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A new species of the genus *Syssphinx* Hübner, 1819 ("1816") from Jalisco and Colima, Mexico (Lepidoptera: Saturniidae, Ceratocampinae)

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Abstract

Syssphinx fabiolae Naumann, Nogueira & Nässig, sp. n., a new species from Jalisco and Colima, Mexico, is described, figured and compared with its closest relative, *S. modena* Dyar, 1913. The male holotype and a female paratype are deposited in the Colección Nacional de Insectos, Universidad Nacional Autónoma de México, Mexico City. The new species is quite well defined in morphology and mtDNA COI barcode data. The partial misinterpretation of populations of *"S. modena*" from Jalisco and Colima in literature is pointed out; specimens from those areas in fact belong to *S. fabiolae* sp. n. An overview (with map) of the known localities of both taxa is provided.
KEY WORDS: Lepidoptera, Saturniidae, Ceratocampinae*, Syssphinx fabiolae,* new species, *Syssphinx modena,* Jalisco, Colima, Mexico.

Una nueva especie del género *Syssphinx* Hübner, 1819 ("1816") de Jalisco y Colima, México (Lepidoptera: Saturniidae, Ceratocampinae)

Resumen

Se describe una especie *Syssphinx fabiolae* Naumann, Nogueira & Nässig, sp. n., de Jalisco y Colima, México, se figura y compara con el pariente más próximo *S. modena* Dyar, 1913. Se depositan en la Colección Nacional de Insectos, Universidad Nacional Autónoma de México, México D.F., el holotipo macho y paratipo hembra. La nueva especie está bastante bien singularizada por la morfología y por los datos del código de barras mtDNA COI. Se señala la interpretación parcialmente equivocada en la literatura de las poblaciones de *"S. modena*" de Jalisco y Colima; los especímenes de estas áreas pertenecen en realidad a *S. fabiolae* sp. n. De ambas taxa se proporciona (con mapa) una visión general de las localidades conocidas.
PALABRAS CLAVE: Lepidoptera, Saturniidae, Ceratocampinae, *Syssphinx fabiolae,* nueva especie, *Syssphinx modena*, Jalisco, Colima, México.

Introduction

Historically, the genus *Syssphinx* Hübner, 1819 ("1816") in its original composition was not monophyletic. As we know today, it was a conglomerate of quite different, largely unrelated groups, and it was even taken as the name-bearing genus for a family "Syssphingidae". LEMAIRE (1976,

[1] 85th contribution to the knowledge of the Saturniidae (84th contribution see: NAUMANN, NÄSSIG & NOGUEIRA G., 2014).

1988) reorganized the entire group, split the polyphyletic mixture into new generic assignments, and today *Syssphinx* is a genus in the Saturniidae subfamily Ceratocampinae containing only about 30 species. With the exception of one widespread species, *S. molina* (Cramer, 1780), occurring in the entire Neotropics (LEMAIRE, 1988), the species of the genus occur mainly from North America to Venezuela and Colombia, with a few in the Andean and Amazonian areas. Most taxa are found in northern Central America with smaller numbers in southern United States and South America. The genus contains (for Saturniidae) relatively small to medium-sized moths which fit well with the usual pattern of the subfamily Ceratocampinae. In general, all members are easily classified within the generic treatment. A complete overview was provided by LEMAIRE (1988). A cladistic analysis based on morphology published later (BALCÁZAR-LARA & WOLFE, 1997) supported the genus *Syssphinx* (as defined by LEMAIRE) to be monophyletic.

Recent collecting in 2000 (a singleton in SMFL), 2011, 2012 and 2013 by one of the authors (G.N.G.) resulted in specimens of the genus *Syssphinx* that resembled *Syssphinx modena* Dyar, 1913, but looked slightly different. During our studies a few more older specimens were found (two specimens in CCGM and one in CCLP). Research in genitalia morphology and in the COI barcode sequence of mtDNA resulted in the recognition of an undescribed species. In the following this species from Jalisco and Colima, Mexico, is described as new to science, a century after the description of its closest relative *Syssphinx modena*.

