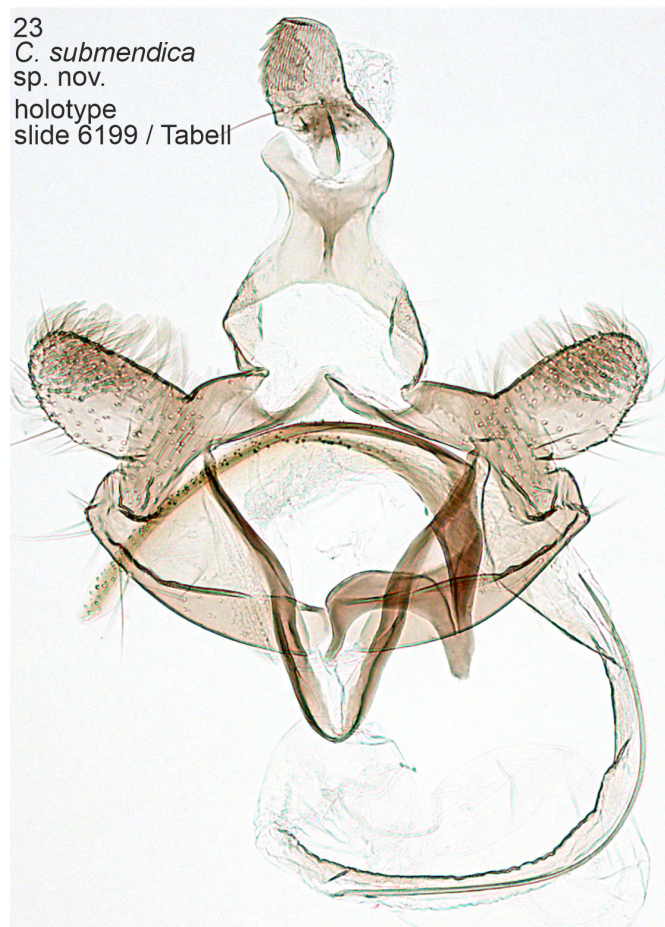
19  
*C. afrofrischella* sp. nov.  
paratype  
slide 5086 / Tabell



Male genitalia of *Coleophora* spp. **18.** *C. retusa* sp. nov., holotype, GP 5533 J. Tabell. **19.** *C. afrofrischella* sp. nov., paratype, GP 5086 J. Tabell.



Male genitalia of *Coleophora* spp. **20.** *C. olei* **sp. nov.**, holotype, GP 5516 J. Tabell. **21.** *C. carsteni* **sp. nov.**, holotype, GP 6155 J. Tabell.

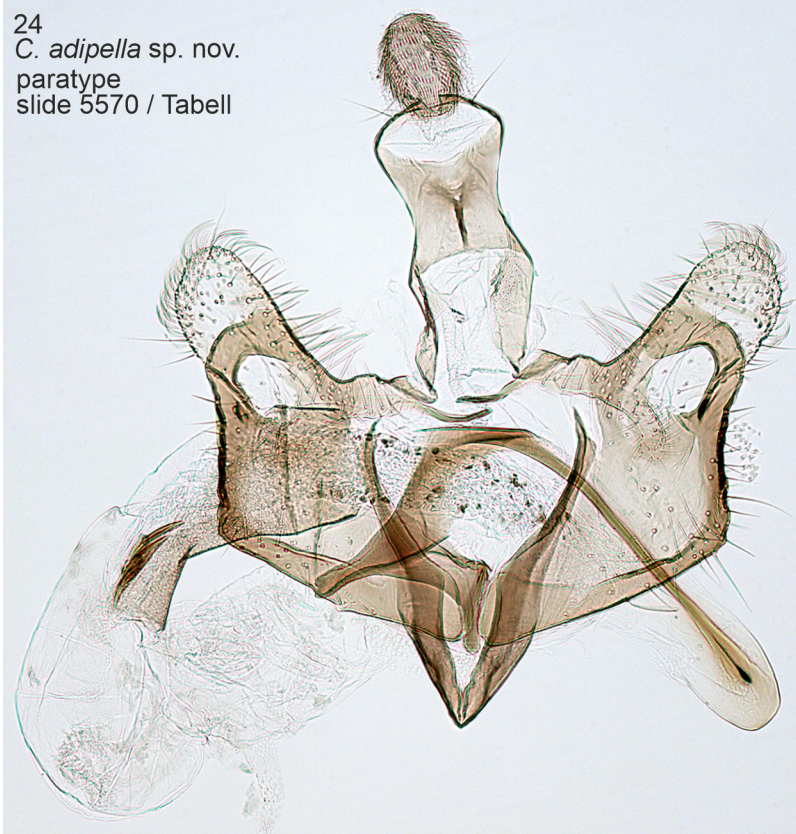


Male genitalia of *Coleophora* spp. **22.** *C. ifranensis* **sp. nov.**, holotype, GP 6209 J. Tabell. **23.** *C. submendica* **sp. nov.**, holotype, GP 6199 J. Tabell.



