

ACTA ZOOLOGICA  
CRACOVIENSIA

Tom XXIII

Kraków, 31. XII. 1978

Nr 4

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Notes on *Pandemis* HÜBNER (*Lepidoptera*, *Tortricidae*) with Descriptions  
of New Species

[Pp. 55-66, 29 text-figs.]

Uwagi o *Pandemis* HÜBNER (*Lepidoptera*, *Tortricidae*) i opisy nowych gatunków

Abstract. The present paper constitutes of three parts, viz., short characteristics of the genus, list of the Chinese species from the collection of H. HÖNE and descriptions of the abdominal organs of some representatives of the genus *Pandemis* HBN. Three new species are described and the redescriptions are given of four others.

ACKNOWLEDGMENTS

I would like express my thanks to the authorities of the Zoologisches Forschungsinstitut und Museum Alexander König, Bonn for providing me in this material. The holotypes of the new described species are deposited in the above-mentioned institution.

CHARACTERISTICS OF THE GENUS

This genus was characterised several times (cf. OBRAZTSOV, 1954: 164) and species the males of which developed a deep incisure of the second joint of antenna were included in it. Then some species with normally developed antenna have been incorporated, of which only *P. dumetana* (TREIT.) is now preserved in this genus. Based on larger material (16 species examined) I am giving the following diagnose of the genus in question.

Labial palpus in male usually 2.5 in female about 3 times as long as the diameter of the eye. Incisure of pedicellus developed in all known species except

for *dumetana*. Costal fold of male forewing found only in two species. Venation typical: all veins separate. In the male genitalia costa of valva completely reduced. Its outer surface develops large sclerite broadening terminally connecting top of pedunculus. Transtilla heavily sclerotized, deeply concave, often emarginate ventrally. Socius and uncus large. Subgenital segment more or less altered, usually provided with bunch of long scales on each side. In the female genitalia sterigma well developed, with broad lateral parts and deep cup-shaped portion (exception: *emptyeta*). The antrum develops elongate internal sclerite. Pair of sclerites of corpus bursae showing a tendency to atrophy. Signum present.

#### LIST OF THE SPECIES OF HÖNE COLLECTION

##### *Pandemis cinnamomeana* (TREITSCHKE)

Numerous specimens from West Tien-mu-shan (Prov. Chekiang) collected in first half of June, early July and first days of August and then throughout September. This population slightly differs from the European in having almost straight left surface of the distal part of the aedeagus.

##### *Pandemis chlorographa* (MEYRICK)

*Pandemis chlorographa* MEYRICK, 1921, Exot. *Microlepid.*, 4: 150. Type locality: Mt. Omei, China.

Male. Labial palpus over 2.5, ochreous cream often mixed rust; head pale brown, front cream; thorax pale ferruginous brown. Forewing 7—9 mm, broadest medially, tolerably uniformly broad in distal part, similar in shape to that in *cinnamomeana* but apex slenderer, termen hardly sinuate, not oblique. Ground colour cinnamon cream to pale cinnamon brown, delicately strigulated brown. Pattern much darker than ground colour, cream edged, similarly shaped as in mentioned species. Fringes concolorous with pattern, much paler in tornal portion. Hindwing brownish grey; fringes paler.

Female. Labial palpus as in male, concolorous with remaining parts of head. Forewing 11—12 mm with costa more curved outwards in basal third, apex somewhat longer, pointed, termen more distinctly sinuate. Ground colour pale, strigulation well developed. Top of hindwing weakly suffused ochreous. Otherwise as for the male.

Male genitalia (figs. 1, 2) as in *cinnamomeana* but uncus stronger, more expanding terminally, aedeagus distinctly longer, provided with dorso-lateral denticle situated apically. Subgenital segment similar to that in the mentioned species.

Female genitalia (fig. 17). Cup-shaped portion of sterigma larger than in



*cinnamomeana*, less tapering proximally, sclerite of antrum much longer, swung laterally, sclerites of corpus bursae smaller.

Known only from China. In the examined collection 4 ♂♂ and 5 ♀♀ from West Tien-mu-shan dated 27. V., 12—29. VI. and 2. VII. present.

*Pandemis ribeana* (HÜBNER)

One specimen collected in Mien-shan (Prov. Shansi). The sclerite of the antrum is somewhat longer than in Central European specimens.

*Pandemis cataxesta* (MEYRICK)

*Pandemis cataxesta* MEYRICK, 1937, Dt. ent. Z. Iris, **51**: 174. Type-locality: Li-kiang, China.

