Scientific Research Publishing

Advances in Entomology, 2026, 14(1), 1-25
https://www.scirp.org/journal/ae
ISSN Online: 2331-2017
ISSN Print: 2331-1991

Contribution to the Knowledge of the Afrotropical Spilomelinae (Lepidoptera, Crambidae): An Unknown Diversity in the Genus *Herpetogramma* Lederer, 1863 on the Southern Arabian Peninsula with Five New Species

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How to cite this paper: Seizmair, M. (2026) Contribution to the Knowledge of the Afrotropical Spilomelinae (Lepidoptera, Crambidae): An Unknown Diversity in the Genus *Herpetogramma* Lederer, 1863 on the Southern Arabian Peninsula with Five New Species. *Advances in Entomology*, **14**, 1-25.
https://doi.org/10.4236/ae.2026.141001

Received: October 12, 2025
Accepted: November 23, 2025
Published: November 26, 2025

Abstract

An unknown diversity in the genus *Herpetogramma* Lederer, 1863 (Lepidoptera, Crambidae) on the Southern Arabian Peninsula is presented based on material collected in southern Oman (province Dhofar) and in south-western Saudi Arabia (province Jizan). Five new species are described, namely *Herpetogramma nigripalpalis* **sp.n.**, *Herpetogramma digitalis* **sp.n.**, *Herpetogramma dilatalis* **sp.n.**, *Herpetogramma lunatalis* **sp.n.** and *Herpetogramma undularis* **sp.n.** The adults, the head profile and the female genitalia of each of these newly described species are described and figured. Additionally, the male genitalia of *Herpetogramma nigripalpalis* **sp.n.**, *Herpetogramma digitalis* **sp.n.** and *Herpetogramma dilatalis* **sp.n.** and the tympanal organs of *Herpetogramma nigripalpalis* **sp.n.**, *Herpetogramma digitalis* **sp.n.** are described and figured. The male genitalia of *Herpetogramma lunatalis* **sp.n.** and *Herpetogramma undularis* **sp.n.** are unknown. The differential character states distinguishing the new species from the closest congeners both in external characters and in internal characters of the male and/or female genitalia are listed. Furthermore, the male genitalia of *Herpetogramma debilis* Seizmair, 2021 are re-described and re-figured. A determination key to the newly described Arabian species and their Afrotropical and Oriental relatives is provided.

Keywords

Pyraloidea, Herpetogrammatini, Taxonomy, Morphology, New Species,

Fauna, Saudia Arabia, Oman

1. Introduction

The genus *Herpetogramma* Lederer, 1863 was erected for the type species *Herpetogramma servalis* Lederer, 1863 from Brazil (Lederer, 1863). It is the type genus of the tribe Herpetogrammatini Mally, Hayden, Neinhuis, Jordal & Nuss, 2019. The synapomorphies of this tribe include the conical and non-capitate uncus in the male genitalia. It is dorso-laterally chaetose. The transition to the tegumen is smooth, from a broadened basal uncus to an equally broadened tegumen. A further synapomorphy is the sclerotization of the corpus bursae in the female genitalia, which consists of zero or one signum and granulated areas. In the genus *Herpetogramma*, the structure of the chaetae in the uncus is simple and the signum in the corpus bursae wall—if present—is of rhomboid shape, often with a transversal sclerite [1]. The genus is made up of species which are commonly known as LBJs (Little Brown Jobs). The fore-and hindwing ground of the species belongs to a spectrum of brown shades, from light or yellowish brown to darkish-brown. The species are highly conservative in wing maculation, which means that a safe determination is possible only by genitalia dissection [2] [3].

The genus is one of the six most diverse genera in the subfamily Spilomelinae, comprising a total of 105 recorded species worldwide [4]. The genus is present in all the main zoogeographic zones. The diversity of the genus is centred on the Nearctic and Neotropical zones, each comprising 35% of the species, followed by the Oriental zone, from which a total of 25 species has been recorded to date [3] [4]. Comprehensive revisions on the genus for these three zones include [2] [5]-[13].

The Afrotropical zone, however, has been little studied both for the genus *Herpetogramma* Lederer, 1863 and for the subfamily Spilomelinae as a whole. A total of 18 species has been known to date for the genus under discussion [14], 12 out of which are restricted in distribution on the Afrotropical zone. Out of the species of exclusively Afrotropical distribution, over the half—58%—have been known as island endemic to date, restricted in distribution to Mascarene and Malagasy islands [14]. There are only four major faunistic and taxonomic studies [15]-[18]. The under-exploration of the subfamily Spilomelinae for the Afrotropical zone has been recently discussed by Maes [19] [20].

The Afrotropical zone reaches its northern boundaries in the southern parts of the Arabian Peninsula made up of the southern province Dhofar of the Sultanate of Oman, Yemen and the southern provinces of Saudi Arabia covering the Saravat mountain systems along the Red Sea [21] [22]. The records of the genus from the southern Arabian Peninsula to date comprise no more than two species [14] [23]. In this paper, five further species are added to the fauna, which are described as new for science, namely *Herpetogramma nigripalpalis* **sp.n.**, *Herpetogramma dig-*

italis **sp.n.**, *Herpetogramma dilatalis* **sp.n.**, *Herpetogramma lunatalis* **sp.n.** and *Herpetogramma undularis* **sp.n.**

2. Materials and Methods

2.1. Sampling

The material (n = 16) presented in this paper is part of samples collected by the author in southern Oman (province Dhofar) in November 2021 and in south-western Saudi Arabia (province Jizan) in September 2022 and in February 2025.

The specimens were captured by night using light traps equipped with UV-Power-LEDs spanning a wave length spectrum of 365 nm - 385 nm. The trapping technique applied is described in Brehm [24].

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-65mm zoom. For examining the genitalia and tympanal organs, dissection and slide-mounting techniques were applied on the specimens according to the protocols described in Robinson and Maes [25] [26]. The preparation of the genitalia and of the tympanal organs was done under a Motic stereomicroscope (SMZ-171). The slides were photographed with a ToupCam c-mount camera (ToupTek Inc., Zhejiang, China). The images were processed by means of the imaging software Adobe Photoshop PS, Version 26.11.0 (2025).

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 and internal characters were calculated on the images by means of the imaging software ToupView, Version 4.14, 2025 (ToupTek Inc., Zhejiang, China).

For the taxonomic assessment of the specimens both original descriptions and recent literature were reviewed, comparisons were done with type specimens and genitalia figures of the known Afrotropical and Oriental species externally close to the specimens of the current sample [2] [3] [6] [7] [9] [15]-[18] [27]-[32].

2.4. Terminology and Abbreviations

The denotations of the veins follow the terminology in Shaffer, Munroe [6]. The descriptions of wing pattern characters, genitalia and tympanal organs follow the terminology in [1] [26].

3. Results and Discussion

3.1. Genus *Herpetogramma* Lederer, 1863

3.1.1. Taxonomic Updates and Descriptions of New Taxa

Herpetogramma debilis **Seizmair, 2021**

Nomenclature: *Herpetogramma debilis* Seizmair, 2021. Seizmair (2021) [30]: 3-4, figs. 1, 2, table 1. Type locality: Oman, Dhofar, 20 km E Sarfait, Road 47, Jebel Al Qamar, 960 m.

Material examined: 1♂ (Holotype), Oman, Dhofar, 20 km E Sarfait, Road 47, Jebel Al Qamar, 960 m, 07-XI-2018, slide no. GPPYR1519, leg. M. Seizmair, coll. ZSM.

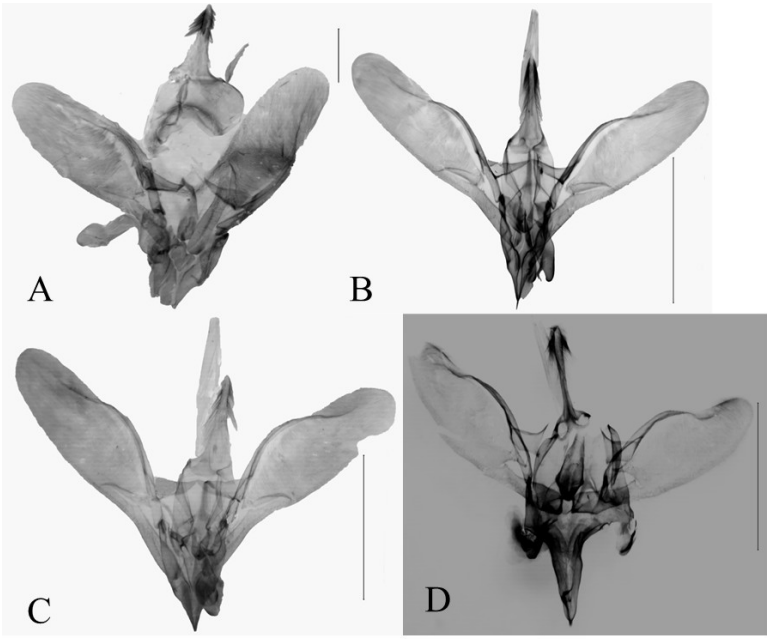

Figure 1. Male genitalia, capsule. (A) *Herpetogramma debilis* Seizmair, 2021, male holotype, slide no. GPPYR1519, costal and ventral border interchanged in the right valva. (B) *Herpetogramma nigripalpalis* **sp.n.**, male paratype, slide no. 25GP035. (C) *Herpetogramma digitalis* **sp.n.**, male holotype, slide No. 22GP010. (D) *Herpetogramma dilatalis* **sp.n.**, male holotype, slide No. 25GP040. Scale bars = 1.0 mm.

