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Monograph of the genus *Archips* HÜBNER (*Lepidoptera*, *Tortricidae*)

[Pp. 55 — 206, 223 text-figs.]

Monografia rodzaju *Archips* HÜBNER (*Lepidoptera*, *Tortricidae*)

Abstract. The present paper contains a revision of the *Tortricinae* genus *Archips* HÜBNER. In the general part the morphology, bionomy and systematics are discussed. The genera *Archippus* FREEMAN and *Pararchips* KUZNETSOV are synonymised. In the systematic part 75 species are discussed, 10 species and 2 subspecies are described as new.

GENERAL PART

Acknowledgments

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Historical

The species of the genus in question were often described under the generic names *Tortrix* LINNAEUS and *Cacoecia* HÜBNER, and the latter name was utilised in almost all recent publications. The genus was revised several times either

on the occasion of an elaboration of the *Tortricidae* or *Tortricinae* (KENNEL, 1910, FREEMAN, 1958, POWELL, 1964, YATSUDA, 1972 and 1975), or in separate papers which were devoted to it (e. g. TOLL, 1958, YATSUDA, 1965), but they were concerned only with parts of the area of its distribution. Many of the species described in *Cacoecia* proved to belong to other genera, mainly *Homona* WALKER especially the Asiatic species. All South American species of *Cacoecia* do not belong in this genus but need a thorough revision. The discussion of their systematic position is not a function of the present paper.

Morphology

The egg is usually oval and greenish in colour. No comparative study on the morphology is available.

The larva in the first instar is usually 2–3 mm long. Full grown larva of male is 15–24 mm long, that of female 15–30 mm. The specific variation in the length reaches in the males 4–6 mm and in the females 5–9 mm.

CHAPMAN & LIENK (1971) record the head width of several Nearctic species. The chetotaxy is characterised by SWATSCHKE (1958) and MACKAY (1962). The diagnosis of the genus based on the Palaearctic species by the first author is useless as two species belonging in different genera are included. MACKAY divides the genus into two groups and treats *Archippus* FREEMAN as a distinct genus. The genera *Choristoneura* LEDERER and *Archippus* FREEMAN are placed between these two groups of *Archips*. It may be supposed that the larval characters are insufficient to distinguish the genus. In all examined species the anal comb is well developed except for *A. cerasivoranus* (FITCH).

The pupa is in the known cases 8–12 mm long, dark brown to blackish-brown in colour. It is characterised by an elongated cremaster. First characteristic is given by MOSHER (1916), then the pupa was figured by DANILEVSKIY & KUZNETSOV (1968) and YASUDA (1972). The majority of the species are characterised by the presence of so called dorsal pits. This term was used by FREEMAN (1958) and accepted by several subsequent authors. MOSHER (1916) gave data on these pits, then DIAKONOFF (1955) described it in his genus *Tremnophora*. VARLEY (1956) characterised it in the pupa of *A. podanus* (SCOPOLI), but OB-RAZTSOV (1956) provided the most detailed description of this structure found in several species of various genera of *Archipini*. He compared these pits found in the pupa and imago.

The dorsal pits occur on the dorsal parts of the second and third abdominal segments and are pairs of round or reniform cavities situated on either side of the median line rather proximally, separated by a ridge from one another. First pair is partially hidden by flanged plates developed from the first and second tergites, the second pair by similar plates of the second and third tergites. In some species the dorsal pits are strong and occur in similar form both in pupa and imago but in other species e. g. *A. purpuranus* (CLEM.) they are completely

lacking in the imago and are weakly developed in the pupa. In some species the pits of the second tergite are better developed than those of the third. An interesting variation is observed in *A. fervidanus* (CLEM.) in some specimens of which the dorsal pits are absent both in the pupae and imagos. It is also noteworthy that in some species (e. g. *A. cerasivoranus* (FITCH), *A. infumatanus* (ZELL.) the dorsal pits of the third segment are atrophied and in *A. inopinatanus* (KENN.) there occurs five pairs of dorsal pits on segments 2—6.

The imago.

Sexual dimorphism is constant and with very few exceptions there are distinctions expressed in size, shape of wings and pattern. The majority of the males posses the costal fold on the forewings.

Head roughly scaled; labial palpus 1—1.5, rarely 2 times longer than diameter of the eye slightly larger and more strongly upcurved in female than in male, usually paler than remaining parts of the head. Antenna delicately dentate and doubly ciliate in male, simple, uniformly short ciliate in female.

Thorax simple or with ventral crest. Forewing of the male more or less distinctly expanding terminally; costa curved outwards in basal third or half, then straight or delicately concave subapically; apex short or very short, usually formed by tolerably vertically positioned costa and termen, often somewhat producing costally; termen straight or sinuate beyond apex, sometimes slightly oblique in costal half, then convexely rounded. Often the top of convexity extends over the level of apex. Costal fold usually present reaching $1/4$ to beyond half of costa. In the female forewing not expanding terminally, or only slightly so in the distal third, usually broadest before middle. Costa distinctly curved outwards basally, then less so, more strongly sinuate before apex than in male; apex in the majority of the species much longer than in male; termen much more deeply concave postapically, very seldom straight or weakly convex post-medially.

Venation. In forewing all veins separate; *sc* long, r_4 to costa before apex, r_5 to termen. Median cell with weak internal vein *M*. In hindwing the position of veins *rr* and m_1 variable at the median cell, usually they are separate; veins m_3 — c_1 separate, from one point or shortly stalked.

Coloration. Ground colour in the majority of cases yellowish to brownish, rarely whitish. Often there occurs red, brown or grey admixture with violet or pink sheen. Erect refractive scales well developed only in *A. micaceanus* (WALKER). Transverse strigulation if present more or less distinct. In male basal blotch reduced to a subtriangular marking situated near dorsum, tapering and terminating usually near middle of breadth of the wing. The area between this and costal fold is often very pale. Proximal edge of median fascia usually from end part of costal fold to beyond middle of dorsum, convex medially. Costal part of median fascia several times slenderer than the remaining parts or atrophied. Subapical blotch from beyond middle of costa to before apex extending in a subtriangular, slender, often separate part towards dorsal portion of termen. Apical or terminal marking showing a tendency to atrophy similarly to terminal

portion of the former marking. Fringes darkest at apex, pale towards tornus. Apical part of hindwing usually short, rounded. The distal portion of wing often pale orange or cream, sometimes dark, strigulated transversely. In female the pattern is more strongly reduced than in male. Basal blotch diffuse, most distinct at dorsum, distal edge often represented by a line in case of atrophy of the blotch. Median fascia in majority of species ill-defined, represented by costal and dorsal diffuse blotches, or proximal edge reduced to a line. Subapical blotch usually reduced to slender costal part; often a dark dot occurs at disc and weak apical (terminal) marking is developed. Hindwing often with pale distal portion; in many species a group of scent scales at costa subapically.

Abdomen. In the tergites of segments 2 and 3 occur in the majority of the species the dorsal pits (c.f. p. 139). They are covered with scales or free of them. They occur in both sexes and show sometimes a specific variation. There is no convincing explanation of their importance. DIAKONOFF (1955) supposed that they were a kind of tympanal organ and then suggested they might be the „equivalents of so-called mite chambers of certain *Hymenoptera*”. OBRAZTSOV (1956) thought they were rather the strengthening structures of the pupa. The pregenital segment is more or less distinctly altered. In the males it forms a membranous evagination situated just at vinculum and covered by long scales. In the females of some species (*A. inopinatus* (KENN.), *A. nigricaudanus* (WALS.) etc. thick, densely growing scales occur apically. They are serving to protect the egg-masses. Pregenital sternite of *A. inopinatus* (KENN.) is characterised with a pair of submedian concavities (cf. p. 138), that of several species (e.g. *A. semistructus* (MEYR.)) develop a pair of submedian wing-shaped folds and deep incisure of the distal edge.

Male genitalia. Tegumen large with weak (small) ventral sclerites; uncus long, hooked, often very strong, thickened and rounded terminally or uniformly broad throughout. Socius weak or absent; distal part of gnathos forming a strong hook; vinculum well developed provided with ventro-lateral folds produced cephalad ventrally. Valva short, ovate, with atrophied costa. Dorso-proximal portion of valva well sclerotised, its outer surface fuses with top of vinculum, the inner surface connects to proximal area of base of transtilla. Internal area of valva weakly sclerotised except for a part fused with above mentioned sclerite. Its proximal part produces a hairy membrane reaching the base of transtilla. Ventral edge of valva more or less convex. Sacculus slender provided with short free termination and sometimes developing a submedian process both being directed rather vertically to surface of valva. Transtilla is a transverse band the basal parts of which form shallow concavities and the median part is rounded and directed cephalad. Juxta strong. Aedeagus with usually long coecum penis and long, tubular distal part. The latter is partially membranous and that unsclerotised surface extends from the distal orifice obliquely along dorsum and then the left side more ventrally to coecum penis. Various dents and prominences may occur mainly ventro-terminally. Cornuti 2—20 long, lancet-shaped spines, variable specifically. Long scent scales on valva.

Musculature of the male genitalia are characterised by typically developed depressor of uncus, part of which insert on tuba analis. The tergal extensor of valva absent, but its flexor is inserted on base of pedunculus and lateral part of transtilla. Sternal extensor of valva strong; protractor of aedeagus inserts on internal surface of sacculus; retractor of aedeagus typically developed.

Female genitalia. Papilla analis typical, with rather indifferentiated proximal part. Eighth tergite large, connected with papillae anales by large membrane. Apophyses posteriores short, thin; apophyses anteriores somewhat stronger. Sterigma with well developed, heavily sclerotised dorsal wall and cup-shaped more or less elongate proximal part. The latter occasionally funnel-shaped, rarely very short or almost completely reduced. Distal edge of ventral portion of sterigma membranously connected with pregenital sternite; dorsal part of sterigma (lamella postvaginalis) characterised with convex latero-subterminal areas covered with scent scales (only exceptionally missing). Distal edge of lamella postvaginalis develop the distal process. The membrane beyond the lamella forms a pair of more or less distinct, often heavily sclerotised convexities directed medially and called the distal lobes. The antrum is provided with internal sclerite folded to form an asymmetrical plate swung along the longer axis or a tube. This sclerite is more or less distinctly separated from proximal portion of sterigma. Ductus seminalis extends from dorso-proximal portion of antrum. Ductus bursae long or very long, completely membranous, provided with variably long cestum. The distal part of the latter is thin, often gradually atrophying, the proximal part sometimes very broad, folded longitudinally, and sculptured. Single funnel-like signum with strong capitulum and variably developed plate-shaped basal sclerite is situated near distal part of corpus bursae. The latter is elongate, pear- or bowl-shaped, more or less distinctly sculptured, mainly towards the signum.

Deformations of the genitalia during preparation may lead to some misinterpretations. In the males the transtilla may so change its shape that its median part seems very small. Processes of sacculus and its free termination may be indistinctly seen in certain positions of the valva. In some positions of aedeagus the dents may be invisible or change their positions in cases of too strong pressure of the cover-glass. In females sterigma and antrum are often swung and change their shapes on the slide.

Bionomy

Oviposition. The females deposit their eggs in masses and cover them with excretion of the glandulae sebaceae which harden quickly in the air. The species which have developed dense groups of scales on the terminal part of abdomen (cf. p. 58) utilise them for additional protection of the eggs. The egg-masses are usually oval, 3×7 to 4.5×10 mm; first patches are large, following ones gradually smaller and according to CHAPMAN & LIENK (1971), more circular. Colour of the newly deposited egg-mass is usually orange, then it changes in a short time

(5 days in case of *A. rosanus* (L.)) into dark brown and bleach during the winter. The non-hibernation egg-masses are greenish. One female may deposit a total of 80 to 300 or more eggs (375 eggs for *A. podanus* (SCOP.)) in several groups. *A. rosanus* (L.) deposits usually ca 50 eggs in one mass but they may contain sometimes about 100 eggs each; *A. cerasivoranus* (FITCH.) deposits 25 to 200 eggs in one mass.

The hibernating eggs are deposited on the bark of trunks or limbs, often in the crevices or on bases of small shoots, e.g. *A. cerasivoranus* (FITCH.). The non-hibernating eggs are usually laid on the upper side of the leaves.

The egg stage of several species, e.g. *A. griseus* (ROB.), lasts 10 months but in the species hibernating as larvae that time is limited to ca 2 weeks. Incubation is often short and in *A. podanus* (SCOP.) it takes 17—23 days at the mean temperature 15—16°C. The embryo develops in those species immediately while in the hibernating eggs, its development is arrested in winter after a few days and further development takes place next spring. The embryology of *A. rosanus* (L.) is amply discussed by GENNELON (1966) who also provides a large number of references to the relating subject.

Hatching is sometimes quick as in the cases of *A. podanus* (SCOP.), or spans several days. The time needed for hatching all larvae of one egg-mass of *A. argyrosipilus* (WALK.) is 5—26 days, depending on the climatic conditions, and 5—15 days for *A. rosanus* (L.). The influence of climate is remarkable; for instance, the larvae of *A. rosanus* (L.) start hatching in Provance (France) at the beginning of March but one month later in the Netherlands.

Dispersal. The newly hatched larvae are very active and crawl immediately to the top of the shoots. Many of them spin silk and are transported by the wind. The majority of the larvae (third instar) of *A. purpuranus* (CLEM.) hibernate in fallen leaves and in the spring migrate back to the trees.

Feeding. The larvae which hatch in early spring feed first on the buds or leaves, spinning silken protections usually near edges of under side of leaves. Third instar larvae start to roll the leaves in various ways, e.g. *A. crataeganus* (Hbn.) along the main nerve and *A. xylosteanus* (L.) transversely. The first instar larvae of *A. argyrosipilus* (WALK.) bore into the buds where they feed for 4—5 weeks, then attack the flowers and finally roll the leaves or eat the fruit. Usually the larvae stick leaves to the fruit and feed superficially under that protection, rarely they bore deeper into the fruit. Two species, viz., *A. cerasivoranus* (FITCH.) and *A. fervidanus* (CLEM.) live gregariously, spinning webs around terminal growth and gradually enlarging the silk tents. The majority of the species have 5 larval instars (e.g. *A. rosanus* (L.), *A. crataeganus* (HBN.) etc.), however, in *A. podanus* (SCOP.) 7 stages are found. Duration of the larval stage is 1—2 months; 28—55 days in *A. rosanus* (L.) depending on the food conditions, temperature and humidity. Exceptionally this period is enlarged to 3 months. In *A. xylosteanus* (L.) duration of the larval stage was 30—40 days. In the hibernating larvae this period extends to eleven months.

Pupation takes place in the final feeding place of the larva. The pupal

stage is short and has a duration of 15—21 days in *A. podanus* (SCOP.), at a mean temperature of 14—16°C, 9—12 days in *A. xylosteanus* (L.), 10—14 days in *A. semiferranus* (WALK.) and 10—12 days in *A. argyrosipilus* (WALK.).

Imago. The moth is active mainly in the evening and first half of the night, more rarely till 3 a. m. The culmination of flight is 1 hour after sunset. The flight period usually extends to 1.5 or 2 months.

Host. Representatives of this genus are olivaceous in first instars. The primary hosts are the plants on which the females normally deposit their eggs (the exception are cases of very dense populations when they utilise various further plants). The fully grown larvae were observed to feed on various secondary hosts (cf. CHAPMAN & LIENK, 1971). The most interesting case of polyphagy of full grown larvae is in *A. xylosteanus* (L.) which even utilise conifers. Usually the host plants are deciduous trees and bushes and only a few species (e.g. *A. pulcher* (BUTLER), *A. abiephagus* YAS., *A. issikii* KOD., *A. fumosus* KOD.) are bound to conifers primarily.

Economic importance. Several species of *Archips* HBN. are adapted to life in the orchards in all parts of the area of their distribution, but the majority of them are only slightly injurious. They are often taken under consideration as a complex consisting of various polyphagous *Tortricidae*. For instance, *A. podanus* (SCOP.) occurs in 1—3% of that complex. Some species, however, are occasionally moderately injurious to some plants in particular parts of their area of distribution, e.g. *A. podanus* (SCOP.) which was important in England (THEOBALD, 1925), *A. semiferranus* (WALK.) to apple in 1915—1935 in Ontario, *A. xylosteanus* (L.) in 1933 to cherry in France or *A. rosanus* (L.) in various years in orchards of Ukraine. BOVEY (1966) and CHAPMAN & LIENK (1971) discuss all species of the genus injurious to the orchards.

Hibernation. Numerous species hibernate in the egg stage, other species in third larval instar. Rarely second instar larvae enter the diapause as do a small percentage of the caterpillars of *A. podanus* (SCOP.). The larvae build thick silken hibernacula in the bark crevices, under old bud-scales etc. The larvae of *A. purpuranus* (CLEM.) hibernate usually in the fallen leaves.

Number of generations. The species hibernating in the egg-stage as far as I know are monovoltine. The remaining species (with some exceptions, e.g. *A. purpuranus* (CLEM.)) have several generations yearly. YASUDA (1972) realised that they develop 2—3 generations a year. This problem needs further investigation as there is no data on the number of generations of the tropical species. Judging from the dates of collection they should have more than 3 generations in the year.

Distribution

This genus is represented in the Palaearctic, Nearctic and Oriental Regions. From the Oriental Region 25 species are known, while the Palaearctic Region is inhabited by 46 species. Sixteen native species are recorded from the Nearctic

Region. There is no species common for the Palaearctic and Nearctic Regions (for *A. rosanus* (L.) see below) whilst 3 species are common for Palaearctic and Oriental Regions and it is supposed that some species inhabiting the south-east part of the former may be included in this group.

On the basis of the present knowledge we can suppose that several species are endemic in some rather small territories. Only few species are widely distributed. *A. oporanus* (L.), *A. decretanus* (TREIT.) and *A. xylosteqanus* (L.) are known from whole Palaearctic Region, and first of them enters far southwards into East Asia. All these species are known from Japan. Another widely spread species, viz., *A. rosanus* (L.) may also be treated as transpalaearctic, however, it has not been recorded from Japan. Distribution of the species of this genus in Central Asia is little known, but probably it is limited to its more southern parts. Several species, e.g. *A. podanus* (SCOP.) or *A. crataeganus* (HBN.) are bound to the western part of the Palaearctic Region being distributed more or less far southwards. Some of them reach 64° of north latitude in Scandinavia and towards the South expanse to northern Mediterranean. There is very scarce data on the eastern limits of their distribution, but probably the West Palaearctic species reach the Urals. The East Asiatic species are mainly the Manchurian elements. To this group one may include for instance *A. subrufanus* (SNELL.), *A. breviplicatus* (WALS.) *A. capsigeranus* (KENN.), *A. issikii* KOD., *A. fumosus* KOD. It is supposed that some species recorded to date exclusively from Japan may belong here too. The data on the distribution of some species from South China are too scarce to draw any conclusion on the type of their distribution. Probably they are also inhabiting more northern territories as well as the northern zone of the Oriental Region.

The distribution of the Oriental species is insufficiently known. The majority of them are recorded from limited areas or even their type-localities only. However, some of the Oriental species are certainly widely distributed, e.g. *A. micaceanus* (WALK.) which is known from India to Malay Archipelago. The species of the western part of this region also enter the Palaearctic Region but they are certainly not numerous. To this group belongs only *A. subsidiarius* (MEYR.).

The Nearctic species are widely distributed. One may only distinguish more northerly and rather southerly species. One Palaearctic species, viz., *A. rosanus* (L.) has been introduced to North America before 1890 and acclimatized there in two separate areas and finding suitable conditions have become very common. The groups of the species (discussed on p. 63) are not characteristic geographically except for the *packardianus*- and *pulcher*- group. The former is bound to Nearctic the latter to the eastern part of Palaearctic Region.

Systematics

Position of the genus. The genus *Archips* HÜBN. belongs to the group of the most advanced *Archipina* together with *Choristoneura* HÜBNER, *Homona* WALKER and several other genera. All are characterized by atrophied costa of

valva. The ventral region of the valva is well developed and the protractor of aedeagus highly specialised and inserted exclusively on the sacculus.

Infrageneric system. The species of this genus are rather slightly differentiated, but form in some instances compact groups. That was the reason for the description of one new genus and one subgenus for the species of *Archips* HÜBNER, viz., *Archippus* FREEMAN and *Pararchips* KUZNETSOV. The distinguishing character of *Archippus* given by FREEMAN (1958) were a rather uniformly broad uncus (without more slender basal part) and strong median process of sterigma. YASUDA (1972) working on the Japanese fauna had to change this diagnosis. In his interpretation *Archippus* FREEMAN differs from *Archips* HÜBNER in a short, broad costal fold not reaching one-third of costa and he supported that by bionomic characters. YASUDA has found that the species of *Archips* HBN. are monovoltine and hibernate in the egg stage, the representatives of *Archippus* FREEMAN have 2—3 generations yearly and hibernate as „mid-stage” larva. The subgenus *Pararchips* KUZNETSOV was described for a single species and characterised as having no costal fold in male, developed longitudinal pattern of forewing and short stalk of the hindwing veins *rr-m*. YASUDA (above cited work) treated *Pararchips* KUZN. a subgenus of *Archippus* FREEMAN, KUZNETSOV (1973) himself placed its type species *A. pulcher* (BUTLER) in *Archips* HBN., however, not formally synonymising *Pararchips*.

In the present paper both above mentioned taxa are treated as synonyms. Each of them shows some constant characters shared, however, with other groups of the genus.

As shown in Fig. 1 there are three main evolutionary trends in this genus. To the first of them belong the three following groups. The *packardianus*-group comprising 5 very close species (no. 1—5) characterised by very strong uncus and long lamella postvaginalis. This is a specialised, however, rather primitive and exclusively Nearctic group. To the second group belong the species with somewhat more slender uncus and more strongly developed sacculus. This group may be divided into two subgroups. In the first of them (*asiaticus*-subgroup; species 6—11) the submedian process of sacculus is developed and the pregenital sternite of the female is well sclerotised and concave distally. Free termination of the sacculus tends to atrophy. The subgroup of *oporanus* (species 12—22) shows a tendency of strengthening the free termination of the sacculus which is usually densely bristled. This bristled part elongates in more specialised species and that is correlated with presence of the submedian lobes of the pregenital sternite of female, and takes an important role in the clasp during copulation. In the species closely related to *A. tharsaleopus* (MEYR.) (species 12—15) the submedian process of the sacculus is still retained but rather weak. In the species close to *A. oporanus* (L.) (species 17—22) this process is absent and the sacculus works to a great degree with strongly bristled free termination. The position of *A. insulanus* KAW. is isolated and its presence in this group may only be supported by the bionomic data. The *formosanus*-group was included in *Archippus* FREEMAN by KAWABE (1968) and YASUDA

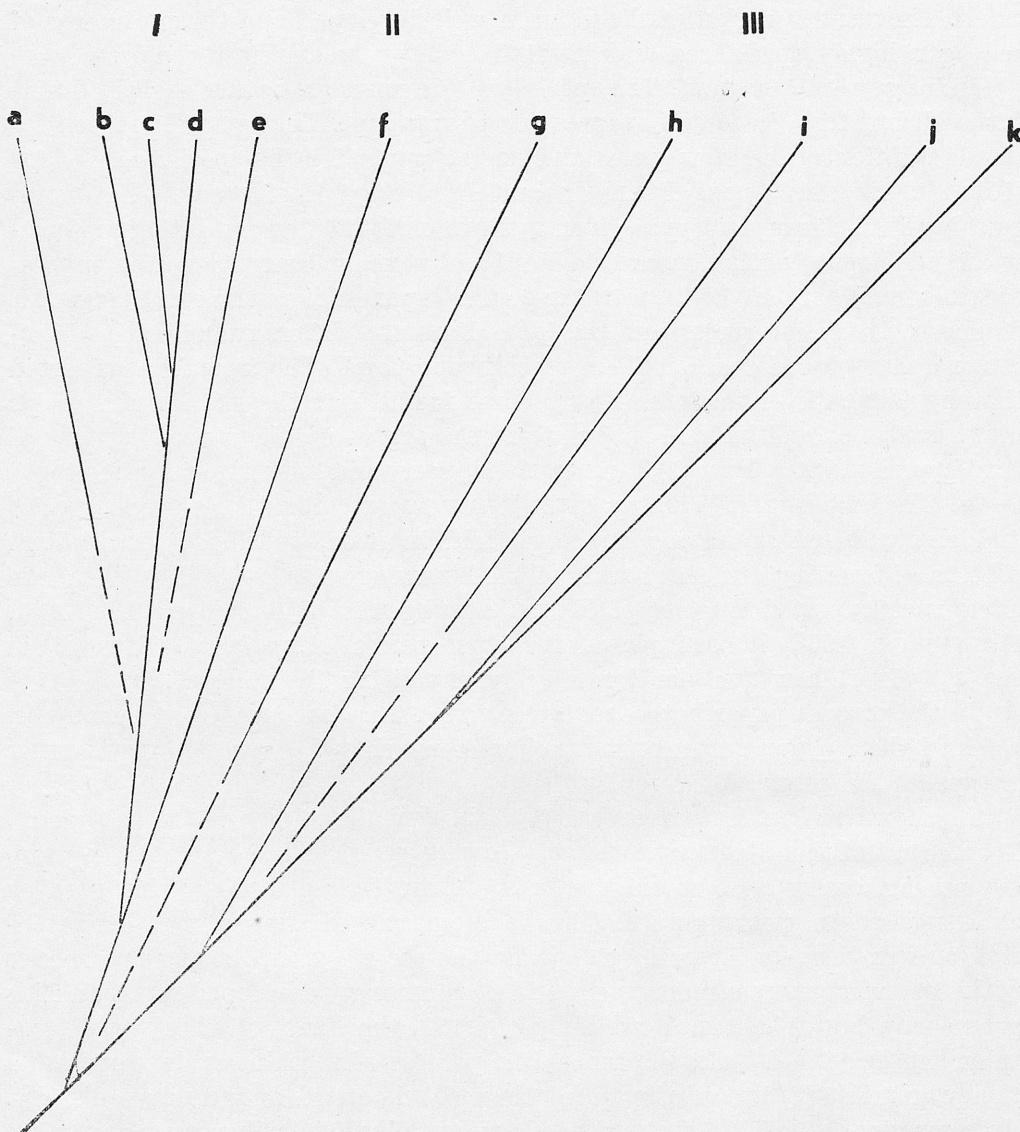


Fig. 1. Phylogenetic tree of *Archips* HBN. I—III — main trends, a — *packardianus*-group, b-d — *asiaticus*-group (b — *asiaticus*-subgroup, c-d — *oporanus*-subgroups, d — *tharsaleopus*-infragroup), e — *formosanus*-group, f — *pulcher*-group, g-i — *termias*-group (b — *termias*-subgroup, c — *dispilanus*-subgroup, i — *micaceanus*-subgroup), j-k — *xylosteanus*-group (j — *xylosteanus*-subgroup, k — *rosanus*-subgroup)

(1972) also on the basis of the bionomy. I am preserving its position, however, some of its characters are shared with *xylosteanus*-group.

The *pulcher*-group (former subgenus *Pararchips* KUZN.) shows the second evolutionary trend. Its characteristic is given above, but it should also be mentioned that the uncus is distinctly broadened terminally, rounded apically as in the species of the *xylosteanus*-group, or bifid.

All the groups of these trends are characterised by the hibernation in the egg-stage and absence of scent scales in the female hindwing.

The third trend is represented by two groups of species. In the *termias*-group (species 29—51) the uncus is much more slender than in the representatives of the preceding trends. The sacculus is simple, exceptionally developing a rounded postbasal lobe, provided with short, usually subtriangular, smooth, free termination. The pregenital sternite in female is normally developed, without lobes. In the distal portion of the costa of the female hindwing a group of scent scales is present. The embryology is unknown. It may be supposed that the majority of the species are multivoltine. There are two subgroups; in the first of them (*termias*-subgroup; species 29—43), the caulis is much shorter than in the *dispilanus*-subgroup (species 44—45). The position of *A. atrolucens* (DIAK.) is doubtful.

The *xylosteanus*-group is characterised by terminally expanding and apically rounded uncus. The ventral complex of the apparatus tends to strengthen by broadening of the dorsal part of the sacculus. The sterigma is variably developed. This group may be divided into subgroups. The species of the *xylosteanus*-group (46—74) are monovoltine and hibernate in the egg stage (with exception of *A. purpuranus* (CLEM.) which shows some peculiar morphological characters and has an isolated systematic position). The embryology has been studied only in *A. rosanus* (L.) (cf. p. 60) but we may suppose that the development of the embryo, arrested after a short initial period, is characteristic of all species of this subgroup. The *xylosteanus*-subgroup is formed by several infra-groups. To the first of them belongs *A. issikii* KOD.) and *A. fumosus* KOD. the larvae of which feed on conifers. They are characterised by rather long lamella postvaginalis, fairly short cup-shaped part of the sterigma and presence of a process on aedeagus. The species closely correlated with *A. xylosteanus* (L.) (species 54—57) usually possess the process of the aedeagus but the females developed short lamella postvaginalis and long cup-shaped part of sterigma fused with the antrum. *A. inopinatanus* (KENN.) has an isolated position and is characterised by 5 pairs of dorsal pits. The male of this species is unknown and the problem of its position remains unsolved. This species and the species close to *A. fuscocupreanus* (WALSM.) (species 59—61) have proportionally short sterigma and short signum. The females protect the egg-masses with the scales of the terminal part of the abdomen. The sacculus in the known males is strongly broadened from beyond base. The species closely correlated to *A. rosanus* (L.) (species 62—73) are distributed mainly in the Nearctic Region. Only two species of that infra-group are recorded from Palaearctic Region. In *A. rosanus* (L.) the sterigma is long with large cup-shaped part but in some North American species it is very short and the cup-shaped part is ill-defined, which is probably a progressive character. The *micaceana*-subgroup is insufficiently studied. It is characterised by a broad uncus, long caulis, very short coecum penis, long ductus bursae and large signum. There is no data on the diapause of those species. Probably they are multivoltine as one can judge from the dates

of collection of the moths. I am placing this subgroup provisionally before the *xylosteanus*-subgroup.

List of species

1. *A. dissitanus* (GROTE) Nearctic Region
2. *A. strianus* FERNALD Nearctic Region: Canada
3. *A. packardianus* (FERNALD) Nearctic Region
4. *A. tsugunus* (POWELL) Canada
5. *A. alberta* (McDUNNOUGH) Nearctic Region: Canada
6. *A. arcanus* sp. nov. China
7. *A. paredreus* (MEYRICK) Taiwan
8. *A. capsigeranus* (KENNEL) East Palaearctic Asia
9. *A. alcmaeonis* (MEYRICK) India: Assam
10. *A. asiaticus* (WALSINGHAM) China, Korea
11. *A. audax* sp. nov. Japan
11. *A. tharsaleopus tharsaleopus* (MEYRICK). China: Chekiang, S. Shansi
- 12a. *A. tharsaleopus yunnanus* ssp. nov. China: N. Yunnan
13. *A. ingentanus* (CHRISTOPH) East Palaearctic Asia
14. *A. enodis* sp. nov. China: Chekinag
15. *A. subrufanus* (SNELLEN) East Palaearctic Asia
15. *A. seditiosus seditiosus* (MEYRICK) Vietnam, Malaya, Java
- 16a. *A. seditiosus orientalis* (DIAKONOFF) E. Java
17. *A. oporanus* (LINNAEUS) Palaearctic Region
18. *A. decretanus* (TREITSCHKE) Palaearctic Region
19. *A. podanus* (SCOPOLI) West Palaearctic Region
20. *A. vulpecularius* (FUCHS) Asia Minor
21. *A. breviplicatus* (WALSINGHAM) East Palaearctic Asia
22. *A. semistructus* (MEYRICK) China, Japan
23. *A. insulanus* KAWABE S. Japan
24. *A. strojny* sp. nov. China
25. *A. peratratus* YASUDA Japan
26. *A. formosanus* (KAWABE) Taiwan
27. *A. pulcher* (BUTLER) East Palaearctic Asia
28. *A. abiephagus* YASUDA Japan
29. *A. inanitis* sp. nov. Afghanistan
30. *A. ceylonicus* sp. nov. Ceylon
31. *A. pruneticolus* (MEYRICK) India
32. *A. citimus* sp. nov. Afghanistan
33. *A. dierli* DIAKONOFF Nepal
34. *A. transcucutatus* (MEYRICK) Java
35. *A. atrolucens* DIAKONOFF Java
36. *A. binigratus* (MEYRICK) India: Assam

37. *A. euryplinthus* (MEYRICK) India: Darjeeling
38. *A. philippus* (MEYRICK) Pakistan: Peshawar
39. *A. subsidiarius* (MEYRICK) India: Kashmir
40. *A. solidus* (MEYRICK) India: Darjeeling
41. *A. termias termias* (MEYRICK) India: Assam
- 41a. *A. termias stenoptychus* (DIAKONOFF) Burma
- 41b. *A. termias argutus* DIAKONOFF Nepal
42. *A. compitalis* sp. nov. China
43. *A. limatus limatus* sp., ssp. nov. China
- 43a. *A. limatus albatrus* ssp. nov. China: Chekiang
44. *A. displanus* (WALKER) India, Bhutan, Ceylon
45. *A. pensilis* (MEYRICK) India
46. *A. machlopiis* (MEYRICK) East Oriental Region
47. *A. apertus* DIAKONOFF Philippine
48. *A. expansus* DIAKONOFF Java
49. *A. micaceanus* (WALKER) Vietnam, Burma, Malaya,
?India
50. *A. seminubilis* (MEYRICK) Vietnam, Java, India, Chi-
na: Chekiang
51. *A. excurvatus* (MEYRICK) Vietnam
52. *A. issikii* KODAMA Japan, U.S.S.R.: Iouzhnoe
Primore
53. *A. fumosus* KODAMA Japan: Hokkaido, China:
N. Yunnan
54. *A. viola* FALKOVITSH U.S.S.R.: Iuzhnoe Primo-
re, Japan
55. *A. crataeganus* (HÜBNER) Europe
56. *A. endoi* YASUDA Japan: Hokkaido
57. *A. xylosteanus* (LINNAEUS) Palaearctic Region
58. *A. inopinatanus* (KENNEL) China, U.S.S.R.: Iuzhnoe
Primore
59. *A. nigricaudanus* (WALSINGHAM) East Palaearctic Asia
60. *A. dichotomus* FALKOVITSH China, Korea, U.S.S.R.:
Iuzhnoe Primore
61. *A. fuscocupreanus* WALSINGHAM East Palaearctic Asia
62. *A. rosanus* (LINNAEUS) Palaearctic Region (Nearctic
Region—artif. introduced)
63. *A. rudy* sp. nov. China: Tsinling
64. *A. infumatanus* (ZELLER) Nearctic Region
65. *A. fervidanus* (CLEMENS) Nearctic Region
66. *A. cerasivoranus* (FITCH) Nearctic Region
67. *A. rileyanus* (GROTE) S. Nearctic Region
68. *A. argyrospilus* (WALKER) Nearctic Region

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| 69. <i>A. magnolianus</i> (FERLAND)..... | U.S.A. |
| 70. <i>A. georgianus</i> (WALKER) | U.S.A. |
| 71. <i>A. griseus</i> (ROBINSON) | U.S.A. |
| 72. <i>A. negundanus</i> (DYAR) | Nearctic Region |
| 73. <i>A. semiferanus</i> (WALKER)..... | Nearctic Region |
| 74. <i>A. purpuranus</i> (CLEMENS) | Nearctic Region |
| 75. <i>A. ignescanus</i> (KUZNETSOV) | East Palaearctic Asia |

Species incertae sedis

The following species are known to me of the literature only. Their types are probably lost. The systematic position of these species is doubtful and there is only slight possibility they belong in the genus *Archips* HÜBNER.

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|---|---------------|
| <i>cirrhocrossa</i> MEYRICK (<i>Cacoecia</i>) | Sarawak |
| <i>menotoma</i> MEYRICK (<i>Cacoecia</i>) | China: Yunnan |
| <i>unimaculata</i> SHIRAKI (<i>Archips</i>) | Taiwan |

Species excluded from *Archips* HÜBNER

Archips minor SHIRAKI, 1913, Special Rept., Bull. Agric. Exp. Station, Formosa, 8: 356. SONAN (in SHIRAKI, 1933: 81) synonymised it with *Adoxophyes privatana* (WALKER) and KAWABE (1968:[125]) with *Adoxophyes orana* (FISCHER v. RÖSLERSTAMM).

Archips citrinella SHIRAKI, 1913, Taiwan Agr. Exp. Station; Special Rept. No. 8:345 described from Taiwan synonymised by SONAN (above cited paper, p. 79) with *Epimaectis tolantas* MEYRICK, *Xylorictidae*.

Cacoecia delibatana ROTSCHILD, 1912, Rovart, Lap., 19: 27, 49. REBEL (1913, ibid.: 87) synonymised it with *Clepsis neglectana* (HERRICH-SCHÄFFER). It was placed by OBRAZTSOV (1955:207) in *Archips*, however. In same paper the latter author mentions *Pandemis educatana* (WALKER) in the genus in question but this was transferred to *Choristoneura* HÜBNER and then to *Hoshinoa* KAWABE (cf. YASUDA, 1975: 111).

Several species described in the genera *Cacoecia* HÜBNER and *Tortrix* LINNAEUS and temporarily placed in *Archips* HÜBNER (e.g. CLARKE, 1958: 39—59) are not included in this paper. Those species (e.g. *Cacoecia salaconis* MEYRICK, *C. difficilis* MEYR., *C. permutata* MEYR., *Tortrix encausta* MEYR. etc.) need reexamination. DIAKONOFF (1948: 509, and further papers) included some of them in *Homona* WALKER but then changed his opinion (DIAKONOFF, 1967: 24) and transferred them to this genus. Moreover, a new species of that group, viz. *Archips diceus* DIAK. was described.

Abbreviations

- AMNH — American Museum Natural History, New York
 ANSPh — Academy of Natural Sciences of Philadelphia
 BM — British Museum (Natural History), London
 BRI — Biosystematics Research Institute, Ottawa
 CUI — Cornell University, Ithaca
 EIHU — Entomological Institute, Hokkaido University, Sapporo
 LNK — Landessammlungen für Naturkunde, Karlsruhe
 LS — Linnean Society, London
 MNHNP — Muséum National d'Histoire Naturelle, Paris
 NRS — Naturhistoriska Riksmuseet, Stockholm
 RNH — Rijksmuseum van Natuurlijke Historie, Leiden
 USNM — United States National Museum, Washington
 UOP — University of Osaka Prefecture, Sakai, Osaka
 ZFMK — Zoologisches Forschungsinstitut und Museum „Alexander KÖNIG“, Bonn
 ZIANL — Zoologitcheskij 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

SYSTEMATIC PART

Archips HÜBNER, [1822]

Airchips HÜBNER, [1822], Syst. alphab. Verz.: 58. Type-species: *Phalaena Tortrix xylosteana* LINNAEUS, 1758, by subsequent designation (by OBRAZTSOV, 1954, Tijdschr. Ent., 97(3):175).

Cacoecia HÜBNER, [1825], Verz. bekannter Schmett.: 388. Type-species: *Phalaena Tortrix xylosteana* LINNAEUS, 1758, by subsequent designation (FERNALD, 1908, Genera *Totricidae*: 14).

Archiceps WEISS & DICKERSON, 1921, J. N. Y. ent. Soc., 29: 142. Name mistakenly used instead of *Archips*.

Archippus FREEMAN, 1958, Can. Ent., 90, Suppl., 7: 15. Type-species: *Tortrix packardiana* FERNALD, 1886, by original designation.

Archips Pararchips KUZNETSOV, 1970, Ent. Obozr., 49(2):448. Type-species: *Ariola pulchra* BUTLER, 1879, by original designation and monotypy.

Review of species

Archips dissitanus (GROTE, 1879)

Tortrix Ptycholoma dissitana GROTE, 1879, N. Am. Ent., 1: 29.

Type locality: Buffalo, New York. Lectotype, male labelled „*Tortrix dissitana* GROTE”; coll BM.

FREEMAN, 1958: 17, fig. 10, 57, 105 (*Archippus*).

Labial palpus shorter than 1.5, brown; head whitish; scape of antenna brownish with white scales; thorax whitish or greyish white, black proximally; abdomen pale, brownish grey.

Male. Forewing 8—9 mm, broad, weakly expanding terminally; costa strongly curved outwards to middle, then fairly straight; apex very short; termen hardly concave postapically, weakly oblique or straight. Costal fold slender, terminating just before middle of wing. Ground colour white; pattern black, consisting of usual but interrupted elements. Basal blotch represented by large costal marking sometimes divided into two parts and connecting with transverse band reaching dorsum or a blotch in middle area joined by thin line. Square costal blotch representing median fascia terminating in middle of costa and before median cell, followed by broad marking (often interrupted beyond median cell). Subapical blotch irregular and variable, followed by small spot or two; terminal pattern rather subtriangular, interrupted or atrophied before tornus. Some black strigulae or spots along dorsum. Fringes black, or grey with tornus or termen partially whitish. Hindwing grey, darker on peripheries, rarely whiter basally; fringes concolorous with wing, darkest at apex. Underside of forewing brown-grey with cream-white, dark suffused costal parts of ground colour, reverse of hindwing whitish, partially suffused or sprinkled dark brownish grey.

Variation. The shape and size of the forewing pattern elements show fairly distinct variation.

Female: forewing 10—11 mm, uniformly broad throughout, costa weakly convex beyond basal third, otherwise as in the male.

Male genitalia (figs. 2, 3). Tegumen broad, uncus strong, somewhat invaginated apically; socius ill-defined. Sacculus convex before middle ventrally, provided with fairly large termination. Aedeagus thick, armed with ventro-terminal process and row of small ventro-lateral dents. Two cornuti in examined specimen. The terminal dent of aedeagus is after FREEMAN (1958:67) well developed, pointed similarly as in the remaining species of this group. Most probably the specimen examined by me is atypical.

Female genitalia (Fig. 147). Sterigma large, with well developed cup-shaped part its distal portion strongly produced terminally. Sclerite of antrum broad; ductus bursae proportionally short; cestum long; signum large.

Bionomy. One specimen examined was reared from balsam fir. The moth is on the wing from mid June to late August.

Distribution. Quebec, Ontario, Maine to Ohio, North Carolina (partially after FREEMAN, 1958).

Archips strianus FERNALD, 1905

Archips strianus FERNALD 1905, Can. Ent., 37: 399, type locality: Quebec. The type unknown to me.

FREEMAN, 1958, 16, fig. 103, 8, 55 (*Archippus*).

Head cream mixed with brownish, especially on vertex; thorax much brown-er proximally, gradually paler towards middle, tegula rather pale terminally; abdomen pale brownish grey. Labial palpus brownish with scattered paler scales and dark, pale apically terminal joint.

In male, forewing about 10 mm, weakly expanding terminally, costa curved outwards throughout, mainly so to middle; apex short; termen hardly sinuate, somewhat oblique. Costal fold reaching almost to middle of costa, narrow, tapering terminally, provided with fairly long scales behind. Ground colour whitish cream suffused with brownish, with weak admixture of dirty pinkish colour. Dark brown or black-brown radial fasciae among the venation, strongest in apical area. Dark spot and often greyish suffusion at disc and before it respectively. Fringes concolorous with darkest parts of the pattern, much paler at tornus. Hindwing brownish grey with more cream terminal portions of veins, especially in apical area; the spaces between them may be strongly darkened. Fringes pale brownish grey, much darker at apex; median line weak.

Underside of forewing brown-grey with paler venation terminally, that of hindwing paler with distinct whitish venation and fringes.

Female has narrower forewing (10—11 mm) with costa almost straight post-medially.

Variation occurs mainly in the intensity of the dark streaks of the forewing.

Male genitalia (figs. 4, 5). As in preceding species but uncus somewhat shorter, valva longer, sacculus with ventral prominence situated more proximally. Aedeagus with subventral row of rather equally large dents extending from middle to the terminal process.

Female genitalia (fig. 148). Sterigma long, distinctly produced apically, with rather weakly sclerotised distal lobes. Sclerite of antrum broad; cestum thin, short. Signum provided with small capitulum.

The larva is described by MACKAY (1962: 47, fig. 38).

Bionomy. Moth in July. Food plant: *Picea* (black and white spruce).

Distribution: Nova Scotia, Maine, New Hampshire, Quebec, Ontario, Alberta.

Comments. Characterized by whitish radial pattern which is unique in this genus. The type is deposited in the USNM (FREEMAN 1958: 17).

Archips packardianus (FERNALD, 1886)

Tortrix packardianus FERNALD, 1886, U.S.D.A. Bull., 12: 20. Type locality: Peaks Island, Casco Bay, Maine (Canada). Type after FREEMAN (1958:18) in USNM.

FREEMAN 1958: 18, fig. 11, 58, 106 (*Archippus*).

Labial palpus about 1, pale brownish cream: head dirty white; thorax grey, white-scaled, darkening anteriorly; abdomen greyish.

Male. Forewing 9—10 mm, weakly expanding terminally; costa distinctly bent to before middle, then weakly so; apex broad, rounded, very short; termen hardly concave just beyond apex, then weakly oblique. Costal fold absent. Ground colour white, sprinkled grey or brownish and strigulate with same colours. Pattern brownish grey to brownish with occasionally an ill-defined olive hue. Basal area usually dark with distal edge strongly curved outwards; median fascia with anterior edge from 1/3 of costa to about middle of dorsum, straight or somewhat concave. The fascia is rather slender, usually interrupted subcostally producing towards tornus or connecting with a tornal marking by a reticulation or suffusion. Subapical blotch alongate or divided into some spots or strigulae, then connecting with terminal (or apico-terminal) suffusion or blotch. A blotch at apex often distinct and darker than remaining terminal pattern. Fringes concolorous with terminal pattern, or paler, almost concolorous with the ground colour and then divided with dark bars, pale at tornus. Hindwing brownish grey to dark grey, sometimes mixed whitish in basal half. Fringes white-grey or whitish, grey at apex, with grey basal line. Underside brownish grey to grey, costa whitish, strigulated darker, or hindwing almost completely whitish with dark reticulation or strigulation.

Female. Forewing 10—11 mm, with costal edge more straight beyond basal third.

Variation. Some specimens dark, with contrasting pattern. In others the pattern partially atrophying but strigulation distinct.

Male genitalia (figs. 6, 7) similar to those in preceding two species but uncus slenderer, dorsal part of sacculus longer and indentation of eadeagus stronger, more lateral.

Female genitalia (fig. 149) more delicate than in preceding species. Sterigma large, produced distally with well developed distal lobes. Cup-shaped part of sterigma broader and shorter than in *A. strianus* FERN. Dorsal unsclerotised area situated at ostium much shorter than in all preceding species, antrum longer, ductus bursae shorter, cestum absent, signum strong.

Larva. Description by MACKAY (1962: 45, fig. 36).

Bionomy. Moth flies in June and early July. Food plants: *Abies*- and *Picea* species (FREEMAN, 1958).

Distribution. From Nova Scotia and British Columbia, in Canada to Maine, New Hampshire and Wyoming in the U.S.A. (FREEMAN, l.c.).

Archips tsuganus (POWELL, 1962)

Archippus tsuganus POWELL, 1962, Gen. Ent., **94** (8): 842. fig. 2. Type-locality: Knight Inlet (British Columbia). Holotype, male labelled (after original paper): Canada: Knight Inlet, British Columbia, VII—21—1949 (reared from) "Hemlock, P49-1060D"; coll. CNC.

Externally very close to *A. packardianus* (FERNALD). Forewing 7—8 mm. Ground colour whitish, distinct.

Male genitalia as in the mentioned species but the aedeagus without dentate crest. Free termination of sacculus somewhat longer.

Comments. This species is unknown to me. It was described on basis of 4 males reared from hemlock and spruce and is known exclusively from British Columbia.

Archips alberta (MCDUNNOUGH, 1923)

Tortrix alberta MCDUNNOUGH, 1923, Can. Ent., **55**: 167. Type locality: Nordegg, Alberta (Canada). The type (after FREEMAN 1958: 17) in coll. CNM.

FREEMAN 1958: 17, fig. 9, 56, 104 (*Archippus*).

Labial palpus over 1, brown; head brownish with front somewhat cream; antenna brownish; thorax brownish, brown anteriorly, often mixed ferruginous medially. More or less distinct pinkish shine developed on head and thorax. Abdomen brownish to brown, terminal tuft in male cream.

Male. Forewing 12—13 mm, weakly expanding terminally; costa curved outwards to end of costal fold; apex broad; very short; termen not sinuate postapically, hardly oblique. Costal fold slender, long-scaled behind postbasally, distinctly tapering terminally, reaching just beyond middle of costa where that edge is only directed upwards. Ground colour ochreous to brownish cream with more or less distinct pinkish hue. Pattern brownish, also with similar hue, at least at places. Basal blotch broad, reaching $1/5$ of costa, with distal edge convex, dark brown, strigulate mainly costally; median fascia with anterior edge from before middle of costa to before $2/3$ of dorsum, narrow in costal area, twice slightly concave at arms of median cell. Distal edge of that fascia diffuse, internal area mixed greyish. Subapical marking long, diffuse terminally, connecting with median fascia subcostally and with the terminal suffusion along the costa. Dark, brown strigulae or lines on surface and anterior edges of pattern, some weaker strigulae transversely on the ground colour. Fringes concolorous with terminal part of wing, darker at apex and terminally, often with short, dark divisions; tornal portion paler. Hindwing tapering terminally, cream or greyish, transversely strigulate pale grey. Weak pinkish hue at apex and on peripheries; fringes concolorous with wing or darker, with pinkish shine. Coloration of underside similar but pattern of forewing weak or not visible.

Female. Forewing 12—13 mm, not expanding terminally, with costa distinct-

ly curved in basal third, then rather straight or hardly concave subapically; termen not oblique. Hindwing broader, with larger angulation at vein m_3 .