Female. Labial palpus over 2.5, cream-brown, upper part of palpus and front ochreous, vertex and browner. Forewing 10—13 mm somewhat slenderer than in *ribeana* with apex shorter and termen not oblique, indistinctly concave postapically. Ground colour brownish yellow mixed ochreous, darkening basally and dorsally, darker spotted in terminal area. Pattern yellowish brown to yellowish ferruginous, indistinct, preserved only in costal portion of wing. Fringes concolorous with pattern to vein  $m_3$ , then cream or concolorous with the ground colour. Hindwing pale brownish grey tinged ochreous at apex; fringes pale brownish cream to whitish cream with brownish basal line. In two specimens some dark brown dots in distal portion of forewing present.

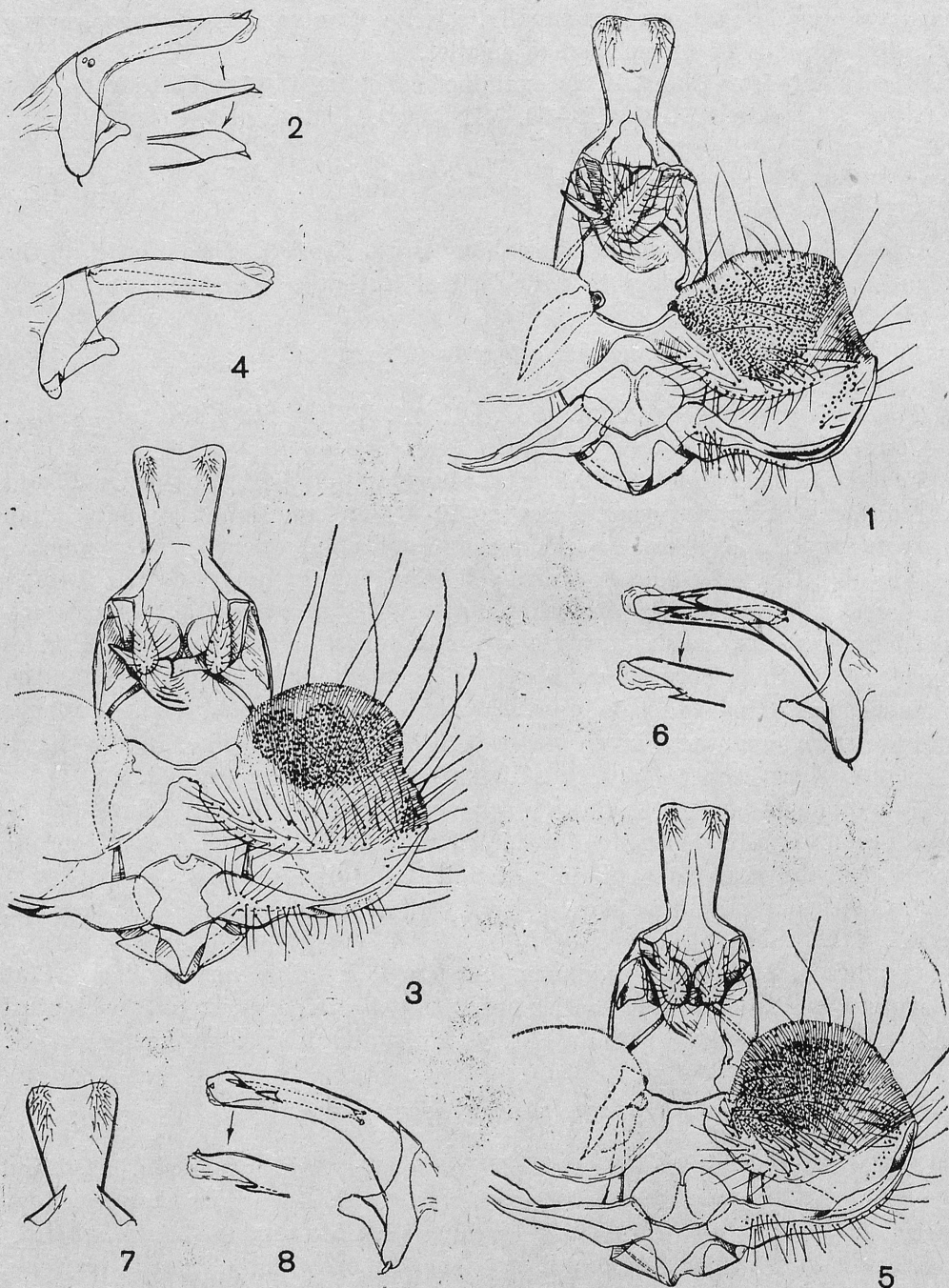
Female genitalia (fig. 18). Cup-shaped part of sterigma broad; sclerite of antrum proportionally short. Signum smaller than in *ribeana*, sclerites of corpus bursae delicate, situated in middle of well sculptured surfaces.

