

Contribution to the Knowledge of the Afrotropical Spilomelinae (Lepidoptera, Crambidae): A New Species from Saudi Arabia, New Combinations and Distributional Updates

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Abstract

Taxonomic and faunistic results are presented on five genera of the Spilomelinae based on material collected in the Afrotropical parts of the Arabian Peninsula. *Synclera fifensis* sp.n. is newly described. The differential characters from the closest related congeners *Synclera traducalis* Zeller, 1852 and *Synclera seychellensis* Shaffer & Munroe, 2007 are listed. The three species form a complex of species discernible in internal character states only. A determination key to the members of this species group is provided. Four new combinations into the genus *Pramadea* Moore, 1888 are proposed—*Pramadea trifidalis* (Hampson, 1908) **comb.n.**, *Pramadea albopunctum* (Guillermet, 1996) **comb.n.**, *Pramadea christophalis* (Viette, 1988) **comb.n.** and *Pramadea minoralis* (Warren, 1892) **comb.n.** *Pramadea trifidalis* (Hampson, 1908) **comb.n.** is redescribed and reported as new for the fauna of Saudi Arabia. The male, female genitalia and tympanal are figured. *Chabulina astomalis* (Felder & Rogenhöfer, 1875) is reported as new to the entomofauna of the Arabian Peninsula. The records of the closely related *Chabulina onychinalis* (Guenée, 1854) for the Arabian Peninsula are discussed and put into question. The presence of *Pardomima zanclophora* Martin, 1955 and *Hodebertia testalis* (Fabricius, 1794) on the Arabian Peninsula is reconfirmed by recent records from Saudi Arabia.

Keywords

Pyraloidea, Taxonomy, Morphology, Fauna, Arabian Peninsula

1. Introduction

The subfamily Spilomelinae is known as the most diverse subfamily in the Pyra-

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loidea, with a total of 4100 described species, 338 genera and 12 tribes [1] [2]. The subfamily has a worldwide distribution. Recent comprehensive faunistic and morphological studies have been done for the Palearctic, Oriental and Neotropical zones [3] [4] [5] [6]. For the Afrotropical zone, recent important faunistic studies have been done for South Africa, West Africa and the Malagasy islands [7] [8] [9] [10] [11].

The other parts of the Afrotropical region, however, have been little explored to date and are known from historical work only [12]. The present paper is thought to be part of a series of studies aimed at exploring the diversity of the Spilomelinae in the Afrotropical part of the Arabian Peninsula. A preliminary checklist and a first summary of the research status have been given by Seizmair [13] [14].

In the present paper, taxonomic changes are proposed for the genera *Synclera* Lederer, 1863 and *Pramadea* Moore, 1888.

The genus *Synclera* Lederer, 1863 presently comprises 12 described species [2] [12], which are distributed in the subtropical and tropical regions. From the Afrotropical region, three species have been known to date, two of which—*Synclera traducalis* Zeller, 1852 and *Synclera seychellensis* Shaffer & Munroe, 2007 are differentiated exclusively by characters in the inner structure of the phallus apodeme and in the female genitalia [11] [15]. Shaffer & Munroe conjecture them to be part of a group of closely related species, the taxonomy and zoogeography of which have been little explored to date [11]. This species group is referred to as the *S. traducalis* species group in the following.

The genus *Pramadea* Moore, 1888 has been removed from synonymy with the genus *Syllepte* Hübner, 1823 by Kirti & Gill due to external differences between the type species of the two genera—*Syllepte comptalis* Hübner, 1823 and *Pramadea denticulata* Moore, 1888 in the labial palpus and in the forewing venation [16]. The male and female genitalia of the type species of the genus *Syllepte* Hübner, 1823 were described and figured for the first time in the study by Becker [17]. This study thus makes it possible to recognize internal differential character states between the two genera. The genus is currently considered to comprise four species, which are distributed in the Oriental and Afrotropical zones.

Furthermore, distributional updates are given for *Chabulina astomalis* (Felder & Rogenhofer, 1875), *Pardomima zanklophora* Martin, 1955 and *Hodebertia testalis* (Fabricius, 1794). *C. astomalis* was removed from synonymy with the externally closely related *Chabulina onychinalis* (Guenée, 1854) in the study by Maes [12]. *C. astomalis* has been known exclusively from the African Mainland, whereas *C. onychinalis* is widely distributed in the Afrotropical and Oriental zones [12]. *P. zanklophora* and *H. testalis* have been known from the Arabian Peninsula exclusively from historical records [15].

2. Materials and Methods

2.1. Sampling

The specimens (n = 13) presented in this paper belong to samples collected in

the research expedition to the province Dhofar in the Sultanate of Oman in November 2021 and to the province Jizan of the Kingdom of Saudi Arabia in September 2022 and March 2023. The material was captured by night by means of light traps equipped with UV-Power-LEDs spanning a wavelength spectrum of 365 nm - 385 nm. The trapping technique applied is described in Brehm [18].

2.2. Macro-Preparation, Dissection and Digital Image Processing

The adults were photographed after relaxation and subsequent preparation with a CANON EOS M6 Mark II under a MP-E-65 mm zoom. For examining the genitalia and tympanal organs, dissection and slide-mounting techniques were applied to the specimens according to the protocols described in Robinson [19] and Maes [20]. The preparation of the tympanal organs and of the genitalia was done under a Motic stereomicroscope (SMZ-171). The slides were photographed with a ToupCam c-mount camera (ToupTek Inc., Zhejiang, China) under a resolution of 18 megapixels. The images were processed by means of the imaging software Adobe Photoshop PS, Version 21.0.2.

2.3. Morphological Analyses and Comparisons

Analyses of wing pattern characters and morphological structures in the specimens of the sample were done on the images. Structural ratios in external characters, genitalia and tympanal organs were calculated on the images by means of the imaging software ToupView, Version 1.0 (ToupTek Inc., Zhejiang, China).

The specimens in the sample were compared with type images and genitalia figures [3] [11] [12] [14] [15] [21] [22].

2.4. Terminology and Abbreviations

The denotations of the veins follow the terminology in Shaffer & Munroe [11]. The descriptions of wing pattern characters, genitalia and tympanal organs follow the terminology in Maes [20]. Abbreviations: n = length of a sample. SD = standard deviation. BMNH = British Natural History Museum. MNHN = Muséum national d'Histoire naturelle de Paris. ZSM = Zoological State Collection Munich.

