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Synopsis of *Carolella* BUSCK (*Lepidoptera*, *Tortricidae*) with Descriptions of New Species and *Mimeugnosta* gen. n.

[with 34 text-figs.]

Synopsis rodzaju *Carolella* BUSCK (*Lepidoptera*, *Tortricidae*) z opisami nowych gatunków i rodzaju *Mimeugnosta*

Abstract. The paper contains the catalogue of the *Carolella* species and descriptions of 13 new species from the Neotropical Region. One new genus similar to *Carolella* but belonging to *Saphenista*-group is also described.

INTRODUCTION

Carolella was described by A. BUSCK in 1939 for *Pharmacis sartana* HÜBNER, 1823. In the same year COMSTOCK included in that genus two other Nearctic species, then several new species were described by myself (c. f. catalogue on p. 415) from the Neotropical Region and some MEYRICK's species were transferred to *Carolella*. The genus in question is in this paper treated provisionally as valid, despite no autapomorphy has been found to date. It may be synonymous with old Palaearctic genus *Eugnosta* HÜBNER, 1825, but further studies are required to solve the problem. The genus seems compact as only some colour groups can be distinguished, showing, however, no genital differences. No one species is coloured similarly to *E. lathoniana* (HÜBNER), the type species of *Eugnosta* (in the Nearctic Subregion only one species can be included in *Eugnosta* on the basis of coloration, viz., *E. argyroplaca* MEYRICK, 1913 — comb. n., described in *Euxanthis* HÜBNER. On the other hand some Palaearctic *Eugnosta*-species resemble *Carolella* in coloration. *Carolella* species show slight specific differences in the male genitalia; those in the female genitalia and pattern are much more distinct. The larvae of *Carolella* bore the roots and stems of shrubs, but little is known of bionomy (excepting the dates of collection of the particular species). The genus is distributed in Nearctic Subregion and Neotropical Region, where the majority of the species occur.

DESCRIPTIONS OF NEW SPECIES

The species described below have been kindly provided by Prof. Dr. Jerry A. POWELL to whom I would like express my thanks. The holotypes of the new described taxa are deposited in the collection of the University of California, Berkeley.

Carolella desinens sp. n.

Alar expanse, 12 mm. Labial palpus ca 2, pale brownish cream, remaining parts of head and distal portion of tegula cream, thorax otherwise brownish. Forewing broad, not expanding terminally; costa weakly convex; termen slightly oblique, straight postapically. Ground colour cream, slightly mixed with brownish ochreous especially in terminal third of wing; costa suffused with brown to middle, concolorously spotted in posterior half; small brownish dots along anterior half of termen; pattern in form of brownish dorsal fascia distinctly suffused with black-brown at dorsum; small, brown dot at disc. Fringes pale cream with brown divisions and brownish ends in apical portion. Hindwing grey-cream, densely suffused and transversely strigulated with brownish grey; fringes dirty cream with weak median line. Variation: median marking more or less dark, usually reaching discal spot; terminal suffusion occasionally brownish.

Male genitalia (Figs 1, 2): Socius slender; median port of transtilla strong; aedeagus small, with slender terminal part; cornutus with large basal plate extending beyond its middle.

Holotype, male: "Mex: Veracruz, Fortin de las Flores VII—7 to 12—74, Elev. 1010 m; J. A. CHEMSAK, J. POWELL at light"; paratypes, 4 males labelled as follows: "Cordoba, Mex. Vera Cruz, VII—25—1966; J. S. BUCKET, M. R. & R. C. GARDNER Coll.", Mexico: Veracruz Cordoba VII—11—74, J. CHEMSAK, J. POWELL at light, Elev. 930 m", "Mex: Veracruz, Rio Metlec, Fortin de las Flores, X—3—75, J. POWELL" and "Mex: Linares, Nuevo Leon X—12/18—76; J. POWELL, J. CHEMSAK at light".

Carolella medioxima sp. n.

Alar expanse, 16 mm. Head and thorax (labial palpus missing) olive brown. Forewing hardly expanding terminally; costa almost straight to before apex where bent; apex very short; termen weakly oblique, rather straight. Ground colour olive cream suffused with pale brownish grey at base; two concolorous transverse shades in postmedian and subterminal area; some brownish spots in apical portion of wing accompanied by dots along costa. Median fascia brownish, atrophied subcostally. Fringes damaged, cream at cornus, brownish at apex. Hindwing brownish with rather concolorous fringes.

Female genitalia (Fig. 28): Papilla analis fairly longe apophyses anteriores very long; sterigma beyond anterior cup-shaped part weakly sclerotized, with

two lateral convexities; antrum broad, membranous similarly as remaining parts of bursa copulatrix; densely spined beyond corpus bursae; accessory bursa submedian, dorsal, ductus seminalis almost opposite to base of the former, also dorsally.

Holotype, female: "Jesus Maria, Nayarit, Mex. VII—27—55, B. MALKIN Collector".

Carolella opalina sp. n.