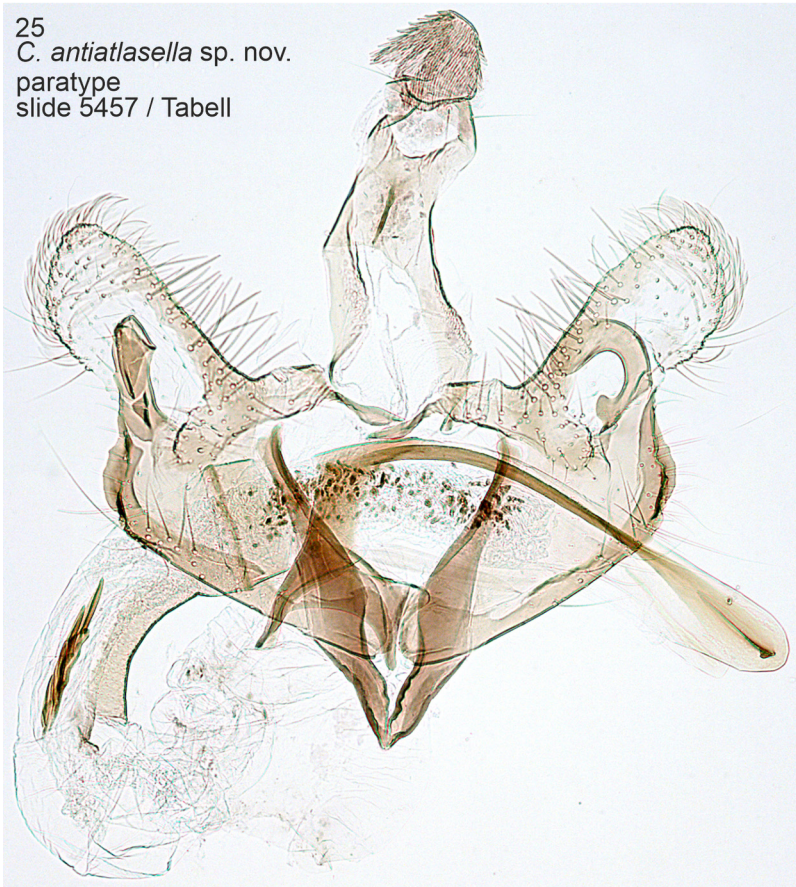
24

*C. adipella* sp. nov.  
paratype  
slide 5570 / Tabell



25

*C. antiatlasella* sp. nov.  
paratype  
slide 5457 / Tabell



Male genitalia of *Coleophora* spp. **24.** *C. adipella* sp. nov., paratype, GP 5570 J. Tabell. **25.** *C. antiatlasella* sp. nov., paratype, GP 5457 J. Tabell.

26  
*C. stenidella* Toll  
slide 5449 / Tabell

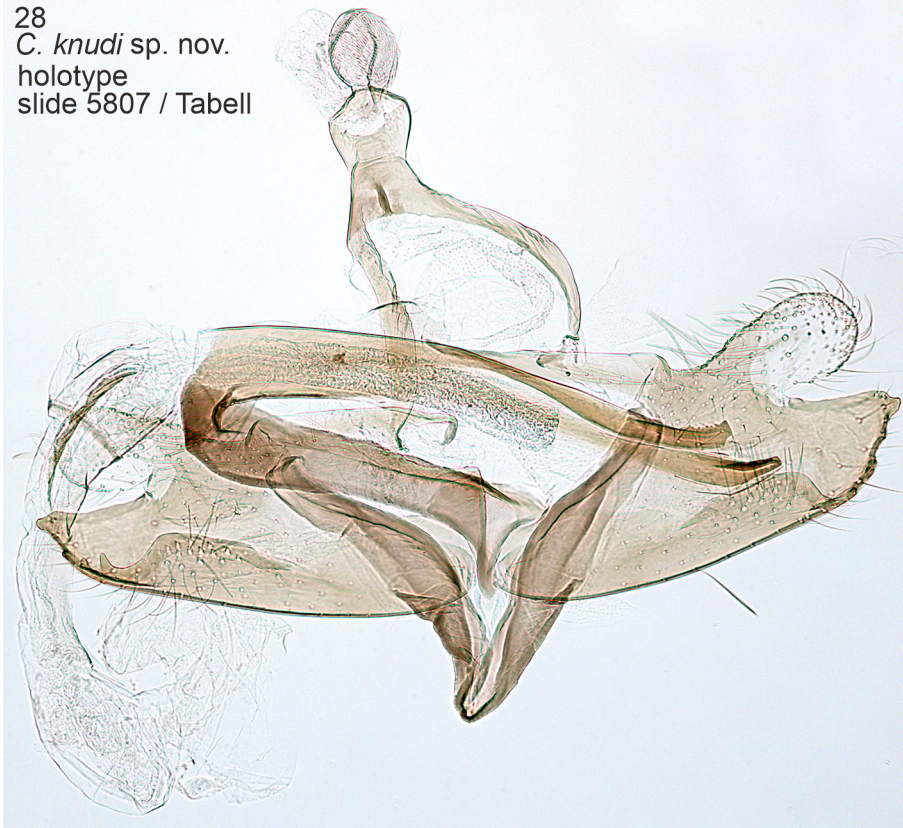


27  
*C. dikeratella* sp. nov.  
holotype  
slide 6212 / Tabell



Male genitalia of *Coleophora* spp. **26.** *C. stenidella* Toll, GP 5449 J. Tabell. **27.** *C. dikeratella* **sp. nov.**, holotype, GP 6212 J. Tabell.