Material and methods

Morphological studies followed standard procedures; photos were taken with digital cameras. The last segments of the abdomen of male moths were cut off and macerated in ca. 2-3% aquatic NaOH solution at ca. 96-98º C for 1 h to clean the genitalia from scales, fat and tissue. After dissection in water and low-concentrated ethanol, the genitalia were stored in 70% ethanol in vials. The genitalia photos were taken from flattened, slide-mounted preparations, although we believe, in accordance with, e.g., ZWICK (2009: 148), that the preservation of the undistorted three-dimensional structure of the genitalia is essential for the understanding of their function; therefore, most other genitalia remained in the vials in ethanol.

Data of the specimens which were used for the mtDNA analysis are listed in Table 1. The barcode mtDNA analysis is based on the sequences of a short region (658 base pairs) of the mitochondrial cytochrome-c oxidase, subunit I [COI], gene; for details see, *e.g.,* RATNASINGHAM & HEBERT (2007). The DNA was extracted from the legs of dried specimens mainly in the collections of the authors. For technical details and references relative to the laboratory protocols see RATNASINGHAM & HEBERT (2007) or on the CCDB website (CCDB 2014) and also in, *e.g.,* DECAËNS & ROUGERIE (2008) or VAGLIA *et al*., (2008). The analysis of the sequence data was conducted using MEGA6 (TAMURA *et al.,* 2013); see Fig. 13. The mtDNA COI barcodes of 11 specimens of *Syssphinx modena* and *S. fabiolae* Naumann, Nogueira & Nässig, sp. n. plus (as an outgroup) 2 specimens of *Syssphinx bicolor* used in our analysis were generated in Guelph, Ontario, by The Barcode of Life Data Systems (BOLD, 2014). We used only sequences that were more than 600 base pairs (bp) long, shorter sequences were discarded.

Abbreviations used

BC [no.] - Barcode [no.].
CCGM - Collection Carlos C. G. Mielke, Carambeí, Brazil
CCLP - Collection Claude Lemaire, Paris, France (in MNHN)
CDHP - Collection Daniel Herbin, Pechabou, France
CGNG - Collection Guillermo Nogueira G., Zapopan, Mexico
CSNB - Collection Stefan Naumann, Berlin, Germany
CWAN - Collection Wolfgang A. Nässig, Frankfurt am Main, Germany (in SMFL)
Fw. - forewing

GP [no.] - genitalia preparation [no.]
HT - holotype
Hw. - hindwing
INBUNAM - Instituto de Biología (Colección Nacional de Insectos), Universidad Nacional Autónoma de México, Ciudad México (Mexico City, Mexico)
MNHN - Musée National d'Histoire Naturelle, Paris, France
PT - paratype
SMFL - Senckenberg-Museum, Lepidoptera collection, Frankfurt am Main, Germany
USNM - United States National Museum, Washington, D.C., USA

Table 1.– Data of the specimens of *Syssphinx modena* and *S. fabiolae* (2 specimens of *S. bicolor* included as outgroup) used for the mtDNA sequence analyses. - Additional abbreviations: BIN = "Barcode Index Number" within the Bold website (see RATNASINGHAM & HEBERT, 2013); GBAC = GenBank Access Code; PT = paratype; SL = Sequence Length (data from BOLD). - In the order of taxa and specimens as in the tree graph.

Species	Sample-ID	Process-ID, GBAC	SL	BIN	Deposition	Locality of origin
S. modena	Her0708	SDHA708-07	609 bp	AAD2446	CDH	Mexico, Puebla
S. modena	Her0707	SDHA707-07	615 bp	AAD2446	CDH	Mexico, Puebla
S. modena	Her0709	SDHA709-07	612 bp	AAD2446	CDH	Mexico, Puebla
S. modena	Her0705	SDHA705-07	612 bp	AAD2446	CDH	Mexico, Puebla
S. modena	SNB 4262	SASNC1893-12	648 bp	AAD2446	CSNB	Mexico, Puebla
S. modena	Her0706	SDHA706-07	612 bp	AAD2446	CDH	Mexico, Puebla
S. fabiolae, PT	SNB 4940	SASNC2476-13	648 bp	ACF0421	CSNB	Mexico, Jalisco
S. fabiolae, PT	CGCM 10.750	SACMA827-12, JX216450	648 bp	ACF0421	CGCM	Mexico, Colima
S. fabiolae, PT	SNB 4263	SASNC1894-12	648 bp	ACF0421	CSNB	Mexico, Jalisco
S. fabiolae, PT	CGCM 11.149	CGCM339-08, JX216453	648 bp	ACF0421	CGCM	Mexico, Colima
S. fabiolae, PT	SNB 4264	SASNC1895-12	648 bp	ACF0421	CSNB	Mexico, Jalisco
S. bicolor	SNB 4333	SASNC1964-12	648 bp	AAD2441	CSNB	USA, Tennessee
S. bicolor	SNB 4332	SASNC1963-12	648 bp	AAD2441	CSNB	USA, Texas