Alar expanse, 12 mm. Labial palpus broad, ochreous, cream above, remaining parts of head concolorous; thorax a little darker. Forewing weakly expanding terminally with straight costa, very short, rounded apex and weakly oblique, tolerably straight termen. Ground colour whitish cream with glossy suffusions in distal part of wing on borders of diffuse, pale ochreous olive transverse markings; concolorous spots along distal part of costa and termen, black dashes at ends of veins terminally and apically; basal half of costa suffused with brownish; median fascia atrophying subcostally, olive brown in colour, marked with brown at dorsum. Black dot at disc. Fringes dark grey, cream at tornus. Hindwing brownish grey, paler basally, strigulated with brown-grey; fringes brownish grey with median line. Variation: Median fascia in much paler paratype preserved only in dorsal half of wing.

Male genitalia (Figs 3, 4): Valva broad; sacculus short. Aedeagus small, with strong cornutus provided with broad but short basal plate.

Female genitalia (Fig. 29): As in the preceding species but with narrower and less strongly sclerotized cup-shaped part of sterigma; distal portion of sterigma subtriangular; bursa copulatrix membranous, spined in median area; accessory bursa submedian, extending ventro-laterally; ductus seminalis dorsal, from before ductus of the latter.

Holotype, female: "Durango, 25 mi W. 8100', Dgo. Mex VII—20—64, J. A. CHEMSAK & J. POWELL. Black & White lights"; G. S. 6064; paratype, male with label "Cuauhtemur 15 mi E., 6000. Chih. [uachua], Mex. VII—11—64, J. A. CHEMSAK & J. POWELL. Black & White lights".

Carolella leonana sp. n.

Alar expanse, 12 mm. Labial palpus over 2, ochreous, cream above; front cream; thorax dirty cream, darker. Forewing uniformly broad throughout; costa hardly convex; apex delicately rounded; termen weakly convex and oblique. Ground colour pale ochreous cream, costa and termen slightly darker; pattern in form of incomplete median fascia tapering terminally, atrophying at cotta, ferruginous in colour; similarly coloured subterminal blotch extending along middle of wing towards disc; indistinct ferruginous spots at costa subapically. Fringes pale ferruginous. Hindwing brownish grey; fringes paler with brownish median line and similar terminations at apex.

Female genitalia (Fig. 30): Papilla analis much shorter than in all preceding species; apophyses anteriores also shorter. Sterigma with very short, ring-shaped anterior part and distinctly sclerotized, incised in middle of distal edge dorsal part the lateral portions of which are membranous. Dense spines in bursa copulatrix, mainly ventrally; ductus bursae free of spines; ductus seminalis broad, extending from middle of bursa subdorsally; accessory bursa small, dorsal, anteriorly to ductus seminalis.

Holotype, female: "Mex: Nuevo Leon 4 mi. W. Iturbides, IX—13/14—76; J. A. CHEMSAK J. POWELL at lights".

Comments. This species resembles externally *C. bimaculana* (ROBINSON) described from Texas but differs in the shape of the sterigma which in *bimaculana* is more strongly sclerotized laterally and anteriorly. The type of the latter is unfortunately unknown to me and the comparison is based on the specimens from Texas.

Carolella ochrolemma sp. n.

Alar expanse, 13 mm. Labial palpus 2, brownish, remaining parts of head and thorax dark grey. Forewing as in preceding species but with more oblique termen. Ground colour pale brownish, paler near dark ferruginous dorsal fascia; terminal pastern almost completely atrophied; some brown dots along dorsal edge of median cell to median fascia, some ones at dorsum. Fringes cream with dark brown median line. Hindwing brownish grey; fringes slightly paler with brownish median line. Variation: paratype paler, with ground colour pale brownish cream and pattern ferruginous. Subterminal marking reaching termen and tornus, extending proximally along vein m_2 .

Male genitalia (Figs 5—7): Terminal portion of tegumen slender except for base of socii which are slightly broader; median part of transtilla slender, long. Valva strongly tapering terminally in distal half; sacculus short. Aedeagus with long, slender cornutus.

Female genitalia (Figs 31, 32) as in preceding species but with weakly sclerotized posterior portion of sterigma and well developed its cup-shaped part; ductus bursae long, membranous with small group of spines in anterior part; accessory bursa at base of ductus bursae, ductus seminalis anteriorly to the latter, both ventrally.

Holotype, female: "Mex: 17 mi SE Saltillo Coah.[uila] 6800', IX—23—76; J. A. CHEMSAK J. POWELL at light"; paratype, identically labelled male.

Carolella ouralia sp. n.

Alar expanse, 14 mm. Labial palpus over 1.5, brownish, white-cream terminally and dorsally; remaining parts of head and thorax whitish, base of tegula brownish. Forewing not expanding terminally; costa hardly concave in median portion; apex very short, broad, termen weakly oblique, delicately

convex. Ground colour cream marbled with grey; some brown dashes along dorsum and termen; median fascia brownish grey, brown at dorsum, tapering towards middle breadth of wing where paler, atrophying costally. Fringes cream at tornus, grey in remaining parts. Hindwing cream with grey transverse strigulation; fringes greyish cream with grey median line.

Male genitalia (Figs 8—11): Bases of socii close to one another; median part of transtilla slender; valva broad, weakly tapering terminally; sacculus slender. Aedeagus short with slender ventro-terminal part; cornutus fairly long, slender with short, broad base.

Holotype, male: "Mex: D[uran]go, El Salto 9 mi. W., 8800', VII—2—64; J. POWELL collector"; G. S. 11746.

Carolella saltillana sp. n.

