

**Three new species of genus *Torodora* Meyrick (Lepidoptera:  
Lecithoceridae: Torodorinae) from North-West India**

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**ABSTRACT.** Three new North-West Indian species of a lecithocerid genus *Torodora* MEYRICK of subfamily Torodorinae are described.

**KEY WORDS:** Lecithoceridae, Torodorinae, North-West India, *Torodora*, three new species.

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INTRODUCTION

Genus *Torodora* was erected on the basis of type-species *characteris* MEYRICK from Burma under family Gelechiidae (MEYRICK 1894). This family name originally spelled as Gelechidae (STANTON 1854), has been subsequently corrected as Gelechiidae (NYE & FLETCHER 1991). CLARKE (1955) treated *Torodora* under family Timyridae, later on synonymised under Lecithoceridae by NYE & FLETCHER (1991). Prior to this, GOZMANY (1978) had proposed subfamily Torodorinae under family Lecithoceridae with genus *Torodora* as type.

This genus is represented by 85 species from all over the world (PARK & HEPPNER 2000). Out of these, 82 are known from the Oriental region, 2 from Palearctic and only 1 from Ethiopian region (PARK & HEPPNER 2000). So far, 12 species have been recorded under *Torodora* from India. (MEYRICK 1911, GAEDE 1937, ROSE & PATHANIA 2003).

Intensive and extensive surveying of three north-west Indian states, namely Haryana, Himachal Pradesh and Rajasthan during 2000-2004 brought to light three species referable to the aforementioned genus. None of them were matching any of the described species. Consultation of relevant literature and comparison with the gelechioid fauna in Indian repositories confirmed new status of all.

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## TAXONOMY

### Genus *Torodora* MEYRICK

*Torodora* MEYRICK, 1894, Trans. ent. Soc. London. 1894: 16.

**Type-species:** *Torodora characteris* MEYRICK, 1894, Trans. ent. Soc. London, 1894: 16, by original designation.

### Key to the species of genus *Torodora* MEYRICK

1. Ground colour of forewing fuscous,  
veins M<sub>2</sub>, M<sub>3</sub> separate; male genitalia  
with gnathos falcate. .... 2
- Ground colour of forewing ochraceous,  
veins M<sub>2</sub>, M<sub>3</sub> connate; male genitalia  
with gnathos squarish..... *quadrangulata* sp. nov.
  
2. A light yellow spot on costa of forewing  
continuing below into a row of diffused white specks  
upto inner margin; male genitalia with juxta  
inverted kite-like, cucullus beset with long anteriorly  
directed setae in addition to smaller ones..... *rectangulata* sp. nov.
- A light yellow spot on costa of forewing continuing  
below as white thin line upto inner margin;  
male genitalia with juxta rectangular, bearing

a pair of latero-distal setose lobes and a medial cone  
- like projection at proximal end, cucullus uniformly  
adorned with moderately long setae..... *biovalata* sp. nov.

## DESCRIPTIONS

### *Torodora quadrangulata* sp. nov.

(Figs 1, 6-9)

#### Male

Head iridescent greyish-ochraceous, side tufts ochraceous. Antennae slightly longer than forewing, ochraceous. Labial palpi with second segment fuscous, ochraceous at tip; third segment ochraceous, suffused with fuscous on inner surface.

Thorax ochraceous, with a broad blackish-fuscous band. Forewing with ground colour ochraceous on upper surface, suffused with fuscous, more so in distal one-third, latter part divided by submarginal band of ground colouration; markings blackish-fuscous – including a patch at base of costa, speck below costa one-third away, large triangular patch between and below these two and a comparatively smaller discocellular spot concave towards base, distinctly pointed towards termen; cilia along margin ochraceous. Under surface fuscous except blackish-fuscous costa at base. Discal cell four-seventh of wing length;  $R_5$  to termen just below apex;  $M_2$ ,  $M_3$  connate (Fig. 6). Hindwing with upper and under surfaces greyish-brown; cilia along inner margin creamy-white, about two-third of wing width. Discal cell three-seventh of wing length;  $M_3$ ,  $CuA_1$  on a short stalk (Fig. 7). Legs brownish-ochraceous; hind tibia roughly scaled with whitish-ochraceous throughout.