Redescription of the male genitalia (Figure 1(A), Figure 3(A)): Basal uncus sub-triangular-shaped, broadened, laterally strongly concave, post-basal uncus narrowed, with an extensive tuft of long chaetae, width relative to the basal uncus 0.4, apex pointed, total length of the uncus relative to the length of the tuba analis 1.9. Scaphium absent. Subscaphium present, marked as a fine, elongate rod-shaped lateral sclerite. Valva relatively short and broadened, 3.2 times longer than wide, apex medially rounded, ventral border straight, costa strongly convex, weakly sclerotized, with a fine, rod-shaped dorso-distal process, terminating far below the apex at the beginning of the posterior fifth of the valva, extension of the basal costa constant in width, unprojected. Sacculus basally rounded, constant in width, unprojected. Transtilla triangular shaped, dorso-laterally slightly convex, elongate, 2.2 times longer than broad. Juxta bi-lobed, lobes rounded, basis medially sclerotized, with an elongate pencil-shaped extension ranging up to the transtilla. Vinculum triangular-shaped, with projected lateral lobes, saccus v-shaped. Coremata in the anterior half dilated, rounded. Phallus with the posterior end weakly scle-

rotized, vesical surface with several elongated granulated strips, and two patches of shorter sclerotized strips laterally. Coecum rounded, membranous.

Remarks: Further key differential characters from the close relatives *Herpetogramma mutualis* (Zeller, 1852), *Herpetogramma basalis* (Walker, 1866), *Herpetogramma juba* Shaffer & Munroe, 2007 beyond those mentioned in the original diagnosis in Seizmair (2021) are the shape of the juxta and the shape of the valva. For details, we refer to Table 1. From the further close *Herpetogramma continualis* Shaffer & Munroe, 2007, *H. debilis* is distinguished by the pencil-shaped extension of the juxta, which is absent in *H. continualis*. The male genitalia are refigured on an enhanced resolution level.

***Herpetogramma nigripalpalis* sp.n.**

Zoobank ID: 7B2CC5C3-ABB5-4F25-AF4F-A6DD00126DBC

Material: Holotype, ♂, Saudi Arabia, Province Jizan, Wadi Lajb, Khatwat Al Ain, 17.5907806, 42.93223888, 1350 m, 23-II-2025, slide no. 25GP034, leg. M. Seizmair & A. Ishag, prep. M. Seizmair, coll. ZSM. Paratypes: 2 ♂, 1♀, Saudi Arabia, Province Jizan, Fayfa Mts, Al Kashah, 17.239321˚, 43.068696˚, 830 m, 24-II-2025, slide no 25GP035, 25GP038, 25GP039, leg. M. Seizmair & A. Ishag, coll. CSM, 1♀, same collection data as for holotype, slide no. 25GP037, prep. et coll. M. Seizmair, 1♀, Oman, Province Dhofar, Jabal Samhan, Viewpoint, 1400 m, 06-XI-2021, slide no. 22GP011, leg., prep., coll. CSM.

External characters (Figure 2(A), Figure 4(A), Figure 4(B)): Wingspan male: 21.1 mm - 24.5 mm, forewing length male: 10.5 mm - 13.0 mm, wingspan female: 21.0 mm - 23.7 mm, forewing length female: 10.3 mm - 11.7 mm. Head: Antenna in both sexes greyish-white in the shaft and in the ciliae, yellowish in the flagellum. Proboscis, frons and vertex white-scaled, with the vertex interspersed with darkish-brown scales in both sexes. Labial palpus in both sexes with a strongly broadened ventral tuft of white scales in segment 1, in segments 2 and 3 with blackish scales, which are interspersed with darkish-grey to light brown scales in segment 3, dorso-laterally with yellowish-brown scales, total length relative to the diameter of the eye 0.77 ± SD 0.02 (n = 4), medially dilated, ratio maximum width/maximum length 0.76 ± SD 0.05 (n = 4). Maxillary palpus darkish-brown to blackish in all segments, 0.4 times wider than long (n = 4), length relative to the length of the labial palpus 0.29 ± SD 0.06 (n = 3). Thorax: Venter with long yellowish-brown scales, dorsum white scaled. Forewing 2.15 times longer than wide in the male, 2.25 times longer than wide in the female, apex pointed, tornus edged. Upperside ground greyish-brown, subterminal area with darkish-brown fasciae. Presence of darkish-brown basocellular and discocellular spots, with the discocellular spot ovate in shape, the basocellular spot marked as a small transversal stroke. Anal border with a basal black spot. Antemedial and postmedial lines concolorous with the cell spots, both developing from the costa, where they are dilated. Antemedial line running oblique, angulated outwards at CuA1. Postmedial line bare from interruption, with an outward curvature towards to the termen at M1, an inward curvature towards the basis at M3, which is followed by a right-angled turn to-

wards the anal border and a further outward angulation at CuA2. Terminal line darkish-brown, interrupted, reduced to a series of interneural strokes. Fringe greyish-brown. Hindwing 1.1 times longer than wide in the male, 1.3 times longer than wide in the female, apex rounded, tornus edged. Presence of a black orbiform ante-medial spot. Medial line concolorous with the forewing postmedial line, developing immediately from the costa, curved outwards at M1, with a further inward curvature at M3, which is followed by a right-angled turn towards the anal border. Between the curvatures, the line runs straight. Postmedial line marked as a broadened band developing from the costa, running straight to M3, from where it is curved parallel with the termen, with a further angulation near CuP. The undersides of both wings are identical with the uppersides. Legs greyish-scaled in the femur, in the tibia and in the spurs. In the male, the anterior end of the tibia is dilated and covered with blackish scales. Abdomen: Venter and segments in the dorsum greyish-white, dorsal intersegmental scaling yellowish-brown, with a yellowish-brown anal tuft in the male. Presence of lateral black spots at segment 2.

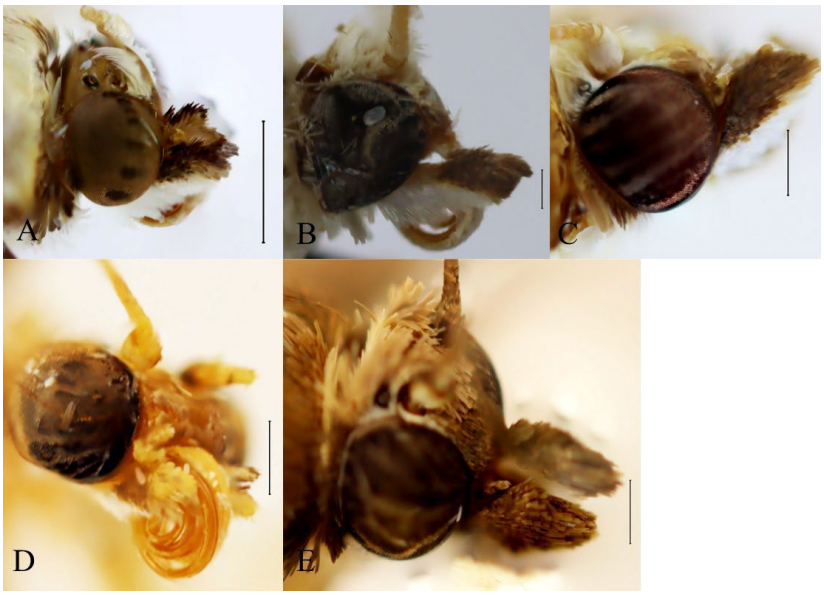

Figure 2. External characters, head profiles. (A) *Herpetogramma nigripalpalis* **sp.n.**, male paratype, slide no. 25GP035. (B) *Herpetogramma digitalis* **sp.n.**, male holotype, slide no. 22GP010. (C) *Herpetogramma dilatalis* **sp.n.**, male paratype, slide no. 22GP036. (D) *Herpetogramma lunatalis* **sp.n.**, female holotype, slide no. 24GP012. (E) *Herpetogramma undularis* **sp.n.**, female holotype, slide no. 25GP047. Scale bars A = 0.5 mm, (B)-(E) = 0.25 mm.