Male genitalia (figs. 8, 9) very large. Uncus broad, similar in shape to that in all preceding species but somewhat broadening subterminally. Aedeagus broad with delicate lateral indentation and strong subterminal thorn directed dorsally.

Female genitalia (fig. 150). Papilla analis very broad. Sterigma very large and broad, with proportionally short cup-shaped part and broad unsclerotised dorsal area at ostium bursae. Distal lobes large but weakly sclerotised, median prominence of distal edge of lamella postvaginalis broad. Sclerite of antrum large; ductus bursae short, without cestum; signum large.

Variation. Ground colour more or less dark, in some specimens brownish. Degree of development of transverse strigulation and darkness of the pattern variable.

Description of larva by MACKAY (1962: 46, fig. 37).

Bionomy. Late instar larvae in August (MACKAY), moth late July and August. Food plant: *Picea*-species (e.g. *P. mariana* BRITTON, STERN & POGG [= *P. nigra* LINK.] cones after MACKAY, *P. rubra* A. DIETR. from a label of a specimen in BRI).

Distribution. Canada: Newfoundland to Alberta (FREEMAN 1958: 17 and examined material).

Archips arcanus sp. nov.

Holotype, male: „West Tien-mu-shan, Prov. Chekiang, 9. VI. 1932, H. HONE” not dissected. Coll. ZFMK.

Paratypes: 9 ♂♂, 2 ♀♀ identically labelled as the holotype but dated 24. V., 1—29. VI. and 4. IX.; 1 ♂, „Li-kiang (China), Provinz Nord-Yuennan, 4. VI. 1934 H. HONE”; 1 ♂, „Hoengshan, Prov. Hunan, 17. V. 1933, HONE”; 33 ♂♂, „Tapaishan im Tsinling, Sued-Shensi (China), H. HÖNE” dated „9. VI. 1935”, 21—27. VI. 1935” and „2. VII. 1935”. Coll. ZFMK and ZZSD.

Male. Labial palpus over 1, brown with slight violet-grey hue; remaining parts of head brownish; abdomen brown-grey with ochreous cream terminal tuft. Forewing 10—13 mm, somewhat expanding terminally; costa delicately curved outwards in basal portion, hardly concave subapically; apex fairly long, pointed; termen distinctly sinuate, strongly convex beyond middle; costal fold rather slender, narrowing in terminal portion, reaching 1/3 of costa. Ground colour yellow-brown to cream-brown suffused with brown-grey except for distal third of wing. Usually only tornal half of that area is pale. Costal fold somewhat darker than the ground colour, with stronger violet-grey shine. Pattern rust brown mixed black, consisting of diffuse basal blotch extending from base of dorsum almost to middle of median fascia, black costally followed by grey area densely sprinkled with pale cream terminating near costal fold. Median fascia from end of costal fold, diffuse in dorsal half, produced towards disc, marked

with black anteriorly and costally; subapical blotch more rust in colour, slender, diffused, extending from before middle of costa to before apex, producing in distal part towards end of termen. The latter part (often separated from the costal portion) is paler, occasionally marked with black along veins m_1 — m_2 . Termen or apex rust brown, the area between apex and subapical blotch glossy grey. Fringes ferruginous, more cream towards tornus, dark brown at apex. Hindwing dark grey-brown to vein cu_1 , yellow-cream in remaining area becoming darker on peripheries; fringes pale brownish grey and yellowish cream respectively, mixed rust at apex.

Female. Labial palpus ochreous-brown, remaining parts of head and thorax grey-brown, abdomen paler and browner. Forewing 16 mm, broad. Costa distinctly curved outwards in basal third, then concave; apex produced costad, long, pointed; termen very strongly concave beyond apex, distinctly convexly rounded in middle. Ground colour brownish with weak hue and indistinct violet-grey shine, delicately stringulated with brown. Basal blotch represented by dark grey suffusion at dorsum and oblique line being its distal edge; median fascia in form of oblique line from before costal concavity to 2/3 of dorsum accompanied by costal and dorsal suffusions; subapical blotch from mid-costa followed by a line from 5/6 costa to before tornus. Apex suffused; fringes concolorous with ground colour, darker at apex and terminally. Hindwing as in male but darker and more orange distally where indistinct brownish transverse strigulation occurs.

Variation. In some males ground colour is much paler than described above, more cream; the pattern rust-brown with more or less distinct olive-yellow admixture, and often black scales absent. Occasionally various parts of the pattern reduced. In females median fascia may be represented by a slender diffused marking and terminal part of wing, especially apex area darker, brown.

Male genitalia (figs. 10—12). Uncus proportionally slender; socius very delicate, almost completely membranous; sacculus strong, provided with ante-median dent (variable in shape) and a broadening situated at free termination. Aedeagus bent, slender in distal portion, provided with ventrally dent terminally.

Female genitalia (fig. 151). Sterigma broad with fairly short cup-shaped part the median portion of which is narrow and anterior prominences rounded. Antrum with rather strong internal sclerite; ductus bursae with long, capitate cestum; signum strong provided with large proximal part of basal sclerite. Pregenital sternite with weak median sclerotisation and paired plate-shaped sclerites in the membrane before antrum.

Bionomy. Moth collected in West Tien Mu Shan between 24. V. and 4. XI., so one can suppose the specimens belong to two generations. Maximum flight in June.

Distribution: Tapaishan (South Shansi), Li-kiang (Nord Yunnan) and Hoengshan (Hunan) in China.

Comments. The specimens from Tapaishan differ somewhat from those of the type locality in having much paler ground colour of the forewing in male.

The differences in the male genitalia (sacculus and termination of aedeagus) are most probably of the infrasubspecific importance.

Archips paredreus (MEYRICK, 1931)

Cacoecia paredrea MEYRICK, 1931, Exot. *Microlepid.*, 4: 149. Type locality: Taihoku (Formosa). Lectotype, male (designated by CLARKE 1958: 44): „Taihoku, Formosa, S. I.[ssiki], 10. 25.", G. Sl. 6817 [BM], Coll. BM.

KAWABE, 1968: 122 pl. 20 figs. 3, 4, 14, 14a, pl. 21, figs. 21, 21a (*Archippus*).

Male. Labial palpus shorter than 1.5, rust-ochreous. Head cinnamon brown, antenna creamer; thorax darker than head with pink-grey hue. Forewing 8 mm somewhat expanding terminally; costa curved outwards in basal third, slightly concave before apex; apex very short, termen hardly concave postapically. Costal fold almost uniformly broad reaching third of costa. Ground colour cinnamon with slight admixture of pink, tinged pale ochreous in dorso-terminal area, cream between costal fold and basal blotch. Pattern dark rust-brown. Basal blotch subtriangular, fairly slender; median fascia slender with proximal edge extending from end of costal fold to beyond middle of dorsum, somewhat convex medially. Costal portion of fascia atrophied, brown-grey suffusion beyond middle part of it developed; subapical blotch from middle to 5/6 costa accompanied by elongate-triangular blotch reaching termen; apex concolorous with pattern. Fringes cinnamon-cream, cinnamon to vein m_3 and at tornus, rust-brown at apex. Hindwing greyish brown, mixed orange in distal part; fringes pale brown-grey with darker median line.

Female similar to that of *A. ingentanus* (CHR.). Forewing ca 11 mm, uniformly broad throughout; costa curved outwards to before middle, then weakly concave; apex somewhat prominent, fairly long; termen sinuate postapically. Ground colour brownish with slight admixture or yellowish or cream, transversely strigulated brown. Pattern ill-defined, dark brown. Basal blotch atrophied except for its distal edge represented by a curved line; median fascia distinct proximally, diffuse distally; subapical blotch large, diffuse; apex dark. Fringes rather concolorous with ground colour except at tornus where brownish cream. Hindwing brownish grey in anal area, orange-cream in costal half and apically, strigulated transversely with brown. Fringes grey, mixed orange towards apex.

Variation. The males occasionally with ochreous-brown ground colour and partially atrophied rust-brown pattern.

Male genitalia (figs. 13, 14). Uncus slender; socius in the type invisible, in other specimens well developed; ventral edge of valva distinctly convex medially; sacculus reaching to beyond middle of valva, provided with strong submedian tooth and smooth, broadening followed by free termination. Aedeagus slender, long, terminating in distinct tooth directed to the right and provided with some minute dents laterally (left side).

Female genitalia (fig. 152). Sterigma very strong with well developed median process and distinctly sclerotised distal lobes. Cup-shaped part broad, hardly

tapering proximally; sclerite of antrum almost as broad as the latter part, asymmetrical proximally (right portion elongate). Ductus bursae rather short; cestum longer than half length of the latter, somewhat broadening in corpus bursae; signum long.

Bionomy. The moth was collected in June, July and (the holotype) October at the altitudes 727 to 1600 m.

Distribution. Formosa.

Archips capsigeranus (KENNEL, 1901)

Cacoecia capsigerana KENNEL, 1901, Dt. Z. Iris, **13** (1900): 212. Type locality: Askold. Holotype, ♂: „Askold, Dörr.[ies], Origin”, G. Sl. 38 OBR.[AZTSOV]. Coll. ZMB.

Male. Labial palpus over 1, rust orange; remaining parts of head and thorax darker. Forewing 11 mm, expanding terminally; costa curved outwards in basal third, indistinctly concave subapically; apex short, delicately prominent costad; termen weakly sinuate, prominent and rounded postmedially. Costal fold to beyond third of costa, cream, suffused with ferruginous. Ground colour in basal area of wing cream mixed pale ochreous, then pale rust-brown with indistinct violet shine, except for distal third of wing where much paler and mixed cream. Delicate brownish transverse strigulation mainly near dorsum and subterminally. Pattern rust-brown; basal blotch dark brown towards costa, median fascia darker costally than dorsally with proximal edge extending from before end of costal fold, atrophied costally, pale edged. Grey suffusion on ground colour between these two pattern elements, median fascia and subapical blotch. The latter from middle of costa, somewhat paler than median fascia, separated from subterminal marking. Apex brown, termen rather concolorous, greyish, refractive suffusion from costa subterminally. Fringes concolorous with pattern excepting tornal portion where more cream, brown terminally to beyond middle of termen. Hindwing brownish, ochreous cream costally, tinged orange apically; fringes orange at apex, more cream to vein *cu*₁, brownish otherwise; median line indistinct.

Female. Head and thorax as in male; forewing 11—12 mm; costa curved outwards in basal third, somewhat concave subapically; apex much shorter than in preceding species, somewhat prominent costally; termen sinuate post-apically. Ground colour brownish to cinnamon-brown, with darker transverse strigulation. Transverse lines more ochreous; pattern dark brown reduced to weak subbasal suffusion dorsally and much darker subapical blotch extending from 2/3 of costa. Apex and costal third of termen suffused black-brown. Fringes concolorous with ground colour, paler tornally, mixed blackish brown at apex. Anal area of hindwing greish brown, remaining parts orange yellow more cream costally; fringes brownish grey and dirty orange respectively.

Variation. Males from Japan often cinnamon-brown, forewing with somewhat darker pattern the most distinct parts of which are subapical and basal blotches.

In those specimens costal fold and partially basal area of wing brownish cream, much paler than remaining parts of ground colour.

Male genitalia (figs. 15, 16). Uncus fairly large; socius vestigial. Saccus provided with a subdorsal dent situated in its 1/3, postmedian process and short free termination. Aedeagus broadening terminally, marked with two minute dents dorso-apically, minutely dentate mainly in median portion.

Female genitalia (fig. 153, 154). Cup-shaped part of sterigma large, proximal prominences very small; antrum approximately as long as the mentioned part of sterigma; cestum to beyond middle of ductus bursae; signum large. Pregenital sternite distinctly sclerotised distally, sculptured mainly along a shallow distal incisure.

Larva (after YASUDA, 1975) to 22 mm long, very similar to that of *A. audax* sp. nov., differing in having pale yellowish ochreous meso- and metathoracic legs.

Bionomy. Moth is on wing in May and June: one specimen collected in mid-September. Host plants after YASUDA (1975) are: *Prunus salicina* LINDL. (Rosaceae), *Maesa japonica* MORITZI (Myrsinaceae), *Daphniphyllum teijsmanii* ZOLL. (Euphorbiaceae), *Acer palmatum* THUNB. (Aceraceae), *Machilus thunbergi* SIEB. & ZUCC. (Lauraceae) and *Abies firma* SIEB. & ZUCC. (Pinaceae). KUZNETSOV (1973) collected this species in Iuzhnoe Primore between mid-July and mid-August. The larvae rolled leaves of *Fraxinus mandshurica* RUPR. (Oleaceae).

Distribution. Described from Askold; KUZNETSOV (1975) recorded it from several localities in Far East of U.S.S.R. (Iuzhnoe Primore) and from China (the latter data need confirmation). Known also from Honshyu (Japan).

Comments. Only the holotype and Japanese specimens (figs. 17, 18) known to me. The males show slight variation of the aedeagus, but this may be of infra-subspecific importance.

Archips alcmaeonis (MEYRICK, 1928)

Cacoecia alcmaeonis MEYRICK, 1928, Exot. *Microlep.*, 3: 455. Type locality. Shillong, Assam. Lectotype, ♀: „Shillong, Assam, T. B. F.[LETCHER], 19. IX: 1927”, G. Sl. 6815 [BM]. Coll. BM.

Misidentification:

Archips contemptrix: CLARKE, 1958: 39.

Female. Labial palpus ca 1, ferruginous cream, darkest distally, remaining parts of head and thorax brownish. Forewing ca 15 mm, broad; costa very strongly curved outwards in basal third, concave postmedially, apex prominent, long; termen distinctly sinuate beyond apex, convexly rounded beyond middle. Ground colour cinnamon brown transversely strigulated with dark brown. Pattern vestigial, dark brown, represented by weak dorsal suffusion near base followed by a convex line extending from third of dorsum atrophying subcostally, diffuse median fascia the proximal edge of which runs from 1/3 of costa

to before 2/3 of dorsum and slender subapical blotch situated in the costal concavity. Slightly concave line bordered distally with ochreous extends from before apex to end of termen; apex ochreous-brown edged black-brown; termen black-brown to vein cu_1 . Very slight violet-pink shine all over the wing. Fringes concolorous with ground colour, much darker terminally, brown-black at apex. Hindwing dark vivid-brown in anal area, orange in the remaining part where delicate transverse brownish strigulation present. Fringes brownish and orange respectively, mixed brown at apex.

Female genitalia (fig. 155). Sterigma short with rather delicate median process and proportionally weakly sclerotised distal lobes. Its proximal cup-shaped portion very short, provided with rounded anterior prominences and deep distal concavity. Antrum somewhat shorter than dorsal plate of sterigma; ductus bursae long, cestum twice shorter. Signum similar to that in preceding species.

Bionomy: no data except for dates of collection of the types: 31. V. and 19 and 26. IX. at the altitude 4900–5000 feet.

Distribution. Only Shillong and Khasis in Assam.

Comments. The male of this species is unknown. All specimens were collected in Assam. The data on its occurrence in China are incorrect because *A. contemptrix* (MEYR.) supposed to be conspecific with it is in fact synonym of the following species.

Archips asiaticus (WALSINGHAM, 1900)

Archips asiaticus WALSINGHAM, 1900, Ann. Mag. nat. Hist., (7) 5: 380. Type locality: Gensan (Korea). Lectotype, male: „Gensan, Corea, VII—IX. 1887. Ito, LEECH 60403”, G. Sl. 5369 [BM]. Coll. BM.

Cacoecia contemptrix MEYRICK, 1925 [in:] CARADJA, Bull. Sect. sci. Acad. roum., 3: 378. Type locality: Canton (China). Holotype, female (unknown to me) — **synon. nov.**

Misidentifications:

Cacoecia decretana: CARADJA, 1934: 10.

Archips decretana asiatica: OBRATSOV, 1955: 204.

Archips altemaemonis [part.]: CLARKE, 1958: 39.

YASUDA 1975: 98 = *audax*.

Male. Labial palpus ca 1, ochreous orange, remaining parts of head brown to grey-brown, thorax concolorous, abdomen brownish with large brownish cream terminal tuft. Forewing 8—10 mm, slightly expanding terminally; costa weakly curved outwards in basal third, then less so, somewhat concave postmedially; apex prominent, short, pointed; termen somewhat concave postapically, then convexely rounded. Costal fold broad, slightly tapering in distal portion, reaching to before middle length of costa. Ground colour ochreous cream to brownish yellow with orange hue suffused ferruginous in median and dorsal areas, cream basally. Costal fold ferruginous, cream towards dorsum. Pattern brownish to rust-brown. Basal blotch subtriangular, suffused dark brown costally; median fascia atrophied in costal portion, rust brown, marked with blackish or brown

suffusion to before middle, strongly broadening in dorsal half but pale and usually diffused. Subapical blotch in form of elongate rust-brown marking extending from middle of costa to before apex separated from subtriangular, convex distally subterminal marking. The later provided with one or two groups of black scales at first two median veins. Termen suffused black-brown beyond apex. Weak pinkish sheen in distal half of wing. Fringes concolorous with paler parts of pattern, dark brown at apex and to middle of termen distally, concolorous with ground colour at tornus. Hindwing brownish in anal area, orange in costal and distal parts; fringes brownish and pale orange respectively, brown at apex.

Female. Labial palpus ca 1.5, ochreous orange, remaining parts of head and thorax cinnamon brown; abdomen cream-brown. Forewing 11—13 mm; costa strongly curved in basal half, concave beyond middle; apex protruding costad, long; termen strongly sinuate, convexely rounded near middle. Ground colour cinnamon brown, rather pale, paler, more ochreous subterminally, delicately strigulated with brown transversely. Pattern brown consisting of dorsal suffusion representing basal blotch, costal and dorsal remainders of median fascia and elongate subapical blotch. Apex and termen suffused dark grey or even black-grey. Transverse brown lines representing the edges of pattern as in females of three preceding species. Fringes brown, paler at tornus, dark brown-grey terminally except for dorsal third of wing. Hindwing brownish, orange to vein cu_1 , more cream costally; fringes concolorous with distal parts of wing.

Variation. The males vary in the intensity of ground colour and degree of reduction of the pattern. Usually basal area between costal fold and basal blotch cream. Costal part of median fascia very often atrophied, in extreme cases only median part of median fascia marked with black-brown preserved. In few specimens subapical blotch very pale or atrophied except for the subdorsal portion. Females rather not variable; sometimes dorsum suffused brown, rarely median fascia almost completely atrophied. Costal portion of subapical blotch constantly well developed.

Male genitalia (figs. 19—23). Uncus slender, slightly tapering terminally; socius membranous, weak. Saccus proportionally short with short, smooth free termination and large, delicately curved submedian process. Aedeagus with row of denticles situated along right dorsal edge in the distal third.

Female genitalia (figs. 156—158). Sterigma short with proportionally large cup-shaped part the anterior corners of which are broad, rounded; antrum broad, rather short; ductus bursae long; cestum to before middle of its length. Pregenital sternite simple, fairly well sclerotised.

Bionomy. Only the dates of the collection of moth are known: between mid-May and end of November. Most probably two or three generations yearly.

Distribution. China: Tapaishan (South Shensi), Hoengshan (Hunan), Shanghai and Lungtan (Kiangsu), West Tien-mu-shan (Chekiang); Korea: Wonsan and Hiesan.

Comments. The males of this species are easily distinguished by pale ground colour of the basal portion of the forewing, the females very similar to those of

the preceding species and of *A. audax* sp. n. In the male genitalia the magnitude and arrangement of the dents of aedeagus are variable. The shape of aedeagus is less variable, but easily is deformable. I have had an occasion to examine some specimens showing slight differences in the female genitalia, and, however, I suppose those are of infrasubspecific importance, I did not include them in this description. Based on the original description and on examination of some specimens from S. E. China I sink *A. contemptrix* (MEYR.) as a synonym of this species. CLARKE (1958) has synonymised *A. contemptrix* (MEYR.) with *A. alcmaeonis* (MEYR.) from India basing on its external similarity but the latter is a distinct species. CARADJA (1934) supposed *A. asiaticus* (WALS.) to be conspecific with *A. decretanus* (TREIT.) and OBRAZTSOV (1955) treated it as a subspecies of the mentioned species. The data on the occurrence of *A. asiaticus* (WALS.) in Japan (all papers concerning Japan incl. YASUDA, 1975) concern a new species.

Archips audax sp. nov.

Holotype, male:,, Japonia: Honshyu, Kogigatake, 1200 m, Nara Pref., 29. VI. 1970, Józef RAZOWSKI leg.". Coll. ZZSD.

Paratypes: 2 ♂♂ labelled as the holotype, but dated 30. VI.; 1 ♂, „Japonia: Honshyu, Kiso-Fukush.[ima], 750 m, Nagano Pref., 22. VI. 1970, Józef RAZOWSKI leg.", 1 ♂ and 6 ♀♀, „Japonia: Honshyu, Yoshino, 400 m, Nara Pref., 8. VI. 1970, Józef RAZOWSKI leg.", 1 ♂, „Japan, Honshyu, Kawati; Iwawakisan, 30. V. 1954, T. YASUDA", and 1 ♂, „Japan-Osaka, Aogemura 10. V. 1955" — all in coll. ZZSD. Further paratypes, 5 ♂♂ and 9 ♀♀ listed by YASUDA (1975: 99), preserved in his collection.

Male. Labial palpus over 1, brownish; remaining parts of head and thorax brown, the latter with rather distinct violet-grey hue; abdomen brownish with cream or brownish cream terminal tuft. Forewing 9—12 mm, slightly expanding terminally, with costa less concave postmedially and apex shorter than in *A. asiaticus* (WALS.). Costal fold broad reaching beyond third of costa. Ground colour yellowish brown suffused ferruginous-brown except for distal third of wing, and with more or less distinct violet-grey sheen. Costal fold somewhat darker than ground colour before median fascia. Pattern deep rust-brown partially suffused with black-brown. Basal blotch connecting with median portion of median fascia submedially, rarely separate edged with dark grey towards costa. Cream area of ground colour between that suffusion and costal fold. Median fascia extending from distal part of costal fold where narrow or atrophied, strongly broadening towards the middle, diffuse or atrophied towards dorsum. Subapical blotch from mid-costa to before apex, more ferruginous in colour, becoming paler distally, its subterminal part distinctly separated, rather pale, delicately sprinkled with dark brown. Apex and apical third of termen rust or brown edged grey, rarely marked with blackish scales. Fringes brownish, violet-brown terminally, darker at apex, more cream at tornus. Hindwing brownish grey to vein

cu_1 orange-cream darkening towards apex in the remaining part; fringes grey-cream or brown-cream and cream-orange respectively.

Female. Head and thorax brown to grey-brown with indistinct violet sheen; abdomen brownish. Forewing 12—16 mm similarly shaped as in *A. asiaticus* (WALS.) Ground colour yellowish brown to brown with weak violet-grey shine, delicately strigulated transversely with brown. Basal and often anterior half of wing suffused brown-grey, fairly dark. Pattern dark brown or ferruginous-brown consisting of costal remainders of median fascia and subapical blotch. Typically developed line limiting the pattern edges present, the subterminal line being ochreous brown. Apex and partially termen dark brown. Fringes concolorous with ground colour, darker terminally, paler at tornus. Hindwing brown to vein cu_1 , orange in remaining area; fringes brownish cream and orange respectively.

Variation. In the males the ground colour, except for the distal third of wing, often distinctly suffused with brownish grey. Its parts being, however, easy to distinguish thanks to refraction. Median portion of median fascia often sealed black-brown. Only one specimen with pale cinnamon ground colour and rust pattern of which only part of basal blotch mixed dark brown. The females are weakly variable. In some specimens the costal portion of median fascia is well visible, in others violet-grey refractive suffusion is very distinct.

Male genitalia (figs. 24—28). Tegumen and uncus stronger than in *A. asiaticus* (WALS.); socius membranous, vestigial. Sacculus provided with strong median process and very short free termination. Aedeagus curved, somewhat bent to the left in distal part, armed with a variably shaped ventro-lateral (directed to the left) thorn.

Female genitalia (figs. 159, 160). Sterigma as in *A. asiaticus* (WALS.) but with shorter, less tapering anteriorly cup-shaped portion of sterigma the proximal corners of which are long, rounded apically. Antrum somewhat smaller and more delicate than in mentioned species; ductus bursae long, with cestum reaching about its middle. Pregnital sternite as in *A. subrufanus* (SNELL.).

Larva. Mature larva 23 mm; grey-green to green, suffused ochreous dorsally; head and prothoracic legs black; pinacula pale whitish green; prothoracic shield ochreous yellow marked with black (description based on characteristics by YASUDA, 1975 and own data).

Bionomy. Moth collected in Hokkaido in June and July, in Honshyu between beginning of May and end of July and in Kyushu in August. Host plants (after YASUDA, 1975): *Malus pumila* MILL., *Sorbus commixta* HEDL., *Prunus salicina* LINDL., *P. sargentii* REHDER, *P. yedoensis* MATS. (*Rosaceae*), *Chloranthus serratus* ROEM. & SCHULT. (*Chloranthaceae*), *Houttuynia cordata* THUNB. (*Sauraceae*) and *Akebia quinata* DECAISNE (*Lardizabalaceae*).

Distribution. Japan only: Hokkaido, Honshu and Kyushu.

Archips tharsaleopus (MEYRICK)

In this species two subspecies are distinguished. The nominate subspecies is recorded from Tien-mu-shan and Tapaishan (South Shensi) and ssp. *yunnanus* North Yunnan, China.

Archips tharsaleopus tharsaleopus (MEYRICK, 1935)

Cacoecia tharsaleopa MEYRICK 1935 [in:] CARADJA & MEYRICK, Mater. *Microlepidopt.* Faun. Chin. Prov.: 50. Type locality: Tien-mu-shan. Holotype (male): „Tian-Mu-Shan, China, H.[ÖENE], 5300, V. [19] 32”, G. Sl. 6806 [BM]. Coll. BM.

Male. Labial palpus somewhat larger than 1, brownish; head pale brown, thorax more ochreous. Forewing 9—11 mm, similar in shape to that in two preceding species but with somewhat longer apex and broader costal fold which extends to beyond 1/3 of costa. Ground colour ochreous cream, paler in basal part of wing, suffused with pale brownish-grey dorsally and beyond the disc; costal fold concolorous with suffusion. Pattern consists of large dark ferruginous brown basal blotch suffused dark brown towards costal edge. Median fascia paler, less ferruginous in shade, narrow in costal third, broad and diffuse in dorsal half, with anterior edge concave, extending from end of costal fold to middle of dorsum, connecting submedially with end of basal blotch. Subapical blotch slender, extending from beyond middle of costa to before apex. Several brownish grey transverse strigulae and lines beyond median fascia and in apical and terminal part of wing. Apex dark brown. Fringes concolorous with ground colour, more cream before tornus, brownish at apex distally. Hindwing as in preceding species, cream, hardly strigulated transversely with brownish in apex area, brownish grey in basal part. Fringes pale cream, pale brownish from beyond vein cu_2 .

Female. Similar to that of *A. ingentanus* (CHR.) but with stronger convexity of basal part of costa and more sinuate termen. Forewing 14 mm. Ground colour pale brownish cinnamon, somewhat paler towards tornus; delicate dark brown strigulation developed. Pattern brown, represented by slender marking at 1/3 of costa being a remainder of median fascia, followed by a curved line terminating at middle of dorsum and slender, subtriangular blotch extending from middle of costa to before apex. Fringes concolorous with ground colour, brown at apex, brownish at the concavity of termen. Hindwing brownish to vein cu_2 , then orange-cream darkening towards apex, distinctly strigulated with brownish. Fringes orange and brownish respectively mixed rust at apex.

Variation. The male often pale, with brownish yellow ground colour of the forewing and more or less distinct brown pattern. Transverse strigulation often well developed, especially strong in basal and median portions of the wing. In some specimens subapical blotch followed by thick, arched line terminating in dorsal part of termen. Slight variation in breadth of forewing noticed.

Male genitalia (figs. 29—33). Tegumen large; uncus thick, rather straight

apically; socius membranous. Ventral prominence of valva situated medially; sacculus with thorn at 1/3 length and large spined termination (spines on more than 1/3 of distal part of sacculus dorsally). Aedeagus slightly curved, provided with ventro-apical plate rounded at the end ventrally, minutely dentate laterally (right side, some dents large).

Female genitalia (fig. 161, 162). Eighth tergite large; sterigma long with well developed cup-shaped part provided with short, rounded anterior prominences. Distal portion of sterigma with strong median process; distal lobes well sclerotised, large. Antrum sclerite slightly longer than cup-shaped part of sterigma; ductus bursae provided with long cestum reaching to its middle, broadening at corpus bursae; signum with unequally large basal parts. Pregenital sternite as in fig. 161.

Bionomy. Moth collected from beginning of May till September in Tapaishan up to 1700 m above sea level.

Distribution. West Tien-mu-shan and Tapaishan (South Shensi) in China.

Archips tharsaleopus yunnanus ssp. nov.

Holotype male: „Li-kiang (China), Provinz Nord-Yunnan, 25. VIII. 1934, H. HÖNE". G. Sl. 20631. coll. ZFMK.

Paratypes, 14 males and 1 female, same label, dated: 20. VI., 2—29. VII. 3—20. VIII. and 1. IX. in Coll. ZFMK and ZZSD.

Male. As in nominate subspecies but in the majority of the specimens distal half of forewing more densely strigulated. Some specimens with distinct deep brown pattern.

Female (a rather damaged specimen) much paler than in nominate subspecies.

Male genitalia (figs. 34, 35) differ from those in the nominate subspecies mainly in the shape of the termination of aedeagus which is larger and minutely dentate.

Female genitalia (fig. 163) with somewhat shorter cup-shaped part of sterigma and antrum. Differences in signum may be of infrasubspecific importance.

Comments. This subspecies is known to date exclusively from the mountains of North Yunnan. For the dates of the collection of specimens see above.

Archips ingentanus (CHRISTOPH, 1881)

Tortrix ingentana CHRISTOPH, 1881, Bull. Soc. imp. Nat. Moscou, **56**: 64. Type locality: Vladivostock (U.S.S.R.), type female: „Wladiwostok ♀, CHRISTOPH coll. 250". Coll. BM.

Male. Labial palpus ca 1.5, orange to rust brown; remaining parts of head rather concolorous; abdomen pale brownish cream. Forewing 9—12 mm, usually 10 mm. Forewing seemingly broader and more strongly expanding terminally than in preceding species; costal fold slightly shorter. Colouration usually darker, more brownish grey in hue; apex of wing very often darkening. Hindwing with

larger and usually darker brownish grey anterior area reaching to vein cu_2 . Distal portion of wing also darker, mixed orange. Otherwise as for *A. subrufanus* (SNELL.).

Female darker, more brownish than the male. Forewing 13—16 mm, slightly broader than in *A. subrufanus* (SNELL.). Ground colour, pattern and transverse strigulation as in that species, but hindwing darker, more brownish grey, orange-yellow in distal half, with fringes darker than in *A. subrufanus* (SNELL.).

Variation as in the preceding species. The males often with a distinct greyish suffusion extending mainly in the median and costal parts of the wing. Many specimens have an indistinct pinkish hue. Occasionally pale coloured specimens occur with an orange-rust pattern and a more cream ground colour on the forewing. Females occur with dark reticulation forming often irregular transverse lines on distal half of wing. Pattern often distinct, consisting of a median fascia and subapical blotch.

Male genitalia (figs. 36, 37). Tegumen with fairly strong uncus; socius vestigial; sacculus shorter than in *A. subrufanus* (SNELL.) with larger, variably shaped submedian thorn and somewhat shorter spined termination. Aedeagus slightly curved ventrad, provided with narrow, acute termination and strong lateral tooth directed to the left subterminally. About 10 cornuti in vesica. Length of aedeagus somewhat variable.

Female genitalia (figs. 164, 165). Sterigma large with strong median process and large well sclerotized distal lobes; anterior, cup-shaped part about half length of lamella postvaginalis, with very short portion as broad as the latter, with proximal lateral prominences short, asymmetrical (left side larger). Antrum fairly short, curving to the right, tapering terminally; ductus bursae long with cestum reaching almost to middle, strongly broadening basally. Signum large.

Seventh sternite rather similar to that in *A. subrufanus* (SNELL.) with slightly shorter submedian processes.

Bionomy. The moth has been collected in Hokkaido between mid-July and mid-August, and in Honshyu from mid-May till end of September. KUZNETSOV (1973: 78) collected it between 23. VI. and 22. VIII. in Iuzhnoe Primore and between 7. VII. and 28. VIII. in S. Kurile Is. He noticed that in first decade of August larvae of every instar occur. Pupation in the Kurile Is. takes place between 7. VI. and 8. VIII. Food plants, according to YASUDA (1961:62), are *Disporum smilacinum* A. GRAY, *Abies firma* SIEB. & ZUCC., *Houttuynia cordata* THUNB. and *Petasites japonicus* MAXIM. After KUZNETSOV (op. cit.) it lives on further 25 plant species (e. g. belonging to the genera, *Acer* L., *Cerasus* MILL., *Filipendula* MILL., *Fragaria* L., *Lonicera* L., *Malus* MILL., *Polygonum* L.) occurring in various biotopes even in the coniferous forest zone in the mountains. Hibernation probably as third instar larvae. In spring they feed on buds and then bind or roll the leaves.

Distribution. U.S.S.R.: S. Kurile Is., Primore, S. Primore, S. Sakhalin; North Korea; China: Manchuria; Japan: Hokkaido, Honshyu. OBRAZTSOV (1955: 205) lists also Kashmir and the Hindukush Mts. and KUZNETSOV (op. cit.)

mentions „N. India”. All such data need confirmation, but it seems unlikely this species is so much expanding southwards.

Comments. Externally this species is extremely similar to *A. subrufanus* (SNELL.). Because of the rather large and similar variation in both species, determination, based on external characters is difficult and only typically coloured specimens are distinguishable. In the two species the differences in the genitalia in both sexes are distinct. Because of its superficial similarity *A. subrufanus* (SNELL.) was treated as a synonymus for instance in the catalogue by OBRAZTSOV (1955:205). The interpretation of illustration of the female genitalia of *A. capsigeranus* (KENN.) as belonging to this species (KAWABE 1965: (28)) is incorrect.

Archips enodis sp. nov.

Holotype, male: „West Tien-mu-shan, Prov. Chekiang, 24. 9. 1932, H. HÖNE”. G. Sl. 20638. Coll. ZFMK.

Paratypes 23 ♂♂ and 6 ♀♀ identically labelled as the type but dated 17 and 18. VI., 22—29. VIII., 1—24. IX. (males) and 17. VI., 31. VII., 28. VIII. and 24. IX. (females). Coll. ZFMK and ZZSD.

Male very similar to male of *A. subrufanus* (SNELL.) Forewing 8—10 mm. Holotypes characterised with pale brownish head and thorax and cream brownish abdomen with yellowish cream apical tuft. Ground colour of forewing pale yellow-brown-cream, costal fold somewhat darker, weak brownish suffusion in basal area of wing. Pattern ochreous brown, rather indistinct except for subapical spot which is the darkest. Strigulation of distal part of wing scarce, concolorous with pattern. Fringes concolorous with ground colour, brownish to mid-termen. Hindwing pale brownish grey to vein *cu*₁, then cream, weakly mixed with yellowish apically; fringes greyish and dark cream respectively.

Female as in the above mentioned species. Forewing 10—13 mm, brownish, slightly mixed with cinnamon, strigulated with brown; pattern vestigial, brown. Hindwing brownish grey, orange cream from beyond vein *cu*₁, often strigulated with brown in distal part.

Variation. In few specimens the pattern rather distinct, cinnamon-brown to yellow-brown and ground colour suffused with greyish brown except for distal part of wing where more or less dense transverse strigulation occurs. In females the pattern is sometimes rather distinct, especially in costal portion of wing. In both sexes the sizes and somewhat also the breadth of forewing are variable.

Male genitalia (figs. 38, 39). Uncus more slender than in three preceding species, rather rounded apically; socius membranous; arm of gnathos fairly short. Sacculus with long free termination, spined densely from before middle, provided with a dent situated before 1/3 its length. Aedeagus terminating in short ventrolateral (directed to the right) dent, spined minutely in distal portion. About 10 cornuti in vesica.

Female genitalia (figs. 166, 167). Sterigma with proportionally large, cup-shaped portion provided with somewhat asymmetric anterior prominences and

rather short dorsal plate terminating in delicate median process. Distal lobes of sterigma rather delicately sclerotised. Antrum delicate with sack-shaped process directed to the right. Ductus bursae shorter than in preceding species; cestum half length of ductus bursae. Signum long with proportionally short proximal part of basal sclerite. Subgenital sclerite provided with deep median incisure, very small submedian prominences and rather rounded, strongly sclerotised parts.

Bionomy: unknown except for dates of collection of the type series.

Comments. The new species is externally very similar to *A. subrufanus* (SNELL.) but the majority of the males are paler, with less distinct pattern and with rather yellow shade.

Archips subrufanus (SNELLEN, 1883)

Tortrix subrufana SNELLEN, 1883, Tijdschr. Ent., 26: 187, pl. 11, fig. 3, 3a. Type-locality: Sujfun. Type material not seen.

Archippus (*Archippus*) *coreensis* PARK, 1976, Trans. lepid. Soc. Jap., 26 (3, 4): 110, figs. 1—3. — *synon. nov.* Type-locality: Suweon, Korea. Holotype, male: „Korea, Suweon, 10. IX. 1974, Y. I. LEE”, G. Sl.: 740 [PARK]; Coll. Inst. Agricultural Sciences, Suweon.

Male. Labial palpus shorter than 1.5, orange-cream to yellow-ferruginous; remaining parts of head and thorax yellow-brown with cinnamon hue. Forewing 8—10 mm, broad, weakly expanding terminally; costa gently curved in basal third, then tolerably straight; apex very short, pointed, termen weakly concave postapically; costal fold fairly slender, tapering in distal portion, reaching to 1/3 of costa followed by somewhat up-turned short portion of costa. Ground colour pale ochreous-cream to brownish yellow with slight cinnamon hue. Indistinct pinkish grey shine occasionally present. Transverse strigulation delicate, forming irregular lines in distal area of wing; pattern browner than ground colour. It consists of a broad, partially diffuse basal triangle, a usually distinct median fascia several times broader in dorsal half than at costa, diffuse distally, and a subapical blotch followed by a pale, narrow subterminal marking; brown occasionally marked with a suffusion of blackish scales at apex or on costal part of termen. Fringes concolorous with ground colour, browner terminally, especially on costal part of termen. Hindwing cream, more or less distinctly mixed pale orange in apical portion, pale brownish grey in anal area and basally; fringes rather concolorous with wing, mixed brownish at apex.

Female. Labial palpus somewhat shorter and darker than in male. Forewing 11—14 mm, rather uniformly broad throughout; costa strongly curved outwards in basal portion, indistinctly concave subapically; apex fairly long with scales of costal part of fringes protruding outwards; termen concave postapically. Ground colour usually darker, more brown than in male, pattern weak, brownish to brown, consisting of a weakly developed median fascia represented usually by a line forming its anterior edge accompanied by a suffusion at dorsum or costa, and a fairly well developed subapical blotch; apex and, partially, termen

marked dark brown. Dense brownish transverse strigulation all over the wing, atrophying costally. Fringes brownish, concolorous with ground colour at tornus. Hindwing darker than in male.

Variation. Males often with ground colour of forewing yellowish cream, atrophied strigulation and yellowish ochreous diffuse pattern. In such specimens the hindwing is almost completely cream. Some females are distinctly dark, brownish, often slightly mixed with grey along costa, with well developed costal part of median fascia and subapical blotch. Rarely the females resemble the males in coloration, having, however, the basal marking reduced to a diffuse spot at dorsum.

Male genitalia (figs. 40, 41). Uncus strong; socius vestigial. Saccus long with a submedian tooth and a strong free termination; spines dense from about middle length of saccus. Aedeagus protruding and pointed ventro-terminally, provided with very strong dorso-lateral hook; caulis large; ca 10 cornuti in vesica.

Female genitalia (figs. 168, 169). Sterigma large with slender median process and large distal lobes; cup-shaped portion well developed with rather short broad part; sclerite of antrum proportionally short, rounded proximally, slightly bent. Ductus bursae long with cestum reaching to middle; signum large, typical of this group.

Seventh sternite with deep incisure of distal edge and rounded distal lobes, rather weakly sclerotised medially, provided with large wing-shaped processes.

Bionomy. The moth is on the wing from the beginning of July till the second decade of September, probably in two generations in southern parts of its range. Food plants unknown but the larva is certainly polyphagous.

Distribution. U.S.R.R.: Shantar I., Iuzhnoe Primore; N. Korea; Japan: Hokkaido and Honshyu. According to KUZNETSOV (1973:80), also in China based on earlier literature. One specimen from Tien-mu-shan examined shows, however, some slight differences in the female genitalia; it is thus not included with this species. The population from Tien-mu-shan may belong to a distinct subspecies, but the problem cannot be solved without examination of further material.

Comments. This species is externally extremely similar to the preceding two species. It differs strongly, however, in having a large both on the aedeagus and a differently shaped antrum.

Archips seditiosus (MEYRICK)

This species is known of two subspecies, both described from Java. *A. seditiosus orientalis* (DIAK.) shows very slight differences to the nominate subspecies. Having no opportunity to examine any specimen of the East Java population I preserve it as a distinct subspecies.

Archips seditiosus seditiosus (MEYRICK, 1921)

Cacoecia seditiosa MEYRICK, 1921, Zool. Meddl., 6: 147. Type locality: Sindanglaya (Java occ.). Holotype male: „Java occ., Sindanglaya, 1882, ♂”, G.Sl. 10125 = 9170 RNH. Coll. RNH.

Cacoecia brachytoma MEYRICK, 1932, Ecot. Microlep., 4: 341. Type locality: Malaya Peninsula: Kuala Lumpur. Holotype: ♂: „Malaya Peninsula, 25. IV. 32, Kuala Lumpur”; „*Cinnamomum zeylonicum*, B”, G.Sl. 273 [BM]; Coll. BM (NH).

Misdetermination:

micaceana (part.): DIAKONOFF, 1941: 387 (*Cacoecia*).

Male. Labial palpus shorter than 1.5, rust brown; remaining parts of head and thorax somewhat darker. Forewing ca 9 mm, slightly expanding terminally with costa curved outwards in basal third, then delicately concave; apex slightly prominent costally, very short; termen hardly concave postapically; costal fold rather uniformly broad throughout excepting terminal fourth, reaching ca 1/3 of costa. Ground colour cinnamon-yellow, cream at tornus; pattern dark rust-brown. Basal blotch delicate; median fascia slender in costal part, broadening medially and dorsally, marked with black scales at disc, with scattered grey scales along edges. Anterior edge of fascia from 1/3 of costa. Subapical blotch from ca middle of costa, darkest proximally, extending to before apex, followed by elongate subtriangular terminal marking reaching dorsal third of termen. Between the two latter elements a blackish spot present; brown-rust stripe at termen near apex also marked by small groups of blackish scales. Fringes cream, ferruginous-orange in costal half, blackish at apex terminally. Hindwing brownish with apical portion yellowish cream marked with few transverse brownish strigulae; fringes brownish grey, cream mixed slightly orange in apex area.

Female. Head, thorax and abdomen brown. Forewing 9 mm; costa strongly curved outwards in basal third, distinctly concave in median part; apex strongly prominent costally, fairly long; termen gently sinuate with deepest point at termination of vein m_2 , slightly prominent near tornus. Ground colour brownish mixed olive-grey, strigulated with brown. Pattern reduced to indistinct dark brown subapical blotch. Apex somewhat suffused brown. Fringes rather concolorous with ground colour, blackish at apex. Hindwing pale ochreous cream with slight admixture of brownish, brownish in caudal portion; indistinct brownish transverse strigulation in distal part of wing developed. Fringes cream-brown, darker at apex.

Male genitalia (figs. 42, 43). Uncus slender; socius rather well developed; sacculus fairly broad, broadening submedially with a delicate dentate plate developed near its ventral edge. Free termination of sacculus sharp, curved upwards, dentate dorso-basally. Aedeagus slightly bent, provided with a large dorso-lateral process directed ventro-laterally (to the right) and a small tooth before end ventrally. Coecum penis very long; two long cornuti in vesica.

Female genitalia (fig. 170). Sterigma fairly broad with short cup-shaped part

fused with antrum, characterised by lateral sack-shaped prominence. Ductus bursae very long with long, thin cestum; signum large.

Bionomy. According to DIAKONOFF (1941:382) larva feeds on leaves of *Capsicum annuum*, *Citrus* L., *Albizia* DURRAZ, *Hibiscus subdariffa* ROTTL., *Derris* LAUR., *Solanum tomentosum* L., and in flower buds of *Tephrosia purpurea*. Moths: September and October in Sumba. Probably in several generations yearly.

Distribution. The species was originally described from W. Java. DIAKONOFF (1947:343) mentions it from E. Java, from Tonkin and Hoa-Binh in Vietnam (1948:343) and from C. and W. Sumba (1947: 382 and 1952: 146). *C. brachytoma* was described from Kuala Lumpur, Malaya.

Archips seditiosus orientalis (DIAKONOFF, 1941)

Cacoecia seditosa orientalis DIAKONOFF, 1941, Treubia, **18** (2): 414. Type locality: Nongkodjadjar, East Java. Type series (unknown to me) bear after the original paper the following label: Tengger Mts, Nongkodjadjar, 1300 m, 5. V. — 27. IX. 1940, at light (A.M.R. WEGNER).

According to the original description this subspecies is distinct by light ochreous ground colour and dark brown or greyish pattern without any admixture of pink, purple or ferruginous. There are no difference in the genitalia between this subspecies and the nominate form.

Archips oporanus (LINNAEUS, 1758)

Phalaena Tortrix oporana LINNAEUS, 1758, Systema Naturae, ed. 10:530. Type locality: not mentioned originally.

Phalaena Tortrix piceana LINNAEUS, 1758, System Naturae, ed. 10: 531. Type locality: Europe.

Lozotaenia dissimilana BENTLEY, 1845, The Zoologist, 3: 1000. Type locality: New Forest, England.

Cacoecia similis BUTLER, 1879, Ill. type Specimens *Lepidopt. Heterocera* Brit. Mus., **3**: 79, pl. 60 fig. 4. Type locality: Japan. Lectotype, female: „Japan, 77.9”, G. Sl. 7858 [BM]. Coll. BM.

Cacoecia impervia MEYRICK, 1928 [in:] JOANNIS, Ann. Soc. ent. Fr., **98**: 473, Suppl. 711. Type locality: Choang su Phi, Tonkin, Vietnam. Holotype, male: „Choang su Phi, Tonkin”, G. Sl. 3736 [VIETTE]. Coll. MHNP. — *synon. nov.*

Cacoecia bathyglypta MEYRICK, 1932 [in:] CARADJA, Bull. Sect. Stn. Acad. Roum., **15**: 23. Type locality: Shanghai, China. Lectotype, male (designated by RAZOWSKI, 1971: 469): „Shanghai, IX., [19]18”, G. Sl. 10312. Coll. MGAB.

Male. Labial palpus ca 1.5, rust-brown or ferruginous-yellow; head rust-brown to brown, with front paler ventrally; thorax concolorous with upper part of head; abdomen paler and greyer. Forewing 7—9 mm, hardly expanding terminally with costa convex in basal third and indistinctly concave or straight subterminally; apex very short; termen hardly concave postapically. Costal fold

to beyond $1/3$ of costa, slender, tapering in distal portion. Ground colour ferruginous, more or less dark, usually with violet-pink shine. Costal fold more violet-grey, paler scaled towards middle of wing; basal portion of wing mixed grey or sprinkled whitish, similar suffusion in distal part of wing costally. Pattern dark rust-brown, with dark costal parts excepting the subapical blotch which is edged cream, grey or pale brownish. Basal blotch typically developed, median fascia atrophied costally, produced into a narrow process near middle distally, often accompanied by a dark spot in disc. Subapical blotch paler than remaining parts of pattern, subterminal pattern well separated. Fringes rather concolorous with ground colour or greyer, rust-brown at apex or along an occasionally developed apical strip. Hindwing with indistinctly differentiated apical part, rounded terminally; it is brownish, grey-brown, often with rust apical portion; fringes somewhat paler than terminal portion of wing.

Female. Head and thorax usually paler than in male, more rust-ochreous. Forewing 7—14 mm, usually 10 mm; uniformly broad throughout with costa distinctly curved outwards basally then straight or hardly concave subterminally; apex slightly longer than in male, provided with extending costal scales; termen somewhat concave postapically with maximum at vein m_2 . Ground colour ochreous to orange, often mixed with brownish. Pattern rust-brown, often with reddish shine, consisting of indistinct basal blotch, rather slender median fascia broadening towards dorsum, slender subapical blotch and indistinct subterminal pattern. Distinct transverse strigulation forming with suffusion of veins, reticulation in basal (when blotch atrophied) and terminal parts of wing well developed. Fringes concolorous with ground colour or darker, dark at apex and postapically. Hindwing brownish to brown, rust to ochreous distally, rarely grey with whole distal third ochreous-cream. Strigulation of pale part occasionally present; fringes brownish and ochreous respectively.

Variation. Besides the above described variations in colour intensely dark specimens, mainly males occur, in which the forewing pattern is dark brown and the ground colour grey-brown with a violet shine. The hindwings in these specimens are dark brown. Some females are characterised by the almost unicolorous orange hindwing and weak pattern replaced by strong transverse strigulation or reticulation. The variation is not correlated with the distribution of the species. Form *impervia* is characterised by the cream ground colour suffused with ferruginous, and the shining pink-violet rust-brown pattern.