Abdomen with upper surface creamy-white; under surface brownish-ochraceous. Male genitalia (Fig. 8) with uncus digitate, blunt at apex, setose; gnathos squarish; tegumen longer than vinculum; juxta bearing a pair of latero-distal setose lobes; valvae with costa concave; cucullus gradually broadened towards distal end bearing setae of equal lengths. Aedeagus (Fig. 9) broadly cylindrical; vesica adorned with numerous denticles in middle and a sclerotised plate at distal end; opening of ductus ejaculatorius antero-lateral.

#### Alar expanse

Male: 20 mm.

**Material examined**

HOLOTYPE: ♂, 21.vi.2001; Chandigarh (U.T.). PARATYPE: 1♂, 23.viii.2000; Renuka Lake, Himachal Pradesh. (coll. D. WADHAWAN & V.K. WALIA) Deposited in Entomology Section, Department of Zoology, Panjab University, Chandigarh, INDIA.

**Flight period**

June and August.

**Type locality**

Chandigarh (U.T.), INDIA.

**Etymology**

Emphasizing the squarish shape of gnathos, the new species is named as *Torodora quadrangulata*.

**Remarks**

After comparing with the descriptions and structure of genitalia of described species under *Torodora* MEYRICK (MEYRICK 1894, 1911, 1916-1923, CLARKE 1965, ROSE & PATHANIA 2003), present species was found nearest to *Torodora fortis* (MEYRICK), a new combination proposed by ROSE & PATHANIA (2003). However, male genitalia of *T. quadrangulata* sp. nov. resembled more with that of *T. fortis* (MEYRICK) given by CLARKE (1965) than with the diagram and description documented by ROSE & PATHANIA (2003) with regards to the shape of valvae, uncus, gnathos, vinculum, juxta and aedeagus. However, curvature of aedeagus in distal half and presence of a sclerotised plate at the same end in the new species differed from the illustration of *fortis* depicted by CLARKE (1965). Furthermore, ground colour of forewings in the present species is ochraceous, suffused with fuscous, a black speck well below costa nearly one-third away from base and pointed edge of discocellular spot facing termen. In contrast, description and photograph of *fortis* documented by MEYRICK (1916-1923) and CLARKE (1965) respectively states light fuscous ground colouration of forewing, in addition to presence of a blackish-mark on its costa before middle and flat surface of discocellular spot directed towards the termen.

***Torodora rectangulata* sp. nov.**

(Figs 2-4, 10-15)

**Male**

Head light fuscous. Antennae slightly longer than forewing, light yellow. Labial palpi creamy-white; second segment laterally compressed, blackish-fuscous on outer side.

Thorax fuscous. Forewing with ground colour on upper surface fuscous; various markings include a light yellow spot on costa at three-fourth away from base, followed by a row of diffused white specks below upto inner margin, two white specks one-third from base and a blackish-fuscous discocellular spot sparsely suffused with white; cilia along margin blackish-fuscous. Under surface greyish-fuscous. Discal cell about four-seventh of wing length;  $R_5$  to termen just below apex;  $M_2$ ,  $M_3$  separate (Fig. 10). Hindwing with upper and under surfaces fuscous, former with ochraceous elongated scales below and parallel to costa; cilia along inner margin about three-fifth of wing width, fuscous. Discal cell three-seventh of wing length;  $R_s$  to costa just above apex;  $M_3$ ,  $CuA_1$  on a short stalk (Fig. 11). Legs ochraceous, suffused with fuscous.

Abdomen on upper surface showing alternate bands of greyish-fuscous and yellow, the latter beset with numerous spines; ventral surface fuscous. Male genitalia (Figs 12-13) with uncus mushroom-like, beset with setae; gnathos falcate; tegumen broadly ovate, slightly longer than evenly broad vinculum; juxta inverted kite-like; valvae broadest at base; costa convex; cucullus of even width, beset with long anteriorly directed deciduous setae in addition to smaller ones; sacculus demarcated. Aedeagus (Fig. 14) broad at proximal end, bluntly narrowed at distal end; vesica adorned with numerous denticles and a few spines; ductus ejaculatorius opening anteriorly. Female genitalia (Fig. 15) with corpus bursae ovoid, bearing microscopic denticles all over; signum rectangular, curved, profusely denticulate; ductus bursae gradually narrowing towards distal end with ductus seminalis joining in middle, former bearing sclerotised plate adjoining corpus bursae; genital plate bearing minute spines and setae; anterior apophyses about half of posterior, both pairs bent at apices; papillae anales oblong, bearing setae of varying lengths.