Male genitalia (Figure 1(B), Figure 3(B)): Uncus with lateral tufts of long chaetae covering the post-basal and distal areas, basally sub-triangular-shaped, post-basally sclerotized and slender, constant in width, length relative to the length of the tuba analis 0.56, 2.2 limes longer than wide. Sub-scaphium absent. Pseudognathos present, maximum length equal with the maximum width, composed of lateral arms, which are acuminate, of sub-triangular shape, and a medial posteriad-directed lobar extension. Valva elongate, narrow, four times longer than

wide. Apex medially rounded. Costa basally narrow, unprojected, straight, post-basally strongly convex, weakly sclerotized, distal portion strongly tapered, terminating in the posterior sixth of the valva. Fibula strongly tapered and slightly convex in its posterior third, terminating at the ventral border. Sacculus strongly broadened in its basal portion, medially projected, distal portion strongly tapered, bare from process. Transtilla arms elongate, acuminate, of sub-triangular shape, in contact. Juxta bi-lobed, with the lobes posteriad-directed, acuminate, basis rounded, strongly sclerotized, with an elongate, pencil-shaped process ranging from the basis to the pseudognathos. Vinculum narrowed, with medially dilated lateral lobes. Saccus v-shaped, ventro-apically extended by an elongate protruding keel. Phallus eight times longer than wide, constant in width, coecum rounded, vesica with extensive strongly sclerotized areas and several granulated strips. Ductus ejaculatorius elongate, weakly sclerotized. Bulba ejaculatoria bare from sclerotization, 3.5 times longer than wide.

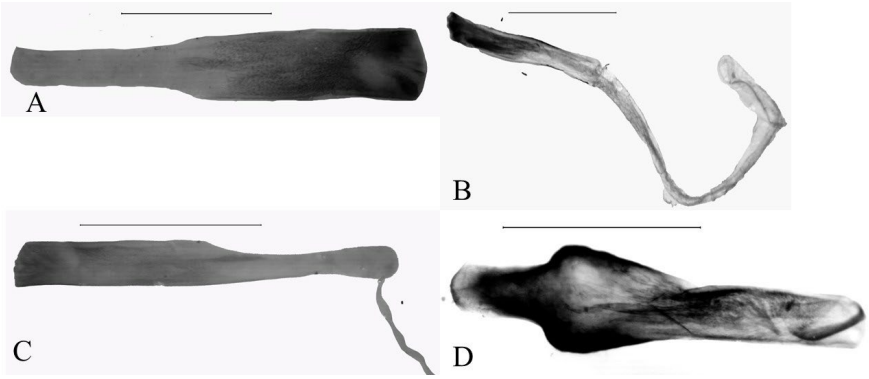

Figure 3. Male genitalia, phallus. (A) *Herpetogramma debilis* Seizmair, 2021, male holotype, slide no. GPPYR1519. (B) *Herpetogramma nigripalpalis* **sp.n.**, male paratype, slide no. 25GP035. (C) *Herpetogramma digitalis* **sp.n.**, male holotype, slide no. 22GP010. (D) *Herpetogramma dilatalis* **sp.n.**, male holotype, slide no. 25GP040. Scale bars = 1.0 mm.

Female genitalia (Figure 5(A), Figure 5(D)): Papilla analis narrowed, five times longer than wide, chaetae short. Posterior and anterior apophyses constant in width, unprojected. Posterior apophyses straight. Anterior apophyses angulated in the posterior fifth, strongly elongated, length relative to the length of the posterior apophyses 1.7. Ductus bursae membranous in the posterior three quarters, the first two quarters slender, the third quarter dilated, with the anterior quarter strongly tapered and strongly sclerotized. Corpus bursae strongly elongated, five times longer than wide, constricted and tapered in the posterior and anterior fifths. Signum near the posterior constriction, with a deciduous transversal sclerite at the basis, transversal axis 1.4 times longer than the longitudinal axis. Widened areas above and below the posterior constriction granulated, with weak lateral sclerotization.

Tympanal organs (Figure 6(A)): Bulla tympani invaginated, venula prima and venula secunda well developed, venula prima short, strongly sclerotized, running

oblique, venula secunda running straight, paralleled with the body axis. Pons tympani strongly sclerotized. Tympanal processes present, acuminate, of sub-triangular shape.

Diagnosis (Table 1): The closest relatives of the new species are *Herpetogramma basalis* (Walker, 1866), *Herpetogramma juba* Shaffer & Munroe, 2007 and *Herpetogramma debilis* Seizmair, 2021, with which it shares the following character states: The forewing terminal line is interrupted, reduced to a series of interneural spots, in the male genitalia, the juxta is bilobed and processed. The diagnostic character states in wing maculation, male and female genitalia are given in Table 1.

Table 1. *Herpetogramma nigripalpalis* **sp.n.**-diagnostic character states.

	H. nigripalpalis **sp.n.**	*H. basalis*	*H. juba*	*H. debilis*
External characters (wing maculation)				
Presence of an outward angle opened towards the termen in the forewing antemedial line (0 = absent, 1 = present)	1	0	0	0
Male genitalia				
Shape of the juxta process (0 = stout, trapezoid, 1 = posteriorly tapered, acuminate)	1	0	1	1
Length of the juxta process (0 = terminating below the transtilla, 1 = terminating at the transtilla, 2 = reaching beyond the transtilla up to the pseudognathos)	2	0	0	1
Shape of the juxta lobes (0 = rounded, 1 = acuminate)	1	0	0	0
Shape of the valva—ratio length/maximum width (0 = <3.3, 1 = >3.6 and <4.0, 2 = ≥4.0	2	1	1	0
Shape of vinculum/saccus (0 = vinculum and saccus narrowed, triangular-shaped, 1 = vinculum widened, saccus narrowed)	0	1	0	1
Shape of the posterior phallus (0 = slightly rounded/flattened, 1 = acuminate)	0	1	0	0
Sclerotization of the vesica (0 = several fine sclerotized strips differing in length and an extensive granulated area on the vesical surface, posterior ridge weakly sclerotized, 1 = posterior ridge weakly sclerotized, vesical surface with two patches of short sclerotized strips laterally and several elongate granulated strips, 2 = posterior ridge weakly sclerotized, vesical surface with several elongate granulated strips and one short strongly sclerotized strip at the anterior end of the vesica, 3 = posterior ridge and entire vesical surface strongly sclerotized	3	0	2	1
Female genitalia				
Shape of the anterior apophyses (0 = constant in width, anterior end excurved, 1 = medially dilated, bare from angulation)	0	1	1	-
Sclerotization and shape of the ductus bursae (0 = constant in width, slender, membranous, anterior end at the transition to the ductus bursae sclerotized, 1 = membranous, constricted and sclerotized in the anterior fifth, 2 = posterior half slender, third quarter dilated, anterior half again constricted and strongly sclerotized	2	1	0	-

Continued

Shape of the corpus bursae—presence of a constriction in the posterior fifth, splitting the corpus bursae into two widened parts (0 = absent, posterior quarter narrowed, immediately followed by a widened portion, 1 = present, resulting in a constricted portion and two widened portions, respectively above and below)	1	0	0	-
Sclerotization of the signum (0 = marked as two broadened, elongated, anteriad-directed lateral sclerites developing from the anterior half, 1 = marked as a denticulate granulated ridge, 2 = marked as a broad transversal sclerite	2	0	1	-

Bionomics: The type material was collected in vegetation dense slopes and terraces on the border of tropical rain forest. The premature stages, host plant selection and voltinity are subject to further research.

Distribution (Figure 7): The new species is known only from the type material collected on the southern Arabian Peninsula—southern Oman (prov. Dhofar), south-western Saudi Arabia (prov. Jizan).

Etymology: The epitheton refers to one of the diagnostic character states, the blackish scaling in the labial palpus (lat.: niger = black).

***Herpetogramma digitalis* sp.n.**

Zoobank ID: 1522B46E-D88B-4154-B809-887E1D9304FA

Material: Holotype, ♂, Oman, Province Dhofar, Jabal Al Qamar, 20 km E Sarfayt, Road 47, 16.7061889, 53.146038888, 800m, 02-XI-2021, slide no. 22GP010, leg. et prep. M. Seizmair, coll. ZSM. Paratypes: 1 ♂, Oman, Province Dhofar, 4 km W Dhalkuth, 16.690525, 53.179405555, 300 m, 04-XI-2021, slide no. 22GP001, leg., prep. M. Seizmair, coll. CMS, 1 ♀, Saudi Arabia, Province Jizan, Fayfa Mts., Ayban Belghazi, 17.263405˚, 43.076147˚, 660 m, 22-IX-2022, slide no. 23GP027, leg., prep. M. Seizmair, coll. CMS.