Male genitalia (figs. 44, 45). Uncus rather slender; socius indistinctly sclerotised. Valva large with ventral edge more or less strongly convex submedially; sacculus provided with long, slender terminal part extending somewhat beyond valva, sparsely bristled, smooth apically. Aedeagus long, terminating into a slender, downwards curved distal process. Split of aedeagus very broad, ventrolateral. Shape of uncus and proportions of sacculus and aedeagus show slight variation.

Female genitalia (fig. 171). Sterigma large, cup-like, strongly elongated proximally where partially fused with sclerite of antrum, with rather short median

process and large strongly sclerotised distal lobes. Ductus bursae proportionally short, broadened and somewhat swung distally; cestum absent. Signum long with fairly short basal sclerites.

Seventh sternite distinctly sclerotised distally, provided with some delicate folds and minute spines at terminal edge. Dorsal pits absent.

Larva greenish with dark brown or black head and similarly edged prothoracic shield. Pinacula and thoracic legs brown. Chaetotaxy described by SWATSCHEK (1958:39).

Bionomy insufficiently known: however, this species is a pest of pine. According to SWATSCHEK (op. cit.) data concerning this species in the plant protection literature are mixed up with those of *Rhyacionia duplana* (HÜBNER). First instar larva mines, then some needles are spun to form a tube. Hibernation in third larval instar. The larva then feeds from April to June on young shoots, spinning the needles. Hibernation and pupation in feeding place of larva. Moth flies from end of May till mid-August. In Europe there is a single generation yearly, but probably in Southern China two generations appear as in Shanghai some specimens were collected in mid-September. Some additional data can be found in the papers by ESCHERICH (1931:225) and KUZNETSOV (1973:78). Food plants: various coniferous trees such as *Pinus* L., *Picea* DIETR., *Abies* MILL., *Larix* MILL. Biotopes: coniferous and mixed forests.

Distribution: Palaearctic Region: British Isles, France, N. Italy, C. Europe, Scandinavia, E. Europe. In Asia: Iuzhnoe Primore, Korea, China to Kwantung, Japan. No data from Central Asia.

Comments. In this paper *Cacoecia impervia* MEYERICK is synonymised and *bathyglypta* and *similis* are treated also as conspecific with *A. oporanus* (L.). The lectotype of *Cacoecia bathyglypta* MEYR. slightly differ from the European specimens in the shape of the aedeagus and sacculus but these are of infrasubspecific value. Further specimens from the type-locality (Shanghai) have been examined and support this opinion. *Cacoecia similis* BUTLER described from Japan was long treated as a distinct subspecies, even in recent years (c.f. KUZNETSOV, 1973:78). Examination of large material from Japan confirms earlier opinions (REBEL, 1901:85 and others) on the conspecificity of the described specimens. The Japanese populations show distinct variation in size and coloration and do not differ externally or in genitalia from the European specimens.

Archips decretanus (TREITSCHKE, 1835)

Tortrix decretana TREITSCHKE, 1835, Schmett. Eur., 10 (3): 56. Type locality: Europe (after title of work).

Phalaena Tortrix betulana HÜBNER, 1787, Beitr. Geschichte Schmett., 1 (2): 3, pl. 1, fig. A, 13. Type locality: district of Augsburg. Type material: lost -- **nom. oblitum**.

— *Tortrix testaceana* EVERSMAAN, 1844, Fauna Volgo-Ural.: 486. Type locality: districts of Kasan and Orenburg.

Misidentification: *asiatica* (part.): OBRATSOV 1955: 204 (*Archips*).

Male. Labial palpus ca 1.3, ochreous-cream to pale yellowish brown; head rather concolorous; thorax slightly browner; abdomen greyer with pale brownish cream terminal tuft. Forewing 9—10 mm, somewhat expanding terminally. Costa gently curved outwards to before middle, then tolerably straight, slightly produced at apex; apex short; termen delicately concave postapically, convex towards tornus. Costal fold very slender, fully developed only at base, then in the form of an erect edge to beyond $1/3$. Ground colour pale yellow-brown to ochreous-cream, darkening basally, delicately strigulated brown. Costal fold brownish grey, basal blotch broad, reaching costa at most with a narrow strip, brownish to olive-brown in colour. Proximal edge of median fascia from $1/3$ of costa to about $2/3$ of dorsum straight or twice convex, dorsal half of fascia several times broader than the costal part, diffuse. Costal and anterior portions of median fascia browner than remaining ones; subapical blotch from beyond middle of costa paler and diffuse distally; terminal pattern atrophied; brown suffusion or strip at apex. Basal blotch and median fascia connecting with brownish grey suffusion in median part of wing. Brown dot at end of median cell costally. Fringes concolorous with ground colour, becoming browner towards apex, dark brown at apex terminally. Hindwing with short, rounded apex, brownish grey, cream to whitish costally and terminally, mixed cream at apex; fringes rather cream with median line, mixed greyish at apex.

Female. Forewing 11—13 mm, rather uniformly broad throughout; costa distinctly curved at base, gradually delicately concave in median area, produced at apex; apex fairly long; termen distinctly concave postapically, then convex. Ground colour brownish cream to ochreous, often with admixture of ferruginous, with fine brownish reticulation or transverse strigulation. Pattern, if developed, in form of somewhat darker or browner diffuse blotchs at the edges of wing representing remainders of typical markings. Apex marked brown or rust-brown. Fringes concolorous with ground colour, mixed cream at tornus, browner at apex where terminations occasionally black-brown. Hindwing slightly darker than in male.

Variation. Some males examined have a more rust ground colour and darker pattern. In these examples the ground colour may be mixed leaden-grey, slightly shining violet and the pattern is indistinctly edged cream. Forewing of females often monochrome, varying in colour from pale brownish cream to brownish or ferruginous orange.

Male genitalia (figs. 46, 47). Uncus more slender than in preceding species; socius almost completely atrophied. Valva large, convexly rounded ventrally; sacculus slender, provided with long, distinctly spined (except apex) terminal portion slightly extending beyond valva. Aedeagus long, provided with long, slender distal part terminating into somewhat downwards curved apical process. Shape of aedeagus and sacculus somewhat variable.

Female genitalia (fig. 172). Sterigma large with proximal part calyx-shaped, partially fused with sclerite of antrum. Median process fairly large, distal lobes strongly sclerotised, very large. Ductus bursae proportionally short with cestum

reaching to about middle. Proximal end of cestum distinctly broadened; signum well developed with fairly large capitulum and long proximal part of basal sclerite.

Seventh sternite deeply incised in middle of distal edge with well developed sublateral sclerotised areas and extended submedian folds.

Larva yellowish brown or greenish brown, paler laterally, with brown head and prothoracic plate (KENNEL, 1908:128).

Bionomy. Moth from mid-June to mid-August. Biotope: deciduous and mixed forests, exceptionally steppes (in Far East according to KUZNETSOV, 1973:78). Larva in late summer and autumn (insufficient data in literature) and then in April and May (according to KUZNETSOV from second decade of May till ca mid-July in Primorskij Kraj). Hibernation in an early instar. Then the larva spins the leaves, mainly of new shoots, of various dicotyledonous plants and according to KUZNETSOV (op. cit.) also on some coniferous trees. Pupation in feeding place. Food plants: *Betula* sp., *Myrica gale* L., *Vaccinium myrtillus* L. (KENNEL 1908:128), *Betula davurica* PALL., *B. platyphylla* SUK., *B. fruticosa* PALL., *Alnus hirsuta* TURCZ., *Carpinus cordata* BLUME., *Filipendula* sp., *Fraxinus rhynchophylla* HANCE, *Malus manshurica* (MAX.) KOMAROV, *Prunus* sp., *Quercus mongolica* FISCH., *Rosa* sp., *Salix brachypoda* KOMAROV and *Schizandra chinensis* C. KOCH, in orchards and gardens observed on apple, plum, rose and sorbtree (in Far East, KUZNETSOV op. cit.).

Distribution. British Isles; Central Europe, S. Scandinavia, E. Europe, Korea, Primorskij Kraj, Iuzhnoe Primore, Japan: Hokkaido.

Comments. OBRAZTSOV (1955:204) treated *Tortrix testaceana* EVERSM. and *A. asiaticus* (WALS.), as subspecies of *A. decretanus* (TREIT.). The first was described from the Urals and is characterised after the original description only by its smaller size. KENNEL (1908:149) treated it as a separate species but suggested it may be a „local form” of *A. decretanus* (TREIT.). In this paper it is considered a synonym. The problem of *A. asiaticus* (WALS.) is now clear and there is no doubt that this is a separate species (cf. p. 81).

Archips podanus (SCOPOLI, 1763)

Phalaena podana SCOPOLI 1763, Ent. Carn.: 232. Type locality: Carniola (from title of work).

Phalaena Tortrix fulvana (DENIS & SCHIFFERMÜLLER), 1775, Wien. Verz.: 128. Type locality: Vienna District (after title of work). Type material: lost.

Tortrix pyrastrana HÜBNER, [1799], Samml. eur. Schmett. pl. 20 f. 124. Type locality: Europe (after title of work). Type material: lost.

Tortrix congenerana HÜBNER [1824], ibid. pl. 47 fig. 295. Type locality: Europe (after title of work). Type material: lost.

Tortrix podana var. (?) *sauberiana* SORHAGEN 1882, Berl. ent. Z., 26: 131.

Male. Labial palpus shorter than 1.5, yellow-brown more or less suffused brown, with terminal joint paler. Head and thorax brownish to yellow-brown,

abdomen usually paler with pale terminal tuft. Forewing 9—11 mm, somewhat expanding terminally with costa gently curved to middle, then indistinctly concave; apex short, slightly prominent costally; termen delicately concave postapically. Costal fold slender, fully developed to $1/5$ of the edge, then in form of an upturned margin. Ground colour ochreous-orange with more or less distinctly developed rust or pinkish hue. In basal half of wing greyish violet-pink shining suffusion present. Costal fold rather concolorous with ground colour but mixed with brown; pattern rust-brown to rust, especially in distal portions. Basal blotch subtriangular, pale-edged, followed towards costa by cream-grey or ash-grey broad suffusion. Median fascia rather slender, especially towards costa where it is atrophied or well preserved, dark. Its proximal edge extending from $1/3$ of costa, straight or convex medially, distal edge in dorsal half of wing usually diffuse. Subapical blotch large, extending rather from mid-costa and connecting with a much paler, subtriangular or stripe-like subterminal marking. Apex and termen beyond it suffused black. Fringes concolorous with ground colour at tornus, brownish in remaining portions, mixed black-brown in the concavity of termen beyond apex. Hindwing brownish with apical portion orange, often transversely strigulated with brown. Fringes brownish grey or paler with brownish basal line, mixed orange in apical area.

Female. Forewing 10—13 mm; costa distinctly curved outwards at base, slightly concave beyond middle; apex elongate, prominent costally; termen distinctly concave postapically. Ground colour ochreous or yellow-brown mixed rust, strigulated transversely or reticulated with brown or rust. Pattern indistinct in form of brownish or ferruginous brown diffuse blotches. Basal blotch atrophied or in form of a dorsal suffusion; median fascia usually disappearing in costal area where it may be represented by a line replacing the proximal edge; subapical blotch fairly well developed, terminal marking in form of an oblique line. Rust brown suffusion at apex. Fringes brownish, mixed brown in costal half of termen, cream at tornus. Hindwing brownish, orange in distal half, indistinctly darker strigulated; fringes cream with basal line brown along dark parts of wing and orange in the remaining part.

Variation. The above described typical form varies mainly in the intensity of coloration. Form *sauberiana* is characterised by dark brown mixed violet-grey forewing and brown-grey hindwing mixed rust apically. In the male the pattern is black-brown and the violet hue distinct, the pale scales are preserved only in front of the basal blotch. In the female the pattern is ill-defined.

Male genitalia (figs. 48, 49). Uncus rather delicate; socius very weak. Ventral edge of valva uniformly convex; sacculus slender with short free termination. Aedeagus somewhat bent in distal half, tapering terminally, provided with strong ventral dent apically.

Female genitalia (fig. 173). Proximal, cup-shaped part of sterigma broad, partially fused with equally broad large sclerite of antrum; distal part of sterigma with long median process; distal lobes large, well sclerotised. Antrum large, long, twisted in anterior portion; ductus bursae long; cestum broadening pro-

ximally, reaching to before middle of ductus. Signum long with fairly large capitulum and long proximal part of basal sclerite.

Seventh sternite strong, incised in middle of distal edge, provided with large folds extending ventrad.

Larva green with paler pinacula, red-brown head and prothoracic plate (the latter being dark edged after SWATSCHEK (1958:39) who also characterised the chaetotaxy).

Bionomy. The moth is on the wing from the beginning June till mid-August; in England it flies till end of July, in Sweden from end of June till beginning of August and in Holland till end of September. One female oviposits 300—375 opalescent eggs in 6—8 groups concolorous with the leaves. Newly hatched larvae immediately migrate to the underside of the leaves and construct silken shelters under which they feed on the parenchyma. Second instar larva feeds till beginning of October and occasionally hibernates, but usually hibernation occurs in the third instar and the larvae feed even till the beginning of November. Hibernaculum dense, hidden in crevice of a bark, bud axil etc. In April the larva is injurious to the buds, then flowers, leaves and fruit. Part of larvae pupate in May, the majority ca one month later in the 7th instar in the feeding place. Food plants are: *Cornus mas* L., *Corylus* L., *Cydonia* MILL., *Fagus* L., *Fraxinus* L., *Heracleum* L., *Juglans* L., *Lonicera* L., *Malus* MILL., *Myrica* L., *Picea* DIETR., *Pirus* L., *Populus* L., *Primula* L., *Prunus* L., *Ribes* L., *Rosa* L., *Rhododendron* L., *Salix* L., *Sorbus* L., *Tilia* L., *Trifolium* L., *Vaccinium* L., *Vitis* L. etc. Parasites are listed by THOMPSON (1944) and MORLEY & RAIT SMITH (1933). It may be a pest feeding on apple, pear, plum etc. (it sticks a leaf to the fruit and feeds on it externally). BOVEY (1966:527) lists further plants after some authors. The data from Japan (on *Citrus*) are incorrect, as this species is unknown from East Asia.

Distribution. Europe including British Isles and Scandinavia. OBRAZTSOV (1955:204) gives also Asia Minor and Syria. Further distribution data by this author seem incorrect. FREEMAN (1958:16) mentions this species from Vancouver and Ontario and SASSER (1921) states that it was introduced in 1919/20 from the Netherlands.

Archips vulpeculanus (FUCHS, 1903)

Cacoecia vulpeculana FUCHS 1903, Stett. ent. Z., 64: 3. Type locality: Konia. Type material (2 ♀♀) unknown to me.

Original description is as follows. „Vorderflügel rostbraunlich mit gleichfarbigen Franzen und einem dunklen Schattenstrif auf dem Innenrande vor dem Hinterwinkel, Hinterflügel bleichgrau mit breit rostgelblicher Spitze. 9—11 mm. ♀. Kleiner als *Podana*, die Flügel kurz und breit. Der Vorderrand der Vorderflügel hinter der Wurzel steil aufwärts strebend, aber dann nur sanft geschwungen. Die Färbung rein rostbräunlich, ohne veilgrauen Ton. Vorderflügel fein dunkel gegittert, das Wurzelfeld ganz ohne Abgrenzung, von der übrigen

Flügelfläche nicht geschieden. Ein breiter Schattenstreif, der beiderseits zerfließt, liegt auf dem Innenrande vor dem Hinterwinkel und reicht aufwärts bis in die Flügelmitte, tritt aber wenig hervor. Ein Costalfleck ist nicht vorhanden und das Saumfeld ausser der Gitterung unbezeichnet, also ohne den braunen Streif, der bei *Podana* oberhalb des Hinterwinkels aus dem Saume zieht. Keine Saumlinie. Die Franzem mit der übrigen Flügelfläche gleichgefärbt, ohne die für *Podana* charakteristische schwarzbraune Verdunkelung an der Spitze. Die Hinterflügel wie bei *Podana*, aber viel bleicher, auch die Unterseite ist bleicher und ungegittert. Kopf und Brustschild mit den Schulterdecken rostbraun, der Halskragen schwach ockergelblich. Rücken dunkelgrau, Bauch hell, ockergelblich. 2 ♀ aus Konia".

KENNEL (1908:709) and OBRAZTSOV (1957:311) suppose that *vulpeculana* is an individual form of *A. oporanus* (L.) but formally retain it as a valid species.

Archips breviplicanus (WALSINGHAM, 1900)

Archips breviplicanus WALSINGHAM 1900, Ann. Mag. nat. Hist., (7) 5: 382. Type locality: Gensan. Holotype, ♂: „Gensan, Corea, VII—IX, 1887, Ito coll., LEECH 1889 No. 60426". GSL. 5305 [BM]. Coll. MB.

Cacoecia criticana KENNEL, 1901, Dt. ent. z. Iris., 13 (1900): 213. Type locality: Amur district. Holotype, ♂: „Origin", GSL. 11574. Coll. ZMB.

Male. Labial palpus shorter than 1.5 ochreous-cream, darker scaled. Head ochreous-brownish, antenna greyer, thorax browner; abdomen brownish grey with cream apical tuft. Forewing 8—11 mm, somewhat expanding terminally (variable) with costa curved outwards in basal half, then straight or hardly concave subterminally; apex short, weakly protruding costad; termen gently concave postapically. Costal fold slender, reaching to beyond fourth of costa. Ground colour ochreous-cream slightly mixed with pinkish or rust-grey; with very delicate transverse brownish strigulation, often suffused grey in postmedian or distal portions costally. Pattern dark, deep brown, occasionally finely edged with cream. It consists of a subtriangular basal blotch terminating in middle of wing or producing sometimes a narrow strip reaching costa. Median fascia with well developed anterior portion and usually atrophied distal parts at costa and termen; with anterior edge extending from the end of costal fold. Subapical blotch paler, extending from mid-costa, diffuse distally. Apex or termen in apical area marked with brown. Fringes concolorous with ground colour, rusty brown terminally, brown in apical portion, pale at tornus. Hindwing pale brownish basally and anally, orange to vein cu_2 , cream costally. Apex short, rounded. Fringes cream, greyer beyond cu_1 with brownish basal line, mixed orange in apical area.

Female. Forewing 10—13 mm, similarly shaped as in *A. podanus* (SCOP.). Ground colour pale brownish with addition of cream, ochreous or grey, distinctly transversly strigulated with brownish or with well developed fine reticulation,

especially in distal half of wing. Pattern indistinct, pale brownish with hue similar to that of the ground colour. It consists of a weak basal suffusion dorsally, a more or less complete median fascia and a subapical blotch. Apex or termen to m_2 marked with brown. Fringes somewhat darker than ground colour. Hindwing brownish with costal and distal portions orange. Fringes variable, usually brownish, mixed orange in distal area of wing.

Variation. In the males intensity of the ground colour and completeness of pattern are distinctly variable. The median fascia often connects to the subapical blotch with grey suffusion, the latter occasionally atrophying. Females less variable.

Male genitalia (figs. 50, 51). Uncus fairly strong, socius vestigial; sacculus with rather short, densely spined free termination and less numerous spines reaching to middle of its length. Aedeagus gently bent beyond coecum penis, minutely dentate, especially ventrally, terminating into sharp tooth directed to the left and a smaller subterminal tooth rather ventro-laterally. Ca 20 cornuti in vesica.

Female genitalia (fig. 174). Distal part of sterigma large with well developed median process; distal lobes fairly well sclerotised; proximal part of sterigma short, the cup-shaped portion slender, slightly broadening at base laterally. Antrum very large, well sclerotised, somewhat curved at base to the right; ductus bursae fairly short with cestum reaching to beyond a third of its length; signum large with very short distal part of basal sclerite.

Seventh sternite deeply incised in middle of distal part, with rounded apical portions and well developed wing-shaped submedian processes.

Larva described and figured by KODAMA (1956: (3), pl. 3, fig. 1).

Bionomy. In Japan this species occurs in three generations yearly from May till August (KAWABE 1965: (28)). In Iuzhnoe Primore two generations are recorded (KUZNETSOV, 1973: 79), the moth having been collected 10—22. VII. and 17. VIII. — 25. IX. Larvae were feeding from 5—22. VI., pupation 23. VI. — 8. VII. KAWABE (op. cit.) mentions this species as being injurious to apple trees but also found on cherry and pear. The same author and YASUDA (1961: (60)) list the following food plants: *Alnus japonica* SIEB. & ZUCC., *Glycine* MAX. MERR., *Malus pumila* MILL., *Morus bombycis* KOIDZ., *Juglans mandshurica sieboldiana* MAKINO, *Pirus simonii* CARR. and *Triticum aestivum* L. whilst KUZNETSOV lists *A. japonica* SIEB. & ZUCC., *Fraxinus rhynchophylla* HANCE, *Crataegus* sp., *Prunus* sp., *Ulmus propinqua* KOIDZ. etc. That author realised that III—IV instar larvae hibernate and feed in the spring on buds spinning the leaves.

Distribution. Korea, China: Manchuria, U.S.S.R.: Primore, Iuzhnoe Primore, S. Sakhalin; Japan: Honshyu, Hokkaido. OBRAZTSOV (1955: 205) mentions also Amur territory, China and Himalaya; however, the latter seems uncertain.

Archips semistructus (MEYRICK, 1937)

Cacoecia semistructa MEYRICK, 1937, Exot. *Microlep.*, 5: 126. Type locality: Taichow in China. Holotype, ♂: „Taichow, China, IV. 9. 1935, coll.” G. Sl. 5308 [BM]. Coll. BM.

Archips brevicervicus KODMMA, 1960, Publ. ent. Lab. Univ. Osaka Pref., 5: (23), fig. 13, YASUDA, 1961, *ibid.*, 6: (59). Type locality: Japan: Sakai-city (Osaka). Holotype ♂: „Japan, Honsyu, Izumi, Sakai, 18. VII. 1954, T. YASUDA”; G. Sl.: JT-1044.; second description. Coll. UOP.

Male. Labial palpus ca 1.3, yellow-brown, cream terminally; remaining parts of head browner, rather concolorous with thorax; abdomen cream. Forewing 9—10 mm, weakly expanding terminally with costa bent to about middle, then tolerably straight; apex very short, rounded; termen not concave postapically; costal fold very short, reaching to 1/12 of costa, tapering terminally. Ground colour yellowish cream with weak admixture of brown, finely striped and sprinkled brownish; pattern brownish or yellowish brown. Basal blotch ill-defined, represented by a narrow fascia limiting dorsal half, of basal area of wing or in form of a basal suffusion. Median fascia slender, somewhat broadened medially, atrophied in dorsal third. Subapical blotch rather triangular; subterminal marking atrophied or as a line joining subapical blotch with dorsal part of termen. Fringes slightly darker than ground colour, cream at tornus. Hindwing cream slightly suffused with brownish and strigulate transversely with pale brownish on peripheries; fringes concolorous with wing, pale cream in anal portion.

Female. Head and thorax more yellowish in hue than in male; forewing 11—12 mm, uniformly broad throughout, distinctly curved outwards in basal third, somewhat concave subapically; apex short; termen tolerably straight postapically; fringes in costal part of apex extending outwards. Ground colour yellowish brown with weak orange hue, transversely strigulated with yellow-brown or rust-brown; pattern indistinct, similar in colour. Fringes slightly paler than pattern, mixed cream at tornus. Hindwing yellowish cream, mixed with pale orange on peripheries; fringes similarly coloured, suffused pale brownish in apex portion of wing.

Variation. Males with variable ground colour, often with indistinct greyish shine in terminal portion of forewing. Pattern usually well developed except for basal blotch. Median fascia sometimes reaching dorsum. Females occasionally with ill-defined pattern.

Male genitalia (figs. 52, 53). Uncus fairly broad; socius vestigial. Sacculus strong, broadening in median portion, provided with very large upturned free termination, densely bristled throughout. Aedeagus bent, strongly directed dorsad and terminating in a heavy tooth in distal portion; several small teeth laterally and one strong thorn present at the end of lateral wall. Usually 15 cornuti in vesica.

Female genitalia (figs. 175, 176). Sterigma somewhat resembling that of

preceding species but with broader cup-shaped proximal portion. Antrum large, broad, slightly curved laterally, strongly sclerotised; ductus bursae without cestum; signum large with strong proximal part of basal sclerite.

Seventh sternite strongly sclerotised with deep distal incision, the sides of which are provided with large, broad, densely spined processes. Similar spines in lateral portions of sclerite submedially.

Larva described by KODAMA (1960:21, fig. 13).

Bionomy. The moth was collected in Shikoku in second decade of February, in Honshyu from second decade of May till second decade of September (probably three generations). Food plants are *Artemisia* spp., *Fragaria chiloensis* f. *ananassa*, *Elaeagnus* sp., *Prunus tomentosa* THUNB. and *Punica granatum* L. (after YASUDA, 1961: (60) and KAWABE, 1965: (30)).

Distribution: China (Taichow) and Japan.

Comments. Although the male genitalia are very peculiar and do not resemble those of the preceding species, the female genitalia of the two species are alike, especially in the structure of the antrum. It seems that there is a correlation between the structure of the sacculus of the male and the ventral processes of the seventh sternite in the female.

Archips insulanus KAWABE, 1965

Archips insulanus KAWABE, 1965, Trans. lep. Soc. Japan, 16 (1/2): (23), figs. 17, 18, 53, 77. Type locality: Japan: Okinoerabu-jima Is. Holotype, ♂: „Okinoerabu-jima Is., 8. Ia. 1957 (M. UMEBAYASHI)”, after original work.

Male. Labial palpus ea 1.3, ferruginous-brown to yellow-brown, remaining parts of head rather concolorous; thorax somewhat paler, yellower. Forewing 6—8 mm, rather uniformly broad throughout; costa curved outwards to middle, then usually straight; apex very short; termen concave postapically; costal fold reaching to 1/3 of costal edge, distinctly tapering terminally. Ground colour cream mixed pale brownish grey, with indistinct pinkish shine, delicately strigulated with brownish. Pattern dark brown with slight addition of ferruginous, costal fold brownish to before middle, darker strigulate. Basal area somewhat suffused with brownish, basal blotch strong, subtriangular; proximal edge of median fascia from end of costal fold, concave subcostally and subdorsally, occasionally edged whitish. Fascia is rather uniformly broad but fused with brownish grey suffusion in dorsal half. Subapical blotch brownish grey, darker anteriorly, diffuse distally; subterminal pattern atrophied. Fringes rather concolorous with ground colour. Hindwing pale greyish cream with weak transverse strigulation; fringes rather concolorous with wing.

Female. Head and thorax more yellow-brown than in male. Forewing 7—11 mm, uniformly broad throughout with costa distinctly convex in basal third, then slightly concave subapically; apex short; termen hardly concave beyond apex. Ground colour yellowish brown with traces of marking in form of dorsal suffusion representing that part of median fascia. Fringes concolorous

with distal part of wing, paler at tornus. Hindwing brownish cream indistinctly mixed ochreous or orange at apex; fringes concolorous with outer parts of wing

Variation. In some males transverse strigulation distinct in distal part of wing forming irregular lines. Females mostly unicolorous with hindwing, usually dirty cream, orange-cream distally with cilia cream or cream-orange respectively.

Male genitalia (figs. 54, 55). Uncus small, delicate, broadening terminally, socius vestigial; sacculus distinctly broadening medially where irregularly shaped blunt process present. No free termination of sacculus but valva provided with minute dentation ventro-distally. Aedeagus broad, fairly short, terminating in small ventral tooth. Ca 20 cornuti present in vesica.

Female genitalia (fig. 177). Sterigma broad, fairly long with proportionally short median process and short, broad, rather weakly sclerotised distal lobes. Cup-shaped anterior portion ill-defined, represented very short fold and narrow anterior prominence; antrum slender, fairly long; ductus bursae rather long; cestum broad basally, rather short, protruding distally in the form of two unequally long threads. Signum proportionally long with large proximal part of basal sclerite.

Bionomy. Moths collected from beginning of January till ca end of April. Food plant: *Arctium lappa* L. (YASUDA, 1972: 99).

Distribution. Japan: Kyusyu Is. (Amami), Okinoerabu-jima Is. and Minamidaito-jima Is.

Comments. Externally this species resembles *A. semistructus* (MEYR.) but morphologically differs strongly from all remaining *Archips* species. YASUDA (1972:91) includes this species in *Archippus*, probably on the basis of its bionomy. It has a separate position in this group of species.

Archips strojny sp. nov.

Holotype, male labelled „Hoengshan, Prov. Hunan, 20. III. 1933. HÖNE”, G. Sl. 20624; coll. ZFMK.

Paratypes: 2 males and 9 females from Hoengshan collected between 4. IV. and 7. VIII. 1933; 1 male and 1 female from Shanghai, 19. VIII. 1943 and 2. IX. 1932; 6 males from Lungtan near Nankin, 29. III. — 28. VI. 1933; 1 male from Likiang (Prov. North Yunnan), 5. VI. 1934; 20 males and 3 females from West Tien-mu-shan (Prov. Chekiang) collected between 2. V. and 17. X. 1932. All specimens collected by H. HÖNE.

Male. Labial palpus ca 1.5, rust-brown, browner apically; remaining parts of head dark brown; collar rust-brown, tegumen almost black-brown proximally. Forewing 7—9 mm, rather uniformly broad throughout; costa distinctly curved outwards in basal third, gently sinuate before apex; apex very short, prominent costally, pointed; termen slightly sinuate, convex postmedially. Costal fold fairly broad except for distal fourth, reaching one-third of costa. Ground colour ochreous with ferruginous suffusion and indistinct violet-pink hue, densely reticulate with rust-brown. Basal blotch ill-defined, rust-brown; median fascia

indistinct with proximal edge extending from one-third of costa to beyond middle of dorsum, convex medially; subapical blotch dark rust-brown costally, extending from middle of costa, with almost completely separate terminal part; terminal marking distinct, extending from beyond apex. Fringes rust-brown, cream between middle of termen and tornus, brownish towards dorsum. Hindwing brownish, orange in apical part where brownish transverse strigulation occurs; fringes concolorous with wing, rust brown at apex, with delicate basal line.

Female. Labial palpus, head and thorax ochreous to orange-brown; abdomen browner. Forewing 8—10 mm; costa strongly curved outwards to middle, then distinctly sinuate; apex prominent costally, fairly short; termen somewhat sinuate postapically, convex postmedially. Wing almost unicolorous ochreous brownish with orange hue, suffused with brownish and delicately strigulated with same colour. Edges of pattern indistinctly marked by ochreous lines; subapical blotch represented by ochreous-brown suffusion at costa; somewhat browner terminal marking at apex. Fringes concolorous with wing, creamer towards tornus. Hindwing brown basally and caudally, otherwise pale orange; fringes concolorous with wing, mixed brownish at its caudal part. No costal group of scent scales.

Variation. The males are more or less dark with rather pale area between basal blotch and dorsal half of median fascia. The population from West Tien-mu-shan is characterised by ochreous or yellow-ochreous ground colour and yellowish rust pattern of the forewing. The females are very slightly variable usually almost completely unicolorous or with darkened apical third of wing.

Male genitalia (figs. 56, 57). Uncus slender, not broadening terminally; socius fairly well developed. Valva somewhat elongate distally; sacculus slender reaching to beyond middle of valva, provided with proportionally long free termination. Aedeagus slender provided with flat, dentate laterally process situated at the left side postmedially. Two cornuti broad subterminally found in all examined specimens. The length of aedeagus and the form of its lateral process somewhat variable. The position of the latter seems constant.

Female genitalia (fig. 178). Papilla analis broad. Sterigma broad, fairly short with slender median process; cup-shaped part of sterigma broad distally, much slenderer in proximal half where distinctly tapering towards antrum; the latter broad, provided with very short internal sclerite; cestum reaching to beyond middle of ductus bursae; signum with large capitulum.

Bionomy. Moth occurs probably in at least three generations yearly. The highest point of collection was at 4000 m. above sea level.

Distribution. China.

Comments. This species is very variable in coloration but is easily distinguished by the male and female genitalia. The males are characteristic mainly by short aedeagus and rather median position of its process and long cornuti. The free termination of the sacculus is long. The females are distinct by the shape of the proximal part of sterigma.

Archips peratratus YASUDA, 1961

Archips peratratus YASUDA, 1961, Publ. Ent. Lab. Univ. Osaka Pref., 6: 63, pl. 18, figs. D, d, pl. 10 figs. H_1 — H_3 , pl. 12 figs. H_1 — H_3 . Type-locality: Mt. Kirisima, Kyushu (Japan). Holotype, male labelled Mt. Kirisima, Kagoshima Pref., 13. IX. 1958, reared by T. YASUDA (food plant: *Dioscorea gracillima* Miq.), after original description; coll. UOP.

Male. Labial palpus shorter than 1.5, brown; antenna brown but scape and remaining parts of head black-brown; tegula black-brown, remaining parts of thorax brown; crest ferruginous. Forewing 9—11 mm, weakly expanding terminally; costa strongly curved basally, weakly concave before apex; apex very short, prominent costally; termen hardly sinuate postapically, convex postmedially; costal fold broad reaching to one-third of costa. Ground colour pale ochreous with violet-pink hue, weak greyish suffusion in median area of wing, cream admixture in tornal area. Costal fold brown-black to grey-black, basal area rather concolorous with groups of cream scales; basal blotch black proximally, ferruginous-brown distally; proximal edge of median fascia straight, extending from one-third of costa to two-thirds of dorsum, brown ferruginous, mixed black in costal third and near middle proximally, diffusely spotted ochreous grey in remaining, mainly distal portions. Similar groups of spots connect costal portions of basal blotch and median fascia. Subapical blotch extending from beyond middle of costa to middle of termen, with slender terminal part, rust-brown proximally, mixed black at costa distally; two blackish stripes apically; fringes brownish cream from beyond middle of termen to tornus. Hindwing brownish, pale orange in terminal third; fringes dirty cream mixed ochreous in apical area, brownish grey at caudal part of wing.

Female. Labial palpus dark rust-brown, remaining parts of head brown, thorax ferruginous black, blackish proximally. Forewing 11.5—13.5 mm, rather uniformly broad throughout; costa very strongly curved outwards basally, less so to middle, distinctly sinuate subapically; apex longer than in male, distinctly prominent costally; termen delicately sinuate, convex postmedially. Ground colour brownish ochreous with delicate pink shine caused by diffuse, greyish violet spots. Costa rust; base of wing rust-black, dorsum broadly suffused with same colour to form broad diffuse blotch extending to middle of wing being remainder of median fascia; apex concolorous with preceding pattern. Similar diffuse grey-violet spots present all over the pattern. Fringes concolorous with ground colour, more cream towards tornus, grey-brown at tornus, black-rust in remaining parts. Hindwing pale brownish grey caudally, orange cream otherwise, mixed with ochreous at apex; fringes concolorous with wing parts respectively, brown at apex.

Male genitalia (figs. 58, 59). Uncus shorter than in *A. formosanus* (KAW.); socius somewhat larger; valva shorter, sacculus slightly longer with smaller free termination. Aedeagus slender, provided with postmedian lateral (left side) dentate process; two long cornuti in vesica.

Female genitalia (fig. 179). Sterigma rather short with dorsal portion provided with slender median process and large cup-shaped part; distinctly tapering proximally; antrum elongate, weakly sclerotised, partially fused with proximal part of sterigma. Ductus bursae long, cestum half length of it; signum somewhat shorter than in *A. formosanus* (KAW.).

Bionomy. Moth collected from mid-April to beginning of November. Hosts (YASUDA, 1961) are: *Dioscorea gracillima* MIQ., *Raphiolepis umbellata* THUNB., *Rapanea reniifolia* MEZ., *Daphniphyllum Teijsmanni* ZOLL. and *Ardisia Sieboldi* MIQ. Some author (YASUDA, 1975) adds *Clerodendron trichotomum* THUNB., *Myrsine sequinii* LÉV. and *Camelia japonica* L.

Distribution. Japan: Honshyu, Kyushu.

Comments. The males of *A. formosanus* (KAW.) and *A. peratratus* YAS. are very similar externally, while the females differ distinctly in the shape of the wings and coloration. The differences in the male and female genitalia are distinct.

Archips formosanus (KAWABE, 1968), **comb. nov.**

Archippus formosanus KAWABE, 1968, *Tinea*, 7 (2): 122, pl. 20 figs. 5, 6, Type-locality: Alisan (Formosa). Holotype, male labelled „Alisan (2200 m). Chiayi, Formosa, 9—11. VII. 1964, H. INOUE”; not dissected; coll. Dr. A. KAWABE, Tokyo.

Male. Labial palpus over 1, ochreous; remaining parts of head brownish; thorax brown, rust distally. Forewing 8—10 mm, weakly expanding terminally; costa curved outwards to before middle, gently concave subapically; apex short; termen weakly sinuate postapically. Costal fold reaching to one-fourth of costa. Ground colour ochreous cream tinged rust, indistinctly shining pink-violet somewhat paler towards tornus; base suffused with brownish; costal fold rust-brown. Pattern concolorous with costal fold; basal blotch ill-defined; median fascia slender in costal third, gradually broadening towards middle, with proximal edge extending from beyond costal fold to beyond middle of dorsum, concave medially; subapical blotch small, from middle of costa, with terminal part reduced to delicate fascia extending from its end to postmedian part of termen. Apex suffused rust-brown. Fringes concolorous with ground colour, rust at apex and at costal half of termen, more cream towards tornus. Hindwing greyish brown in caudal and basal parts, scarcely strigulated with brownish in remaining area, slightly yellower apically; fringes cream in distal portion of wing, pale brownish at its caudal parts.

Female. Labial palpus ca 1.5, ochreous brown. Remaining parts of head and thorax greyish brown. Forewing 11—12 mm, not expanding terminally; costa strongly curved outwards in basal half, then sinuate; apex somewhat prominent costally, rather short; termen somewhat oblique, hardly sinuate postapically. Wing rust-brown, paler more ochreous towards tornus where brown reticulation present; weak rust-ochreous reticulation more medially. Dorsum suffused with dark grey-brown especially to one-third and beyond two-thirds

of dorsum; similar suffusion forming subapical blotch. Apex glossy brown-grey. Fringes ochreous cream, browner to vein m_2 , dark brown terminally and at apex. Hindwing as in male but apical area orange, more cream proximally.

Male genitalia (figs. 60, 61). Uncus not expanding terminally; socius small; sacculus short, reaching to about middle length of valva, provided with large free termination; aedeagus long, slender, provided with short, dentate subterminal process at the left side subdorsally; two long cornuti present in vesica.

Female genitalia (fig. 180). Sterigma large with strong cup-shaped part; antrum longer than in preceding species; cestum to beyond middle of ductus bursae; signum long.

Bionomy. The moth has been collected in July and September. Some specimens found at the altitudes 1600—2200 m above sea level.

Distribution. Formosa.

Archips pulcher (BUTLER, 1879)

Ariola pulchra BUTLER, 1879, Ill. *Lepid. Heterocera* Br. Mus., 3: 19, pl. 44, fig. 6. Type locality: Japan. Lectotype, male: „Japan, 77—9”; abdomen missing; coll. BM.

KUZNETSOV, 1970:448 (*Archips*, *Pararchips*).

Male. Labial palpus ca 1.5, ochreous brown to rust brown; remaining parts of head rather concolorous, thorax a little browner, tegula delicately shining violet. Forewing 9—11.5 mm, broad, indistinctly broadening terminally; costal fold absent; costa distinctly curved outwards at base, then weakly so; apex very short, rounded; termen in costal half rather straight and indistinctly oblique, then bent. Ground colour ochreous brown to orange ochreous without transverse pattern. Four pale grey-blue or grey-violet longitudinal fascias present. One extending subcostally from base of wing to beyond its middle, one along anal vein. Median fascia along dorsal edge of median cell and vein cu_1 often connecting along termen with short fascia extending from middle of radial arm of cell. Rust brown or brown dots at termen medially. Fringes paler than ground colour, orange at tornus. Hindwing brown, greyer basally; fringes ochreous orange, brownish grey in anal part of wing.

Female hardly differing from the male. Length of forewing 10—12.5 mm.

Variation. In some examined specimens ground colour of the forewing browner and black-brown suffusions along the fascia present. Sometimes the subcostal and subdorsal fascias vestigial. In such specimens the hindwing is dark brown.

Male genitalia (figs. 62, 63). Uncus somewhat broadening and rounded terminally; socius vestigial. Valva broad, rounded, strongly convex ventrally; sacculus broadening beyond basal part, provided with distinct free termination. Aedeagus marked with a row of teeth before end laterally.

Female genitalia (fig. 181). Cup-shaped part of sterigma large, median pro-

minence of distal part of lamella postvaginalis atrophied. Sclerite of antrum rather delicate, tapering towards ductus bursae, well sclerotised along the edges. Cestum long, signum proportionally small.

Larva (according to YASUDA 1975:109). Mature larva 15 mm long, deep green with pale green small pinacula. Head black-brown, prothoracic shield brown darkened laterally and posteriorly with dark brown pinacula. Thoracic legs black; anal comb well developed.

Bionomy (YASUDA, op. cit.). In Hokkaido occurs single generation yearly whilst in Honshyu two generations were noticed. Food plants are various conifers but mainly *Abies firma* SIEB. & ZUCC. YASUDA mentions also *A. homolepis* SIEB. & ZUCC., *A. sachalinensis* F. SCHMIDT and *Picea excelsa* LK. The eggs are deposited in patches (ca 20 per patch) on upper surface of needles. First instar larvae bore the needles entering near the tip, larger larvae feed in sheaths built of needles. Hibernation in larval stage. Moth collected in Hokkaido in June and July, in Honshu from mid-May to mid-June and in July and in Kyushu till mid-August.

Distribution. The species is known from Japan (Hokkaido, Honshyu, Shikoku, Kyushu) and U.S.S.R. (Iuzhnoe Primore, De Friz). Some authors record it also from China and Korea.

Comments. Discussion on the systematic position of this species is given on p. 63.

Archips abiephagus (YASUDA, 1975)

Ariola abiephaga ISSIKI, 1962, Publ. Ent. Lab. Coll. Agric. Univ. Osaka Pref., No. 7: (3) — nom. nud.

Archippus (*Pararchips*) *abiephage* [sic] YASUDA, 1975, Bull. Unix. Osaka Pref., (B) 27: 109, figs. [*abiephaga*], 51, 52, 396, 579. Holotype, male: „Japan, Hokkaido, Yamabe; bred from *Abies concolor*, 12. VI. 1959, T. KODAMA”, not dissected. Coll. UOP.

Male. Labial palpus as in preceding species but more ochreous, head concolorous, thorax browner. Forewing 9—11 mm, slightly expanding posteriorly; costa curved outwards to middle, then rather straight; apex short, pointed; termen more oblique than in preceding species. Costal fold absent. Ground colour ochreous brown, suffused dark brown in costal half, termen and partially basal area of wing. Radial fascias leaden-violet, rather diffuse, arranged similarly as in the preceding species. Fringes dark ochreous-brown. Hindwing dark brown; fringes paler, ochreous in apical half of wing.

Female. Forewing 12 mm, somewhat slenderer than in male, not expanding terminally. Ground colour paler, more ochreous especially at dorsum. Termen without brown suffusion; refractive fascias more blue than in male accompanied by distinct dark brown markings.

Variation. Some specimens with distinct dark brown suffusion and elongate markings at the edges of refractive fascias.

Male genitalia (figs. 64, 65). Uncus very characteristic, long, bifurcate apically;

socius vestigial; transtilla broad laterally. Valva and sacculus as in *A. pulcher* (BUTL.) but the latter with much smaller free termination. Aedeagus slenderer, with distinct subapical prominence and small lateral teeth.

Female genitalia (fig. 182). Papilla analis broad; sterigma broad, straight distally, rounded proximally with very short cup-shaped part. Antrum with rather delicate sclerite; ductus bursae shorter than in preceding species provided with long cestum; signum small.

Bionomy. Food plants: *Abies concolor* LINDL. and *A. sachalinensis* F. SCHMIDT. Moth collected between mid-June and late August.

Distribution. Japan: Hokkaido and Honshyu.

Comments. Externally this species is extremely similar to *A. pulcher* (BUTL.), but strongly differs in the genitalia.

Archips inanis sp. nov.

Holotype, female, „SO Afghanistan, Safed Koh, S. Seite, Kotkai, 2350 m., 19—23. VI. 1966, H. G. AMSEL leg.” G. Sl. 20011; coll. LNK. Paratypes, male and female identically labelled as the holotype.

Male. Labial palpus over 1, pale brownish; head and thorax greyish brown, Forewing 8 mm, weakly expanding terminally; costa slightly bent to middle. hardly concave subapically; apex very short, rounded; termen not sinuate. Costal fold to beyond third of costa. Ground colour greyish brown delicately darker strigulated in distal portion of wing. Pattern indistinct brown with slight rust hue and diffuse edges. Fringes darker than ground colour. Hindwing grey-brown, fairly dark with concolorous fringes.

Female. Labial palpus, remaining parts of head and thorax brown. Forewing 10 mm, hardly expanding terminally in basal half; costa gently curved outwards to before apex indistinctly concave subapically; apex very short, rounded; termen straight to vein m_3 , then convexely oblique. Wing unicolorous pale ochreous-brown with slight admixture of grey dorsally. Fringes hardly paler than wing. Hindwing pale brownish grey; fringes brownish cream, greyer in caudal area of wing, with brownish basal line.

Male genitalia (figs. 66, 67). Uncus delicate, slender; sacculus with fairly short free termination; aedeagus densely spined ventro-medially and towards the end, without any terminal dent.

Female genitalia (fig. 183). Papilla analis broad; apophyses thin, long. Sterigma proportionally large with short cup-shaped part and slender median process; antrum delicate, fairly well sclerotised, shorter than breadth of sterigma; ductus bursae in comparison with other species of this group short; cestum very short; signum thick, short, with small basal sclerite.

Bionomy and distribution known only from the labels of the type material.

Comments. The female of this species is very distinct by the shape of the forewing especially by the very short apex. The female genitalia, however, are typical of this group of the genus in question.

Archips ceylonicus sp. nov.

Holotype, male: „Ceylon, Hakgala, Botanic gardens, 26. II. 1971, 1700 m., B. GUSTAVSSON", G. Sl. 6536. Coll. NRS.

Male. Labial palpus ca 1.5, brownish grey, remaining parts of head thorax rather concolorous but front more ochreous. Forewing 7 mm, hardly expanding terminally; costa curved outwards in basal part, weakly so beyond 1/3; apex very short; termen rather vertical to costa in the costal half, hardly concave to vein m_3 , then convexely oblique. Costal fold in form of upturned edge of wing extending to distal edge of median fascia. Ground colour pale brownish cream, weakly suffused brownish basally and apically, densely spotted and transversely strigulated brown. Basal blotch almost completely atrophied, median fascia indistinct dorsally with proximal edge extending from 1/3 costa to beyond middle of dorsum, concave subcostally. Subapical blotch in form of a weak suffusion. Fringes brownish between apex and vein m_3 , otherwise concolorous with ground colour. Hindwing cream, darker apically, mixed grey medially, delicately strigulated brown-grey. Fringes ochreous-cream.

Male genitalia (figs. 68, 69) small; uncus broad, rounded and broadened apically; socius absent. Valva somewhat elongate; sacculus weakly convex near middle of ventral edge, provided with small, acute free termination. Aedeagus rather straight in distal portion, pointed ventro-terminally.

Bionomy and distribution: no data except for the mentioned above.

Comments. The female is unknown. The species resembles genitally *A. inanis* sp. nov. but is quite different in shape of wing and coloration.

Archips pruneticolus (MEYRICK, 1935)

Cacoecia pruneticola MEYRICK, 1935, Exot. *Microlep.*, 4: 569. Type-locality: Tarnab (India). Holotypus, male: „Plum leaf rolle[d], Tarnab, N.W.F.P., H.N. BATRA, 27. V. [19]34". G. Sl. 5309 [BM]. Coll. BM.

Male. Labial palpus brownish yellow; head and thorax more cream. Forewing 8 mm, somewhat expanding terminally; costa curved outwards in basal portion, hardly concave before apex; costal fold to before middle of costa, tapering terminally; apex very short; termen not sinuate. Ground colour brownish yellow, costal fold much darker and browner especially in basal portion. Basal blotch vestigial, rather concolorous with ground colour; median fascia indistinct, brownish with proximal edge extending from one-third of costa to before tornus, atrophied at edges of wing. Subapical blotch elongate extending from beyond middle of costa to before apex, vivid yellow-brown slightly mixed ferruginous. Fringes brownish, darker terminally beyond vein m_1 rather concolorous with ground colour. Hindwing orange cream, rather pale, fringes paler.

Female unknown.

Male genitalia (figs. 70, 71). Uncus tapering terminally, slender in distal third; socius small; sacculus with fairly short, subtriangular free termination.

Aedeagus with proportionally short distal portion, minutely spined ventro-laterally in median area of the mentioned part, pointed ventro-apically.

Bionomy. No data except for date of collection of holotype, and its food plant (cf. above).

Archips citimus sp. nov.

Holotype, male: „SO Afghanistan, Safed Kuh, S. Seite, Kotkai, 2350 m., 19—23. VI. 1966, H. G. AMSEL leg.”, G. Sl. 20004; coll. LNK. Paratypes 7 males identically labelled as the holotype.

Male. Labial palpus 1.5, ochreous-brown, cream beneath; remaining parts of head brownish ochreous mixed cream; thorax concolorous with head but base of tegula rust-brown. Forewing 10 mm, weakly expanding terminally; costa bent to middle, rather not concave before apex; apex very short; termen weakly sinuate. Costal fold slender, slightly tapering terminally, reaching middle length of costa. Ground colour ferruginous cream, paler in distal area of wing where indistinct transverse strigulation occurs. Costal fold blackish brown basally, rust-brown to middle then concolorous with ground colour. Basal blotch subsquare or subtriangular ochreous-ferruginous; median fascia slender in costal third, very broad and diffuse distally in the remaining parts, with proximal edge extending from one-third of costa to middle of dorsum, gently convex medially. Colour of fascia varying from ochreous-brown to rust-brown being most intense medio-proximally. Subapical blotch from beyond middle of costa with separate subterminal part; termen marked with rust-brown beyond apex. Fringes concolorous with ground colour of distal part of wing, rust-brown in apical part of termen. Hindwing pale brownish grey, cream in apical area, or unicolorous greyish; fringes greyish white to dirty cream with grey basal line.

