

Józef RAZOWSKI

Revision of the Genus *Aphelia* HÜBNER (*Lepidoptera*, *Tortricidae*)

[with 84 text-figs.]

Rewizja rodzaju *Aphelia* HÜBNER (*Lepidoptera*, *Tortricidae*)\*

Abstract. The *Archipini* genus *Aphelia* is revided and its 29 species redescribed and placed in 4 subgenera. Two subgenera and 4 species are described as new, 1 subgenus and 7 species and subspecies are sunk as synonyms.

*Aphelia* HÜBNER

*Aphelia* HÜBNER [1825], Verz. bekannter Schmett.: 390. Type-species: *Pyralis viburniana* FABRICIUS 1787 (designated by FERNALD, 1908: 15, 53).

OBRAZTSOV 1954: 189.

External characters. Labial palpus usually ca 2; antenna short bristled, sometimes the bristles arranged in two rows. Venation (cf. OBRAZTSOV, 1954): in forewing all veins run separately, chorda more or less distinct, *pcu* usually well developed; in hindwing the veins also separate from one another except for  $m_3-cu_1$  which may extend from a common point of the median cell. Pattern typical of *Tortricinae*, often ill-defined. Sexual dimorphism in majority of species distinct expressed in size and shape of forewing which in female is much slenderer, the apex is more elongate and termen more oblique than in male. The differences in coloration are smaller and concern the shape or presence of pattern.

Male genitalia characterise with large or very large tegumen; pedunculus often slender terminally, membranous ventrally. Uncus strong, variable in shape, occasionally bifurcate; socius small, drooping; gnathos strong, usually provided with prominences or processes of lateral arms. Valva with atrophied costa, tapering towards the end, rounded apically, hair scarce except for *ochreana* in which large group of woolly hair occur in dorsal area postbasally. Saccus strongly sclerotized, somewhat convex ventrally, provided with free term-

\* Praca wykonana w ramach problemu MR. II. 3.

ination or dorsal plate. Transtilla strong, often broadening or provided with processes medially or laterally; juxta fairly large. Aedeagus rather small, usually simple; cornuti present in majority of species.

Female genitalia. Papilla analis fairly large, typical of *Archipini*; eighth tergite broad or very large. Sterigma delicate, usually developed in form of large postvaginal lamella and weak or completely atrophied antevaginal plate. Median part of sterigma concave, often membranous, at least partially, lateral parts slender. Occasionally small, sack-shaped proximal prominences developed. Membrane beyond sterigma occasionally convex postmedially or (and) densely spined throughout. Antrum usually with weak internal sclerite, or developed in form of distinctly sclerotized tube fused with sterigma. Ductus bursae fairly short, often provided with cestum; ductus seminalis extending from dorsal area of antrum proximally; receptaculum seminis situated rather close to base of ductus seminalis. Signum, if present, typical of *Archipini*, funnel-shaped provided with rather small basal sclerite and ill-defined or absent capitulum (exception: *Sacaphelia*) or is plate-shaped, concave proximally, armed with some (at least two) empty dents directed to the inside of corpus bursae. Sculptures of the latter ill-defined or absent.

Early stages. Larval characters incl. chaetotaxy described by SWATSCHKE (1958) on basis of 3 Palaearctic species and by MACKAY (1962) on 2 Nearctic ones.

Bionomics. As far as we know there is a single generation yearly and hibernation takes place in the larval stage. Hibernated small larvae feed in spring and early summer in flowers and spun leaves. The better known species are recognised as polyphags. The species occur in various biotops, mainly in the open, often steppe areas.

Distribution. The genus is Holarctic in distribution but only 5 species are Nearctic.

Comments. FERNALD (1908) mistakenly included *Amelia* HÜBNER in this genus (cf. OBRAZTSOV, 1954, or RAZOWSKI, 1977). OBRAZTSOV divided *Aphelia* into three subgenera, viz., *Zelotherses*, *Aphelia* s. str. and *Djakonovia*, previously described as a distinct genus. That author could not define any differences between *Zelotherses* and *Djakonovia*. In 1964 OBRAZTSOV changed his opinion and separated *Aphelia* from *Zelotherses* and *Djakonovia*. In this paper the mentioned older interpretation of the genus is followed until all genera of the tribe are revidet. However, *Djakonovia* is here treated as the synonym of *Zelotherses* and two subgenera are described. *Anaphelia* subgen. n. is distinct mainly by the shape of the transtilla whilst *Sacaphelia* by its fusion with peculiar process of the basal portion of the valva (cf. p. 368). The relations among the subgenera are difficult for interpretation. Most probably at least *Sacaphelia* may appear a distinct genus. The supposed phylogenetic tree of the genus is shown in fig. 1 and the key for the identification of the subgenera is as follows:

1. Transtilla with strong prominence or process . . . . . 2
- . Transtilla without prominences or processes . . . . . *Zelotherses*, p. 344.



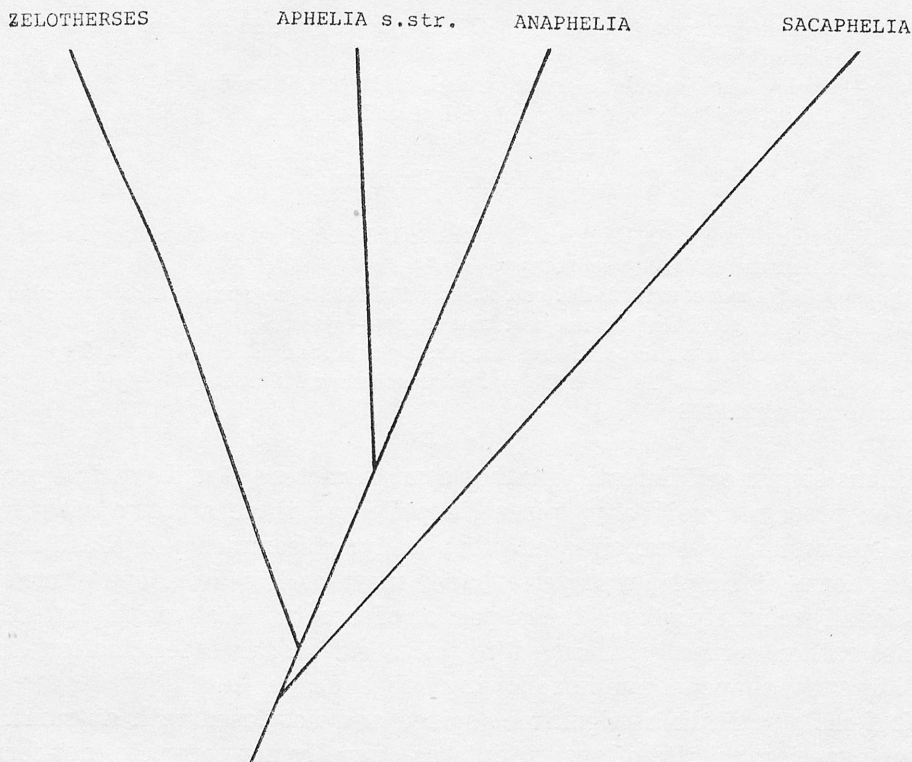


Fig. 1. Phylogenetic tree of *Aphelia* HÜBNER

2. Transtilla fused with process of basal area of valva . *Sacaphelia*, p. 368.
- . Transtilla free, valva without such process . . . . . 3
3. Large median process of transtilla developed . . . . *Anaphelia*, p. 366.
- . No median process of transtilla (lateral processes present) . *Aphelia*, p. 358.

The genus is rather insufficiently known as the females of 17 species remain unknown and the males of several species are studied in innumerable examples. The bionomics and distribution are also little known except for a few better known species.

The systematic position of the genus cannot be precised before a revision of the tribe is finished. On basis of the available data it should be placed near *Archis* HÜBNER, among the genera with atrophied costa of valva and with well developed transtilla.

#### Abbreviations used

- BM — British Museum (Natural History), London  
 MNMB — Magyar Nemzeti Museum, Budapest  
 NHMW — Naturhistorisches Museum, Wien  
 USNM — United States National Museum, Washington  
 ZIANL — Zoologicheskij Institut Akademii Nauk U. S. S. R., Leningrad

- ZMB — Institut für Spezielle Zoologie und Zoologisches Museum der Humboldt Universität, Berlin  
 ZSM — Zoologische Sammlung des Bayerischen Staates, München  
 ZZSD — Zakład Zoologii Systematycznej i Doświadczalnej PAN, Kraków

### *Zelotherses* LEDERER

*Zelotherses* LEDERER 1859, Wien. ent. Mschr., 3: 123, 250. Type species: *Cochylis albociliana* HERRICH-SCHAEFFER 1851, by monotypy.

*Djakonovia* OBRAZTSOV 1942, Dt. ent. Z. Iris, 56: 158. Type species: *Tortrix euxina* DJAKONOV 1929, by original designation and monotypy — *synon. nov.*

*Tortricomorpha* AMSEL 1955, Beitr. naturk. Forsch. SüdWtl., 14: 124. Type species: *Tortricomorpha shaqlawana* AMSEL 1955 = *Tortrix ochreana* HÜBNER [796—99]  
 OBRAZTSOV 1954: 192.

Uncus simple or bifurcate; gnathos arm characterised with ventral prominence or process devoid any spines (in *pallorana* there are two sack-shaped spined processes, however, situated submedially; cf. comments on p. 345). Transstilla in form of simple, transverse band, more or less broadening medially, occasionally minutely spined. Dorsal portion of sacculus usually with plate-shaped sclerite rather vertically arranged to valva surface; free termination absent or differently shaped than in following subgenus.

In female genitalia sterigma not spined and not fused with antrum in all but one species. Sclerite of antrum internal, usually not complete (not forming a tube), flattened laterally. Signum usually typical of *Archipina*, e. a. with main funnel-shaped portion and basal plate, but without capitulum, if present. Only in single species signum is plate-shaped.

Early stages. SWATSCHKE (1958) provided only slight differences between this subgenus and *Aphelia* s. str. occurring in the coloration of shields.

Distribution. The subgenus is basically Palaearctic in distribution as only one species (*pallorana*) is known from North America (see also comments).

Comments. OBRAZTSOV (1954) provided almost identical characteristics of *Zelotherses* and *Djakonovia* treating them as subgenera. Really, there is no one character separating these two groups of species listed by him in 1955. I am sinking thus *Djakonovia* as a synonym of *Zelotherses*. *Tortricomorpha* described by AMSEL as monotypic for his *shaqlawana* (= *amplana*) is also a synonym of this subgenus, and moreover the name was praecoccupied by *Tortricomorpha* FELDER & ROGENHOFER, 1861.

The species of this group are externally similar to one another as almost all characterise with pale, usually yellowish ground colour of forewing and rather ill-defined pattern. The basal blotch shows a tendency to atrophy similarly as the dorsal part of the median fascia. The males differ from the females mainly in the shape of the forewing, and less so in the coloration which often are almost monochrome. The variation in colour and pattern is in some species rather distinct, that in the shape of the forewing and some parts of the genitalia is also noticed, however, insufficiently studied. Two main groups of species

may be distinguished in this genus; in the group one the species characterise with simple, expanding apically uncus and in the group two with bifurcate uncus. This character, however, is only of infrasubgeneric importance. In group one a process of specialisation of the gnathos is observed. Its ventral processes become gradually larger. Only in first three species they are absent and the ventral portion of the gnathos is only somewhat expanding distally and ventrally. In the group with pear-shaped processes the genital differences among the species are very slight and need reexamination on larger material. The systematic position of *pallorana* is doubtful and cannot be solved on basis of the available material. It certainly is separate, however, some genital characters of this species are shared between this subgenus and *Aphelia* s. str. I am placing *pallorana* in *Zelotherses*, however, judging on the shapes of the signum and antrum is close to the following subgenus. I suppose that the spined processes of the gnathos are in this species not homologous with those in *Aphelia* s. str. as they are placed submedially and do not represent ventral processes of the arms of the gnathos. The signum is in *Archipina* inconstant in shape, and its curious shapes are occasionally realised in some genera, e. g. in *Clepsis* GUENÉE. Judging on the shape of the transtilla *pallorana* is rather closer to remaining species of *Zelotherses* than to following three subgenera, however, its systematic position is separate.

*Aphelia (Zelotherses) imperfectana* (LEDERER)

*Tortrix imperfectana* LEDERER 1858, Wien. ent. Mschr., 2: 150, pl. 4 fig. 8. Type locality: Beirut, Lebanon. Holotype, male: "Origin.; *Imperfectana* m. [ihi]"; G. S. 11652; coll. ZBM.

*Aphelia ineffecta* OBRAZTSOV, 1968, J. N. Y. ent. Soc., 76 (4): 246, figs. 11, 20. Type locality: Bescharré, Lebanon. Holotype, male: "Nord Libanon, Bescharré 1400 m, 3—10. VI. 31"; G. S. 6810; coll. BM — *synon. nov.*

KENNEL 1910: 183, pl. 9 fig. 40 (*Tortrix*); OBRAZTSOV 1968: 246 (*Aphelia* — incorrect designation of type).

Labial palpus ca 2, brownish yellow; remaining parts of head and thorax yellow. Forewing 10—12 mm, somewhat expanding posteriorly in male, with costa delicately arched outwards basally and termen slightly oblique, hardly convex. Ground colour cream-yellow to yellow, indistinctly suffused with brownish basally and dorsally, weakly strigulated so subterminally. Pattern brownish ferruginous consisting of small, ill-defined basal blotch, short subapical blotch and slender median fascia concave proximally, diffuse posteriorly, atrophying towards dorsum. Fringes yellowish tinged with brownish at tornus. Hindwing cream-grey, paler, more cream apically, occasionally mixed with brownish towards base; fringes whitish, cream basally.

Variation concerns mainly the shape of the pattern which shows a tendency to atrophy especially in basal and dorsal portions of forewing. The colour varies from rust to ochreous. One examined specimen unicolorous straw-yellow.



Male genitalia (figs. 2—5): tegumen fairly broad; uncus delicately narrowing near middle, more or less rounded apically; gnathos slender with lateral arm distinctly broadening ventrally and rather small terminal plate. Valva convex ventrally, dorsal plate of sacculus well developed. Transtilla in form of fairly broad transverse plate, weakly concave dorsally, provided with weak fold medially. Aedeagus small, with ventro-apical, sharp tip and short coecum penis; two cornuti in vesica.

Female genitalia (after OBRAZTSOV, 1968): sterigma rather broad medially, with short, cup-shaped portion and distinct distal prominence of dorsal plate; antrum sclerite short; cestum much shorter than ductus bursae; signum proportionally long with rather delicate basal sclerite typical of this subgenus.

Bionomics. Moth collected in June at the altitude of 1400 m.

Distribution. Lebanon only (Beirut, Bescharré). Other data need confirmation (cf. OBRAZTSOV, 1955).

Comments. The species is somewhat variable externally and genitally. The differences between *imperfectana* and *ineffecta* recorded by OBRAZTSOV (1968) are rather slight. In a series of about 10 specimens there are some intermediate forms of the uncus and transtilla. The shapes of the valva and sacculus depend on the pressure of the covering glass. KUZNETSOV (1960) mentions this species from West Kopet-Dagh (Turkmenia) but this data may concern *insincera* which is probably a distinct species.

*Aphelia (Zelothereses) insincera* (MEYRICK), **comb. nov.**

*Tortrix insincera* MEYRICK 1912, *Exotic Microlepidopt.*, 1: 7. Type locality: Alma Dagh. Lectotype (designated by CLARKE 1958): "Alma Dagh, Asia Minor, J. 06"; G. S. 9363 [CLARKE]; coll. BM.

Labial palpus as in preceding species, cream; remaining parts of head slightly darker, concolorous with thorax. Forewing 8—11 mm, rather uniformly broad throughout; costa weakly bent before middle; unicolorous, slightly suffused with ochreous especially in basal area and dorsally. Traces of subapical blot concolorous. Fringes cream. Hindwing whitish cream, hardly mixed with ochreous on peripheries. Female (not dissected) with forewing slightly darker than in male; more ochreous cream; hindwing pale brownish cream.

Male genitalia (figs. 6, 7) as in *imperfectana* but uncus somewhat stronger, arm of gnathos slenderer and ventro-apical prominence of aedeagus very short, somewhat differently shaped. No cornutus in vesica.

Comments. The species is insufficiently known. The genital characters are probably sufficient for the separation of this species but they must be checked on larger material. The data on *imperfectana* from Turkmenia are probably referable to this species.

*Aphelia (Zelotherses) euxina* (DJAKONOV)

*Tortrix euxina* DJAKONOV 1929, Revue russ. Ent., 23: 153, figs. 1—3. Type locality: Karadag, E. Crimea. Type location: unknown to me.

*Tortrix regisborissi* DRENOVSKI 1931, Mitt. Bulgar. ent. Ges., 6: 62, pl. 3 fig. 3. Type locality: no data. Type location: unknown to me.

Labial palpus ca 1.5, dark yellow tinged with ochreous medially; remaining parts of head incl. antenna and thorax mixed brown. Forewing 11—13 mm, not expanding terminally; costa curved basally, hardly concave subapically; termen slightly oblique and convex. Ground colour dark yellow weakly tinged with brownish at base and occasionally along dorsum; terminal portion of wing paler than the median one. Pattern ill-defined, diffuse, reddish brown to ferruginous in form of elongate-ovate transversely placed blotch being a median remainder of median fascia. Basal blotch in form of weak suffusion or absent. Fringes paler than ground colour. Hindwing grey-cream to cream, darkening caudally, with short, rounded apex; fringes white-cream.

Variation rather slight. Some examined specimens are paler than described above, in one head and thorax mixed with brownish, ground colour brownish yellow, median fascia diffuse, rather well developed costally. In some males forewing distinctly expanding terminally.

Male genitalia (figs. 8—12): tegumen broad; uncus long, distinctly broadening apically, somewhat concave at tip; arm of gnathos slender basally, expanding terminally, produced near base of median plate distally. Aedeagus small, slender; 2—3 cornuti in vesica. Transtilla somewhat variable in shape being more or less tapered medially.

Female unknown.

Bionomics. Moths collected in July at the altitudes 1200 m (Anatolia) and 2000 m (Olympus).

Distribution. Mountains of SE Europe and Asia Minor: Alibotusch Mts., Bulgaria; Prenj, Montenegro, Yugoslavia; Olympus, Greece; Crimea; Anatolia (Akshehir).

*Aphelia (Zelotherses) paleana* (HÜBNER)

*Tortrix paleana* HÜBNER 1793, Sammlung ausserl. Vögel Schmett.: 8, pl. 8 fig. 30. Type locality: not given. Type material: lost. (*Tortrix palleana* [sic!] TREITSCHKE 1830, Schmett. Eur.: 99).

[*Tortrix*] *flavana* HÜBNER [1799], Sammlung eur. Schmett., pl. 25 fig. 157. Type locality: Europe (after title of work). Type material: lost.

*Tortrix icterana* FRÖLICH, Enumeratio Tortr. Würtemb.: 68. Type locality: Württembergia ("Algoviae"), after title of work. Type material: lost. (*Tortrix ictericana* [sic!] KENNEL, 1910 pl. 9 fig. 32).