External characters (Figure 2(B), Figure 4(C), Figure 4(D)): Wingspan male: 22.0 - 24.8 mm, forewing length male: 10.7 - 12.0 mm, wingspan female: 24.2 mm, forewing length female: 11.53 mm. Head: Antenna greyish-white in the shaft and in the ciliae, yellowish in the flagellum. Vertex and frons covered with greyish-yellowish scales. Labial palpus elongate, narrowed in segment 1 and posterior half of segment 2, strongly widened and rectangular-shaped in segment 3, 2.3 times longer than wide, length relative to the diameter of the eye 0.8, segment 1 and posterior half of segment 2 yellowish, anterior half of segment 2 and segment 3 covered with darkish brown scales, which in segment 2 exceed the dorsal border, interspersed with yellowish-brownish scales, ventral border extended with a broad tuft of greyish-white scales. Maxillary palpus elongate, narrow, six times longer than wide, length relative to the length of the labial palpus 0.64, ventrally darkish-grey, dorsally darkish-brown. Thorax: Dorsum and venter greyish, tegula yellowish-grey. Forewing 2.3 longer than wide, apex down-turned, pointed, termen convex at M3, tornus edged. Upperside ground brownish-grey. Costa with a darkish-brown stripe terminating at the posterior end of the cell. Presence of darkish-brown basocellular and discocellular spots, with the discocellular spot reniform

and greater than the orbiform basocellular spot. Antemedial and postmedial lines concolorous with the cell spots. Antemedial and postmedial lines developing from the costa, where they are both slightly dilated. Antemedial line slanted towards M1, from where it is straight up to a slight angulation at CuA1. Postmedial line serrate, slightly interrupted, with an outward curvature at M1, an inward curvature at M3, which is followed by a right-angled turn towards the anal border and a further outward angulation near CuA2. Terminal line reduced to a series of brownish interneural spots. Fringe yellowish-brown. Hindwing 1.4 times longer than wide in the male, 1.2 times longer than wide in the female, apex rounded, tornus edged. Ground concolorous with the forewing ground. Presence of a darkish-brown antemedial spot. Medial and postmedial lines concolorous with the forewing lines, identical in shape with the hindwing lines in *H. nigripalpalis* **sp.n.** Terminal line and fringe as for the forewing. The fore- and hindwing undersides are identical with the uppersides. Legs dorsally grey-scaled, ventrally yellowish brown, forelegs with an extensive darkish-brown anterior tibial spot. Abdomen: Venter and dorsal segments greyish-white, dorsum inter-segmentally greyish-yellowish, segment 2 with a black lateral spot.

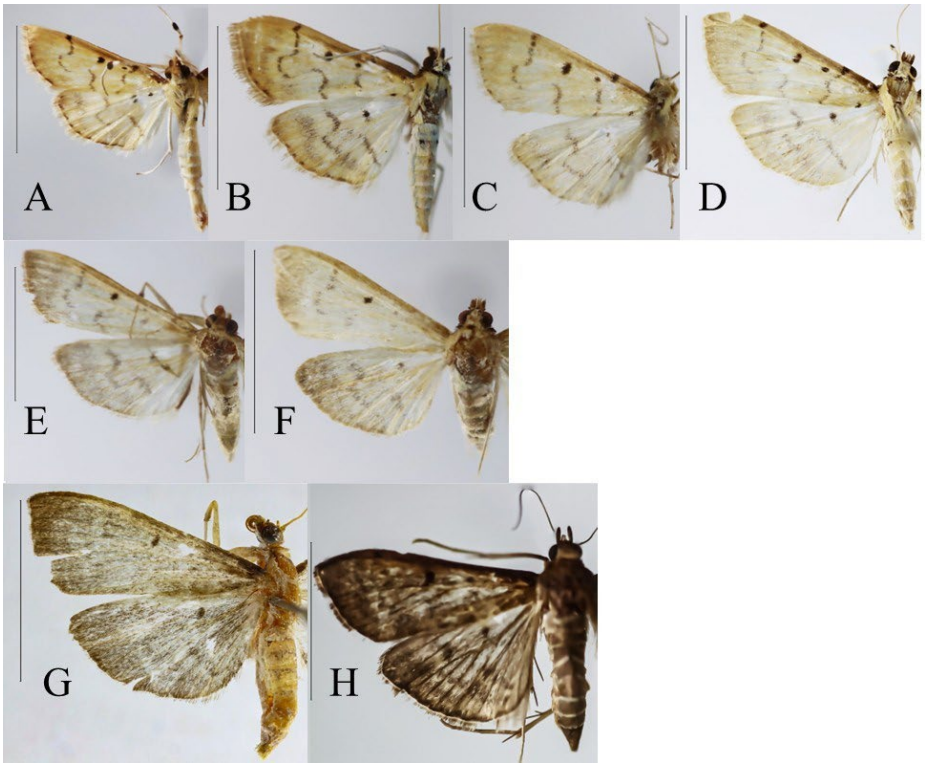

Figure 4. External characters, adults, dorsal view. (A) (B) *Herpetogramma nigripalpalis* **sp.n.**, A: male holotype, slide no. 25GP034, B: female paratype, slide no. 25GP039. (C) (D) *Herpetogramma digitalis* **sp.n.**, C: male holotype, slide no. 22GP010, D: female paratype, slide no. 23GP027. (E) (F) *Herpetogramma dilatalis* **sp.n.**, € male holotype, slide no. 25GP040, (F) female paratype, slide no. 25GP041. (G) *Herpetogramma lunatalis* **sp.n.**, female holotype, slide no. 24GP012. (H) *Herpetogramma undularis* **sp.n.**, female holotype, slide no. 25GP047. Scale bars = 10 mm.

Male genitalia (Figure 1(C), Figure 3(C)): Uncus basally sub-triangular-shaped, post-basally slightly broadened, distally tapered, with the lateral chaetae becoming distally shorter, 2.0 times longer than broad, length relative to the tuba analis 0.58, basis medially with a small digitiform process. Scaphium and subscaphium absent. Pseudo-gnathos with the lateral arms and the lobar extension broad and rounded, 1.8 times wider than long. Valva 3.7 times longer than wide. Costa strongly convex, weakly sclerotized, distal process terminating in the posterior fifth of the valva. Apex medially rounded. Ventral border straight. Fibula present, strongly tapered and convex in the posterior third, ranging to the ventral border of the valva. Basal and post-basal sacculus equal in width, post-basal sacculus projected. Juxta bi-lobed, with the lobes weakly sclerotized and acuminate, with an elongate, slender process ranging to the pseudognathos. Transtilla arms elongate, sub-triangular shaped, in contact. Vinculum sub-triangular shaped, narrow, vinculum lobes constant in width, unprojected, saccus v-shaped, bare from ventro-apical extension. Vesical surface of the phallus with granulated strips, weakly sclerotized at the posterior end, bare from strong sclerotization. Coecum membranous, anteriorly rounded. Ductus ejaculatorius membranous, slender, inserted at the anterior end of the coecum.

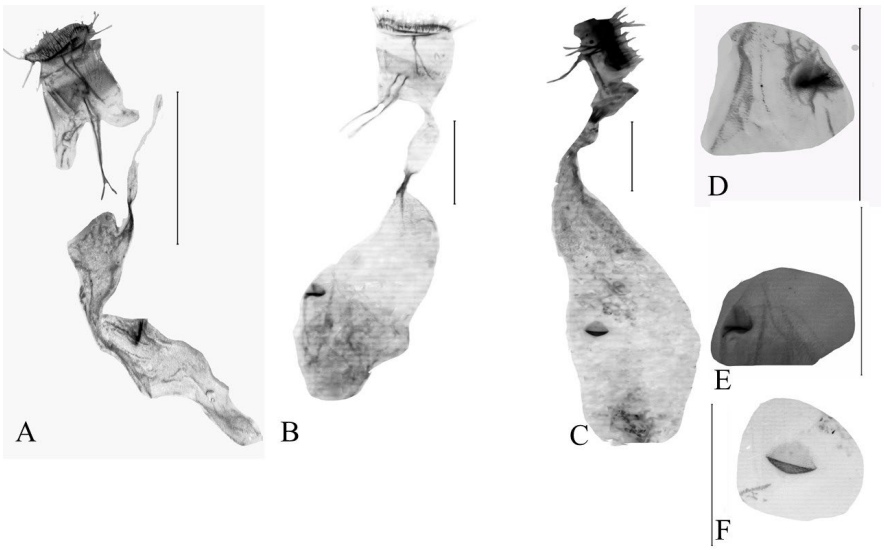

Figure 5. Female genitalia. (A) (D) *Herpetogramma nigripalpalis* **sp.n.**, female paratype, slide no. 22GP011. (B) (E) *Herpetogramma digitalis* **sp.n.**, female paratype, slide no. 22GP027. (C) (F) *Herpetogramma dilatalis* **sp.n.**, female paratype, slide no. 25GP041. (A)-(C) capsule. (D)-(F) signum. Scale bars = 1 mm.