Alar expanse, 14 mm. Labial palpus about 3, broad, dark grey; front greyish, vertex and termen grey with paler scales. Forewing broad, indistinctly expanding terminally; costa hardly convex; apex rounded; termen straight, weakly oblique. Ground colour ash-grey, strongly suffused with indistinct, darker strigulation. Median fascia in form of ovate blotch atrophied subcostally, hardly reaching dorsum, dark brown in colour. Fringes brownish grey, greyish basally. Hindwing dark, brown-grey, paler and transversely strigulated in basal half. Fringes somewhat paler than wing, mixed with white-grey in anal area.

Male genitalia (Figs 16—18): Socius broad basally; median part of transtilla club-shaped; valva broad; aedeagus slender, with long, slender ventro-terminal part; cornutus very large with capitulum expanding proximally.

Holotype, male: "Mex: 17 mi. SE Saltillo, Coah.[uila] 6800' IX—23—76; J. A. CHEMSAK, J. POWELL at lights"; G. S. 11743.

Comments. Externally the new species resembles *deceptana* and *busckana* but differs in the shape of termen that is almost straight and less oblique than in the latter species. The genital differences are mainly in the shape of the aedeagus, cornutus and transtilla.

Carolella macneilli sp. n.

Alar expanse, 20 mm. Labial palpus 5, whitish grey, remaining parts of head and thorax concolorous. Forewing uniformly broad throughout; costa delicately curved outwards; termen slightly oblique, delicately convex. Ground colour grey-white delicately strigulated with brownish grey especially along wing edges; weak concolorous shades in subterminal area; subdorsal blotch grey, strigulated with brown-grey representing median fascia. Fringes damaged, probably concolorous with ground colour. Hindwing brownish grey with much darker strigulation; fringes pale brownish grey.

Male genitalia (Figs 19—21): Socius short, broad basally; median part of transtilla very slender, long; valva large, up-curved, alightly tapering term-

inally; sacculus fairly long. Aedeagus long; cornutus strong with two proximal prominences of capitulum.

Holotype, male: "Mex: D[uran]go, 30 mi W. Durango 8000', VIII—3/7—72, J. POWELL, D. VEIRS, C. D. MACNEILL at lite"; G. S. 11700.

Carolella chemsakiana sp. n.

Alar expanse, 20 mm. Labial palpus 4, broad, grey, pale scaled, ash-grey above; remaining parts of head and thorax grey. Forewing distinctly expanding terminally; costa tolerably straight; apex rather rounded; termen straight, weakly oblique. Ground colour white-grey, densely suffused with brownish, preserved mainly at pattern borders; pattern in form of uniformly broad dorsal fascia extending to below disc, and delicate subapical marking. Fringes brownish grey, white basally. Hindwing brownish grey, paler, more whitish anteriorly, densely strigulated with grey-brown, fringes white-grey with weak brownish grey median line.

Male genitalia (Figs 22—24): As in preceding species but broad portions of socii larger; median part of transtilla short; valva strongly tapering terminally. Aedeagus shorter; cornutus long, with small, rounded capitulum.

Holotype, male: "Mex: D[uran]go, 28 mi E. El Salto, 8000', VII—22—64, J. A. CHEMSAK & J. POWELL, Black & White lights"; G. S. 11737. Paratype; also male (alar expanse 13 mm!) bears identical label.

Carolella californica sp. n.

Alar expanse, 24 mm. Labial palpus ca 2, grey; head and thorax concolorous, the latter with darker scales. Forewing slightly expanding terminally; costa slightly concave medially; apex rounded; termen straight, somewhat oblique. Ground colour whitish grey densely spotted and strigulated with brownish grey, suffused with brownish at 2/3 of costa; median fascia in form of uniformly broad, pale edged dorsal marking not reaching subcostal area. Fringes whitish with brownish grey divisions. Hindwing whitish grey, strigulated with brown-grey; fringes whitish.

Male genitalia (Figs 25—27): Tegumen very broad; socius with broad base; median part of transtilla slender; valva elongate, upcurved, slightly tapering terminally; sacculus slender. Aedeagus proportionally small, slender; cornutus thick with inequally long proximal processes of capitulum.

Holotype, male: "Mex: Baja Calif.[ornia] N[or]jte, Bahia los Angeles 5 km. S., 27 Dec.'78, R. DIETZ & R. CLARKE at blacklight"; G. S. 11741.

Carolella dyschiria sp. n.

Alar expanse, 17 mm. Labial palpus 1.5, whitish, remaining; parts of head and thorax rather concolorous. Forewing uniformly broad throughout; costa

weakly convex; apex rounded; termen fairly oblique, hardly convex. Ground colour whitish delicately sprinkled and strigulated with grey, suffused with dark grey with terminal half of wing, mainly beyond disc and at apex, where some brown and black scales occur. Median fascia dark grey with some darker strigulae at dorsum, interrupted before costa. Fringes dark grey. Hindwing whitish with delicate greyish strigulation becoming stronger towards apex; fringes whitish with greyish median line.

Female genitalia (Figs 33, 34): Sterigma with large dorsal plate extending in middle of convex distal edge the distal edges of which fuse with apophyses anteriores; vicinity of ottium bursae sclerotized; ductus bursae long, membranous distally; corpus bursae with ovate sclerite; ductus seminalis extending from beyond middle of ductus bursae, ventrally, accessory bursa also ventral, originating beyond submedian concavity; apophyses, especially posteriores long.