#### **Alar expanse**

Male: 16-17 mm; Female: 17 mm.

#### **Material examined**

HOLOTYPE: ♂, 28.ix.2002; Kalesar (Forest Rest House), Haryana. PARATYPES: 5♂♂, 29.ix.2002; 4♀♀, 2♂♂, 30.ix.2003; 1♂, 1♀, 15.ix.2004; 1♂, 2♀♀, 16.ix.2004; Kalesar (Forest Rest House), Haryana. 1♂, 23.vi.2004; 1♂, 9.ix.2004; 1♂, 12.ix.2004; 1♀, 17.ix.2004; Sairighat (Forest Rest House), Himachal Pradesh. 1♂, 30.viii.2004; Subathu (Forest Rest House), Himachal Pradesh. (coll. D. WADHAWAN & V.K. WALIA) Deposited in Entomology Section, Department of Zoology, Panjab University, Chandigarh, INDIA.

#### **Flight period**

June, August and September.

**Type locality**

Kalesar (Haryana), INDIA.

**Etymology**

Owing to characteristically rectangular shape of signum in corpus bursae of the female genitalia, this species is named as *Torodora rectangulata* sp. nov.

**Remarks**

Because of similar general body colouration and tufts of long and strong setae on the inner surface of valvae in male genitalia, present species looks close to *Torodora pubesensovalvata* ROSE and PATHANIA. However, the newly described new species has somewhat mushroom-like uncus and vesica of aedeagus adorned with numerous denticles and a few spines in the male genitalia. In contrast, the closely allied species has thorn-like uncus and vesica without cornutus (ROSE & PATHANIA 2003). Furthermore, signum in the corpus bursae of *T. rectangulata* sp. nov. is rectangular and curved with numerous denticles, in contrast to pepper-shaped in *T. pubesensovalvata*.

Interestingly, forewings of the new species revealed intra-specific variations in the length of stalk of veins CuA<sub>1</sub>, CuA<sub>2</sub> that varied from short to long in different specimens of both the sexes collected from the aforementioned localities.

***Torodora biovalata* sp. nov.**

(Figs 5, 16-21)

**Male**

Head light fuscous. Antennae light yellow, scape with a longitudinal fuscous streak above. Labial palpi light yellow; outer and upper surfaces of second segment fuscous.

Thorax fuscous. Forewing with ground colour fuscous on upper surface, costa narrowly light yellow, expanded at three-fourth from base, continued below as white thin line upto inner margin, bent in middle towards termen, two blackish-fuscous spots in discal cell with one in middle and other at end, former spot accompanied with three to four patches of a few white scales; cilia along margin fuscous, sparsely tipped with white. Under surface light fuscous, a yellow costal spot more prominent on under surface with concolourous suffusion beyond it. Discal cell about four-seventh of wing length; M<sub>2</sub>, M<sub>3</sub> separate (Fig. 16). Hindwing with upper and under surfaces brownish-ochraceous, basal half of costa creamy-white on upper surface; cilia along inner margin nearly half of wing width, brownish-ochraceous. Discal cell half of wing length; M<sub>3</sub>, CuA<sub>1</sub> minutely stalked (Fig. 17). Legs ochraceous, suffused with fuscous.

Abdomen with upper surface grey; under surface fuscous, ochraceous at distal end. Male genitalia (Figs 18-19) with uncus curved, digitate, flat at tip; gnathos

falcate; tegumen broad; vinculum strap-like, each lateral side broadened in middle; juxta rectangular, bearing a pair of latero-distal setose lobes and medial cone-like projection at proximal end; valvae broadest in basal half, abruptly narrowed into digitate distal half, adorned with moderately long setae. Aedeagus (Fig. 20) cylindrical, broadened at ends; vesica adorned with bunch of long spines, preceded by rows of microscopic denticles; ductus ejaculatorius opening anteriorly. Female genitalia (Fig. 21) with corpus bursae somewhat spherical; signum cone-like, denticulate; ductus bursae longer than corpus bursae, wide anteriorly; genital plate beset with numerous minute spines; both pairs of apophyses straight; oblong papillae anales furnished with setae of varying lengths.