Syssphinx fabiolae Naumann, Nogueira & Nässig, sp. n.

Holotype: ♂, Mexico, Jalisco, Tuxcacuesco, El Camichin, 805 m, 1-2-5-VII-2011, leg. G. Nogueira G.; GP 2329/11 SMFL. Figs. 1, 10. A red holotype label is added accordingly. The HT and a ♀ PT are deposited in the Colección Nacional de Insectos, Universidad Nacional Autónoma de México (INBUNAM).

Paratypes (in total 31 ♂♂, 12 ♀♀): 1 ♀, same locality as HT, but 783 m, 30-VII-2011, ex CWAN in INBUNAM. 1 ♂, same locality as HT, but 805 m, 1, 2 and 5-VII-2011, leg. G. Nogueira G., GP 2257/11 Naumann (Fig. 11); 1 ♀, same locality, 810 m, 4-VII-2011, leg. G. Nogueira G., BC SNB 4264; 1 ♂, 1 ♀, same locality, 790 m, 31-VII-2011, leg. G. Nogueira G., ♂ with BC SNB 4263; 1 ♂, same locality, 785 m, 18-VII-2012, leg. G. Nogueira G.; 1 ♂, same locality, 785 m, 27-VI-2014, leg. G. Nogueira G. leg. 3 ♂♂, 1 ♀, same locality, 790 m, 28-29-VI-2012, leg. G. Nogueira G.; 3 ♂♂, 1 ♀, Tuxcacuesco, 860 m, 28-VI-2014 (2 ♂♂) and 19-VII-2014 (1 ♂, 1 ♀); all these in CSNB. 1 ♂, Mexico, Colima, Minatitlán, 800 m, 3-VI-2000, leg. V. O. Becker, BC CGCM 11149; 1 ♂, same locality, 11-VI-2000, BC CGCM 10862; 1 ♀, Mexico, Colima, Coquimatlán, 19.1833º N 103.8º W, 500 m, BC CGCM 10750; all these in CGCM. 1 ♂, Mexico, Jalisco, San Patricio, Estación Biológica Chamela, in CCLP in MNHN (examined by S. N.). 1 ♂ (GP 2325/11 SMFL, BC 4940 SNB), Mexico, Jalisco, San Mateo, 70 m, 2-IX-2000, leg. G. Nogueira G.; 1 ♂, Mexico, Jalisco, Mixtlán, 1840 m, 21-VII-2012, leg. G. Nogueira G.; 10 ♂♂, 3 ♀♀, same locality as HT, all leg. G. Nogueira G., but: 2 ♂♂ (1 with GP 2328/11 SMFL), 805 m, 1-2-5-VII-2011; 1 ♀, 810 m, 4-VII-2011; 1 ♀, 783 m, 30-VII-2011; 1 ♂ (GP 2327/11 SMFL), 790 m, 31-VII-2011; 3 ♂♂ 1 ♀, 790 m, 28-29-VI-2012; 2

♂♂, 785 m, 18-VII-2012 and 21-VI-2014; 2 ♂♂, 855 m, 3-4-VII-2013; 4 ♂♂, 2 ♀♀, Tuxcacuesco, 860 m, 19-22-VI-2013 (1 ♂, 1 ♀), 28-VI-2014 (2 ♂♂) and 19-VII-2014 (1 ♂, 1 ♀); all these in CWAN in SMFL, 1 ♂, 1 ♀, same locality as Holotype, but 785 m, 18-VII-2014, leg. G. Nogueira G.; 1 ♂, 1 ♀, Mexico, Jalisco, Tuxcacuesco, 860 m, 19-VII-2014, leg. G. Nogueira G.; all these in CGNG. Blue paratype labels will be added accordingly.