Two specimens from Li-kiang (Prov. Nord Yunnan) collected the 9. VIII. and 3. VIII.

Comments. The male is unknown. The female genitalia very similar to that in *ribeana* and the following species but with delicate concavity of the ventral surface of the sterigma especially distinct in the middle of its proximal portion.

*Pandemis phaenotherion* sp. nov.

Labial palpus over 2.5 both in male and female, brownish cream. Head and especially front in male often pale cream, vertex usually darker; thorax yellow-brown. Male similar to that of *P. corylana* (F.); forewing 9—11 mm, slightly variable in shape but usually apex very short, more pointed than in *corylana*, indistinctly oblique, straight in costal half or hardly sinuate. Ground colour ochreous yellow, densely strigulated yellow-ferruginous or rust, suffused with same colour terminally. Pattern rust-brown, cream edged, similar to that in mentioned species, somewhat variable. Fringes rust-brown to orange-brown, brownish at tornus. Hindwing greyish brown with pale ochreous cream or



Figs. 1—8. Male genitalia of *Pandemis* HÜBN.: 1 — *P. chlorograptus* MEYR., Tien-mu-shan, G. S. 20758, 2 — aedeagus of same specimen, 3 — *P. phaenotherion* sp. nov., holotype, 4 — aedeagus of same specimen, 5 — *P. phaenodroma* sp. nov., paratype, G. S. 20759, 6 — aedeagus of same specimen, 7 — uncus of holotype of same species, 8 — same specimen, aedeagus



yellowish, often transversely strigulated terminal part; fringes pale brownish except for terminal part of wing where cream. Female: forewing 11—13 mm; apex slightly longer than in male; termen more oblique and sinuate. Coloration usually darker, more ochreous-rust. Distal third of hindwing yellowish to pale ochreous cream often strigulated transversely.

Male genitalia (figs. 3, 4) similar to those in *corylana* but uncus gradually broadening terminally, gently concave apically.

Female genitalia (fig. 19) differing from that in *corylana* in smaller, rounded proximally cup-shaped part of sterigma.

Holotype, ♂ labelled „Tapaishan im Tsinling, Sued Shensi, Ca. 1700 m, 10. VIII. 1936, H. HÖNE”, G.S. 20765. Paratypes: 22 ♂♂ and 6 ♀♀ labelled as cited above but dated 28. V., 6—28. VIII. and 4. IX.

***Pandemis phaedroma* sp. nov.**

Labial palpus in both sexes 2.5, cream often mixed brownish; thorax brown-er. Male: forewing 10—11 mm, similarly shaped as in preceding species but termen tolerably straight beyond apex. Ground colour whitish cream suffused yellowish, densely strigulated with brownish or reticulate in distal third of wing; pattern pale brownish hardly tinged yellowish cream, dark at costa, pale medially towards dorsum where distinct strigulation present. Edges of pattern dark, similar to that in *corylana*. Fringes concolorous with ground colour to middle, brownish terminally. Hindwing pale brownish cream, cream in distal third; fringes paler than wing. Female: forewing 13 mm, broader than in preceding species with termen indistinctly concave postapically. Coloration as in male but with weak transverse strigulation and pale ternal portion of fringes.

Male genitalia (figs. 5—8). Uncus as in preceding species but less concave terminally. Aedeagus provided with two lateral denticles, one situated at 2/3 of right surface, the second (minute one) at the opposite edge rather terminally. The latter often completely atrophying.

Female genitalia (fig. 20). Cup-shaped part of sterigma long, tapering proximally; dorsal part (lamella postvaginalis) short; sclerite of antrum broad distally; two small sculptured sclerites of corpus bursae and irregular sclerotization of the surface near signum present.

Holotype, ♂ labelled „Tapaishan im Tsinling, Sued-Shensi (China), F., 21. VI. 1934, H. HÖNE”, G. S. 20763. Paratypes: 19 ♂♂ and 1 ♀ labelled as cited above but dated 20. VI. to 1. VII.

***Pandemis phaiopteron* sp. nov.**

Labial palpus as in preceding species, brownish, remaining parts of head concolorous, antenna paler, thorax much darker. Forewing broadest submedially; termen indistinctly oblique, hardly sinuate. Ground colour pale brownish; pattern similar to that in *dumetana*, darker than ground colour and with weaker

transverse strigulation. Edges of pattern brown. Fringes concolorous with distal portion of wing, brownish. Hindwing pale brownish; fringes pale. Female unknown.