3. Results and Discussion

3.1. Taxonomic Changes—New Species, New Combinations

3.1.1. Genus *Synclera* Lederer, 1863

Diagnosis: Labial palpus and maxillary palpus upturned. The second segment of the labial palpus is broadly scaled, the third segment is short with scale tuft. Maxillary palpus is broadly scaled in the second and third segments, and the fourth segment is strongly tapered. Frons is flat and rounded. Antenna filiform, dorsally scaled. Abdomen with anal tuft in the male. Legs slender, the outer tibial spurs are significantly shorter than the inner tibial spurs. Tegumen in the male genitalia of irregular trapezoid shape, posterior margin strongly sclerotized. Transtilla

complete. Juxta is bifid. Saccus v-shaped. Valva with the costa inflated and post-basally arched, subcostal ridge present, with a rod-shaped process extending up to the subapical area. Ventral border is quasi-straight. Fibula thorn-shaped, developing from the ventral end of a sclerotized ridge running across the middle of the valva. Basal sacculus is inflated, post-basal and distal sacculus are strongly tapered [11] [23].

1) *Synclera fifensis* sp.n.

Zoobank ID:

urn:lsid:zoobank.org:act:0F65467C-0E6A-412C-AF3E-BCCFBAA56EEF

Material examined: Holotype: ♀, Saudi Arabia, Province Jizan, Fayfa Mts., 17°14'30.21"N, 43°03'40.99E, 22-III-2023, slide no. 23GP018, leg. M. Seizmair, coll. ZSM. Paratypes: 1 ♀, Saudi Arabia, Province Jizan, 5 km NW Fayfa, 22-IX-2022, slide no. 22GP074, 1 ♀, same collection data as holotype, slide no. 22GP017, 1 ♂, Saudi Arabia, Province Jizan, Fayfa Mts., 17°14'35.66"N, 43°3'30.72"E, 18-III-2023, slide no. 23GP019, 1 ♂, Saudi Arabia, Province Jizan, Fayfa Mts., 17°14'35.56"N 43°03'30.72"E, 23-III-23, slide no. 23GP022, leg. et coll. M. Seizmair.

External characters (Figure 1(A), Figure 2(A), Figure 2(B)): Wingspan, forewing length (n = 5): mean 19.4 mm SD ± 0.5, mean 10.1SD ± 0.6. Head: Antenna yellowish in the shaft and in the flagellum, ciliae yellowish brownish, length relative to the width of the flagellum 30%. Frons, vertex, basal proboscis, labial and maxillary palpus with yellowish-white scales. Labial palpus equal in length with the diameter of the eye. Maxillary palpus half as long as the labial palpus. Thorax: Venter, dorsum and tegula with whitish-grey scales. Legs with the tibia, femur and spurs white scaled, tarsi yellowish-brown. Forewing upper side with the ground white. Line pattern composed of brownish-yellowish basal, antemedial, medial and postmedial lines. Basal line is straight, broken. Presence of two antemedial lines, the anterior most one simple, running slightly oblique, the posterior most one composed of two outer lines, with an orbiform dilatation below 1A + 2A. Medial line is composed of two outer lines, bifurcate at M2. Postmedial line is broken into two segments, a straight one between the costa and M2, an arched one between M1 and CuA2. Subterminal area is yellowish-brown interspersed with numerous white blotches of variable size. Termen is brownish. Fringe yellowish-brown. Hindwing with the ground concolorous with the forewing ground. Presence of a darkish-brown antemedial line with a cascade of bifurcations above M2, near CuA1 and near M2. Subterminal band is yellowish-brown and interspersed with numerous white blotches of varying shape. Termen and fringe are concolorous with the termen and fringe of the forewing. Fore- and hindwing undersides are identical with the upper sides. Abdomen: Dorsum with yellowish-brown transversal lines between segments A1 and A5, spaces between the transversal lines white-scaled, darkish-grey to brown scaled from segment A6 onwards. Venter greyish-white scaled. Anal tuft black.

Male genitalia (Figure 1(B), Figure 2(C), Figure 2(D)): Uncus curved near the basis, 1.3 times as long as the tuba analis, apex dilated, pointed, dorsally chaetose, scaphium present, marked with a pair of lateral sclerites. Tuba analis broadened in the anterior half, subscaphium marked as an elongate, arched, rod-shaped sclerite. Valva 1.6 times as long as broad, apex broadly rounded, fibula running parallel with the ventral border, posteriad-directed, length one-third of the maximum width of the valva, basis slightly sclerotized. Basal costa with a pair of thin, acuminate, anteriad-directed processes. Basal sacculus is ventrally projected, the projection triangular-shaped and strongly sclerotized. Vinculum double as long as broad, with strong lateral sclerotization. Transtilla arms sub-triangular shaped, strongly sclerotized ventro-laterally, with acuminate, strongly sclerotized extensions. Coecum strongly sclerotized ventrally and apically. Vesica is armed with three cornuti, the longest one equal in length with 40% of the length of the phallus, the two shorter ones slightly differing in length, half as long as the longer cornutus. Ductus ejaculatorius is inserted near the apex of the coecum.

Female genitalia (Figure 1(C), Figure 2(E)): Papilla analis ovate. Posterior apophyses are straight, constant in width. Anterior apophyses are basally strongly sclerotized, medially projected, 1.5 times as long as the posterior apophyses. Ostium is strongly sclerotized. Colliculum present. Antrum with a transversal sclerite. Ductus bursae strongly sclerotized in its posterior third, slightly sclerotized with granulate areas in its anterior third, constant in width in its posterior half, widened towards the corpus bursae. Corpus bursae globular, signum reniform, four times as long as wide.

Tympanal organs (Figure 1(D)): Venula secunda present, straight, slightly sclerotized. Ramus tympani elongate, very slender, concave. Bulla tympani is slightly invaginated. Pons tympani widened towards the ramus tympani, with short, thorn-shaped posterior processes. Fornix tympani slightly sclerotized, tergo-sternal sclerite elongate, acuminate.

Diagnosis (Table 1): The new species is attributed to the *S. traducalis* species group. The species group is dissolved primarily by internal character states in the male and female genitalia (Table 1). The male and female genitalia of the two comparative species are described in figured in Slamka [3] and Shaffer & Munroe [11].

The new species is unique in the *S. traducalis* species group in the presence of ventral projections in the basal sacculus of in the male genitalia, in the strongly sclerotized coecum, in the number of cornuti—three in the new species, at least four in the two comparative species, in the strongly sclerotized antrum in the female genitalia and in the strongly sclerotized posterior ductus bursae.

Bionomics: The type material was captured on richly vegetated mountainous slopes on the verge of a tropical forest zone.

Distribution: Known only from south-western Saudi Arabia.

Etymology: The epitheton refers to the type locality situated near Fayfa in south-western Saudi Arabia (pronounced “Fifa”).