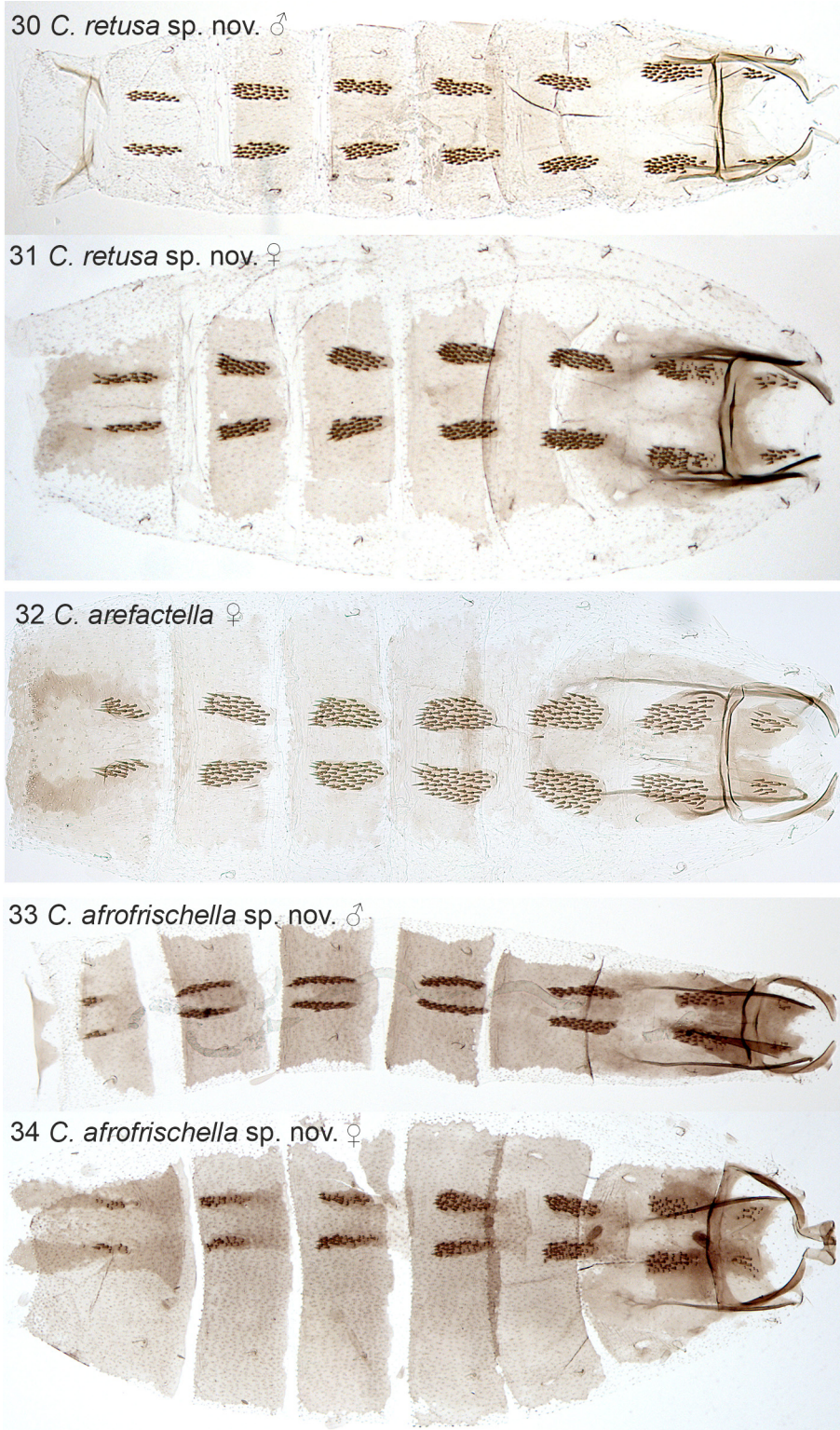
28  
*C. knudi* sp. nov.  
holotype  
slide 5807 / Tabell