*Tortrix Tortrix intermedia* HERRICH-SCHÄFFER 1856, Syst. Bearb. Schmett. Eur., 6: 157. Type locality: Grossglockner. Type material: no data.

*Tortrix paleana rabeli* TOLL 1951, Bull. Soc. ent. Mulhouse: 45 fig. 5. Type locality: Altvater (= Pradziad Mts., Type: "Altvater, 15. VII. 1941"; coll. ZZSD.

KENNEL 1910: 180, pl. 9 figs. 30—32 (*Tortrix*); OBRAZTSOV 1955: 210; 1957: 313 (*Aphelia, Zelothereses*).

Labial palpus over 2, yellow; remaining parts of head concolorous, thorax darker; abdomen more grey with yellowish anal tuft. Forewing in male 9—11 mm, somewhat expanding terminally; costa curved at base; termen hardly oblique, tolerably straight to middle. Unicolorous yellow, more or less dark, with paler fringes. Hindwing broad, yellowish cream; fringes cream. Reverse of forewing brownish grey except for edges which are yellow-cream. Female forewing 8—11 mm, slender, uniformly broad throughout with oblique, rather straight termen and more convex basal part of costa. Hindwing occasionally brownish grey with cream fringes. Otherwise as for male.

Variation. Some males characterise with dark coloration: forewing, head and thorax brownish grey or grey, fringes pale grey-white or grey-cream. Hindwing brown-grey with white-grey cilia. The shape of the forewing slightly varies in males, more distinctly so in females. OBRAZTSOV (1955, 1957) described ab. *stenoptera* characterised with slender forewing.

Male genitalia (figs. 13, 14): uncus fairly long, narrowing medially, strongly broadening distally, rounded apically. Distal process of gnathos arm long, broadening and rounded apically, lateral prominence situated near its base fairly small. Sacculus convex postbasally, provided with well developed dorsal plate. Transtilla broad, band-shaped, with median portion directed distally when valvae are not opened. Aedeagus rather short, tapering distally, provided with subterminal dent situated on dorsal margin of right wall and group of dorsal and lateral thorns; 2—5 cornuti in vesica.

Female genitalia (fig. 73): sterigma fairly large, delicately concave in middle of distal wall, with weakly sclerotized antevaginal plate (except for surrounding of antrum). Antrum flattened laterally, rounded proximally; ductus bursae with median cestum; cornutus strong. Eighth tergite characterised with two dorsal thorns situated medially.

Early stages. SWATSCHEK (1958) provided characteristics of chaetotaxy and coloration of larva which is black with white pinacula; head yellow-brown marbled with black; plates and thoracic legs black. BRADLEY & all. (1973) give similar diagnosis and mention that the body colour varies from grey-green to black.

Bionomics. BOVEY (1966) writes that the female deposits on upper side of leaves batches of eggs each consisting of 10—30 ones. Hatching in about one week in July and August. Larvae feed in autumn and then till May as polyphags on *Gramminae* and many other plants (*Agropyron*, *Centaurea*, *Caltha*, *Filipendula*, *Phargmites*, *Plantago*, *Tussilago*, *Scabiosa*, *Rubus*, *Quercus* etc.). Moth in July and August, sometimes in June. Single generation yearly. Biotops: usually humid meadows.

Distribution. British Isles, Central and North Europe, Leningrad in East



Europe. The data from Iran are referable to *christophi* and those from Altai need confirmation as single examined specimen shows some differences to Central European population in the shape of the aedeagus.

Comments. OBRATSOV (1955, 1957) treated *christophi* as a subspecies of this species (cf. RAZOWSKI 1963) and included *unitana* in the synonyms of it. TOLL (1951) described five subspecies of *paleana* but only one of them is conspecific with it, remaining four ones are synonyms of the following species. The male genitalia are variable to various degrees. The magnitude of the subapical dent, size, number and positions of the dorsal dents and size or presence of the lateral thorns are the most variable characters. HOLST (1962) illustrate two aedeagi with large dorsal dents and BENTINCK & DIAKONOFF (1968) that with peculiar dents situated similarly. For further comments see p. 350.

### *Aphelia (Zelothereses) unitana* (HÜBNER)

[*Tortrix*] *unitana* HÜBNER [1796—99], Sammlung eur. Schmett., pl. 19 fig. 123. Type locality: Europe (after title of work). Type material: lost.

*Tortrix paleana fumatana* TOLL 1951, Bull. Soc. ent. Mulhouse: 45 fig. 1. Type locality Stuttgart. Holotype, male: "11. VI. 1926, Stuttgart"; coll. ZZSD. — *synon. nov.*

*Tortrix paleana pseudoviburniana* TOLL 1951, *ibid.*: 45, fig. 2. Type locality: Kormatschawand, Krain. Holotype, male: "Kormatschawand, 900—1100 m, 12. VII. 20, Osth. [ELDER]"; coll. ZZSD — *synon. nov.*

*Tortrix paleana carpathica* TOLL 1951, *ibid.*: 48, fig. 3. Type locality: Czarnohora. Holotype, male: "Czarnohora, Zaroślak, 26. VI., St. STACH"; coll. ZZSD — *synon. nov.*

*Tortrix paleana fischeri* TOLL, 1951, *ibid.*: 48, fig. 4. Type locality: Schlucht, Elsass. Holotype, male: "24. VII. 1938, Schlucht, Crête-Vosges, Ht.-Rhin, Ch. FISCHER (1130 m)"; coll. ZZSD — *synon. nov.*

HOLST 1962: 303 (*Tortrix*).

Forewing in male ca 9—11 mm, broad, less expanding terminally than in *paleana*, with costa more strongly curved at base and termen almost straight. The colour of wing varies from brownish grey with olive hue to yellowish grey; fringes paler, more whitish grey. Hindwing brownish grey; fringes greyish to whitish. Female after HOLST almost so large as the male (expanse 22 mm) with broad forewing, differing from those of *paleana* in almost straight distal part of costa and less oblique termen.

Variation. The shape of the male forewing varies a little especially in the degree of its expansion towards the end. The colour is occasionally yellowish olive.

Male genitalia (figs. 15, 16) as in preceding species but aedeagus stout, with short distal, tapering apically portion, provided with subventral directed laterally dent of the left wall; 3 or 4 cornuti in vesica.

Female genitalia unknown to me; HOLST (1962) did not find any difference between this species and *paleana* except for somewhat different shape of the antrum.

Bionomics. Moth is on wing earlier than in case of *paleana* as it has been

collected in June and July. OFHEIM (1965) supposes that the food plant is *Trifolium* and BRADLEY (1964) records *Heracleum* and *Rubus*.

Distribution. Ireland (BRADLEY 1964); France (Ht. Rhin); West Germany (Stuttgart); Denmark; Norway, Sweden; S. Carpathian Mts. (Czarnohora); Austria; Yugoslavia: Vucia (HOLST 1962).

Comments. The problem of this species is still not clear as the differences with *paleana* are rather small whilst its variability seems distinct. The differing characters given by HOLST are shared between the two species except for the position of the subapical dent of the aedeagus, which however, is not ventral as supposed by the mentioned author. This dent is in *paleana* situated at the dorsal edge of the left wall of aedeagus whilst in *unitana* somewhat below it and its base is rather parallel to the ventral edge of aedeagus. The length of the tapering distal portion of aedeagus is somewhat variable, but always shorter in the present species than in *paleana*. The number and size of dorsal and lateral dents are inconstant.

### *Aphelia (Zelothereses) christophi* OBRAZTSOV

*Tortrix verbascana* CHRISTOPH 1877, Trudy vses. ènt. Obsheh., 12: 290, pl. 8 fig. 62 — nom. praecoc. Type locality: Schahrud. Neotype (designated by OBRAZTSOV 1968): "Schahrud" B-4 [OBRAZTSOV]; coll. ZMB.

*Aphelia (Zelothereses) christophi* OBRAZTSOV 1955, Tijdschr. Ent., 98: 211 — nom. nov. for *Tortrix verbascana*.

OBRAZTSOV 1968: 248, fig. 8 (*Aphelia*).

Labial palpus over 1.5, cream hardly tinged with ochreous terminally, remaining parts of head ochreous cream, thorax rather concolorous. Forewing in male 11—13 mm, slightly expanding terminally; costa curved basally, then almost straight; apex indistinctly protruding; termen fairly oblique, straight. Wing unicolorous, yellowish ochreous hardly mixed with brownish; fringes much paler, more cream. Hindwing pale brownish to brownish cream; fringes whitish cream or darker.

Variation. Some examined specimens are rather dark, yellowish cream mixed with brownish, with paler fringes. Female, illustrated by KENNEL (1910) is a rather dark coloured specimen.

Male genitalia (figs. 17, 18): uncus narrowing subterminally; process of gnathos arm rather short, lateral prominence absent. Transtilla distinctly produced dorso-medially, rounded apically, concave ventrally. Dorsal edge distinctly sclerotized, ventral edge rather irregular, weak. Aedeagus small, slender, somewhat curving to the left terminally.

Female genitalia (fig. 74): sterigma fairly large, rounded posteriorly, with rather weak ventral portion; antrum delicately sclerotized, rather slender; ductus bursae broad, short; cestum proximal; signum long.

Bionomics. Moth collected in July at the altitudes of 2200 and 4000 m.

Distribution: Iran: Elburs Mts.

*Aphelia (Zelothereses) conscia* sp. nov.

Holotype, male: "Iran, Fars, Strasse Ardekan Talochosroe, Comèe (Barm i Firus) 3750, 5. VII. 1937, leg. BRANDT"; G. S. 5724; coll. LNK. Two paratypes identically labelled, but one collected at the altitude of 2600 m.

Similar to the preceding species but pale yellowish cream. Hindwing cream-white with whitish fringes.

Male genitalia (figs. 19, 20) as in *christophi* but uncus strongly tapering postmedially, with broad distal part, producing dorsally in narrow portion. Transtilla characterised with very broad dorsal prominence.

*Aphelia (Zelothereses) amplana* (HÜBNER)

[*Tortrix*] *amplana* HÜBNER [1813], Sammlung eur. Schmett., pl. 31 fig. 201. Type locality: Europe (after title of work). Type material: lost.

*Epagoge peramplana* HÜBNER 1825, Verz. bekannter Schmett.: 389.

KENNEL 1910: 183, pl. 9 figs. 38, 39 (*Tortrix*); OBRATSOV 1955: 211 (*Aphelia, Zelothereses*).

Labial palpus over 2, brownish to ochreous brown; remaining parts of head concolorous; thorax paler, more cream medially and distally. Forewing in male 12—14 mm, weakly expanding terminally; costa curved to before middle; termen fairly oblique, rather straight. Ground colour yellow, weakly suffused with pale ochreous or orange at costa. Pattern rust-brown to ferruginous consisting of basal blotch well developed costally, median fascia extending from mid-costa to before tornus, thin costally, atrophying or diffuse dorsally and subapical blotch reaching apex. Fringes paler than ground colour. Hindwing greyish cream, whitish cream distally; fringes paler than wing, grey-cream and cream respectively. Female with slender, uniformly broad forewing; costa more strongly convex basally, rather straight posteriorly; termen more oblique than in male, hardly sinuate medially. Ground colour usually darker than in male, pattern weaker. Hindwing brownish; fringes cream.

Variation. Ground colour varies from yellow to orange, suffusions occasionally strong; pattern more or less distinct with tendency to atrophy in dorsal and partially median areas of wing. Basal blotch often absent or replaced by weak suffusion. Some specimens unicolorous, vivid yellow (ab. *vallettai* BRADLEY). Fringes of female hindwing often ochreous-cream.

Male genitalia (figs. 21, 22): tegumen very broad; uncus proportionally small, slender, weakly broadening terminally; process of gnathos arm very long, accompanied by small lateral prominence. Valva elongate; sacculus slender. Transtilla broad, tapering laterally, convex dorsally. Aedeagus small, pointed ventro-apically; 2 or 3 cornuti in vesica.

Female genitalia (fig. 75): antrum rather weakly sclerotized, with small proximal prominence ventrally; ductus bursae short; signum proportionally short with large basal plate.



Larva (after KENNEL 1910) black with pale pincula; head and shields black, glossy.

Bionomics. Larva found from January till March on *Urginea maritima* and *Asphodelus* (KENNEL, 1910); further food plant is *Calendula arvensis*. Moth in May. Hibernation probably in the egg stage.

Distribution: coasts of S. Europe and N. Africa: Portugal, Spain, Sicily, Crete, Malta, Morocco, Tunisia.

*Aphelia (Zelotherses) plagiferana* (REBEL)

*Tortrix plagiferana* REBEL 1916, Dt. ent. Z. Iris, 30: 190. Type locality: Schawyr. Lectotype (designated by OBRAZTSOV 1968), male: "Ost Tannuola, Schawyr 2500 m, BANG-HAAS 1914"; abdomen missing; coll. NHMV.

OBRAZTSOV 1968: 242 (*Aphelia*).

Labial palpus shorter than in *amplana*, brownish to ochreous, remaining parts of head and anterior portion of thorax concolorous, distal part of thorax yellowish. Forewing in male 14—17 mm, expanding terminally with costa weakly expanding at base; termen slightly oblique, almost straight. Ground colour pale yellowish, darker basally and costally; pattern ferruginous or reddish brown consisting of small costal and large, ovate median parts of median fascia and indistinct subapical blotch reduced usually to costal suffusion. Fringes paler than ground colour, tinged with ochreous-rust at apex. Hindwing pale brownish grey, cream distally; fringes paler. Female forewing 11—14 mm, uniformly broad throughout, slender, with costa strongly convex at base, hardly sinuate subapically; termen oblique, tolerably straight. Ground colour darker than in male, mixed with orange-yellow towards costa; costa orange to ferruginous. Hindwing darker than in male, with smaller, cream apical portion.

Male genitalia (figs. 23, 24) as in preceding species but uncus broader and shorter; distal process of gnathos arm broader and shorter, transtilla slenderer, more distinctly spined dorsally. Aedeagus much shorter than in *amplana*, stout.

Female genitalia (fig. 76) differs from that of *amplana* in size and larger signum.

Bionomics. Moth collected in July and early August at the altitudes of 2400—2700 m.

Distribution. Besides the type locality known from Kuraiskij Range, Altai.

*Aphelia (Zelotherses) stigmatana* (EVERSMANN)

*Tortrix stigmatana* EVERSMANN 1844, Fauna Volgo-Ural.: 493. Type locality: Ural Mts. Type material: no data.

KENNEL 1910: 181, pl. 9 fig. 33 (*Tortrix*); OBRAZTSOV 1968: 244 figs. 3—5 (*Aphelia*).

Head, thorax and forewing yellow. Forewing 12—13 mm, expanding posteriorly; costa curved outwards at base; termen weakly oblique, almost straight.

Base of wing and often basal third of costa ferruginous, concolorous small blotch near disc (remainings of median fascia). Fringes paler than wing. Hindwing cream, hardly mixed with ochreous terminally, with pale brownish grey in anal area; fringes cream.

Variation. Unicolorous pale straw-yellow specimens are probably predominant.

Male genitalia (figs. 25, 26) as in *amplana* but uncus more strongly tapering postbasally and arm of gnathos provided with strong lateral prominence. Transtilla slender, minutely spined dorsally; aedeagus slender.

Female genitalia (fig. 77) differs from that in above mentioned species in presence of strong cestum and in better sclerotized antrum; signum strong.

Distribution: highlands of Ural Mts: Guberli.

Comments. The species is insufficiently known and must be reexamined. The differences are in this group of species rather slight and the variability of the genitalia little studied.

### *Aphelia (Zelothereses) galilaeica* OBRAZTSOV

*Aphelia galilaeica* OBRAZTSOV 1968, J. N. Y. ent. Soc., 76: 244, figs. 9, 19. Type locality: Galilea. Holotype, male: "Galilea, IV. 1886, PRATT, LEECH 60036"; G. S. 6808 [BM]; coll. BM.

Head and thorax cream mixed with ochreous (damaged), labial palpus ca 2. Forewing as in *amplana*; ground colour yellowish, darker along costa especially in basal area of wing; pattern ferruginous brown consisting of median fascia which extends from before middle of costa to before tornus, almost interrupted subcostally and small subapical blotch reaching apex of wing. Fringes concolorous with ground colour, ferruginous at tornus. Hindwing pale brownish grey, cream in apical area; fringes cream.

Male genitalia (figs. 27, 28) as in mentioned species but uncus broadening and rounded apically and arm of gnathos provided with much larger lateral prominence; distal process of gnathos arm shorter, aedeagus thicker. Shape of transtilla of the type altered during preparation (in another known specimen transtilla is broad, less tapering laterally than in *amplana*, minutely spined).

Distribution. Palaestine: Galilea and Tel Aviv. Moth collected in April.

### *Aphelia (Zelothereses) albociliana* (HERRICH-SCHÄFFER)

*Tortrix Cochylis albociliana* HERRICH-SCHÄFFER 1851, Syst. Bearb. Schmett. Eur., 4: 192. Type locality: Sarepta (= Krasnoarmiejsk), URSS. Type material: no data.

KENNEL 1908—10: 107, fig. 6, pl. 6 fig. 16 (*Zelothereses*); OBRAZTSOV 1955: 212 (*Aphelia Zelothereses*).

Labial palpus 2, white-grey, remaining parts of head more cream, thorax olive cream; antenna long bristled. Forewing 8—9 mm, slender, rather uniformly broad throughout with costa somewhat curved outwards basally, apex

broad, termen oblique, convex. Wing whitish to white cream, base and venation often delicately suffused with brown or grey. Fringes white. Hindwing white, apex delicately edged brown (occasionally the peripheries near apex are black-brown — cf. KENNEL). Female forewing 9—10 mm, slenderer than in male with costa weakly sinuate subapically, termen more oblique. Otherwise as for male.

Variation. In examined specimens venation of forewing occasionally suffused only in distal part of wing. Suffusion varies from described above to greyish. In one example weak brownish hue along dorsum.

Male genitalia (figs. 29, 30): uncus short, strongly broadening apically, rounded. Arm of gnathos with distal rounded process and large broadening at base of terminal plate. Valva subtriangular, rounded apically; sacculus strong with ventral edge convex postbasally. Transtilla broadening laterally, minutely spined dorsally. Aedeagus with numerous lateral and dorso-lateral dents and large subterminal dent situated on the left wall. Termination sharp accompanied by small lateral dent. Two cornuti in vesica.

Bionomics: moth collected in June.

Distribution. Known from vicinity of Akmolinsk, Kazakhstan and the type locality.

### *Aphelia (Zelotherses) ochreana* (HÜBNER)

[*Tortrix*] *ochreana* HÜBNER [1796—99], Sammlung eur. Schmett., pl. 21 fig. 134. Type locality: Europe (after title of work). Type material: lost.

*Tortrix ferrugana* HÜBNER 1793, Sammlung ausserl. Vögel Schmett.: 10, pl. 51 (non DENIS & SCHIFFERMÜLLER, 1775). Type locality: not given. Type material: lost.