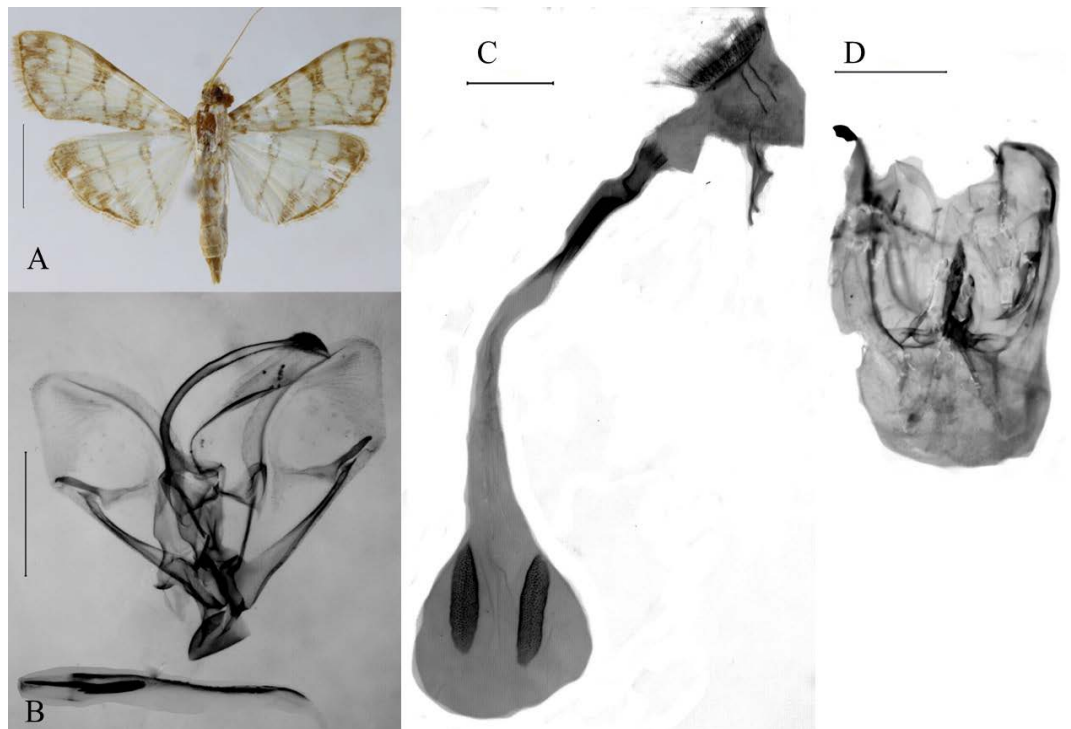


Figure 1. *Synclera fifensis* sp.n., external and internal characters. (A): Holotype, ♀, slide no. 23GP018, adult, dorsal view, scale bar = 2 mm. (B): Paratype, male genitalia, slide no. 23GP019. (C): Holotype, female genitalia, slide no. 23GP018. (D): Paratype, ♂, tympanal organs, slide no. 23GP022. Scale bars (B) - (D) = 1 mm.

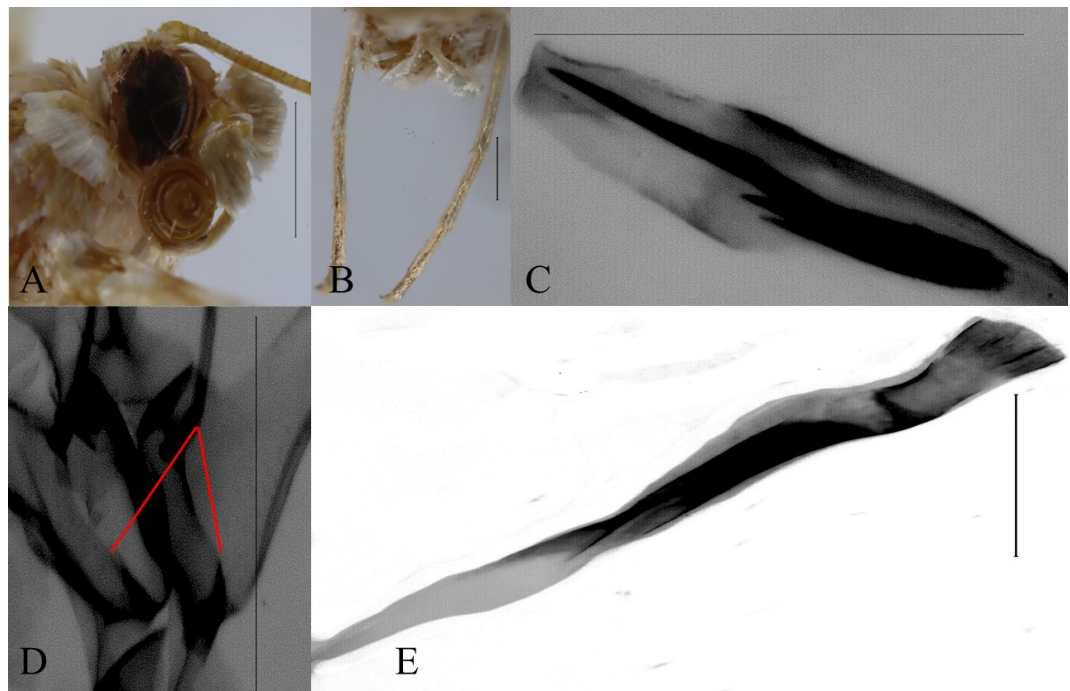


Figure 2. *Synclera fifensis* sp.n., close-ups. (A): Holotype, ♀, slide no. 23GP018, head profile. (B): Paratype, ♂, slide no. 23GP022, hind tarsi. (C): Paratype, ♂, slide no. 23GP022, cornuti. (D): Paratype, ♂, slide no. 23GP019, basal saccular processes. (E): Holotype, ♀, slide no. 23GP018, posterior ductus bursae, antrum, colliculum, ostium. Scale bars = 1 mm.

Table 1. Differential character states, *S. traducalis* species group.

	<i>S. fifensis</i>	<i>S. traducalis</i>	<i>S. seychellensis</i>
External character states			
Presence of distinct apical bands in the hind tarsi (0: absent; 1: present)	0	1	0
Internal character states—male genitalia			
Presence of ventral projections in the basal sacculus (0: absent; 1: present)	1	0	0
Sclerotization of the coecum (0: weak; 1: strong)	1	0	0
Number and shape of the cornuti (0: three, the longest one equal in length with 40% of the phallus length, each of the other two half as long; 1: four to five in <i>S. traducalis</i> differing in length; 2: numerous short cornuti)	0	1	2
Internal character states—female genitalia			
Presence of a diverticulum in the ductus bursae (0: absent; 1: present)	0	1	0
Sclerotization of the antrum (0: absent; 1: present)	1	0	0
Presence of a colliculum (0: absent; 1: present)	1	1	0
Sclerotization of the posterior ductus bursae (0: absent; 1: weak; 2: strong)	2	0	1