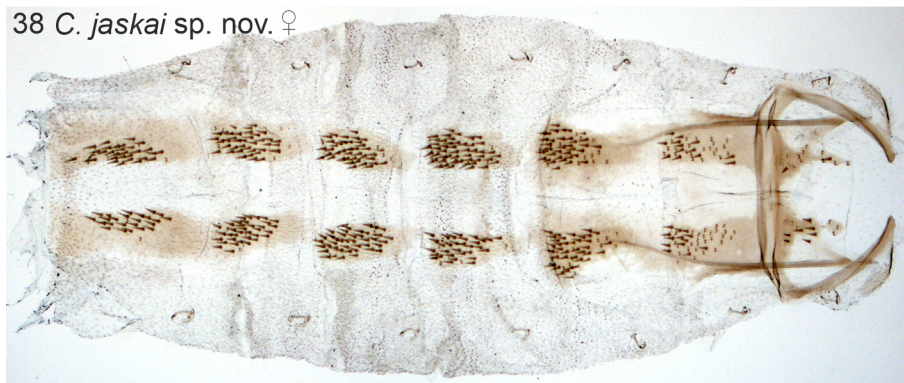
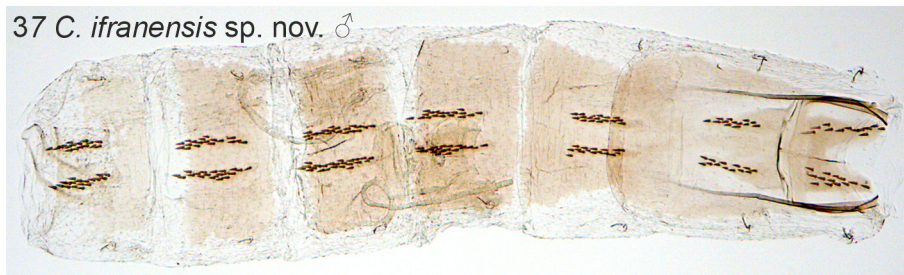
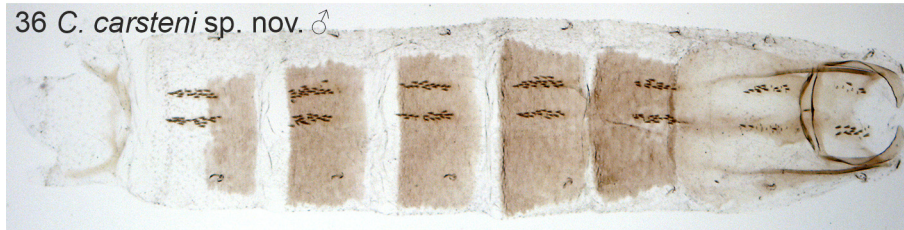
29  
*C. afrodiathi* sp. nov.  
holotype  
slide 5718 / Tabell



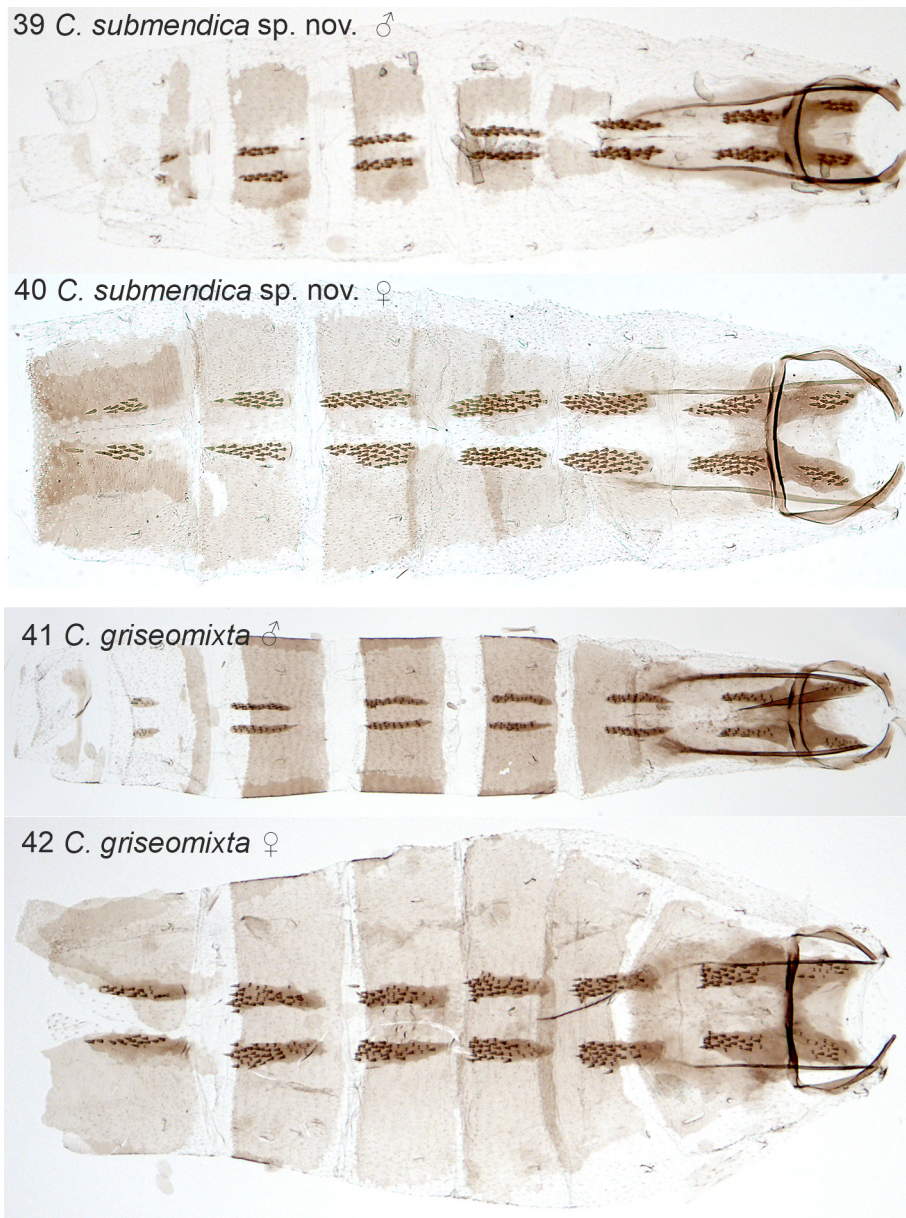
Male genitalia of *Coleophora* spp. **28.** *C. knudi* sp. nov., holotype, GP 5807 J. Tabell. **29.** *C. afrodiathi* sp. nov., holotype, GP 5718 J. Tabell.