#### **Alar expanse**

Male: 20-21 mm; Female: 26 mm.

#### **Material examined**

HOLOTYPE: ♂, 29.ix.2000; Jharoal (Forest Rest House), Rajasthan. PARATYPES: 1♂, 02.iv.2001; Chandigarh. 1♀, 22.iii.2001; Naraingarh, Haryana. 1♂, 31.x.2000; 1♂, 18.viii.2002; 1♂, 3.x.2003; 1♀, 12.ix.2004; 1♂, 15.ix.2004; Sairighat (Forest Rest House), Himachal Pradesh. (coll. D. WADHAWAN & V.K. WALIA) Deposited in Entomology Section, Department of Zoology, Panjab University, Chandigarh, INDIA.

#### **Flight period**

March, April, August, September and October.

#### **Type locality**

Jharoal (Rajasthan), INDIA.

#### **Etymology**

Highlighting the two latero-distal oval processes on the juxtal plate, this species is named *Torodora biovalata* sp. nov.

#### **Remarks**

Present species because of strikingly similar shapes of valvae and gnathos with that of *Torodora parafuscoptera* ROSE and PATHANIA looked extremely close to it. This was further corroborated by alike body colouration of both. However, critical observations revealed a few significant differences not only in alar expanse and colour pattern of forewings but also in the shape of various genitalic structures of both the sexes.

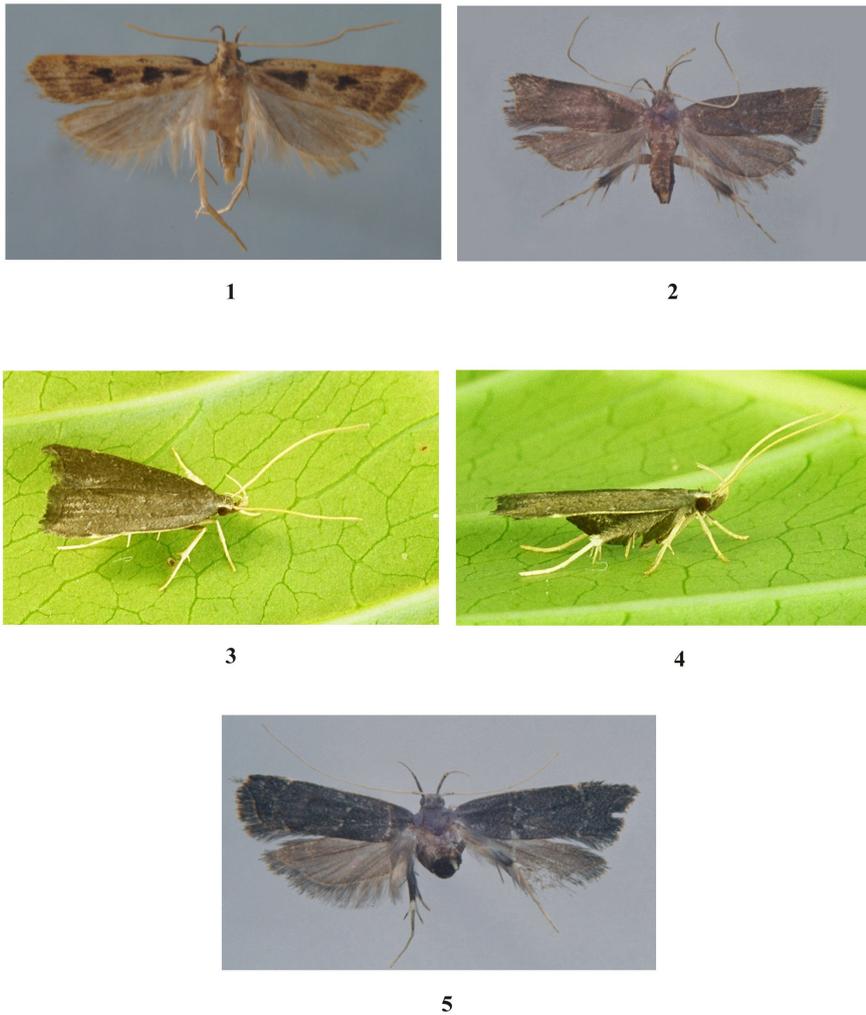
Whereas *Torodora biovalata* sp. nov. having wing expanse of 20-21 mm in male and 26 mm in female possessed a light yellow spot on costa at four-fifth from base with an outwardly bent transverse line beneath, in addition, to presence of two blackish-fuscous spots, one in middle and other at end of discal cell. In contrast, alar expanse in both the sexes of the closely allied species measures from 17-19 mm, without costal spot or a line below on the forewing.