Male genitalia (figs. 9, 10). Uncus slender, indistinctly expanding terminally, concave in middle of apex. Valva semiovate, tapering distally; sacculus slender; transtilla thin medially. Aedeagus fairly long bent, provided with minute lateral denticle subterminally.

Holotype, ♂ labelled „Tapaishan im Tsinlig, Sued Shensi (China), 6. VIII. 1935, H. HÖNE" G. S. 20764. Paratypes: 3 ♂♂ labelled similarly as the holotype but dated 10. and 19. VIII.

Comments. Subgenital segment with bunches of long, thin scales; peculiar organ of the second abdominal segment described on p. 64.

*Pandemis heparana* (DENIS & SCHIFFERMÜLLER)

Harbin, 10. VII 1951 — 1 specimen. The species is widely distributed in the Palaearctic Region.

*Pandemis dumetana* (TREITSCHKE)

Imianpo (Manchuria), 3. and 6. VIII. 1950 — 2 specimens. Distributed through the Region.

*Pandemis dryoxesta* (MEYRICK)

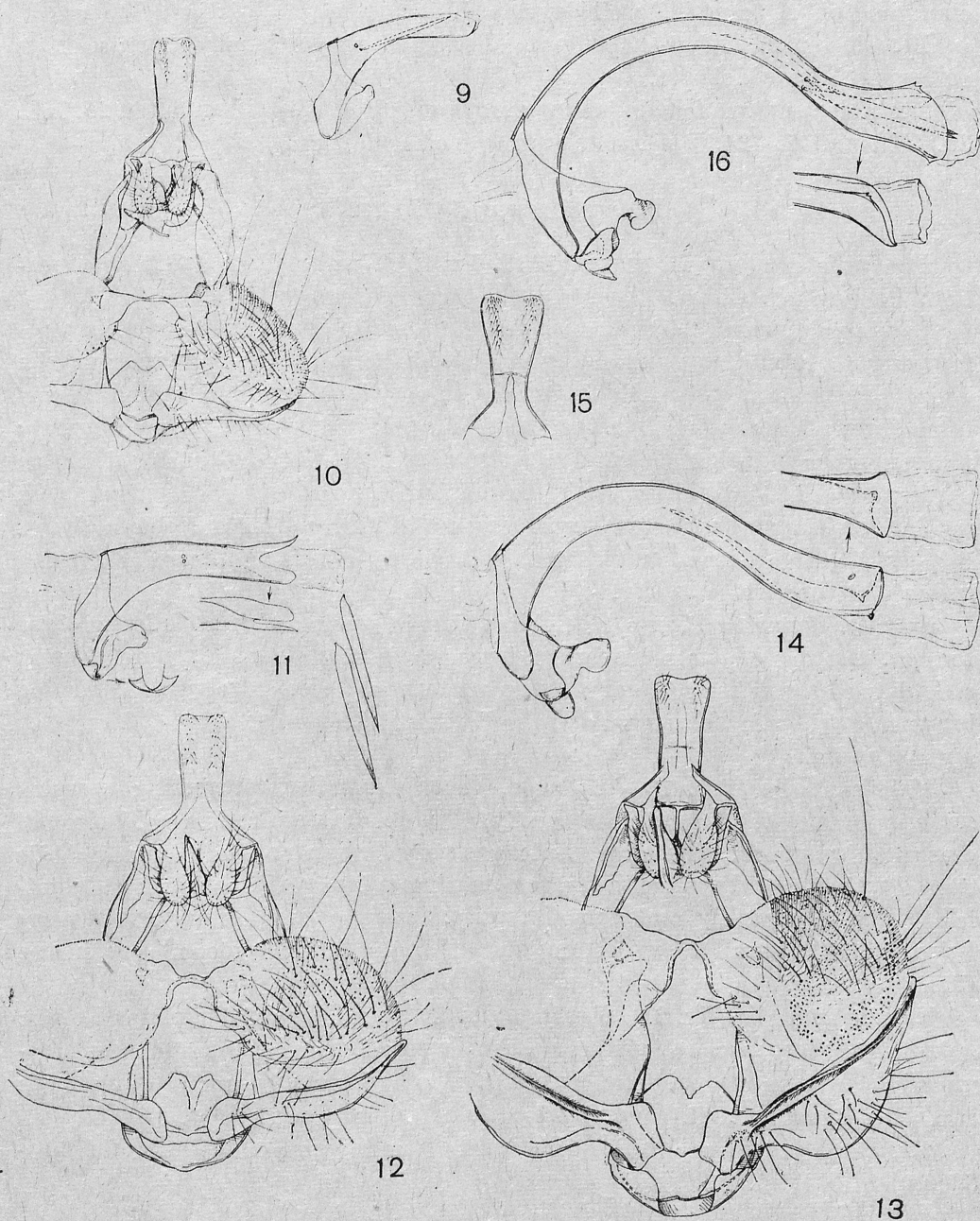
*Pandemis dryoxesta* MEYRICK, 1920, Exot. *Microlepid.*, 2: 341. Type-locality: Murree, Punjab.