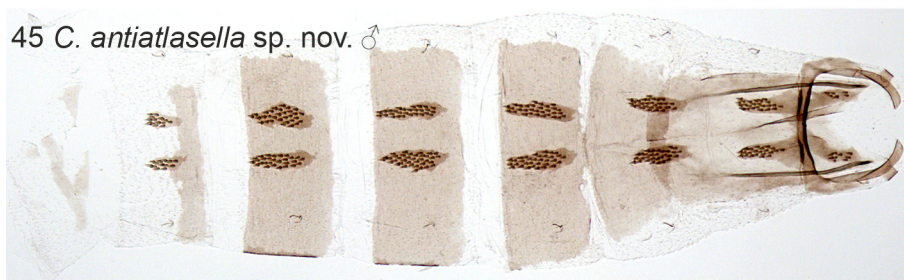
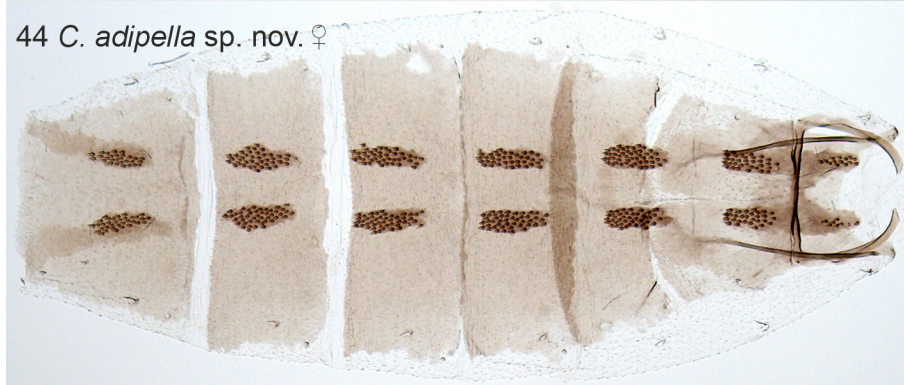
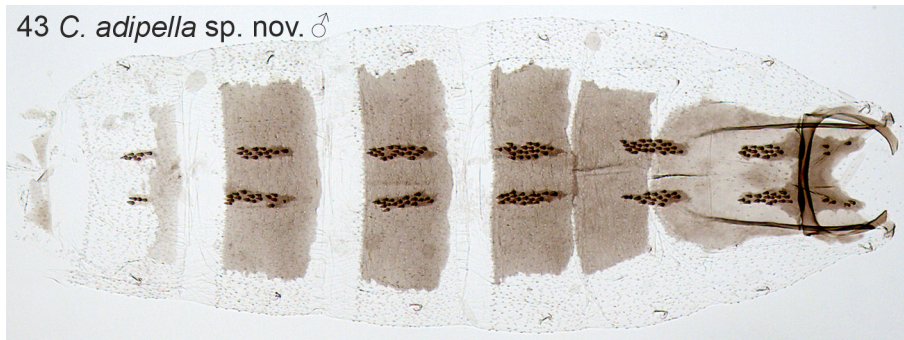
Abdomens of *Coleophora* spp. **30–31.** *C. retusa* sp. nov., 30. ♂. 31. ♀. **32.** *C. arefactella* Staudinger, ♀. **33–34.** *C. afrofrischella* sp. nov., 33. ♂. 34. ♀.



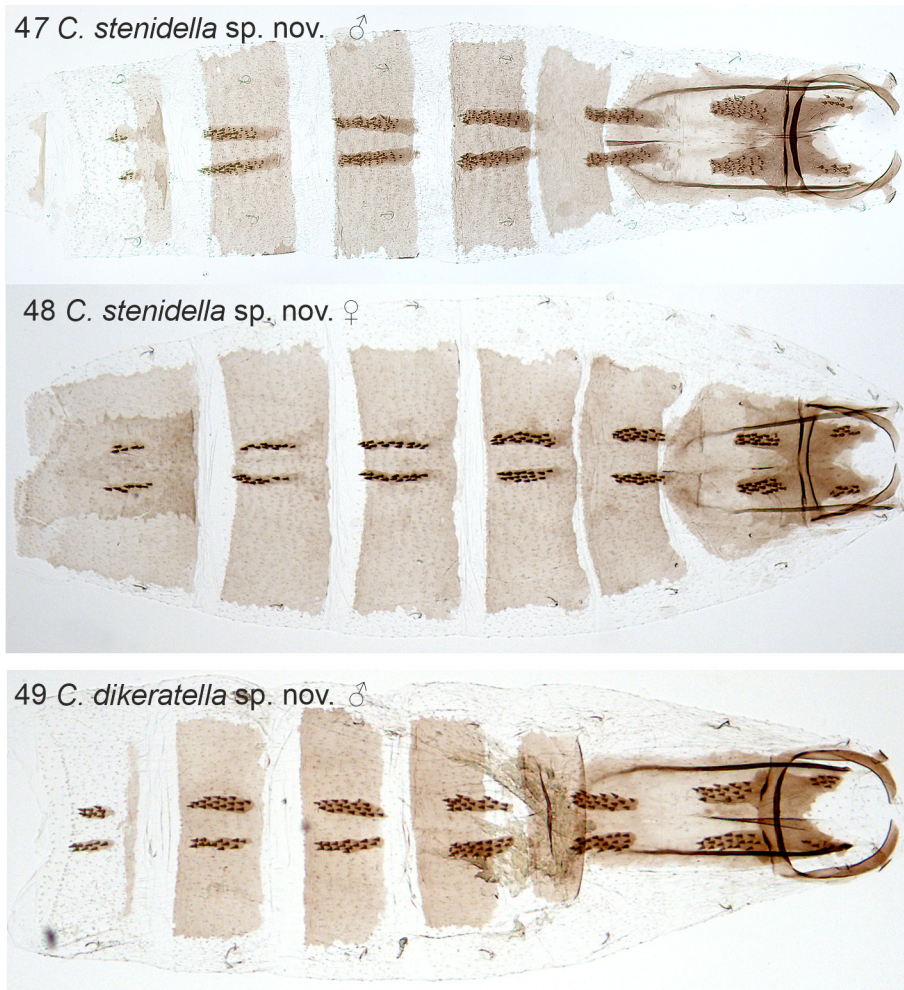
Abdomens of *Coleophora* spp. 35. *C. olei* sp. nov., ♂. 36. *C. carsteni* sp. nov., ♂. 37. *C. ifranensis* sp. nov., ♂. 38. *C. jaskai* sp. nov., ♀.