Holotype, female: "Mex: Oax.[aca], 7 mi SE Nochixtlan 7000' X—7—1975; J. POWELL & J. CHEMSAK collectors"; G. S. 11736.

Comments. The species is distinct in coloration and resembles Palaearctic *Cochylis posterna* (ZELLER). Its systematic position cannot be solved until the male is examined.

CATALOGUE OF SPECIES

- aphrobapta*** (MEYRICK) 1931, Exotic *Microlepid.*, **4**: 152 (*Eulia*). Type locality: Espirito Santo, Guandú
- argentinae*** RAZOWSKI 1967, Acta zool. cracov., **12**: 196 (*Carolella*). Type locality: Villa Ana, Argentina
- asthenia*** CLARKE 1968, Proc. U. S. natn. Mut., **125**: 55 (*Carolella*). Type locality: Palin, Guatemala
- selecta*** (MEYRICK) 1931, Exot. *Microlepid.*, **4**: 158. (*Euxanthis*). Type locality: Asunción, Paraguay
- molybdina*** CLARKE 1968, Proc. U. S. natn. Mus., **125**: 53 (*Carolella*). Type locality: Tamazunchale, Mexico
- molybdanthos*** (MEYRICK) 1932, Exot. *Microlepid.*, **4**: 266 (*Phtheochroa*). Type locality: Neu Bremen, Santa Catarina, Brazil
- hysterosiana*** RAZOWSKI 1967, Acta zool. cracov., **12**: 195 (*Carolella*). Type locality: Tucuman, Argentina
- desinens*** sp. n. (p. 410)
- medioxima*** sp. n. (p. 410)
- erigeronana*** (RILEY) 1881, Trans. Acad. St. Louis, **4**: 316 (*Conchylis*). Type locality: Texas, U. S. A.
- opalina*** sp. n. (p. 411)
- leonana*** sp. n. (p. 411)
- ochrolemma*** sp. n. (p. 412)

- beevorana* COMSTOCK 1940, Bull. S. Calif. Acad. Sci., **38**: 180 (*Carolella*). Type locality: California, U. S. A.
- deceptana* (BUSCK) 1907, Jl N. Y. ent. Soc., **15**: 29 (*Pharmacis*). Type locality: Karreville, Texas, U. S. A.
- ouralia* sp. b. (p. 412)
- saltillana* sp. n. (p. 413)
- busckana* COMSTOCK 1939, Bull. S. Calif. Acad. Sci., **38**: 113 (*Carolella*). Type locality: El Segundo, California, U. S. A.
- willettana* COMSTOCK 1939, *ibid.*: 115 (*Carolella busckana* f.). Type locality: Chuckawalla Springs, Riverside Co., California, U. S. A.
- macneilli* sp. n. (p. 413)
- chemsakiana* sp. n. (p. 414)
- californica* sp. n. (p. 414)
- mexicana* (BUSCK) 1907, J. N. Y. ent. Soc., **15**: 30 (*Pharmacis*). Type locality: Beulah, N. Mexico, U. S. A.
- dyschiria* sp. n. (p. 414)

Mimeugnosta gen. n.

Type species: *M. particeps* sp. n.

The new genus characterizes with the following autapomorphies: Socius very long, well sclerotized, large group of pectinate, transformed scales in median area of internal surface of valva. Other character: tagumen rather short, with ill-defined posterior portion represented by short base of socii; transtilla with slender median part; costa of valva almost straight, sclerotized; vinculum arms not coalescent ventrally; cornutus capitate.

Comments. Externally the type species of this genus resembles the species of *Carolella* and was included in this genus until further Neotropical species (described in other paper) is found. The latter characterizes with well developed abdominal organ occurring in the genera of the *Saphenista*-group. The new genus is most probably closest to *Mielkeana* RAZOWSKI & BECKER as the structure of the socii shows.

Mimeugnosta particeps sp. n.

Alar expanse, 9 mm. Labial palpus ca 1, ochreous cream, concolorous with thorax, front and vertex cream. Forewing hardly expanding terminally; costa weakly convex; apex pointed; termen fairly oblique, delicately convex. Ground colour cream, base of wing and its terminal area suffused with ochreous, pattern darker than suffusion, diffuse median fascia ill-defined, mixed with brownish ar dorsum; subapical blotch weakly developed. Black dot at disc and before middle of termen. Fringes cream, Hindwing brownish grey with paler fringes. Variation: In paratype head and thorax pale ochreous, ground colour a little paler; pattern yellow-brown. Median fascia darkest in costal portion.

Male genitalia (Figs 12—15): Tegumen small; socius very long; median part of transtilla short, slender. Valva elongate with costa slightly convex subterminally; sacculus weakly differentiated; large area of strong pectinate scales in middle of internal surface of valva. Aedeagus slender; cornutus curved at base, capitate. Group of thick dorso-lateral scales on eighth tergite present.