*Tortricomorpha shaqlavana* AMSEL 1955, Beitr. naturk. Forsch. Südwdtl., 14: 124. Type locality: Shaqlawa, Iraq. Holotype, male: "E. P. WILTSHIRE, 13—25. IV. 53, Shaqlawa, 2500 ft., Kurdistan, Iraq"; G. S. 3182 [LNK]; coll. LNK — *synon. nov.*

*Aphelia (Zelotherses) amplana chretieni* OBRAZTSOV 1957, Tijdschr. Ent., 100 (3): 313. Type locality: Alps. Holotype, male: "Hautes Alpes, 9. VIII. 1899 (CHRÉTIEN); coll. ZSM — *synon. nov.*

KENNEL 1910: 162, pl. 8 fig. 35 (*Tortrix*); OBRAZTSOV 1955: 211 (*Aphelia, Zelotherses*).

Labial palpus ca 2, brownish; remaining parts of head and thorax more ochreous, front paler. Forewing in male 11—12 mm, broad, somewhat expanding terminally; costa curved basally, usually straight medially; termen indistinctly oblique, tolerably straight. Ground colour ochreous-cream to pale ochreous, paler distally and above median fascia in costal area; pattern ferruginous, more or less dark. Basal blotch absent; median fascia concave proximally, extending from middle of costa to before tornus, fusing with posterior part of subsquare or subtriangular subapical blotch. Fringes cream ochreous, ochreous at apex, often brownish at tornus basally. Hindwing pale brownish, cream in apical and costal areas; fringes white-cream. Female forewing slenderer than in male, usually ca 12 mm, with costa distinctly curved basally and with somewhat more oblique termen. Hindwing brown, often mixed with ochreous in apical area; fringes brownish ochreous.



Variation concerns the intensity of coloration of the ground and pattern. Often the latter dark rust mixed or strigulate with brown. In some specimens almost whole distal portion of wing suffused with brown except for median part of termen. In other examples subapical blotch is distinctly separated from the median fascia. In ab. *chretieni* subapical blotch shows a tendency to atrophy. One specimen almost unicolorous.

Male genitalia (figs. 31, 32): tegumen extremely broad; uncus long, slender except for terminal third which is expanding laterally, tapering apicad. Arm of gnathos fairly broad, provided with large curved and broadening terminally distal process. Valva slender, ovate; sacculus slender; transtilla a folded medially elongate plate. Aedeagus delicate with ventro-apical sharp prominence; 2 or 3 cornuti in vesica. Group of very thin woolly hair in dorso-basal area of valva.

Genitalia of female (fig. 78): antrum delicate; ductus bursae long; signum small.

Early stages. Larva (KENNEL, 1910) dark olive-grey with dark pinacula; head brown, black posteriorly; prothoracic shield black.

Bionomics. KENNEL (op. cit.) mentions that the larva feeds on lower plants as *Anemone pulsatilla* in April and May (new data: *Prunus avium* and *Manisa*). Moth collected in June, July and August.

Distribution. S. France (e.g. Digne), Switzerland, S. Germany; Italy, Austria (Wien, S. Tirolia); Hungary (Budaörs), Podolia (Dżwinogród), Bulgaria (Danube valley), Yugoslavia, Greece (Pelopones), Anatolia (Akshehir at 1700 m), Syria (Taurus: Marasch), Iraq (Shaqlawah), URSS (Kaukasus, Krasnoarmiejsk at Volga River).

### *Aphelia (Zelothereses) ignoratana* (STAUDINGER)

*Tortrix ignoratana* STAUDINGER 1880, Trudy vses. ènt. Obsheh., 15: 235. Type locality: Amasia (Asia Minor). Holotype, male: "Amasia; coll. LED. [ERER], Origin."; G. S. 11655; coll. ZMB.

KENNEL 1908—10: 114, pl. 6 fig. 29 (*Epagoge*); OBRAZTSOV 1955: 227 (*Hastula*); RAZOWSKI 1971: 473 (*Aphelia*).

Labial palpus ca 1.5 yellow-ochreous mixed with brownish; remaining parts of head rather concolorous; thorax browner proximally and medially. Forewing 12.5 mm, distinctly expanding terminally; termen weakly oblique, hardly sinuate. Ground colour brownish yellow somewhat mixed with ochreous, darker basally; pattern in form of ferruginous radial stria situated in distal part of cubital arm of median cell and trace of subapical blotch. Fringes paler than ground colour. Hindwing broad, cream, weakly mixed with brownish; fringes paler.

Male genitalia (figs. 33, 34): tegumen broad; uncus broad basally, slenderer medially, deeply incised apically to form pair of lateral processes. Distal process of arm of gnathos large, flattened, accompanied by rounded lateral prominence

situated at its base; terminal plate of gnathos long. Sacculus slender; transtilla band-shaped, minutely spined dorsally. Aedeagus small, producing ventrally; single cornutus in vesica.

Distribution: known from type locality only.

*Aphelia (Zelotherses) tschetverikovi* DANILEVSKY

*Aphelia tschetverikovi* DANILEVSKY 1963, Ent. Obozr., 42: 166, figs. 4, 5. Type locality: Teberde, NW Caucasus. Holotype, male: Teberde, 23. VIII, 1912, S. S. TSCHETVERIKOV; G. S. 6715 [ZIANL]; Coll. ZIANL.

Labial palpus 2, cream tinged with brown terminally, head and thorax rather concolorous. Forewing in male 11 mm, somewhat expanding terminally; costa weakly convex; termen somewhat oblique, hardly concave submedially. Ground colour yellow-cream; pattern rust-brown. Basal blotch short, atrophied in dorsal area of wing and except for costa basally, with posterior edge almost straight, parallel to straight proximal edge of median fascia extending from mid-costa, dorsal portion of fascia atrophied; subapical blotch short, delicate. Fringes paler than ground colour. Hindwing greyish, cream in terminal third; fringes cream. In female forewing 12 mm, not expanding terminally, with more strongly curved costa and less oblique termen. Ground colour dark yellow tinged with brownish ochreous anteriorly and dorsally. Pattern paler than in male consisting of slender oblique streak representing median part of median fascia and a suffusion situated in middle of basal area of wing. Fringes paler than ground colour, mixed with rust at tornus. Hindwing brownish grey, whitish grey terminally; fringes paler.

Male genitalia (figs. 35, 36) as in preceding species but bifurcation of uncus ca twice longer, terminal process of gnathos arm much larger and median plate of gnathos twice shorter. The differences in valva and aedeagus very slight.

Female genitalia (fig. 76): sterigma broad; antrum short, partially well sclerotized; signum large. No cestum in ductus bursae.

Bionomics. Moth collected in August.

Distribution: Caucasus: Teberde and Atskhur.

*Aphelia (Zelotherses) effigies* OBRAZTSOV, comb. nov.

*Clepsis effigies* OBRAZTSOV, 1968, J. N. Y. ent. Soc., 76 (4): 251, figs. 10, 22. Type locality: Atskhur. Holotype, male: "Azkur [= Atshkhur], CHRISTOPH coll."; G. S. 6806 [BM]; coll. BM.

Labial palpus 1.5, ochreous cream, darker terminally, front concolorous, remaining parts of head rather paler; thorax pale ochreous-cream. Forewing, ca 12 mm, expanding terminally; costa somewhat curved outwards basally, then hardly so; termen rather oblique, tolerably straight to beyond middle. Ground colour dark yellowish cream, more yellow costally. Pattern ferruginous-brown. Basal blotch strongly expanding in middle of wing posteriorly,

atrophied dorsally and basally except for costa. Median fascia divided into two blotches, smaller situated before mid-costa, larger in median area of wing terminating just beyond vein  $cu_2$ ; weak, concolorous suffusion below tornus. Subapical blotch reaching apex, diffuse posteriorly; two delicate lines extending from proximal portion of blotch and subterminally. Fringes concolorous with ground colour. Hindwing dirty cream with slight admixture of brown in anterior half; fringes pale cream.

Male genitalia (figs. 38—40) similar to those of preceding species but with somewhat differently shaped gnathos.

Comments. The genitalia need reexamination and accurate comparison with those of the preceding species. The species was described in the genus *Clepsis*, however, its author discussed the shape of the transtilla, which is absent in the representatives of the mentioned genus.

### *Aphelia (Zelotherses) pallorana* (ROBINSON)

*Tortrix pallorana* ROBINSON 1869, Trans. am. ent. Soc., 2: 266, pl. 1 fig. 13. Type localities: Ohio and Illinois.

Labial palpus 2 (2.5 in female), pale orange-cream, darkening distally, remaining parts of head paler; thorax orange-yellow. Forewing 11—12 mm; indistinctly expanding terminally in male; costa curved basally, then weakly so; termen gently convex, weakly oblique. Wing unicolorous yellowish cream, darker in basal area; fringes concolorous. Hindwing white-cream, venation except for costal area delicately suffused with brownish, similar suffusion in anal portion of wing; fringes white, tinged with yellow in apex area. Female forewing 11—13 mm, slenderer than in male, with costa more strongly convex in basal third, then straight, hardly concave subapically; termen more oblique, rather straight. Coloration darker than in male, with more or less distinct brownish or greyish brown suffusion. Hindwing cream; anal area brownish; fringes white.

Male genitalia (figs. 41, 42): uncus broad, provided with two terminal dents directed ventrally; gnathos very strong: lateral arm forming ventral, curved, sharp, process marked with some dents dorsally, median process slender, hook shaped, provided with smaller dorsal prominence, two dentate, sack-shaped processes in membrane laterally to base of the median process. Valva provided with dentate internal sclerite; sacculus slender with hook-shaped free termination; transtilla simple, somewhat expanding basally. Aedeagus slender, weakly bent; two thin cornuti in vesica present.

Female genitalia (fig. 80): eight tergite strong, produced dorsally, provided with median rib dorsally; sterigma with elongate lateral parts; antrum distinctly sclerotized, curved tube fused with sterigma; ductus bursae long; signum in form of somewhat concave plate, dentate laterally.

Early stages. MACKAY (1962) describes the larva and provides characteristics of chaetotaxy. The larva is 20—23 mm long, pale green or yellowish green with small pinacula.



**Bionomics.** Larva in spring and early summer feeding on flowers and tying leaves together, damages the new growth of pines in the plantations (MACKAY after MARTIN, 1958). Food plants: clover, alfalfa, bladder campion, goldenrod, dentation etc.

**Distribution:** from Quebec to Washington and south to Texas.

**Comments.** The systematic position of this species is doubtful as it shares some characters of *Zelotherses* (transtilla, valva-complex, aedeagus and uncus) and *Aphelia* s. str. (antrum, signum, cornutus and partially gnathos). I am placing it provisionally in the subgenus *Zelotherses*.

### *Aphelia* HÜBNER

*Aphelia* HÜBNER [1825], Verz. bekannter Schmett.: 390. Type-species: *Pyralis viburniana* FABRICIUS 1787 (designated by FERNALD 1908; cf. RAZOWSKI 1977).

OBRAZTSOV 1954: 189.

**Male genitalia** with strong, usually sinuate apically uncus. Gnathos provided with large lateral prominences of the arms extending ventrally, densely spined and membranous, small pocket marked also with dents immediately below base of median plate. Valva subtriangular; sacculus with long free termination. Transtilla broad, developed in form of strong plate, the dorso-posterior portions of which form a pair of pockets being more or less elongate or fused with one another. Exceptionally, the distal parts of transtilla form short directed dorsally lateral plates. Aedeagus simple or with strong dorsal process; cornuti very thin spines, if present.

**Female genitalia** characterise with strong eighth tergite and membranous, often densely spined ventral part of this segment; sterigma fairly strongly sclerotized, minutely spined throughout ventrally, developed as a postvaginal plate provided with small proximal prominences or somewhat protruding proximal corners. Antrum fused with sterigma; ductus bursae broad; cestum present; signum in form of slightly concave plate armed with two or more thorns.

Early stages little known. SWATSCHEK (1958) provides the characteristics of the chaetotaxy of one species (*viburniana*) and MACKAY (1962) of two ones including, however, in her *Aphelia* three species of the genus *Clepsis* GUEN. Judging on the larval characters this group cannot be separated from other subgenera.

**Bionomics.** Single generation yearly. The hibernation takes place probably in the egg stage. The larvae are polyphagous and may utilise both dicotyledonous and coniferous plants.

**Range.** Five species are known from the Palaearctic Region, four ones are Nearctic. No species has a Holarctic distribution.

**Comments.** This subgenus is rather compact as one can judge on the genital characters. However, the species can be divided in two groups. In group one

the transtilla is most probably more generalized being broad, weakly concave dorso-medially. The dorso-lateral prominences are more or less densely dentate. Only in *septentrionalis* these parts are atrophied and the distal wall of transtilla is reduced to subtriangular, lateral plates. To this group belong all Nearctic species as well as *caradjana* and *inumbatana* known from Far East. Two latter species characterise with large process of aedeagus, the characters occasionally found in other genera of the *Archipina*. It is supposed that some Palaearctic species with simple aedeagus and broad transtilla will be discovered in the Nearctic Region. In the group two belong exclusively the Palaearctic species characterised by more specialised transtilla. The dorso-lateral parts of it are strongly elongate, pocket-shaped, dentate in apical areas. The median part of transtilla constitutes exclusively of the posterior wall. Arranging the species according to the structure of the transtilla one must accept that the shape of the dentate processes of the gnathos arm is a secondary character. In some species of the two groups the gnathos is similarly developed.

*Aphelia (Aphelia) alleniana* (FERNALD)

Two subspecies are distinguished in this Nearctic species. One is distributed in the northern part of the continent reaching Maine and New York in the south, the second is known from Colorado.

*Aphelia (Aphelia) alleniana alleniana* (FERNALD)

*Tortrix alleniana* FERNALD 1882, Trans. am. ent. Soc., **10**: 68. Type locality: Orono, Maine. Lectotype (designated by OBRAZTSOV 1959), male, no collection data; coll. USNM. *Tortrix alleniana* [sic!] LLEWELLYN-JONES 1935, Proc. ent. Soc. Br. Columbia, **31**: 32.

*Tortrix trentonana* McDUNNOUGH 1923, Can. Ent., **55**: 168. Type locality: Trenton, Ontario. *alleniana alleniana* OBRAZTSOV 1959: 2, figs. 7, 8 (*Aphelia*).

Labial palpus ca 3, ochreous mixed with orange, brownish apically; remaining parts of head and thorax browner. Male forewing 11—13 mm, hardly expanding terminally; costa curved outwards in basal third, weakly so posteriorly; apex rounded; termen slightly oblique, hardly concave before middle. Ground colour ferruginous cream to brownish grey or olive-brown, variable as mentioned in the original description. OBRAZTSOV (1959) mentions, however, that the forewings vary not from reddish to golden-yellow but are somewhat olive or grey. Pattern indistinct, in form of cross lines or dense reticulation somewhat darker, more brown than ground colour. In some specimens indistinct rust markings on costa representing remainders of median fascia and subapical blotch present. Fringes concolorous with ground colour. Hindwing cream mixed with brown except for apical third; fringes cream. Female forewing ca 13 mm, uniformly broad throughout with costa more strongly expanding basally, slightly sinuate subapically and much shorter, distinctly oblique termen. Ground colour usually darker than in male, orange brown, reticulate

posteriorly. Hindwing slender, brownish with yellowish apical third and more cream cilia.

Variation. Some specimens examined by OBRAZTSOV were unicolorous. The shape of the forewing is also inconstant.

Male genitalia (figs. 43—46). Uncus strong, expanding apically, somewhat sinuate at the tip, rather variable. Dentate processes of gnathos long, protruding ventrally, expanding dorso-posteriorly; terminal plate large. Transtilla broad with large, dentate lateral parts.

Female genitalia (fig. 81): sterigma with fairly long proximal sack-shaped prominences, concave in middle part; antrum well sclerotized, rather large; ductus bursae with well developed cestum; signum marked with two thorns.

Early stages. After MACKEY (1962) larva is 18—23 mm long, green ventrally, dorsum or dorsal longitudinal fascia dirty dark green, head pale, tinged with green, prothoracic shield green, patterned, pinacula pale, conspicuous.

Bionomics. Larva tying and folding leaves and webbing shoots of various plants, eg. alfalfa, sweet clover, rose, oak, choke cherry, strawberry, *Monarda*, *Aster*, *Rubus*, *Viburnum* (MACKEY after MARTIN, 1958). After the latter author injurious to young coniferous plantations. Moth collected in June and July.

Distribution. Known from British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Quebec, New Brunswick, Washington, Oregon, Michigan, New York and Maine.

### *Aphelia (Aphelia) alleniana rindgeorum* OBRAZTSOV

*Aphelia alleniana rindgeorum* OBRAZTSOV 1959, Am. Mus. Novit., no. 1964: 6 figs. 3, 4, 10, 11. Type locality: Valley View Lodge. Holotype (after original paper), male: Valley View Lodge, 10 miles S. of Steamboat Springs, 7600 f., Routt County, Colorado, July, 16 1957, F. and P. RINDGE, G. S. 201 [USNM]. Coll. USNM.

Male: antenna ochreous, reddish basally; labial palpus brown, head and thorax darker. Forewing 12 mm, cinnamon-ochreous with fine, partly interrupted reddish brown striation; wing base and terminal area more brown; median fascia brown, distinct at costa, rather diffuse dorsally; subapical blotch broad. Fringes concolorous with ground. Hindwing greyish white, usually paler on peripheries with weak obsolescent, grey striation.

Variation. In one paratype the pattern is ill-defined, in others shows a tendency to atrophy.

Male genitalia. Uncus weakly expanding terminally; gnathos shorter than in nominate subspecies, with slenderer spined areas. Transtilla more sinuate dorsally, spined dorso-laterally. Two cornuti in vesica.

Comments. The subspecies is unknown to me. The above description is based on the original characteristics and drawings. The female remains unknown. Range: Colorado.



*Aphelia (Aphelia) koebelei* OBRAZTSOV

*Aphelia koebelei* OBRAZTSOV 1959, Am. Mus. Novit., no. 1964: 7, figs. 5, 12, 13. Type locality: Easton, Washington. Holotype, male: "Easton, Wash. K. [OEBELE]"; G. S. 1-Obr. Coll. USNM.

Labial palpus ca 2.5 pale ochreous-yellow; antenna paler; remaining parts of head concolorous with palpus, thorax darker. Forewing 14.5 mm, broadest medially, not expanding distally; costa strongly curved at base, indistinctly so postmedially; termen weakly oblique, somewhat sinuate at  $m_1$ . Ground colour pale ochreous-cream suffused with yellowish, delicately, strigulated with ochreous-yellow. Base of wing suffused with brownish ochreous; pattern rust-ochreous consisting of costal blotch situated before middle and representing median fascia proximal edge of which being hardly preserved and subapical blotch paler than the former, almost reaching the apex. Fringes concolorous with ground. Hindwing white cream suffused with brownish except for apical third and anal area; fringes whitish.

Male genitalia (figs. 47, 48): uncus slender medially, somewhat sinuate apically; gnathos large with dentate process extending ventrally. Transtilla strongly incised dorsally, irregularly dentate laterally. Aedeagus slender; three cornuti in vesica.

*Aphelia (Aphelia) gregalis* sp. nov.

Holotype, male: "Mc Kinley, Alaska, Aug. 5, 31, F. W. MORAND Coll."; G. S. not numbered; coll. USNM.

Labial palpus 2, brownish, remaining parts of head and thorax rather concolorous. Forewing ca 10 mm, with indistinctly sinuate termen, weakly expanding terminally. Ground colour grey-brown with ochreous suffusion. Fringes ochreous, concolorous with strigulation of terminal third of wing. Hindwing brownish grey; fringes white-grey.