2) Key to the species in the *S. traducalis* group

1	Diverticulum present in the ductus bursae; vesica with 4 - 5 cornuti differing in length (20% - 50% of the length of the phallus); apical bands present in the hind tarsi.....	<i>S. traducalis</i>
-	Diverticulum absent in the ductus bursae; number of cornuti smaller than four or significantly greater than five; apical bands absent in the hind tarsi.....	2
2	Colliculum present; antrum strongly sclerotized transversally; posterior ductus bursae strongly sclerotized; basal sacculus ventrally projected; vesica with three cornuti, grouped into an elongate one and two shorter ones equal in length; coecum strongly sclerotized.....	<i>S. fifensis</i>
-	Colliculum absent; antrum bare from sclerotization; basal sacculus unprojected; vesica with numerous short cornuti; coecum weakly sclerotized.....	<i>S. seychellensis</i>

3.1.2. Genus *Pramadea* Moore, 1888

Diagnosis: Labial palpus obliquely ascending, reaching to the upper end of the vertex, third segment short, porrect. Maxillary palpus is simple and very slender. Antenna filiform simple in the female, filiform ciliate in the male. Forewing elongate, apex pointed, costa arched, termen oblique, R5 slightly curved, not closely approximated with R3 + 4. Hindwing elongate, apex angular and pointed, termen strongly oblique, cell one-third of the wing length, M2, M3 and CuA1 de-

veloping from the posterior angle of the cell [16] [24]. Male genitalia with the uncus composed of a moderately long neck and a dorsally chaetose apex. Valva ovate with the presence of a fibula developing from near the basal sacculus. Saccus v-shaped [16]. Female genitalia with the ductus bursae long, membranous, anterior apophyses strongly sclerotized and basally dilated [16]. The genus is differentiated from the genus *Syllepte* Hübner, 1823 in the shape of the R5 in the forewing, which is strongly curved in *Syllepte* Hübner, 1823, the directedness of the labial palpus, which is upturned up to the middle of the frons in *Syllepte* Hübner, 1823 in the shape of the uncus, which is simple and truncate in *Syllepte* Hübner, 1823 and in the presence of a fibula in the basal valva [16] [17].

1) *Pramadea trifidalis* (Hampson, 1908) comb.n.

Type material examined: Holotype ♂, Kenya, British E. Africa, Mukuniu, 17-X-1901, leg. C.S. Betton, coll. BMNH (no. 1054985), image checked [15], Paratype ♀, Yemen, Aden, 16-IV-1906, leg. E.G.B. Meade-Waldo, coll. BMNH (no. 1054986), image checked [15].

Further material examined: Saudi Arabia, Province Jizan, Fayfa Mts., 17°14'30.21"N, 43°3'40.99"E, 640 m, 21-III-2023, 2 ♂, 1 ♀, slide no. 23GP020, 23GP021, 22GP024, Saudi Arabia, Prov. Jizan, Fayfa Mts., 17°14'35.66"N, 43°03'30.72"E, 624 m, 23-III-2023, 1 ♂, slide no. 23GP025, leg., prep. et coll. M. Seizmair.

External characters (Figure 3(A), Figure 3(B), Figure 4(A)): Wingspan and forewing length (n = 4): mean 22.6 mm ± SD 1.16, mean 10.5 mm SD ± 0.25. Head: Antenna yellowish in the shaft and in the flagellum, ciliae greyish-white, double as long as the width of the flagellum. Labial palpus equal in length with the diameter of the eye, three times as long as wide, greyish-brown scaled in the third segment, first and second segments dorso-laterally concolorous in scaling with the third segment, ventro-laterally greyish-white scaled. Maxillary palpus unscaled, darkish-brown, one-third as long as the labial palpus. Frons and vertex with tufts of greyish-white scales. Thorax: Dorsum and venter yellowish-grey scaled. Legs with white scales in the tibia, femur and the spurs, tarsi yellowish interspersed with short white scales, inner spurs three times as long as the outer spurs. Forewing upper side with the ground darkish-grey to brownish. Costal border darkish-yellow. Presence of an antemedial subcostal white spot of trapezoid shape between R2 and the R3 + 4 stem, which is immediately followed by a blackish doubled stroke and immediately preceded by a blackish sub-rectangular spot. Presence of a postmedial white stroke running from R1 to R5, which is immediately preceded by a darkish-brown to black stroke and followed by a darkish-brown to black line retracted below the middle of the cell near CuA1 and angled outwards near CuP. Termen is concolorous with the ground. Fringe greyish brown. Hindwing upper side: ground darkish grey to brownish. Presence of darkish brown undulated antemedial and medial lines weakly contrasted with the ground. Termen and fringe are concolorous with the forewing. Fore- and hindwing underside identical with the upper sides. Abdomen: dorsum and venter greyish-white scaled. Anal tuft white.

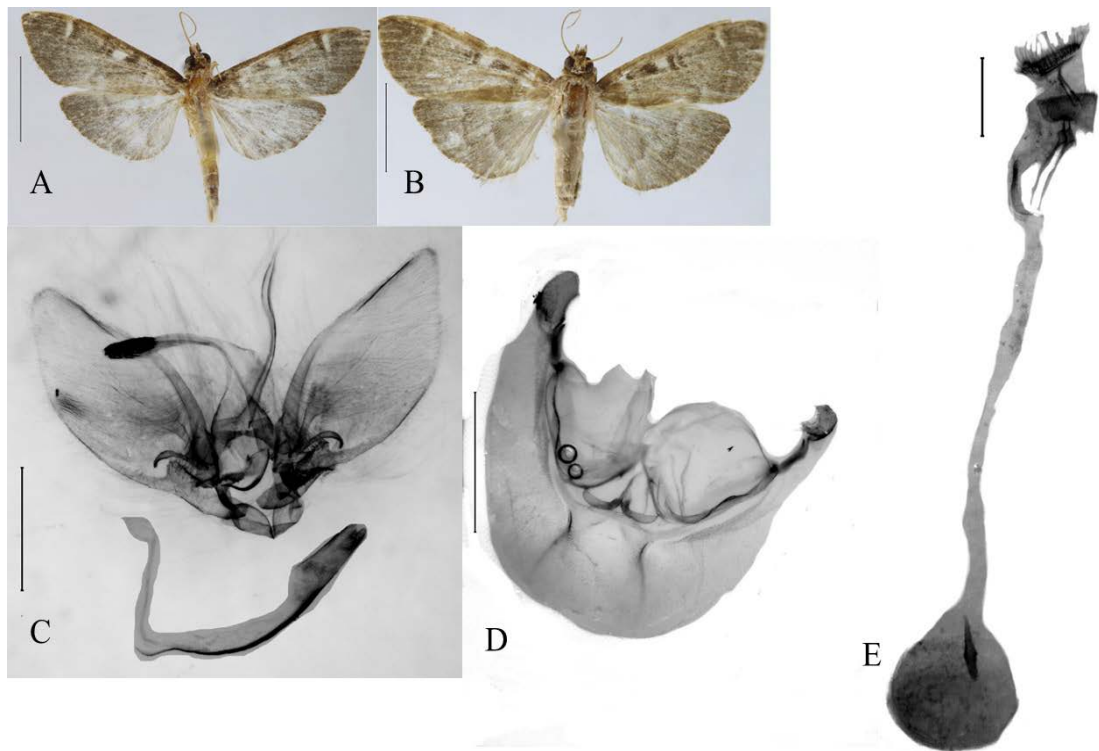


Figure 3. *Pramadea trifidalis* (Hampson, 1908) comb.n., external and internal characters. (A): Adult, ♂, slide no. 23GP020. (B): Adult, ♀, slide no. 23GP021. (C): Male genitalia, slide no. 23GP024. (D): Tympanal organs, ♂, slide no. 23GP024. (E): Female genitalia, slide no. 23GP021. Scale bars A, B = 2 mm, scale bars (C) - (E) = 1 mm.