Female genitalia (Figure 5(B), Figure 5(E)): Papilla analis strongly narrowed, 4.5 times longer than wide, dorsum covered with fine chaetae. Posterior apophyses very slender, constant in width, unprojected, straight. Anterior apophysis equal in width with the posterior apophyses, slightly dilated in the posterior fourth, elongate, 2.2 times longer than the posterior apophyses, medially slightly bent. Antrum membranous. Ductus bursae strongly tapered in the posterior

fourth, medially with a bulbous dilation making up 65 % of the total length, anterior fourth again strongly narrowed and strongly sclerotized, with the remaining parts membranous. The transition from the ductus bursae to the corpus is smooth, with the anterior ductus bursae and the posterior corpus bursae equal in width. Corpus bursae bulbous in shape, medially dilated, strongly constricted in the anterior fourth. Signum sub-triangular shaped, transversal axis 1.1 times longer than the longitudinal axis, anterior fourth strongly sclerotized along the transversal axis.

Tympanal organs (Figure 6(B)): Venula prima elongate, running oblique. Venula secunda weakly sclerotized, running straight, parallel with the body axis, length relative to the length of the venula prima 60%. Bulla tympani invaginated. Rama tympani present. Pons tympani widened, weakly sclerotized. Processi tympani present, acuminate, posteriad-directed.

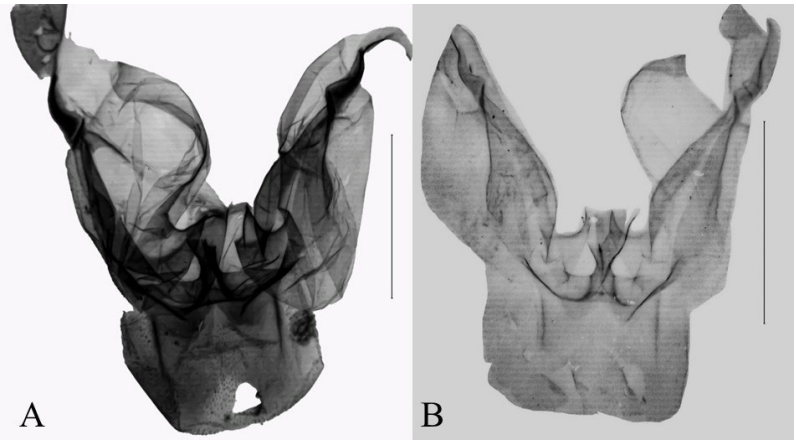

Figure 6. Tympanal organs. (A) *Herpetogramma nigripalpalis* **sp.n.**, male paratype, slide no. 25GP036. (B) *Herpetogramma digitalis* **sp.n.**, slide No. 22GP010. Scale bars = 1.0 mm.

Diagnosis: Characters in the male genitalia—in particular the bilobed and processed juxta—place *H. digitalis* **sp.n.** into the species group comprising *H. nigripalpalis* **sp.n.**, *H. basalis*, *H. juba* and *H. debilis*. *H. digitalis* **sp.n.** is unique in this species group by the presence of a small digitiform process in the basal uncus. *H. digitalis* **sp.n.** is closest to *H. nigripalpalis* **sp.n.** in the male genitalia. The two species are differentiated from the other members of the species group in the elongated process of the juxta, which ranges to the pseudo-gnathos. *H. digitalis* **sp.n.** is distinguished from *H. nigripalpalis* **sp.n.** in the following (further) external and internal character states: Presence of blackish scaling in the labial palpus: absent in *H. digitalis* **sp.n.**, present in *H. nigripalpalis* **sp.n.**. Ratio length/width of the valva: <4.0 in *H. digitalis* **sp.n.**, >4.0 in *H. nigripalpalis* **sp.n.**, Presence of a ventro-apical extension in the saccus: absent in *H. digitalis* **sp.n.**, present in *H. nigripalpalis* **sp.n.** Shape of the posterior apophyses in the female genitalia– presence of lateral angulation: absent in *H. digitalis* **sp.n.**, present in *H. nigripalpalis* **sp.n.** Length and shape of the ductus bursae: tapered portion posteriad from the dilation significantly longer in *H. nigripalpalis* **sp.n.** than in *H. digitalis* **sp.n.** the dilation making up 65% of the total ductus bursae in *H. digitalis* **sp.n.**, 25% in *H.*

nigripalpalis. Shape of the ductus bursae: Two strong constrictions present in *H. nigripalpalis* sp.n., one (anterior) constriction present in *H. digitalis* **sp.n.**

Bionomics: The type habitat and the research status with respect to premature stages, ecology and abundancy are the same as for *H. nigripalpalis* **sp.n.**.

Distribution (Figure 7): The new species is known only from the type material collected on the southern Arabian Peninsula—southern Oman (prov. Dhofar), south-western Saudi Arabia (prov. Jizan).

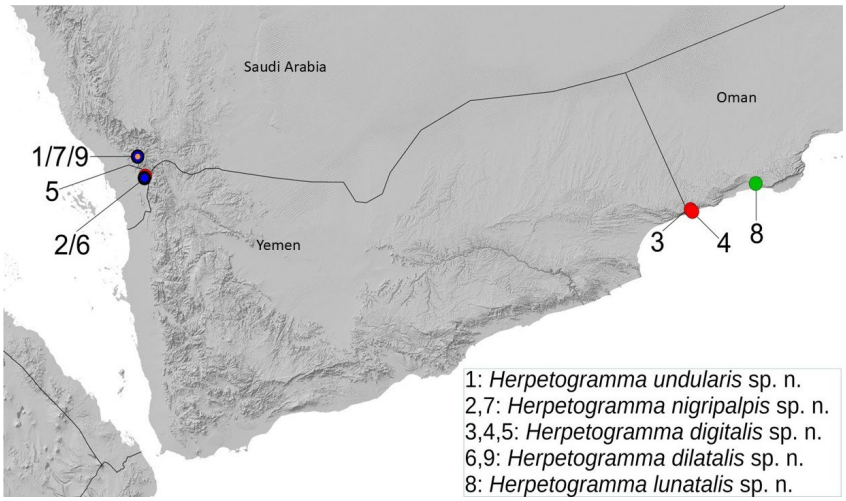

Figure 7. Distribution of the newly described species of *Herpetogramma* Lederer, 1863.

Etymology: The epitheton refers to one of the differential character states in the male genitalia, namely the small digitiform process in the basal uncus (lat.: digitus).

***Herpetogramma dilatalis* sp.n.**

Zoobank ID: ABA672E6-D579-4A25-BE9C-2635F9FBB25F

Material: Holotype, ♂, Saudi Arabia**,** Province Jizan, Fayfa Mts, Al Kashah, 17.239321˚, 43.068696˚, 830 m, 24-II-2025, slide no. 25GP040, leg. M. Seizmair & A. Ishag, coll. ZSM. Paratypes, 3 ♂, same collection data as holotype, slide no. 25GP036, 25GP043-44, leg. M. Seizmair & A. Ishag, coll. CMS, 1 ♀, Saudi Arabia**,** Province Jizan**,** Wadi Lajb, Khatwat Al Ain, 17.5907806˚, 42.9322388˚, 1350 m, 23-II-2025, slide no. 25GP041, leg. M. Seizmair & A. Ishag, coll. CMS.

External characters (Figure 2(C), Figure 4(E), Figure 4(F)): Wingspan male: 22.8 mm - 26.8 mm, forewing length male: 10.0 mm - 14.6 mm, wingspan female: 20.0 mm, forewing length female: 10.1 mm. Head: Antenna in both sexes greyish-white in the shaft and in the ciliae, brownish-ochreous in the flagellum, shaft short, strongly dilated. Vertex, frons and proboscis covered with white scales, frons interspersed with yellowish scales. Labial palpus twice as long as wide, length relative to the diameter of the eye 0.8 in both sexes, of sub-triangular shape, first segment with darkish-brown scales, segments 2 and 3 with darkish-yellowish to brownish scales, ventral border with greyish-white scales. Maxillary palpus filiform, yellowish brown in segments 1 - 3, greyish-white in segment 4, length rela-

tive to the length of the labial palpus 0.2. Thorax: Venter and dorsum covered with greyish scales. Forewing twice as long as wide, apex rounded, termen slightly convex at CuA1, tornus edged. Upperside ground greyish-yellowish, costa with a darkish-brown stripe terminating near the apex, postmedial area with darkish-grey, subterminal area with darkish-brown fasciae. Presence of one darkish-brown reniform discocellular spot. Antemedial and postmedial lines interrupted, blurred, darkish-grey. Postmedial line slightly serrate, curved outwards towards the termen at M2, curved inwards at CuA1, followed by a right-angled turn towards the anal border, with another inward directed angulation at 1A + 2A. Terminal line greyish-brown. Fringe darkish-brown. Hindwing 1.4 times as long as wide, apex rounded, tornus edged. Ground and postmedial, subterminal fasciae as for the forewing. Medial line darkish-grey, with an outward angle at M1, an inward directed curvature at CuA1, with a right-angled turn towards the anal border, terminating at 1A + 2A. Presence of a small antemedial darkish-grey spot. Terminal line and fringe as for the forewing. Anal border with an elongate tuft of darkish-brown fasciae. The fore-and hindwing undersides are identical with the uppersides. Fore- and midleg in the dorsal femur with greyish scales, in the ventral femur and in the tibia yellowish-brown, tibia anteriorly with a darkish-brown dilation. Hindleg in the procoxa darkish-brown, in the femur and in the tibia covered with greyish scales. Abdomen: Dorsum and venter greyish, male with a yellowish-greyish anal tuft.