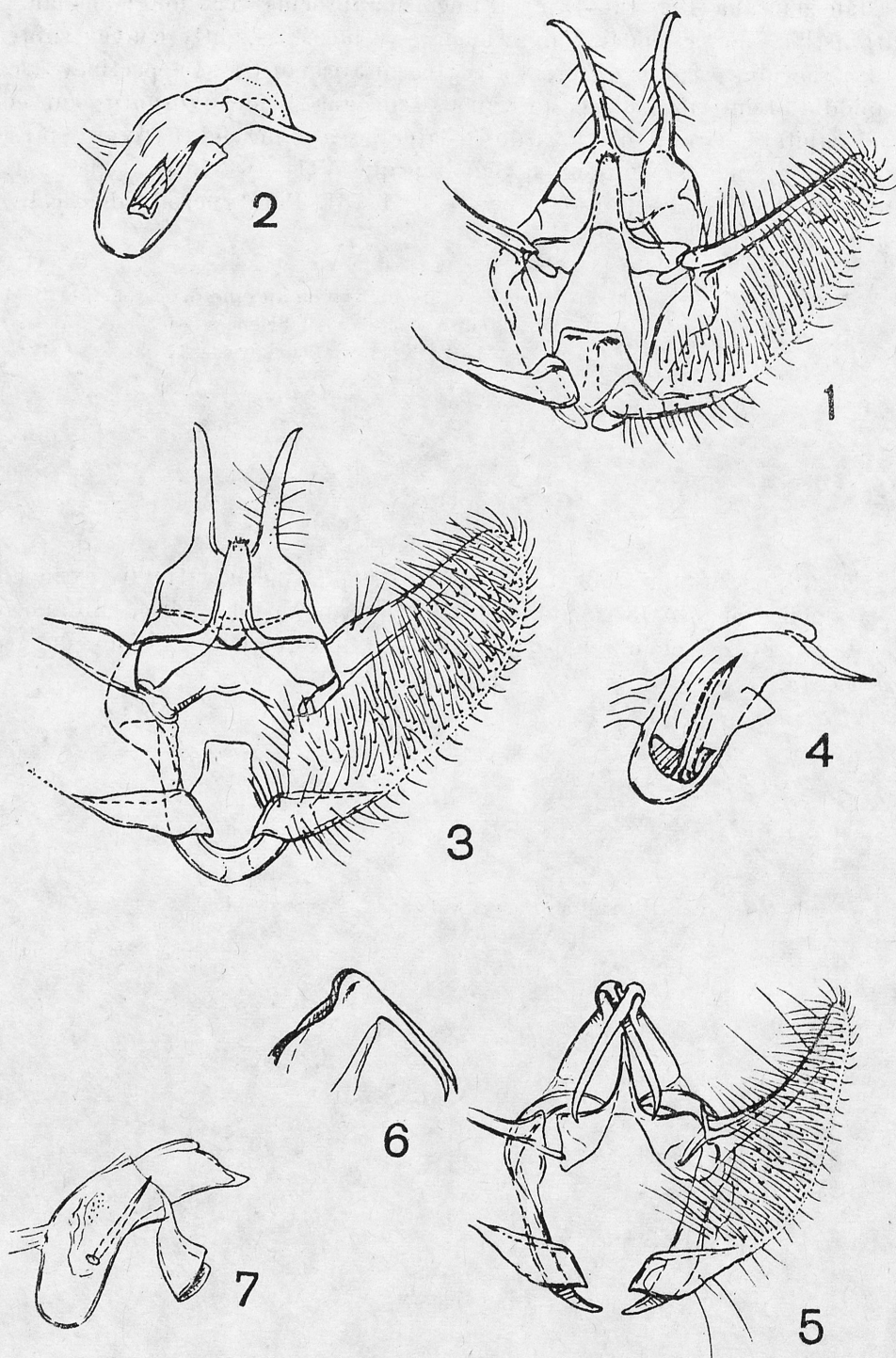
Holotype, male: "Honduras: Siguatepeque VII—16—1978 at light, J. A. CHEMSAK, E. G. & J. M. LINSLEY"; G. S. 11781. Paratype, an identically labelled male.