Derivatio nominis: This new species is named after the wife of the collector (and coauthor of the present publication, G. N. G.), Fabiola López Cuellar, in recognition of all her support and help during the intensive studies and work on the Mexican fauna by her husband.

Diagnosis

S. fabiolae on average is slightly larger than its probably nearest relative *S. modena* which occurs much further eastward in Mexico in generally higher altitudes. The here described species can easily be separated from the latter by it yellowish or creamy white ground colour, the straight antemedian line of the forewings, a much reduced single discal spot of the forewing, and details in male genitalia structures as mentioned below.

Description

Male (Figs. 1-3): Head yellow, labial palpi of same colour; antennae dark ochreous brown, 6.0-6.2 mm long, basal 14 segments with long rami, quadripectinate, apical ca. 3.0 mm without pectination. Dorsal thorax in light yellow ground colour, with pinkish to pinkish-white tegulae, abdomen on dorsal side yellow, fading to more creamy white in the last segments. Ventral side of thorax including legs and abdomen creamy white.

Forewing length, measured from wing basis to apex, 23.9-26.0 mm (holotype 23.9 mm). Dorsal side with yellowish pink costa and antemedian field, the antemedian line pinkish brown, straight. Median field in yellow ground colour, lower margin pink, with small round white discal spot, which is circled with pinkish grey scales. Postmedian line again pinkish brown, postmedian area again in homogenous ground colour, only lower angle with hinted pink shade. Marginal frindges pink. Anal edge of forewings often with a pinkish shade. Dorsal hindwing of homogenous yellow ground colour, basally around the inner margin with an intense red patch of hair. Marginal frindges pinkish white. *S. modena* is usually more colourful, with a deeper orange yellow ground colour, a light violet suffusion of ante- and postmedian field, more prominent discoidal spots on the forewings (often distinctly two white spots), and smaller, more elongate forewings.

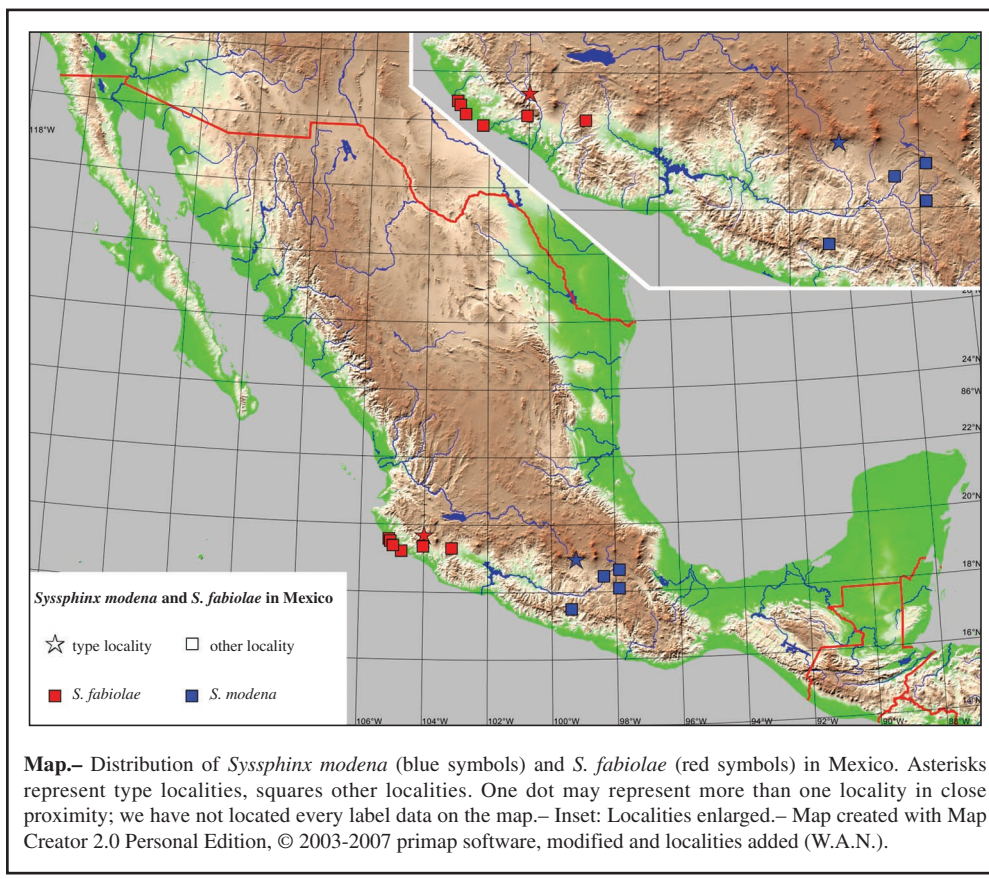
On ventral side of forewing antemedian line missing. Basal to the oval discal spot, which consists of an outer black ring with creamy white center, a faded pink field. Postmedian line in apical half dark greyish brown, basally very thin and almost reduced. Rest of the forewing of yellowish white colour, marginal frindges dark yellow. Hindwing of homogenous very light yellow colour, upper margin suffused with greyish scales, the postmedian line only slightly indicated as curved line in the very apical part. On ventral side of *S. modena,* colours of the discoidal spot are more prominent, and the violet suffusion of ante- and postmedian fields shines slightly through. Generally, the very light yellow ground colour fades quite fast to a creamy white in older and flown specimens.