Abdomens of *Coleophora* spp. **39–40.** *C. submendica* sp. nov., 39. ♂. 40. ♀. **41–42.** *C. griseomixta* Toll, 41. ♂. 42. ♀.

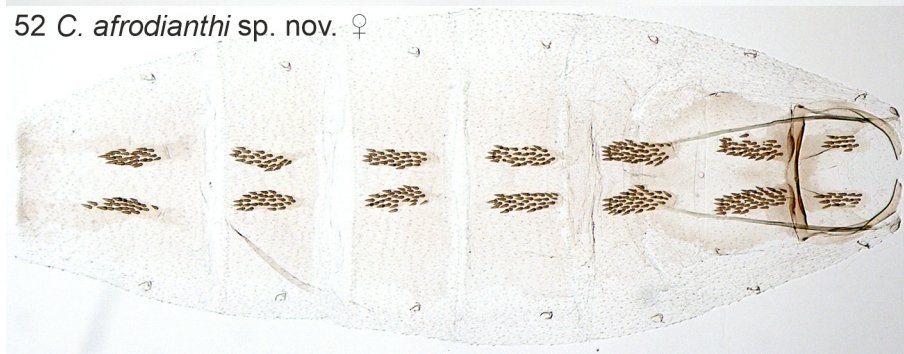
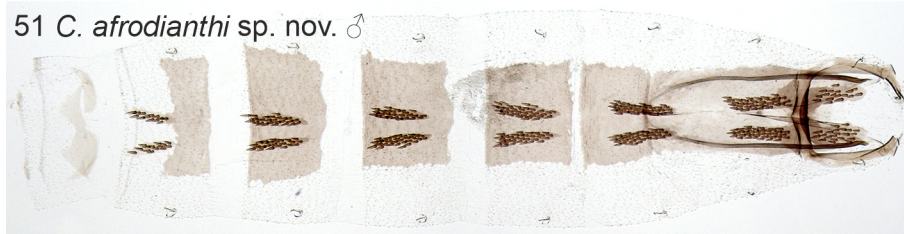
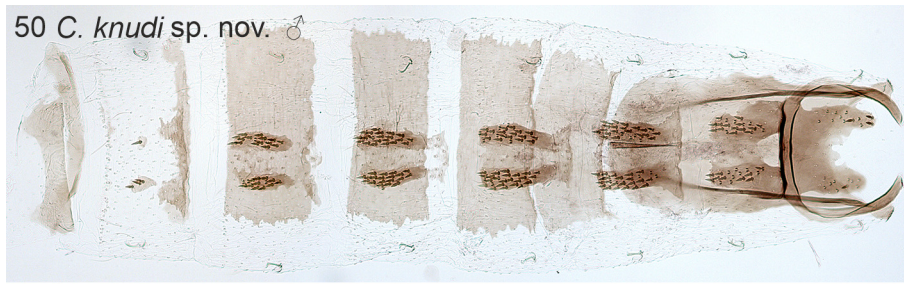


Abdomens of *Coleophora* spp. 43–44. *C. adipella* sp. nov., 43. ♂. 44. ♀. 45–46. *C. antiatlasella* sp. nov., 45. ♂. 46. ♀.



Abdomens of *Coleophora* spp. 47–48. *C. stenidella* Toll, 47. ♂. 48. ♀. 49. *C. dikeratella* sp. nov., ♂.





Abdomens of *Coleophora* spp. 50. *C. knudi* sp. nov., ♂. 51–52. *C. afrodiathi* sp. nov., 51. ♂. 52. ♀.