As far as genitalic structures are concerned, uncus in *T. biovalata* sp. nov. is flat at distal end, vesica in aedeagus adorned with a bunch of long spines and rows of microscopic denticles in male genitalia and a cone-like signum in corpus bursae of female genitalia is profusely denticulate. In comparison, male genitalia of *T. parafuscoptera* has pointed tip of uncus, spindle-shaped cornutus in vesica and signum is somewhat oval in the corpus bursae of female genitalia (ROSE & PATHANIA 2003).

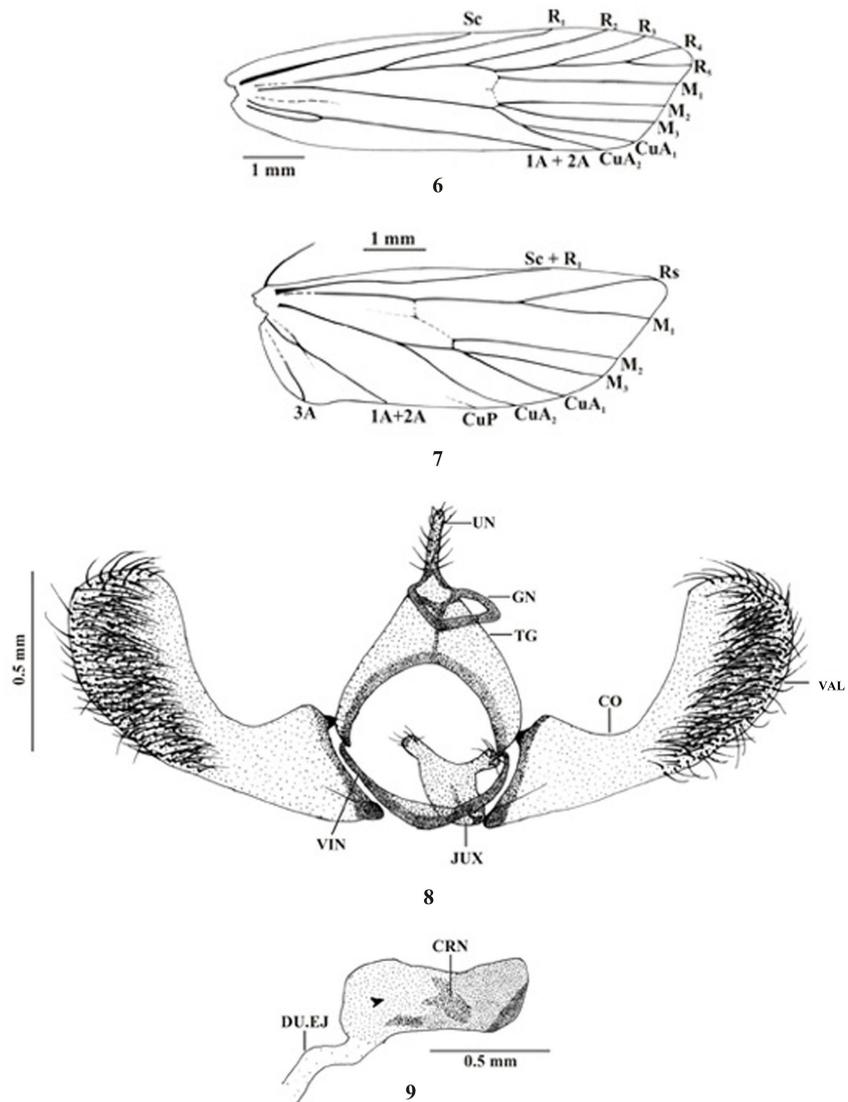
In addition to the status of this species being a new addition to the science, intra-individual and intra-specific variations were observed in the length of stalk of veins  $M_3$  and  $CuA_1$  in the hindwing which varied from minute to short.