Male genitalia (Figs. 11-12, GPs 2329/11 SMFL/Nässig and 2257/11 Naumann): Uncus bifid, with two rather soft dorsal and two strongly sclerotised ventral rounded lateral lobes and a small dorsal protuberance on the dorsal mid between the soft lobes. The two strongly sclerotised lobes with a more or less straight ventral edge. Juxta strongly sclerotised, triangular, with rounded tip and rather long; the ventral edge curved inwardly. The valves rather narrow, strongly bent towards tip, with a rather long, compact internal spine bent in crescent-shape. Phallus with three spines; one of these is the prolongation of the right ventral sclerotisation of the phallus itself, the other two sit on the vesica, the largest one on dorsal side, the other on left ventral side, sometimes connected with the ventral sclerotisation.

Female (Figs. 4-6): Females of *S. fabiolae* mainly differ from the males in typical sexually dimorphic characters, such as larger size, larger abdomen and filiform antennae, but otherwise quite resemble the males. Ground colour as in males, but the tegulae are of lighter whitish pink, and the abdomen is covered with brownish grey hairs on dorsal side. Antennae dark reddish brown, 6.3-6.5 mm long, filiform, covered on dorsal side of the basal 6-7 segments with white scales. Forewing length, measured from basis to apex, 32.5-33.5 mm. Dorsal side with more yellowish antemedian field, the ante- and postmedian lines as in males, a discal spot is missing in the median area. Markings and colouration of the ventral side as in the males but the pink portion of the basal forewing is missing. The forewing discal spot is indicated as a greyish brown shadow which sometimes shines through on dorsal side. As in males, older specimens fade to light whitish yellow.

The preimaginal instars, ecology and life history remain unknown.

Distribution (see Map): The new species *S. fabiolae* is known only from localities in the states of Jalisco and Colima, in the West of the distribution area of its closest relative *S. modena*. The two species appear to be allopatric. The new species was found mainly on lower slopes of the mountains (ca. 70-850 m) towards the Pacific Ocean and the Río de Comala Valley (Sierra de Amula and other mountains). Details of the type locality may be seen below. One specimen came from 1840 m near Mixtlán in Jalisco. In contrast, *S. modena* occurs mainly at higher elevations and deeper into the mountains, mainly around the valley of Río Balsas and its tributaries.



Map.– Distribution of *Syssphinx modena* (blue symbols) and *S. fabiolae* (red symbols) in Mexico. Asterisks represent type localities, squares other localities. One dot may represent more than one locality in close proximity; we have not located every label data on the map.– Inset: Localities enlarged.– Map created with Map Creator 2.0 Personal Edition, © 2003-2007 primap software, modified and localities added (W.A.N.).