The lectotype (designated by CLARKE, 1958: 164) slightly differs from the specimens of the Chinese population. Its forewing is broadest medially, costa distinctly curved outwards throughout. Head (except for front which is cream), thorax and ground colour brownish, base of forewing suffused brown, pattern dark brown. Basal blotch indistinct, median fascia pale edged distally, subapical blotch weakly so proximally. Hindwing brownish. Female with forewing less broad than in the male, resembling that of *heparana*.

The Chinese specimens are characterised as follows. Labial palpus over 2.5, pale brownish, remaining parts of head brownish but antenna cream; thorax brown. Forewing weakly expanding terminally; costa curved outwards to middle; apex very short; termen hardly sinuate, rather not oblique. Costal fold broad, reaching almost to middle of costa. Ground colour pale brownish to brown, without ferruginous shine, pattern indistinct, much browner, with very fine pale edges or without any pale scales. Median fascia strongly broadening from beyond middle. Fringes concolorous with pattern except for tornal portion which is somewhat paler. Hindwing pale brown-grey; fringes paler.

Male genitalia (figs. 11, 12). Uncus weakly expanding terminally; valva





Figs. 9—16. Male genitalia of *Pandemis* HÜBN.: 9 — *P. phaiopteron* sp. nov., holotype, 10 — aedeagus of same specimen, 11 — *P. dryoxesta* MEYR., Tapaishan, G. S. 20755, 12 — aedeagus of same specimen, 13 — *P. emptycta* MEYR., Tapaishan, G. S. 20766, 14 — aedeagus of same specimen, 15 — uncus of same species, Tapaishan, G.S. 20777, 16 — aedeagus of same specimen

semiovate; sacculus strong. Aedeagus with large dorso-lateral process. Ventral emargination of transtilla well developed.

Female genitalia. Cup-shaped part of sterigma proportionally short; sclerites of corpus bursae delicate.

Six males and one female (abdomen missing) from Tapaishan dated 20. XI., 30. VII. and 5.—24. VIII. in the examined collection.

*Pandemis emptycta* MEYRICK

*Pandemis emptycta* MEYRICK, 1937, Exot. *Microlepid.*, 5: 156. Type-locality: Pehlingting, China.

Labial palpus over 2.5, brownish cream in male, browner in female. In male forewing 8—10 mm, not expanding in distal half; apex short, pointed; termen delicately sinuate, hardly oblique. Costal fold very large reaching beyond median fascia, brownish grey in colour. Ground colour pale yellowish brown to brownish; pattern much browner delicately cream edged. Distal edge of basal blotch usually straight, in one female somewhat concave at edges of median cell; median fascia strongly broadening beyond costal third, rather variable in shape. Fringes slightly paler than pattern, pale brown-cream at tornus. Hindwing greyish brown; fringes paler.

Female. Forewing 11 mm, resembling that in *heparana* but with less oblique termen. Ground colour more brown-ferruginous than in male, more densely strigulated brown; strigulae or dots on pattern also well developed. Hindwing browner, with pale ochreous cream apex; fringes brownish cream, darkest at apex of wing.

Male genitalia (figs. 13—16) large, uncus expanding terminally; sacculus strongly broadening in middle ventrally, with small free termination. Proximal emargination of transtilla large. Aedeagus very long, curved to beyond middle dorsally, then weakly so ventrally, terminating in two variably developed denticles situated ventrally and dorso-laterally. Coecum penis short; caulis very large, dilated laterally. Two strong cornuti found in the type, no one in the China material.