Male genitalia (Figure 1(D), Figure 3(D)): Uncus basally of triangular shape, short and narrow, post-basally elongate and constant in width, distally dilated and with the chaetae short, scaphium present, marked as a slender, rod-shaped sclerite ranging from the basis into the post-basal area. Tuba analis equal in length with the uncus, bare from subscaphium. Valva three times longer than wide (n = 4, SD ± 0.23). Costal border strongly convex and strongly sclerotized, distal process terminating in the distal sixth of the valva. Ventral border slightly concave. Apex medially rounded, bare from fibula. Sacculus basally strongly widened and sclerotized, post-basally with a dorsal posteriad-directed projection, bare from distal process. Juxta simple, of rhomboid shape, elongate ranging beyond the transtilla arms, twice as long as wide. Transtilla arms of sub-rectangular shape, dorso-laterally with an acuminate, posteriad-directed process. Vinculum narrow, of sub-triangular shape, laterally strongly sclerotized. Saccus narrow, v-shaped, elongate, length relative to the length of the valva 0.25, with ventro-apical extension. Phallus with a strong dilation in the posterior third, which is laterally strongly sclerotized and with granulated strips.

Female genitalia (Figure 5(C), Figure 5(F)): Papilla analis with long chaetae, strongly sclerotized. Posterior apophyses constant in width, unprojected. Anterior apophyses elongate, dilated in the posterior fifth, twice as long as the posterior apophyses. Ductus bursae membranous, widened at the transition to the corpus bursae. Colliculum present. Antrum membranous. Corpus bursae narrowed and granulated in the posterior third. Signum of rhomboid shape, ratio longitudi-

nal/transversal axis 0.8, strongly sclerotized in the anterior third.

Diagnosis: The new species is closest related to *Herpetogramma mutualis* (Zeller, 1852). The two species are distinguished from the species group comprising *H. nigripalpalis* **sp.n.**, *H. juba*, *H. basalis*, *H. debilis*, in the simple, rhomboid shaped juxta. The new species is differentiated from *H. mutualis* in the following character states: Presence of darkish-grey fasciae in the fore- and hindwing postmedial area—present in the new species, absent in *H. mutualis*, presence of a small basocellular spot in the forewing—absent in the new species, present in *H. mutualis*, shape of the distal uncus in the male genitalia—dilated in the new species, constant in width in *H. mutualis*, shape of the transtilla arms—sub-rectangular shaped and projected in the new species, sub-triangular shaped, unprojected in *H. mutualis*, shape of the juxta—rhomboid, laterally projected, ranging beyond the transtilla in the new species, plate-shaped, bare from lateral projection, terminating below the transtilla in *H. mutualis*, presence of fibula in the basal valva—absent in the new species, present in *H. mutualis*, shape of the saccus—elongate, with ventro-apical extension in the new species, short, bare from ventro-apical extension, presence of dilation in the posterior phallus—present in the new species, absent in *H. mutualis*.

Bionomics: The type material was collected in a vegetation dense slope on the border of tropical rain forest. The premature stages, food plant selection and voltinity are subject to further research.

Distribution (Figure 7): The new species is known only from the type material collected in south-western Saudi Arabia (prov. Jizan).

Etymology: The epitheton refers to one of the differential character states in the male genitalia, the dilation in the posterior portion of the phallus.

***Herpetogramma lunatalis* sp.n.**

Zoobank ID: DF539F98-F074-484E-9D1A-66620EEAE656.

Material: Holotype, ♀, Oman, Province Dhofar, Ayn Athoum Waterfalls, 17.1182222˚, 54.366538888, 273 m, 06-XI-2021, slide no. 24GP012, leg. M. Seizmair, coll. ZSM.

External characters (Figure 2(D), Figure 4(G)): Wingspan: 22.6 mm, forewing length: 11.1 mm. Head: Antenna grey-scaled in the shaft and in the ciliae, ochreous in the flagellum, shaft short, widened, 1.3 times wider than long. Frons and vertex with darkish-brown to fuscous scaling. Labial palpus porrect, 1.7 times longer than wide, length relative to the diameter of the eye 0.68, segments 1 and 2 with very short darkish-fuscous scales sporadically interspersed with darkish-grey scales, ventral border extended by an elongated tuft of greyish-white scales, segment 3 retracted in segment 2, with yellowish-brownish scales. Maxillary palpus broadened, truncate, three times longer than wide, length relative to the length of the labial palpus 0.53, segments 1 - 3 brownish-yellowish, tip of segment 4 greyish-white. Thorax: Dorsum, venter and tegula with darkish-grey to brownish scales. Forewing twice as long as wide, apex rounded, termen convex at CuA2, tornus edged. Upperside ground darkish-grey to brown. Presence of a blackish costal

stripe ranging from the basis to the antemedial area and of a darkish brown claviform discocellular spot. Postmedial line darkish-brown, interrupted, blurred, weakly contrasted from the ground, with a right-angled curvature towards the basis at M3, with a further right-angled turn towards the anal border below the discocellular spot, with the section between the turns undulated. Fringe darkish-brown. Hindwing 1.2 times longer than wide, apex and tornus rounded. Ground concolorous with the forewing ground. Presence of a reniform darkish-brown midcellular spot. Medial line strongly blurred, developing from the costa, with a slight inward angulation at M2, with an inward right-angled curvature at CuA2 and another right-angled turn towards the anal border below the middle of the cell. Fringe concolorous with the forewing fringe. The fore- and hindwing undersides are identical with the uppersides. Legs greyish-yellowish, posterior femur darkish brown. Abdomen: Venter covered with greyish scales. Dorsum in the segments darkish-brown, inter-segmentally yellowish, with a yellowish-grey anal tuft.

Male genitalia: The male genitalia are unknown.

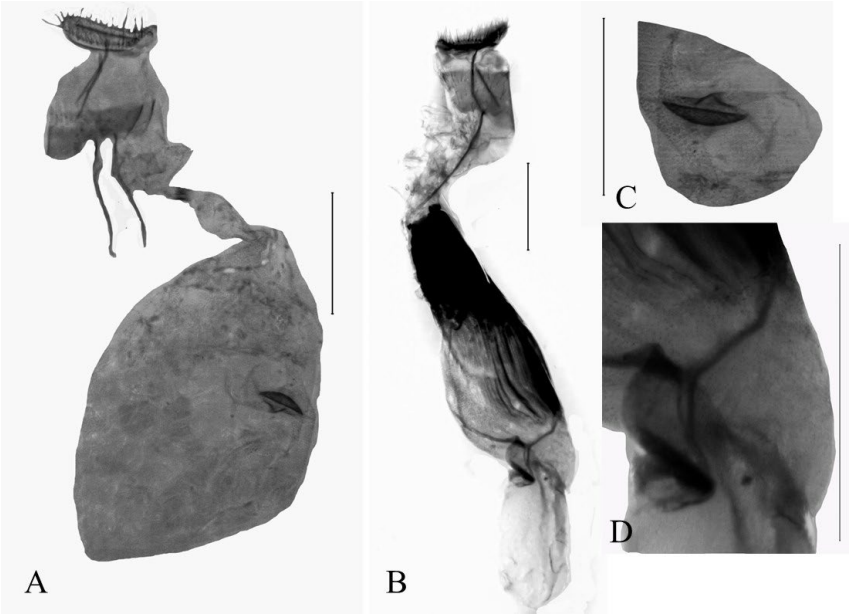

Figure 8. Female genitalia. (A) (C) *Herpetogramma lunatalis* **sp.n.**, female holotype, slide No. 24GP012. (B) (D) *Herpetogramma undularis* **sp.n.**, female holotype, slide No. 25GOP047. (A) (B) capsule, (C) (D) signum. Scale bars = 1 mm.