Female unknown.

Variation. The forewing of the males more or less distinctly suffused grey in costal and median areas postbasally. Median fascia often dark rust, pale edged proximally. In such specimens remaining parts of pattern also dark.

Male genitalia (figs. 72, 73). Uncus slender, tapering terminally; socius rather well developed; free termination of sacculus short; aedeagus with straight distal part, minutely dentate ventro-laterally, provided with very short ventro-apical dent; cornuti slender.

Bionomy: moth flies in June at altitude of 2350 m.

Distribution. S.O. Afghanistan (the type locality known only).

Archips transcutus (MEYRICK, 1935), **comb. nov.**

Cacoecia transcutata MEYRICK, 1935. Exot. *Microlep.*, 4: 569. Type locality: Buintenzorg (Java). Holotype, male „Inst. v. Plantenziekten gewas Djeroek. bladspiner, pop. 4. VII. [19] 31—10. VII. 1931; Dr. A. D. Voote, datum: 10. VII.

1931; Inst. v. Plantenziekten gewas. on *Citrus*. Leg. Dr. VoOTE. Buitenzorg, datum: 10. VII. 1931", G. Sl. 283 [BM]. Coll. BM.

Male. Labial palpus 1.3, ochreous brownish; head and thorax yellowish brown. Forewing 6.5 mm, weakly expanding terminally; costa curved outwards basally then indistinctly concave; apex very short; termen hardly sinuate, weakly convex beyond middle; costal fold to one-fourth of costa, broad, tapering distally. Ground colour pale brownish with yellow-cream admixture, costal fold yellow-brown. Basal blotch indistinctly suffused with brown darker than costal fold, concolorous with other parts of pattern. Proximal edge of median fascia extending from one-third of costa to mid-dorsum, convex medially. Median fascia almost completely atrophied in costal part, with broad dorsal half, reaching to disc medially, dark proximally, concolorously strigulated distally and dorsally. Subapical blotch extending from middle of costa to before apex, with straight proximal edge and convex distal edge. Brownish marking apically. Fringes concolorous with ground colour, browner distally except for tornal part. Hindwing pale brownish cream, yellow-cream beyond vein cu_2 , mixed ochreous apically; fringes cream grey, greyer at apex, with median line somewhat browner.

Female unknown.

Male genitalia (figs. 75, 75). Uncus slender terminally; sacculus fairly long with acute free termination. Aedeagus weakly bent, minutely dentate in distal part laterally, provided with short ventro-terminal dent. Caulis large, minutely spined distally.

Distribution and bionomy. No data except for given for the holotype.

Archips atrolucens (DIAKONOFF, 1941)

Cacoecia atrolucens DIAKONOFF, 1941, Treubia, **18**: 384, figs. 1 EF, pl. 16. figs. 3—5. Type-locality: Sindanglaya, Java. Holotype, male „Java occ., Sindanglaya, 1881, ♂", G. Sl. 140 [DIAKONOFF]; coll. MNHL.

Male. Labial palpus over 1, brownish. Head and thorax brown, especially anteriorly; abdomen pale brownish grey. Forewing 5.5—7.5 mm, weakly expanding terminally; costa curved outwards basally, then straight, hardly concave subterminally; apex somewhat elongate, pointed; termen sinuate, oblique. Costal fold very short (to one-fourth of costa), broad, not tapering terminally. Ground colour pale brownish partially mixed cream, slightly shining. Pattern brownish with dark brown parts. Costal fold and basal area dark, dorsal blotch subtriangular, rather indistinct; proximal edge of median fascia from one-fourth of costa to beyond middle of dorsum, convex medially, distal and dorsal halves of fascia pale with cream scales on venation and dark brown radial stripe medially; subapical blotch slender, from middle of costa, weakly broadening to before apex where, vertical to costa. It is produced towards end of termen by a separate, small subtriangular spot; apical marking elongate, reaching one-third of termen. Fringes brownish, concolorous with ground colour at tornus.

Hindwing brownish grey basally and in anal area to vein cu_2 , otherwise yellowish with slight addition of orange. Fringes pale brownish and cream respectively.

Female. Labial palpus ca 1.5, brownish rust, head rather concolorous, thorax brown; abdomen brownish grey. Forewing 7—10 mm, hardly expanding terminally; costa strongly curved in basal third, then concave, prominent in apical portion; apex fairly long; termen distinctly concave beyond apex, convexly rounded in dorsal portion. Ground colour olive-brown, somewhat mixed cream in distal half, glossy. Pattern indistinct: basal blotch broad, brownish, darkest dorsally, with diffuse distal edge; remainder of median fascia in form of a weak olive-brownish suffusion at top of costal curvature and broad, more grey-brown diffuse blotch in terminal half of dorsum; subapical blotch weak, slender; apex brown-grey. Fringes concolorous with ground colour, grey-brown at apex and partially on terminations. Hindwing darker than in male with large group of brownish andronical scales in terminal third of costa; fringes cream suffused brownish grey. Underside orange except dorsal areas with dense brownish strigulae.

Variation. Some males with whitish brown or brownish cream ground colour occasionally indistinctly shining pink. The pattern with dark brown or even black-brown scales; costal fold grey-brown. In some specimen the basal area almost completely dark often fused with subcostal part of the median fascia. Some parts of the pattern olive-brown. In other specimens the median fascia partially diffuse, the subapical blotch usually divided into costal and terminal parts. Hindwing in some examples cream, grey caudally. In one examined female basal blotch completely atrophied while the median fascia rather well developed brown with rust-brown edges; slender in costal third of wing, the subapical blotch and the transverse strigulation of the distal half of wing are present. In almost unicolorous grey or grey-black specimens pinkish or violet shine may occur and occasionally black dot at disc and olive-ferruginous subapical blotch.

Male genitalia (figs. 76, 77). Uncus delicate, rounded apically; socius absent; valva convex postbasally; sacculus with short apically rounded free termination; aedeagus bent, provided with flat ventral termination. Six cornuti in vesica.

Female genitalia. (fig. 184). Sterigma fairly short with well developed cup-shaped termination; antrum delicate. In examined specimen proximal part of bursa copulatrix absent.

Bionomy. Moth in March. Food plant: *Evodia* sp.

Distribution: Java.

Archips binigratus (MEYRICK, 1928)

Cacoecia binigrata MEYRICK, 1928, Exot. *Microlep.*, 3: 456. Type-locality: Shillong (India). Lectotype, male, „Shillong, Assam, T. B. F.[LETCHER], X. [19]16”, G. Sl. 6814 [BM]; coll. BM.

Male. Labial palpus ca 1, ochreous brownish, browner terminally and beneath; head yellow-brown, antenna paler; thorax cinnamon. Forewing 9 mm,

costa rather weakly curved outwards in basal third, hardly concave subapically; apex very short, with scales prominent costally termen delicately sinuate, weakly convex medially. Costal fold to beyond one-third of costa, slender, tapering in terminal portion, cinnamon brown. Ground colour ochreous-cinnamon with weak pinkish hue, somewhat paler in distal part of wing, more cream in apical area. Pattern dark, rust-brown; basal blotch subtriangular, darker apically, partially pale edged; median fascia from beyond $1/3$ of costa, atrophied costally; its anterior edge weakly convex in middle, pale edged, terminating in middle of dorsum, distal edge diffuse reaching tornal area; weak grey suffusion on disc and greyish shine on the ground colour between costal half of this fascia and subapical blotch. The latter concolorous with other pattern elements extending from before middle of costa. Its terminal portion pale brownish mixed ochreous, marked with longitudinal blackish stripe on vein m_2 . Apex brownish. Fringes ochreous brown, darker at apex where blackish brown terminally, cream from beyond vein cu_1 . Hindwing grey-brown with orange apex; fringes brownish cream and orange respectively.

Female unknown.

Male genitalia (fig. 78, 79). Uncus tapering terminally; socius very weak; sacculus simple with short free termination. Aedeagus large, narrowing subterminally, with somewhat elongate, acute ventral termination. No cornuti found (most probably dropped).

Bionomy. Unknown except for dates of collection of the types: August and October.

Distribution: Shillong in Assam (India) only.

Archips euryplinthus (MEYRICK, 1923)

Cacoecia euryplintha MEYRICK, 1923, Exot. *Microlep.*, 3: 53. Type-locality: Darjeeling (India). Holotype, female, „Darjiling, Bengal, T. B. F.[LETCHE], 4000 feet, IX. 1920”, G. Sl. 6818 [BM]; coll. BM.

Female. Labial palpus ca 1.5, orange-yellow; remaining parts of head and thorax browner. Forewing 10 mm, not expanding terminally; costa strongly curved outwards to beyond middle, then gently concave, prominent apically; apex short; termen indistinctly sinuate, somewhat convex at vein m_3 . Ground colour brownish orange, suffused basally especially along dorsum where browner, delicately darker strigulate transversely. Remainers of median fascia at one-third of costa and two-thirds of dorsum in form of weak brownish suffusions. Subapical blotch small, rust-brown. Fringes damaged. Hindwing orange-yellow, brownish caudally; fringes yellow-orange and brownish respectively, with brownish median line; costal group of scent scales brown.

Female genitalia (figs. 185, 186). Sterigma with very small, slender cup-shaped part (ill-preserved in slide); antrum fairly long; cestum to middle of ductus bursae, broad proximally; signum with broad basal sclerite.

Bionomy. Holotype collected in September at the altitude of 1500 m. DIA-

KONOFF (1976:93) records the altitudes up to 2800 m and flight period from beginning of May to late September.

Distribution. Apart of the type locality also several localities in Nepal (DIAKONOFF, op. cit.).

Comments. Only the females of this species is known to date. It is very close to *A. termias* (MEYR.) from which differs mainly in the shape of the sterigma DIAKONOFF in the above mentioned publication records some further characters differing the two species.

Archips philippus (MEYRICK, 1918)

Cacoecia philippa MEYRICK, 1918, Exot. *Microlepid.*, 2: 165. Type-locality: Abbottabad. Holotype, male „Abbottabad, N. W. India, T. B. F.[LETCHER]” G. Sl. 6813 [BM]. Coll. BM.

Male. Labial palpus ca 1, ochreous-orange with weak reddish violet hue laterally; head yellowish brown; thorax paler. Forewing 9 mm, expanding to middle; costa curved outwards to middle, slightly concave subapically; apex short; termen weakly sinuate, slightly convex postmedially. Costal fold slender, broadest medially, tapering beyond middle, terminating at middle of costa. Ground colour brownish cream tinged with yellowish in distal third, brownish cinnamon in basal third of wing. Costal fold brownish cream, browner basally. Pattern consists of elongate rounded apically, rust-brown slightly cream edged basal blotch; median fascia very slender in costal third, atrophied at costa, broad from before middle, with proximal edge sharp, convex medially, pale edged, extending from before end of costal fold to 2/3 of dorsum; distal edge diffuse; subapical blotch subtriangular, small, extending from beyond middle of costa to before apex, diffuse between r_4 — r_5 . Delicate brownish strigulation in distal portion of wing. Fringes concolorous with ground colour, brownish in apical part and to before middle of termen. Hindwing pale orange-yellow, slightly mixed brownish grey caudally; fringes paler than wing, with weak median line.

Female unknown.

Male genitalia (figs. 80, 81). Uncus slender in distal portion; socius small; sacculus long, provided with acute free termination; aedeagus tolerably straight in distal half, minutely spined ventrally and laterally mainly in median portion provided with a dull ventral prominence situated subapically.

Bionomy. According to the original description larva feeds in June on *Hedera* sp.

Distribution: known from the type locality only.

Archips subsidiarius (MEYRICK, 1924)

Cacoecia subsidiaria MEYRICK, 1924, Exot. *Microlepid.*, 3: 107. Type locality: Srinagar (Kashmir, India). Lectotype designated by CLARKE (1958), male „Kashmir, Srinagar, 5200 feet, T.B.F.[LETCHER], V. [19]23”, G. Sl. 6822 [BM]. Coll. BM.

Male. Labial palpus 1.5, brownish orange; head and thorax brownish yellow; abdomen mixed cream. Forewing 8—10 mm, weakly expanding terminally; costa curved outwards to middle, weakly concave before apex; apex very short, pointed; termen hardly sinuate beyond apex, expanding and rounded beyond middle. Costal fold slender tapering in distal third, reaching to $1/3$ — $1/2$ of costa. Ground colour brownish yellow reticulate with brownish in terminal area of wing, distinctly suffused with grey to median fascia. Costal fold greyish. Basal blotch yellow-brown convex posteriorly, pointed apically. Median fascia brownish yellow, browner proximally slender in costal third, then broad with distal edge rather diffuse reaching to tornus. Proximal edge of median fascia straight, edged cream, extending from one-third of costa to before middle of dorsum. Subapical blotch rather weak, diffuse, extending from beyond middle of costa to before apex. Fringes concolorous with ground colour, browner to end of concavity of termen. Hindwing brownish grey, ochreous-yellow to vein cu_1 , more ochreous apically; fringes cream and pale brownish grey respectively, greyer at apex.

Female. Labial palpus orange. Forewing 12 mm, not expanding terminally; costa strongly curved outwards in basal third, concave towards apex; apex prominent costally, fairly long; termen sinuate, convexly rounded near middle. Ground colour brownish yellow, strigulated with rust-brown. Pattern brownish consisting of costal suffusion (remainders of median fascia) and weak dorsal marking; subapical blotch small, subtriangular extending from $2/3$ of costa to before apex. Fringes brownish between apex and vein m_2 and distally to cu_2 , more cream at tornus, otherwise concolorous with ground colour. Hindwing pale brownish cream, yellowish to vein cu_2 , gradually mixed orange towards apex; fringes cream orange more grey-brown in anal part of wing, brownish at apex; small group of costal scent scales orange-ochreous.

Variation. In the males the ground colour of proximal half of wing often leaden grey with indistinct violet shine, yellow-brown to cinnamon brown with weak violet-pink shade in distal portion. Proximal edge of median fascia straight or convex medially, often pale edged. Basal blotch shows a tendency to atrophy in its dorso-proximal portion. Females sometimes pale yellow-brown with almost completely atrophied pattern.

Male genitalia (figs. 82—84). Uncus slender, tapering terminally; free termination of sacculus more or less broad; aedeagus distinctly spined in distal half, mainly ventrally; small subterminal tooth ventrally.

Female genitalia (figs. 187, 188). Proximal, cup-shaped part of sterigma very short, rounded anteriorly, with ventral portion rather weakly sclerotised; median process long; distal lobes membranous. Antrum broad, with fairly large internal sclerite; cestum delicate, reaching to beyond one-third of ductus bursae; both parts of basal sclerite of signum large, somewhat variable.

Bionomy. Moth collected at the type locality between 5 and 10. VI, 16—18. VII and (one specimen) 1. VIII. at the altitude ca 2000 m. In Baluchistan (Quetta) collected in first days of May, and in Afghanistan (Paghman Mts., 2500 m)

between 9. VI. and 1. VIII. Food plant in Afghanistan (Kabul) *Armeniaca vulgaris* LAM.

Distribution. Originally found in Kashmir (India), then in Quetta (Baluchistan, Pakistan), Paghman Mts. near Kabul and Nuristan (Afghanistan). DIAKONOFF (1976:92) records it from N. W. Karakorum.

Archips solidus (MEYRICK, 1908)

Cacoecia solida MEYRICK, 1908, J. Bombay nat. Hist. Soc., **18**: 614. Type-locality: Darjeeling (India). Lectotype, male (designated by CLARKE, 1958): „Darjiling, Bengal, D., VIII. [19]04”, G. Sl. 6816 [BM]; coll. BM.

Male. Labial palpus over 1, yellowish brown; remaining parts of head and antenna paler; thorax brownish. Forewing 9 mm, hardly expanding terminally; costa curved outwards to middle, somewhat concave subapically; apex short, weakly prominent costally; termen delicately sinuate, gently convex medially. Costal fold to middle of costa, slender, tapering distally. Ground colour greyish brown with weak violet hue; costal fold somewhat darker, marked with brown subterminally; distal portion of wing slightly mixed yellowish, weaker admixture of yellow beyond median fascia costally. Pattern dark brown; dorsal portion of median fascia and almost entire subapical blotch mixed ferruginous. Basal blotch elongate, rounded apically; median fascia slender, diffuse distally except for a narrow costal part, with anterior edge extending from one-third of costa to before end of dorsum; subapical blotch from before middle of costa to vein cu_1 at termen; apex and termen beyond it suffused dark brown; fringes rather concolorous with ground colour of distal part of wing brownish distally. Hindwing pale brown with costal and apical areas pale cream; fringes paler.

Female. Head and thorax brown, abdomen paler. Labial palpus ca 1.3 dirty cream-ochreous. Forewing 13 mm, not dilated towards the end; costa strongly curved outwards in basal third, weakly concave subapically; apex prominent; termen sinuate postapically. Ground colour ochreous-cream, more cream distally, sprinkled ochreous, with brownish strigulation; veins suffused. Pattern brown, mixed grey dorsally, with indistinct violet shine. Basal blotch reduced to large dorsal suffusion, median fascia indistinct subcostally, diffuse, provided with black dot at disc. Subapical blotch reaching to termen, occasionally fused with distal portion of median fascia. Fringes concolorous with pattern from apex to vein m_2 , brown grey at tornus, otherwise cream. Hindwing without costal group of scent scales, pale brown-grey, white-grey costally, ochreous towards apex. Fringes brownish grey.

Variation. A female with dark brownish dorsum and distinct strigulation examined. Median fascia atrophied costally. Costal half of forewing suffused ochreous brown. Hindwing brownish with orange apical area.

Male genitalia (figs. 85, 86) very similar to those in *A. termias termias* (MEYR.) but sacculus shorter and aedeagus slenderer, provided with weaker terminal tooth.

Female genitalia (fig. 189) partially damaged in examined slide. Sterigma probably similar to that in *A. subsidiarius* (MEYR.); sclerite of antrum broad; ductus bursae rather short; cestum thin, reaching to 2/3 of ductus. Signum large with small basal sclerite.

Bionomy. Moth collected in August.

Distribution. Known from the type locality only.

Comments. This species is externally very similar to *A. termias termias* (MEYR.) and differs only in the shape of the costal fold and coloration in the males. The females are distinct mainly by the coloration of the forewing.

Archips termias (MEYRICK, 1918)

This widely distributed species is distinctly variable. However, the particular populations show to slight differences to the nominate form to treat them as the subspecies. Only one of them was described as such, viz., *A. termias argutus* DIAK. and one is transferred from the genus *Homona* WKR.

Archips termias termias (MEYRICK, 1918)

Cacoecia termias MEYRICK, 1918, Exot. *Microlep.*, 2: 164. Type locality: Shillong (India). Lectotype (designated by CLARKE, 1958), male: „Shillong Assam, T. B. F.[LETCHER], X. [19]16”, G. Sl. 6812 [BM] coll. BM.

Cacoecia pomivora MEYRICK, 1920, Exot. *Microlep.*, 2: 340. Type locality: Ramgarh (India). Lectotype, male (designated by CLARKE, 1958): „Ramgarh, Kumaon, T. B. F.[LETCHER] bread IX. [19]19”, G. Sl. 6810 [BM]; coll. BM.

Cacoecia sarcostega MEYRICK, 1924, Exot. *Microlep.*, 3: 107. Type locality: Muktesar (Kumaon, India). Lectotype, male (designated by CLARKE, 1958): „Muktesar, Kumaon, T. B. F.[LETCHER], 7300', IV. [19]23”, G. Sl. 6821 [BM]; coll. BM.

Male. Labial palpus less than 1.5 ochreous-brown, darker distally; head yellowish brown, antenna more cream; thorax ferruginous-brown with yellow-brown tegula. Forewing 8—9 mm weakly expanding terminally; strongly bent at 1/3, indistinctly concave subapically; apex very short; termen hardly concave beyond apex. Costal fold reaching just beyond middle of costa, broad in basal half, thin in distal portion, tapering apically. Ground colour ochreous-cream with delicate pinkish hue especially in anterior half of wing, leaden grey suffusion in postbasal area. Costal fold concolorous with ground colour but browner in basal half, marked with three transverse more grey-brown fascias. Pattern cinnamon-brown; basal blotch wedge-shaped, rust-brown terminally; median fascia narrow costally, broad from radial arm of median cell, with anterior edge extending from one-third of costa to 2/3 of dorsum convex medially. Costal portion of fascia atrophied. Weak grey suffusion at disc and before middle of distal edge dark brown admixture in costal and postmedian portions. Subapical blotch from end of costal fold, divided into three parts last of which reaches and of vein cu_1 . Weak grey suffusion apically marked with black-grey stripe. Fringes

paler than pattern, brownish cream between last median vein and tornus. Hindwing pale brownish grey except for terminal and costal areas where pale ochreous-cream; fringes pale brownish cream, browner at apex; median line brownish.

Female. Head and thorax cinnamon-brown, abdomen paler. Forewing 11—12 mm, uniformly broad; costa strongly curved outwards to middle, concave subapically; apex distinctly prominent costally; termen sinuate, convex at vein m_3 . Ground colour cinnamon-brown delicately darker strigulated, suffused at costa and dorsum. Subapical blotch narrow, rust-brown, apex rust-orange. Fringes concolorous with ground colour, paler at tornus, brown-grey at apex and terminally. Hindwing brownish grey, orange-cream in distal half more cream costally; fringes brownish grey, more orange at paler areas of wing.

Variation. The males with more or less distinct pink hue and occasionally with white cream apical portion of forewing. *Ab. sarcostegus* characterises with cream ground colour and indistinct pale brownish pattern of the forewing.

Male genitalia (figs. 87, 88). Uncus slender; socius vestigial. Sacculus provided with rounded fold before middle of dorsal edge. Aedeagus minutely spined ventromedially, marked with short ventro-apical dent.

Female genitalia (fig. 190). Cup-shaped part of sterigma fairly short with small, rounded proximal prominences; slender median process of sterigma and weakly sclerotised distal lobes present. Antrum almost as long as distal portion of sterigma; cestum to before middle of ductus bursae; signum with almost equally long parts of basal sclerite.

Bionomy. Moth occurs in 2—3 generations yearly as one may judge of the collection data (June, July, September and October). Food plant: only the larva of *ab. pomivorus* has been observed to bore the apple and roll the leaves of apple and rose. DIAKONOFF (1939a:233) records *Acacia arabica* WILLD.

Distribution. India, Nepal, S. O. Afghanistan, N. E. Burma.

Comments. DIAKONOFF (1976:87) synonymised *Cacoecia pomivora* MEYR. and *C. sarcostega* MEYR. with this species. That author has examined large series of this species and its forms. The genitalia of the lectotype of *sarcostega* hardly differ from those of the lectotype of the species in question, but the external differences are distinct. The genital slide of the lectotype of *pomivora* is not good enough to accurate analysis, but I suppose that the termination of the sacculus is in fact much longer than it can be seen in the fixed position. I had an opportunity to examine some specimens of various populations which somewhat differ from one the other. Those differences are treated as infrasubspecific only. I cannot find any difference between the nominate form of this species and a specimen from Burma described by DIAKONOFF under the name *Homona stenoptycha*.

Population from Li-kiang (China).

The males of this population are characterised by more rust coloration and blackish suffusion of the basal part of the forewing. The females are very alike to those of the Indian population. In the male genitalia slight differences to the nominate form are found in the length of the narrowed distal part of the aedeagus (fig. 89).

Archips termias stenoptychus (DIAKONOFF, 1952), **comb. nov.**

Homona stenoptycha DIAKONOFF, 1952, Ark. Zool., 3 (6): 65. Type-locality: Kambaiti (Burma). Holotype, male: "N. E. Burma, Kambaiti, 7000 ft., 9. IV, R. MALAISE", G. Sl. 1195 [DIAKONOFF]; coll. NRS.

Male. Head and thorax brown. Ground colour of forewing (9 mm) yellow-brown with cinnamon hue; pattern ill-defined, rust-brown consisting of traces of basal blotch and median fascia. Subapical blotch slender, brown at costa. Costal fold paler than pattern, slender. Fringes brownish, paler and greyer at tornus. Hindwing pale brownish, fringes rather concolorous.

Male genitalia as in the nominate form, however, aedeagus seemingly longer, smooth provided slightly smaller terminal dent.

Comments. Most probably *stenoptychus* is conspecific with the nominate form of the species in question. I am treating it provisionally as a distinct subspecies until larger material from Burma is compared.

Archips termias argutus DIAKONOFF, 1976

Archips termias argutus DIAKONOFF, 1976, Zool. Verh., 144: 91, figs. 76, 77. Type locality: Bujan, Dudh Kosi Tal (Nepal). Holotype, male (after the original publication): Prov. Nr. 3 East, Bujan, Dudh Kosi Tal, 2900 m, 18—19. VIII. 1964 (W. DIERL), G. Sl. 8992. Coll. ZSM.

After the original description the forewing is distinctly expanding posteriorly. Costa narrow, reaching to middle of wing. Ground colour pale lilac with strong pale bluish shine; pattern dull ferruginous and purple, costal fold purple-grey, light ochreous apically. Fringes glossy fulvous; grey at tornus, deep purple at apex and partially along termen. Hindwing pale whitish ochreous, golden-ochreous at apex, fuscous-bronze in anal region. Fringes ochreous-fuscous, darkened at apex.

Male genitalia characterised by fairly broad uncus and strong, curved downwards ventro-apical dent of aedeagus.

Comments. This subspecies is after its author characterised by dark colouring, glossy ground colour and distinctly sinuate costa and termen of the forewing. Of the description one can judge that DIAKONOFF intended to describe *argutus* as a distinct species. Unfortunately I have had no opportunity to examine this recently described subspecies.

Archips compitalis sp. nov.

Holotype, male, „West Tien-mu-shan, Prov. Chekiang, 31. VIII. 1932, H. HÖNE". Coll. ZFMK. Paratypes 66 ♂♂ and 34 ♀♀ from same locality, dated 2. IV. — 5. X. 1932. Coll. ZFMK and ZZSD.

Male. Head and palpus ochreous brown; thorax much darker. Forewing 7—9 mm, uniformly broad throughout; costa strongly curved outwards to before middle, concave subapically; apex very short, prominent; termen hardly sinuate

and weakly convex postmedially. Costal fold broad, weakly tapering apically, reaching to beyond middle of costa. Ground colour cream-cinnamon, more cinnamon in proximal half of wing, with weak pinkish hue. Costal fold brownish grey to before end; pattern rust, basal blotch darker. Proximal edge of median fascia bordered cream; costal portion of fascia atrophied, distal edge in dorsal part of wing diffuse; subapical blotch with almost completely separated terminal part. Hindwing pale brownish, somewhat more cream apically.

Female. Forewing 8—11 mm; costa with distinct concavity before apex; apex produced costally; termen distinctly sinuate. Ground colour yellow-brown with ochreous shine, browner in basal and dorsal halves of wing, delicately stri-gulated transversely with brownish. Pattern represented by slender, brownish subapical blotch. Fringes brownish except for tornal part where more cream.

Variation. Males with a tendency to atrophy of median fascia; in some specimens only its median part is preserved. Subapical blotch often divided into two parts, the tornal part being pale edged. Females with more or less pale distal (tornal) part of forewing. Subapical blotch often ochreous-brown.

Male genitalia (figs. 90, 91). Uncus longer and slenderer than in preceding species; submedian fold of sacculus large; aedeagus distinctly dentate, provided with ventral dent subterminally.

Female genitalia (fig. 191) with cestum and distal part of sterigma somewhat longer than in *A. termias* (MEYR.).

Comments. This species is distinct by the shape of the forewing, especially by the costa and long costal fold. The female genitalia are characterised by long cestum.

Archips limatus sp. nov.

Two subspecies are distinguished. The nominate subspecies is known from Tsinling, South Shensi, the second from West Tien-mu-shan. There is also a group of specimens from Li-kiang, North Yunnan which distinctly differ from the preceding subspecies. Unfortunately the knowledge on the species in question is insufficient and I cannot decide if the Li-kiang population is a separate subspecies.

Archips limatus limatus ssp. nov.

Holotype, male „Tapaishan in Tsinling, Sued Shensi (China), 21. VI. 1935, H. HÖNE”, coll. ZFMK. Paratypes, 59 males and 2 females identically labelled as the holotype but dated 21. VI. — 12. VIII.

Male. Labial palpus 1.5, brownish, cream distally; remaining parts of head paler, concolorous with thorax. Forewing 10—12 mm, 11 mm in holotype; costa gently concave subapically; apex short; termen concave beyond apex with deepest point at vein m_1 , then convex. Costal fold slender tapering in distal third. Ground colour pale ferruginous cream, suffused brownish, provided with

indistinct violet-pink shine. Basal half of wing distinctly suffused grey-black except for dorsal edge. Costal fold blackish, ochreous-rust in distal third. Pattern cinnamon brown; basal blotch ill-defined; median fascia atrophied in costal third of wing and dorsally; subapical blotch well developed, extending from mid-costa to before apex with distal edge slightly concave terminating beyond vein cu_1 . Terminal portion of this blotch somewhat paler than the costal part, often indistinct. Narrow marking along termen postapically. Fringes between apex and middle of termen brownish then gradually paler and more cream, concolorous with ground colour before apex. Hindwing pale brownish grey in caudal area, cream costally, cream mixed pale orange apically; fringes cream, darker at apex.

Female. Head and thorax paler than in male, cream brown. Forewing ca 11 mm; costa as in other species of this group; apex long; termen sinuate. Ground colour cream brown mixed ferruginous, suffused brownish basally and dorsally, finely strigulated transversely with brownish. Pattern rust-brown, diffuse except for narrow, vivid subapical blotch. Basal blotch atrophied in costal area, median fascia from one-third of costa to middle of dorsum where broader and darker than costally. Brown spot at disc; ferruginous suffusion at apex and termen postapically. Fringes concolorous with ground colour, rust-brown between apex and middle. Hindwing pale orange except for caudal area which is brownish. Fringes cream.

Variation. The males sometimes pale with cream ground colour and distinct terminal portion of the subapical blotch. The median fascia showing a tendency to atrophy, usually preserved in median portion of wing. Some specimens are dark with rust-brown pattern and strong blackish suffusion of basal half of wing.

Male genitalia (figs. 92, 93). Uncus slender, tapering terminally; socius delicate; sacculus long with proportionally short free termination. Aedeagus large, densely spined ventrally, dentate dorso-laterally, provided with long ventro-terminal pointed process somewhat directed to the left.

Female genitalia (fig. 192). Sterigma proportionally short with small median process and weak distal lobes; cup-shaped part well developed; antrum very large; cestum reaching to beyond middle of ductus bursae; signum with well developed basal sclerite.

Bionomy and distribution. Moth in June, July and August in Tapaishan (South Shansi, China).

Archips limatus albatrus ssp. nov.

Holotype, male: „West Tien-mu-shan, Prov. Chekiang, 4. VI. 1932, H. HÖNE", Coll. ZFMK. Paratypes, 15 males identically labelled as the holotype but dated: 23 and 29. V., 3, 4 and 6. VI., 4 and 31. VII., 5. X. and 3. XI.

Male. Forewing much slenderer than in nominate subspecies with costa less curved outwards, longer apex and more oblique termen. Ground colour pale brownish ochreous, mixed cream in distal half of wing, suffused brown or brown-

grey in basal area. Costal fold blackish brown except for terminal portion. Pattern rust brown; median fascia indistinct, diffuse; subapical blotch rust. Hindwing pale brownish grey in anal half, whitish cream or cream in costal half, occasionally darkening apically. Otherwise as for the nominate form.

Female unknown.

Male genitalia (fig. 94) somewhat smaller than in nominate subspecies, differing mainly in the shape of the aedeagus which is shorter and provided with smaller, more ventrally directed apical dent. Minute teeth in postmedian portion of distal part of aedeagus mainly ventro-laterally.

Archips dispilanus (WALKER, 1864)

Pandemis dispilana WALKER, 1864, List Specimens lepid. Insects Colln Br. Mus., 30: 983. Type locality: Bhutan. Holotype, male „Bootan; 60. 15, E. I. C.". Coll. BM.

Archips mimicus WALSINGHAM, 1900, Cat. *Lepid.* Oxford Mus., 2: 573. Type locality: Ooty (India). Lectotype (here designated), male, „Ooty, India, 1884, MINCHIN Coll. No. 29", G. Sl. 7862 [BM.] Coll. BM.

Cacoecia epicryta MEYRICK, 1905, J. Bombay nat. Hist. Soc., 16: 589. Type-locality: Maskeliya, Ceylon. Lectotype (designated by CLARKE, 1958), „Maskeliya, Ceylon, E. E. G., VII. 1902", G. Sl. 6807 [BM]; coll. BM. — **synon. nov.**

Cacoecia eupatris MEYRICK, 1908, J. Bombay nat. Hist. Soc., 18: 614. Type-locality: Welawaya, Ceylon. Holotype, male with abdomen missing, „Welawaya, Ceylon, E. E. G., II. 1905. Coll. BM — **synon. nov.**

Misidentification:

micaceana: DIAKONOFF 1939: 172 (*Cacoecia*).

Male. Labial palpus ca 1.5 yellowish brown; head and thorax greyish brown. Forewing 7—9 mm, somewhat expanding terminally; costa bent to middle, hardly concave subapically; apex very short, with scales slightly prominent costally; termen weakly sinuate. Ground colour pale yellowish brown hardly mixed ochreous, scarcely sprinkled with brown, weakly strigulated transversely in terminal third of wing. Costal fold slender reaching to before middle of costa, brownish. Pattern brown with indistinct admixture of ferruginous; basal blotch rounded apically; median fascia slender in costal third, very broad from beyond middle of median cell, with proximal edge extending from one-third of costa to middle of dorsum; subapical blotch subtriangular with almost atrophied (in the holotype, probably damaged) or separate subterminal part; apex suffused with brown. Fringes rather concolorous with pattern, cream towards tornus. Hindwing greyish brown with cream apical and costal areas; fringes dirty cream with weak, darker median line.

Female. Forewing 8—11 mm; costa convex in basal third, concave beyond middle; apex fairly long; termen slightly sinuate postapically. Ground colour yellow-brown with admixture of ochreous or orange; pattern and delicate transverse strigulation of distal portion of wing browner. Basal blotch weak often preserved only as dorsal suffusion, median fascia indistinct, in form of costal

and dorsal suffusions, subapical blotch well developed, slender. Fringes concolorous with ground colour, brownish terminally between apex and middle of termen. Hindwing yellowish cream except for caudal area which is brownish grey.

Variation. In the males ground colour often more brown-grey and pattern varying in shade. *Ab. eupatris* is characterised by ochreous rust shade of ground colour and dark pattern. Proximal edge of median fascia straight or convex medially, often edged whitish.

Male genitalia (Figs. 95—98). Uncus delicate, slightly tapering terminally; socius vestigial; ventral edge of valva strongly convex medially; free termination of sacculus large; aedeagus with proportionally short coecum penis, provided with sharp ventral termination situated on the right side and minute lateral tooth before it.

Female genitalia (figs. 193, 194). Sterigma proportionally short with short cup-shaped portiln; antrum shorter than length of sterigma; ductus bursae very long; cestum very long; signum with reduced distal sclerite.

Bionomy. Moth collected in May, June and September in Khasis at the altitude of over 1500 m. The larva feeds in fruit of plum.

Distribution. Bhutan, India (Assam: Khasi Hills) and Ceylon.

Comments. The abdomen of the holotype of *A. displanus* (WALK.) is missing. This species is distinctly variable externally. I have had an opportunity to examine three males of the Ceylon population. They have subapical tooth of aedeagus somewhat longer than in Indian specimens, but that is most probably of the infrasubspecific importance. Examination of larger material is needed to confirm the present point of view.

Archips pensilis (MEYRICK, 1920)

Cacoecia pensilis MEYRICK, 1920, Exot. *Microlep.*, 2: 339. Type locality: Madras (India). Holotype, female „Madras, S. India, T. B. F.(LETCHER), bred, VIII”, G. SL. 6809 (BM). Coll. BM.

Misidentification:

micaceana (part.): DIAKONOFF, 1976: 86 (*Archips*).

Male unknown.

Female. Labial palpus over 1, brownish yellow; head cinnamon brown, thorax browner especially in middle. Forewing 7.5 mm, broadest postbasally and subterminally distinctly curved outwards to about middle, then conspicuously concave; apex strongly prominent, fairly short; termen sinuate postapically, convexely rounded beyond middle extending behind level of apex. Ground colour pale cinnamon brownish, paler and yellower in terminal third of wing, delicately darker strigulated and lined. Costa dark to before middle; subapical blotch dark cinnamon brown delicately edged yellowish anteriorly situated in costal concavity. Apex yellow-brown mixed olive. Fringes concolorous with ground colour, blackish

grey at apex, dark brown to beyond middle length of termen. Hindwing pale orange-yellow, mixed brownish caudally; fringes rather concolorous with wing except for apex where greyer, and caudally where more cream; costal group of scent scales golden-grey.

Female genitalia (fig. 195). Proximal, cup-shaped portion of sterigma almost as long as distal part; antrum longer than half of sterigma; cestum long, reaching to beyond middle of ductus bursae.

Bionomy. The larva has been found to bore in fruit of orange at the base of stalk; moth collected in August.

Distribution: South India: Madras.

Comments. DIAKONOFF (1976:86) synonymised this species with *A. micaceanus* (WALK.). However, in the latter the cestum is twice shorter than in the species in question. Before further material of the two is examined I am preserving *A. pensilis* (MEYR.) as a valid species.

Archips machlopiis (MEYRICK, 1912)

Cacoecia machlopiis MEYRICK, 1912, Exot. *Microlep.*, 1: 4. Type locality: Khasi Hills, India. Lectotype (designated by CLARKE, 1958), male, labelled „Khasi Hills, Assam, X. 1906”, G. SL. 6808 [BM]; coll. BM.

Cacoecia compacta MEYRICK, 1918, Exot. *Microlep.*, 2: 164. Type locality: Pusa (Bengal), India. Lectotype, female (designated by CLARKE, 1958), „Pusa, Bengal, T. B. F.[LETCHER], IV. [19]16”, G. SL. 6811 [BM], coll. BM.

Cacoecia isocyrtia MEYRICK, 1920, Exot. *Microlep.*, 2: 340. Type locality: Pusa, India. Holotype, female „Pusa, Bengal, T. B. F.[LETCHER], II. [19]17”. Coll. BM.

Misidentification:

micaceana (part): DIAKONOFF, 1939: 172 (*Cacoecia*).

Male. Labial palpus ca 1.5, orange ferruginous; head and thorax browner; abdomen brownish grey. Forewing 10—11 mm, somewhat expanding terminally; costa weakly curved outwards in basal third then gently concave; apex fairly long, produced costally; termen sinuate beyond apex, distinctly convex in dorsal half; costal fold reaching to one-fourth of costa, tapering in distal half. Ground colour brownish, pattern brown, both with ferruginous hue. Basal blotch represented by dorsal indistinct triangle; median fascia extending from end of costal fold to beyond middle of dorsum; subapical blotch slender, from mid-costa, with separate terminal part reaching dorsal part of termen; terminal marking weak. Fringes concolorous with ground colour. Hindwing pale orange-cream except for anal area which is greyish brown; fringes orange-cream and grey-brown respectively.

Female. Labial palpus about 1.5, ochreous; remaining parts of head and thorax dark brown; abdomen more yellowish. Forewing hardly expanding terminally; costa strongly curved outwards in basal third then abruptly concave, produced in apical portion; apex long; termen strongly sinuate, convex at vein *cu*₂. Ground colour brown with indistinct violet-grey shine; strigulation dense,

brown; an oblique line from apical portion of costa to before end of termen. Pattern reduced, vivid dark brown to subapical blotch extending from middle of costa to before apex. Fringes brown mixed with ochreous, cream at tornus, dark brown at apex. Hindwing pale brown-grey to vein cu_1 yellowish cream mixed orange in remaining parts, delicately strigulated with brown-grey; fringes brownish cream, cream beyond dark parts of wing, more ochreous-brown at apex; costal group of scent scales dark grey.

Variation. In the males the ground colour varies from pale ochreous to cream-grey, the pattern is darker and browner. The forewing of females often cinnamon brown with grey suffusion and dark brown pattern.

Male genitalia (figs. 99, 100). Uncus broad, slightly expanding terminally, rounded apically; socius membranous, almost completely strophied. Valva similar to that in *A. micaceana* (WALKER). Aedeagus as in mentioned species but provided with small ventro-subterminal dent directed to the right.

Female genitalia (figs. 196, 197). Sterigma proportionally small with minute median process and short cup-shaped part; antrum short; cestum to beyond middle of ductus bursae.

Bionomy. The moth flies from February to April, and in October. One specimen (ab. *isocyrtus*) has been bread from shoot of lucerne (*Medicago* L.). Most probably the data (flight period, list of the food plants) given by DIAKONOFF (1939a:232) for *A. micaceanus* (WALK.). concern the species in question.

Distribution. This species is known to me from India (Khasis, Bengal) and Java. DIAKONOFF (1948) mentions it from Tonkin, Cho-Ganh and (1971) from South Thailand.

For comments see *A. micaceanus* (WALK.).

Archips expansus (DIAKONOFF, 1941)

Cacoecia expansa DIAKONOFF, 1941, Treubia, **18** (2): 413, pl. 22 fig. 6. Type-locality: Tjibodas, Mt. Gede (W. Java). Lectotype, male, labelled „W. Java, 1400 m, Mt. Gede, Tjibodas, 25. IV. 1940, Dr. L. J. TOXOPEUS” with abdomen missing; coll. MNHL.

DIAKONOFF, 1976: 93 (*Archips*).

Labial palpus over 1, orange-rust; head rather concolorous; thorax browner; abdomen brownish cream (remainders). Forewing 11 mm, distinctly expanding terminally costa curved outwards in basal fourth, then distinctly gradually concave; apex protruding costally, fairly long; termen sinuate, convex beyond vein m_1 , extending beyond apex level. Costal fold broad, tapering in terminal fourth, reaching fourth of costa, then the wing margin only slightly directed upwards. Ground colour cream ferruginous suffused cinnamon, with indistinct violet shine in terminal half of wing. Pattern rust-brown with darker and paler places. Basal blotch represented by a diffuse triangle at dorsum, costal fold brownish; median fascia from end of costal fold, narrow in costal half of wing, paler and broad in dorsal half where diffuse except for proximal edge; subapical

blotch narrow extending from before middle of costa, terminating before apex, pale distally, followed by elongate, curved outwards marking terminating in acute tip at vein cu_1 ; terminal marking rust-brown, developed in apical third of wing. Blackish spot near disc, some similarly coloured groups of scales in terminal third of wing in costal area. Fringes concolorous with ground colour browner rust at termination, dark brown mixed black at apex. Hindwing pale orange-cream except for anal area (to vein cu_2) which is greyish brown; fringes rather concolorous respectively.

Comments. Unfortunately the genitalia of this species are unknown to me. DIAKONOFF (1968:137) synonymised it with *A. machlopis* (MEYR.) but then (1976:93) resurrected it treating the latter as a synonym of *A. micaceanus* (WALK.). The discussion given by DIAKONOFF is insufficient to decide about the systematic position of this species as the problem of the „*micaceanus*-complex” is not clear enough (cf. p. 126).

Archips micaceanus (WALKER, 1863)

Cacoecia micaceana WALKER, 1863, List Specimens lepid. Insects Colln Br. Mus., 28: 314. Type-locality: Shanghai, China (originally mistakenly given as Hong-Kong). Holotype, female, „Shanghai”, G. Sl. 287 [BM]; coll. BM.

Cacoecia micaceana var. *obscura* DIAKONOFF, 1939, Rec. Indian Mus., 41: 231.

Cacoecia eucroca DIAKONOFF, 1958, Beitr. Ent., 8: 119. Type-locality: Canton, China. Holotype, male „China, Canton, 28. X. 1956, on *Citrus*, leg. S. K. LIU”, G. Sl. 21 ♂ [DIAKONOFF]; coll. MNHL.

Misidentifications:

epicyrta, *machlopis*, *isocyrtia*, *transcutata*, *compacta*: DIAKONOFF, 1939: 172—173 (*Cacoecia*).

brachytoma: DIAKONOFF, 1941: 387 (*Cacoecia*).

pensilis: DIAKONOFF, 1976: 86 (*Archips*).

Male. Labial palpus over 1, orange-yellow; remaining parts of head brownish except for front and vertex which are rather concolorous with palpus; thorax brown, darkest proximally. Forewing 7.5—8.5 mm, somewhat expanding terminally; costa strongly curved outwards in basal third then straight, hardly concave subapically; apex short, slightly prominent costally; termen weakly sinuate, convex postmedially. Costal fold fairly broad reaching to about middle of costa. Ground colour brownish yellow, partially suffused brown especially in proximal and dorsal parts of wing. Basal blotch indistinct, rust-brown darkest dorsally; median fascia darker in costal area of wing paler and broader in median and dorsal portions with proximal edge extending from one-third of costa to 2/3 of dorsum; subapical blotch usually uniform, rather delicate, darkest in costal area. Weak brown marking at termen postapically. Distinct pearl gloss all over the wing. Fringes brownish yellow from beyond vein m_2 . Hindwing orange-yellow, more brown in caudal area; fringes grey-orange, brownish at apex.

Female. Labial palpus yellow-brown mixed ochreous, remaining parts of head darker, with rust scales on front and vertex; thorax rather concolorous with

head. Forewing 9 mm, uniformly broad; costa distinctly curved basally, hardly concave before apex; apex produced costally, rather short; termen sinuate, convex postmedially, extending over apex level. Ground colour cream-ochreous with distinct pearl gloss especially well developed in distal half of wing where groups of refractive scales arranged in the fascia parallel to pattern. Scarce refractive scales (more leaden-grey in colour) scattered all over the pattern. Basal area ferruginous brown darkest costally, median fascia rather concolorous, interrupted subcostally; subapical blotch browner than preceding parts of pattern apex rust-brown. Three delicate brownish lines in terminal area of wing parallel to median fascia. Fringes concolorous with ground colour of distal part of wing, rust brown at apex and terminations of costal half of termen. Hindwing pale orange, slightly mixed brownish in caudal area; fringes somewhat paler than wing, tinged brownish at apex; costal group of scales greyish black.

Variation. In the males the ground colour occasionally pale brownish grey and the pattern black-brown and brown or yellowish cream, strongly suffused brown-grey in basal area of wing with dense transverse strigulation and brown-grey pattern. In ab. *eucrocus* ground colour is brownish yellow, mixed orange terminally and the pattern rust brown, partially diffuse except for subapical blotch which is dark brown. The pattern shows a tendency to atrophy in basal portion of wing and to darken in the costal portions. The pattern of the female is usually strongly reduced; the basal blotch is represented by a dorsal suffusion, the median fascia atrophies in costal and median parts of the wing while the subapical blotch is distinct. The ground colour is browner. Often transverse brownish strigulation occurs.

Male genitalia (figs. 101, 102). Uncus broad, expanding distally, rounded apically. Socius absent. Valva somewhat produced distally; sacculus with well developed free termination; aedeagus with short coecum penis and very long caulis, provided with a single or two minute teeth at the end laterally. Four to six cornuti present in vesica.

Female genitalia (figs. 198, 199). Sterigma short, with small median process and proportionally large cup-shaped part the proximal corners of which are rounded; antrum short; ductus bursae with very long cestum long.

Bionomy. The type of ab. *eucrocus* was bred from *Citrus* sp. two specimens from Hanoi and Tonkin on *Iriga* sp. and ricin. Moth collected in October (the only data, but certainly occurring in two generations).

Distribution. Shanghai, Kanton and Canton (China), Hanoi (Vietnam). After DIAKONOFF (1948) also India, Burma and Malay Archipelago. The above data need, however, confirmation especially those concerning the occurrence of *micaceanus* in India and (1971) in South Thailand.

Comments. Although DIAKONOFF (1939:172) synonymised some species (listed on p.125) with *A. micaceanus* (WALK.) and confirmed his opinion in this paper of 1976 the problem is still unclear. However, some further authors as OBRAZTSOV (1955:206) or CLARKE (1958:43) followed DIAKONOFF. In the paper of 1976 DIAKONOFF figured correctly the female genitalia of this species (fig. 71)

but his fig. 79 represent the aedeagus of a different species, viz., *A. seminubilus* (MEYR.). I have had an opportunity to examine the types of the latter, and accept that the two sexes are conspecific. The female paralectotype of that species differ from that of the holotype of *A. micaceanus* (WALK.). The examination of the typically coloured specimens (with a distinct pearl gloss) allowed, I do hope, to find a male of *micaceanus*. Third species mixed up with *micaceanus* was *A. machlopiis* (MEYR.). It characterises by presence of subterminal tooth of aedeagus and shorter ductus bursae. I find no character differing it from *Cacoecia compacta* MEYR., and *C. isocyrtia* MEYR. treated previously as conspecific with the species in question. *C. epicyrtia* MEYR. is treated here as a distinct species. *A. pensilis* (MEYR.), last of the species synonymised by DIAKONOFF with *micaceanus* somewhat differs from *A. machlopiis* (MEYR.) and is preserved as a valid species. *C. micaceanus* var. *obscurus* is unknown to me and I accept the point of view of its author treating it as an infrasubspecific form of *micaceanus*. I am finding also that *C. eucroca* DIAK. from China is synonymous with this species.