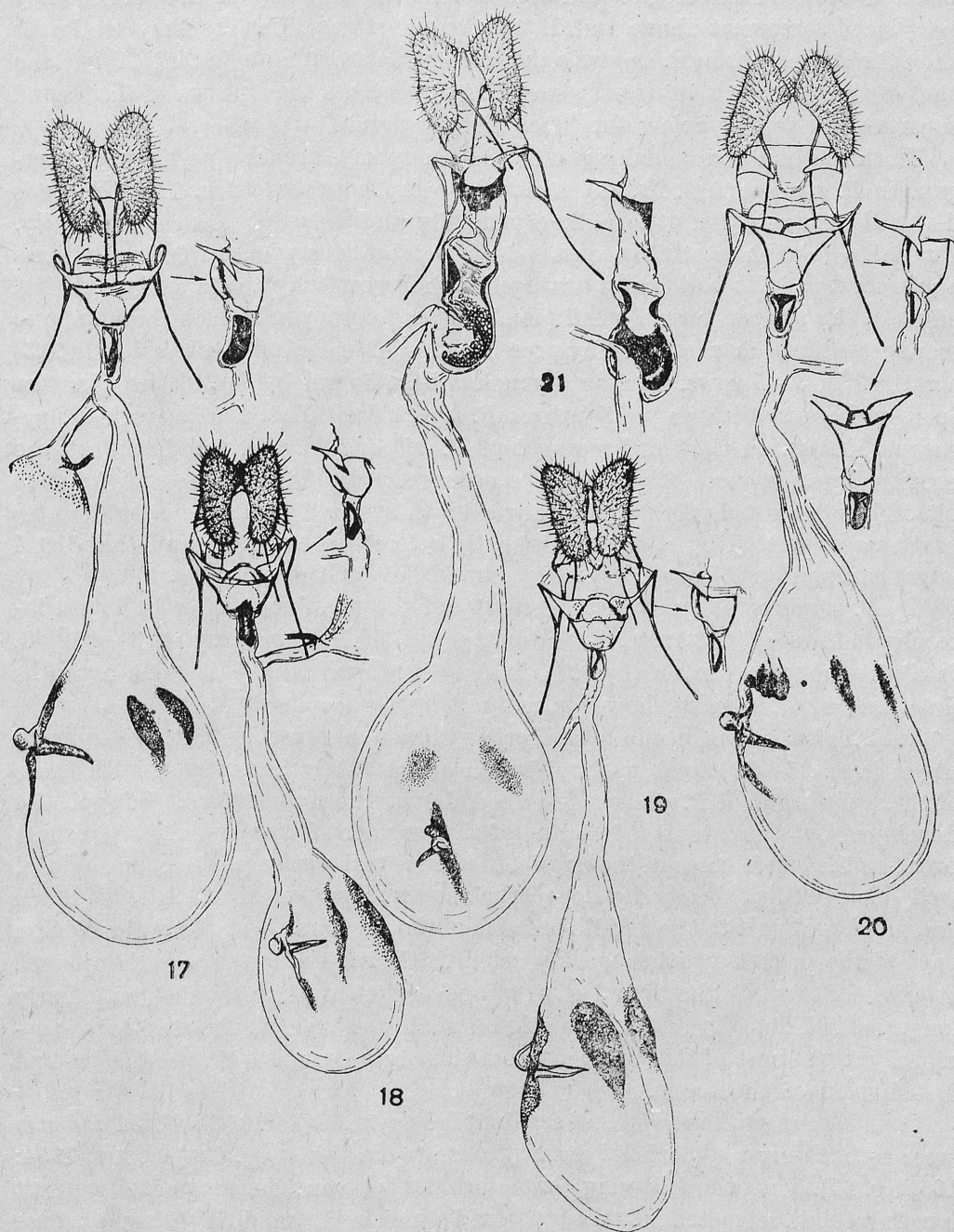
Female genitalia (fig. 21). Sterigma developed in form of dorsolateral arms; antrum very large, sclerotized near ostium ventrally, swung in middle and proximally where additional sclerites occur. Ductus bursae broad; signum small; two densely sculptured, convex areas of corpus bursae present.

Six males and three females collected in Tsinling at the altitude of 1700—3000 m in August.

DESCRIPTIONS OF THE ABDOMINAL ORGANS

In the second and third abdominal segments of the males and females of the *Pandemis*-species occur small organs of an unknown importance. These are rounded, hardly concave areas of very thin, indistinctly sculptured membrane





Figs. 17—21. Female genitalia of *Pandemis* HÜBN.: 17 — *P. chlorograptæ* MEYR., West Tien-mu-shan, G. S. 20768, 18 — *P. catawæstæ* MEYR., Li-kiang, G. S. 20762, 19 — *P. phaenotherion* sp. nov., paratype, G. S. 20760, 20 — *P. phaedroma* sp. nov., paratype, G.S. 20769, 21 — *P. emptyctæ* MEYR., Tapaishan G. S. 20761

situated between the tergite and sternite. In the majority of the species they are placed somewhat above and distally to the stigma. Usually they are larger than the stigma but in *P. emptycta* these fenestrae are minute and in *P. dumetana* that of the third segment is very small. In *P. corylana* the fenestra of the second segment is situated below the level of the stigma.