Male genitalia (figs. 49, 50): uncus long, expanding terminally (terminal part indistinctly seen in the slide); dentate processes of gnathos strongly expanding ventrally, curved laterally. Transtilla broad, weakly sinuate apically, marked with two lateral dents on each side.

Comments. The holotype of this species was included in the type series of the following species from which it differs mainly in the shapes of the uncus and transtilla.

*Aphelia (Aphelia) septentrionalis* OBRAZTSOV

*Aphelia septentrionalis* OBRAZTSOV 1959, Am. Mus. Novit., nr. 1964: 8, figs. 6, 14, 15. Type locality: Mc Kinley, Alaska. Holotype, male: Kotzebue, Alaska, June 27, 1956, P. R. EHRLICH; G. S. 203 (after original paper); coll. USNM.

Male: labial palpus ca 2 reddish brown; antenna black, remaining parts of head and patagia reddish brown; thorax greyish brown. Forewing 9 mm, weakly expanding terminally; costa gently curved to middle; termen oblique,

hardly sinuate. Ground colour yellowish grey with diffuse reddish brown median fascia and transverse striation. Fringes pale yellow. Hindwing grey, yellow at apex, grey strigulate transversely; fringes yellowish.

Variation. The specimen examined by me characterises with olive-grey-brown densely scaled ochreous-ferruginous and rust-brown to form transverse strigulation and broader suffusions. Fringes brownish grey. Hindwing brownish grey; fringes dirty white.

Male genitalia (figs. 51, 52): uncus distinctly expanding in terminal third, incised apically; ventral portion of dentate process of gnathos broad. Transtilla peculiar with lateral parts folded dorsally. Three cornuti in vesica.

Bionomics. Moth: June and August.

Distribution. Alaska; apart from the type locality Mac Kinley Park.

### *Aphelia (Aphelia) caradjana* (CARADJA)

*Tortrix caradjana* CARADJA 1916, Dt. ent. Z. Iris, **30**: 47. Type locality: Radde. Lectotype, male (designated by RAZOWSKI 1971): "Raddé, 1908, WLSM. No. 15062"; G. S. 7723 [BM]; coll. BM.

Labial palpus 2, ochreous cream basally, ochreous brown towards the tip; remaining parts of head pale ochreous-rust; thorax browner. Forewing 10 mm, uniformly broad throughout; costa strongly curved at base, then weakly so; termen indistinctly oblique, somewhat convex. Ground colour yellowish ochreous, base somewhat suffused with ochreous-rust. Remaining pattern darker, diffuse, consisting of median fascia and subapical blotch. Fringes cream. Hindwing dark greyish brown tinged with ochreous at apex; fringes cream, mixed with yellow at apex.

Variation. The pattern shows a tendency to atrophy; ground colour occasionally paler than described above.

Male genitalia (figs. 53, 54): uncus fairly broad medially, incised apically; dentate parts of gnathos large, extending ventro-laterally; termination of sacculus broad; transtilla broad, concave in middle dorsally, delicately dentate laterally. Aedeagus provided with large dorsal process situated just beyond zona; cornuti absent.

Comments. Four specimens seen. The female and biology unknown.

### *Aphelia (Aphelia) inumbratana* (CHRISTOPH)

*Tortrix inumbratana* CHRISTOPH, 1881, Bull. Soc. imp. Nat. Moscou, **56**: 67. Type locality: vicinity of Vladivostok.

KENNEL 1910: 179, pl. 9 figs. 22, 23 (*Tortrix*).

Externally very similar to the preceding species; forewing 11 mm, slightly expanding terminally in male, rather uniformly broad throughout in female in which the apex is somewhat elongate, pointed and termen distinctly oblique,

slightly convex. Ground colour in male pale ochreous with indistinct brown suffusions and brownish strigulation; pattern ochreous-brown or rust-brown, similar to that in *caradjana*. Fringes ochreous cream. Hindwing brownish with cream cilia. Female darker than male; ground colour yellowish brown, pattern brown consisting of median fascia and subapical blotch fused with subterminal suffusion. Fringes rather concolorous with ground colour. Hindwing paler than in male.

Variation. As in *viburniana* the forewings in males are occasionally unicolorous yellowish brown, darker strigulated, or the ground colour varies from ochreous to brownish. The pattern in female shows also slight tendency to atrophy and the ground colour varies from yellow-brown to brownish.

Male genitalia (figs. 55, 56): uncus slenderer than in preceding species, more strongly sinuate apically; dentate portions of gnathos slenderer; free termination of sacculus elongate, thin apically; transtilla stronger, dentate dorso-laterally.

Female genitalia (fig. 82): sterigma rather weakly sclerotized posteriorly except for lateral arms, with indistinct proximal prominences, fused with well sclerotized antrum; ductus bursae with fairly long cestum; signum provided with one strong dent and some three small ones.

Bionomics. The larvae observed in May and June; moth in July. After KUZNETSOV (1973) omnivorous on *Rosales* and *Asterales* (*Rosa dahurica*, *Spirea butulifolia*, *Artemisia* sp.).

Distribution. Juzhnoe Primore: Iakovlevka, vicinity of Ussurijsk, De Friz, Vladivostok, Askold.

Comments. The two species need reexamination, as a variation of their genitalia (rather important in this genus) is unknown.

### *Aphelia (Aphelia) viburniana* (FABRICIUS)

*Pyralis viburniana* FABRICIUS 1787, Mantissa Ins., 2: 229. Type locality: not mentioned originally, [Vienna distr.]; *Phalaena Tortrix viburnana* [DENIS & SCHIFFERMÜLLER] 1775, Ank. Verz. Schmett. Wien. Geg.: 128 — nom. nudum.

*Tortrix galiana* STEPHENS 1834, Ill. Brit. Ent. *Haustellata*, 4: 845. Type locality: Whittlesea Mere, New Forest; CURTIS 1829, Guide Arr. Brit. Ins.: 166 — nom. nudum.

*Tortrix brunneana* ZETTERSTEDT 1840, Ins. Lapponica: 980. Type locality: Lapponia.

*Tortrix unipunctana* TENGSTRÖM 1847, Notis. Sällsk. Fauna Flora Fenn. Färh., 1: 158 — nom. praeocc.

*Tortrix Tortrix scrophulariana* HERRICH-SCHÄFFER 1851, Syst. Bearbeitung Schmett. Eur., 4: 174. Type locality: Frankfurt/Main.

*Tortrix geleana* HUMPHREYS & WESTWOOD 1845, Brit. Moths, 2: 109, pl. 79 fig. 15. Type locality: not mentioned.

*Tortrix teucriana* TUTT 1890, Ent. Rec., 1: 31. Type locality: Folkestone Warren. Holotype, male: "Folkestone, Kent, TUTT 1890"; Coll. BM.

*Tortrix donelana* CARPENTER 1891, Proc. R. Soc. Dublin 6: 92, pl. 7 figs. 1—6. Type locality: Tuam, Co. Galway (Ireland).

*Tortrix viburniana altaica* CARADJA 1916, Dt. Ent. Z. Iris, 30: 47. Type locality: Altai Mts. KENNEL 1910: 178, pl. 9 fig. 20 (*Tortrix*); OBRAZTSOV 1955: 210 (*Aphelia*).



Labial palpus ca 2, brownish; remaining parts of head and thorax brownish ferruginous or with ochreous admixture. Forewing 7.5—11 mm. Male forewing fairly broad; costa weakly curved outwards; apex short, rounded; termen indistinctly oblique, tolerably straight to before tornus. Ground colour varying from grey-brown to reddish brown; pattern ill-defined, browner or darker, typical of *Tortricinae* or the specimens are unicolorous. Fringes paler than wing (or ground colour), more ochreous cream. Female: forewing much slenderer than in male with costa distinctly convex in basal third, straight or weakly concave subapically; apex pointed, somewhat produced; termen distinctly oblique, hardly sinuate submedially. Ground colour as in male or more ferruginous cream; pattern much more distinct, rust-brown. Basal blotch atrophied, median fascia strong, tapering costally, atrophying towards dorsum; subapical blotch delicate, rarely accompanied by subterminal suffusion. Fringes more cream than ground colour especially posteriorly. Hindwing in both sexes brown-grey with paler, often whitish cream cilia, much broader in male than in female.

Variation. The most common is the unicolorous form of male and patterned form of female. Some males examined are olive-brown. The females vary also in the shape of the forewing which occasionally is very slender. BRADLEY & all. (1973) suggest that the variation in the forewing coloration is influenced by the foodplant and biotope.

Male genitalia (figs. 57, 58): uncus rather short, slender medially, distinctly sinuate apically; gnathos strong with large, somewhat expanding ventrally dentate prominences extending from before top of the lateral arm to beyond median portion. Sacculus strong, with well developed free termination. Transstilla strong, provided with long, almost entirely dentate lateral processes. Aedeagus with single cornutus.

Female genitalia (fig. 83): sterigma large, densely spined, except for small proximal prominences situated near short antrum. Lateral arms of sterigma concave submedially, tapering terminally; median portion concave dorsally, producing plate-shaped, incised medially prominence which covers ostium bursae. Ductus bursae broad; cestum long; signum small concave plate armed with two lateral empty prominences.

Early stages. Chaetotaxy described by SWATSCHEK. The larva after SWATSCHEK is dark bluish grey or olive-green, paler laterally with pale brown head and plates (the anal plate marked with black) and paler pinacula. BRADLEY & all. (1973) write that it is dark green to greenish black with paler subspiracular line and whitish pinacula and setae; peritreme of spiracle black; head yellowish brown, marked with black posteriorly and laterally; prothoracic plate light brown to greenish brown, variably marked with black; anal plate light green or brown spotted with black; anal comb brownish; thoracic legs greenish or brownish marked with black. Pupa black.

Bionomics. Moth flies in June and July in Europe, from end of May in Far East. Larva in May and June in spun leaves of many plants as *Vaccinium*, *Erica*, *Myrica*, *Salix*, *Helianthemum*, *Potentilla*, *Lythrum*, *Lonicera*, *Spiraea*,

*Pastinca*, *Teucrium*, *Centaurea*, *Abies* and *Pinus* in England (BRADLEY & all.) and on *Viburnum*, *Andromeda*, *Alisma*, *Ledum*, *Sanguisorba*, *Artemisia*, *Coronilla*, *Lysimachia*, *Scrophularia* etc. in continental Europe. KUZNETSOV (1967) obtained it from *Malus pallasiana*, *Spirea sericea*, *Quercus mongolica*, *Rhododendron dahuricum*, *Salix*, *Rosa*, *Betula* etc. in the Far East. The ova hatch before winter and the small larvae hibernate as they have been observed already in April (half-grown ones). Biotops: mainly moors and mosses.

Distribution. Known from whole of Europe incl. Portugal and British Islands. In Pyrenees collected up to 1500 m, in Alps even on 2000 m above sea level. Probably widely distributed in Siberia as known from Tuva (Kostyuk, 1971) Altai Mts., Primorski Kraj and South Kurile I. (KUZNETSOV, 1967). The same author (KUZNETSOV, 1975) mentions it also from Mongolia (vicinity of Ulan Baator) but these data need confirmation as another species (*polygloch-ina*) occurs in that country.

Comments. OBRAZTSOV (1955) listed *unitana* as the synonym of *viburniana*, however, it is a distinct species close to *paleana*. That author provides also several misidentifications of the discussed species. The genitalia of *viburniana* are variable to some degree, e. g. the shape of the processes of the transtilla, sacculus and uncus. Thus some differences found in the North European specimens (the signum in the female from Bosekopp differs from that in the Central European population) must be reexamined on larger material. The Far East and Altai specimens have not been examined by me.

### *Aphelia (Aphelia) polyglochina* sp. nov.

Holotype, male: "Central aimak, SO von Somon Bajanzogt, 1600 m, 27. VII. 1966; Exp. Dr. Z. KASZAB, 1966; Nr. 751"; G. S. 8605. Paratype, male: Bulgan aimak, 7 km. NW Somon Chanzhargalant, 1350 m, 22. VII. 1968; Nr. 1140. Coll. MNMB.

*viburniana*: RAZOWSKI 1972: 148 (*Aphelia*).

Externally not differing from the preceding species.

Male genitalia (figs. 59, 60): uncus slenderer than in *viburniana*; gnathos strongly expanding ventrally, dentate from about middle; lateral arm of transtilla proportionally short, minutely dentate terminally; aedeagus seemingly longer than in preceding species; cornutus not found.

Bionomics and distribution: as mentioned on the labels of the types.

Comments. In the shape of the uncus and transtilla the new species is very similar to those in *viburniana*, however, the shape of the dentate prominences of the gnathos resemble those in *septentrionalis*. Female unknown.

*Aphelia (Aphelia) caucasica* KOSTYUK

*Aphelia caucasica* KOSTYUK 1975, Vestnik Zool., 2: 59, fig. 1. Type locality: Mamisonskij Pereval, Caucasus. Holotype, male: Bolshoi Kavkaz, Mamisonskij pereval 2400—2500 m, 22. VII. 1973. V. Logvinenko (after original paper).

The species is unknown to me. KOSTYUK writes that expansion of forewing is 24 mm. Forewing as in *viburbiana*, unicolorous brownish grey, somewhat glossy.

Male genitalia characterise with long, slender uncus strongly expanding apically, rounded terminally, indistinctly sinuate on tip. Lateral arm of gnathos densely spined in ventral half, expanding at the end dorsally; dents extending in a row to before middle ventrally. Aedeagus without cornuti. Process of transtilla fairly long.

Originally compared with *septentrionalis* and *viburniana*. It is also close to the preceding species but differs in the shapes of the uncus and gnathos.

*Anaphelia* sgen. nov.

Type species: *Tortrix Heterognomon aglossana* KENNEL 1899

Male genitalia: uncus very broad; gnathos arm folded laterally. Transtilla plate-shaped, provided with large, dentate median prominence directed posteriorly, producing small ventral process. Lateral part of transtilla fused with internal sclerite of valva ventrally and medially and with its membranous part dorsally.

Comments. The female is unknown. The subgenus is distinguished by the shape of the transtilla which works with its peculiar chamber like median prominence during first phase of the clasping before the copulation.

*Aphelia (Anaphelia) aglossana* (KENNEL)

*Tortrix Heterognomon aglossana* KENNEL 1899, Dt. ent. Z. Iris, 12: 9, pl. 1 fig. 7. Type locality: Tarbagatai (E. Kazakhstan). Holotype, male: "Tarbagatai, 1877 H[A]B[ER]H[AUER] Origin"; G. S. 11612; coll. ZMB.

*Tortrix accuratana* KENNEL 1901, *ibid.*, 12: 224. Type locality: Uliassutai, Mongolia. Holotype, male: "Uliassutai, Mongolei, D. 94"; G. S. B-3; coll. ZMB.

*Tortrix continentana* REBEL 1916, *ibid.*, 30: 189. Type locality: Schawyr. Holotype, male with abdomen missing: "Ost Tannuola, Schawyr, 2500 ft., BANG-HAAS, 1914"; coll. NHMW.

*Tortrix continentana iliensis* REBEL, 1916, *ibid.*: 190. Type locality: vicinity of Djarkent. Holotype, male: "Asia centr., Ili Gebiet, Umb. Djarkent; Coll. WAGNER"; Coll. NHMW.

*Djakonovia scutellana* OBRAZTSOV 1943, *ibid.*, 57: 73 fig. 1. Type locality: Schawyr. Holotype, male: "Tannuola, Schawyr, 2500 m, 1914 (BANG-HAAS); coll. NHMW.

KENNEL 1910: 181, pl. 9 fig. 34 (*aglossana*), 35 (*accuratana*) (*Tortrix*)

OBRAZTSOV 1968: 240 (*Aphelia accuratana*).

Labial palpus ca 2 pale cream mixed with brownish; remaining parts of head rather concolorous, vertex and thorax brownish. Forewing 11—14 mm,



somewhat expanding posteriorly; costa almost straight; apex rounded; termen weakly oblique, indistinctly convex. Ground colour cream at costa, suffused brownish grey and hardly mixed with olive in remaining area. Transverse strigulation distinct especially in posterior third of wing and towards costa, more brown-grey than ground; remainders of pattern in form of costal part of median fascia and indistinct subapical blotch present. Fringes ochreous-cream with brownish grey median line. Hindwing brownish with darker venation; fringes grey-cream; median line and terminations somewhat darker.

Variation distinct. The most common form is characterised by pale coloration. Head cream, labial palpus variably mixed with brown or ferruginous; thorax slightly darker than head. Ground colour of forewing cream to ochreous cream, more or less distinctly strigulated with pale brown, ochreous or grey-brown. Pattern darker than strigulation, occasionally rust-brown consisting of ill-defined basal blotch extending from beyond 1/3 of dorsum atrophying towards costa, oblique median fascia interrupted near middle or atrophied in dorsal half, and subapical blotch. Fringes concolorous with ground colour or paler. Hindwing pale ochreous-cream, mixed with grey in anal area; fringes cream. The shape of the forewing is also variable to some degree.

Male genitalia (figs. 61—63): tegumen large, broad; uncus very broad, expanding apically, somewhat concave on tip; gnathos strong, with well developed lateral arm expanding in form of rounded distal prominence and large, folded dorsally lateral area. Vinculum delicate; sacculus slender with weak apical termination. Transtilla as described for the subgenus. Aedeagus slender long, with long dorsal split and elongate coecum penis.

Bionomics. No data except for dates of the collection of moth: June and July at the altitudes up to 2100 m (in Tuva). Biotopes: steppes.

Distribution. Known from Central Asia: Tarbagatai Mts., Dshungarian Ala-Tau (Djarkent) in Kazakhstan, Tuva, E. Tannuola, W. China and Mongolia (Central aimak).

Comments. However, the species is known of numerous specimens the female is still unknown. It has been described five times as new on the basis of variably coloured specimens. The most common is pale coloured variation widely distributed in Central Asia, but unfortunately the only known dark example represents the nominate form. The discussed species is characterised mainly with long, slender aedeagus. The second species described below characterises with diffuse, dark pattern and much shorter aedeagus provided with small coecum penis and proportionally short dorsal split (in comparison with the terminal part).

*Aphelia (Anaphelia) mongoliana* sp. nov.

Holotype, male: "Mongolia, Süd gobi aimak, Gurban Sajchan ul, 30 km. S. von Somon Bulgan, 1700 m., 10. VI. 1964; Exp. Dr. Z. KASZAB"; GS. 2174; coll. MNMB. Paratypes: 7 males from Mongolia collected in Central, South Gobi and Gobi Altai aimaks in 1964 and 1967.

Head as in preceding species, pale, usually ochreous cream; thorax brownish grey or olive-grey, abdomen pale, rather dirty cream. Forewing 11—15 mm, weakly expanding terminally, somewhat variable, termen usually less oblique than in *aglossana*. Ground colour ochreous cream, densely strigulated or reticulate with brown-grey; pattern brown-grey, complete, diffuse, more or less confluent. Fringes rather concolorous with ground. Hindwing grey with indistinct admixture of cream colour in apical area in some examples; fringes cream to cream-grey.