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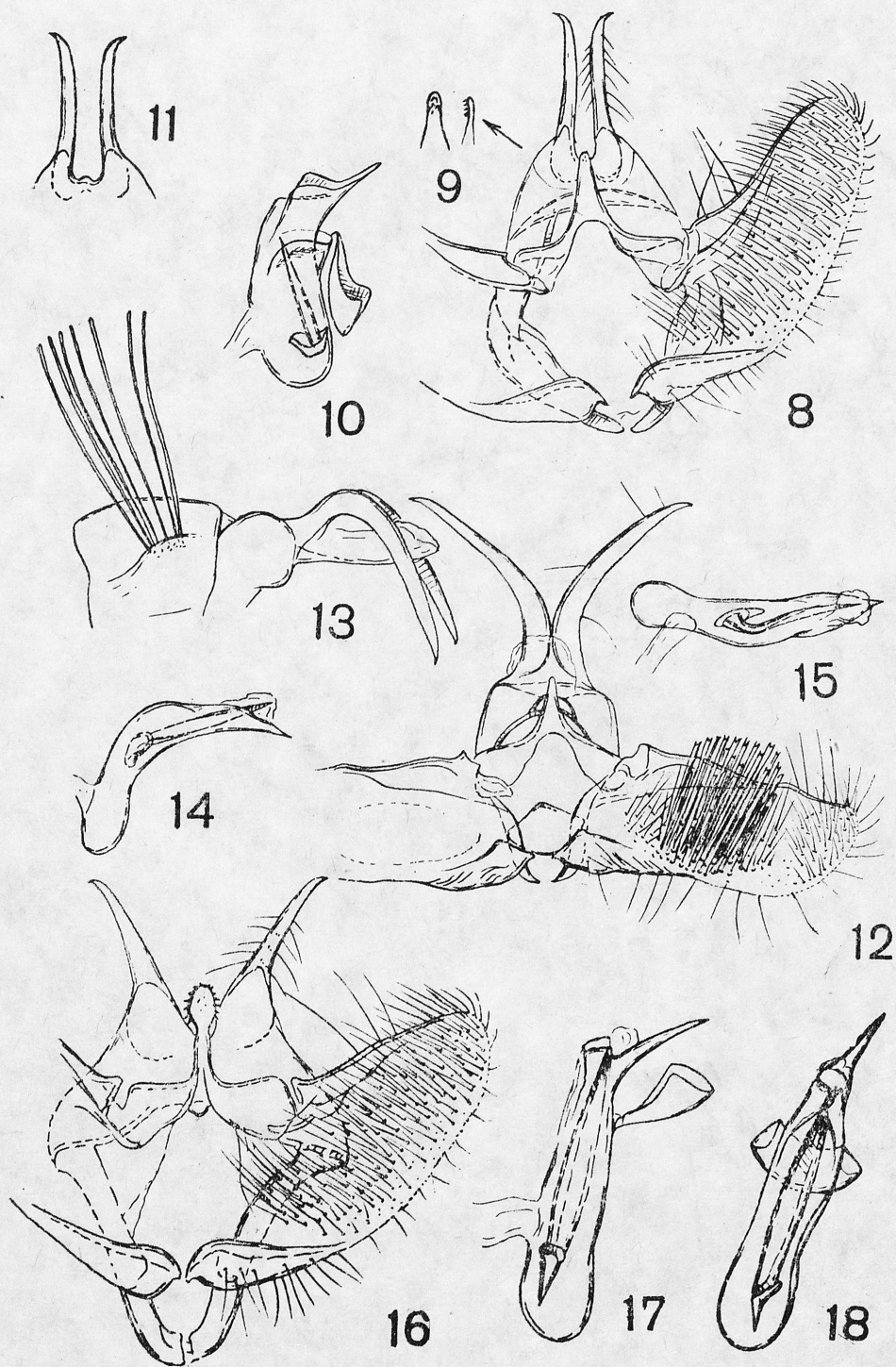
STRESZCZENIE

Scharakteryzowano rodzaj *Carolella* BUSCK, a jego gatunki wymieniono w katalogu. Ponadto 13 gatunków zostało opisanych jako nowe. Opisano również nowy rodzaj podobny do *Carolella* genitaliowo, lecz należący do grupy *Saphenista*.