Results of the COI mtDNA barcode study

The pairwise distances (computed by the Bold website) between the two species *S. modena* and *S. fabiolae* are between 1.44 and 2%, while the within-species distances are always clearly below or equal to 0.6%, suggesting the existence of a so-called "barcode gap" between the two. This corresponds to two different BIN codes ("Barcode Index Number") within the Bold website (RATNASINGHAM & HEBERT, 2013) for the two: *S. modena* is listed under BIN AAD2446, while *S. fabiolae* is found under BIN ACF0421. See Fig. 13 for a graphic representation of the relationship (computed with MEGA6 software, see TAMURA *et al*., 2013), with two specimens of *Syssphinx bicolor* (Harris, 1841) used as outgroup to root the analysis.

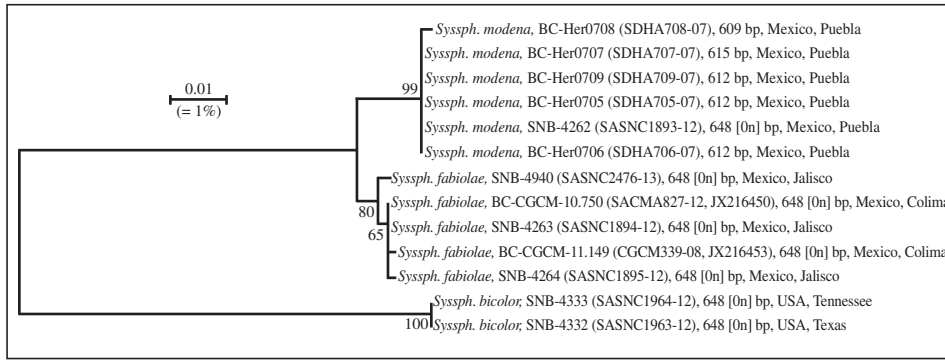


Fig. 13.– The molecular evolutionary history was inferred using the Neighbor-Joining method (SAITOU & NEI, 1987). The optimal tree with the sum of branch length = 0.15671065 is shown. The percentage of replicate trees in which the associated taxa clustered together in the bootstrap test (2500 replicates) are shown next to the branches (FELSENSTEIN, 1985); values below 50% are omitted. The tree is drawn to scale. The evolutionary distances were computed using the Maximum Composite Likelihood method (TAMURA *et al*., 2004). The rate variation among sites was modeled with a gamma distribution (shape parameter = 2). The differences in the composition bias among sequences were considered in evolutionary comparisons (TAMURA & KUMAR, 2002). The analysis involved 13 nucleotide sequences (= specimens). There were a total of 608 positions (= base pairs) in the final dataset. Evolutionary analyses were conducted in MEGA6 (TAMURA *et al*., 2013).

Ecological and general information about the collecting locality

The type locality is described as follows: Mexico, Jalisco, Sierra de Amula, Tuxcacuesco, El Camichín; elevation 790-810 m, 19º 39' N, 104º 2' W. This locality is found in the "Region Xerofitica Mexicana" in the "Province of the Eje Volcanico Transversal" (RZEDOWSKI, 1994), with limestone sedimentary rocks of the Mezozoic Era (INEGI, 1981). The locality is found close to a small valley surrounded by mountains and hills between the Tuxcacuesco and the Ayuquila rivers. The climate classification at the area according to GARCÍA (1973) is "ACw1 (semicalido y subhumedo)". The area has about 800-1000 mm annual rainfall, 60-65 % average relative humidity and an annual mean temperature range of 18-22º C (LLORENTE-BOUSQUETS *et al*., 1996). The type locality is an ecotone area of "Tropical deciduous forest and Xerophile scrub"; the tropical deciduous forest has elements like *Bursera bipinnata* (Moç.& Sessé ex DC.) Engl., *Bursera* sp. (Burseraceae), *Ficus cotinifolia* Kunth, *Ficus* ssp. (Moraceae), *Jatropha* ssp. (Euphorbiaceae), *Lysiloma* sp. (Fabaceae), *Leucaena esculenta* (DC.) Benth. (Mimosaceae), *Opuntia* sp. (Cactaceae), *Ipomoea* sp. (Convolvulaceae), and epiphytes of the genera *Epidendrum* (Orchidaceae), *Tillandsia* (Bromeliaceae),