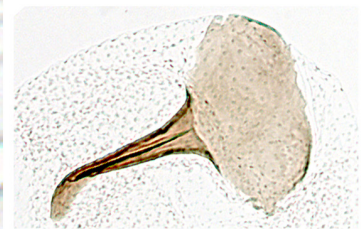
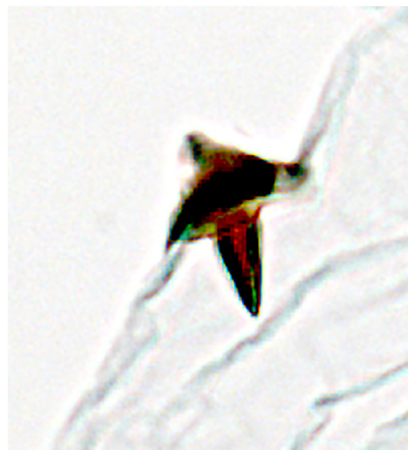
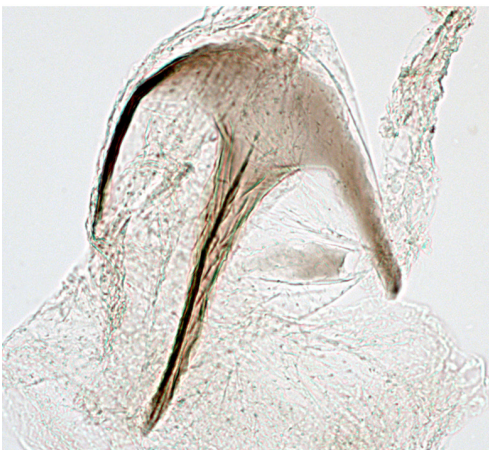
53 *C. retusa* sp. nov.  
paratype, slide 6149 / Tabell



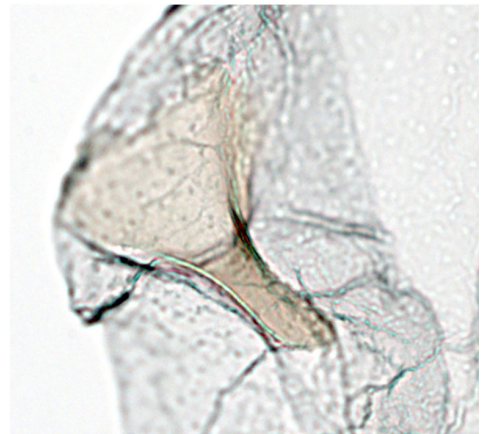
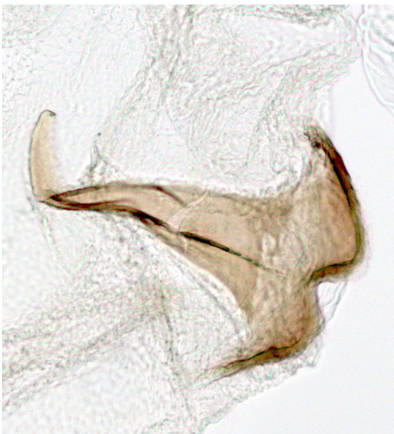
54 *C. arefactella*  
slide 5797 / Tabell



55 *C. afrofrischella* sp. nov.  
holotype, slide 5087 / Tabell



Female genitalia of *Coleophora* spp. **53.** *C. retusa* sp. nov., paratype, GP 6149 J. Tabell. **54.** *C. arefactella* Staudinger, GP 5797 J. Tabell. **55.** *C. afrofrischella* sp. nov., holotype, GP 5087 J. Tabell.

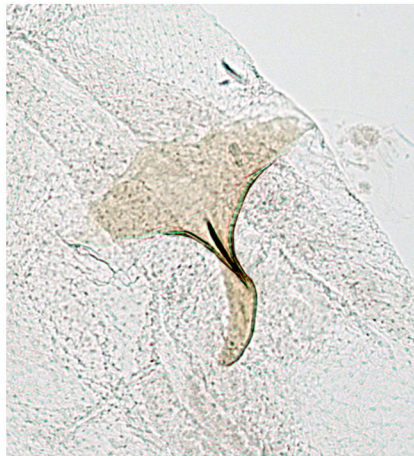
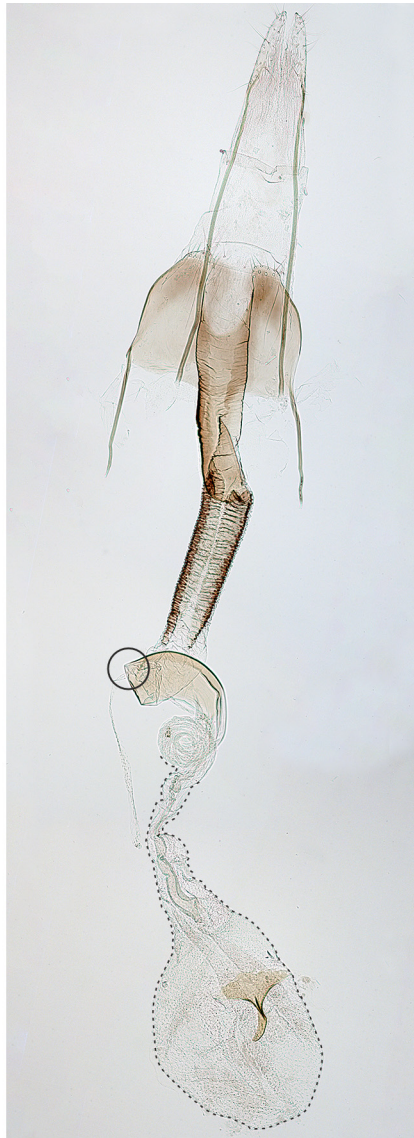