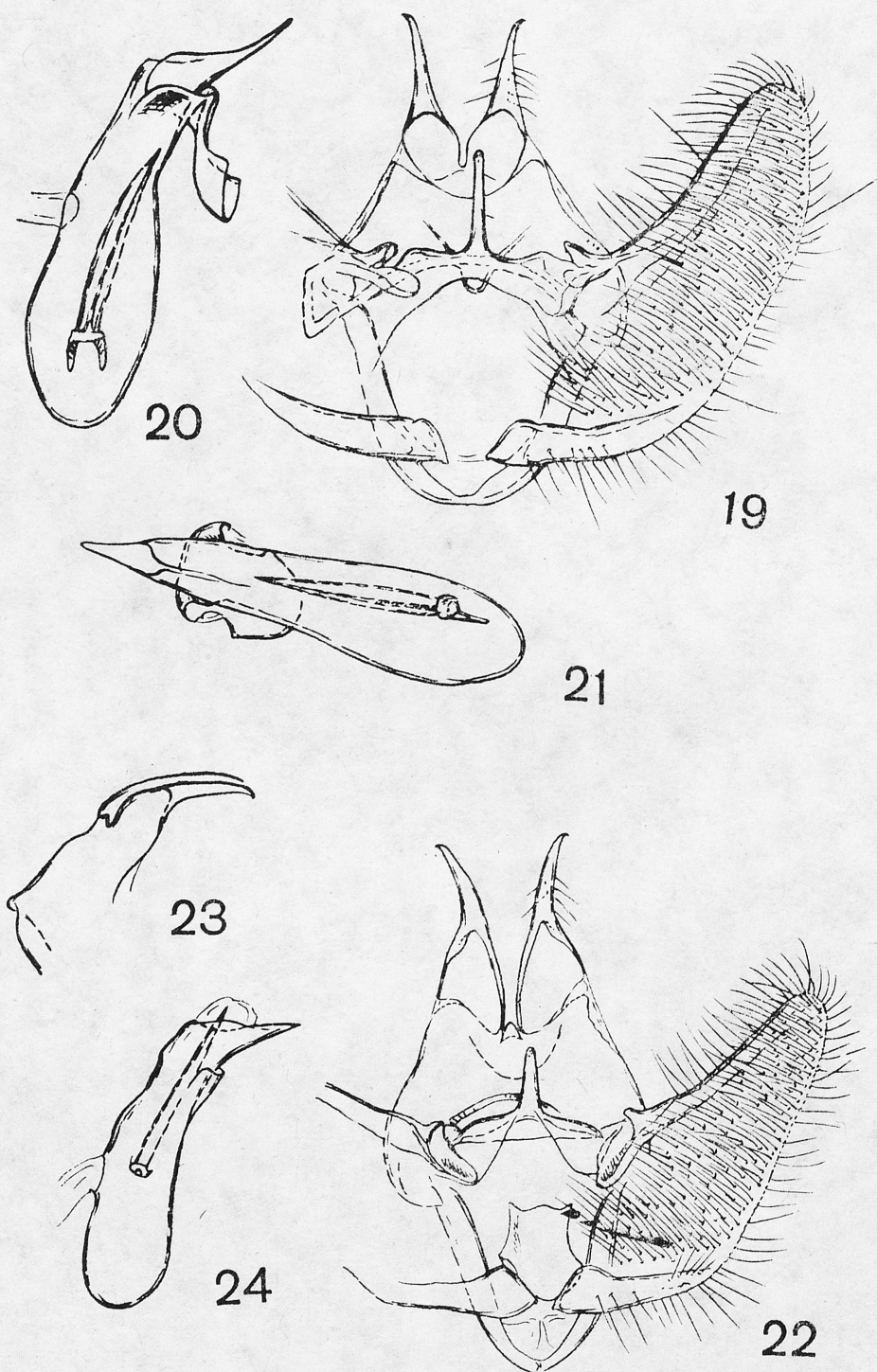
Redaktor pracy: prof. dr A. Krzanowski



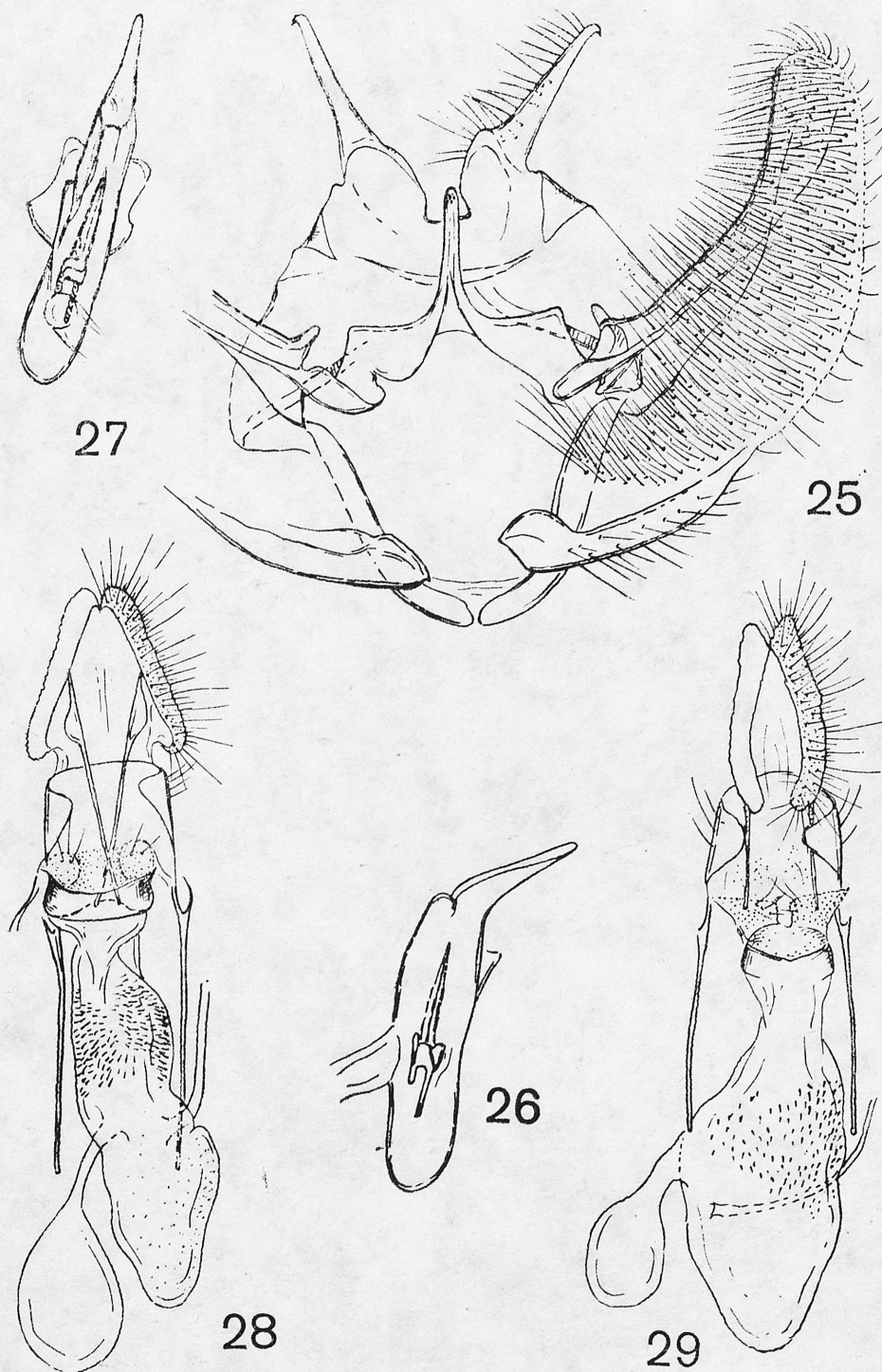
Figs. 1—7. Male genitalia of *Carolella* BUSCK: 1, 2 — *C. desinens* sp. n., holotype; 3, 4 — *C. opalina* sp. n., holotype; 5—7 — *C. ochrolemma* sp. n., holotype