Variation concerns the shape and intensity of the pattern and strigulation. Some examples are very dark, with traces of the ground colour only.

Male genitalia (figs. 64, 65) as in preceding species but aedeagus much shorter, with short, broad coecum penis and proportionally long apex. Other characters are rather variable.

Comments: cf. p. 367. Female unknown. The species is widely distributed in Mongolia and probably will be found in other parts of Central Asia.

### *Sacaphelia* sgen. nov.

Type species: *Euxanthia disjuncta* FILIPIEV 1924

Gnathos armed with ventral processes of lateral arms; saccus with small free termination. Transtilla in form of transverse, folded ventrally and (little so) dorsally band fused with very large cone-shaped process of valva. The internal hole of the process communicates with hole of valva through small elliptic opening situated subdorsally.

Sterigma cup-shaped, with ventral part somewhat smaller than the post-vaginal lamella; antrum provided with strong internal sclerite; signum strong with well developed capitulum.

Comments. The new subgenus shares some characters of *Zelotheres* and *Aphelia* s. str. being distinct especially by the structure of valva-transtilla complex.

### *Aphelia* (*Sacaphelia*) *disjuncta* (FILIPIEV)

*Euxanthia disjuncta* FILIPIEV 1924, Jber. Martia nov. Staatsmus., 2: 54. Type locality: at Telekoe Lake, Tomsk District. Holotype, male: "Tomskaja gub., Telekoe ozero, ur. [otchisch] Biele, A. EMILIANOV, 29. VI. 09"; coll. ZIANL.

RAZOWSKI 1966: 495, figs. 2—4 (*Aphelia*).

Labial palpus over 1.5; head cream-white; thorax rather concolorous with ochreous-yellow base of tegula. Forewing 8—10 mm, weakly expanding terminally, with costa distinctly curved at base; termen oblique, usually straight. Ground colour cream to whitish; pattern pale brownish orange consisting of three elements typical of *Torticinae* but divided into several diffused spots and large terminal suffusion. Fringes creamy, ochreous to middle. Hindwing

cream, mixed with grey basally and in anal area; fringes cream. Female similar to male in the shape of wings, but often unicolorous.

Variation. Ground colour of forewing often white; pattern occasionally pale orange. Basal blotch in one specimen atrophying at costa, expanding distally towards dorsum, median fascia slender at costa, very broad dorsally, fused with basal blotch and terminal pattern which shows a tendency to separate from the subapical blotch. In other examples the ground colour preserved only in costal area of wing or limited to very slender fascias among broad, diffuse and confluent pattern.

Male genitalia (figs. 66—72): uncus fairly large, somewhat expanding terminally, rounded apically; ventral process of gnathos arm sharp apically; dorsal portion of transtilla concave medially, provided with various number of dents varying also in size. Cone-shaped process of valva with densely arranged dents and apical thorn. Aedeagus long, almost straight, with very short coecum penis; two cornuti in vesica present. Otherwise as described for the subgenus.

Female genitalia (fig. 84): dorsal plate of sterigma somewhat producing in middle distally, ventral plate deeply incised; antrum sclerite rather divided medially; ductus bursae without cestum; signum fairly large.

Bionomics little known. Moth collected in July and early August in the steppes at the altitudes of 600—1300 m above sea level.

Distribution. Besides the type locality in Altai known also from Minusinsk in Krasnojarsk district and Tuva as well from various parts of Mongolia (cf. RAZOWSKI, 1966, 1972).

Comments. The systematic position of this species was doubtful also for KOSTYUK (1971) who placed it in the genus *Aneuxanthia* LE MARCH.

Institute of Systematic and Experimental Zoology  
Polish Academy of Sciences  
31-016 Kraków, Sławkowska 17

## REFERENCES

- BOVEY P. 1966. *Tortricinae* [in:] A. S. BALACHOWSKY, Entomologie appliquee à l'agriculture, **2**, *Lepidoptera*. Paris.
- BENTINCK G. A., DIAKONOFF A. 1968. De Nederlandse Bladrollers (*Tortricidae*). Monogr. Nederl. Ent. Ver., **3**. Amsterdam.
- BRADLEY J. D. 1962. *Lepidoptera* in Ireland. Part III: Descriptions of *Aphelia unitana* (HÜBNER) (*Tortricidae*) ..... Entomologist's Gaz. London, **15**: 74—82, pl. 3.
- BRADLEY J. D., TREMEWAN W. G., SMITH A. 1973. British Tortricid Moths. *Cochylidae* and *Tortricidae*: *Tortricinae*. London.
- CLARKE J. F. G. 1958. Catalogue of the type specimens of *Microlepidoptera* in the British Museum (Natural History) described by Edward MEYRICK. London, **3**.

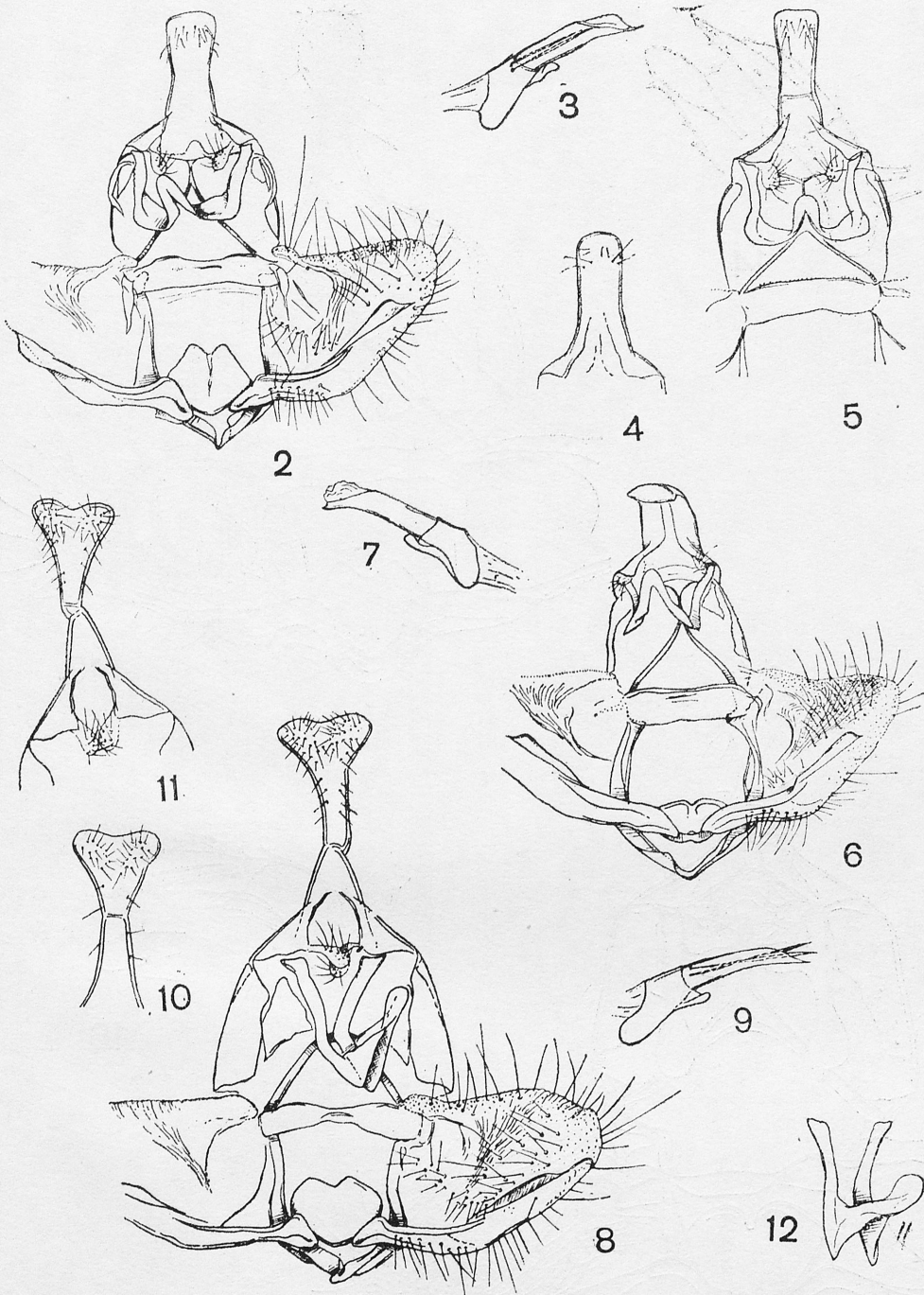


- FERNALD C. H. 1908. The genera of the *Tortricidae* and their types. Amherst, Mass.
- HOLST P. L. 1962. *Tortrix unitana* HÜBNER, a distinct species (*Lepidoptera*, *Tortricidae*). Ent. Meddr. København, **31** (4): 303—310.
- KENNEL J. 1908—1910. Die Palaearktischen Tortriciden. Zoologica, Stuttgart, **21** (54); 1908: 1—100+2+12, pls. 1—6; 1910: 101—232, pls. 7—12.
- KOSTYUK Iu. O. 1971. Do piznannia luskokrylikh (*Lepidoptera*) Tuvy i pivnitchno-zakhidnoi Mongolii. Listoviiikovi (*Tortricoidea*). Povidomlennia I..... Zyrn. Prats' zool. Mus., Kiiv, nr. 34: 38—50.
- KUZNETSOV V. I. 1960. Materialy po faunie i biologii tchechuekrylikh (*Lepidoptera*) zapadnogo Kopet-Dagha. Trudy zool. Inst. Leningrad, **27**: 11—93.
- KUZNETSOV V. I. 1967. Listovvertki (*Lepidoptera*, *Tortricidae*) Amursko-zeiskogo mezhdurechya i ikh ekologiya. Trudy zool. Inst. Leningrad, **41**: 5—(72).
- KUZNETSOV V. I. 1973. Listovvertki (*Lepidoptera*, *Tortricidae*) iuzhnoi tchasti dalnogo vostoka i ikh sezonnye cykli. Trudy vses. ent. Obsheh. Leningrad, **56**: 44—161.
- KUZNETSOV V. I. 1975. K faune listovertok (*Lepidoptera*, *Tortricidae*) Mongolii. Nasekomye Mongolii, Leningrad, **3**: 408—437.
- MACKEY M. R. 1962. Larvae of the North American *Tortricinae* (*Lepidoptera*, *Tortricidae*). Can. Ent., Suppl. Ottawa, **28**: 182 pp.
- MARTIN J. L. 1958. Observations on the biology of certain tortricid species in young coniferous plantations in southern Ontario. Ibid., **90**: 44—53.
- OBRAZTSOV N. S. 1954. Die Gattungen der Palaearktischen *Tortricidae*. I. Allgemeine Aufteilung der Familie und die Unterfamilien *Tortricinae* und *Sparganothinae*. Tijdschr. Ent., Amsterdam, **97** (3): 141—231.
- OBRAZTSOV N. S. 1955. Ditto. 1. Fortsetzung. Ibid., **98** (3): 147—228.
- OBRAZTSOV N. S. 1957. Ditto. 3. Fortsetzung und Schluss. Ibid., **100** (3): 309—347.
- OBRAZTSOV N. S. 1959. Note on North American *Aphelia* species (*Lepidoptera*, *Tortricidae*). Am. Mus. Novit., New York, nr. 1964.
- OBRAZTSOV N. S. 1968. Notes on and descriptions of *Aphelia*, *Olepsis* and *Choristoneura* species (*Lepidoptera*: *Tortricidae*). J. N. Y. ent. Soc., New York, **76** (4).
- OPHEIM M. 1965. Notes on the Norwegian *Tortricidae* III. (*Lepidoptera*). Norsk ent. Tidsskr., Oslo, **13** (1—2): 23—30.
- RAZOWSKI J. 1963. *Tortricoidea* (*Lepidoptera*) from Iran. Acta zool. crac., Kraków, **8** (5): 251—277.
- RAZOWSKI J. 1966. The *Tortricoidea* (*Lepidoptera*) from Mongolia. Annls zool. Warszawa, **23** (21): 495—507.
- RAZOWSKI J. 1971. The type specimens of the species of some *Tortricidae* (*Lepidoptera*). Acta zool. crac., Kraków **16** (10): 463—524.
- RAZOWSKI J. 1972. The results of Dr. Z. KASZAB zoological expedition to Mongolia. Nr. 273: *Tortricidae* and *Cochylidae* (*Lepidoptera*). Ibid., **17** (6): 131—162.
- RAZOWSKI J. 1977. Catalogue of the generic names used in *Tortricidae* (*Lepidoptera*). Ibid., **22** (6): 207—296.

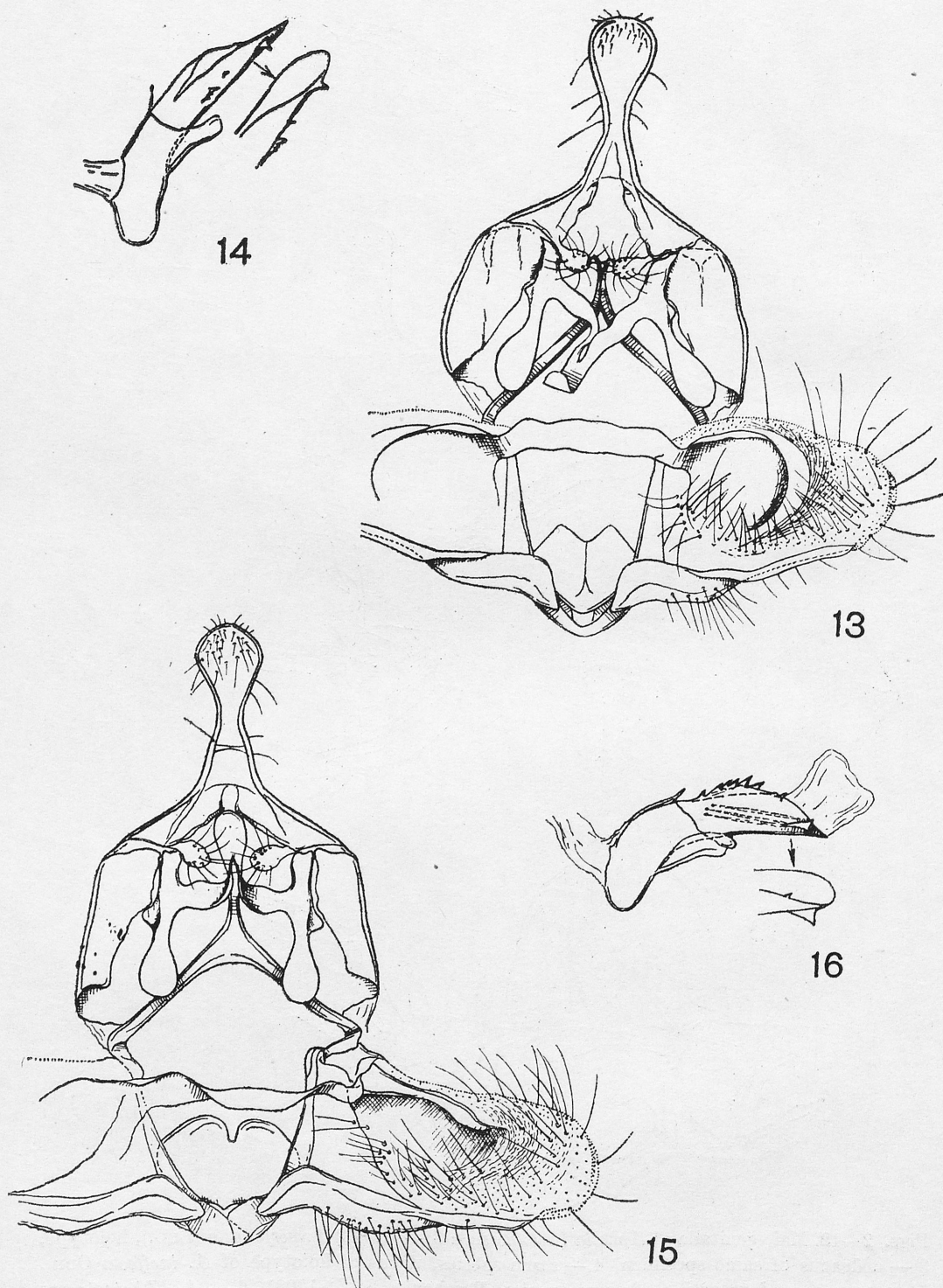
## STRESZCZENIE

Praca jest rewizją rodzaju *Aphelia* obejmującego 29 gatunków skupionych w 4 podrodzajach. Jako nowe opisano 2 podrodzaje i 4 gatunki, a zsynonimizowano 1 podrodzaj i 8 taksonów szczebla gatunkowego.