Selenicereus (Cactaceae), *Aristolochia* (Aristolochiaceae) and Araceae. The Xerophile scrub vegetation includes elements like *Opuntia* ssp. (Cactaceae), *Rhus radicans* L. (Anarcardiaceae), *Agave* sp. (Asparagaceae, Agavoideae), *Plumeria rubra* L. (Apocynaceae), *Pithecellobium dulce* (Roxb.) Benth., *Goldmania* sp., *Acacia* sp., *Prosopis* sp., *Mimosa benthamii* J. F. Macbr. (Fabaceae) (RZEDOWSKI & MCVAUGH, 1966).

The males of *Syssphinx fabiolae* came to light between 21:00 h and 23:30 h; the females arrived between 23:00 h and 2:30 h. Some of the specimens where found at a set with mercury vapor bulb plus UV light, most others arrived at a smaller collecting site called the "ghost" (for details, see NÄSSIG *et al*., 2014: 56).

FURTHER NOTES ON MORPHOLOGY

S. fabiolae Naumann, Nogueira & Nässig, sp. n. is obviously the closest relative of *S. modena* Dyar, 1913 which was described from Cuernavaca, Morelos, Mexico, and shows similarities in the typical elongated forewing, indicated already by LEMAIRE (1988), and male genitalia structures. The lectotype of *S. modena* Dyar, 1913, designated by LEMAIRE (1988), is deposited in USNM (type no. 15218) and was examined by LEMAIRE (1988). The new species differs from *S. modena* in several details which usually allow separation. Most male specimens of *S. modena* known to us are on average slightly smaller, having a forewing length of around 23.0 mm, but the specimen from Cuernavaca in SMFL has 26.5 mm. Generally, *S. modena* has a darker dorsal forewing, with purplish-grey ante- and postmedian areas and more orange median area, a bent antemedian line, and one or two white discal spots widely surrounded by a purplish area; these characters of wing pattern and colour are the best and evidently most constant differentiating characters. The basal dull red hindwing patch is on average larger in *S. modena,* and followed centrally by a faintly indicated red discal spot. On the ventral side the portion basal to the forewing discal spot is widely pink coloured, the discal spot more triangular with a tip to apical area. The postmedian area is of a purplish grey colour, the marginal forewing frindges are coloured brown. The hindwing shows in the very apical part a slightly bent portion of the postmedian line, followed by a purplish darkened postmedian area.

Male genitalia of *S. modena* differ from those of *S. fabiolae* by the shorter or missing dorsal central protuberance of the uncus and a slightly different shape and smaller size of the two ventral sclerotized uncus processes; the juxta is slightly shorter, but also triangular; the inner processes of the valves are slightly more slender and less bent; and, according to the figures in BOUVIER (1931: 91, pl. I, fig. 17) and LEMAIRE (1988: 263), the vesica has only 2 instead of 3 spines; however, our specimen from Cuernavaca (= topotypic specimen, GP 2324/11 SMFL/Nässig; Fig. 12) also has 3 spines plus an additional, very small one at the vesica tip. There appears to be quite some variability, and the male genitalia of the two species apparently do not always differ clearly.

Due to differences in size of the uncus and harpe and a few other details, MICHENER (1949: 143) erected a subgenus *Bouvierina* within *Syssphinx* (see also MICHENER, 1952: 393), comprising the "bulk of species" (MICHENER), which later was again synonymised with *Syssphinx* by LEMAIRE (1976; overview in LEMAIRE, 1988, 1996); *S. modena* was also therein included. The subgenus *Bouvierina* does not find support in the barcode analysis of the genus *Syssphinx* and does not appear to form a monophyletic group or subgenus within *Syssphinx*.