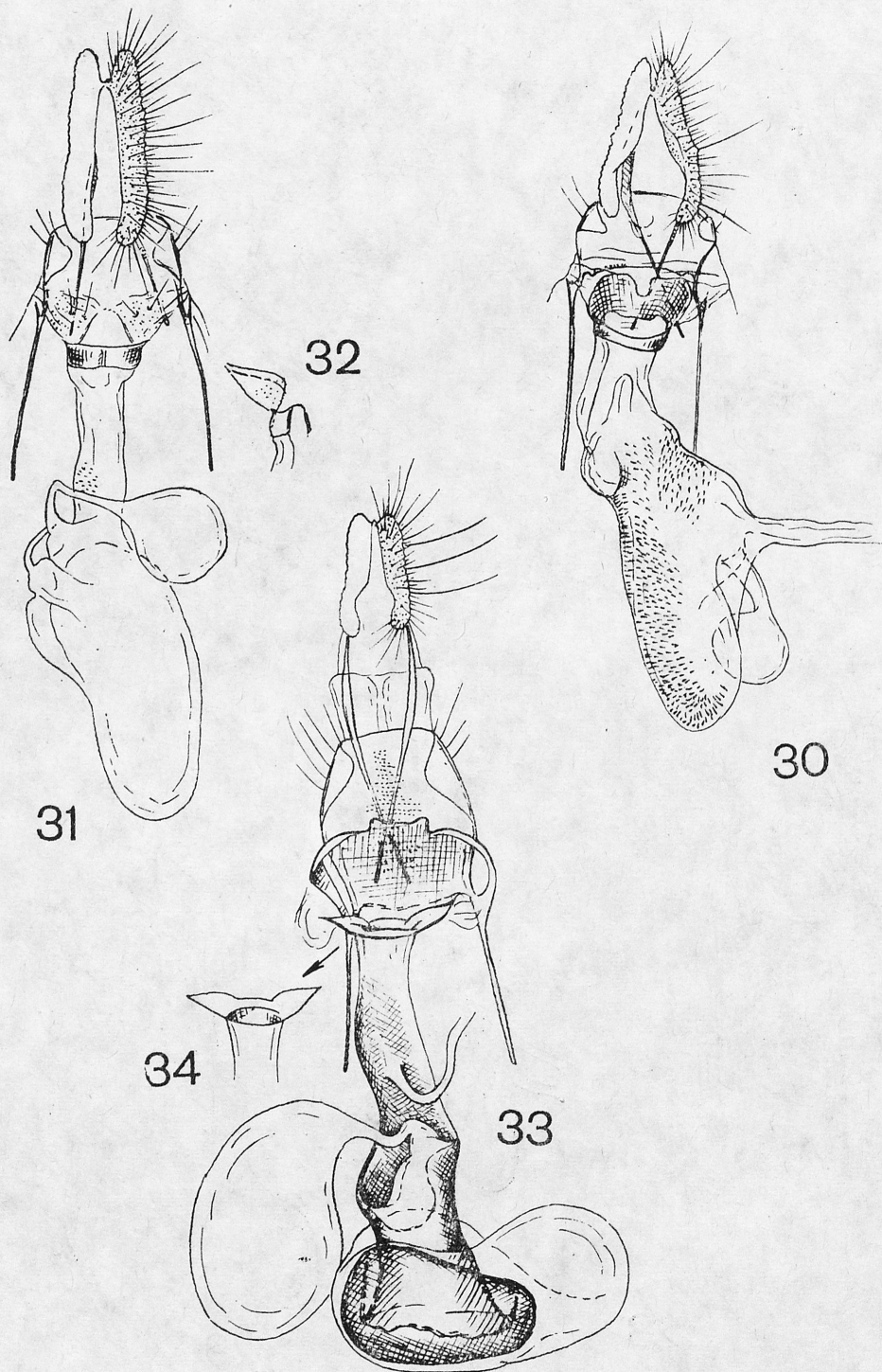
Figs. 8—18. Male genitalia of *Carolella* Busck and *Mimeugnosta* gen. n.: 8—11 — *C. uralia* sp. n., holotype; 12—15 — *M. particeps* sp. n., holotype; 16—18 — *C. saltillana* sp. n., holotype



Figs. 19—24. Male genitalia of *Carolella* BUSCK: 19—21 — *C. macneilli* sp. n., holotype; 22—24 — *C. chemsakiana* sp. n., holotype



Figs. 25—29. Genitalia of *Carolella* BUSCK: 25—27 — male of *C. californica* sp. n., holotype; 28 — female of *C. medioxima* sp. n., paratype; 29 — female of *C. opalina* sp. n., paratype



Figs. 30—34. Female genitalia of *Carolella* BUSCK: 30 — *C. leonana* sp. n., holotype; 31, 32 — *C. ochrolemma* sp. n., holotype; 33, 34 — *C. dyschiria* sp. n., holotype