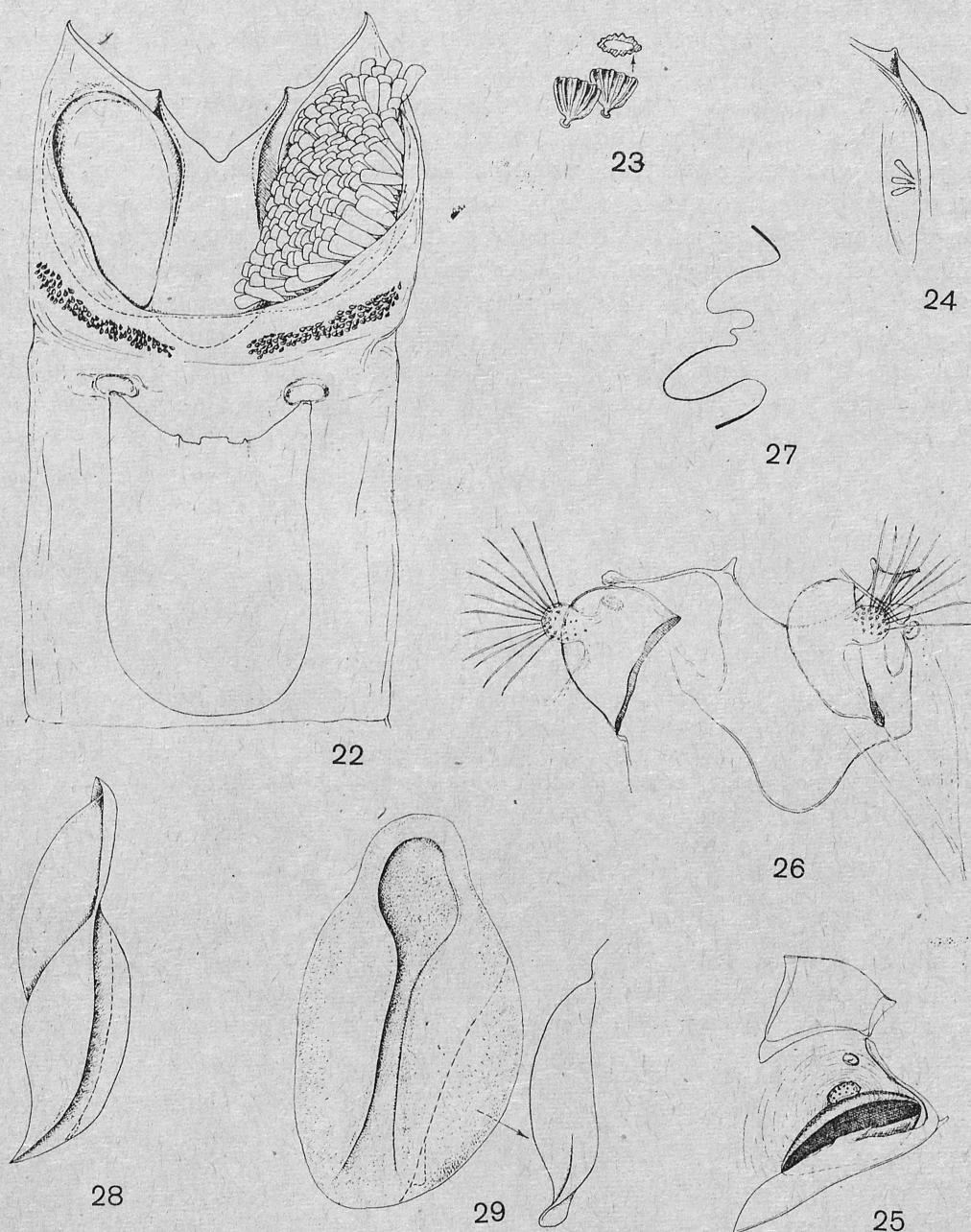
In the second abdominal segment of some species occurs a peculiar scent organ. In *P. ribeana* (figs. 22, 23) it shows a complicate structure. The sternite is distinctly convex along the middle ventrally and delicately concave laterally. At each side of the sternite occurs a deep membranous pocket filled with dense agglomeration of broad scales arranged rather vertically to its surface. Distal edges of the pockets form a small membranous fold beyond which there are two transverse areas characterised by presence of minute conical black scales (fig. 23) arranged in 3—5 rows. Similar organ has been found by Dr. Tosiro YASUDA (personal communication) in Japanese *P. monticolana* YAS. and Nearctic *P. pyrusana* KEARF. In the third segment of *P. ribeana* in the membrane at the proximal prominences of the sternite occurs a pair of transverse membranous pits. Their proximal edges are rather weakly sclerotized while the lateral, outer parts are protected by a small, distinctly sclerotized sclerites and the distal edges strengthened by an inwardly curved tips of the sternites.