Redaktor pracy: doc. dr A. Krzanowski

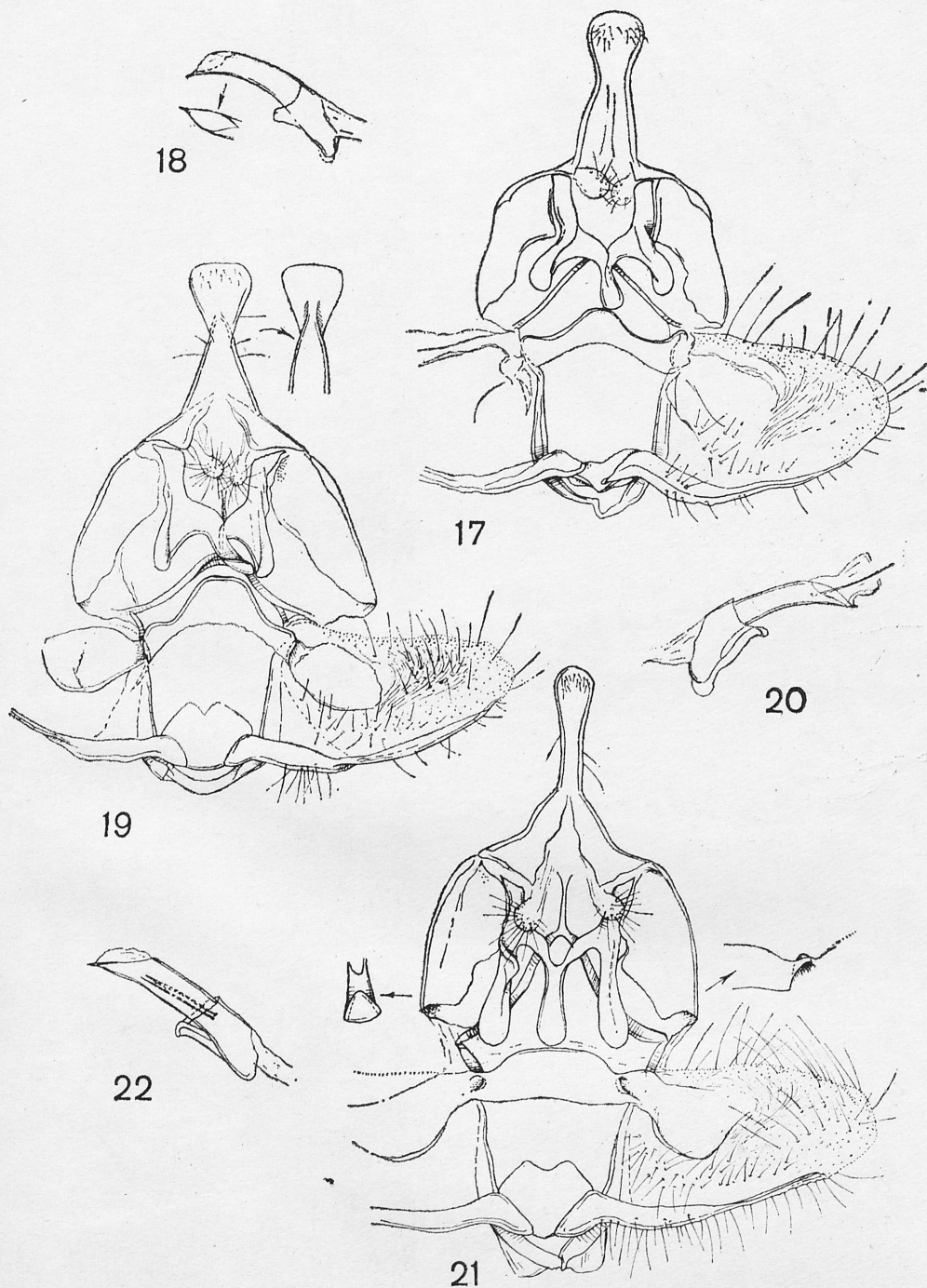


Figs. 2—12. Male genitalia of *Aphelia* (*Zelotherses*): 2 — *A. (Z.) imperfectana* (LED.), holotype, 3 — aedeagus of same specimen, 4 — same species, uncus of holotype of *A. ineffecta* OBR., 5 — tegumen and transtilla of same species, Bescharée, G. S. 10081, 6 — *A. (Z.) insincera* (MEYR.), holotype, 7 — aedeagus of same specimen, 8 — *A. (Z.) euxina* (DJAK.), Akshehir, Anatolia, G. S. 10084, 9 — aedeagus of same specimen, 10 — uncus of same species, Prenj, Yugoslavia, G. S. 10079, 11 — uncus with distal part of tegumen of same species, Alibotush Mts., G. S. 10095, 12 — gnathos of same species, Olympus, G. S. 8954

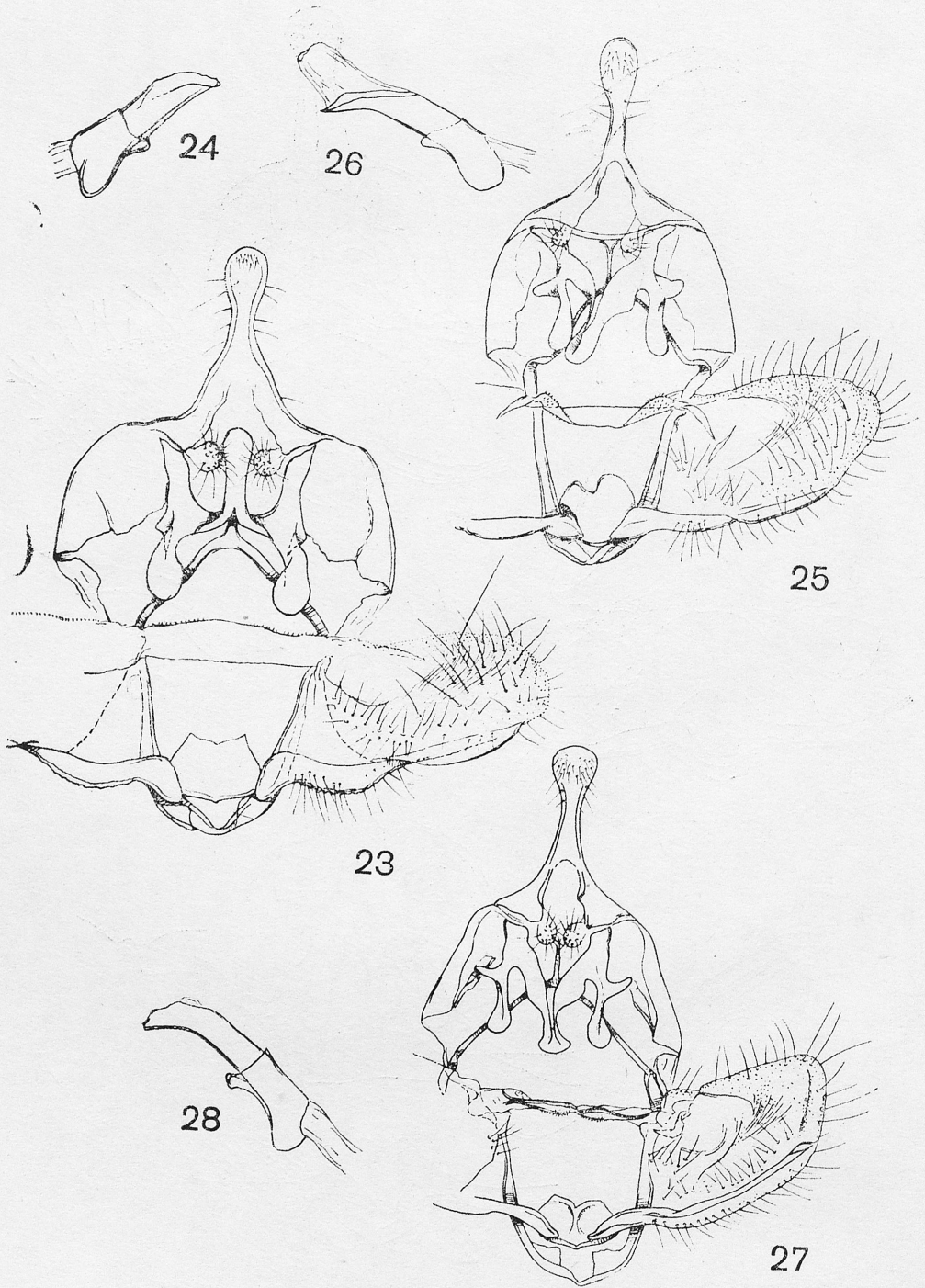


Figs. 13—16. Male genitalia of *Aphelia (Zelotherses)*: 13 — *A. (Z.) paleana* (HBN.), Pieniny Mts., Poland, G. S. 12809, 14 — aedeagus of same specimen, 15 — *A. (Z.) unitana* (HBN.), Saitdalen, Schøyen, Norway, 16 — aedeagus of same specimen

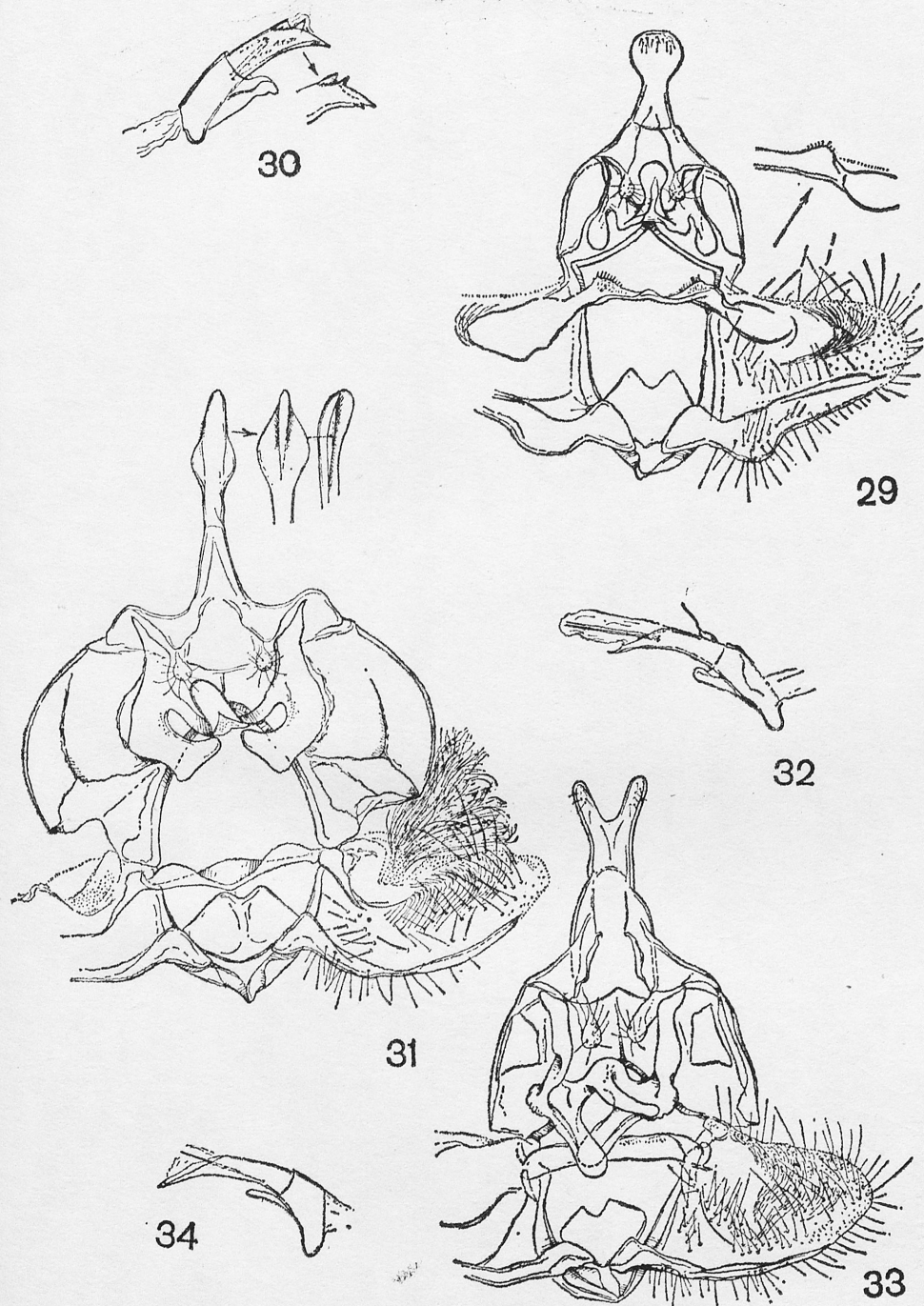




Figs. 17—22. Male genitalia of *Aphelia* (*Zelotherses*): 17 — *A. (Z.) christophi* OBR., neotype of *Tortrix verbasana* CHR., 18 — aedeagus of same specimen, 19 — *A. (Z.) conscia* sp. nov., paratype, Iran, Fars, G. S. 12992, 20 — aedeagus of same specimen, 21 — *A. (Z.) amplana* (HBN.), Mauretania, G. S. 12989, 22 — aedeagus of same specimen

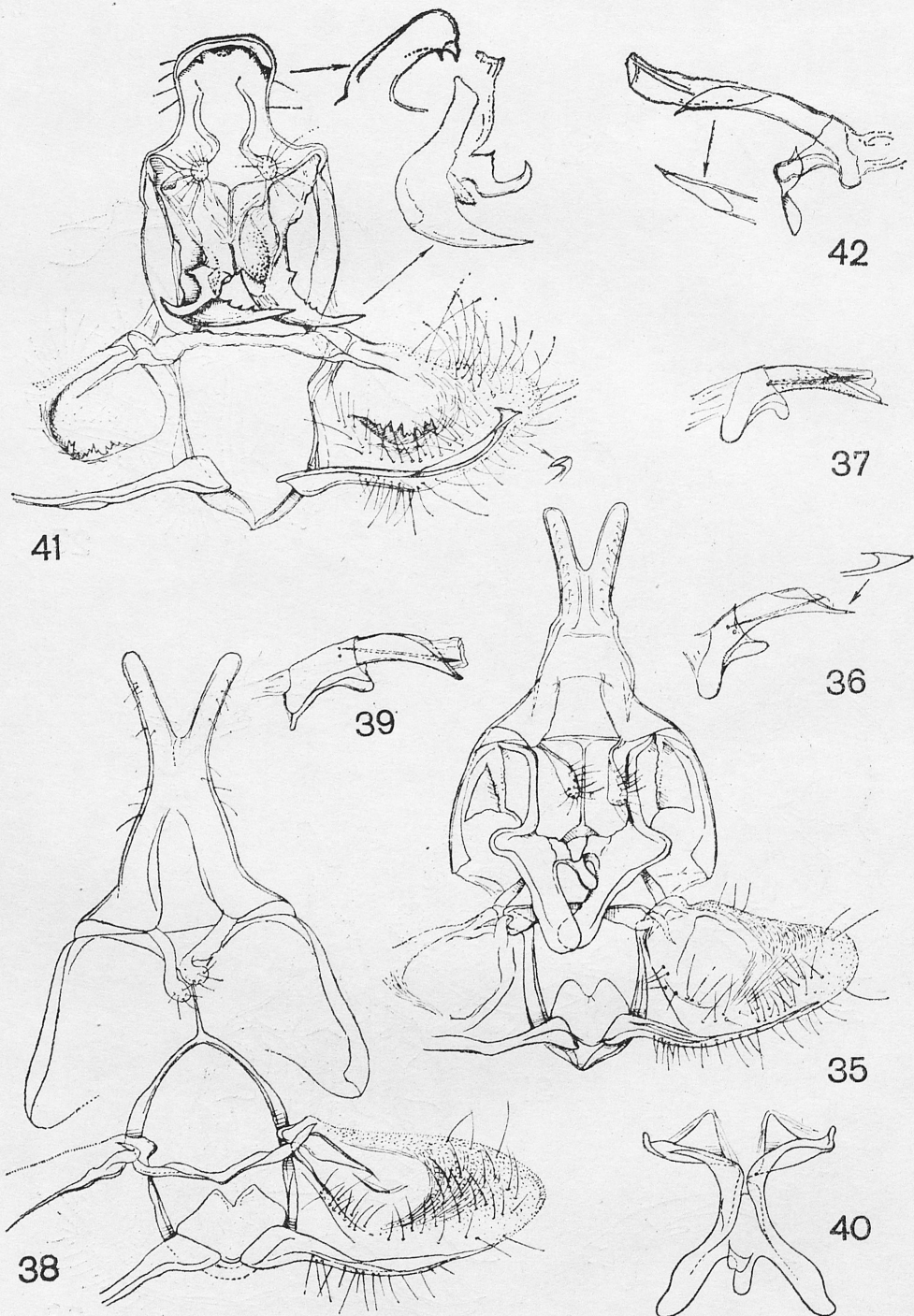


Figs. 23—28. Male genitalia of *Aphelia* (*Zelothereses*): 23 — *A. (Z.) plagiferana* (RBL.), Kurai Mts., Tuva, G. S. 12797, 24 — aedeagus of same specimen, 25 — *A. (Z.) stigmatana* (EVERSM.), Guberli, G. S. 6811 [BM], 26 — aedeagus of same specimen, 27 — *A. (Z.) galilaeica* OBR., holotype, 28 — aedeagus of same specimen

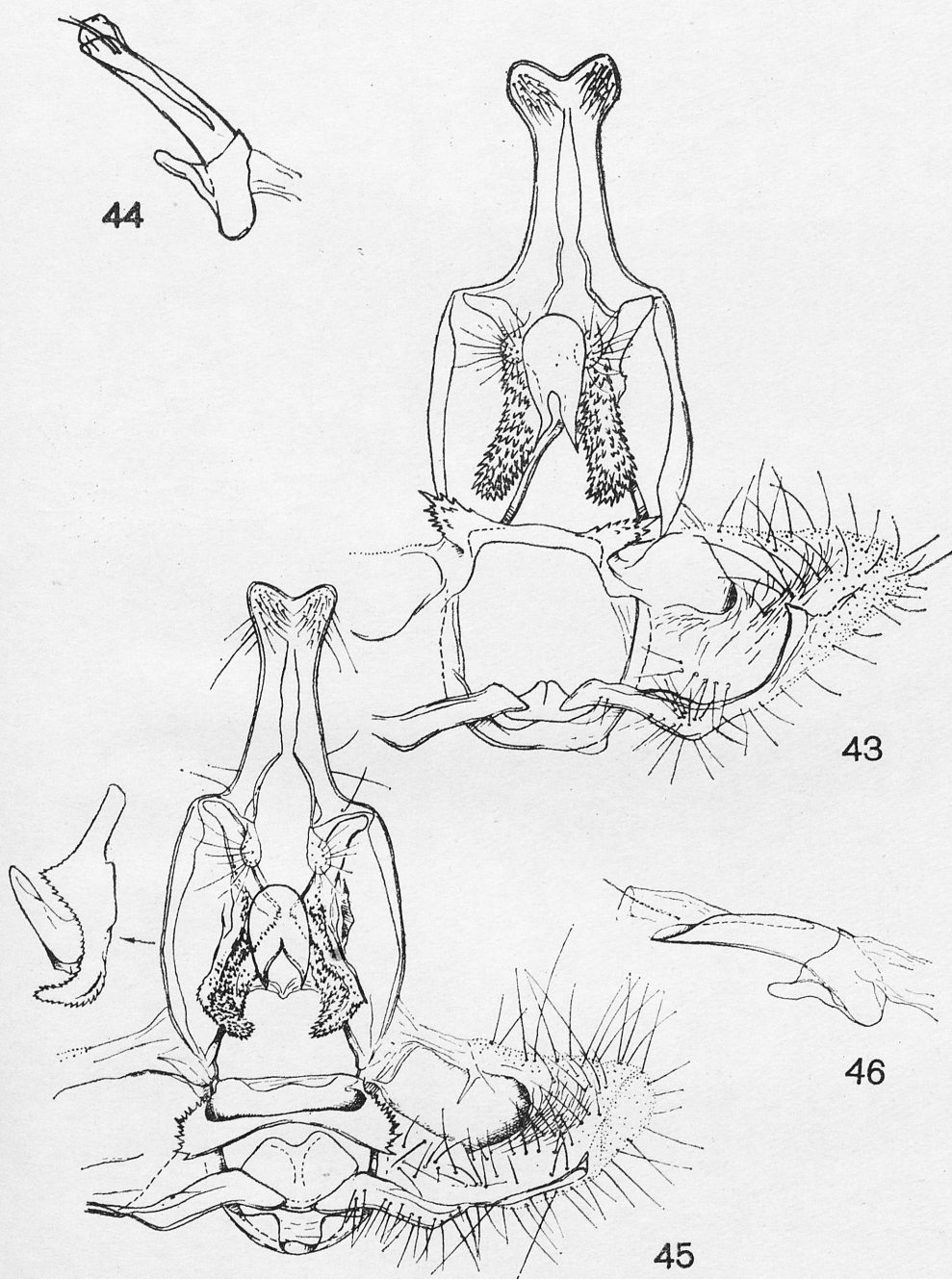


Figs. 29—34. Male genitalia of *Aphelia* (*Zelotherses*): 29 — *A. (Z.) albociliana* (H.-S.), Krasno-armiejsk, G. S. 12988, 30 — aedeagus of same specimen, 31 — *A. (Z.) ochreana* (HBN.), Sistov, Bulgaria, G. S. 12986, 32 — aedeagus of same specimen, 33 — *A. (Z.) ignorata* (STGR.), holotype, 34 — aedeagus of same specimen