#### ABBREVIATIONS USED IN FIGURES

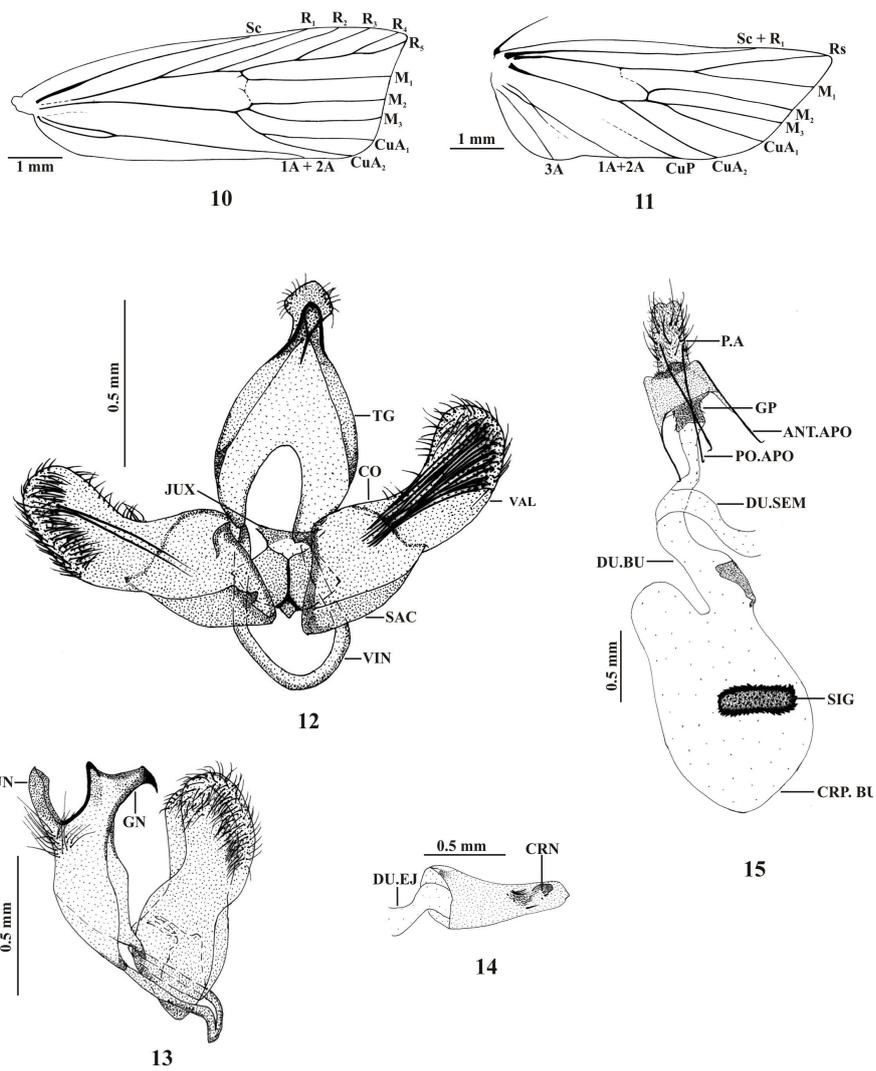
1 A + 2 A = vein representing fused first and second anal vein; 3A = third anal vein; ANT. APO = anterior apophysis; CO = costa; CRN = cornuti; CRP. BU = corpus bursae;  $CuA_1$  = first anterior cubital vein;  $CuA_2$  = second anterior cubital vein; Cu.P = posterior cubital vein; DU. BU = ductus bursae; DU. EJ = ductus ejaculatorius; DU. SEM = ductus seminalis; GN = gnathos; GP = genital plate; JUX = juxta;  $M_1$  = first median vein;  $M_2$  = second median vein;  $M_3$  = third median vein; P. A = papilla analis; PO. APO = posterior apophysis;  $R_1$  = first radial vein;  $R_2$  = second radial vein;  $R_3$  = third radial vein;  $R_4$  = fourth radial vein;  $R_5$  = fifth radial vein; Rs = radial sector vein; SAC = saccus; Sc = subcosta; Sc +  $R_1$  = fused subcosta and first radial veins; SIG = signum; TG = tegumen; UN = uncus; VAL = valvae; VIN = vinculum.