In *P. corylana* an indistinct concavity of the membrane is to be found laterally to the second sternite. At the bottom of this hollow a group of 3—4 small, fairly broad scales occur (fig. 24). It may be supposed this is same organ as described in *P. ribeana*, however, very strongly degenerated.

In *P. phaiopteron* occur a similarly situated but much more complicate organ (figs. 25—27) some parts of which are certainly homologous with those of the scent organ of *P. ribeana* described above. The second sternite is typically developed but the lateral membrane of this segment forms a shallow pouch as broad as the lateral edge of the tergite. In the ventral portion of the pouch a deep, well sclerotized pocket is developed the terminal portion of which is rounded and reaches almost to the middle breadth of the segment. Just above the median part of the pocket a rather weakly sclerotized sack-shaped process is present. It extends towards the dorsal edge of the pocket and is provided with fairly long, pointed apically scales. The stigma of this segment is situated dorso-proximally to the base of the sack. I suppose this organ serves to the production and distribution of the scent.

Scent organ of the subgenital segment is known in the males of all *Pandemis*-species but only a superficial descriptions are available (eg. OBRATSOV, 1954: 165, fig. 27). Thus the following characteristics is given. The subgenital segment is rather small, retracted into the segment 7 which is also modified to some degree and the intersegmental membrane between the two is very long. The tergite and sternite are reduced to narrow transverse plates situated in the proximal portions of the segment. In the distal part of the segment a pair of latero-ventral plates is present. The plates form main part of the organ and are connected with one another ventrally by a short membrane. Median part of each plate is deeply





Figs. 22—29. Male abdominal scent organs of *Pandemis* HÜBN: 22 — ventral side of the second and third abdominal segments of *P. ribeana* (HÜBN), 23 — conical scales of the above organ, 24 — part of second segment of *P. corylana* (F.), 25 — second segment of *P. phaiopteron* sp. nov., laterally, 26 — scent organ of same species, dorsally, left pocket extruded, 27 — cross-section of the lateral part of the segment of same species, 28 — plate of subgenital segment of *P. ribeana* (HÜBN.) laterally, 29 — same, distally (with internal sclerite)

concave in the middle distally and its edges are emarginate especially in their ventral halves. The concavity of the dorsal portion of the plate is strongly broadening, rounded apically while the remaining part is groove-shaped, atrophying ventrally. The internal portion of the plate is distinctly sclerotized and develops semioval fold directed proximally. This sclerite is produced ventrally to form a process connecting the plate with the distal emargination of the vinculum. Internally the plate is membranously connected with the genital apparatus. In the dorsal portion of the concavity of the plate grow very long, usually hairlike scales; shorter and broader scales cover lower portions of the plate. The magnitude and the shape of the plate varies specifically (eg. in *P. phaiopteron* the plate is very small and its concavity is deep and short). Also the shape of its internal sclerite (fig. 29) and the process connecting the vinculum are variable. The scales are usually long as in the species closely related to *P. heparana*.

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#### STRESZCZENIE

Praca zawiera krótką charakterystykę rodzaju *Pandemis* HÜBN. opartą na 16 przebadanych gatunkach, wykaz chińskich gatunków ze zbioru H. HÖNEGO wraz z opisem 3 nowych i redeskrypcjami 4 mało znanych gatunków oraz opis narządów odwłokowych wykrytych u przedstawicieli tego rodzaju.

ISBN 83-01-00428-2  
ISSN 00 65-1710

Redaktor zeszytu: doc. dr hab. A. Krzanowski

PAŃSTWOWE WYDAWNICTWO NAUKOWE—ODDZIAŁ W KRAKOWIE—1978

Nakład 800+80.  
Zam. 343/78.

Ark. wyd. 1.

Ark. druk. 12/16.

Papier ilustr. kl. V 70×100 71 g  
Cena zł 10,—

DRUKARNIA UNIwersytetu Jagiellońskiego W KRAKOWIE