Archips seminubilus (MEYRICK, 1929)

Cacoecia seminubila MEYRICK [in:] JOANNIS, 1930, Annl. Soc. ent. Fr., 98 (1929): 711. Type-locality: Hoang-du-phi (Tonkin), Vietnam. Lectotype, male (here designated), „Hoang-su-phi, Tonkin”, G. Sl. 3738 [MHNP]; coll. MHNP.

Misidentification:

micaceana: DIAKONOFF, 1976: 85 (part), fig. 79 (*Archips*).

Male. Labial palpus ca 1.5, yellow-brown; head and thorax rather concolorous, the latter browner anteriorly. Forewing 7—9 mm, weakly expanding terminally; costa curved outwards in basal third, slightly concave postmedially; apex very short, produced costally; termen weakly sinuate beyond apex, distinctly convex beyond middle. Costal fold slightly variable in size, usually reaching to before middle of costa, tapering in distal third apically. Ground colour brown-cream with indistinct pink shine dorsally. Pattern brown; basal blotch ill-defined; median fascia extending from one-third of costa to two-thirds of dorsum, mixed rust-brown in dorsal area; subapical blotch from middle of costa to before apex, tapering towards end of vein cu_2 ; weak suffusion subterminally beyond apex. Fringes concolorous with ground colour, cream at tornus, brown at apex and terminally to middle of termen. Hindwing brownish cream, suffused pale ochreous towards apex; fringes paler with fairly well developed median line.

Female. Labial palpus pale brownish ochreous, head and thorax darker with cinnamon hue. Forewing 9 mm, broadest at one-third. Costa strongly curved basally, concave beyond middle (with deepest point at 2/3); apex fairly long, termen concave postapically, convex beyond middle, not reaching the apex level. Ground colour brownish yellow slightly mixed ochreous especially in terminal third of wing; weak brownish strigulation present; base of wing and apex suffused brown. Pattern brownish, in form of a weak shade representing median fascia

and distinct subapical blotch at $2/3$ of costa. Fringes concolorous with ground colour, pale brownish in apical half of termen. Hindwing pale ochreous cream, brownish caudally; fringes concolorous with apical part of wing, mixed brownish in caudal area; costal group of scent scales small, brownish.

Variation. Males from province Chekiang, China with more or less dark ground colour (admixture of brown) and delicate transverse strigulation; pattern brownish to brown; in examined specimens median fascia rather indistinct; subapical blotch is the darkest part of pattern, often with separate terminal portion. Hindwing pale cream with brownish grey caudal area, brownish grey hardly mixed with ochreous at apex. Specimen from Pusa (India) is larger than the China examples and characterised by ochreous, violet shining ground colour and violet-brown pattern distinctly edged with orange-ferruginous; distal part of subapical blotch concolorous with edges of pattern; fringes black-brown at apex, otherwise rust brown, cream at tornus. Hindwing yellow-cream, brown caudally.

Male genitalia (figs. 103, 104). Uncus very broad, strongly broadening and rounded distally; socius atrophied. Valva short, strongly convex ventrally; sacculus with fairly short free termination. Aedeagus with proportionally short coecum penis, weakly bent beyond it, terminating in distinct subapical dent situated on the right side and directed ventrally, left end of aedeagus rounded, directed distally; 8—20 cornuti in vesica.

Female genitalia (fig. 200). Sterigma fairly broad with broad, rather short cup-shaped part and small median process; antrum proportionally long, rather weakly sclerotised; cestum reaching to before end of extremely long ductus bursae; signum delicate.

Bionomy. In Chekiang the moth collected in April and September; in Bengal found in August. The later specimen has been bred from leaf of *Cedrela toona* ROXB. ex ROTTL.

Distribution. Besides the type-locality (Tonkin, Vietnam) the species is known from Wenchow and West Tien-mu-shan (province Chekiang, China), Buitenzorg (Java) and Pusa (Bengal, India).

Archips excurvatus (MEYRICK, 1931)

Cacoecia excurvata MEYRICK 1930 [in] JOANNIS, Annls Soc. ent. Fr., 98, Suppl.: 712. Type-locality: Tonkin, Vietnam. Holotype, female, „Hoang Su Phi, Tonkin” with abdomen missing; coll. MHNP.

Male unknown.

Female. Labial palpus over 1.5, pale brownish suffused black-brown towards the end. Head and thorax brownish grey (end of scales pale). Forewing 11 mm; costa strongly curved outwards in basal third, distinctly concave postmedially; apex fairly long, protruding costally; termen distinctly concave beyond apex (deepest point at vein m_1), convex between m_3 — cu_1 . Ground colour concolorous with thorax, paler at places, scarcely strigulated with brownish along costa near

base. Dark brown spot in middle of postbasal area. Pattern dark vivid brown; median fascia represented by a spot at end of convexity of costa; subapical blotch slender, extending from middle of costa, broadest before end, marked with cream scales costally, mixed yellowish terminally. Two small spots before apex. Fringes brownish, brown to middle line externally, cream from m_3 to tornus, mixed yellow-cream before apex. Hindwing pale brownish grey suffused ferruginous in apical fourth, becoming darker towards apex; fringes greyish with grey-brown median line.

Genitalia unknown to me.

Bionomy and distribution: no data except for the type locality.

Comments. The species is rather similar to *A. machlopi* (MEYR.) and some other species of this group and may be synonymous with one of them.

Archips issikii KODAMA, 1960

Archips issikii KODAMA, 1960, Publ. Ent. Lab. Univ. Osaka Pref., 5: (23)-fig. 17 (no type designation). YASUDA, 1961, ibid., 6: 62, pl. 18, figs. C, c. Type, locality: Asakawa, Tokyo Prefecture (Japan). Holotype, male labelled „Asakawa, Tokyo Pref., 23. V. 1959, T. KODAMA; bred f. [rom... — the name in Japanese] = *Abies firma* SIEB & ZUCC.”; second description; coll. UOP.

Archips abietis FALKOVITSCH, 1965, Ent. Obozr., 44: 414. fig. 1, 2. Type-locality: Okeanskaja (near Vladivostok), U.S.S.R. Holotype, male labelled: „Vladivostok, Okeanskaja, FALKOVITSCH, 30. VII. [II]963”, G. Sl. not numbered; coll. ZIANL.

Misidentification.

Archips fumosus (part.) YASUDA 1972: 96.

Male. Labial palpus ca 1.5, brownish, darkening terminally; remaining parts of head slightly paler; thorax ochreous brown to yellowish brown. Forewing 9—10 mm; costa curved outwards to middle, almost straight towards apex; apex pointed, not protruding; termen straight. Costal fold slender reaching just beyond middle of costa. Ground colour pale brownish cream with indistinct ochreous hue, mixed ochreous basally. Costal fold ochreous brown at base then concolorous with ground colour. Pattern brown, basal blotch dark brown; median fascia atrophied costally, very broadened from middle to dorsum, with proximal edge strongly convex, darkest proximally, mixed cream-brown distally; brown spot at disc; subapical blotch from beyond middle of costa, with slender, curved outwards terminal part reaching to termen before tornus; postapical terminal pattern delicate. Fringes concolorous with ground colour, cream towards tornus. Hindwing greyish brown, rather pale; fringes dirty white-cream, mixed pale brownish at apex; median line pale brown.

Female. Forewing 10—11.5 mm; costa curved outwards to middle, then straight; apex as in male; termen not sinuate. Ground colour ochreous brownish with more or less distinct olive-grey hue and delicate more brownish transverse strigulation. Pattern ill-defined consisting of traces of the median fascia at costa and dorsum and more distinct subapical blotch. Hindwing brown; fringes whitish grey with pale brownish basal line.

Variation. The ground colour more or less dark, often suffused grey. In *ab. abietis* ground colour is brownish mixed grey and the pattern distinct, brown. In other specimens the ground colour varies from yellowish-grey to brownish being usually mixed cream or ochreous cream in the proximal or (and) costal parts of wing. The females are usually unicolorous ochreous-brownish to olive brown-grey, more or less dark, with rather well developed darker transverse strigulation or reticulation. The remainders of pattern preserved mainly in the distal third of the wing. Very often an oblique narrow marking representing terminal portion of subapical blotch occurs.

Male genitalia (figs. 105, 106). Uncus slender, delicately broadening terminally rounded apically; sacculus with fairly short free termination; aedeagus proportionally short, rather straight in distal half, pointed ventro-apically, provided with a dorso-lateral sharp process situated postmedially. Seven cornuti in vesica found in examined specimens.

Female genitalia (fig. 201). Sterigma with fairly large dorsal plate and minute median process; cup-shaped part broad, short; antrum with very short median sclerite; cestum reaching to before antrum; signum with fairly long capitulum.

Larva. After YASUDA (1975) the mature larva is 20 mm long, pale green with head glossy brownish-ochreous and yellowish ochreous black distally prothoracic shield. Thoracic legs and pinacula of thorax black, peritreme of spiracles blackish ochreous.

Bionomy. The moth flies in Honshyu between 7. V. and 29. VII. In Iuzhnoe Primore KUZNETSOV (1972) observed the larvae in June and the flight between 16 and 21. VIII. Host plants in Japan are: *Abies sachalinensis* MASTERS, *A. concolor* LINDL., *A. firma* SIEB. & ZUCC. and *Larix leptolepis* GORDON and in Iuzhnoe Primore *Abies holophylla* MAX.

Distribution. Japan: Hokkaido and Honshyu; U.S.S.R.: Iuzhnoe Primore.

Archips fumosus KODAMA, 1960

Archips fumosus KODAMA, 1960, Publ. Ent. Lab. Univ. Osaka Pref., 5: (23), fig. 16 (no type designation). YASUDA, 1961, *ibid.*, 6: (60), pl. 18 figs. B, b, pl. 9 figs C₁—C₃, pl. 11 fig. C₁—C₃. Type-locality: Yamabe, Hokkaido (Japan). Holotype, male labelled „Yamabe, Hokkaido, 22. VII. 1958, C. NISHIGUCHI (food plant: *Picea pungens* ENQUELM.)”; Coll. UOP.

Archips abietis (part.): YASUDA 1972: 96.

YASUDA 1975: 93.

Male. Labial palpus shorter than 1.5, brown; remaining parts of head slightly darker; thorax brownish, darker proximally. Forewing 10 mm, not expanding terminally; costa curved to about middle, tolerably straight in distal portion; apex very short, rounded; termen hardly sinuate, weakly convex postmedially; costal fold slender, tapering terminally from middle, reaching to middle of costa. Ground colour pale brownish cream in distal and costal portions of the wing,

greyish to median fascia and before tornus; costal fold dark brownish grey, darker strigulated transversely, paler distally; pale cream area between costal fold and basal blotch. Pattern dark chestnut brown, usually pale edged (cream), dorsal portion of median fascia suffused greyish; terminal portion of subapical blotch pale brownish. Basal blotch large, proximal edge of median fascia extending from one-third of costa to two-thirds of dorsum, concave subcostally and subdorsally; proximal edge of subapical blotch rather vertical to costa, extending from beyond its middle; terminal pattern black-brown developed in costal half of termen, accompanied by glossy grey suffusion. Weak transverse strigulation often developed in terminal portion of wing. Fringes brownish to brownish grey, rather cream towards tornus. Hindwing grey-brown, fringes somewhat paler.

Female. Forewing 13 mm, rather slender, uniformly broad throughout with costa curved outwards in basal third, indistinctly concave before apex; apex short; termen weakly sinuate postapically. Ground colour more yellowish brown than in the male, transversely strigulated and reticulate brown, mixed brown-grey in dorsal area where indistinct violet hue occurs. Pattern brown, median fascia suffused dark grey in dorsal portion except for the edges. Basal blotch fairly well developed in dorsal part of wing, ill-defined in remaining parts where represented by a line (distal edge); median fascia divided into a narrow dorsal portion situated at costa and broad subsquare part extending from middle. Costal portion of subapical blotch long, terminal portion paler and slender; terminal pattern as in male. Fringes paler than in male, brown in apical third of termen. Hindwing as in male.

Male genitalia (figs. 107, 108). Uncus thick, slightly narrowing postmedially, expanding towards the end, rounded apically; socius atrophied; sacculus strong, somewhat broadening terminally, provided with subtriangular free termination. Aedeagus proportionally short, elongate, pointed ventro-terminally, provided with small, dentate process situated beyond middle dorso-laterally. Two cornuti in examined specimens.

Female genitalia (fig. 202). Papilla analis broad; sterigma with proportionally short dorsal portion and small median process; cup-shaped part of sterigma rather large, somewhat tapering proximally; antrum with short internal sclerite; cestum reaching to almost the end of ductus bursae.

Bionomy. The moth was collected in June and July in Japan, one specimen from China in beginning of August. Hosts (after YASUDA, 1961) are *Taxus cuspidata* SIEB. & ZUCC. and *Picea pungens* ENQUELM. In the paper of 1975 YASUDA adds *Abies sachalinensis* MASTERS.

Distribution. Japan: Hokkaido; China: Li-kiang (Provinz North Yunnan).

Archips viola FALKOVITSH, 1965

Archips viola FALKOVITSH, 1965, Ènt. Obozr., **44**: 415, fig. 3, 4. Type-locality: Okeanskaja (Iuzhnoe Primore), U.S.S.R. Holotype, male, „St.[ancija] Okeanskaja, Vladivostok; 18. VII. 1959, ex. 1.”, G. Sl. 260 [FALKOVITSH]; coll. ZIANL.

Archips purpuratus KAWABE, 1965, Trans. lepid. Soc. Jap., 16: 16, figs. 1, 2, 39, 40, 70. Type-locality: Mt. Akagaki, Gunma Prefecture, Japan. Holotype, male, „Mt. Akagaki, Gunma Pref., 19—21. VII. 1964, A. KAWABE”; coll. Dr. A. KAWABE, Tokyo.

Male. Labial palpus over 1.5, pale brownish, more cream basally; remaining parts of head greyish brown; thorax brown; abdomen paler than thorax with pale brownish terminal tuft. Forewing 7—9 mm hardly expanding terminally; costa curved outward in basal third, then slightly so; apex very short, not protruding costally; termen hardly sinuate, weakly convex postmedially. Costal fold reaching two-thirds of costa, bent, tapering terminally in distal half. Ground colour grey, in basal third of wing tinged brown especially towards dorsum, with violet-grey shine; costal fold brown-grey grey scaled distally. Pattern deep brown more or less distinctly pale (cream to grey-cream) edged. Basal blotch broad, rather ovate; median fascia thin in costal third, very broad in the remaining portion, or atrophied costally, marked with black-brown, with proximal edge extending from one-third of costa to two-thirds of dorsum, convex medially; subapical blotch from middle or 2/3 of costa to 2/3 of termen. Apex marked with black. Fringes brownish, black-brown at apex, dirty cream brown or concolorous with ground colour at tornus. Hindwing grey-brown with paler and greyer fringes. Basal line brown.

Female. Forewing 11—12 mm, uniformly broad throughout; costa curved outwards in basal third, then straight and weakly concave subapically; apex short; termen hardly sinuate, weakly convex postmedially. Coloration and shape of pattern as in male; apex area grey-cream with black markings; fringes concolorous with ground colour, mixed brownish in costal half of wing especially terminally. Hindwing brown-grey, mixed yellowish or orange cream apically; fringes pale greyish cream, brownish apically; basal line brown.

Variation. In the males the median fascia shows a tendency to reduction in costal half of wing. One or two black-brown vertical markings in median portion developed. In dark specimens the ground colour is brownish, suffused violet-grey or dark grey near median fascia rather medially. Distal edge of median fascia often incised beyond disc, or both edges diffuse, without pale borders. Subapical blotch more or less elongate, curved outwards in terminal part. The females sometimes with weak pinkish hue in distal third of wing where the ground colour is whitish-grey in hue, delicately strigulated brown transversely. Median fascia shows a tendency to divide into two or three parts and the subapical blotch into two parts. In one female the hindwing is orange distally.

Male genitalia (figs. 109, 110). Uncus slender, slightly broadening distally, rounded apically; socius vestigial or absent. Sacculus slender with rather short free termination. Aedeagus proportionally small, tapering and pointed ventro-apically, provided with some minute subapical teeth; one or two cornuti in vesica present.

Female genitalia (fig. 203). Papilla analis broad; sterigma with very large tapering proximally cup-shaped part and very short dorsal portion; antrum slender.

er, shorter than proximal part of sterigma; cestum to before end of ductus bur-sae.

Bionomy. The moth occurs in various types of forests. In Iuzhnoe Primore (KUZNETSOW, 1973) it lives from end of May to beginning of July on *Juglands mandshurica* MAX., *Pirus ussuriensis* MAX., *Sorbaria sorbifolia* A. BR., *Ulmus laciniata* MAYR., *Lonicera edulis* TURCZ., *Syringa amurensis* RUPR., *Alnus hirsuta* RUPR., *Carpinus cordata* BLUME, *Aralia mandshurica* RUPR., *Quercus mongolica* FISCHER, *Corylus heterophylla* FISCH. ex BESS. and *Lespedeza bicolor* TURCZ., moth flies from first days of July till beginning of August. In Japan (YASUDA, 1975) the food plants are *Populus sieboldi* MIQUEL., *Acer rufinerve* SIEB. & ZUCC. and *Alnus hirsuta* RUPR.

Distribution. Continental Asia: Iuzhnoe Primore, Island De Friz, Japan: Hokkaido and Honshyu.

Archips crataeganus (HÜBNER, [1799])

[*Tortrix*] *crataegana* HÜBNER, (1799), Sammlung eur. Schmettt., pl. 17 fig. 107. Type-locality: Europe (after title of work).

Tortrix roborana HÜBNER, [1799], ibid., pl. 20 fig. 126. Type-locality: Europe (after title of work).

Cacoecia crataegana ab. *rubromaculata* SCHAWERDA, 1933, Z. öst. EntVer., 18: 76.

Archips crataegana var. *confluens* OBRAZTSOV, 1955, Tijdschr. Ent., 98 (3): 205.

Misidentifications:

Phalaena Tortrix xylosteana: ILLIGER, 1801: 54.

Tortrix americana: SCHRANK, 1802: 76.

Tortrix gerningana: CHARPENTIER, 1821: 64.

Cacoecia heparana: HÜBNER, 1825: 388.

Tortrix piceana: FRÖLICH, 1828: 31.

Lozotaenia branderiana: STEPHENS, 1829: 76.

Lozotaenia oporana HUMPHREYS & WESTWOOD, 1845: 112, pl. 80, fig. 5

Male. Labial palpus 1.5, pale brownish. Head rather concolorous, thorax darker medially and proximally. Forewing 10—12 mm broad; costa curved outwards to middle, tolerably straight in apical portion; apex short, pointed; termen delicately sinuate postapically, then gently convex; costal fold slender, reaching to middle of costa. Ground colour pale brownish with greyish hue, brownish cream to dirty cream to basal blotch costally and often near the edges of pattern. Pattern dark vivid brown; basal blotch and proximal edge of median fascia usually pale bordered, the latter distinctly convex medially; costal third or half of median fascia usually atrophied; subapical blotch extending from beyond middle of costa, rather short, with terminal part slender, subtriangular, weak suffusion at termen postapically. Fringes concolorous with ground colour, browner at apex and in apical part of termen, more cream towards tornus. Hindwing brownish; fringes whitish with brownish basal line.

Female. Forewing 12—14 mm, broad; costa distinctly curved outwards especially in basal third, concave subapically; apex rather short, pointed;

termen abruptly concave beyond apex (deepest point before vein m_1), then convex. Ground colour brownish olive grey with more or less distinct grey-brown suffusion and weak violet shine. Pattern olive-brown with delicate admixture of yellow or brown, usually well developed, with basal blotch often identical as in the male. Costal portion of median fascia at least three times narrower than the median part, proximal edge of fascia strongly convex postmedially; dark brown spot at disc; subapical blotch large with long, delicately arched outwards terminal portion. Delicate terminal marking near apex. Fringes browner than ground colour, dark brown at apex, mixed cream before it and at tornus. Hind-wing brownish with weak pale ochreous cream suffusion at apex; fringes much paler than wing with brownish basal line.

Variation. In the males ground colour more or less suffused grey or grey-brown, rarely the pattern indistinct, without trace of pale edges. In pale specimens some parts of the pattern (especially distal and dorsal portions of the basal blotch and median fascia) chestnut-brown. In some specimens terminal portion of wing mixed cream, with well developed apical marking or with transverse strigulation. Females rarely with indistinct pattern.

Male genitalia (figs. 111, 112). Uncus slender, hardly expanding terminally; socius small; sacculus similar to that in *A. rosanus* (L.) but with stronger free termination. Aedeagus pointed ventro-apically, provided with slender dorso-lateral process; two cornuti in examined specimens.

Female genitalia (fig. 204). Sterigma with very short dorsal portion, without median process but with large lateral parts, and slender, broadening distally cup-shaped part; antrum slender, proportionally short; cestum reaching to before end of ductus bursae signum, fairly small.

Larva (SWATSCHEK, 1958: 39) blackish; head, neck- and anal-shield black. Thoracic legs and pinacula also black. The description is completed with the characteristics of the chaetotaxy.

Bionomy (BOVEY, 1966: 534). Life cycle similar to that in *A. rosanus* (L.). Egg-mass opalescent white, deposited on upper part of trunk and on limbs in the bark crevices. Each mass contains ca 30 eggs. The embrional development arrested during the winter terminates in spring. The larvae hatch from mid-April to beginning of May (data from England). First instar larva (much paler than in following instars) is very active and crawls immediately to upper parts of shoots boring into undeveloped buds. Then it feeds under delicate webbs at the border of lower side of leaves. Third instar larva rolls the leaves usually longitudinally. Food plants are mainly *Betula* L., *Crateagus* L., *Pirus* L., *Populus* L., *Prunus* L., *Acer* L., and *Quercus* L. It was occasionally observed in the orchards (apple, pear, plum, apricot and win-shoots) but never as a serious pest. The moth flies from beginning of June to mid-August.

Distribution. Recorded from Europe, towards the North entering southern Sweden (Uppland). KENNEL (1910) mentions it from North Italy and Greece; his data on the occurrence of *A. crataeganus* (HBN.) in China are not confirmed, and those of Japan concern *A. endoi* YAS.

Archips endoi YASUDA, 1975, status nov.

Archips crataeganus endoi YASUDA, 1975, Bull. Univ. Osaka Pref., (B) 27: 97, figs. 31, 32, 367–369, 568. Type-locality: Yaata, Akita (Japan). Holotype, male labelled „Japan-Akita, Yaata (pupa) 14. VI. 1955; Japan Osaka, Sakai, 23. VI. 1955 (Emergence); leaves rolled of *Prunus pumila*”; coll. UOP.

Misidentification:

Archips crataeganus: INOUE, 1954: 85 (and subsequent Japanese authors, e. . YASUDA 1975).

Male. Labial palpus ca 2, pale brownish to cream-brown, remaining parts of head rather concolorous; thorax much browner. Forewing 9.5–11 mm, similarly shaped as in *A. crataeganus* (HBN.) but with very short, rounded apex and hardly sinuate termen. Costal fold long, slender, reaching to two-thirds of costa. Ground colour pale cream-brown mixed brownish grey especially in median area of wing; pattern brown with delicate olive hue, without pale edges. Basal part of costal fold brownish, remaining concolorous with ground colour. Basal blotch slender; median fascia very broad, atrophied in costal area of wing, with convex proximal edge; subapical blotch smaller than in preceding species, not reaching termen; terminal marking small, dark. Fringes paler and more cream than ground colour, mixed brown in apical part of termen. Hindwing greyish brown, slightly paler at apex; fringes dirty cream, greyer at caudal part of wing with weak basal line.

Female. Forewing 12–13 mm; costa curved outwards in basal half, then weakly so; apex shorter than in *A. crataeganus* (HBN.), pointed; termen weakly sinuate. Ground colour greyish brown with yellowish or olive hue. Dense, brownish transverse strigulation forms in distal portion of wing distinct reticulations. Pattern much browner, rather diffuse; basal blotch absent, subapical blotch much weaker than in male. Fringes concolorous with ground colour, browner in costal half of termen, more cream at tornus. Hindwing rather pale, brownish or grey-brown with paler apical area; fringes pale ochreous cream except for caudal area of wing where greyish; basal line weak.

Male genitalia (figs. 113, 114). Uncus broader than in *A. crataeganus* (HBN.), not rounded apically; socius weak; sacculus stronger and broader, with larger free termination. Aedeagus slender, slightly curved, with longer latero-dorsal process placed more distally; three cornuti in examined specimens.

Female genitalia (fig. 205) much larger than in *A. crataeganus* (HBN.) with shorter dorsal part of sterigma and much longer, tapering proximally, and rounded distally cup-shaped part. Antrum fused with proximal part of sterigma; cestum reaching to subterminal part of ductus bursae.

Larva. The mature larva is 23 mm long. Body dull black; head, shields, thoracic legs and pinacula glossy black.

Bionomy. Moth is on wing from before mid-June till beginning of August. Host plants are: *Malus pumila* MILL., *M. baccata* BORKH., *Pirus simonii* CARR.,

Prunus yedoensis MATS., *P. sargentii* REHDER, *Alnus japonica* STEUD. and *Salix* sp.

Distribution. Endemic in Japan: Hokkaido.

Comments. The species was described as a subspecies of *A. crataeganus* (HBN.) but shows several important differing characters.

Archips xylosteanus (LINNAEUS, 1758)

Phalaena Tortrix xylosteana LINNAEUS, 1758, Systema Naturae, edit. 10: 531. Type-locality: not given originally.

Tortrix westriniana THUNBERG, 1784, Dissert. Ent., 1: 21, pl. 3, fig. 19. Type-locality: Sweden.

Phalaena Tortrix densana VILLERS, 1789, Linn. Ent., 2: 416. Type-locality: Europa.

Tortrix characterana HÜBNER, 1793, Sammlung ausserl. Vögel Schmett.: 11, pl. 58. Type-locality: no data.

Pyrallis hybernana DABRICIUS, 1794, Ent. Syst., 3 (2): 247. Type-locality: Saxonia („Helae saxorum”), Germany.

Pyrallis obliquana FABRICIUS, 1781, Species Insect., 2: 281. Type-locality: England.

Cacoecia xylosteana var. *pallens* KENNEL, 1910, Zoologica, 21 (54): 130, pl. 7, fig. 6, 7. Misidentifications:

Tortrix piceana (part.): FROLICH, 1828: 31.

Tortrix cinnamomeana: DOUBLEDAY, 1850: 21.

Phalaena rosana: RETZIUS, 1783: 531.

Cacoecia gilvana: KENNEL, 1910: 130.

Pandemis corylana (part.): DIANOKOFF, 1939: 182.

Male. Labial palpus ca 1.5, pale brownish cream often mixed rust; remaining parts of head and thorax rather concolorous, tegula darker proximally, or more ferruginous; abdomen brownish grey with similarly coloured terminal tuft. Forewing 7—9.5 mm, fairly broad, somewhat expanding terminally; costa curved outwards to middle, then rather straight, weakly sinuate just before apex; apex very short; termen not oblique, gently sinuate postapically. Costal fold reaching to two-thirds of costa, gradually tapering terminally from the middle. Ground colour pale brownish cream with more or less distinct grey, slightly refractive suffusion, pale cream along the edges of pattern, pale ochreous-cream along costa. Pattern ochreous- or ferruginous-brown, costal fold browner with dark brown or blackish spot at the median fascia. Basal blotch variably developed, usually slender, broadening subterminally; median fascia slender in costal fourth, very broad in remaining parts with proximal edge extending from one-third of costa to beyond middle of dorsum, more or less convex near middle; black-brown dot at disc; subapical blotch large, with costal part of proximal edge vertical to costa, dark chestnut brown in costal area; terminal part of the blotch usually much paler, often separated from the main part. Rust-brown spot or elongate marking at apex or in apical part of termen. Fringes concolorous with the ground colour of distal portion of wing, grey-brown at tornus, mixed rust at apex. Hindwing brown, mixed ferruginous in apical area; fringes pale ochreous-cream or cream, brownish in caudal part of wing, with brown basal line.

Female. Forewing 9—12 mm, fairly broad; costa distinctly curved outwards in basal third, then weakly so, hardly concave before apex; apex fairly short (much longer than in male); termen sinuate, convex and rounded postmedially. Coloration as in male.

Variation. The males with more or less distinct contrast between the ground colour in costal and remaining parts of the wing. Terminal part of wing often also paler than the dorsal area. In the dark specimens ground colour in dorsal portion of wing is rusty but pattern proportionately paler. Median fascia shows a tendency to become gradually paler towards the dorsum, and dark brown towards the costa. Costal portion of basal blotch often also dark brown. Rarely distal part of median fascia and subapical blotch confluent and the spot at disc diffuse, large. The females are usually more greyish in hue than the males. The ground colour of the forewing is often olive-grey, transversely strigulated. The pattern is grey-brown to brown, but always, at least partially, with ochreous or ferruginous hue. Paler costal portions of the ground colour less contrasting than in the males. Pale specimens described by KENNEL from Southern Europe and treated by OBRATSOV (1955) as a distinct subspecies are no more than an infrasubspecific form.

Male genitalia (figs. 115, 116). Uncus broadening in distal half; socius vestigial; sacculus with short free termination. Aedeagus short, tapering terminally, pointed ventro-apically, with long, slender lateral process; usually 6 cornuti present in vesica.

Female genitalia (fig. 206). Sterigma delicate with short dorsal portion and small median process; cup-shaped portion well developed, broad distally, distinctly tapering proximally, fused partially with fairly short antrum. Cestum reaching. Cestum reaching almost to the end of ductus bursae; signum with basal sclerite.

Larva. The chaetotaxy is characterised by SWATSCHKE (1958:40). He gives also the following diagnosis of the coloration: body whitish green or grey-green, head, neck-shield, pinacula, anal-shield and thoracic legs dark brown to black.

Bionomy (mainly after BOVEY, 1966:537). One female deposits 200—3000 eggs in 5—8 brown egg-masses. The eggs hibernate and the larvae hatch from the end of March till beginning of April. The new hatched larvae are very active and crawl to the buds of the tops of branches. The bionomy is corresponding with that of *A. rosanus* (L.). The larger larvae roll the leaves (mainly diagonally). The larval stage durates 30—40 days, that of the pupa 9—12 days. Moth is on wing from end of June till mid-August in various parts of Europe and Japan and from beginning of July till about mid-August in Iuzhnoe Primore, U.S.S.R.

Food plants. The larvae feed on various deciduous trees and bushes as *Acer* L., *Crataegus* L., *Lonicera* L., *Betula* L., *Tilia* L. as well as on some conifers as *Abies* MILL. It seems, however, that the primary host are innumerable, similarly as in case of *A. rosanus* (L.) and other species of the genus in question. These may be oak, apple or pear on which the species feeds in whole area of its distribution, and most abundantly.

Economic importance slight, however, the larvae have been noticed in the

orchards to injury cherry (France in 1933) currant, raspberry, rhododendron (England), pear, cherry, plum, apple and citrus (Japan). ESCHERICH (1931) mentions that on oak this species is sometimes more abundant than *Tortrix viridana* L.

Distribution. This species does not enter so far towards the North as *A. rosanus* (L.) does (in Sweden to 64°). It is known from whole Europe, Asia Minor, Central Asia: Turkmenia, East Asia; Iuzhnoe Primore, South Sakhalin, South Kurile, Japan: Hokkaido and Honshyu, China: South Shensi and after BOVEY (1966) also Korea.

Archips inopinatanus (KENNEL, 1901), **comb. nov.**

Pandemis inopinatana KENNEL, 1901, Dt. ent Z. Iris, **13** (1900): 220. Type-locality: Askold Island, East Asia. Holotype, male labelled „Askold, DÖRR.[IES], Origin”, G. Sl. 11596; coll. ZMB.

Misidentifications:

Tortrix nigricaudana: KENNEL, 1910: 189.

Archips nigricaudana: OBRAZTSOV, 1955: 202.

Female. Labial palpus over 1.5, pale brownish cream, remaining parts of head and thorax rather concolorous, with slight admixture of ochreous; abdomen dirty cream with brown terminal tuft. Forewing 8–9 mm, rather uniformly broad throughout; costa curved outwards in basal half, sinuate subapically; apex short, pointed; termen somewhat oblique, hardly concave postapically. Ground colour pale ochreous-cream, in basal half of wing mixed yellowish delicate ferruginous suffusion from beyond median fascia, provided with more or less distinct transverse rust strigulation. Pattern vivid ferruginous consisting of median fascia the proximal edge of which extends from one-third of costa to before two-thirds of dorsum, slightly concave subdorsally. Costal third of fascia narrow, remaining parts 2–3 times broader. Basal blotch atrophied or ill-defined; subapical blotch small extending from beyond middle of costa accompanied by a slightly curved line reaching to dorsal part of termen. Fringes ochreous-cream, paler towards tornus. Hindwing pale brownish, cream, cream-white in apical half of wing; fringes concolorous except at apex where more ferruginous.

Female genitalia (figs. 207, 208). Papilla analis with slender proximal part; apophyses posteriores long. Sterigma large, rounded distally with short median process and cup-shaped part; antrum broad, large; cestum reaching to before middle of ductus bursae; signum strong.

Bionomy. No data except for dates of collection of the moth: August.

Distribution. Apart from the type-locality (Island Askold, U.S.S.R.) known from China: Manchuria (Province Kirin).

Comments. This species was described in the genus *Pandemis* HÜBNER and then synonymised by KENNEL (1910) with *A. nigricaudanus* (WALS.) and placed in *Tortrix* LINNAEUS. Also OBRAZTSOV (1955) treated it as a synonym

of the mentioned species transferring it to *Parapandemis* OBRAZTSOV. However, *A. inopinatanus* (KENN.) is a distinct species differing from *A. nigricaudanus* (WALS.) in coloration and in the female genitalia. It resembles it only in having dark tuft of scales at the end of the abdomen. It is very characteristic by the presence of 5 pairs of the dorsal pits in the tergites 2—6. Two first pairs are larger and deeper than the following ones; the pregenital segment is characterised by a weakly sclerotised tergite and strong sternite provided with a pair of lateral concavities placed subterminally and separated from one another by a rather membranous median area. Short, stiff scales present in the concavities allow us to suppose that this organ may serve to the distribution of scent. Distal edge of the sternite is distinctly concave. Whole plate is covered with numerous scales with which the moth covers the egg-masses after oviposition. Dense scales occur also in whole tergite and on distal membranous part of dorsal portion of the segment.

Archips nigricaudanus (WALSINGHAM, 1900)

Tortrix nigricaudana WALSINGHAM, 1900, Ann. Mag. nat. Hist., (7) 5: 459.

Type-locality: Gensan, Korea. Lectotype (here designated), male with Nr. 60060. Coll. BM.

Parapandemis? nigricaudana: OBRAZTSOV, 1955: 202.

YASUDA, 1975: 92, figs. 21, 22, 364, 381—383, 365 (*Archips*).

Male. Labial palpus about 1.5, brownish cream; remaining parts of head and thorax browner; abdomen paler with cream terminal tuft. Forewing 9—10.5 mm, expanding to middle, rather uniformly broad in remaining part; costa weakly curved outwards beyond costal fold; apex rounded; termen not sinuate, hardly oblique, bent at vein m_3 . Costal fold reaching to beyond middle of costa, broad except for small terminal part. Ground colour pale brownish cream, indistinctly sprinkled with brown, sometimes delicately strigulated transversely along dorsum. Pattern brown, often with weak admixture of yellowish, costal fold concolorous. Basal blotch subtriangular with rather straight distal edge; median fascia atrophying costally, very broad in remaining parts of wing followed by dark suffusion reaching to the disc. Proximal edge of median fascia convex medially; subapical blotch rather short extending from beyond middle of costa with vestigial or completely atrophied terminal part; terminal pattern usually absent. Fringes concolorous with ground colour. Hindwing brownish; fringes whitish with brownish basal line.

Female. Labial palpus somewhat longer than in male, brownish; remaining parts of head and thorax concolorous; abdomen slightly paler and greyer, provided with dark grey-brown apical tuft of scales. Forewing 11—12.5 mm, rather uniformly broad throughout; costa curved outwards in basal third, then weakly so, slightly concave subapically; apex short, pointed; termen hardly sinuate, oblique. Ground colour pale brownish with weak admixture of yellowish, strigulated brown transversely. Pattern brown with slight admixture of yellowish

or greyish and darker edges. Basal blotch atrophied, median fascia from one-third of costa to two-thirds of dorsum, narrow in costal portion; subapical blotch small, subtriangular, or atrophied; terminal pattern occasionally present. Fringes cream except for apical and tornal parts which are brownish. Hindwing greyish brown; fringes whitish or dirty cream with brownish basal line.

Variation. In some males ground colour very pale, distinctly strigulated brown. Basal blotch and costal portion of the median fascia show a tendency to atrophy. Some females characterised by rust hue of the forewing seen.

Male genitalia (figs. 117, 118). Uncus large, club-shaped, rounded apically, slender in basal third; socius small. Sacculus slenderer than in preceding species, with smaller free termination; ventral edge of valva less convex sub-medially. Aedeagus proportionally small, weakly bent, provided with minute dent ventro-terminally; three cornuti in vesica.

Female genitalia (fig. 209). Sterigma with fairly long dorsal part and well developed cup-shaped portion; median process small; distal lobes membranous; antrum fairly short; cestum much shorter than in two preceding species; signum short.

According to YASUDA (1975) the larva is very similar to that of *A. endoi* YAS., distinguished by dark pinacula. KUZNETSOV (1973) writes that it is brownish grey or olive-black with black head, legs, thoracic and anal shields.

Bionomy. In Japan the moth flies from mid-May to first days of July. In Iuzhnoe Primore KUZNETSOV observed the larvae between 25. V. and 15. VI. and the flight between 16. VI. and 20. VII. Food plants in Japan are: *Malus pumila* MILL., *Pirus simonii* CARR., *Castanopsis* sp., *Quercus serrata* THUNB., *Morus* sp. and *Diospyros kaki* THUNB., and in continental Asia (after KUZNETSOV) several other plants e.g., *Quercus mongolica* FISCH., *Lespedeza bicolor* TURCZ. and *Corylus heterophylla* FISCH. ex BESS. The latter author lists also other plants, the most interesting of which are *Salix* sp. and *Abies holophylla* MAX. Hibernation in egg stage.

Distribution. Korea; U.S.S.R.: Iuzhnoe Primore; Japan: Hokkaido and Honshyu. After YASUDA also Sakhalin. KUZNETSOV mentions it from China. The data of literature not checked.

Comments. KENNEL (1910) synonymised *A. inopinatanus* (KENN.) with this species. OBRAZTSOV (1955) followed KENNEL and placed *A. nigricaudanus* (WALS.) in the genus *Parapandemis* OBRAZTSOV. KUZNETSOV (1974) and YASUDA (1975) correctly treated *A. nigricaudanus* (WALS.) as a representative of the genus *Archips* HÜBN.

Archips dichotomus FALKOVITSH, 1965

Archips dichotoma FALKOVITSH, 1965, Ènt. Obozr., **44**: 417, figs. 5, 6. Type-locality: "Vladivostok, Okeanskaja, FALKOVITSH, 10. VII. 1959", G. Sl., 261 [FALKOVITSH]; coll. ZINANL.

Male. Labial palpus ca 2, pale brown ochreous; remaining parts of head slight-

ly darker except for upper part of front which is more cream; thorax brown; abdomen brown-grey. Forewing 8—10 mm, somewhat expanding terminally especially to middle; costa curved outwards to middle, then straight; apex very short with scales slightly extending costally; termen indistinctly sinuate postapically, then weakly convex. Costal fold reaching to before middle of costa, slender, tapering distally. Ground colour yellow-grey or cream tinged brown; transverse brownish grey strigulation or suffusions developed especially along the dorsum; greyish shade between median fascia and subapical blotch present. Pattern dark brown; basal blotch subtriangular. Median fascia atrophied costally with proximal edge extending from end of costal fold to middle of costa, indistinctly convex medially; distal edge incised in median cell. Subapical blotch broad with separate terminal portion, blackish at costa; apex and postapical part of termen brown. Fringes brownish yellow, brown at apex. Hindwing greyish brown; fringes cream, greyer in caudal area of wing with brownish median line.

Female. Forewing 11—13 mm; costa strongly curved outwards basally, somewhat concave at $3/4$; apex slightly prominent costally; termen delicately sinuate postapically, convex postmedially. Ground colour greyer than in holotype, suffused brownish dorsally, delicately strigulated or reticulated in distal portion of wing. Pattern dark brown; basal blotch atrophied or ill-defined, irregularly shaped; median fascia distinct, slender in costal third, gradually broadening towards middle, with proximal edge weakly concave; subapical blotch typically developed; apex and termen to vein *cu*₁ suffused black. Fringes concolorous with ground colour of distal part of wing tinged brown, black-brown at apex, with ill-defined median line. Hindwing greyish brown, ferruginous-yellow in distal third; fringes concolorous with wing.

Variation. In some males ground colour is ochreous yellow to pale ochreous grey or cream ochreous weakly suffused brownish. The pattern is yellow-brown to brown, sometimes rust-brown with darker reticulation, often pale edged especially proximally. Median fascia usually incomplete; subapical blotch sometimes also reduced to some degree or divided into two parts. The ground colour in some females is ferruginous or yellow-brown, greyer in distal part of wing often with violet-grey hue. The pattern varies from brown to rust-brown.

Male genitalia (figs. 119, 120). Uncus proportionally short, gradually broadening terminally, rounded apically; socius small. Valva distinctly convex before middle ventrally; sacculus strongly broadening from beyond base, provided with short free termination. Aedeagus slender with proportionally short caulis, provided with ventro-terminal dent; two cornuti in vesica.

Female genitalia. Sterigma short with long lateral parts and short cup-shaped portion; cestum to before end of ductus bursae; signum proportionally short.

Larva (medium stages) greyish green; head, neck-shield and thoracic legs black.

Bionomy. After KUZNETSOV (1973) the hibernation takes place in the egg stage, on the bark. The larva spins the leaves of numerous plant-species, being injurious to plum and pear in the orchards. Recorded hosts: *Aralia mandshurica*

RUPR., *Juglands mandshurica* MAX., *Armeniaca mandshurica* (KOCHNE) KOST., *Fraxinus rhynochophylla* HANCE, *Lespedeza bicolor* TURCZ., *Maackia amurensis* RUPR., *Ulmus propinqua* KOIDZ., and *Salix rorida* LACKSCH. The larvae observed from end of May till end of June, flight between 23. VI. and 5. VIII.

Distribution. Iuzhnoe Primore, De Friz. After mentioned author also Korea and China.

Archips fuscocupreanus (WALSINGHAM, 1900)

Archips fuscocupreana WALSINGHAM, 1900, Ann. Mag. nat. Hist., (7) 5: 384. Type locality: Satsuma, Japan. Lectotype (here designated), male, „Satsuma, Kiusiu-Japan, V. 1886, LEECH, 60578”; G. Sl. 67 [BM]; coll. BM.

Lozotaenia ishidai MATSUMURA, 1900, Ent. Nachr., 26: 194. Type-locality: Sapporo, Japan. Lectotype (here designated), female labelled „Sapporo, MATSUMURA”; G. Sl. M-16; coll. EIHU.

Cacoecia punicae MATSUMURA, 1930, 6000 Insect. Jap. Imp.: 1065. Type-locality: Shibuya (Tokyo), Japan. Lectotype (here designated), female labelled „Shibuya, Tokyo, Japan, 16. VI. 1925 (E. L.), S. HIRAYAMA”, G. Sl. M-4; coll. EIHU.

Cacoecia ishidai (n. emend.) MATSUMURA, 1931: 1065.

YASUDA, 1975: 95, figs. 27—30, 365, 384—386, 567 (*Archips*).

Male. Labial palpus shorter than 1.5, ochreous cream; remaining parts of head slightly darker, antenna browner; thorax brown, tegula paler terminally. Forewing 7—9.5 mm, weakly expanding terminally except for basal half; costa curved outwards to middle, then almost straight; apex very short; termen hardly oblique, not sinuate, gently arched outwards throughout; costal fold narrow terminally, reaching to middle of costa. Ground colour brown; basal part of costal fold concolorous, distal portion paler. Pattern consists of broad basal blotch reaching almost to costa, dark brown, weakly mixed rust dorsally; median fascia with proximal edge extending from one-third of costa to two-thirds of dorsum, dark rust brown, delicately pale edged near costa and dorsum proximally; subapical blotch ill-defined with rust-brown suffusion. Fringes concolorous with ground colour. Hindwing dark brown; fringes slightly paler with dark median line.

Female. Labial palpus ca 1.5, slightly darker than in lectotype, head and thorax browner. Forewing 8—12.5 mm, rather uniformly broad throughout; costa strongly curved outwards in basal third, hardly concave before apex; apex short; termen indistinctly sinuate. Ground colour brown, slightly tinged yellowish in basal area and costally, provided with delicate violet shine especially in distal portion of wing. Delicate brown transverse strigulation present. Pattern dark brown; median fascia slender, almost interrupted subcostally and narrowing postmedially, with proximal edge extending from one-third of costa to two-thirds of dorsum. Two rather parallel, irregular, delicate fascias in distal third of wing and terminal suffusion near apex of wing. Fringes brown, dark brown at apex. Hindwing dark brown; fringes pale brown with brown median line.

Variation. The males almost uniformly brown or brownish cream, suffused

ochreous in basal half of wing, with well developed, dense brownish strigulation and dark spot at disc. The specimens with well developed pattern dominate in examined material. The ground colour is in those specimens pale yellowish brown to cream ochreous often with brown or grey hue and variably developed transverse strigulation. The pattern is darker, browner or dark ochreous. Basal blotch is often ill-defined, median fascia broad or atrophied costally; subapical blotch shows a tendency to divide into two parts. The fringes rather concolorous with the ground colour. The females are also unicolorous brownish to brownish ochreous sometimes with grey admixture and developed to varying degree transverse strigulation. In other specimens the pattern is more or less distinct, brownish or ochreous. Hindwing constantly unicolorous, more or less dark.

Male genitalia (figs. 121, 122). Uncus larger than in preceding species, more strongly broadening terminally, rounded apically; socius small. Valva strongly convex before middle of the ventral edge; sacculus similar to that in preceding species but with larger free termination. Aedeagus slightly bent beyond coecum penis, minutely dentate ventrally, provided with thick, subtriangular ventro-apical dent; three cornuti in examined specimens.

Female genitalia (fig. 210). Cup-shaped part of sterigma strong, hardly tapering proximally; distal part short with large lateral portions and indistinct median process. Antrum fairly long, rather delicately sclerotised; cestum reaching almost to the end of ductus bursae; signum very short.

Larva is described by YASUDA (1975) and KUZNETSOV (1973).

Bionomy. First of the above authors lists 30 host plants, the second author mentions that the larva is polyphagous and feed on the representatives of 10 plant suborders. It seems that the species of *Prunus* L., *Malus* L., *Padus* L. and *Rosa* L. are the primary host of this species. The larvae were observed in Iuzhnoe Primore between 17. VI. and 7. VII., the moth 8—31. VIII.; in South Kurile Islands the larvae feed between 1—19. VII. and the moth flies 23. VII. — 9. VIII.

Distribution. The species occurs throughout Japan (Hokkaido, Honshyu, Shikoku, Kyushu), in Southern Kurile and Iuzhnoe Primore. YASUDA (1975) mentions also Korea.

Archips rosanus (LINNAEUS, 1758)

Phalaena Tortrix rosana LINNAEUS, 1758, Systema Nat., edit. 10: 530. Type-locality: not mentioned originally.

Phalaena Tortrix ameriana LINNAEUS, 1758, Systema Nat., edit. 10: 531. Type-locality: not mentioned originally.

Phalaena Tortrix amerina [sic!] LINNAEUS, 1761, Fauna suecica, edit. 2: 343 — misspelling.

Phalaena Tortrix americana [sic!] GMELIN, 1778, Systema Nat., edit. 13: 2504 — misspelling.

Phalaena Tortrix laevigana [DENIS & SCHIFFERMÜLLER], 1775, Ank. syst. Werke Schmett. Wienergegend: 129. Type-locality: Vienna district (after title of work).

Phalaena Tortrix levigana [sic!] ILLIGER, 1801, Syst. Verz. Schmett. Wienergegend: 231 — misspelling.

Tortrix oxycanthana HÜBNER, [1799], Sammlung eur. Schmett., pl. 18 fig. 117. Type-locality: Europe (from title of work).

Tortrix acerana HÜBNER, [1799], Sammlung eur. Schmett., pl. 18 fig. 118. Type-locality: Europe (from of work).

Cacoezia rosana orientata KRULIKOWSKIJ, 1909, Mater. Pozn. Fauny Flory Russ. imp., (9): 203.

Cacoezia rosana var. *splendana* KENNEL, 1910, Zoologica, 21 (54): 131, pl. 7 fig. 13.

Cacoezia rosana ab. *ochracea* DUFRANE, 1945, Bull. Mus. R. Hist. nat. Belge, 20: 8.

Cacoezia rosana ab. *obscura* DUFRANE, 1945, ibid.: 8.

Misidentifications:

Tortrix branderiana: HAWORTH, 1811:424.

Tortrix fuscana: HAWORTH, 1811:424.

Cacoezia xylostana: HÜBNER, 1825:388.

Male. Labial palpus ca 1.5, brownish to yellowish brown; remaining parts of head and thorax browner. Forewing 7.5—8.5 mm, broad; costa curved outwards to middle, hardly concave subapically; apex very short, rounded; termen indistinctly concave beyond apex, not oblique in costal half, convexly rounded post-medially. Basal blotch slender reaching to mid-costa. Ground colour pale brownish with admixture of ochreous, ferruginous or greyish, finely strigulated brownish or reticulated in distal third of wing. Pattern usually ferruginous brown with slight admixture of yellowish especially near the edges. Proximal edge of median fascia delicately convex medially, extending from one-third of costa to two-thirds of dorsum. Costal third of fascia slender or ill-defined, dorsal part broad, distal edge diffused. Subapical blotch short, with narrow or ill-defined terminal part. Fringes rather concolorous with ground colour, suffused brownish or grey-brown in apical area, more cream in the tornal portion. Hindwing brownish with more or less distinct pale ochreous-cream apical portion; fringes pale brownish cream to cream paler in distal half of wing with brownish basal line.