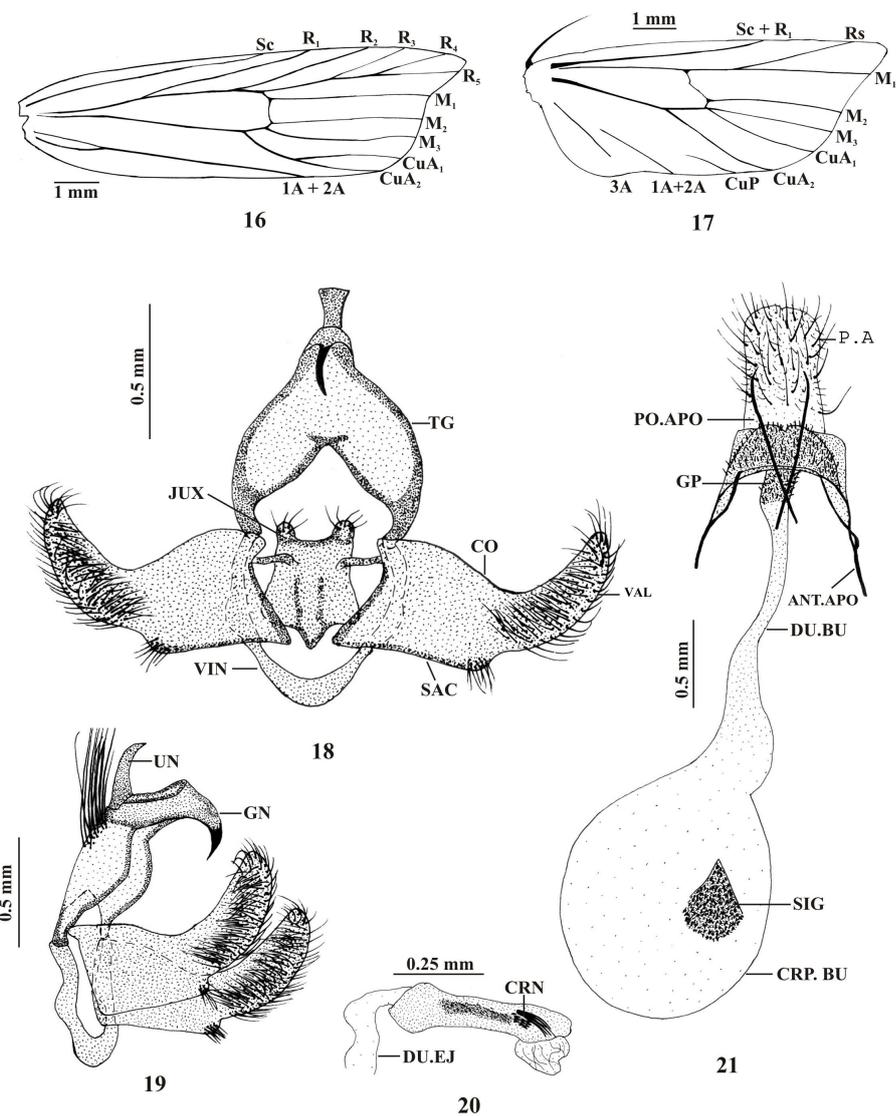
**Figs 1-5.** 1 - *Torodora quadrangulata* sp. nov., stretched moth; 2 - *Torodora rectangulata* sp. nov., stretched moth; 3, 4 - *Torodora rectangulata* sp. nov., reposing postures; 5 - *Torodora biovalata* sp. nov., stretched moth.



**Figs 6-9.** *Torodora quadrangulata* sp. nov.: 6 - forewing; 7 - hindwing; 8 - external male genitalia (ventral view), 9 - aedeagus.



**Figs 10-15.** *Torodora rectangularata* sp. nov.: 10 - forewing, 11 - hindwing, 12 - external male genitalia (ventral view), 13 - external male genitalia (lateral view), 14 - aedeagus, 15 - external female genitalia.



**Figs 16-21.** *Torodora biovalata* sp. nov.: 16 - forewing, 17 - hindwing, 18 - external male genitalia (ventral view), 19 - external male genitalia (lateral view), 20 - aedeagus, 21 - external female genitalia.

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