56 *C. jaskai* sp. nov.  
holotype, slide 6144 / Tabell

57 *C. submendica* sp. nov.  
paratype, slide 5808 / Tabell

58 *C. griseomixta*  
slide 6198 / Tabell

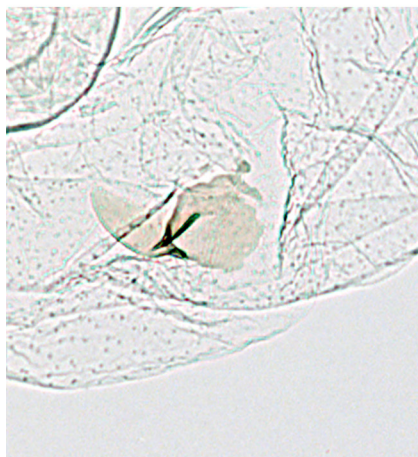
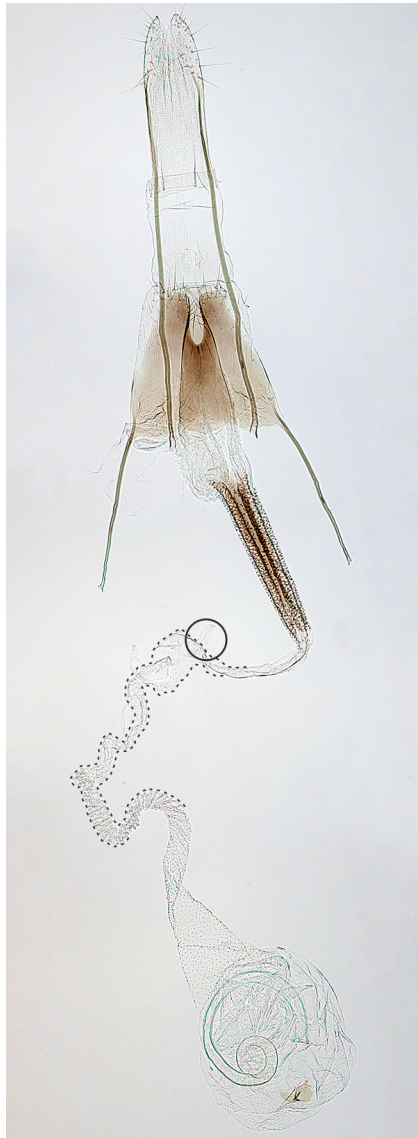
Female genitalia of *Coleophora* spp. **56.** *C. jaskai* **sp. nov.**, holotype, GP 6144 J. Tabell. **57.** *C. submendica* **sp. nov.**, paratype, GP 5808 J. Tabell. **58.** *C. griseomixta* Toll, GP 6198 J. Tabell.



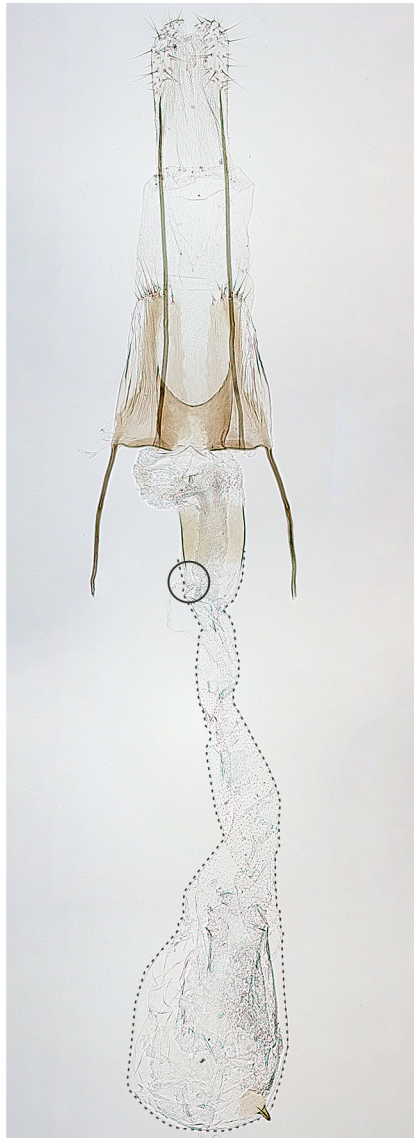
59 *C. adipella* sp. nov.  
holotype, slide 5436 / Tabell

60 *C. antiatlasella* sp. nov.  
holotype, slide 5438 / Tabell

Female genitalia of *Coleophora* spp. **59.** *C. adipella* sp. nov., holotype, GP 5436 J. Tabell. **60.** *C. antiatlasella* sp. nov., holotype, GP 5438 J. Tabell.



61 *C. stenidella*  
slide 5437 / Tabell



62 *C. afroianthi* sp. nov.  
paratype, slide 5713 / Tabell

Female genitalia of *Coleophora* spp. **61.** *C. stenidella* Toll, GP 5437 J. Tabell. **62.** *C. afroianthi* sp. nov., paratype, GP 5713 J. Tabell.