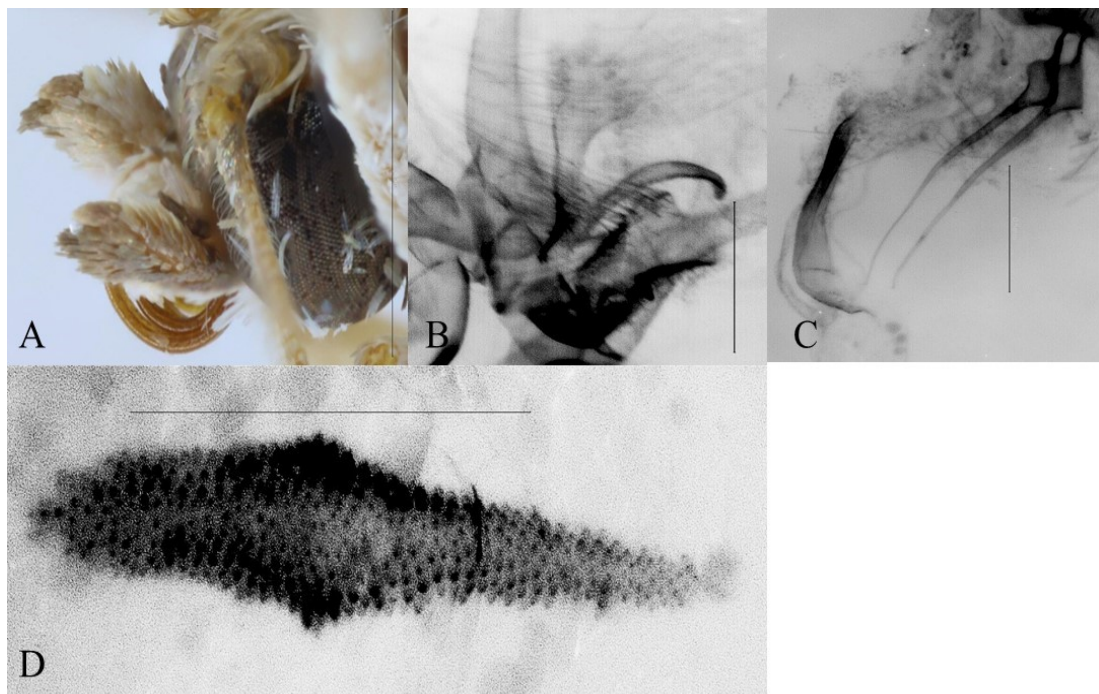


Figure 4. *Pramadea trifidalis* (Hampson, 1908) comb.n., close-ups. (A): ♂, slide no. 23GP020, head profile. (B): slide no. 23GP020, basal valva: fibula, secondary process. (C): slide no. 23GP021, antrum. (D): slide no. 23GP021, signum. Scale bars = 0.5 mm.

Male genitalia (Figure 3(C), Figure 4(B)): Tegumen of sub-triangular shape. Uncus elongate with its length relative to the length of the uncus 85%, apical portion ovate. Scaphium is present, marked as a rod-shaped sclerite. Tuba analis elongate, slender, subscaphium marked as a pair of lateral sclerites. Valva medially strongly broadened, two times as long as wide. Costa inflated, basal costa with a globular-shaped dilatation, distal costa tapered into a rod-shaped sclerite running straight, parallel to the border and terminating shortly below the apex. Apex triangular shaped. Basal sacculus with a trapezoid projection, which is dorsally sclerotized and chaetose, and distal sacculus tapered into a rod-shaped sclerite running parallel to the ventral border. Fibula sickle-shaped, down-turned, anteroad-directed, acuminate. Basal valva with an anteroad-directed, thorn-shaped, elongate, acuminate process, running straight from near the post-basal costa, the basis globular shaped and dorsally chaetose. Vinculum broadened, double as wide as long. Saccus strongly constricted. Transtilla arms of trapezoid shape, laterally sclerotized. Phallus with the coecum sclerotized ventrally over its entire length, vesica granulated, bare from cornuti.

Female genitalia (Figure 3(E), Figure 4(C), Figure 4(D)): Anterior apophyses with sub-triangular shaped basal dilatation, length relative to the posterior apophyses 2.6. Ostium is membranous. Antrum is strongly sclerotized, with anterior dilatation. Colliculum absent. Ductus bursae widened in its posterior third. Corpus bursae of globular shape. Presence of one signum of elongate, flat, asymmetrical sub-rhomboid shape, ratio length of the longitudinal axis/length of the transversal axis 4.8.

Tympanal organs (Figure 3(D)): Ramus tympani present, strongly sclerotized at the tip, posterior end strongly shortened. Puteolus tympani present, triangular-shaped, slightly sclerotized laterally. Venula secunda present, elongate, angled inwards, posterior end strongly sclerotized.

Distribution: Kenya, Mozambique, Yemen. New for Saudi Arabia [15].

2) *Pramadea albopunctum* (Guillermet, 1996) comb.n.

Material examined: Holotype ♀, La Réunion, Les Hauts de Quartier français, 1200 m, 31-III-1986, leg. Guillermet, coll. MNHN, image checked [15].

Diagnosis: Fore- and hindwing ground darkish brown. Forewing with post-medial claviform, medial reniform and antemedial orbiform white spots present. Postmedial and antemedial lines darkish-brown to black, weakly contrasted with the ground, with the antemedial line right-angled and the postmedial line retracted below the white medial spot. Hindwing antemedial and postmedial lines are concolorous with the forewing lines, with the antemedial line weakly undulated, the postmedial line strongly angled. Uncus in the male genitalia equal in length with the tuba analis, apex ovate. Valva slender, elongate, three times as long as broad, costal border medially convex, distal costal process straight, terminating immediately after the convexity of the border, apex acuminate, fibula sickle-shaped, down-turned, elongate, reaching the ventral border. Vinculum widened, saccus narrowed, v-shaped, with a protruding keel. Basal sacculus bare

from projection. Vesica bare from cornuti. Ductus bursae wall in the female genitalia with an elongate, slender signum of ellipsoid shape. Colliculum present, elongate.