Female genitalia (Figure 8(A), Figure 8(C)): Papilla analis 3.5 times longer than wide, with fine, long chaetae. Posterior apophyses constant in width, unprojected, straight. Anterior apophyses projected in the posterior third, 1.8 times longer than the posterior apophyses. Antrum widened, membranous. Ductus bursae membranous, medially with a bulbous dilation, anteriorly narrowed. Colliculum present, fully sclerotized, its length making up 10% of the total length of the ductus bursae. Corpus bursae ovate, elongate and strongly widened, 1.6 times longer than wide, 3.5 times longer than the ductus bursae. Posterior half granu-

lated. Signum crescent-shaped, transversal axis 2.5 times longer than the longitudinal axis, posterior half strongly sclerotized, ventral border straight and with a rounded medial projection.

Tympanal organs: The tympanal organs are unknown.

Diagnosis: The new species is closest related to the Afrotropical *Herpetogramma brunnealis* (Hampson, 1913) externally and in the female genitalia. The two species are distinguished from the further externally similar *Herpetogramma licarsisalis* (Walker, 1859) and *Herpetogramma viraktamathi* Shankaramurthy & Nagaraj, 2025 in the female genitalia by the presence of a colliculum and the absence of sclerotization in the ductus bursae, and in the shape of the widened anterior ductus bursae. The four species are furthermore distinct from the further externally similar *Herpetogramma phaeopteralis* (Guenée, 1854) in the presence of a signum in the corpus bursae wall, which is absent in *H. phaeopteralis* [3].

The new species is externally distinguished from *H. brunnealis* in the absence of a white terminal line in the fore- and hindwing, in the presence of yellowish scaling in segment 3 and of white scaling in segment 4 in the maxillary palpus.

In the female genitalia, the new species is differentiated from *H. brunnealis* in the following character states: Shape of the ductus bursae: medially dilated, anteriorly strongly narrowed in the new species, constant in width, anteriorly slightly widened in *H. brunnealis*, length of the corpus bursae relative to the ductus bursae: 3.5 in the new species, 5.2 in *H. brunnealis*—the corpus bursae is shorter and the ductus bursae is longer in the new species than in *H. brunnealis*. Shape of the signum—ratio length of the transversal axis/length of the longitudinal axis: 2.5 in the new species, 1.8 in *H. brunnealis*, *i.e.* the signum is transversally longer, longitudinally shorter, more condensed than in *H. brunnealis*, ventral border bulged, constantly rounded, unprojected in *H. brunnealis*, ventral border, straight, medially projected in the new species.

Bionomics: The type specimen was collected in a densely vegetated mountainous slope at medium altitude. The premature stages, foodplant usage, ecology and abundancy are subject to further research.

Distribution (Figure 7): The new species is known only from the type material collected in southern Oman (prov. Dhofar).

Etymology: The epitheton refers to one of the diagnostic character states in the female genitalia, the crescent shape of the signum (lat. luna).

***Herpetogramma undularis* sp.n.**

Zoobank ID: 31B44B70-90C2-4CD9-A2FD-BC88E8151406.

Material: Holotype, ♀, Saudi Arabia, Province Jizan, Wadi Lajb, Khatwat Al Ain, 17.5907806, 42.93223888, 1350 m, 23-II-2025, slide no. 25GP047, leg. M. Seizmair & A. Ishag, coll. ZSM.

External characters (Figure 2(E), Figure 4(H)): Wingspan: 32.3 mm, forewing length: 14.8 mm. Head: Antenna grey-scaled in the shaft and in the ciliae, flagellum yellowish-brown, shaft strongly shortened. Vertex with long greyish scales, frons with short darkish-brown scales. Labial palpus porrect, sub-triangular

shaped, equal in length with the diameter of the eye, 2.5 times longer than wide, second segment dilated, third segment elongate, with short darkish fuscous scales sporadically interspersed with yellowish-grey scales, ventro-laterally with darkish-grey scales. Maxillary palpus obliquely upturned, shortened, truncate, length relative to the length of the labial palpus 0.2, darkish-fuscous, tip of segment 4 darkish-yellowish. Thorax: Dorsum and tegula darkish-brown to blackish. Venter greyish-brown. Forewing sub-triangular shaped, 2.5 times longer than wide. Apex down-turned, pointed. Tornus edged. Costa convex near the apex. Termen slightly concave at CuA1. Upperside ground darkish-grey to brownish, with darkish brown subcostal and subterminal fasciae. Presence of a black costal stripe ranging from the basis up to the apex. Presence of a black reniform discocellular spot and a smaller concolorous orbiform basocellular spot. Postmedial line darkish-brown, blurred, weakly contrasted from the ground, developing from the costa, with a slight inward angulation, a right-angled turn at CuA1 towards the medial area below the discocellular spot, and a further right-angled turn towards the anal border, broadened, interrupted, serrate between the costa and M2, strongly tapered and undulated between M2 and the first right-angled turn, straight from the first right-angled turn onwards. Antemedial line concolorous with the post medial line, strongly interrupted and blurred. Termen blackish. Fringe darkish-brown, basally interspersed with yellowish-white. Hindwing 1.4 times longer than wide. Apex pointed. Tornus edged. Presence of darkish-brown equally sized orbiform basocellular and discocellular spots. Postmedial line darkish-brown to blackish, serrate, with a right-angled turn towards the basis at CuP. Presence of blackish subterminal fasciae. Termen greyish. Fringe brownish, at the tornus and at the anal border with elongate and darkish-grey setae. Legs dorsally with darkish-brown scales at the anterior procoxa, yellowish ochreous to greyish-brown at the posterior procoxa, at the femur and at the tibia, ventrally with greyish-white scales. Abdomen: Dorsum with greyish-white segments, inter-segmentally with darkish-brown scales. Venter greyish-white.

Male genitalia: The male genitalia are unknown.

Female genitalia (Figure 8(B), Figure 8(D)): Papilla analis narrowed, dorsally with short, fine chaetae. Posterior apophyses well developed, constant in width, unprojected, straight. Anterior apophyses strongly elongated, slightly bent, in width constant and equal with the posterior apophyses, 2.4 times longer than the posterior apophyses. Antrum bulbous in shape, membranous. Colliculum absent. Ductus bursae with the posterior end membranous, making up 15% of the total length, the medial part broadened and entirely sclerotized, making up one third of the total length, the posterior half widened relative to the medial part, bulged, strongly granulated, with several rod-shaped sclerites, strongly sclerotized lamellae and a strong lateral sclerotization, transition to the ductus bursae smooth, from a slightly narrowed anterior end to an equally wide posterior corpus bursae. Corpus bursae short, length relative to the length of the ductus bursae 0.4, with granulated and slightly sclerotized areas and the signum near the transition to the ductus bursae, which is composed of a slightly sclerotized orbiform structure and

a broad transversal sclerite at the posterior end.

Tympanal organs: The tympanal organs are unknown.

Diagnosis: The new species is closest to the Oriental *H. viraktamathi* externally and in the female genitalia. The two species share the darkish brown fore-and hindwing ground and the undulated shape of the postmedial line between the first angulation near R2 and the right-angled turn at CuA1. In the female genitalia, the two species share the strongly elongated anterior apophyses, the widened ductus bursae, the completely sclerotized areas at the posterior end of the ductus bursae and the extensive areas of sclerotized lamellae along the dorso-lateral border, the absence of colliculum and the presence of signum in the corpus bursae wall.

The new species is externally distinguished from the comparative species in the following character states: presence of dilation in the mid-femora: absent in the new species, present in *H. viraktamathi*, shape of the third segment of the labial palpus: elongate, strongly protruding from the second segment in the new species, recessed into the scales of the second segment in *H. viraktamathi*.

In the female genitalia, the two species are differentiated in the following character states: overall shape of the ductus bursae—anterior two thirds widened, bulged in the new species, constant in width in *H. viraktamathi*, sclerotization of the ductus bursae, extension of the completely sclerotized area relative to the total length of the ductus bursae: 42% in the new species, with strong sclerotization, 33% in *H. viraktamathi*, with weak sclerotization, presence of further sclerites in the ductus bursae—present—marked as several rod-shaped sclerites near the anterior end in the new species, absent in *H. viraktamathi*. Shape of the signum—orbiform with a deciduous transversal sclerite at the posterior end in the new species, longitudinally strongly shortened, narrowed, crescent-shape, with a very fine transversal sclerite medially in *H. viraktamathi*.

Bionomics: The type specimen was collected in a vegetation dense wadi on the verge of tropical rain forest. The premature stages, life cycle, the ecology and abundance are unknown.

Distribution (Figure 7): The new species is known only from the type material collected in south-western Saudi Arabia (prov. Jizan).

Etymology: The epitheton refers to one of the external characters of the new species, the strongly undulated area in the forewing postmedial line (lat.: unda).

3.1.2. Determination Key to the Newly Described Species and to Their Afrotropical and Oriental Relatives (Table 2)

Table 2. Determination key to the newly described Arabian species of *Herpetogramma* and their closest related Afrotropical and Oriental relatives.