Female. Forewing 9—10 mm; costa curved outwards in basal area, less so medially, somewhat concave subapically; apex fairly short, slightly prominent costally; termen sinuate postapically. Ground colour brownish with slight admixture of yellowish, pale ochreous or olive-grey, more or less distinctly strigulated transversely. Pattern indistinct, brownish, usually with greyish hue. It consists of median fascia interrupted subcostally and small subtriangular subapical blotch. Apex marked with small suffusion. The strigulae of distal part of wing may form some oblique lines. Fringes concolorous with ground colour, browner in apical half of termen, more cream tornally. Hindwing greyish brown, pale ochreous or ochreous cream in apical portion; fringes dirty cream, darker at apex, basal line brownish grey.

Variation. In the males the ground colour is sometimes pale brownish cream ochreous and the pattern indistinct more ochreous brown. Sometimes the edges of pattern are suffused ochreous. There is a tendency to atrophy of the terminal portion of the subapical blotch which may be represented by a narrow fascia or a line directed towards dorsal portion of termen. In dark coloured specimens (often grey-brown in hue) the pattern is usually well developed. In the females the pattern is usually ill-defined or completely atrophied. In the unicolorous

specimens only the transverse strigulation is developed and may form incomplete lines.

Male genitalia (figs. 123, 124). Uncus slender; socius minute; valva broadening from beyond basal third, provided with short free termination. Aedeagus weakly bent with rather short coecum penis, provided with long, slender lateral process extending beyond end of main part; usually 4 cornuti present in vesica.

Female genitalia (fig. 211). Sterigma fairly short with slender median process and very short cup-shaped portion; antrum slender, provided with minute sack latero-proximally; cestum well developed in basal third of ductus bursae, then in traces; signum short.

Larva 15–20 mm long, pale green to dark olive-green with pale pinacula. Head chestnut brown, neck-shield and thoracic legs dark brown; anal shield yellow-green. SWATSCHEK (1958:40) provides the description of chaetotaxy.

Bionomy (mainly after BOVEY, 1966:518). One female deposits up to 300 eggs in groups of 50, sometimes 100. The egg-mass is ovate. After CHAPMAN & LIENK (1971) it is dull-orange changing into dark brown within few days, bleached out during the winter. The eggs are deposited on the bark of limbs and trunks of trees in June and July and the larvae hatch from the beginning of March to beginning of April depending on the environment conditions (there is one month difference in time between Provance, France and Holland). The egg of one mass hatch in 5–8, rarely 10–15 days (for embryological data see p. 60). There are five larval instars; the larval life durates 28–55 days, however, under the inconvenient climatic conditions even three months. Pupation from end of April till beginning of May, in northern Europe till end of May. This stage durates 15 to 20 days; the flight 1.5–2 months.

Food plants. After literature very many plants are utilised by the larvae of this species (listed by BOVEY, 1966), but it is supposed that the primary hosts are not numerous. After CHAPMAN & LIENK (1971) these are apple, pear, hawthorn currant and privet and in the U.S.A. hedge, however, the larvae are common on *Ligustrum* sp. First instar larvae bore the flower buds, then feed in leaves and fruit.

Economical importance. The larvae are injurious mainly to apple and pear in whole area of the distribution of the species. It attacks also other cultivated plants as plums, rosas, hop, currant, rhododendron etc.

Parasites are listed by BOVEY mainly after THOMPSON, 1944. The most important is ichneumonid *Trichogramma cacoeciae* which involves two generations in the eggs of one generation of the moth.

Distribution. The species is characteristic of the Palaearctic Region. In Europe it enters far to the North (66° in Sweden), in the South it was noticed in Asia Minor and in the South-East in Turkmenia. KUZNETSOV (1973) records it from Iuzhnoe Primore and Sakhalin. It was introduced to North America before 1890 and has colonised two large, isolated areas, the North-east and the North-west (FREEMAN, 1958; CHAPMAN & LIENK, 1971).

Archips rudy spec. nov.

Holotype, female, „Tapaishan im Tsiling, Sued-Shensi, ca 1700 m, 8. VII. 1936, H. HÖNE”, G. Sl. 20636; coll. ZFMK.

Female. Labial palpus ca 1.5, pale brownish ochreous; remaining parts of head and thorax browner. Forewing 11 mm, broad, not expanding terminally; costa curved outwards to middle, then weakly so, somewhat concave before apex; apex short, slightly protruding costally (scales only); termen weakly sinuate postapically, convex in dorsal half. Wing almost unicolorous ochreous brown, somewhat paler towards tornus, indistinctly transversely strigulated with brownish especially along the edges. Oblique brownish line from apical part of costa to before end of termen; two dark brown strigulae at apex. Fringes somewhat paler and more cream than ground colour. Hindwing brownish with orange-yellow apical part; fringes pale brownish and orange-cream respectively.

Female genitalia (fig. 212). Papilla analis broad; sterigma large, with broad cup-shaped part and indistinct distal lobe; antrum small, cestum reaching to two-thirds of ductus bursae; signum strong.

Bionomy and distribution. Only the data from the label of the holotype are available.

Comments. The systematic position of this species is incertain as the male genitalia are unknown. Distinct by the shape of the forewing and coloration.

Archips infumatanus (ZELLER, 1875)

Tortrix (*Cacoecia*) *infumatana* ZELLER, 1875, Verh. zool.-bot. Ver. Wien, 25: 216. Type-locality: Missouri. Lectotype, male (here designated): „Missouri, RILEY, 7/10/[18]69”; „Syntype”, G. Sl. 7865 [BM]; Coll. BM.

Male. Labial palpus ca 1.5, brownish, concolorous with remaining parts of head; thorax darker. Forewing 8—9 mm, hardly expanding terminally; costa curved to middle, concave subapically; apex short; termen sinuate beyond apex, convexly rounded in dorsal half. Costal fold slender reaching to about 2/3 of costa being in distal third represented by an upwardly directed edge. Ground colour yellow-brown suffused brown-grey, shining violet especially in the dorsal half of wing. Costal fold concolorous with ground colour; pattern dark brown delicately edged cream. Basal blotch broad, convex distally; median fascia broad with anterior edge extending from 1/3 of costa to middle of dorsum, convex medially; subapical blotch from 2/3 of costa extending towards termen, reaching almost termen; brown dot at apex. Fringes yellow-brown, darkest at apex.

Female. Head brownish, laterally mixed ochreous; thorax brown. Forewing 10—12 mm, rather uniformly broad throughout; costa distinctly curved in basal third, concave subapically; apex short; termen concave beyond apex. Ground colour ochreous brown, suffused brown, with weak violet shine; pattern black-brown weakly edged ochreous. Basal blotch in form of dorsal suffusion; median fascia diffuse posteriorly except costal third, with proximal edge extend-

ing from 1/3 of costa to 2/3 of dorsum; subapical blotch reduced to small spot at costa accompanied by edged line reaching to 2/3 of termen. Some brown striae in apical area. Fringes concolorous with ground colour, darker at apex. Hindwing grey-brown with paler fringes.

Variation. FREEMAN (1958:20, figs. 107, 108) mentions that the males are purpish with dark brown basal blotch and characterised by the forewing expanding posteriorly.

Male genitalia (figs. 125, 126). Uncus slender, rather uniformly broad throughout; socius absent. Saccus broad except for basal portion, provided with long free termination. Aedeagus slender with subapical tooth and some minute denticles ventro-laterally. FREEMAN (op. cit., fig.13) figured a specimen with a crest of denticles on aedeagus.

Female genitalia (fig. 213). Sterigma fairly large with broad cup-shaped part tapering towards antrum. The latter provided with long median sclerite. Ductus bursae proportionally short, armed with long, slender cestum.

Larva (after MACKAY, 1962:36) 20–22 mm long, pale coloured with head, thoracic and anal shields, thoracic legs and pinacula dark brown. Spinules long.

Bionomy. According to MACKAY larva in May. FREEMAN mentions *Carya* sp. as food plant. Moth in June and July, the type collected in October (?).

Distribution. According to FREEMAN this species is distributed in the U.S.A. in the following states: New York, Connecticut, Massachusetts, Virginia, Florida, Texas, Louisiana, Arkansas, Montana, Iowa, and Wisconsin.

Archips fervidanus (CLEMENS 1860)

Lozotaenia fervidana CLEMENTS, 1860, Proc. Acad. Nat. Sci. Philadelphia, 12: 347. Type-locality: Pennsylvania. Type location: ANSPH.

Tortrix paludana ROBINSON, 1869, Trans. Am. ent. Soc., 2: 275. Type locality: Pennsylvania. Type location: AMNH.

FREEMAN, 1958: 22, fig. 17, 66, 130, 131.

Labial palpus over 1, orange-cream; head darker: thorax orange-rust; abdomen brownish grey, cream terminally.

Male. Forewing 9–10 mm, weakly expanding terminally; costa curved outwards especially in basal half, hardly concave subapically; apex very short, pointed; termen in apical half not oblique, hardly sinuate postapically. Costal fold slender, long scaled behind, reaching to middle of costa. Ground colour pale ochreous-cream to pale rust, cream in costal area; pattern rust-brown or pale yellowish brown with brown parts in both cases, with margins often peler-edged. Both on the ground colour and pattern weak metallic shine in form of transverse arched fasciae, spots or lines. Basal blotch almost completely atrophied with distal portion ochreous in form of arched outwardly directed line or fascia; anterior edges of median fascia extending from third of costa to 2/3 of dorsum, usually gently concave. Costal portion of fascia brown, rather concolorous spot postmedially. Subapical spot elongate, tapering towards middle of termen,

brown costally, then paler. Occasionally weak apical suffusion. Fringes pale brownish cream to cream, darkening apically, paler towards tornus often mixed grey at dorsal edge. Hindwing grey with similar, but paler cilia; median line of fringes brownish.

Female. Forewing 10—24 mm, not expanding terminally, costa curved outwards in basal half, then weakly so, hardly concaving subapically. Otherwise as for male.

Variation. Ground colour varies and the pattern also varies in colour and intensity. Often the specimens are pale, shining grey because of dense refractive markings. The pattern is brownish grey, usually reduced to costal part of median fascia, subapical spot and a spot near wing centre. In vividly coloured specimens the rust pattern is more or less distinctly cream edged.

Male genitalia (figs. 127, 128). Uncus slender, rounded apically; socius absent; sacculus broad except for basal portion, provided with distinct free termination. Aedeagus slender, delicately curved, minutely spined near middle laterally, with small ventro-lateral dent subterminally.

Female genitalia (fig. 214). Cup-shaped part of sterigma large distal prominence small; sclerite of antrum broad distally; cestum almost as long as the ductus bursae.

Larva. Description by MACKAY (1962:35, fig. 30).

Bionomy. According to FREEMAN (1958) the larvae are partially social and build small nests (webs covered with frass). The moth flies from early July to August. Hosts: *Quercus* and *Carya* sp.

Distribution. Nearctic species distributed in the following states of Canada and U.S.A.: Quebec, Ontario, Maine, New York, Pennsylvania, New Hampshire, New Jersey, Massachusetts, North Carolina, Virginia, Michigan, Illinois and Wisconsin (FREEMAN 1958).

Archips cerasivoranus (FITCH, 1856)

Lozotaenia cerasivorana FITCH, 1856, N. Y. Agr. Rept.: 382. Type-locality: ?New York. Type location: unknown.

FREEMAN 1958: 21, fig. 15, 64, 113, 114 (*Archips*).

POWELL 1964: 147, figs. 34, 94, pl. 3 fig. 4, pl. 8, fig. 3 (*Archips*).

Labial palpus over 1, orange; head and thorax ferruginous to reddish orange; abdomen brownish with orange hue and similar but paler terminal tuft in male.

Male. Forewing 9—10 mm, broad, weakly expanding terminally; costa distinctly curved outwards in basal half, then weakly so; apex hardly prominent costally due to extending scales, very short; termen tolerably straight to vein m_3 , then bent. Costal fold narrow, somewhat variable in length, usually reaching middle of costa, provided with group of long, cream coloured scales before end directed towards wing middle. Ground colour orange with admixture of reddish or rust, rarely more brownish, provided with glossy, transverse, pearl strigulation

or fasciae which also occur partially on the pattern. Pattern rust to rust-brown, broad at places, orange-edged (ground colour without pearl markings). It consists of ill-defined basal blotch represented usually by parts of its distal edge, median fascia extending from third of costa to $2/3$ of dorsum reduced to distinct costal blotch, somewhat weaker median part and indistinct suffusion at tornus. Subapical spot at $2/3$ of costa often accompanied by another dot or two. Terminal markings indistinct or absent. Fringes rather concolorous with ground colour, cream towards tornus. Hindwing orange-cream, brownish beyond median cell; fringes rather cream, mixed orange in apical area, median line indistinct. Under-side smooth orange-cream, in forewing weak brownish suffusion medially.

Female. Forewing 10—12 mm, slenderer than in male, costa hardly concave postmedially, apex longer, termen somewhat sinuate. Coloration darker, usually more brownish than in male, pattern much more reduced, lines of orange colour diffuse but distinct. Hindwing rather unicolorous orange-brownish, cream towards costa.

Variation concerns the degree of development of the pattern in forewing and in intensity of coloration.

Larva. MACKAY (1962: 33, fig. 31a) gives an accurate description of two colour forms of the larva. The dark, so-called eastern form is known from British Columbia to Ontario, the pale form from Ontario and Quebec. In western Ontario both forms occur in the same nests.

Male genitalia (figs. 129, 130). Uncus slightly broadening apically; socius absent; sacculus rather slenderer than in *A. fervidanus* (CLEM.) but with larger free termination. Subterminal dent of aedeagus seemingly smaller.

Female genitalia (fig. 215). Cup-shaped part of sterigma smaller than in *A. fervidanus* (CLEM.), distal part large, without median prominence. Sclerite of antrum rather uniformly broad throughout; ductus bursae and cestum long.

Bionomy. The larvae of this species build web-covered nests in which they feed, and are sometimes of economic importance. Host is *Prunus* L. but sometimes the larvae also attack *Salix* L., *Amelanchier* MED. and *Populus* L. (MACKAY, 1960). In eastern U.S.A. they live especially on *Prunus virginiana* L., in California on *P. emarginata* WALP., and *P. subcordata* BENTH. Other data include apple, raspberry, birch etc. (POWELL, 1964). Description of development is given by PATCH (1907) and POWELL (1964). Eggs are deposited on the host plant near the ground. Young larvae migrate to tops of branches where they feed in shelters made of silk into which the leaves are incorporated. Each larva makes its own cell in the nest, where it pupates. In smaller nests 13—40 mature larvae may usually be found while in the largest as many as 250 specimens have been observed. Development from hatching of egg till emergence of moth takes 47—61 days and begins at the beginning of May in California. There are usually six larval instars. The parasites are: *Trichogrammatomyia tortricis* GIRAULT and some braconids, ichneumonids and tachinids (cf. THOMPSON, 1953a, 1953b).

Distribution. The western form is known from Ontario, New Hampshire, Maryland and New York, the eastern form from British Columbia to Ontario

(Canada) and Nebraska, Idaho and Wyoming in U.S.A. (MACKAY, l.c.) and in California according to POWELL (1964).

Comments. FREEMAN (1958) included *rileyanus* under this species, treating it as a subspecies and finding only slight external differences between them. MACKAY (1962) realised some distinct specific characters in the setal arrangement of the larvae. She found two forms of larvae of this species mentioned above which differ in colour of pinacula, proleg shields and spinules. These differences are correlated with slight colour differences in adults.

Archips rileyanus (GROTE, 1868)

Tortrix rileyanus GROTE, 1868, Trans. Am. ent. Soc., 2: 121. Type-locality: Missouri. Type location: unknown.

Cacoecia fervidana WALKER, 1863, List. Lepidopt. Ins. Brit. Mus., 28: 313 — nom. praeocc. (CLEMENS, 1860). Type locality: Georgia. Lectotype, ♂: „Georgia” with abdomen missing in the coll. of BM.

Archips carasivoranus [sic!] *rileyanus*: FREEMAN, 1958: 22, fig. 115, 116.

Labial palpus as in preceding species, head and thorax ochreous; abdomen cream.

Male. Forewing 9—10 mm, broad, not expanding terminally; costa strongly curved outwards especially to middle, hardly concave subapically; apex very short, rounded; termen somewhat concave postapically, then convex with top of convexity at vein *m*₃. Costal fold slender, terminating just beyond one-third of costal edge. Ground colour ochreous or orange with admixture of cream colour, sometimes with pinkish shine. Pattern rust or ferruginous-brown in form of spots. A row of small spots in place of distal edge of basal blotch, a larger spot at end of costal fold followed by some two or three smaller spots medially or subdorsally, being the remainder of the median fascia; a distinct spot subapically connecting with a line or row of dots running in an arch towards tornus; a parallel row of minute transverse dashes at apex and along termen. Fringes concolorous with ground colour. Hindwing orange-cream with similar cilia. Underside unicolorous, resembling coloration of hindwing.

Female. Forewing 10—15 mm, broad with termen slightly more convex than in male; coloration usually darker, especially the ground colour.

Variation slight, occurring in the intensity of the coloration and size of the forewing spots.

Male genitalia (figs. 131, 132). Uncus somewhat broadening terminally; socius absent. Saccus strongly broadening from before middle, provided with strong free termination. Aedeagus slender, without subterminal tooth.

Female genitalia (fig. 216). Cup shaped part of sterigma fairly large, somewhat tapering towards antrum; distal part weakly convex medially; antrum with rather short median sclerite; ductus bursae proportionally short.

Larva described by MACKAY (1962:35, fig. 29) who differentiates it from

the preceding species. Also OBRAZTSOV (1959:265) provides characteristics of the larva gathered from the publication by PETERSON (1948:174).

Bionomy. Moth from mid-June till August. Hosts: dogwood (MACKEY, 1962), buckeye trees (PETERSON, 1948), *Carya* NUTT., *Symphoricarpos* JUSS., *Prunus* L., *Juglans* L., *Veronica* L. and *Aesculus* L. (FREEMAN, 1958). Larvae live gregariously in web-covered nests.

Distribution. The more southern parts of the Nearctic: Virginia, Arkansas (MACKEY, l.c.), Pennsylvania, North Carolina, Ohio, Mississippi, Texas, Missouri, Washington (FREEMAN, 1958), California (OBRAZTSOV, 1959).

Comments. This species was treated as a subspecies of *A. cerasivoranus* (FITCH) by FREEMAN (1958) who realised that external and genital differences are not of specific value. The examination of the larvae enabled MACKEY (1958) to distinguish the two species. FREEMAN (op. cit.) writes: „This is a southern subspecies that intergrades in intermediate localities with the typical form”. Unfortunately I have had no occasion of examining any intermediate specimens. OBRAZTSOV (1959) gives the characteristics of the two species. He finds that in this species the veins r_4 and r_5 of the forewing are connate or stalked and vein cu_1 of the hindwing departs often from slightly before lower angle of the median cell. Then some differing characters of the coloration and genitalia are given. Both *cerasivoranus* and *rileyanus* are very interesting because of the biology, as they are the only species of the genus whose larvae live in nests.

Archips argyrosphilus (WALKER, 1863)

Retinia argyrosphila WALKER, 1863, List. Lepidopt. Brit. Mus., 28: 373. Type-locality: Georgia (U.S.A.). Holotype, ♀: „Georgia”. Coll. BM.

Tortrix furvana ROBINSON, 1869, Trans. Am. ent. Soc., 2: 265, pl. 1, fig. 9. Type locality: no data.

Tortrix v-signatana PACKARD, 1870, Rept. Agr. Mass.: 238. Type locality: no data.

Cacoecia vividana DYAR, 1902, Proc. ent. Soc. Wash., 5: 78. Type locality: Platte Canyon, Colorado (U.S.A.). Type location: USNM.

Archips argyrosphila mortuana KEARFOTT, 1907, Can. Ent., 39: 158. Type locality: New Brighton, Pennsylvania (U.S.A.). Type location: AMNH.

Cacoecia eleagnana McDUNNOUGH, 1923, Can. Ent., 55: 166. Type locality: Aweme, Manitoba. Type location: BRI.

Cacoecia myricana McDUNNOUGH, 1923, Can. Ent., 55: 167. Type locality: New Brighton, Pennsylvania. Type location: AMNH.

Cacoecia columbiana McDUNNOUGH, 1923, Can. Ent., 55: 167. Type locality: Salmon Arm, British Columbia (Canada). Type location: CNC.

FREEMAN, 1958: 24, figs. 16, 65, 117, 118; 119, 120 (as *argyrosphilus vividanus*), 121 (as *argyrosphilus columbianus*) (*Archips*).

POWELL, 1964: 151, fig. 35, 93, pl. 3, figs. 1—3, pl. 7, fig. 3 (*Archips*).

Misidentifications:

semiferanus (part.): FREEMAN 1958: 20;

negundanus (part.): FREEMAN, 1958: 21.

Labial palpus smaller than 1.5, cream often mixed with orange. Head and

thorax rather ochreous, the latter darker and more rust; abdomen brownish grey.

Male. Forewing 9—10 mm, hardly expanding terminally; costa curved outwards distinctly in basal third, then weakly so, rather straight before apex; apex very short; termen hardly concave postapically, not oblique. Costal fold rather slender, tapering in distal portion, terminating before middle of costa. Ground colour, cream suffused brownish except for costal area, often whitish. Dorsal half of wing with leaden or brownish suffusion. Pattern ferruginous-brown to brown. Basal blotch indistinctly spotted or with darker strigulations or larger spot usually in middle of distal edge. Anterior edge of median fascia from third of costa to 2/3 of dorsum straight or concave. Costal portion of fascia distinct, dark, remaining parts gradually paler towards dorsum, diffusing. Subapical blotch elongate, preserved along costa, rarely subtriangular, protruding towards end of termen. Terminal suffusion usually weak. Fringes somewhat darker than ground colour, brownish from beyond middle, dark at tornus. Hindwing brownish grey, fairly pale; fringes cream to greyish cream, grey from vein cu_2 , small grey spot before apex.

Female. Forewing 10—12 mm, rather uniformly broad throughout, costa more strongly curved outwards in basal third than in male, then straight and weakly concave subapically; termen less oblique. Coloration vivid, contrasting, ground colour strongly suffused by spots or transverse strigulation, so only costal spots of the ground colour are pale. In hindwing the apical portion may be cream coloured.

Variation. This is one of the most variable species. Some specimens are very pale, both males and females, with ground colour spaces broad, and remainder of pattern preserved in various degrees, more or less dark. In *ab. vividanus* the coloration is bright, rather reddish ochreous. The specimens characterised by chestnut-red or similar pattern and pale ground colour are named as *ab. columbianus*. The males of forms *mortuanus*, *myricanus* and *eleagnanus* characterize with well developed costal portion of pattern and indistinct dorsal parts of it whilst the ground colour is whitish or cream only at costa. Remaining areas of ground colour are dark, completely suffused. In *eleagnanus* ground colour is olive-ochreous mixed greyish, pattern somewhat darker, more ochreous. Occasionally the pattern is brownish and may appear in dorsal area of wing. In two remaining forms pattern varies from reddish to chestnut-brown or brown and ground colour is brownish grey or brownish. Some specimens are, however, almost reddish ochreous except for costal portion of ground colour which is always whitish. Of the pattern median fascia is usually best developed, atrophying only at dorsum. Fringes concolorous with terminal area of ground colour. Females are similarly coloured or much darker than males, often with ill-defined pattern or unicolorous. The transverse strigulations or spots may completely disappear. Of more interesting colour forms are those with forewing olive-brown or grey-brown, weakly cream and paler costally with diffuse traces of pattern in costal area, or completely ochreous-red specimens.

Hindwing rather slightly but some specimens they are grey-cream or whitish.

Male genitalia (figs. 133, 134). Uncus slender, broadening apically; socius small; sacculus gradually broadening terminad, provided with pointed free termination. Aedeagus proportionally small, with short coecum penis, terminating in a slender tip curved to the left.

Female genitalia (fig. 217). Sterigma rather short with short cup-shaped part and small distal process; sclerite of antrum broad, fairly short; cestum long.

Larva described by MACKAY (1962: 49—51, fig. 40—42). Two forms have been realized which MACKAY treated as subspecies (n nominate and *argyrospilus columbianus*).

Bionomy. POWELL (1964:157) gathered the data on the biology of this species. The eggs are deposited on the bark in oval batches. Each batch contains 20—100 eggs. The female covers the eggs with a secretion which hardens and becomes brown on exposure to the air. The moth flies in V, VI, and VII up to an altitude ca of 2000 m (in California); the flight period lasts 3 weeks. Literature on the parasites is mentioned in same publication. The hosts are: fruit trees, citrus (pest!), oak, willow, ash, maple and also alfalfa, onion, locust, poplar, various berries, basswood, elm, aspen, rhododendron, sweet fern and even *Pseudotsuga* CARR. as reported by POWELL after some authors. FREEMAN (1958) and MACKAY (1962) list other hosts too. The moth is often a pest, especially of fruit trees and citrus, defoliating them completely during heavy infestation.

Distribution. POWELL (1964) characterizes this species as typically Nearctic, being distributed throughout the subcontinent along the eastern seaboard and Appalachian states and across southern Canada. It occurs also in the northern mid-west states of U.S.A., reaching the Rocky Mts. Towards the south it enters New Mexico. It is also noted from Arizona and distributed on the west coast except for arid and high elevated terrains.

Comments. The problem of *argyrospilus* is not solved to date; however several publications deal with it. FREEMAN treated the „*argyrospilus*-complex” as listed by McDUNNOUGH (1939). In his work, *vividanus*, *columbianus* and *argyrospilus argyrospilus* are treated as subspecies. He did not found any genital differences between them, giving only the characteristics of the coloration. Other species listed above as synonyms of *argyrospilus* are treated by him as valid. MACKAY (1962) found larval differences between *argyrospilus argyrospilus* and *argyrospilus columbianus* but only in coloration. *A. eleagnanus*, *myricanus* and *mortuanus* are treated as distinct species, but based mainly on the coloration. Moreover, that author doubts the specific distinctness of two latter species. POWELL (1964), having examined more extensive material of the species in question, synonymized *vividanus* (previously stated by FERNALD, 1903 as a subspecies only) *mortuanus* and *columbianus* (described originally as the subspecies) with it. Two other names, viz., *eleagnanus* and *myricanus* are supposed by that author to be foodplant forms or local populations, and therefore infrasubspecific forms. Based on examined material and POWELL's opinion expressed in the mentioned work I am treating all these names as synonymous. However, further

investigations should be done to explain the value of the larval characters presented by MACKAY.

Archips magnolianus (FERNALD, 1892)

Cacoecia magnoliana FERNALD, 1892, Can. Ent.; **24**: 121. Type locality: Ithaca, New York (U.S.A.). Type location: USNM.

FREEMAN 1958: 29, figs. 20A, 70 (*Archips*).

Labial palpus over 1, cream; head more brownish; thorax brownish yellow; abdomen almost concolorous.

Male. Forewing fairly broad, weakly expanding terminally; costa bent to middle, slightly concave before apex; apex rather short, somewhat prominent costally; termen weakly sinuate beyond apex, then distinctly convex. Costal fold broadest before middle, strongly tapering at the end, reaching about middle of costa. Ground colour brownish cream with indistinct pinkish hue in some specimens often paler in places. Pattern brownish ferruginous, partially brown, brownish or brownish grey in terminal area of wing. Postbasal blotch elongate, usually rounded terminally; median fascia incomplete or divided into two or three blotches, often distinctly pale edged. Subapical blotch from beyond middle of costa elongate, rust-brown, protruding towards end of termen with arched grey-brown fascia. Weak brownish grey subterminal marking occasionally strigulate with black. Fringes concolorous with ground colour, browner towards apex, creamer towards tornus, with basal line rust or brownish. Hindwing brownish grey with similarly coloured, however, sometimes more cream cilia. Median line of cilia brownish.

Female. Forewing 12 mm, not expanding terminally; costa strongly curved outwards in basal third, weakly concave subterminally; apex somewhat longer than in male, termen more concave beyond it. Pattern similar or darker than in male, terminal or apical markings usually distinct, blackish.

Variation. Some males with dark pattern and distinct purpish suffusion of ground colour especially in dorsal half of wing. Some females with partially atrophied pattern.

Larva. No data.

Male genitalia (figs. 135, 136). Uncus distinctly broadening terminally; socius vestigial; valva somewhat elongate with broad sacculus terminating in a slender tip. Aedeagus slender, long with slender terminal portion.

Female genitalia (fig. 218). Distal part of sterigma very short, cup-shaped part rather slender, deep; median sclerite of antrum long; cestum very long.

Bionomy. Moth from mid June to early July. Host: *Magnolia acuminata* L. (FREEMAN, 1958).

Distribution. Only in the states of New York and Virginia in U.S.A. (FREEMAN, 1958).

Archips georgianus (WALKER, 1863)

Retinia georgiana WALKER, 1863, List Specimens Lepidopt. Insects Colln Br. Mus., 28: 372. Type-locality: Georgia. Holotype, male: „Georgia”, G. Sl. 5350 [BM]; coll. BM.

FREEMAN, 1958:28 (*Archips*).

Male. Labial palpus 1.5, ochreous; remaining parts of head ochreous brownish; abdomen greyer. Forewing 7—9 mm, weakly expanding posteriorly; costa curved outwards basally, then almost straight; apex very short; termen not sinuate postapically, convex beyond middle; costal fold reaching to before middle of costa, thin terminally. Ground colour yellowish cream suffused violet-pink medially. Pattern rust brown in costal area and medially, more ochreous towards dorsum; costal fold rather concolorous scarcely strigulated brown. Basal area bordered by a narrow fascia curved outwardly; median fascia extending from 1/3 costa to beyond middle of dorsum; subapical pattern divided into some three parts; terminal markings delicate. Fringes ochreous cream, paler towards tornus, more brown-pink to median line in the apical half of wing. Hindwing brown mixed rust, more ferruginous apically. Fringes dirty cream indistinctly suffused ferruginous, mixed grey in anal area; median line weak.

Female. Forewing 10—11 mm, slender than in male with costa strongly curved outwards in basal third, indistinctly concave before apex; termen straight to vein m_2 , somewhat oblique. Ground colour more ochreous than in male, mixed leaden grey in distal half of wing, more cream along costa, especially pale beyond median fascia. Pattern rust-ochreous. Basal blotch more or less distinct; median fascia well developed in costal portion of wing; subapical blotch joined with termen by leaden grey streak. More or less distinct transverse strigulation present on the pattern. Fringes rather concolorous with ground colour. Hindwing ferruginous to orange-fuscous; fringes paler.

Variation. In some specimens the head, thorax and ground colour pale brownish cream or the ground colour cream with pearl shine more or less distinctly mixed brownish. In some specimens brownish transverse strigulation developed. The pattern is rust-ochreous. Often the median fascia diffuse medially where represented by one or two rust strigulae. The ground colour beyond median fascia forms usually white-cream costal blotch. Subapical pattern often distinct. The females are seemingly less variable and show a tendency to atrophy of the pattern.

Male genitalia (figs. 137, 138). Uncus broadening terminally; socius vestigial. Sacculus slender basally, otherwise broad terminating in a subtriangular process. Aedeagus proportionally short with distinct ventral tooth subapically and short coecum penis.

Female genitalia (fig. 219). Cup-shaped part of sterigma short, rounded proximally, distal portion of sterigma fairly short; antrum with well developed

median sclerite. Ductus bursae long; cestum reaching almost to its end. Signum small with ill-defined basal sclerite.

The larva is described by MACKAY (1962:54). It is green with light brown head marked dark in ocellar area. Thoracic shield concolorous with body, brownish antereolaterally. Lateral prothoracic pinacula brownish or green. Thoracic legs pale.

Bionomy. Examined moths collected in May. FREEMAN records *Quercus* L. and *Vaccinium* L. as probable larval pabula.

Distribution. U.S.A. only: New Jersey, Florida, Texas, Washington. No data from Canada.

Comments. This species is very similar to *A. griseus* (ROB.) in the male genitalia. The differences in the female genitalia are distinct.

Archips griseus (ROBINSON, 1869)

Tortrix grisea ROBINSON, 1869, Trans. Am. ent. Soc., 2: 268, pl. 4, fig. 18
Type locality: Ohio. Type location: unknown.

FREEMAN 1958: 28, figs. 20, 69, 136, 137 (*Archips*).

Labial palpus over 1, cream-grey, head and thorax grey to pale brownish grey; abdomen paler.

Male. Forewing 9—10 mm, weakly expanding terminally; costa bent to before middle; straight before apex; apex very short; termen hardly sinuate, convex postmedially. Costal fold slender, tapering in terminal portion, reaching to middle of costa. Ground colour grey to ash grey delicately darker strigulate ash grey at costa medially. Pattern consisting of dark grey or blackish grey dorsal elongate blotch and costal suffusion at base; incomplete median fascia the costal part of which is almost completely atrophied, median part broad, brownish or yellowish brown edged black-grey posteriorly and towards costa or suffused in that portion and dorsal portion, gradually paler or atrophying at dorsum. Subapical black-grey blotch from beyond middle of costa rather triangular, terminating far from apex or followed by some three minute dots. Often indistinct pale brownish grey shade from distal part of blotch towards end of termen. Some transverse black strigulae terminally. Fringes concolorous with ground colour or paler. Hindwing pale brownish grey, with even paler cilia with brownish basal line.

Female. Forewing 12—13 mm, rather uniformly broad throughout, with costa strongly curved outwards in basal third, weakly concaving before apex; apex rather short; termen more strongly sinuate than in male. Ground colour as in the male or with weak addition of brownish. Pattern consisting of median fascia that extends from third of costa to beyond middle of dorsum, blackish grey, slender in costal half, broader but diffuse pale brownish grey in remaining portion and of subapical, distinct blotch. Otherwise as for male.

Variation occurs mainly in degree of the development of the pattern and intensity of its coloration.

Male genitalia (figs. 139, 140). Uncus large, broadening terminally; socius vestigial. Sacculus similar to that in preceding species, with large free termination. Aedeagus more slender, provided with distinct subapical dent situated ventrally.

Female genitalia (fig. 220). Sterigma short, with short distal portion the arms of which are directed laterally and with short, delicate cup-shaped part (in the drawing the ventral portion directed proximally). Sclerite of antrum rather short; cestum very long, signum strong with ill-defined basal sclerite.

Larva. No data.

Bionomy. Moth in first half of July. Hosts: *Quercus* L., *Rudbeckia* L., *Carya* NUTT and *Pirus* L. (FREEMAN, 1958).

Distribution. Nearctic species known from U.S.A.: Maine, New York, Pennsylvania, Ohio, Illinois, Montana, Utah and Texas.

Archips negundanus (DYAR, 1902)

Cacoecia negundana DYAR, 1902, Proc. ent. Soc. Wash., 5: 778. Type locality: Pike's Peak, Colorado (U.S.A.). Type in USNM.

FREEMAN 1958: 21, fig. 111, 112.

Labial palpus ca 1.5, cream, more or less dark; head more ochreous or orange dorsally; thorax similarly coloured with darker bases of tegulae and suffused anteriorly; abdomen cream, or with ochreous admixture, grey-black in female ventrally except the base and termination.

Male. Forewing 9—10.5 mm, as in *A. semiferranus* (WALK.) but apex shorter and more rounded and termen oblique, distinctly convex at vein m_3 . Costal fold rather broad except terminal part beyond the curvature where it is slender, reaching to distal edge of median fascia. Ground colour whitish cream with weak shine; pattern ferruginous or pale brownish cream. Basal blotch rather distinct (more than in *semiferranus*), strongly convex; proximal edge of median fascia from third of costa to before middle of dorsum, concave medially. Costal portion of median fascia narrow, dorsal very broad, diffuse, somewhat atrophying proximally. Subapical blotch extending from costa to curve of termen where usually rounded; indistinct spots or shade at apex connecting with weak terminal pattern often represented as a narrow line. Fringes concolorous with ground colour, with weak rust basal suffusion or basal line, more ferruginous at apex. Hindwing white-cream, somewhat darkening on peripheries; fringes rather concolorous with wing. Underside cream with admixture of orange, much paler than in compared species.

Female. Forewing rather uniformly broad throughout, costa bent outwards in basal third, then very weakly concave in middle part; apex longer than in

male, termen more oblique. Coloration usually paler, often a strigulation occurs. Otherwise as in the male.

Variation. The intensity of the colour pattern and the degree of the development of the fasciae are most variable. Some specimens examined are almost unicolorous or with a very weak pattern, occasionally with the darker discal spot preserved.

Male genitalia (figs. 141, 142). Uncus broad, expanding terminally; socius small; sacculus proportionally slender with minute free termination. Aedeagus slender, somewhat tapering terminally, provided with minute dent before end laterally.

Female genitalia (fig. 221). Sterigma short, concave in middle distally, with very short (in the drawing its ventral portion directed proximally) cup-shaped part; sclerite of antrum long, slender; ductus bursae and cestum long; signum small, delicate.

Larva. A description is given by MACKAY (1962: 49, fig. 39).

Bionomy. Moth occurs from end of June to mid-July. Hosts: *Acer negundo* L., *Urtica* L., *Lonicera* L. (FREEMAN, 1958).

Distribution. Manitoba, Colorado, Minnesota, Nebraska, Washington, Utah, California, Texas, Florida, New Jersey (FREEMAN, 1958).

Comments. This species although very similar to the preceding one, is easily distinguished by its pale hindwing. The tuft of abdominal scales in the female is at right angles to the surface of the abdomen in this species, but is somewhat more inclined in *A. semiferanus* (WALK.). Some smaller differences are also found in the shape and coloration of the forewings.

Archips semiferanus (WALKER, 1863)

Lophoderus? *semiferanus* WALKER, 1863, List. Lepidopt. Ins. Brit. Mus., 28: 336. Type-locality: unknown. Holotypus, ♂: „550”, G. Sl. 7945 [BM], Coll. BM.

Tortrix flaccidana ROBINSON, 1869, Trans. Am. ent. Soc., 2: 277, pl. 6, fig. 53. Type locality: no data.

FREEMAN 1958: 20, fig. 14, 63, 109, 110.

Labial palpus smaller than 1.5, cream; head rather concolorous with palpus front paler than vertex; thorax ochreous-cream with more or less distinct admixture of brownish olivaceous; tegula mixed ferruginous; abdomen pale brownish cream, grey-black ventrally except the base and end in female.

Male. Forewing 9—10.5 mm, slightly expanding terminally; costa curved outwards to before middle, then almost straight; apex very short, pointed; termen hardly concave postapically, then almost straight, weakly oblique, bent at vein m_3 . Costal fold fairly broad, distinctly but gradually tapering towards the end in distal fourth, reaching approximately one-third of costa. Ground colour glossy cream with indistinct olivaceous tint in many specimens; pattern

rusty brown, darker in costal than in dorsal area, with more or less distinct olive or olive-brown admixture. Basal blotch convex distally, almost atrophying towards dorsum, with browner suffusion in middle of distal edge. Median fascia strongly tapering towards costa, with anterior edge concave submedially, extending from third of costa to before middle of dorsum; brown or blackish spot at disc. Subapical costal pattern divided into some three parts with ground colour coalescent with large subterminal blotch. The latter sometimes just separated from median fascia by the ground colour. Costal fold as the surrounding coloration of wing, often strigulate terminally. Fringes cream-white except at apex where concolorous with pattern and basally where somewhat paler. Hindwing brownish grey with orange hue; fringes whitish, cream-orange at apex or darker, with basal line pale brownish.

Female. Forewing 10—13 mm, not expanding terminally or hardly so; costa straight beyond basal third, hardly concave subapically; apex slightly longer and termen less oblique, more convex at vein m_3 than in male. Pattern rather diffuse dorsally. Hindwing usually more cream than in male.

Variation occurs in the intensity and colour of pattern and in the degree of the reduction of ground colour. Some of the specimens examined are brownish olivaceous in hue, dark. Basal blotch with a tendency to atrophy. The pale form seems to be the most common (ab. *flaccidanus*).

Male genitalia (figs. 143, 144) similar to those in the preceding species but aedeagus without minute subterminal dent.

Female genitalia (fig. 222). Sterigma shorter than in preceding species, with very short cup-shaped part and much shorter sclerite of antrum. Cestum shorter, signum much stronger.

Bionomy. Moth appears June and early July. Food plants are *Quercus* L., *Hamamelis* (L.) GRON. and *Pirus malus* L. (FREEMAN 1958).

Distribution. The species does not extend beyond the southern part of the Nearctic Region. The above author mentions it from: SW Ontario, Ohio, Massachusetts, New York, Pennsylvania, New Jersey, Texas, Arkansas, California, Colorado, Wisconsin and Illinois.

Archips purpuranus (CLEMENTS, 1865)

Loxotaenia purpurana CLEMENS, 1865, Proc. Ent. Soc. Philad., 5: 136.

Type locality: Pennsylvania? Type location: ANSPH.

Tortrix gurgitana ROBINSON, 1869, Trans. Am. ent. Soc., 2: 263. Type locality: Pennsylvania. Type location: unknown to me.

Tortrix lintneriana GROTE, 1873, Trans. ent. Soc., 4: 424. Type locality: New York. Type location: unknown to me.

FREEMAN, 1958: 30, figs. 21, 71, 138—141.

Labial palpus about 1.5, longer in female, brownish cream to brownish; head and thorax brownish, often brown; abdomen brownish with admixture of cream or grey, without dorsal pits.

Male. Scale tuft on scape of antenna dorsally. Forewing 10—11 mm, not expanding terminally; costa strongly curved outwards to middle, then distinctly concave; apex rather short, protruding costally; termen sinuate beyond apex, then strongly convex with the tip of convexity at vein *cu*₁. Costal fold atypical, not emarginated on the wing surface, directed upwards, variably long, reaching usually third of costa. Ground colour brownish to dark brown, with delicate darker transverse strigulation in some specimens. Pattern darker than ground colour consisting of weak basal blotch darkest dorsally, atrophied costally; anterior edge of median fascia from one-third of costa to 2/3 of dorsum, straight, or bent submedially. Median fascia slender in costal portion, gradually broadening towards dorsum. Subapical blotch in concavity of costa, rather weak, often accompanied by a line directed towards dorsal portion of termen. Fringes concolorous with ground colour, or with pattern. Hindwing brownish grey except for costal half and apical portion which are white-cream to ochreous-cream (apically), occasionally provided with minute transverse strigulation. Fringes concolorous with wing or brownish with darker basal line.

Female. Forewing 10—13.5 mm, costa strongly curved outwards to middle, deeply incised in distal half; apex longer than in male, protruding costally and terminally; termen strongly sinuate beyond apex, then distinctly convex. Pattern usually weaker than in male with edges often darker and with more distinct transverse strigulation developed mainly in distal part of wing. Apical area may be suffused brown-black. Almost unicolorous females are probably not rare. Fringes often brown to brown-black at apex or throughout.

Variation. Males occur with tendency to atrophy of some parts of pattern or with distinct brown-black suffusion in various parts of forewing, or almost completely unicolorous with more ochreous suffusion in place of dorsal blotch. Females with well developed lines, being the edges of atrophied pattern, and with distinct transverse strigulation in forewing. Tendency of darkening of wing seemingly less frequent than in male. In both sexes hue of forewing varies from ferruginous-brown to dark brown or yellowish, eventually a grey admixture appears. More rare are forms with ochreous or rust-violet hues. Other forms seen.

Male genitalia (figs. 145, 146). Uncus broad, proportionally short, distinctly broadening terminally; socius absent. Valva elongate; sacculus long, slender with well developed free termination. Aedeagus slender, provided with two minute teeth before end laterally.

Female genitalia (fig. 223). Sterigma strong, with large cup-shaped part rounded and narrowing proximally, somewhat broadening in middle length of sterigma. Median sclerite of antrum long; cestum almost as long as ductus bursae.

Larva described by MACKAY (1962:51, fig. 43).

Bionomy. Moth in July, more rarely by the end of June. Larva folds lengthwise the leaves of golden rod, webbing together the edges (MACKAY, 1962). Other host plants are (after FREEMAN, 1958): *sassafras*, *Rhus* L., *Ribes* L., *vaccinium* L., *Rubus* L., *Salix* L., *Prunus* L., *Viola* L., *Geranium* L., *Fragaria* L.

Distribution. This Nearctic species is distributed from Nova Scotia to Manitoba, Maine to Florida, Wisconsin, Illinois and Texas (FREEMAN 1958).

APPENDIX

Archips ignescanus KUZNETSOV, 1976

Archips ignescana KUZNETSOV, 1976, Trudy zool. Inst. Leningr., **64**: 8. Type-locality: Tchuguevsk district. Holotype, male: „Iuzhnoe Primore, Tchuguevskij raion, 1. VIII. 1974”; coll. ZIANL.

This recently described species is unknown to me. After the original diagnose it is externally similar to *A. pulcher* (BUTL.). Head and thorax are black-brown, tegula yellow-brown. Expansion of forewing 17.5 in male, 19—21 mm in female. Male lacks costal fold and characterizes with short stalked two last radial veins. In female these veins are separate or extend from one point. In female ground colour brown-orange; pattern black consisting of three longitudinal fascias, the longest running along radius, second being situated at vein cu_2 and third at dorsum; weak streaks at subcosta, and among veins r_5-cu_1 . Hindwing dark grey. The ground colour in male is darker than in female and the pattern fuses in distal part of wing.

Male genitalia. Uncus very broad, slightly concave apically; gnathos fairly short; socius very large. Valva short, rounded dorso-caudally; sacculus slender, hardly concave ventrally, provided with indistinct termination situated in ventral end of valva. Aedeagus strongly curved medially, with short, oblique distal portion and minute ventro-apical dent. Two slender cornuti in vesica. Transtilla strongly narrowing medially.

Female genitalia. Cup-shaped part of sterigma slender proximally, as broad as lamella postvaginalis in the distal portion. Antrum sclerite well developed, fairly long; ductus bursae proportionally short; ductus seminalis placed subterminally; signum with rather short sharp portion and large basal sclerite. No cestum.

Larva green with pale head.

Bionomy. The larva feeds on *Abies nephrolepis* and *Picea ajanensis*, moth flies from mid-July to early August.

Comments. Originally this species was compared with *A. pulcher* (BUTL.) and included in the subgenus (here synonymised) *Pararchips* KUZN. It shows, however, a number of peculiar characters and its systematic position is uncertain. In some characters it resembles the representatives of the genus *Pandemis* HÜBNER (especially the socii). A reexamination of the transtilla should elucidate this question.

Archips dierli DIAKONOFF, 1976

Archips dierli DIAKONOFF, 1976, Zool. Verh., **144**: 83, figs. 67—70. Type-locality: Jumbesi, Nepal. Holotype, ♂: Prov. Nr. 3 East, Jumbesi, 2750 m, 25—31. VII. 1964 (W. DIERL), G. Sl. 6921 [DIAKONOFF]; coll. ZSM.

This species is unknown to me. After the original description the male (expansion 20 mm) has suboval-oblong forewing with costal fold narrow reaching to $2/5$ of costa, apex obtusely pointed, termen sinuate, little oblique. It is „bright reddish-fulvous, faintly spotted with deeper reddish-ferruginous, with an orange-golden gloss, irregularly spotted and banded [pattern] pale fulvous, with a strong silvery-whitish gloss in certain lights, except on costal fold.” Pattern in form of interrupted three elements. Fringes fulvous-ochreous, infuscated towards tornus. Hindwing fuscous-bronze, glossy; cilia pale, ochreous.