Remark: The male and female genitalia are figured in Guillermet [21].

Distribution: Known to date as endemic to La Réunion.

3) *Pramadea christophalis* (Viette, 1988) comb.n.

Material examined: Holotype ♀, La Réunion, Parking du Cap Noir, 1100 m, 13-X-1985, leg C. & C. Guillermet, coll. MNHN, image checked [15].

Diagnosis: Fore- and hindwing ground darkish brown. Forewing with the presence of medial reniform and antemedial orbiform white spots and a post-medial weakly curved blackish line. Hindwing with a whitish area covering 60% of the wing. Male genitalia with the uncus elongate, apex ovate. Valva double as long as broad, apex rounded, costa arched, end of the distal process widely spaced from the apex, fibula sickle-shaped, down-turned, anterior end widely spaced from the ventral border. Vinculum short, widened, saccus rounded with a protruding keel ventro-medially. Basal sacculus bare from projection. Vesica bare from cornuti. Female genitalia with the corpus bursae wall bare from signa. Colliculum absent.

Remark: The male and female genitalia are figured in Guillermet [21].

Distribution: Known to date as endemic to La Réunion.

4) *Pramadea minoralis* (Warren, 1892) comb.n.

Material examined: 1 ♂, La Réunion, La Possession, 29-VIII-2013, leg., det. et coll. M. Bippus, image checked [15] [25].

Diagnosis: Fore- and hindwing ground darkish brown. Forewing with the presence of a medial white claviform spot, a darkish-brown to black postmedial line retracted below the medial white spot and a weakly undulated antemedial line of the same colour. Hindwing with an angled darkish-brown to blackish postmedial line. Male genitalia with the uncus elongate, length relative to the tuba analis 75%. Valva double as long as wide, ventral border medially strongly concave, costa arched, end of the distal costal process wide-spaced from the apex, fibula sickle-shaped, down-curved, elongate, terminating shortly before the ventral border. Basal saccular projection present, triangular-shaped. Vinculum widened, short, sacculus strongly constricted, and v-shaped. Vesica bare from cornuti. Female genitalia with the presence of an elongate, slender, lanceolate signum in the corpus bursae wall. Colliculum absent.

Remark: The male and female genitalia are figured in Bippus [25] and De Prins & De Prins [15].

Distribution: Ghana, Nigeria, La Réunion, Madagascar.

5) Key to the Afrotropical species of the genus *Paramadea* Moore, 1888

The genus is considered to comprise five Afrotropical species, *P. trifidalis*, *P. albopunctum*, *P. christophalis*, *P. minoralis* and *Pramadea oivalis* (Walker, 1859), whereby *P. oivalis* has been reported also from the Oriental region (India), and three species restricted to the Oriental zone—*Pramadea denticulate*

Moore, 1888, *Pramadea crotonalis* (Walker, 1859), *Pramadea lunalis* (Guenée, 1854). The internal diagnostic characters (male and female genitalia) of the Oriental species and of *P. oviialis* are described and figured in Kirti & Gill [16].

1	FW with three white subcostal spots.....	2
-	Number of white subcostal spots in the FW less than three.....	3
2	FW with a distinct orbiform medial white spot near CuA1, Uncus short, length relative to the tuba analis < 30%, Fibula short, anterior end widely spaced from the ventral border, signum star-shaped with an oblong extension.....	<i>P. oviialis</i>
-	FW without orbiform medial white spot near CuA1, Uncus elongate, length relative to the tuba analis > 75%, fibula elongate, terminating near the ventral border.....	4
3	FW with two white subcostal spots, corpus bursae wall bare from signa.....	<i>P. christophalis</i>
-	FW with one white subcostal spot, signum present, elongate, lanceolate.....	<i>P. minoralis</i>
4	Basal valva with a secondary process, basal sacculus projected, distal costal process terminating near the apex, signum elongate, sub-rhomboid, asymmetrical.....	<i>P. trifidalis</i>
-	Basal valva without secondary process, basal sacculus unprojected, distal costal process terminating in the middle of the valva, signum ellipsoid.....	<i>P. albopunctum</i>

3.2. Faunistic Updates

3.2.1 *Chabulina astomalis* (Felder & Rogenhofer, 1875)

Material: Oman, Dhofar, 4 km W Dalkuth, 01-XI-2021, 1 ♂, slide no. 22GP014, leg. et coll. M. Seizmair.

Diagnosis (Figure 5(A), Figure 5(D), Figure 5(G)): Wingspan 13.0 mm. The species is differentiated from the closely related *Chabulina onychinalis* (Guenée, 1854) in the following character states: Shape of the space between the forewing medial line and the postmedial line: widened and ovate in *C. astomalis*, narrowed and sub-rectangular shaped in *C. onychinalis*. Scaling of the space between the two postmedial outer lines: yellowish in *C. astomalis*, darkish-brown in *C. onychinalis*. Presence of cornuti in the vesica of the male genitalia: absent in *C. astomalis*, present in *C. onychinalis* [12].

Distribution: Afrotropical known only from the African mainland to date: Cameroon, Kenya and South Africa [12]. The species is reported as new to the Arabian Peninsula.