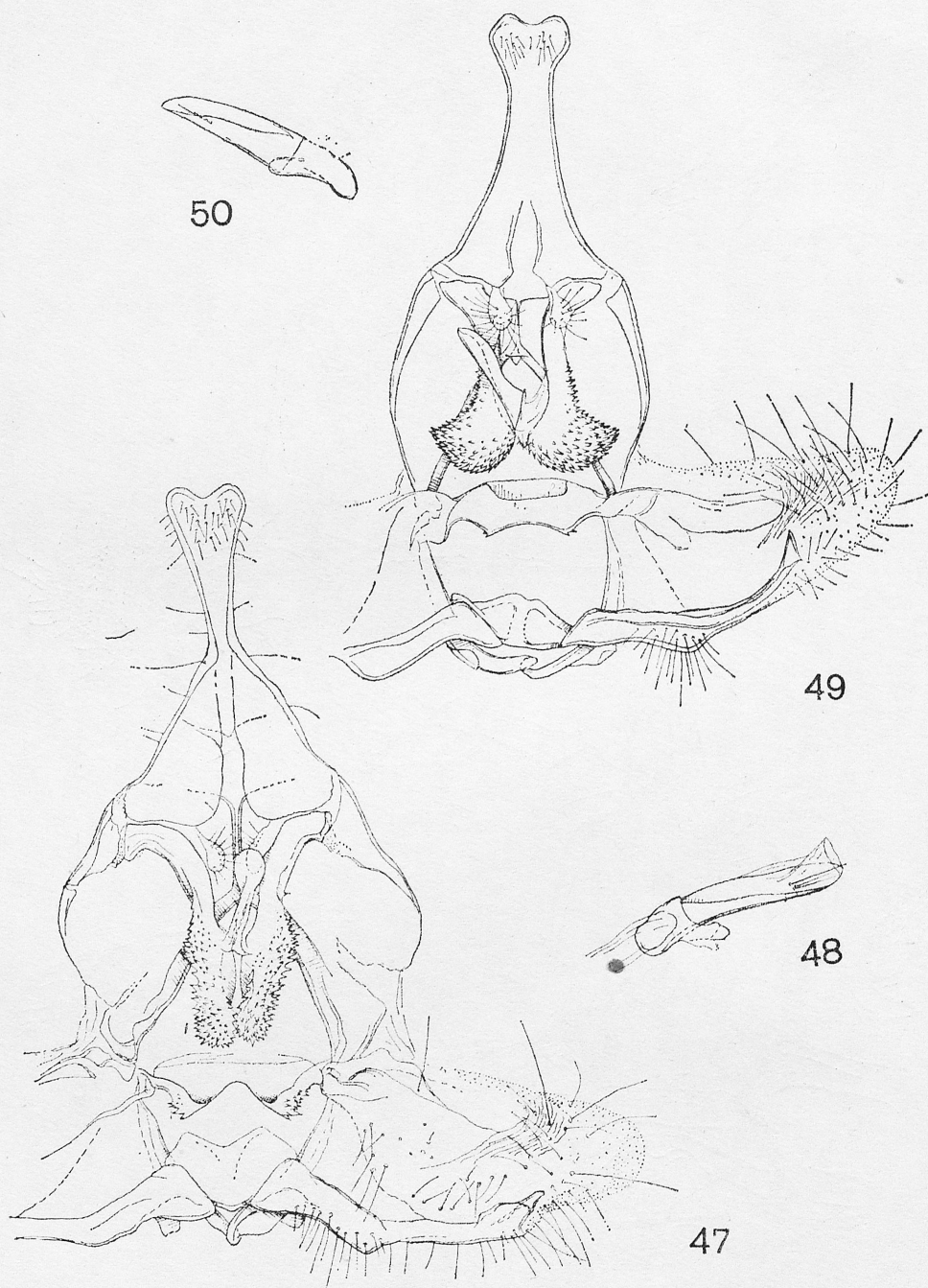




Figs. 35—42. Male genitalia of *Aphelia* (*Zelotherses*): 35 — *A. (Z.) tschetverikovi* DANIL., Atskhur, Caucasus, G. S. 11654, 36 — aedeagus of same specimen, 37 — same species, aedeagus of holotype, 38 — *A. (Z.) effigies* (OBR.), holotype, 39 — aedeagus of same specimen, 40 — gnathos of same specimen, 41 — *A. (Z.) pallorana* (ROB.), Walla Wella, Wn., G. S. 10965, 42 — aedeagus of same specimen

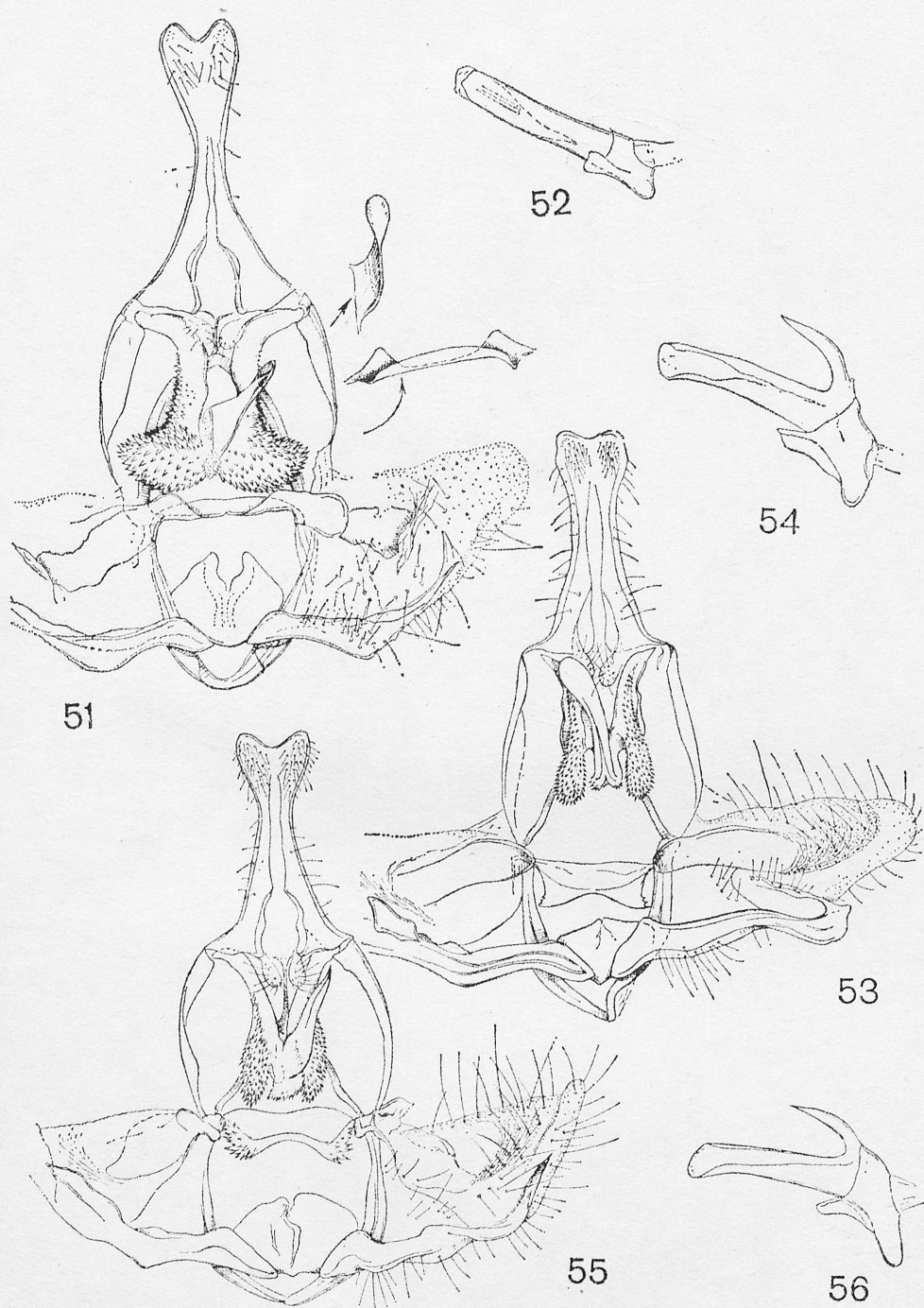


Figs. 43—46. Male genitalia of *Aphelia* (*Aphelia*) *alleniana* (FERN.): 43 — Orono, Maine, G. S. 10962, 44 — aedeagus of same specimen, 45 — Lloydminster, Sask., G. S. 10961, 46 — aedeagus of same specimen

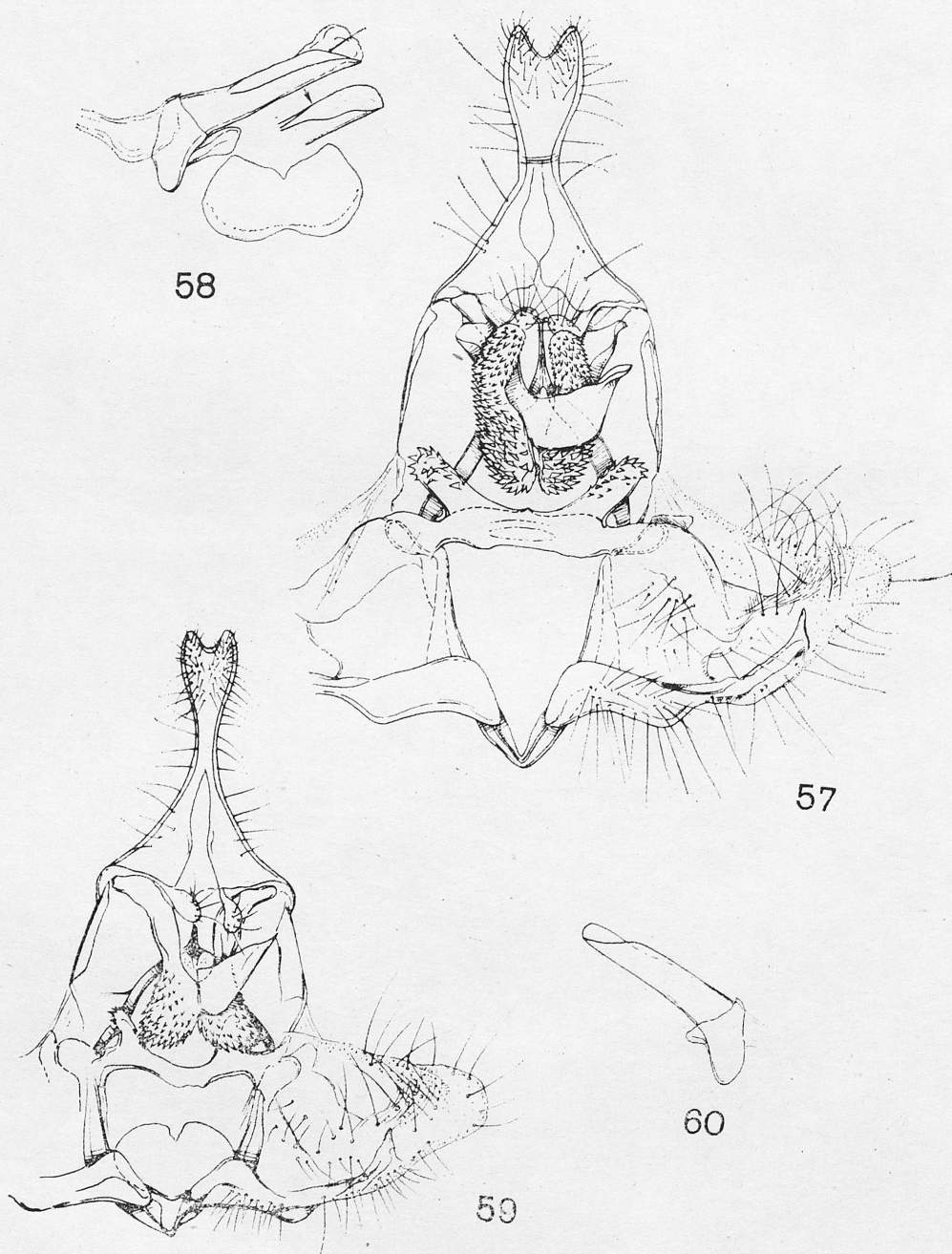


Figs. 47—50. Male genitalia of *Aphelia* (*Aphelia*): 47 — *A. (A.) koebelei* OBR., holotype, 48 — aedeagus of same specimen, 49 — *A. (A.) gregalis* sp. n., holotype, 50 — aedeagus of same specimen

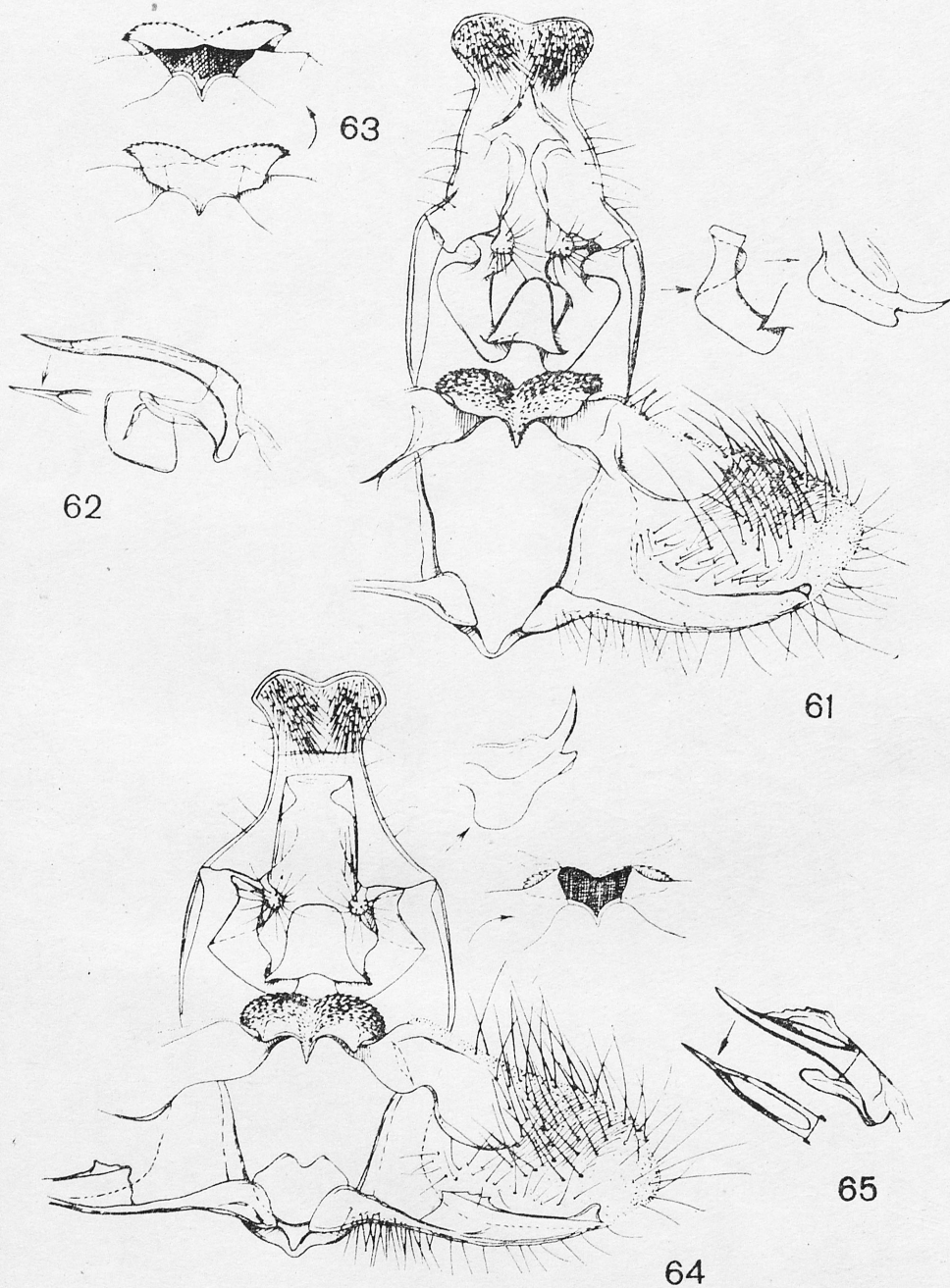




Figs. 51—56. Male genitalia of *Aphelia* (*Aphelia*): 51 — *A. (A.) septentrionalis* OBR., Mac Kinley, Alaska, G. S. 10960, 52 — aedeagus of same specimen, 53 — *A. (A.) caradjana* (CAR.), Raddé, Amur distr., G. S. 5654 [BM], 54 — aedeagus of same specimen, 55 — *A. (A.) inumbratana* (Chr.), Askold, G. S. 11602, 56 — aedeagus of same specimen

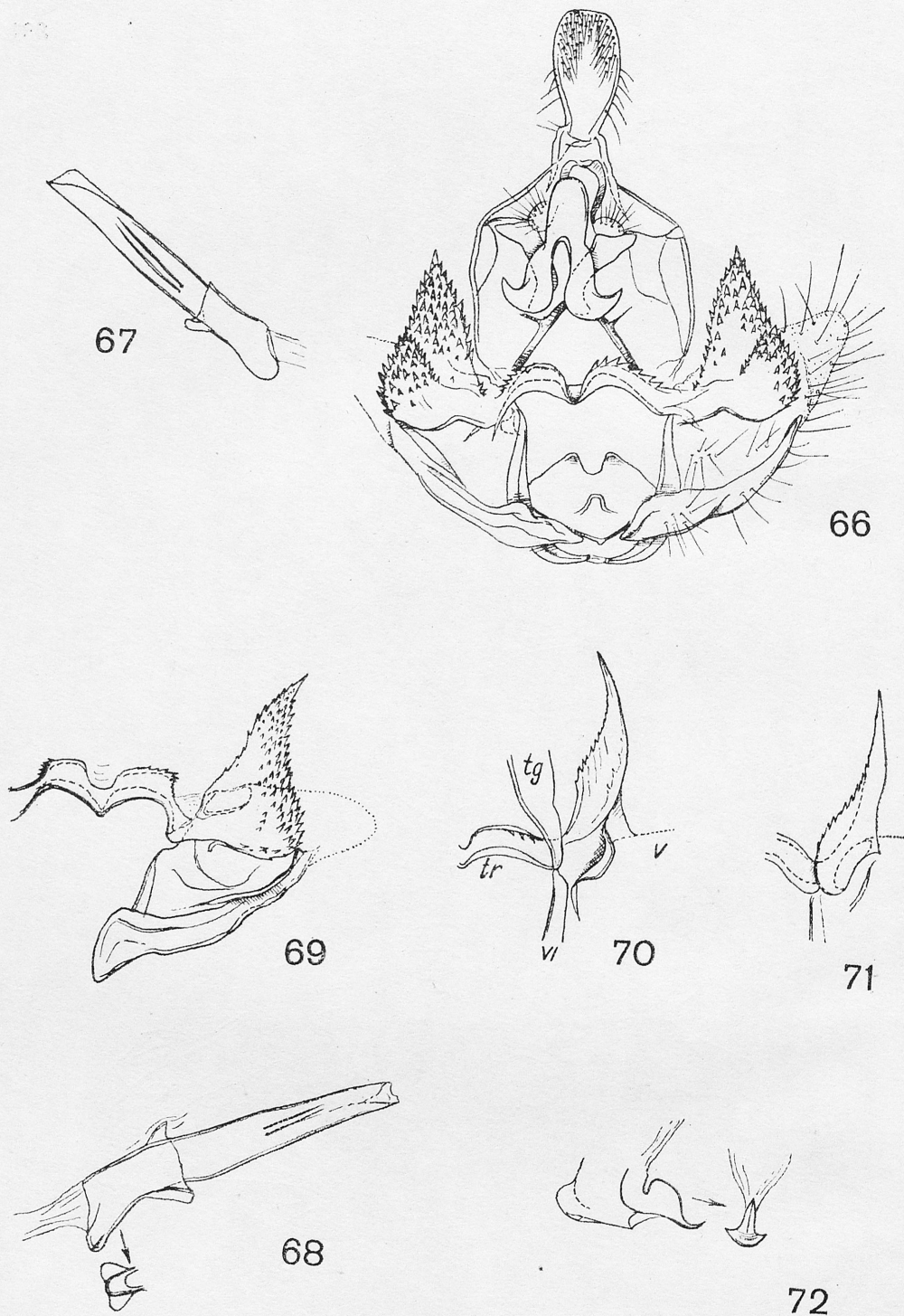


Figs. 57—60. Male genitalia of *Aphelia* (*Aphelia*): 57 — *A. (A.) viburniana* (F.), Baligród, Poland, G. S. 12849, 58 — aedeagus and juxta of same specimen, 59 — *A. (A.) polyglochina* sp. n., holotype, 60 — aedeagus of same specimen