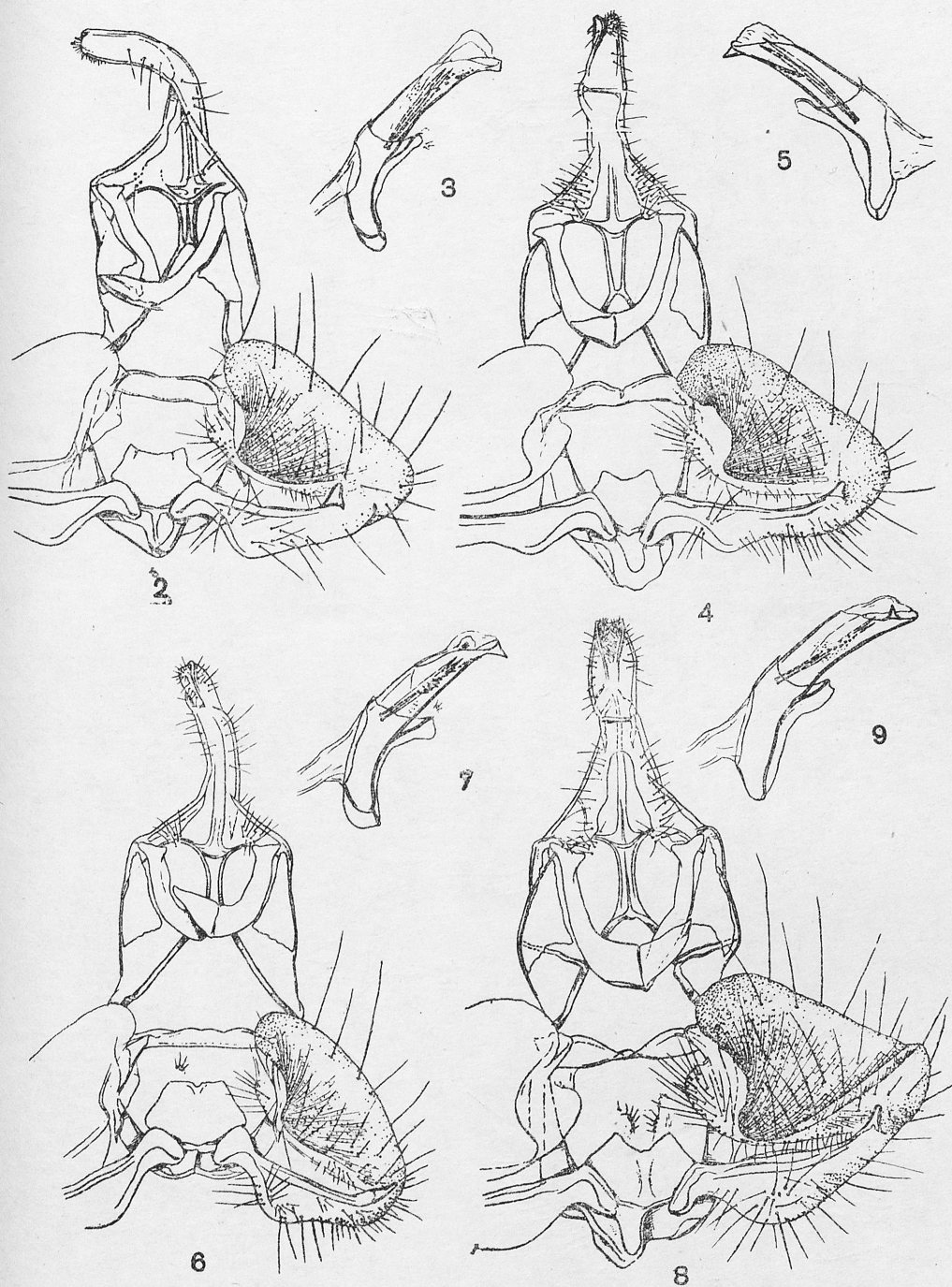
Female (expansion 24 mm) similarly coloured as the male but „with pale markings so extended, as to fill out the wing giving impression of a pale glossy colour, marbled with reddish-fulvous and ferruginous (being the actual ground colour, as in the male) except along reddish-fulvous anterior $2/3$ of dorsal chird of wing; costal spot represented by a posterad-shifted and almost terminal eight fascia”. Hindwing as in male but orange-pink apically.

Male genitalia with short free end of sacculus and short termination of aedeagus.

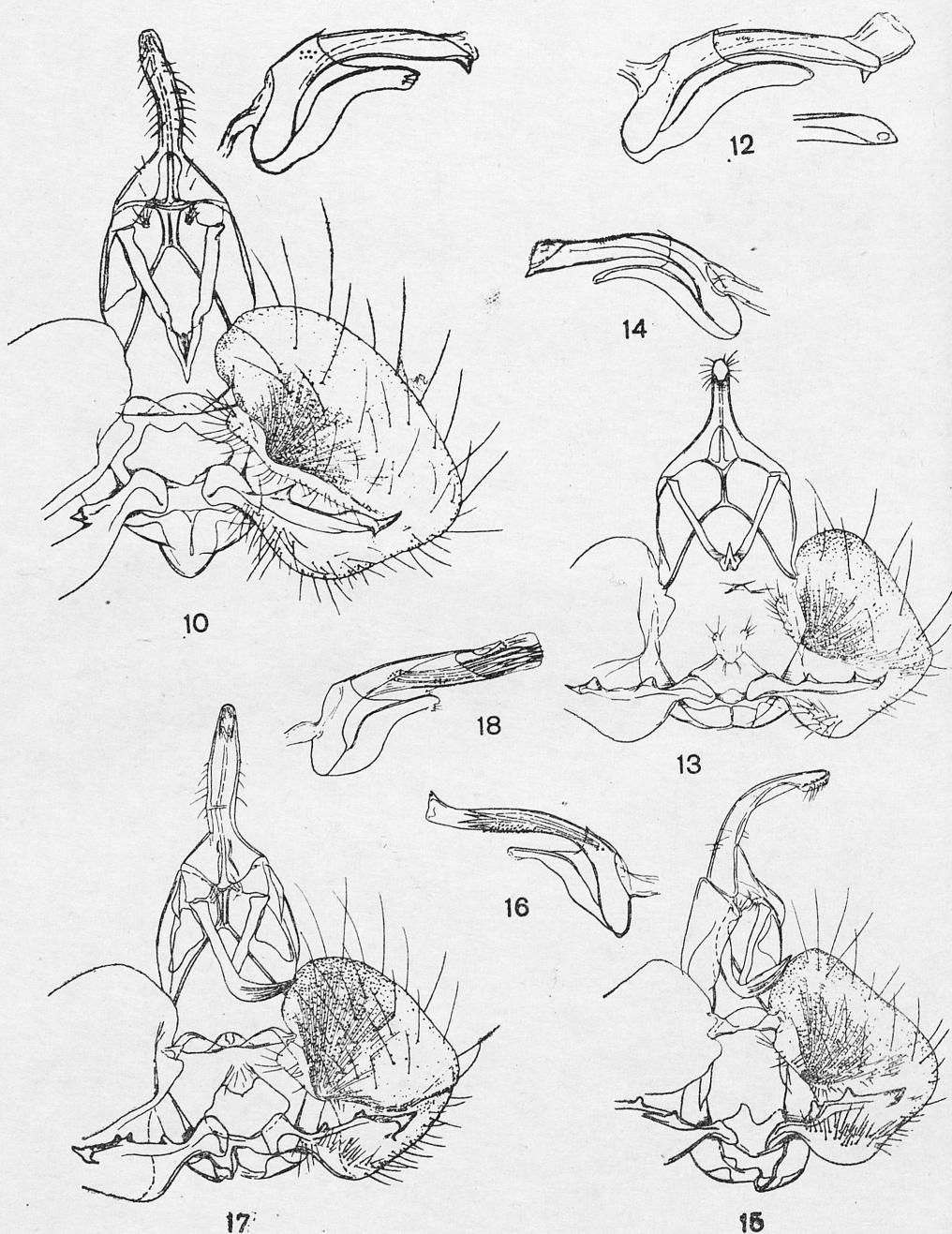
Female genitalia. Sterigma large with very short cup-shaped part provided with small anterior prominences; sclerite of antrum long; cestum vestigial, anterior.

Comments. Originally compared with *oporānus*.

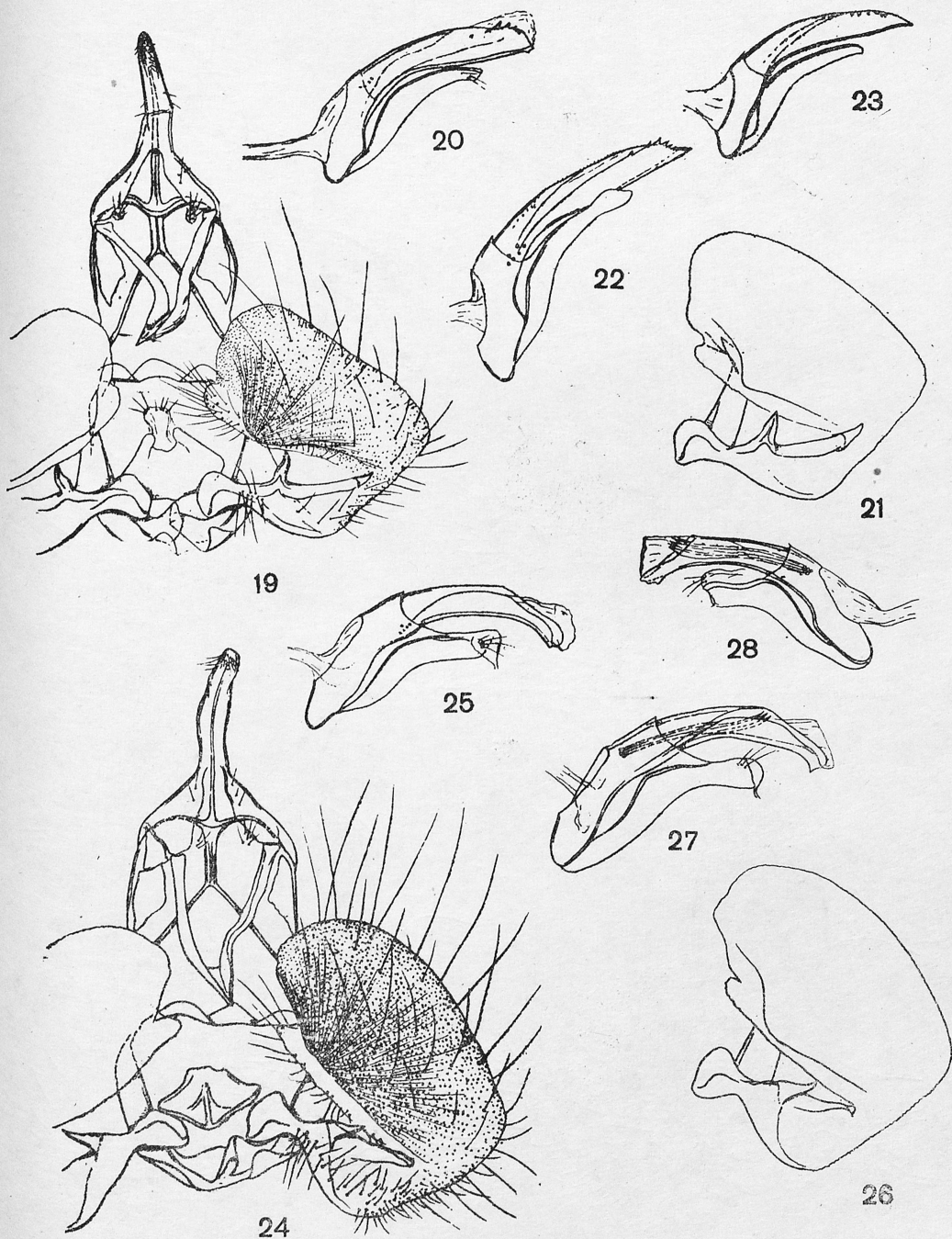
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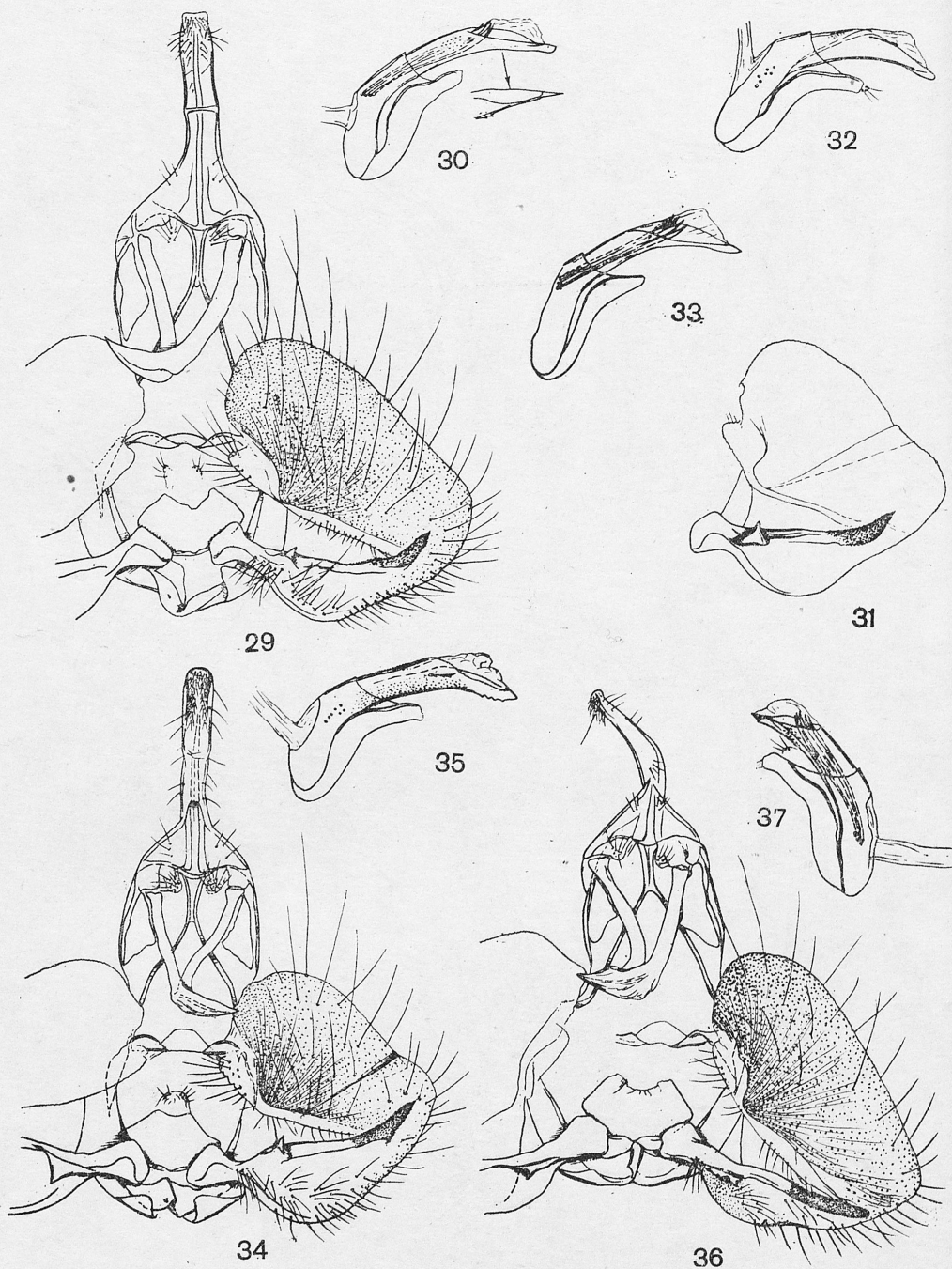
Figs. 2—9. Male genitalia of *Archips* HBN.: 2 — *A. dissitanus* (GROTE), „Norway Bay, Que., 28. VII. 1938, A. HOBBS”, G. Sl. 21410, 3 — aedeagus of same specimen, 4 — *A. strianus* FERN., „Hetanooga, N. S., July 13, 1961, FREEMAN & LEWIS”, G. Sl. 21408, 5 — aedeagus of same specimen, 6 — *A. packardianus* (FERN.), „Aweme, Man., N. CRIDDLE, 13. VII. 1925”, G. Sl. 21406, 7 — aedeagus of same specimen, 8 — *A. alberta* (MCDUNN.), „Grander Nfld., 24. VIII. 1949, R. A. HENNIGER”, G. Sl. 21399, 9 — aedeagus of same specimen



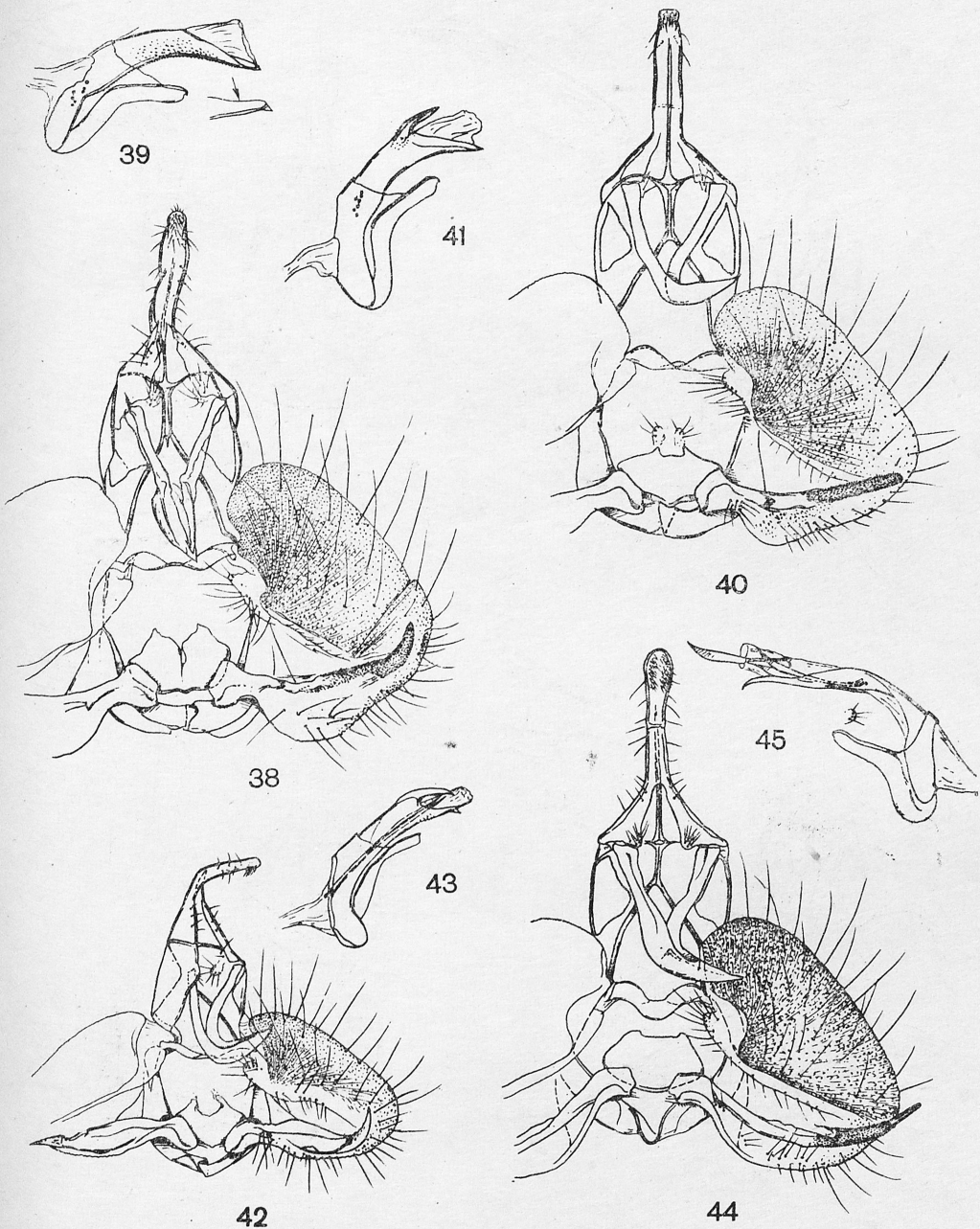
Figs. 10—18. Male genitalia of *Archips* HBN.: 10 — *A. arcanus* sp. nov., paratype, „Tapaishen im Tsinling, Sued Shensi (China), 21. VI. 1935, H. HÖNE”, G. Sl. 20622, 11 — aedeagus of same specimen, 12 — aedeagus of same species, paratype, same label except for date: 24. VI. 1935, G. Sl. 20676, 13 — *A. paredreus* (MEYR.), lectotype, 14 — aedeagus of same specimen, 15 — *A. capsigeranus* (KENN.), holotype, 16 — aedeagus of same specimen, 17 — *A. capsigeranus* ssp.?, „Kasugayama, 20. VI. 1968, T. YASUDA”, G. Sl. 12652, 18 — aedeagus of same specimen



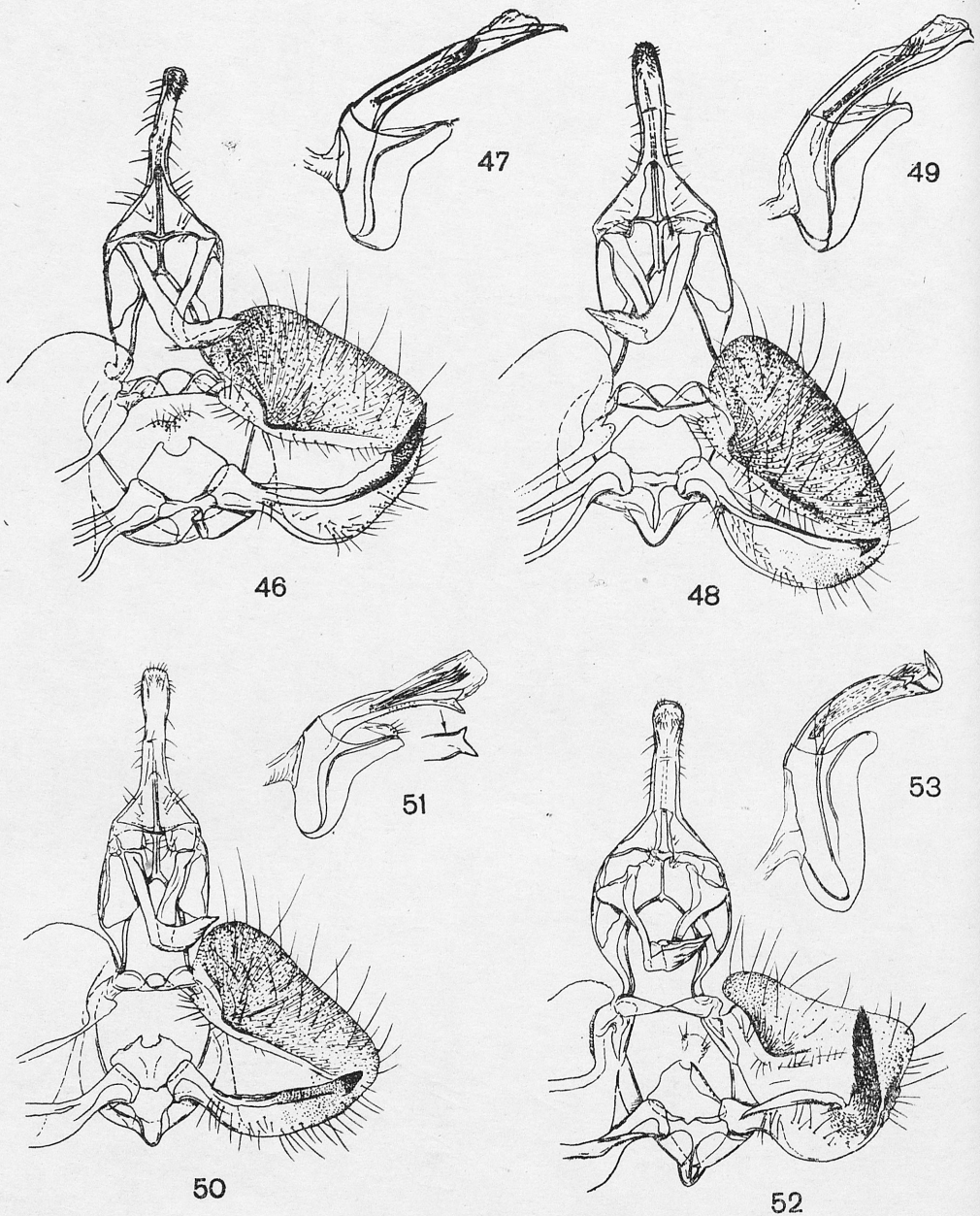
Figs. 19—28. Male genitalia of *Archips* HBN.: 19 — *A. asiaticus* (WALS.), „Shanghai (China). Provinz Kiangsu, 27. VII. 1934, H. HÖNE”, G. Sl. 20625, 20 — aedeagus of same specimen, 21 — valva of same species, „Hoengshan, Prov. Hunan, 12. VIII. 1933, H. HÖNE”, G. Sl. 20619, 22 — aedeagus of same specimen, 23 — aedeagus of same species, „Zi-ka-wy, Chine”, G. Sl. 10412, 24 — *A. audax* sp. nov., paratype, „Japonia, Honshyu, Kogaitake, 1200 m., Nara Pref., 30. VI. 1970, Józef RAZOWSKI leg.”, G. Sl. 12604, 25 — aedeagus of same specimen, 26 — valva of same species paratype, „Japonia, Honshyu, Yoshino, 400 m, Nara Pref., 8. VI. 1970, Józef RAZOWSKI leg.”, G. Sl. 12603, 27 — aedeagus of same specimen, 28 — aedeagus of same species, paratype, „Japan, Honshyu, Kawati, Iawawakisan, 30. V. 1954, T. YASUDA”, G. Sl. 12657



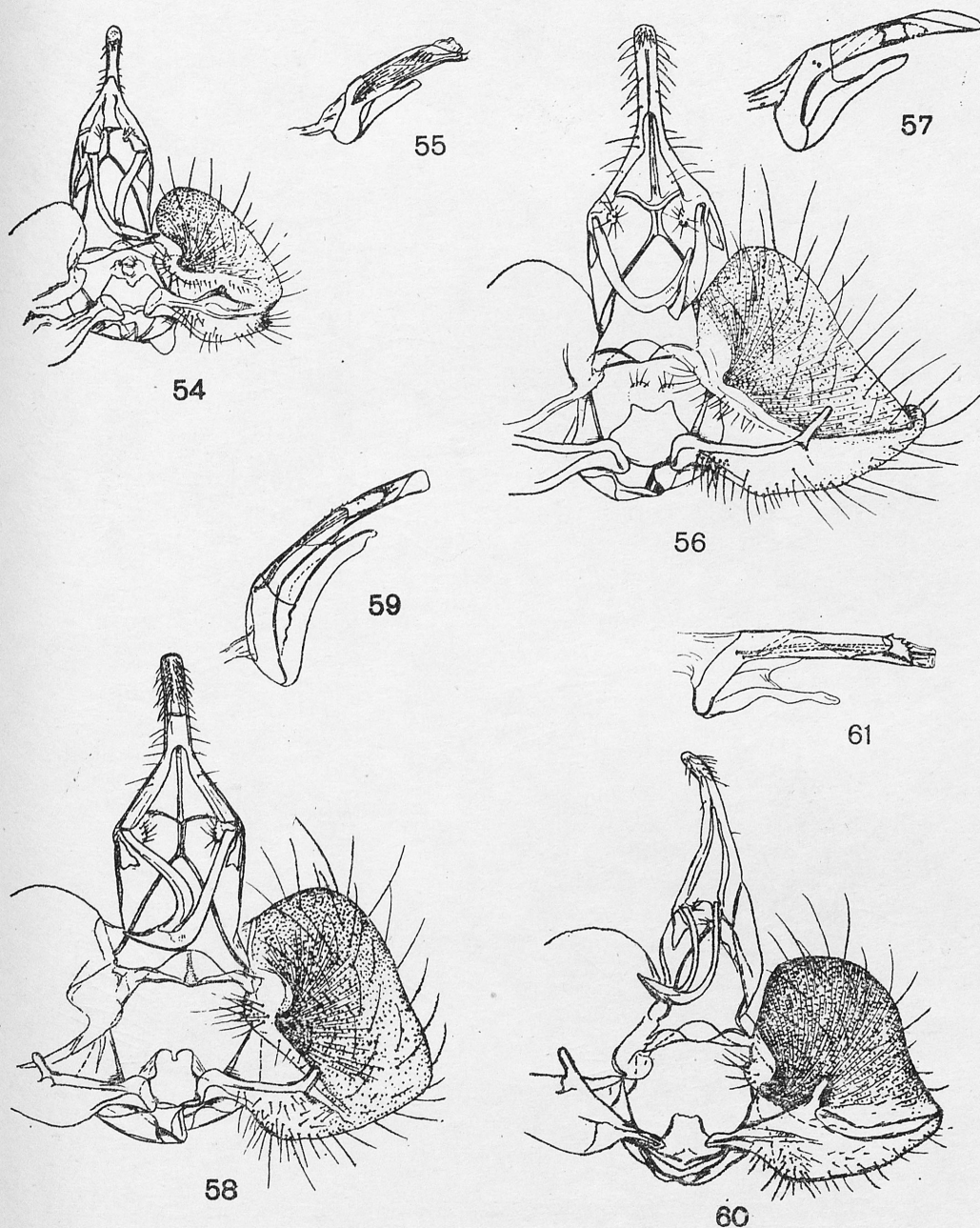
Figs. 29—37. Male genitalia of *Archips* HBN.: 29 — *A. tharsaleopus tharsaleopus* (MEYR), „West Tien-mu-shan, Prov. Chekiang, 21. VI. 1932, H. HÖNE”, 30 — aedeagus of same specimen, 31 — valva of same species, „Tapaishan im Tsinling, Sued Shensi, ca 1700 m, 10. VIII. 1939, H. HÖNE”, G. Sl. 20618, 32 — aedeagus of same specimen, 33 — aedeagus of same species, same label, G. Sl. not numbered, 34 — *A. tharsaleopus yunnanus* ssp. nov., holotype, 35 — aedeagus of same specimen, 36 — *A. ingentanus* (CHR.), „Japonia, Honshyu Amami, 300 m, Kinki Pref., 9. V. 1970, Józef RAZOWSKI leg.”, G. Sl. 12691, 37 — aedeagus of same specimen



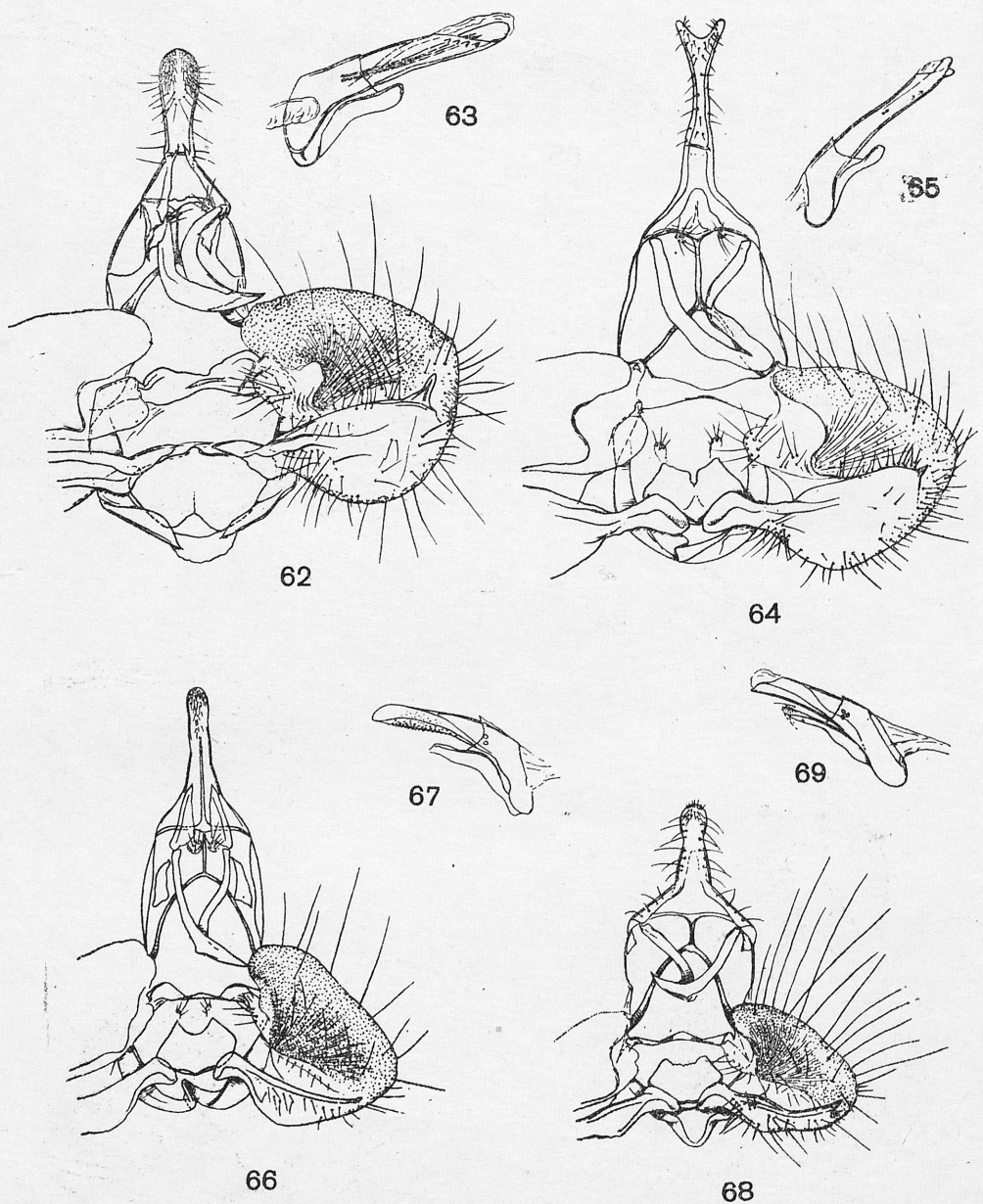
Figs. 38—45. Male genitalia of *Archips* HBN.: 38 — *A. enodis* sp. nov., holotype, 39 — aedeagus of same specimen, 40 — *A. subrufanus* (SNELL.), „Manchuria, Hsiaoling (Prov. Kirin), 4. IX. 1939“, G. Sl. 12609, 41 — aedeagus of same specimen, 42 — *A. seditiosus seditiosus* (MEYR.), holotype, 43 — aedeagus of same specimen, 44 — *A. oporamus* (L.), „Pieniny, Upszar, 18. VI. 1957, Dr. S. TOLL leg.“, G. Sl. 12630, 45 — aedeagus of same specimen



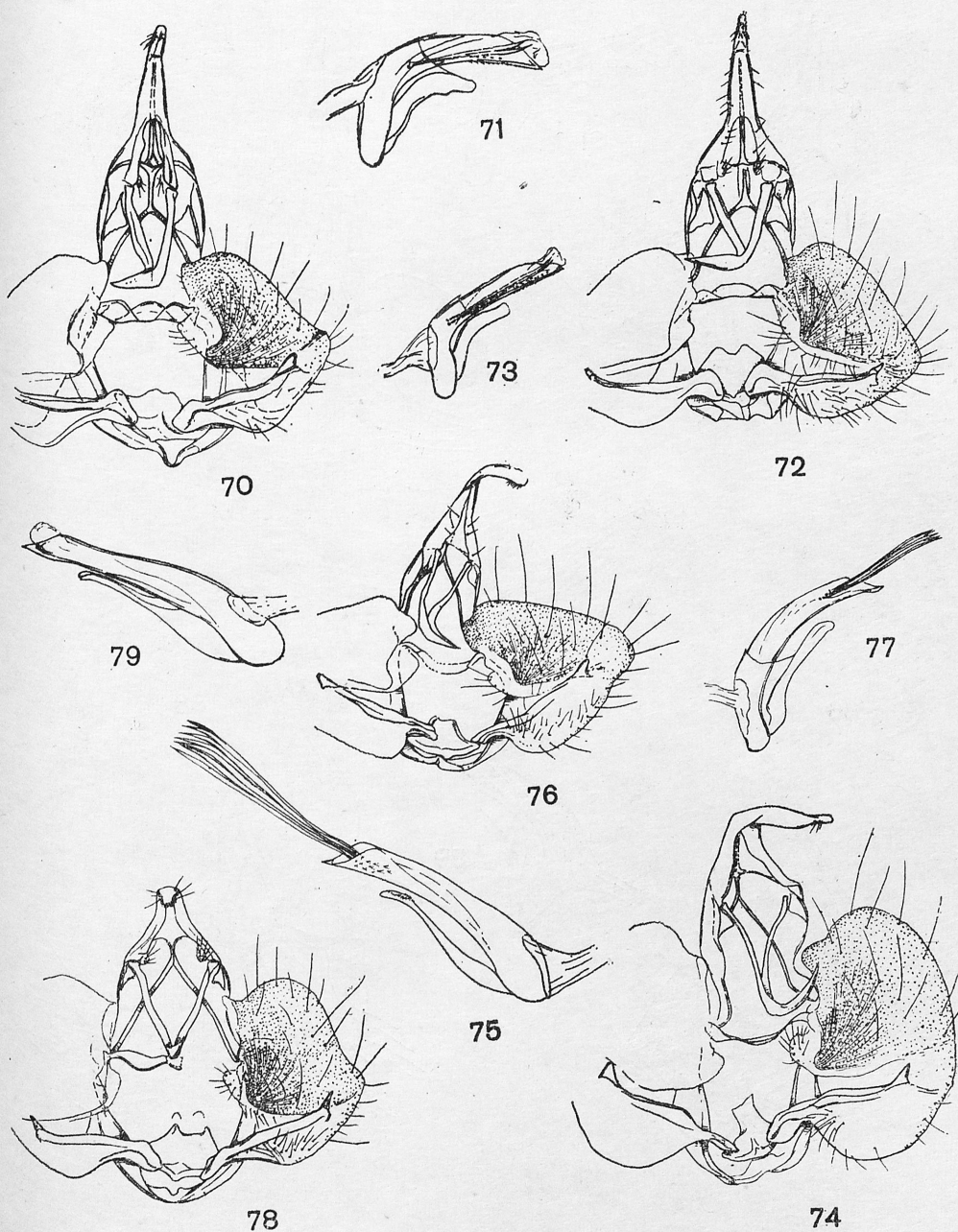
Figs. 46—53. Male genitalia of *Archips* HBN.: 46 — *A. decretanus* (TREIT.), „Stemplew, Z.[ziemia] Kaliska, 29. VII. 1921, Coll. Hr. S. TOLLA”, G. Sl. 12628, 47 — aedeagus of same specimen, 48 — *A. podanus* (SCOP.), „Baligród pow. Lesko, 26. VII. 1960, Dr. S. TOLL leg.”, G. Sl. 12626, 49 — aedeagus of same specimen, 50 — *A. breviplicatus* (WALS.), „Manchuria, Hsiaoling (Prov. Kirin), 30. VIII. 1930”, G. Sl. 12637, 51 — aedeagus of same specimen, 52 — *A. semi-structus* (MEYR.), „Japan, Honsyu, Izumi: Daisentyoo (Sakai), 24. VI. 1955, MORIUTI”, G. Sl. 12640, 53 — aedeagus of same specimen



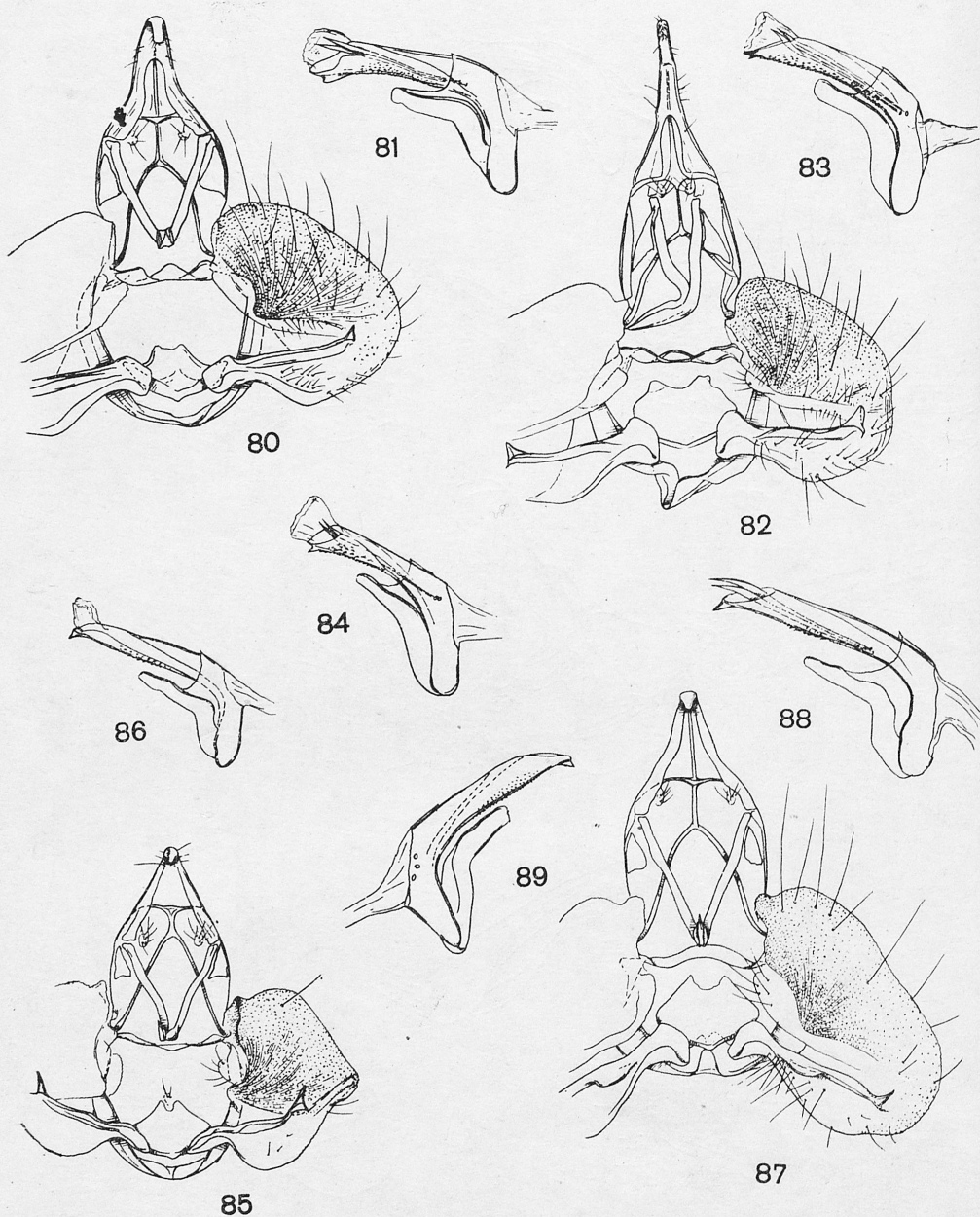
Figs. 54—61. Male genitalia of *Archips* HBN.: 54 — *A. insulanus* KAW., „Japan-Kyusyu, Amamiosima, Nase, 30. IV. 1966, T. KODAMA”, G. Sl. 12642, 55 — aedeagus of same specimen, 56 — *A. strojny* sp. nov., holotype, 57 — aedeagus of same specimen, 58 — *A. peratratus* YAS., paratype, „Japan, Kyusyu, Oosumi: Sata, 19. IV. 1958, S. ISSIKI & T. YASUDA”, G. Sl. 12660, 59 — aedeagus of same specimen, 60 — *A. formosanus* (KAW.), holotype, 61 — aedeagus of same specimen



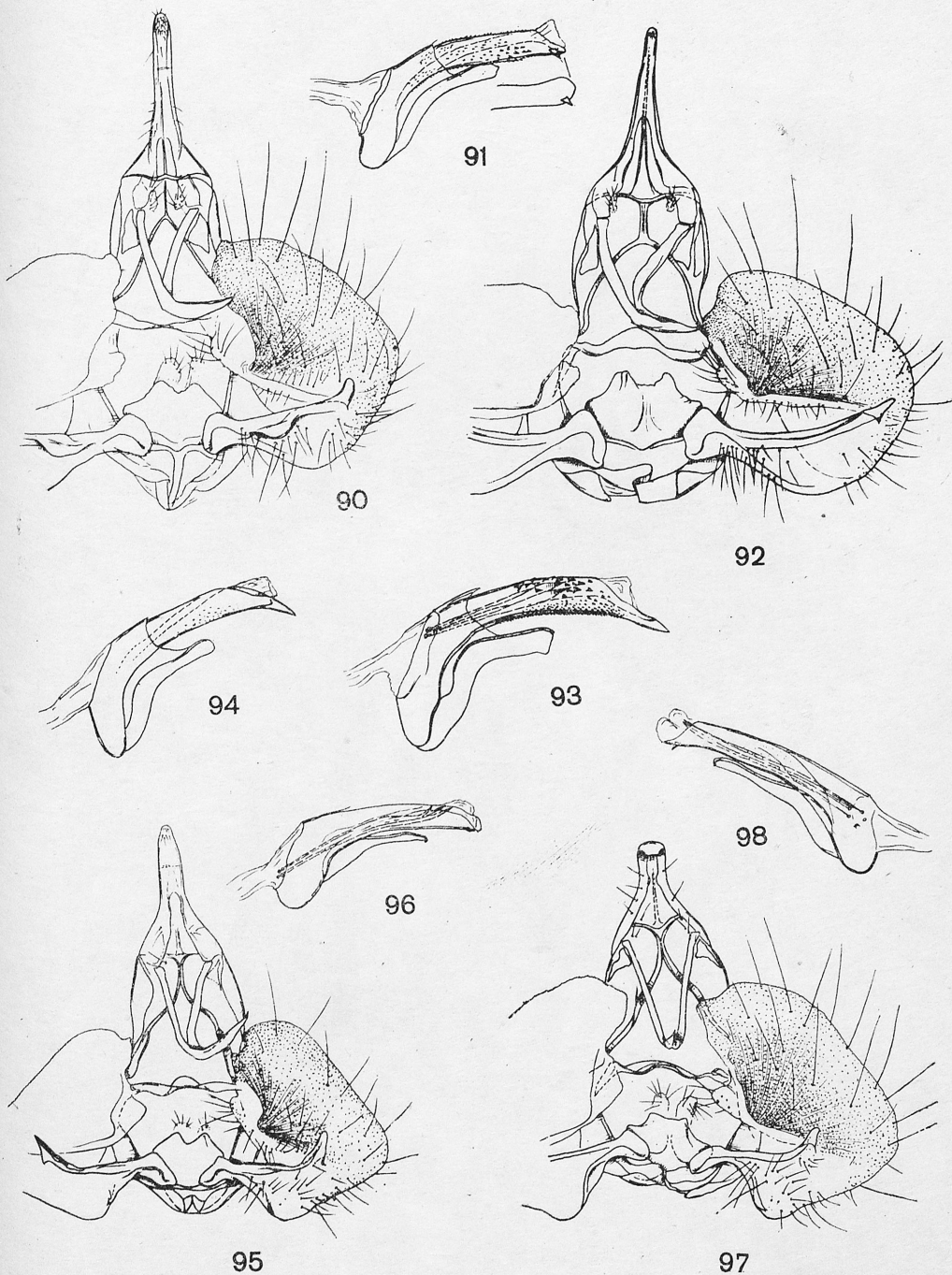
Figs. 62—69. Male genitalia of *Archips* HBN.: 62 — *A. pulcher* (BUTL.), „Japan, Tokyo, Asakawa bred..., 9. VI. 1958, T. KODAMA”, G. Sl. 12688, 63 — aedeagus of same specimen, 64 — *A. abiephagus* YAS., paratype, „Japan, Honshyu, Sinano, Manza, 27. VII. 58, T. YASUDA“, 65 — aedeagus of same specimen, 66 — *A. inanis* sp. nov., paratype, „SO Afghanistan, Safed Koh, S. Seite, Kotkai, 2350 m, 14—23. VI. 1966”, G. Sl. 20015, 67 — aedeagus of same specimen, 68 — *A. ceylonicus* sp. nov., holotype, 69 — aedeagus of same specimen



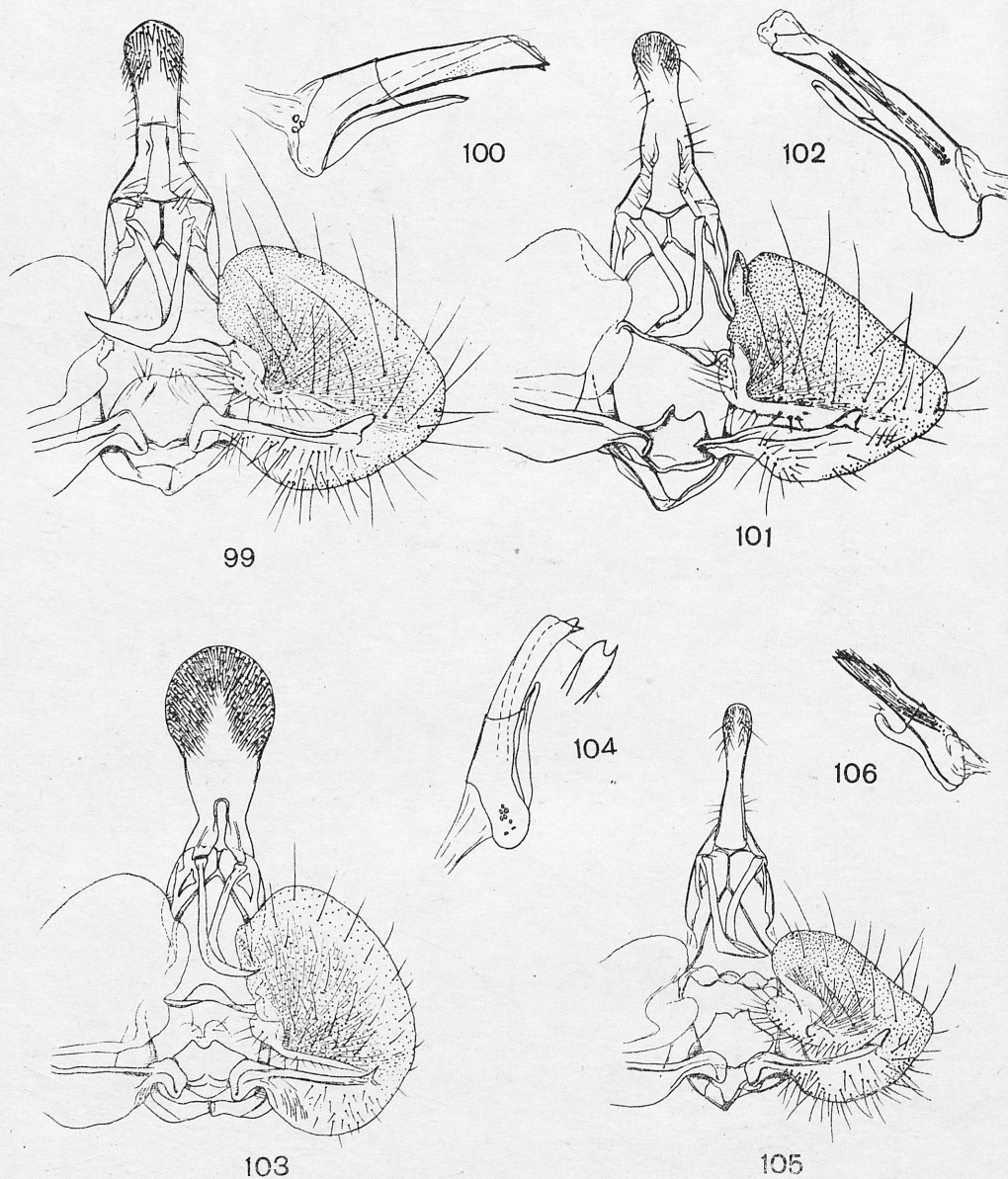
Figs. 70—79. Male genitalia of *Archips* HBN.: 70 — *A. pruneticolus* (MEYR.), holotype, 71 — aedeagus of same specimen, 72 — *A. citimus* sp. nov., holotype, 73 — aedeagus of same specimen, 74 — *A. transcutatus* (MEYR.), holotype, 75 — aedeagus of same specimen, 76 — *A. atrolucens* DIAK., holotype, 77 — aedeagus of same specimen, 78 — *A. binigratus* (MEYR.), lectotype, 79 — aedeagus of same specimen