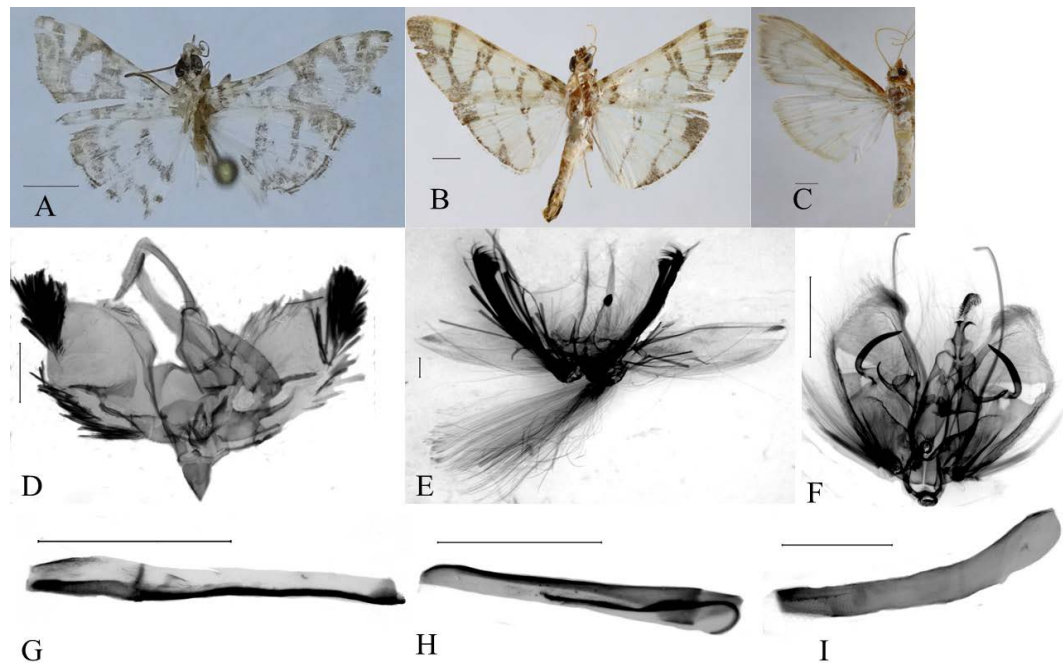


Figure 5. Adults and male genitalia. (A), (D), (G): *Chabulina astomalis* (Felder & Rogenhofer, 1875), ♂, slide no. 22GP014. (A): adult, dorsal view. (D): male genitalia capsule. (G): phallus. (B), (E), (H): *Paradomima zanclophora* Martin, 1955, ♂, slide no. 23GP016. (B): adult, dorsal view. (E): male genitalia capsule. (H): phallus. (C), (F), (I): *Hodebertia testalis* (Fabricius, 1794), ♂, slide no. 22GP026. (C): adult, dorsal view. (F): male genitalia capsule. (I): phallus. Scale bars (A) - (C) = 2 mm, scale bars (D) - (I) = 1 mm.

Remarks: The specimen from Oman, Province Dhofar listed in this paper has been figured for the first time and erroneously attributed to *C. onychinalis* in Seizmair [13]. The valid species name was made available by Maes, who removed *C. astomalis* from synonymy with *C. onychinalis* [12]. *C. onychinalis* has been recently reported for the Ain region in Dhofar by Gillet [26]. However, the record is considered as doubtful. The adult figured in this paper is bare from the forewing postmedial double line structure characteristic of *C. onychinalis* and *C. astomalis*. The wing maculation of the specimen appears characteristic of the *S. traducalis* group. The presence of *C. onychinalis* in Oman is thus in need of further verification. From Yemen and Saudi Arabia, exclusively historical records have been known, which need re-validation [27] [28].

3.2.2. *Paradomima zanclophora* Martin, 1955

Material: Saudi Arabia, Province Jizan, 5km NW Fayfa, 600m, 25-IX-2022, 1 ♂, slide no. 23GP012. Saudi Arabia, Province Jizan, Fayfa Mts., 17°15'51.11"N 43°04'9.43"E, 18-III-2023, 1 ♂, slide no. 23GP016, leg. et coll. M. Seizmair.

Diagnosis (Figure 5(B), Figure 5(E), Figure 5(H)): Wingspan 25.0 mm - 25.7 mm. Forewing discal spot wide spaced from the antemedial line. Apical and tornal patches are large, widely separated, the apical patch extending up to M2, the tornal patch reaching from CuA2 to the anal border. Second and third segments of the postmedial line are broad and prominent. Hindwing apical patch widely separated from the postmedial line, tornal patch widely separated from

the antemedial line. The species is unique among its congeners in the falciform posterior end of the cornutus in the male genitalia [15] [22].

Distribution: Afrotropical—East-Afro-Eremic (Ethiopia, Kenya, Tanzania, Mozambique). Congo, Gambia, South Africa, Malagasy and Mascarene islands (Comoros, Seychelles) [15]. The species has been known to date from one single historical record in the paratype series from the province of Asir in Saudi Arabia dating to 1937. Re-confirmed for the Arabian Peninsula.

3.2.3. *Hodebertia testalis* (Fabricius, 1794)

Material: Saudi Arabia, Prov. Jizan, Fayfa Mts., 17° 14'35.66"N, 43° 03'30.72"E, 624 m, 23-III-2023, 1 ♂, slide no. 23GP026, leg. et coll. M. Seizmair.

Diagnosis (Figure 5(C), Figure 5(F), Figure 5(I)): Wingspan 17.3 mm. Ground greyish-yellow. Forewing with a reddish-yellow subcostal stripe. Forewing and hindwing with darkish-brown antemedial and postmedial bands of irregular shape. Uncus in the male is genitalia cordate at base, with medial lateral processes. Valva with two posteriad-directed fibulae differing in size. Vesica bare from cornuti.

Distribution: Subtropical-tropical. Palearctic (Mediterranean basin). Oriental, Neotropical (Cuba), Afrotropical (East Africa, South Africa, Malagasy and Mascarene Islands, Congo, Gambia, Mali) [15]. From the Arabian Peninsula, the species has been known to date from historical records in Yemen and Saudi Arabia [15] [28] [29] [30]. Re-confirmed for the Arabian Peninsula.

4. Conclusion

In this study, a new species—*Synclera fifensis* sp.n. was added to the *S. traducalis* species group, which now comprises a total of three species. The taxonomy and zoogeography of this species group have to date been little explored. The distribution of *S. fifensis* sp.n. is still unknown. Four Afrotropical species were added to the genus *Pramadea* Moore, 1888 by re-combination, only one of which, *P. trifidalis* had been reported from the Arabian Peninsula to date. The internal character states of this species were described for the first time. The species was reported as new to the fauna of Saudi Arabia. Further distributional updates have been given on three further described species, *C. astomalis*, *P. zanclophora* and *H. testalis*. Further study is needed on the distribution of the two closely related species *C. astomalis* and *C. onychninalis* on the Arabian Peninsula.

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urn:lsid:zoobank.org:pub:A003AB97-8997-44F1-906B-E143BE435D44.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