1	Fore-and hindwing ground yellowish to light brown…….	2
-	Fore-and hindwing ground darkish-grey to darkish brown……	11
2	Juxta in the male genitalia bi-lobed……..	3
-	Juxta in the male genitalia not bi-lobed, plate- or shield-shaped……..	9

Continued

3	Juxta with pencil-shaped or finger-shaped extension……	4
-	Juxta bare from extension, vinculum short, widened, sub-triangular-shaped, saccus rounded, phallus with the posterior end strongly sclerotized, vesical surface with elongate granulated strips and two short strongly sclerotized patches, fore- and hindwing terminal line straight, continuous,	*Herpetogramma continualis* Shaffer & Munroe, 2007
4	Extension of the juxta ranging up to the pseudo-gnathos	5
-	Extension of the juxta terminating below the pseudo-gnathos	6
5	Small digitiform process present in the basal uncus, ratio length/width of the valva < 4.0, saccus bare from ventro-apical extension, labial palpus bare from black scaling	*H. digitalis* **sp.n.**
-	Basal uncus bare from process, ratio length/width of the valva > 4.0, saccus with ventro-apical extension, labial palpus with black scaling	*H. nigripalpalis* **sp.n.**
6	Extension of the juxta terminating at the transtilla, valva rather short and widened—ratio length/width < 3.3, posterior ridge of the phallus weakly sclerotized, vesical surface with two patches of short sclerotized strips laterally and several elongate granulated strips	*H. debilis*
-	Extension of the juxta terminating below the transtilla	7
7	Extension of the juxta in its posterior end truncate, stout, trapezoid, vinculum widened with the saccus narrowed, vesical surface of the phallus with several fine sclerotized strips differing in length and an extensive granulated area on the vesical surface, posterior ridge weakly sclerotized, ductus bursae in the female genitalia membranous, constricted and sclerotized in the anterior fifth, sclerotization of the signum marked as two broadened, elongated, anteriad-directed lateral sclerites developing from the anterior half	*H. basalis*
-	Extension of the juxta posteriorly strongly tapered, digitiform, phallus with the posterior ridge weakly sclerotized, vesical surface with several elongate granulated strips and one short strongly sclerotized strip at the anterior end of the vesica, ductus bursae in the female genitalia constant in width, slender, membranous, anterior end at the transition to the ductus bursae sclerotized, sclerotization of the signum marked as a denticulate granulated ridge	*H. juba*
8	Vinculum narrowed, triangular-shaped, saccus rounded, phallus with the posterior end strongly sclerotized and the vesica with two deciduous, elongate sclerites, length of the ductus bursae in the female genitalia relative to the length of the corpus bursae 0.5	*Herpetogramma continualis* Shaffer & Munroe, 2007
-	Vinculum strongly widened, quadrangular-shaped, saccus pointed, phallus with the posterior end strongly sclerotized and the vesica with two small sclerotized patches, length of the ductus bursae in the female genitalia relative to the length of the corpus bursae 1.3	*Herpetogramma bipunctalis* (Fabricius, 1794)
9	Valva with presence of a fibula	*H. mutualis*
-	Valva bare from fibula	10
10	Phallus with a strong medial dilation, vesica with the entire posterior portion strongly sclerotized, uncus distally dilated, transtilla trapezoid and projected	*H. dilatalis* ***sp.n.***
-	Phallus bare from dilation, constant in width, vesica with granulated areas, bare from strong sclerotization, post-basal and distal uncus bare from dilation, transtilla band-shaped, unprojected, slender,	*Herpetogramma couteyeni* Guillermet, 2008
11	Corpus bursae wall in the female genitalia with signum	12
-	Corpus bursae wall bare from signum	*H. phaeopteralis*
12	Colliculum present, ductus bursae bare from sclerotization	13
-	Colliculum absent, sclerotization present in the ductus bursae	14

Continued

13	Ductus bursae medially dilated, length of the corpus bursae relative to the ductus bursae < 4.0, signum with the ventral border straight and medially projected,	*H. lunatalis* **sp.n.**
-	Ductus bursae bare from medial dilation, length of the corpus bursae relative to the ductus bursae > 5.0, signum constantly rounded, unprojected	*H. brunnealis*
14	Posterior ductus bursae strongly sclerotized, with the sclerotized area making up 30% - 40% of its length, presence of a lateral area of strongly sclerotized lamellae	15
-	Posterior ductus bursae bare from strong and complete sclerotization, lateral areas of strongly sclerotized lamellae absent	16
15	Femur with medial dilation, third segment of the labial palpus recessed into the scales of the second segment, signum strongly constricted in the longitudinal axis with the medial transversal sclerite very fine	*H. viraktamathi*
-	Femur bare from medial dilation, third segment of the labial palpus protuberant, elongated, signum orbiform, with a broadened, deciduous transversal sclerite at the posterior ridge	*H. undularis* ***sp.n.***
16	Ductus bursae laterally with elongated sclerites, ductus bursae strongly elongated, corpus bursae short, orbicular	*H. licarsisalis*
-	Ductus bursae bare from lateral sclerites, shortened, corpus bursae elongate, ovoid	17
17	Corpus bursae split into a posterior narrowed half, and an anterior widened, ovoid half, signum very small, weakly sclerotized	*Herpetogramma vacherin* Guillermet, 2008
-	Corpus bursae constant in width, signum extensive, medially with a transverse, fine sclerite	*Herpetogramma stultalis* (Walker, 1850)

4. Conclusions

In this paper, five new species in the genus *Herpetogramma* Lederer, 1863 were described based on material from the southern Arabian Peninsula. The two new species *Herpetogramma nigripalpalis* **sp.n.** and *Herpetogramma digitalis* **sp.n.** were attributed to a species group comprising the closest relatives *Herpetogramma basalis* (Walker, 1866), *Herpetogramma juba* Shaffer & Munroe, 2007, and *Herpetogramma debilis* Seizmair, 2021. The new species *Herpetogramma dilatalis* **sp.n.** was placed close to *Herpetogramma mutualis* (Zeller, 1852). The differential character states in the male genitalia differentiating the two species groups and the diagnostic character states of the new species in external characters, male and female genitalia were listed.

The new species *Herpetogramma lunatalis* **sp.n.** and *Herpetogramma undularis* **sp.n.** were placed close to the Afrotropical *Herpetogramma brunnealis* (Hampson, 1913) and to the Oriental *Herpetogramma viraktamathi* Shankaramurthy & Nagaraj, 2025 respectively based on the female genitalia.

Key differential character states are summarized in a determination key to the new Arabian species of the genus and their Afrotropical and Oriental relatives. The biology—premature stages, habitat selection, and abundance—of the new species are subject of further research. Due to the small sizes of the type series understanding the intraspecific variability of the newly described taxa still needs study of further field material. The external and internal morphology of the male

in *Herpetogramma lunatalis* **sp.n.** and *Herpetogramma undularis* **sp.n.** are also subject to further research.

The number of species of the genus *Herpetogramma* on the Arabian Peninsula is thus raised from two to seven. This relatively high number of new species in one and the same genus recorded from the Fayfa Mts and their wider surroundings including the Jabal Al Assouad in the south-western province Jizan of Saudi Arabia and in the coastal mountain system in the province Dhofar of the Sultanate of Oman, the Jabal Al Qamar, can be interpreted as evidence of the high diversity and the potential of still undiscovered species in the two regions. The two regions have already been shown to be diversity hotspots for the Papilionoidea [33] [34] and thus to have an over-regional importance as possible protected areas.

Acknowledgements

The author acknowledges Hathal al-Dhafer (King Saud University, Riyad, Saudi-Arabia) for his constant support of the research and Alrabea Ishag (King Saud University, Riyad, Saudi-Arabia) for his company, support, advice and help in organizing the trapping nights in the expeditions to Saudi Arabia. The author acknowledges Rudi Verovnik (University of Ljubljana, Biotechnical Faculta) and Marco Kosmac for the shared successful expedition to Saudi Arabia in September 2022. The author acknowledges Jürgen Hensle (Teningen, Germany) for his efforts in producing the distribution map.

Ethical and Legality Statement

The author declares that the sampling of the material is in conformance with the Nature Protection Legislations of the two countries involved, the Sultanate of Oman and the Kingdom of Saudi Arabia. In particular, the samples were collected outside Protected Areas (Nature Reserves, National Parks).

The collecting activities were done under the supervision of and in cooperation with the King Saud University Museum of Arthropods, Institute of Plant Protection, Riyadh, Saudi Arabia.

Conflicts of Interest

The author declares no conflicts of interest.

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Abbreviations and Symbols

n = Length of a Sample;

SD = Standard Deviation;

ZSM = Zoological State Collection Munich, Munich, Germany;

CMS = Private Collection of Michael Seizmair, Gröbenzell, Germany.