Discussion

There is some confusion in literature about the handling and determination of *S. modena:* The species was described from Cuernavaca, Morelos, but some authors (BEUTELSPACHER-BAIGHTS, 1982, 1988; LEMAIRE, 1988) mentioned it also from Jalisco and Colima. We believe that the mentioned records from Jalisco and Colima do not belong to that species and are misinterpreted or misidentified specimens of the here described *S. fabiolae*. The typical habitat for *S. modena* are the medium slopes of the temperate and warm-temperate valley of Río Balsas, its tributaries and neighbouring rivers in

Morelos (locus typicus; material examined: 1 ♂, Cuernavaca, 1529 m, V-1954, ex coll. Creek, in SMFL; 1 ♂, Cuernavaca, 29-VII-1976, leg. R. S. Peigler, in CCLP [illustrated by LEMAIRE, 1988: pl. 45, fig. 5]), in Puebla (3 ml. NE Petlacingo [LEMAIRE, 1988: 263]; 1 ♂, rd. Izucar de Matamoros-Acatlan, km 20, 1250 m, 26-VII-1992, leg. D. Herbin, in CSNB), and in Guerrero (HOFFMANN, 1942), specimens all originating from localities at altitudes of between 1250 and 1530 m.

The misinterpretation of the Jalisco population is probably based on a note in HOFFMANN (1942) who mentioned *S. modena* to also occur on the "hot Pacific coast up to Sinaloa", having misidentified *Adelocephala boisduvalii* Doûmet, 1859 (this species now placed in *Adeloneivaia,* compare LEMAIRE, 1976, 1988) and interpreting this species as synonymous with *S. modena*. *A. boisduvalii* in fact was described from Pará, Brazil, and does not occur in Mexico at all; this misidentification by HOFFMANN (1942) is probably based on a misinterpretation by DRUCE (1881-1900: XVI, 171, tab. 16, figs. 1, 2) who mentioned *A. boisduvalii* (therein cited as *A. boisduvali* [sic]) to occur both in Mexico and in Brazil, and, in fact, shows in his colour figure a female of [most likely] *Syssphinx mexicana* (Boisduval, 1872); this further caused some persistent misinterpretation based on the almost identical pattern, in spite of different body and wing size, of *S. mexicana* and *S. modena* males. In addition, some copies of the "Biologia Centrali-Americana" in libraries apparently show only black and white illustrations and thus probably enhance this misinterpretation.

Records in literature of *"S. modena*" from Jalisco and Colima are all from lower areas close to the Pacific coast line (Jalisco, Chamela, VII-IX-1975-1977 [BEUTELSPACHER BAIGHTS, 1982]; Jalisco, San Patricio, Estación Biológica Chamela [LEMAIRE, 1988]; Colima [BEUTELSPACHER BAIGHTS, 1988]) and should be referred to the herein described *S. fabiolae* sp. n. for which the type locality is just behind the coastal mountains in the valley of Rio de Comala, south of the Cordillera Volcánica.

The notes on *S. modena* by DRAUDT (1930) and D'ABRERA (1995) mentioning only "Mexico" as origin give no details about the distribution of that species, but at least their figures apparently correctly show typical *S. modena* specimens.

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Figs. 1-12.– *Syssphinx* specimens from Mexico and male genitalia. **1-6.** *S. fabiolae* Naumann, Nogueira & Nässig, sp. n. **1.** ♂ holotype, dorsal view (INBUNAM). **2.** ♂ paratype, dorsal view; **3.** Same specimen, ventral view (CSNB). **4.** ♀ paratype, dorsal view. **5.** ♀ paratype, dorsal view; **6.** Same specimen, ventral view. - **7-9.** *S. modena* Dyar, 1913, males. **7.** ♂, Morelos, Cuernavaca, SMFL, dorsal view. **8.** ♂, Puebla, CSNB, dorsal view; **9.** same specimen, ventral view.– Scale bars for specimens = 1 cm. **10-11.** ♂ genitalia of *S. fabiolae* Naumann, Nogueira & Nässig, sp. n. **10.** holotype, GP 2329/11 SMFL/Nässig, in INBUNAM. **11.** paratype, GP 2257/11 Naumann, CSNB. **12.** ♂ genitalia of *S. modena,* GP 2324/11 SMFL/Nässig, Cuernavaca, Morelos, SMFL.– All genitalia approximately to the same scale, 1 scale bar = 1 mm.