References

- [1] Mally, R., Hayden, J., Neinhuis, C., Jordal, B.H. and Nuss, M. (2019) The Phylogenetic systematics of Spilomelinae and Pyraustina (Lepidoptera: Pyraloidea: Crambidae) Inferred from DNA and Morphology. *Arthropod Systematics and Phylogeny*, **77**, 141-204.
- [2] Nuss, M., Landry, B., Mally, R., Vegliante, F., Tränkner, A., Bauer, F., Hayden, J., Segerer, A., Schouten, R., Li, H., Trofimova, T., Solis, M.A., De Prins, J. and Speidel, W. (2023) Global Information System on Pyraloidea. <http://www.pyraloidea.org/index.php?id=10>
- [3] Slamka, F. (2013) Pyraloidea of Europe, Pyraustinae & Spilomelinae, Identification-Distribution-Habitat-Biology. Vol. 3, Frantisek Slamka, Bratislava.
- [4] Alipanah, H. and Slamka, F. (2023) A Revision of the Subfamily Spilomelinae (Lepidoptera, Crambidae) in Iran with Description of a New Species. *Zootaxa*, **5258**, 1-70. <https://doi.org/10.11646/zootaxa.5248.1.1>
- [5] Pasam, M.R., Muddappa, S.M. and Aralimarad, P. (2023) Taxonomy of Agriculturally Important Spilomelinae (Lepidoptera: Pyraloidea: Crambidae) of Karnataka, India. *Oriental Insects*, **57**, 839-897. <https://doi.org/10.1080/00305316.2022.2162142>
- [6] Landry, B. (2016) Taxonomic Revision of the Spilomelinae (Lepidoptera, Pyralidae s. l.) of the Galápagos Islands, Ecuador. *Revue Suisse de Zoologie*, **123**, 315-399.
- [7] Krüger, M. (2020) Checklist of the Lepidoptera of Southern Africa. *Metamorphosis*, **30**, 1-201. <https://doi.org/10.4314/met.v3i2.2>
- [8] Poltavsky, A.N., Kravchenko, V.D., Traore, M.M., Traore, S.F., Gergely, P., Witt, T.J., Sulak, H., Beck, R.H.T., Junnila, A., Revay, E.E., Doumbia, S., Beier, J.C. and Müller, G.C. (2018) The Pyraloidea (Lepidoptera) Fauna of the Woody Savannah Belt in Mali, West Africa. *Zootaxa*, **4457**, 39-69. <https://doi.org/10.11646/zootaxa.4457.1.2>
- [9] Poltavsky, A.N., Safian, S., Simonics, G., Kravchenko, V.D. and Müller, G.C. (2019) The Pyraloidea (Lepidoptera) Fauna in the Liberian Nimba Mountains, West Africa, at the End of the Dry Season. *Israel Journal of Entomology*, **49**, 11-40.
- [10] Viette, P. (1990) Faune de Madagascar. Supplément 1. Liste recapitulative des Lépidoptères Hétérocères de Madagascar. Publications de la Société Linnéenne de Lyon, Lyon, 1-261.
- [11] Shaffer, J.C. and Munroe, E.G. (2007) Crambidae of Aldabra Atoll (Lepidoptera: Pyraloidea). *Tropical Lepidoptera*, **14**, 1-110.
- [12] Maes, K.V.N. (2022) Studies on African Crambidae II: On the Identity of *Asopia onychinalis* Guenée, 1954, Its Synonyms, Generic Placement and Related Species (Pyraloidea: Crambidae: Spilomelinae). *Metamorphosis*, **33**, 85-91. <https://doi.org/10.4314/met.v33i1.7>
- [13] Seizmair, M. (2022) Faunistic and Taxonomic Notes on Eleven Recently Recorded Species of Spilomelinae Guinée, 1854 (Lepidoptera, Crambidae) from the Arabian Peninsula with an Updated Checklist. *International Journal of Zoological and Entomological Letters*, **22**, 21-30. <https://doi.org/10.22271/letters.2022.v2.i2a.43>

- [14] Seizmair, M. (2023) Taxonomic and Faunistic Notes on Four Species of the Spilomelinae (Lepidoptera, Crambidae) in Saudi-Arabia with Description of a New Species of *Cirrhochrista* Lederer, 1863. *International Journal of Entomology Research*, **8**, 1-7.
- [15] De Prins, J. and De Prins, W. (2023) Afromoth Online Database of Afrotropical Moth Species (Lepidoptera). Afromoths. <https://www.afromoths.net/>
- [16] Kirti, J.S. and Gill, N.S. (2004) Revalidation and Recharacterisation Genus Pramaea Moore (Pyraustinae: Pyralidae: Lepidoptera). *Journal of Entomological Research*, **28**, 179-186.
- [17] Becker, V.O. (2023) The Identity of Syllepte Incomptalis Hübner (Lepidoptera: Crambidae: Spilomelinae) with Synonymies, New Combinations and New Species. *Revisita Brasileira de Entomologia*, **67**, 2-11. <https://doi.org/10.1590/1806-9665-rbent-2022-0093>
- [18] Brehm, G. (2017) A New LED Lamp for the Collection of Nocturnal Lepidoptera and a Spectral Comparison of Light-Trapping Lamps. *Nota Lepidopterologica*, **40**, 87-108. <https://doi.org/10.3897/nl.40.11887>
- [19] Robinson, G. (1976) The Preparation of Slides of Lepidoptera Genitalia with Special Reference to the Microlepidoptera. *Entomologist's Gazette*, **27**, 127-132.
- [20] Maes, K.V.N. (1995) A Comparative Morphological Study of the Adult Crambidae (Lepidoptera, Pyraloidea). *Proceedings and Annals of the Belgian Entomological Royal Society*, **131**, 383-434.
- [21] Guillermet, C. (2009) Les Hétérocères, ou papillons de nuit, de l'île de La Réunion. Vol. 3, Familles des Pyralidae et Crambidae, Nature Découverte et Partage, Parc National de La Réunion.
- [22] Martin, E.L. (1955) The African Species of the Genus Pardomima Warren (Lepidoptera: Pyralidae: Pyraustinae). *Bulletin of the British Museum (Natural History), Entomology*, **3**, 503-521. <https://doi.org/10.5962/bhl.part.1061>
- [23] Pajni, H.R. and Rose, H.S (1978) Revision of the Genus Pagyda Walker for the Revalidation of Its Synonym Synclera Lederer along with the Description of a New Species (Lepidoptera: Pyraloidea: Pyraustinae). *Entomon*, **3**, 215-219.
- [24] Moore, F. (1888) Descriptions of Indian Lepidoptera Heterocera from the Collection of the Late Mr. W.S. Atkinson. In: Hewitson, W.C. and Moore, F., Eds., *Descriptions of New Indian Lepidopterous Insects from the Collection of the Late Mr. W.S. Atkinson*, Asiatic Society of Bengal/Taylor & Francis, Calcutta/London, 199-299.
- [25] Bippus, M. (2019) Pyraloidea of Mauritius and Neighbouring Islands (Lepidoptera). *Phelsuma*, **27**, 36-57.
- [26] Gillett, M.P.T. (1997), Brief Notes on Some Species of Micro-Moths Newly Recorded from Al Ain (Lepidoptera: Micro-Heterocera: Pyralidae). *Tribulus*, **7**, 19-20.
- [27] Ghesquière, J. (1942), Lépidoptères Microlépidoptères (deuxième partie). [Annales du Musée du Congo Belge, Zoologie [3, Arthropodes] Section 2. *Catalogues Raisonnés*, **7**, 121-240.
- [28] Walsingham, T. and Hampson, G.F. (1896) On Moths Collected at Aden and in Somaliland. *Journal of Zoology*, **64**, 257-283. <https://doi.org/10.1111/j.1096-3642.1896.tb03044.x>
- [29] Butler, A.G. (1884) On a Collection of Lepidoptera Made by Major J.W. Jerbury at or near Aden. *Journal of Zoology*, **13**, 478-503. <https://doi.org/10.1111/j.1096-3642.1884.tb02861.x>
- [30] Rebel, H. (1907) Lepidopteren aus Südarabien und von der Insel Sokotra. *Denkschriften der österreichischen Akademie der Wissenschaften*, **71**, 31-130.