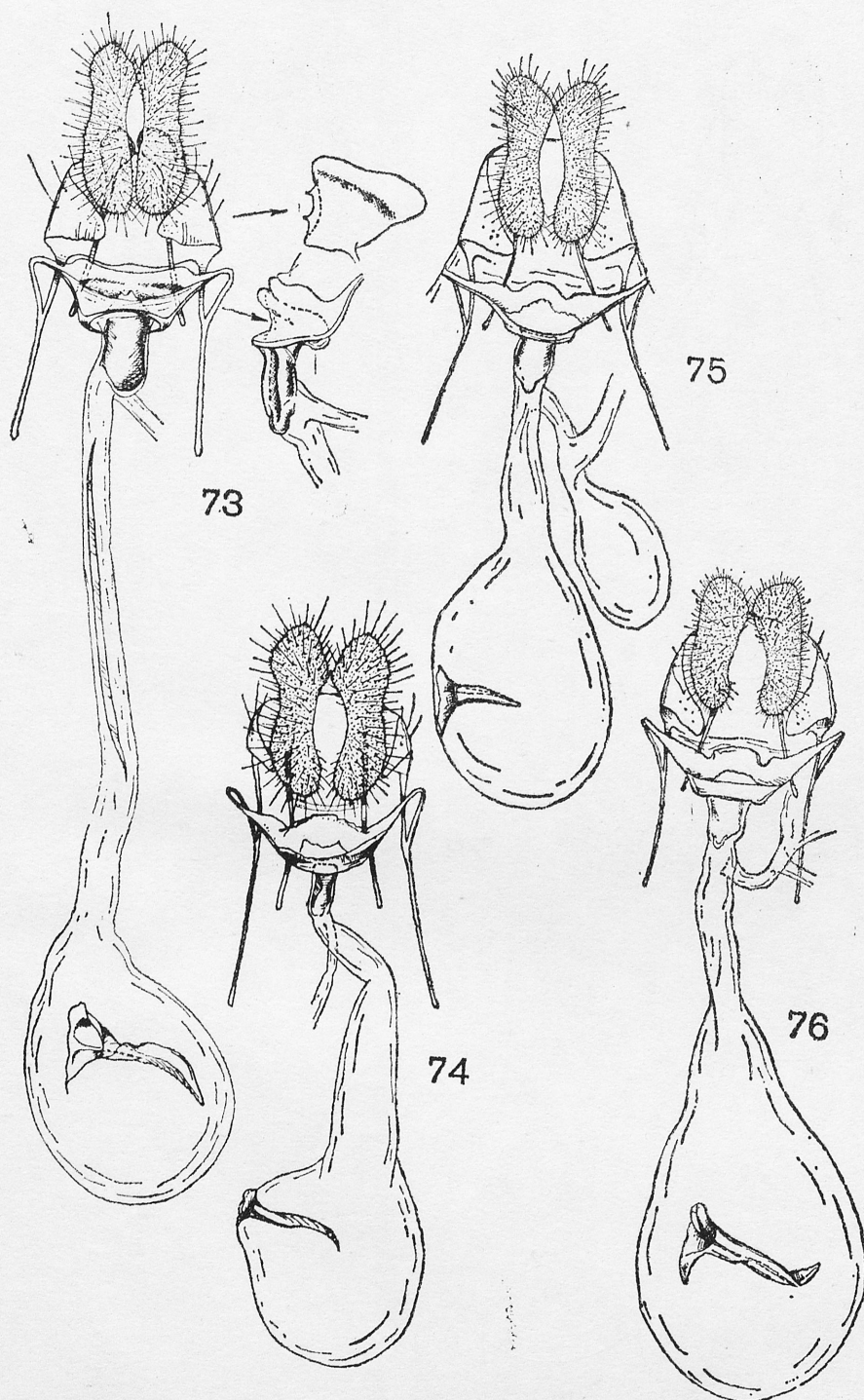


Figs. 61—66. Male genitalia of *Aphelia* (*Anaphelia*): 61 — *A. (A.) aglossana* (KENN.), Mongolia, G. S. 12985, 62 — aedeagus of same specimen, 63 — transtilla of same specimen, anteriorly and posteriorly, 64 — *A. (A.) mongoliana* sp. nov., Mongolia, G. S. 12983, paratype, 65 — aedeagus of same specimen

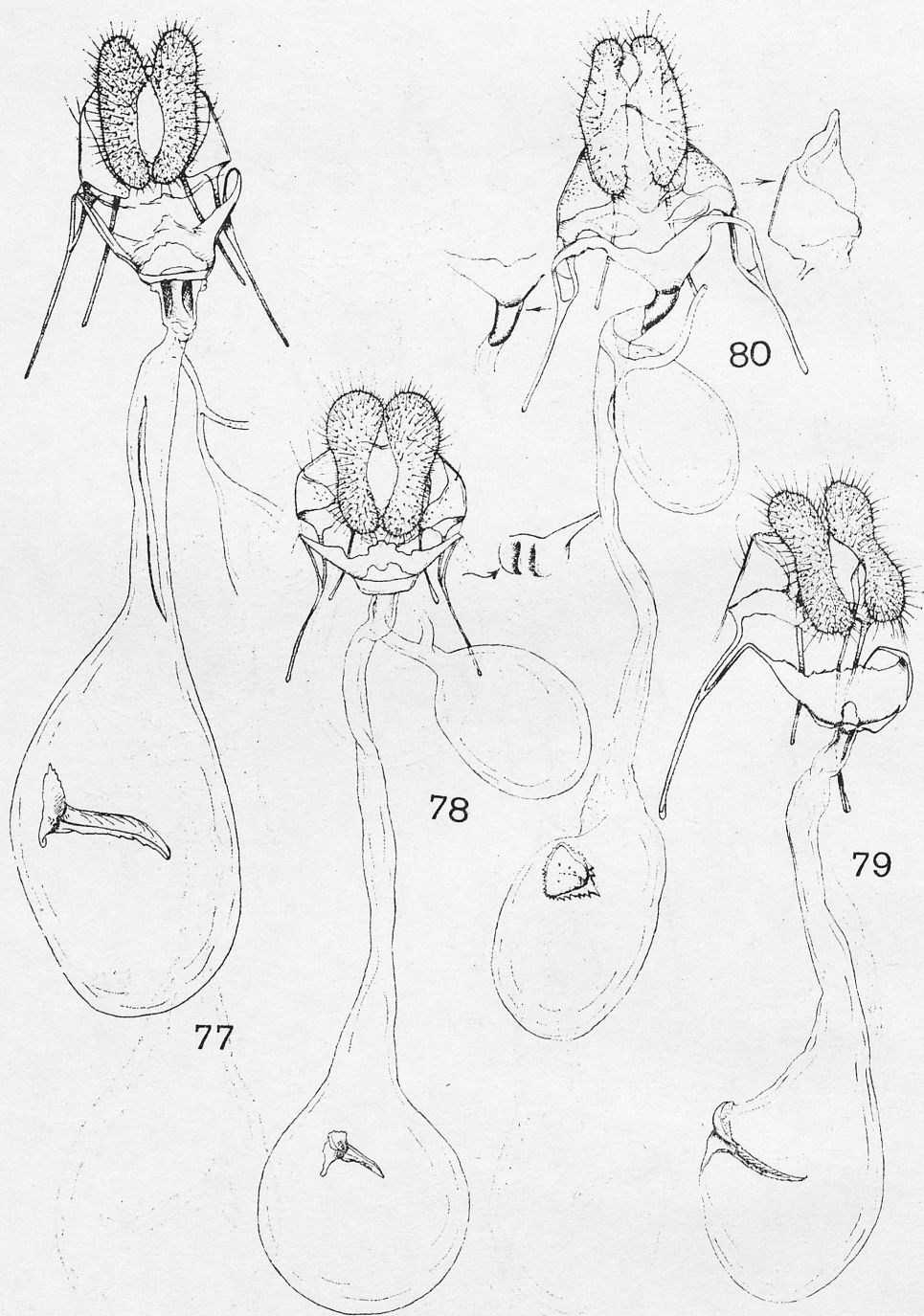




Figs. 66—72. Male genitalia of *Aphelia* (*Sacaphelia*) *disjuncta* (FIL.): 66 — Central aimak, Mongolia, G. S. 8515, 67 — aedeagus of same specimen, 68 — Mongolia, Bulgan aimak, G. S. 12984, aedeagus, 69 — valva and transtilla of same specimen, 70 — upper side of basal part of valva, proximally, 71 — base of valva in natural position, distal view, 72 — gnathos of same specimen; tg — tegumen, tr — transtilla, v — valva, vi — vinculum

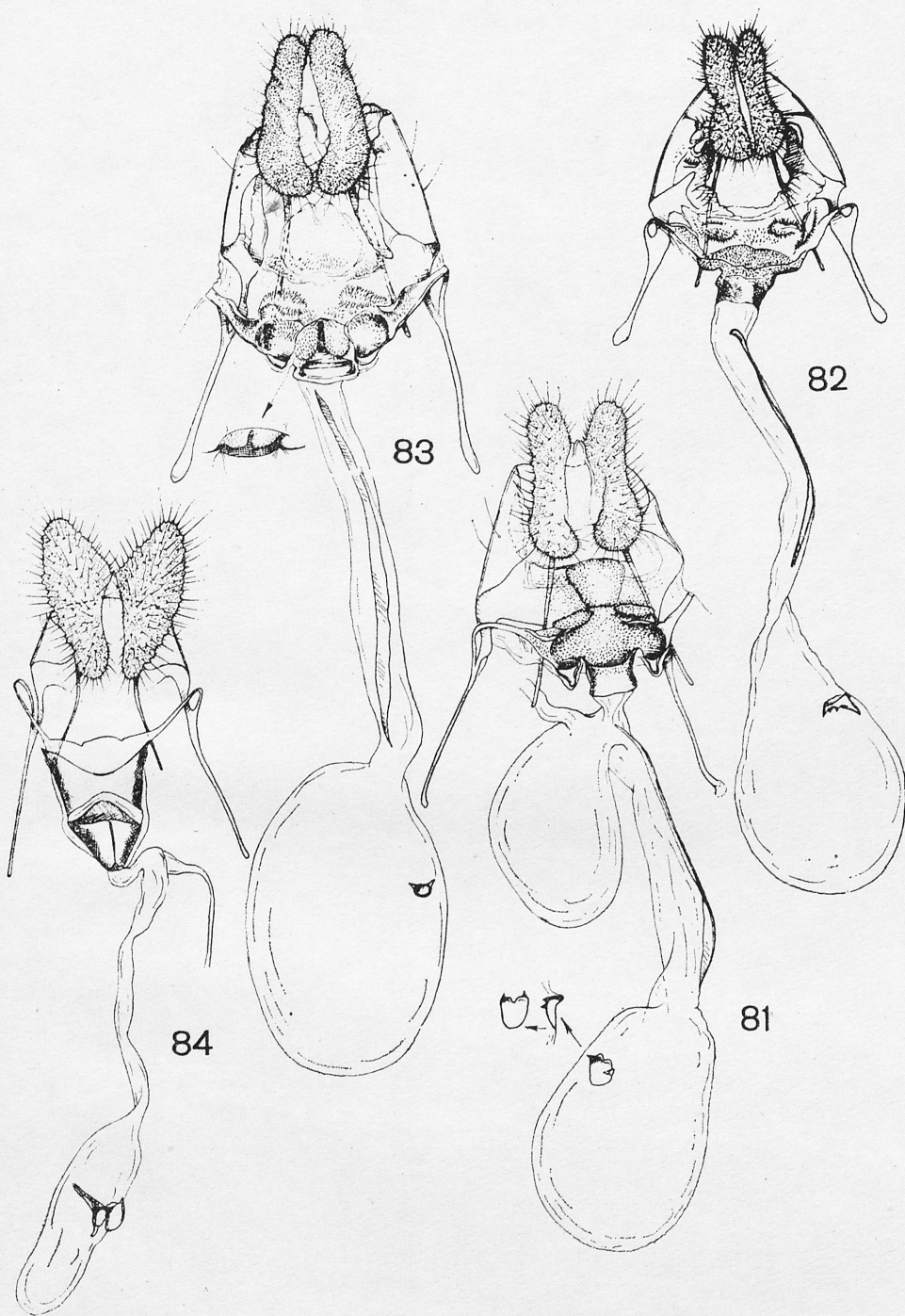


Figs. 73—76. Female genitalia of *Aphelia* (*Zelotherses*): 73 — *A. (Z.) paleana* (HBN.), Tuł, Poland, G. S. 12880, 74 — *A. (Z.) christophi* OBR., Elburs, Iran, G. S. 10807, 75 — *A. (Z.) amplana* (HBN.), Andalusia, Spain, G. S. 12990, 76 — *A. (Z.) plagiferana* (RBL.), Kurai Range, Tuva, G. S. 12991



Figs. 77—80. Female genitalia of *Aphelia* (*Zelotherses*): 77 — *A. (Z.) stigmatana* (EVERSM.) Guberli, G. S. 6817 [BM], 78 — *A. (Z.) ochreana* (HBN.), Ubierzowa, Podolia, G. S. 12987, 79 — *A. (Z.) tschetverikovi* DANIL., allotype, 80 — *A. (Z.) pallorana* (ROB.), Decatur, Ill. G. S. 10966





Figs. 81—84. Female genitalia of *Aphelia* (*Aphelia*) and *A.* (*Sacaphelia*): 81 — *A.* (*A.*) *alleniana alleniana* (FERN.), lectoparatype, Orono, G. S. 10963, 82 — *A.* (*A.*) *inumbratana* (CHR.), Biskin, G. S. 11603, 83 — *A.* (*A.*) *viburniana* (F.), Międzyzdroje, Poland, G. S. 12850, 84 — *A.* (*S.*) *disjuncta* (FIL.), Mongolia, G. S. 8525



# INDEX

- Abies* 365  
*accuratana* 366  
*aglossana* 366, 381  
*Agropyron* 348  
*albociliana* 353, 375  
*Alisma* 365  
*allenana* 359  
*alleniana* 359, 360, 377, 385  
*altaica* 363  
*amplana* 344, 351, 352, 373  
*Anaphelia* 342, 343, 366, 367  
*Anemone* 355  
*Andromeda* 365  
*Aneuzanthis* 369  
*Aphelia* 341—385  
*Archipini* 342  
*Atremisia* 363, 365  
*arvensis* 352  
*Asphodelus* 352  
*Aster* 360  
  
*Betula* 365  
*betulifolia* 363  
*brunneana* 363  
  
*Celendula* 352  
*Caltha* 348  
*carpathica* 344  
*caradjana* 362, 379  
*caucasica* 365  
*Centaurea* 348, 365  
*chretieni* 354  
*christophi* 349, 350, 351, 373, 383  
*Clepsia* 345, 356, 358  
*Cochylis* 344, 353  
*continentana* 366  
*conscia* 351, 373  
*Coronilla* 365  
  
*dahuricum* 365  
*disjuncta* 368, 382  
*Djakonovia* 342, 344, 366  
*donelana* 363  
  
*effigies* 356, 376  
*Epagoge* 351, 355  
*Erica* 363  
*Euxanthis* 368  
*euxina* 344, 347, 371  
  
*ferrugana* 354  
*Filipendula* 348  
*fischeri* 349  
*flavana* 347  
*fumatana* 349  
*galeana* 363  
*galiana* 363  
*galilaeica* 353, 374  
*gregalis* 361, 378  
  
*Hastula* 355  
*Helianthemum* 364  
*Heracleum* 350  
*Heterognomon* 366  
  
*icterana* 347  
*ignoratana* 355, 375  
*iliensis* 366  
*imperfectana* 345, 346, 371  
*ineffecta* 345, 346, 371  
*insincera* 346, 371  
*intermediana* 347  
*inumbratana* 362, 379, 385  
  
*koebelei* 361, 378  
  
*Ledum* 365  
*Lisymachia* 365  
*Lonicera* 364  
*Lythrum* 364  
  
*Malus* 365  
*maritima* 352  
*mongoliana* 367, 381  
*mongolica* 365  
*Myrica* 363  
  
*ochreana* 344, 354, 375, 384  
  
*paleana* 347, 349, 350, 365, 371, 383  
*pallasiana* 365  
*pallorana* 345, 357, 376, 384  
*Pastinaca* 365  
*peramplana* 351  
*Phalaena* 363  
*Phragmites* 348  
*Pinus* 365  
*plagiferana* 352, 374, 385  
*Plantago* 348



*polyglochina* 356, 380  
*Potentilla* 364  
*pseudoviburniana* 349  
*pulsatilla* 355  
*Pyrallis* 358, 363

*Quercus* 348, 365

*raebli* 348  
*regisborissi* 347  
*Rhododendron* 365  
*rindgeorum* 360  
*Rosa* 365  
*Rubus* 348, 350, 360

*Sacaphelia* 342, 343, 368, 382, 385  
*Salix* 364, 365  
*Sanguisorba* 365  
*Scabiosa* 348  
*Scrophularia* 365  
*scrophulariana* 363  
*scutellana* 366  
*septentrionalis* 361, 365, 366, 374  
*sericea* 365  
*shaglavana* 344, 354

*Spiraea* 364, 365  
*stenoptera* 348  
*stigmatana* 352, 374, 384

*teucrisana* 363  
*Teucrium* 365  
*Tortricinae* 341, 363  
*Tortricomorpha* 344  
*Tortrix* 344—355, 357, 359, 362, 363, 366  
*trentonana* 359  
*Trifolium* 350  
*tschetverikovi* 356, 376, 384  
*Tusillago* 348

*unipunctana* 363  
*unitana* 349, 365, 371  
*Urginea* 352

*Vaccinium* 364  
*verbascana* 350, 373  
*viburniana* 341, 358, 363, 365, 366, 380, 385  
*Viburnum* 360, 365

*Zelothereses* 342—358, 371—376, 383, 384