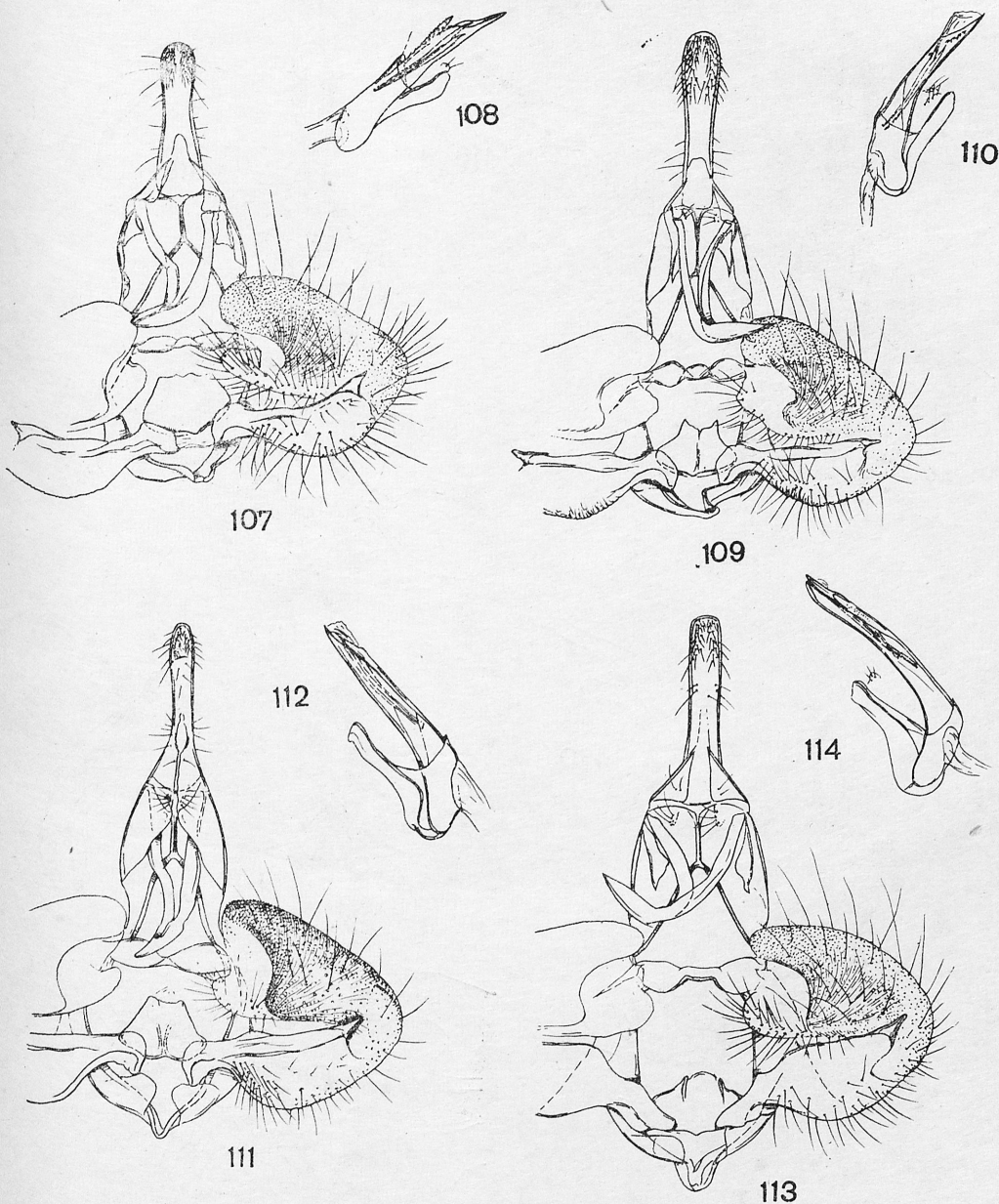
Figs. 80—89. Male genitalia of *Archips* HBN.: 80 — *A. philippus* (MEYR.), holotype, 81 — aedeagus of same specimen, 82 — *A. subsidiarius* (MEYR.), „e. l., 10. VIII. 1965, Aprikose, Kabul, Afgh.[anistan]”, G. Sl. 12678, 83 — aedeagus of same specimen, 84 — aedeagus of same species, lectotype, 85 — *A. solidus* (MEYR.), lectotype, 86 — aedeagus of same specimen, 87 — *A. termias termias* (MEYR.), lectotype, 89 — aedeagus of same species, „Li Kiang (China), Provinz Nord Yunnan, 11. VII. 1934, H. HÖNE”



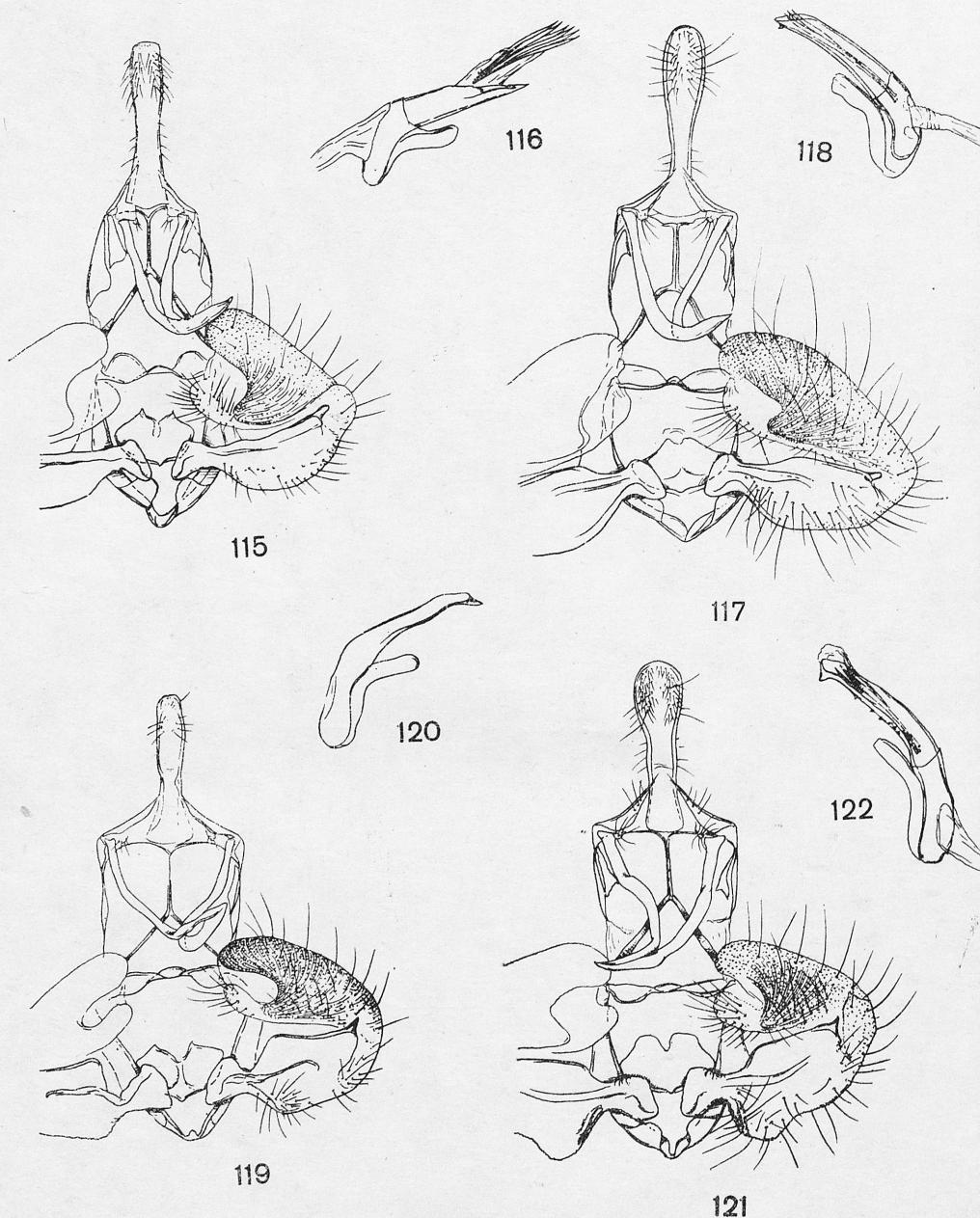
Figs. 90—98. Male genitalia of *Archips* HBN.: 90 — *A. compitalis* sp. nov., paratype, „West Tien-mu-shan, Prov. Chekiang, 22. VIII. 1932, H. HÖNE”, G. Sl. 20659, 91 — aedeagus of same specimen, 92 — *A. limatus limatus* sp. & ssp. nov., holotype, 93 — aedeagus of same specimen, 94 — aedeagus of *A. limatus albatu*s ssp. nov., paratype, „West Tien-mu-shan, Prov. Chekiang, 29. V. 1932, H. HÖNE”, G. Sl. not numbered, 95 — *A. dispilanus* (WALK.), holotype of *A. mimicus* WALS., 96 — aedeagus of same specimen, 97 — same species, lectotype of *Cacoecia epicyrta* MEYR., 98 — aedeagus of same specimen



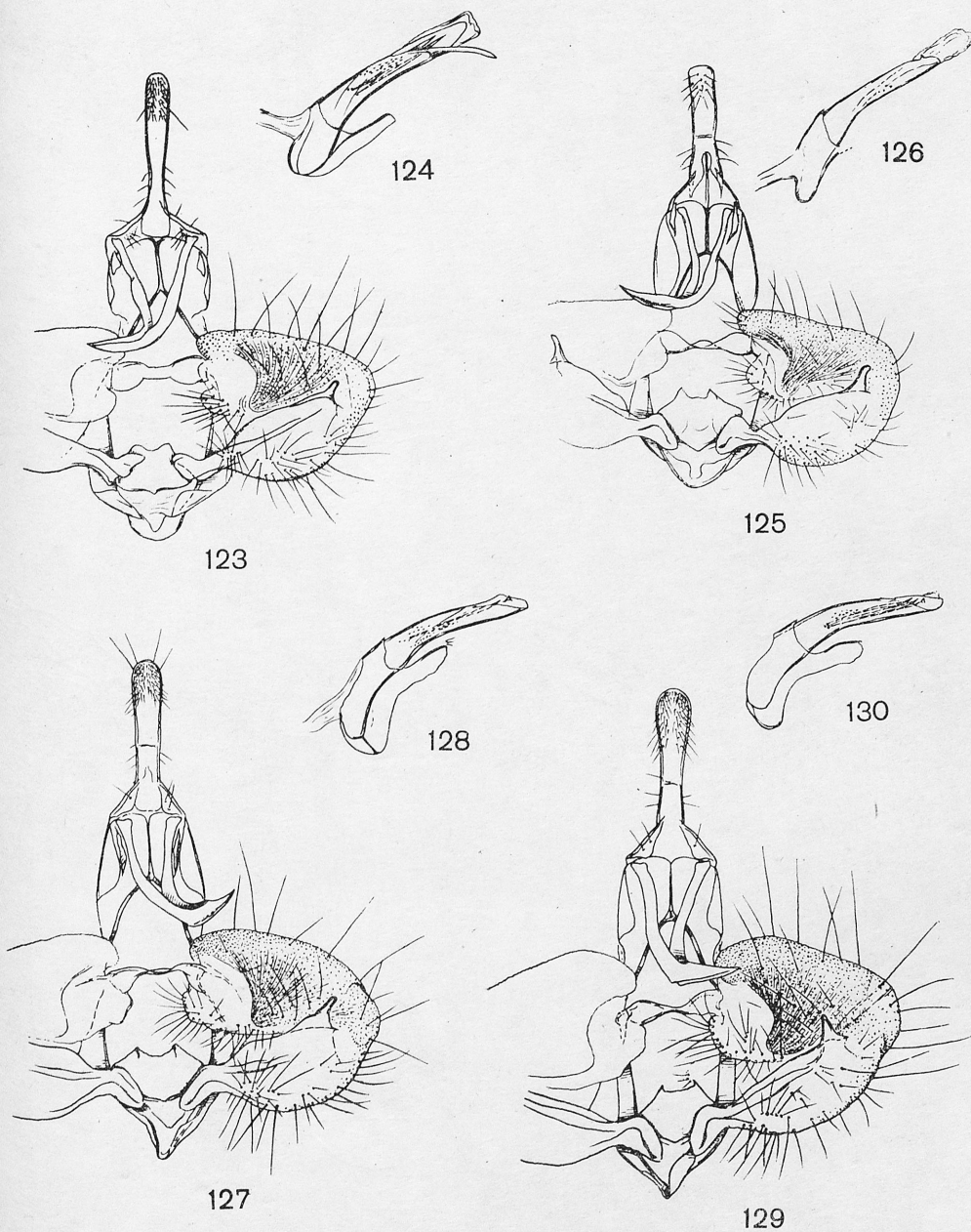
Figs. 99—106. Male genitalia of *Archips* HBN.: 99 — *A. machlopi* (MEYR.), „W. Java, 1400 m, Mt. Gedeh, 1940, Tjibodas, 6. IV., L. J. TOXOPEUS”, G. Sl. 10126, 100 — aedeagus of same specimen, 101 — *A. micaceanus* (WALK.), holotype of *Cacoecia eucroca* DIAK., 102 — aedeagus of same specimen, 103 — *A. seminubilis* (MEYR.), lectotype, 104 — aedeagus of same specimen, 105 — *A. issikii* KOD., „Hokkaido, Yamabo, 10. VII. 1959, M. NISHIGUSHI”, G. Sl. 12648, 106 — aedeagus of same specimen



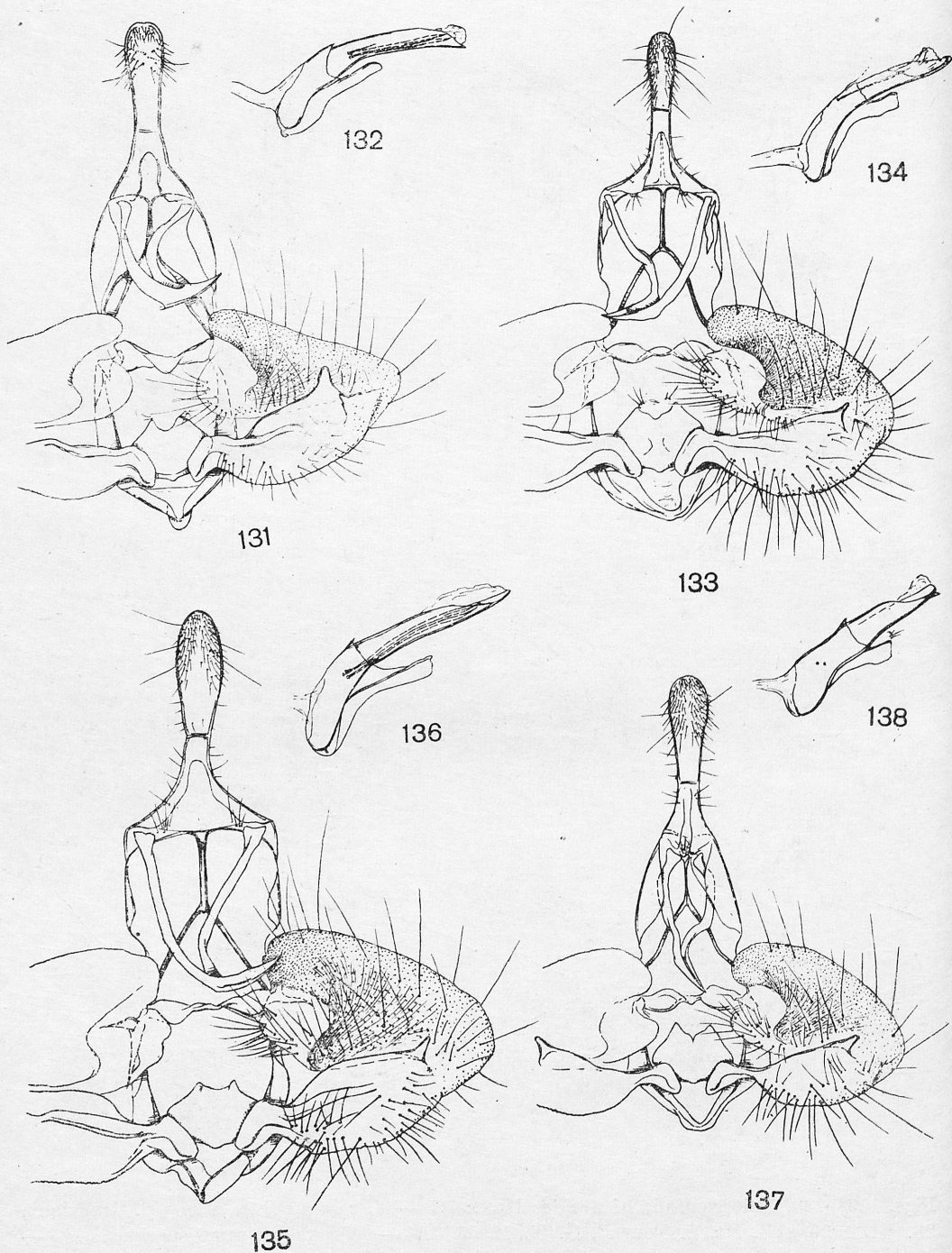
Figs. 107—114. Male genitalia of *Archips* HBN.: 107 — *A. fumosus* KOD., „Asahigawa, Hokkaido, S. SUZUKI, 11. VII. 1955, coll., Pupa[.tion] 19. VII., Em[er]gence[.tion] 31. VII. Host *Abies sachalinensis* MASTERS”, G. Sl. 12671, 108 — aedeagus of same specimen, 109 — *A. viola* FALK., „Japan, Honsyu, Yamato, Kasugayama, 1. VI. 1956, T. YASUDA”, G. Sl. 12644, 110 — aedeagus of same specimen, 111 — *A. crataeganus* (HBN.), „Cieszyn, 12. VI. 1936, A. RÓŻYCKI leg.”, G. Sl. 12633, 112 — aedeagus of same specimen, 113 — *A. endoi* YAS., „Japan, Akita Yaata (pupa), 14. VI. 1955, ... 23. VI. 1955 (Emergence) leaves rolled of *Malus pumila*”, G. Sl. 12646, 114 — aedeagus of same specimen



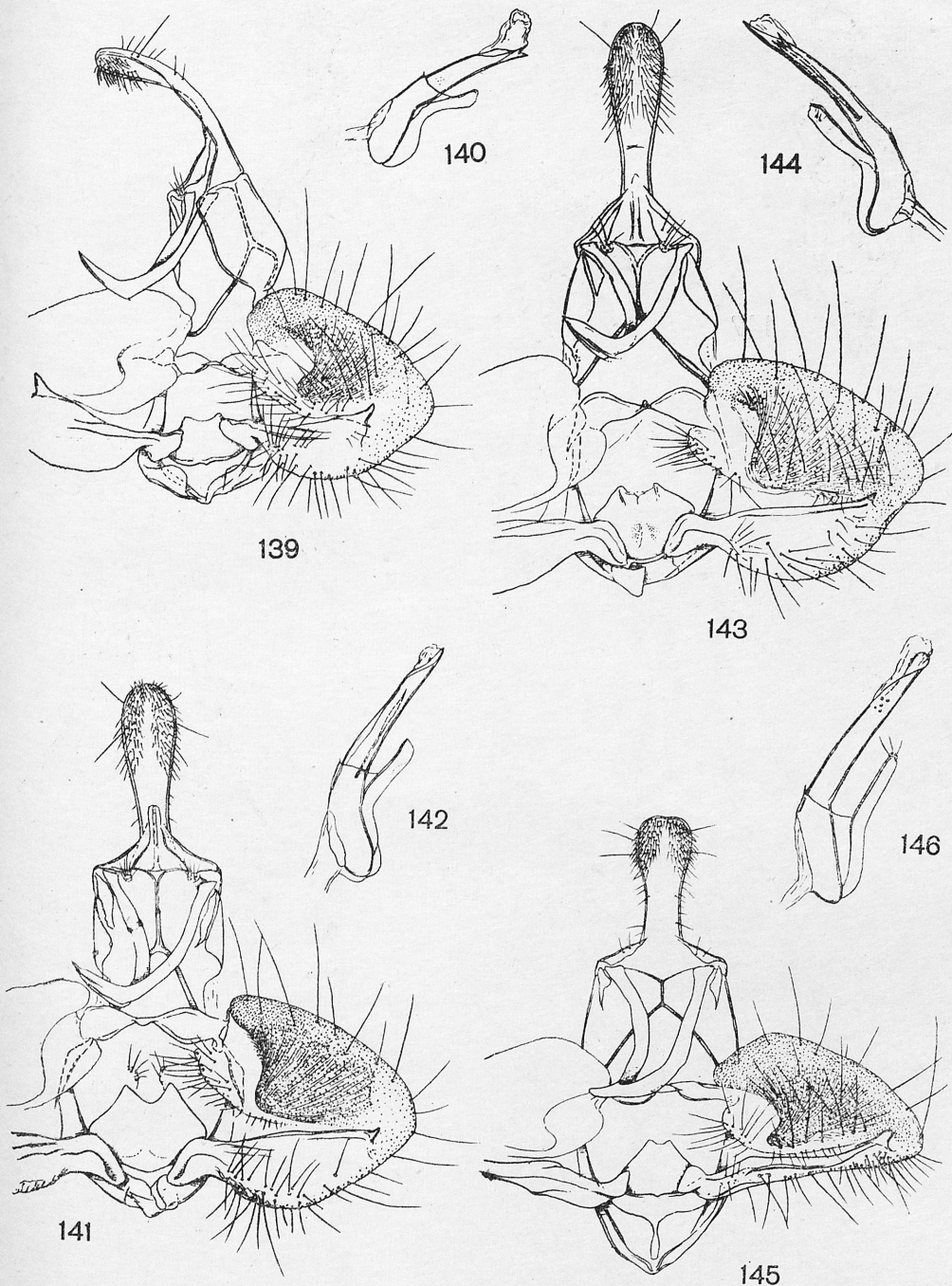
Figs. 115—122. Male genitalia of *Archips* HBN.: 115 — *A. xylosteanus* (L.); „Stemplew, Z.[zie, mia] Kaliska, 26. VII. 1920, Coll. Hr. S. TOLLA”, G. Sl. 12636, 116 — aedeagus of same specimen- 117 — *A. nigricaudanus* (WALS.), „Japan, Honsyu, Sinano: Kutukaka, 30. VI. 1956, T. YASUDA“, G. Sl. 12658, 118 — aedeagus of same specimen, 119 — *A. dichotomus* FALK., holotype, 120 — aedeagus of same specimen, 121 — *A. fuscocupreanus* WALS., „Japan, Osaka, Kawataginano, 2. V. 1955 (larva) leaves rolled of *Pyrus simonyi*, 19. V. 1955 (Emergence)”, G. Sl. 12662, 122 — aedeagus of same specimen



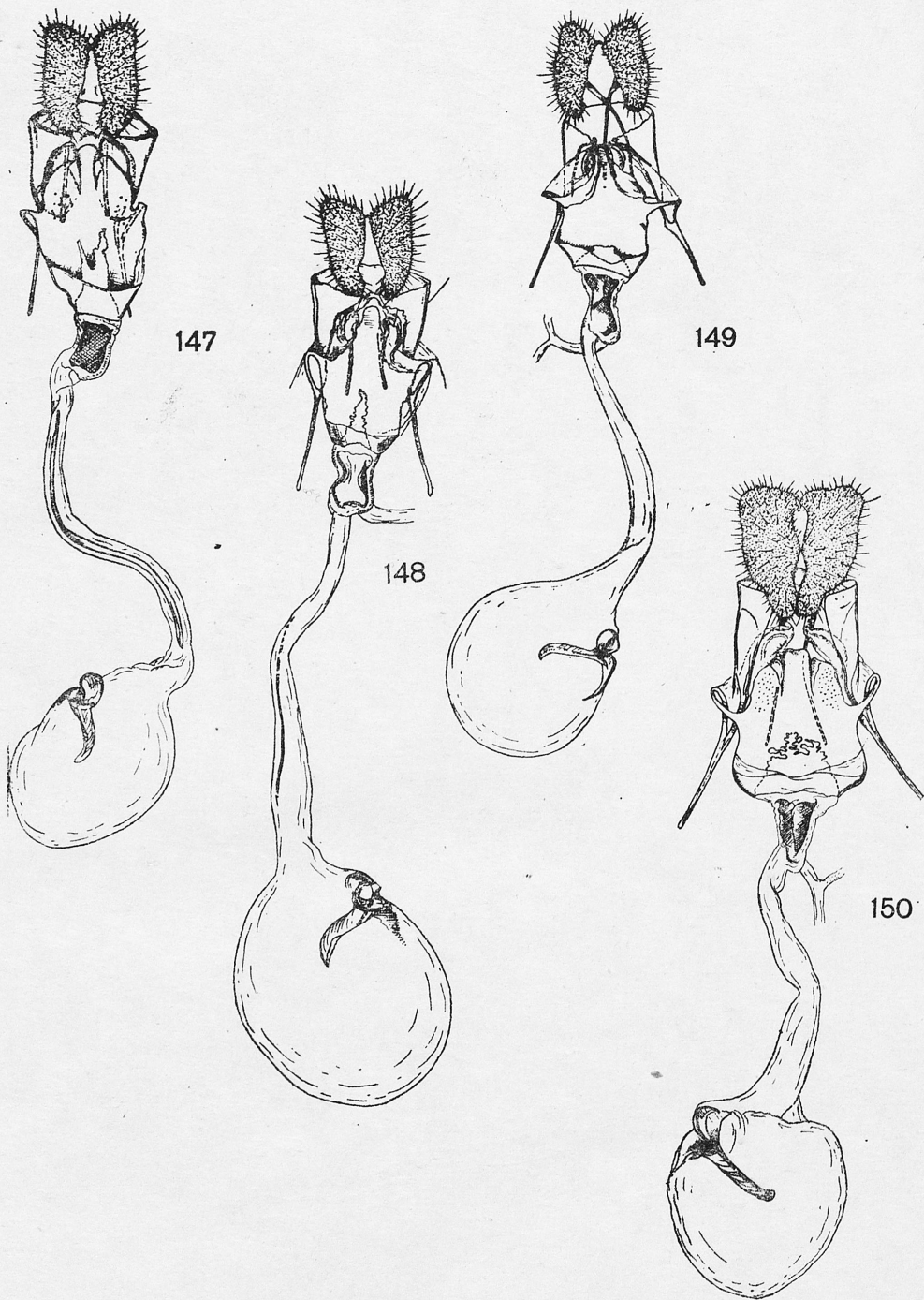
Figs. 123—130. Male genitalia of *Archips* HBN.: 123 — *A. rosanus* (L.), „Jamy p. Grudziądz, 28. VI. 1926, coll. Hr. S. TOLLA”, G. Sl. 12665, 124 — aedeagus of same specimen, 125 — *A. infumatanus* (ZELL.), „Syntype; Missouri, RILEY, 7. X. [18]69”, G. Sl. 7865 [BM], 126 — aedeagus of same specimen, 127 — *A. fervidanus* (CLEM.), „Cap Rouge, Que., 9. VIII. 1950, R. LAMBERT”, G. Sl. 21424, 128 — aedeagus of same specimen, 129 — *A. cerasivoranus* (FITCH), „Forestville, Que., 9. VIII. 1950, R. de REUTTE”, G. Sl. 21422, 130 — aedeagus of same specimen



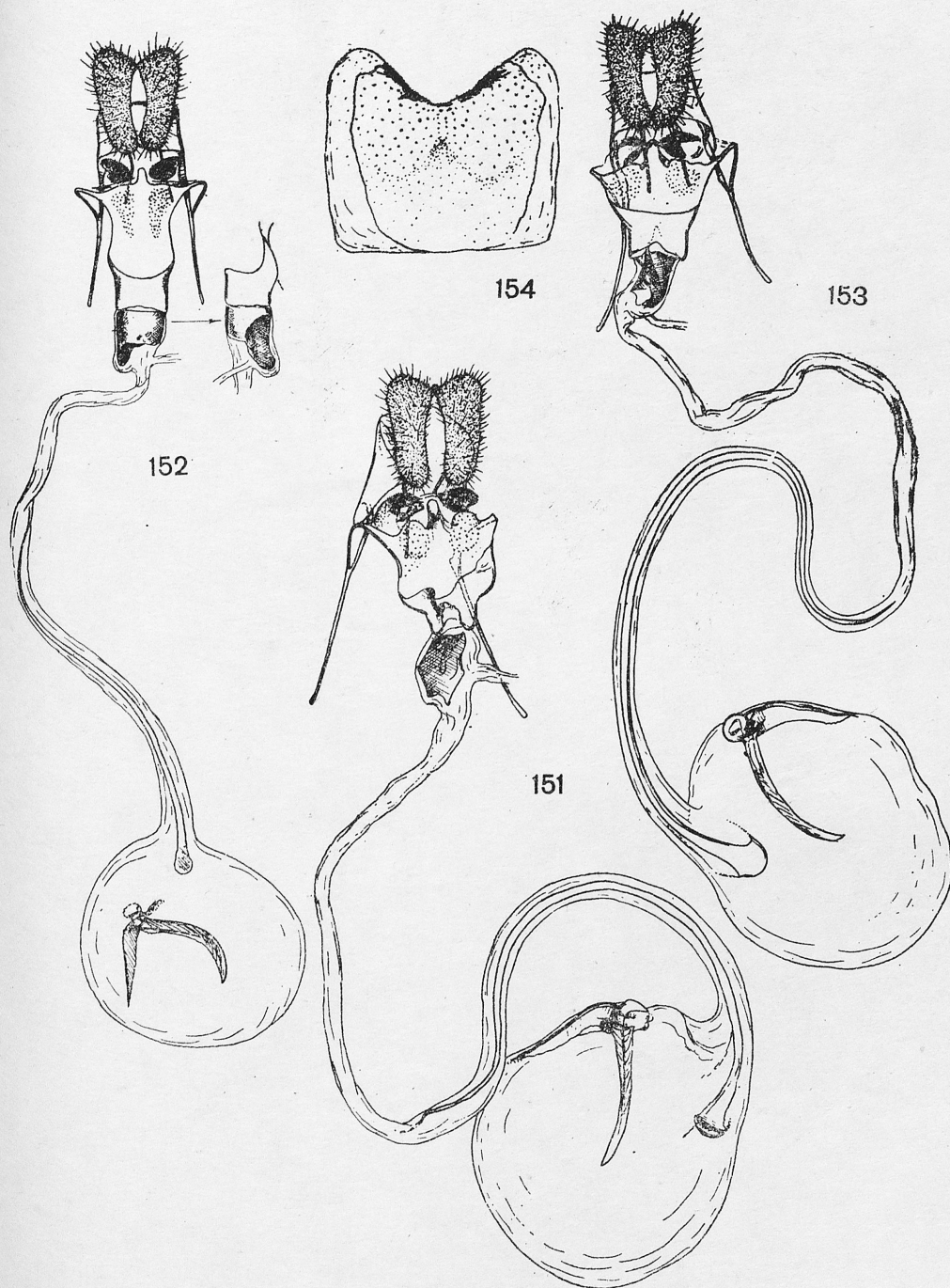
Figs. 131—138. Male genitalia of *Archips* HBN.: 131 — *A. rileyanus* (GROTE), „Iowa”, G. Sl. 19804 [BM], 132 — aedeagus of same specimen, 133 — *A. argyrosipilus* (WALK.), „Aweme, Man., N. CRIDDLE, 2. VII. 1921”, G. Sl. 21420, 134 — aedeagus of same specimen, 135 — *A. magnolianus* (FERN.), „Mountain L., Va., July 4, 1938, L. J. & W. J. MILNE”, G. Sl. 21414, 136 — aedeagus of same specimen, 137 — *A. georgianus* (WALK.), Quincy Gudsen Fla, 5. V. 1963, W. B. TAPPER”, G. Sl. 21418, 138 — aedeagus of same specimen



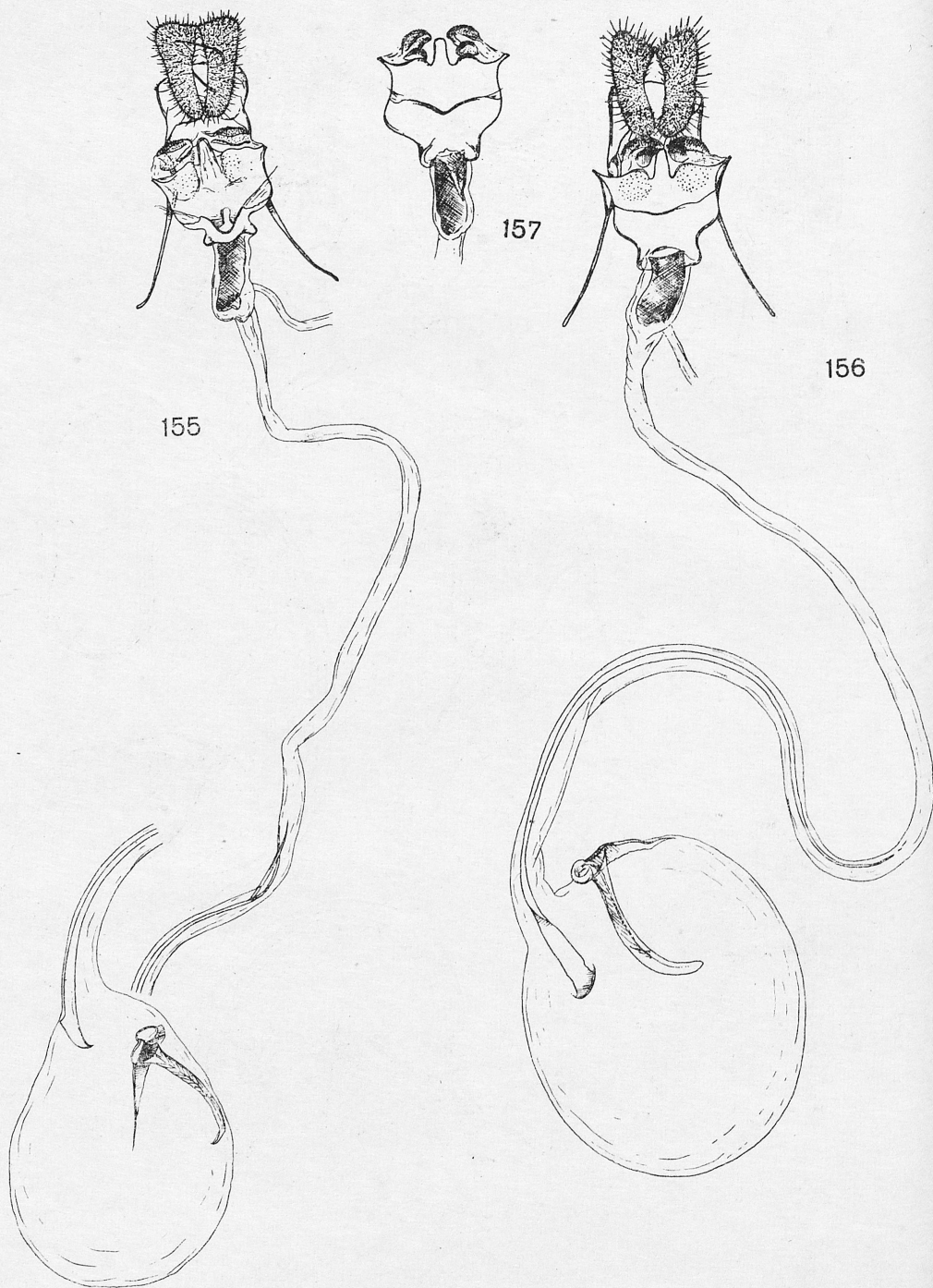
Figs. 139—146. Male genitalia of *Archips* HBN.: 139 — *A. griseus* (ROB.), „Sta. Study Insects, Tuxedo, N. Y., 5. VII. 1925”, G. Sl. 21416, 140 — aedeagus of same specimen, 141 — *A. negundanus* (DYAR), „Aweme, Man., N. CRIDDLE, 11. VII. 1923; Bred from *Acer negundo*”, G. Sl. 21403, 142 — aedeagus of same specimen, 143 — *A. semifervans* (WALK.), „Mountain L., Va., 9. VIII, 1938, L. J. & M. J. MILNE, 144 — aedeagus of same specimen, 145 — *A. purpuranus* (CLEM.), „Meach Lake, Que., 28. VI. 1941, G. A. HOBBS”, G. Sl. 21411, 146 — aedeagus of same specimen



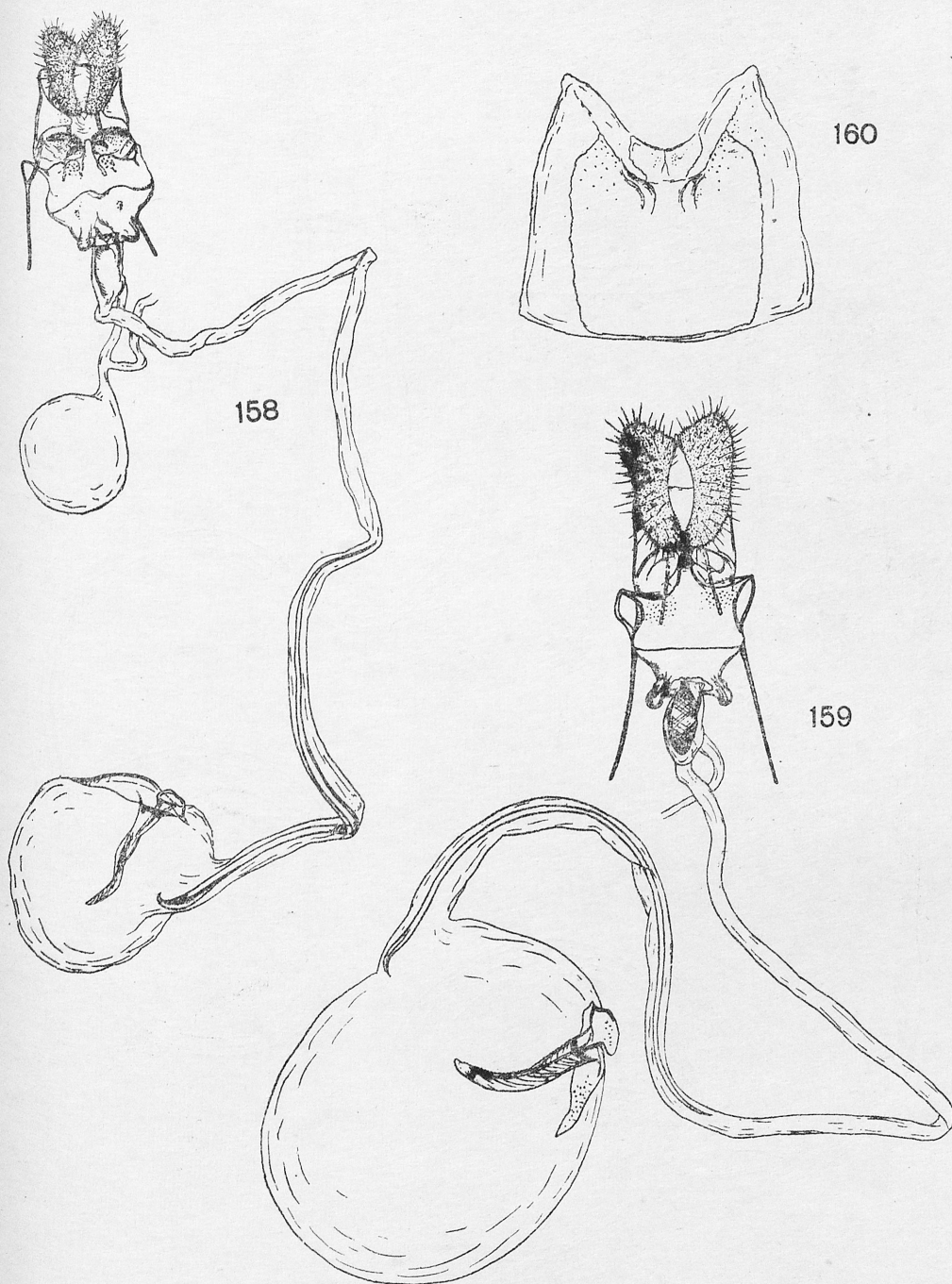
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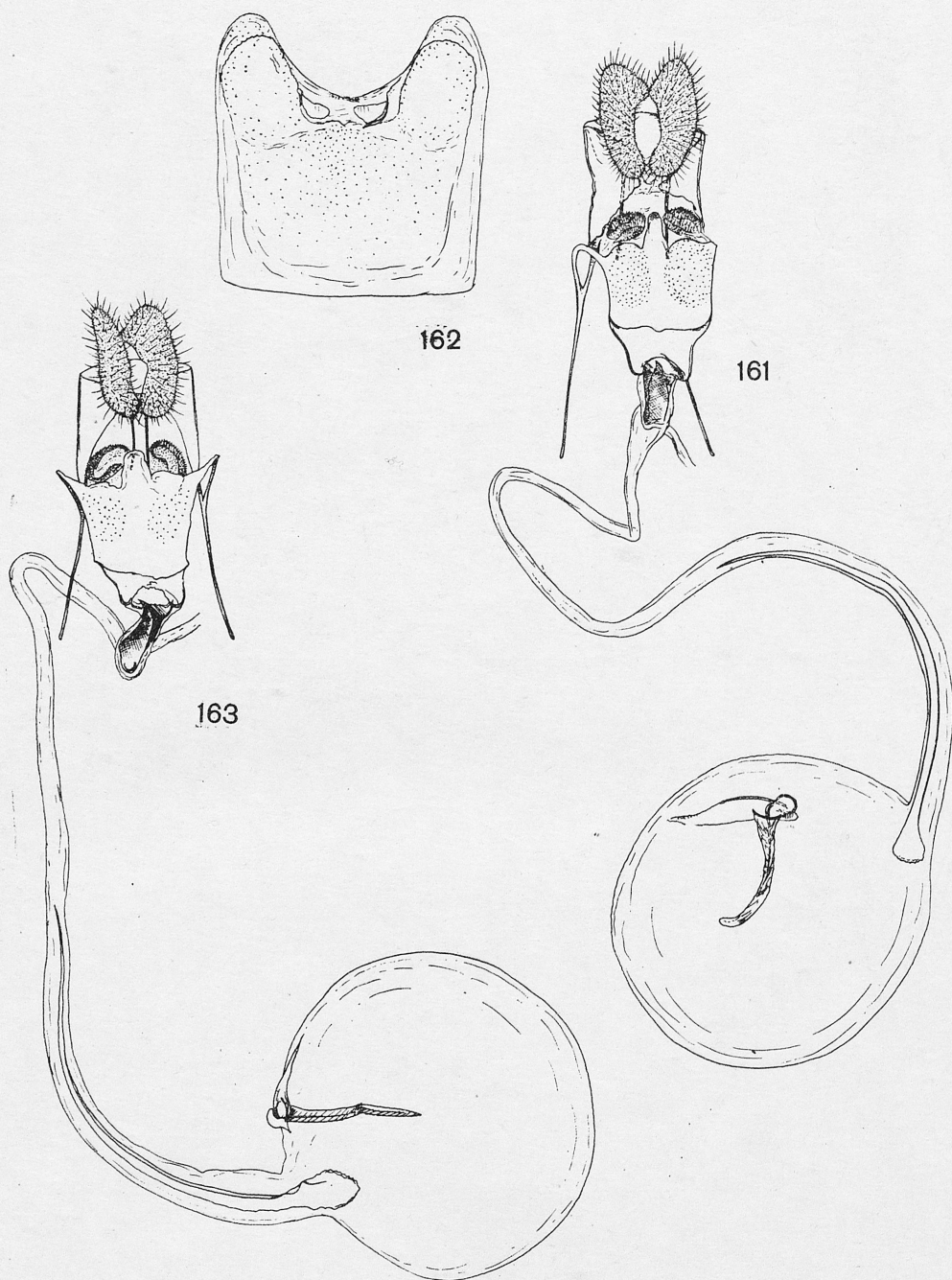
Figs. 151—154. Female genitalia of *Archips* HBN.: 151 — *A. arcanus* sp. nov., paratype, „West Tien-mu-shan, Prov. Chekiang, 21. VI. 1932, H. HÖNE”, G. Sl. 20664, 152 — *A. paredreus* (MEYR.), „(Near Wushe), Nantou-Hsien, Taiwan (1100 m), July 27th 1974, coll. Y. SHIBATA”, G. Sl. 12807, 153 — *A. capsigeranus* (KENN.), „Kasugayama, 20. VI. 1968, T. YASUDA”, G. Sl. 12653, 154 — eighth sternite of same specimen



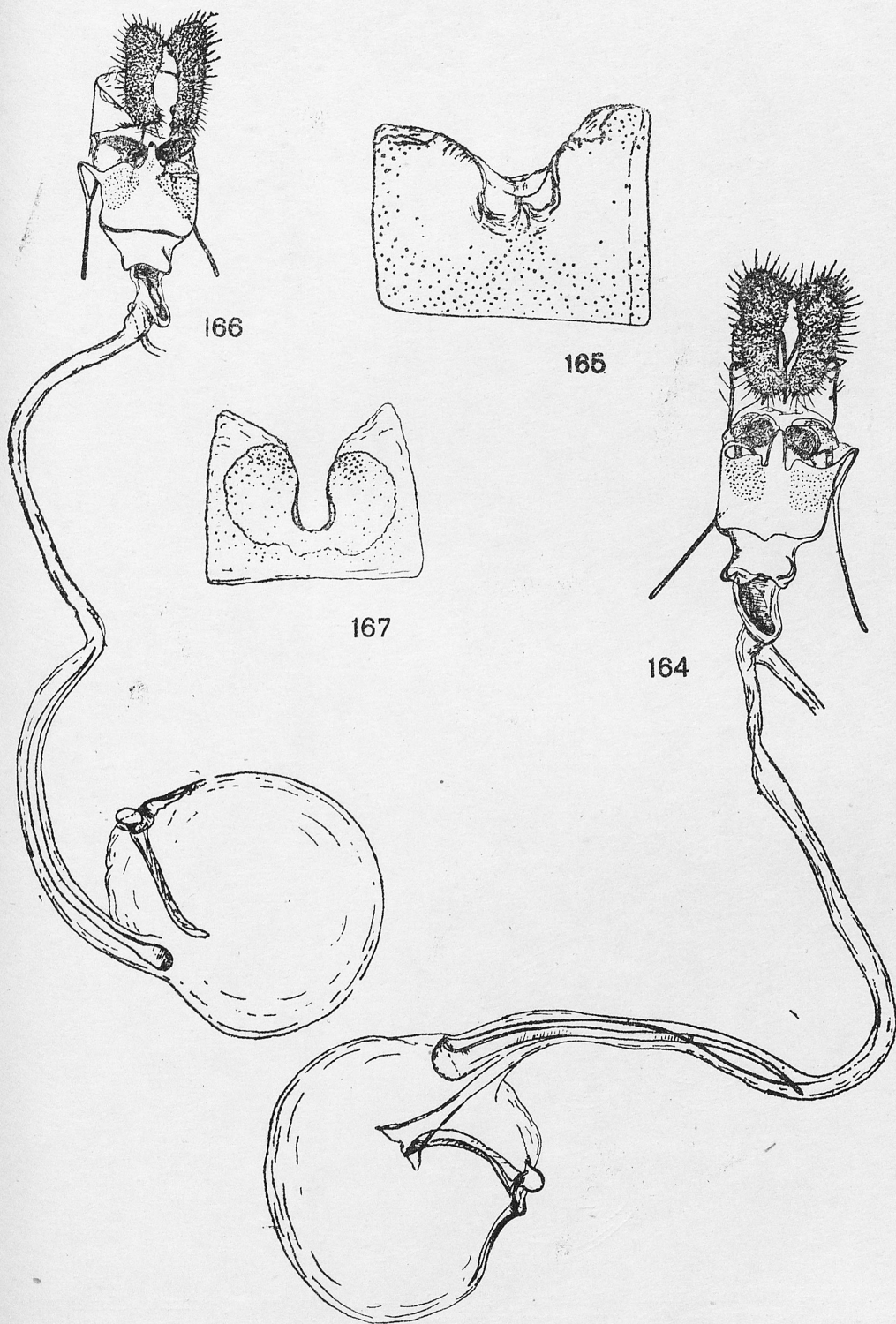
Figs. 155—157. Female genitalia of *Archips* HBN.: 155 — *A. alcmaeonis* (MEYR.), lectotype, 156 — *A. asiaticus* (WALS.), Korea, Hiesan, prov. Youngkang-do, 13. IX. 71, RAZOWSKI, G. Sl. 12664, 157 — same species, sterigma and antrum, „Schanghai (China), Provinz Kiangsu, 4. IX. 1942, H. HÖNE”, G. Sl. 20626



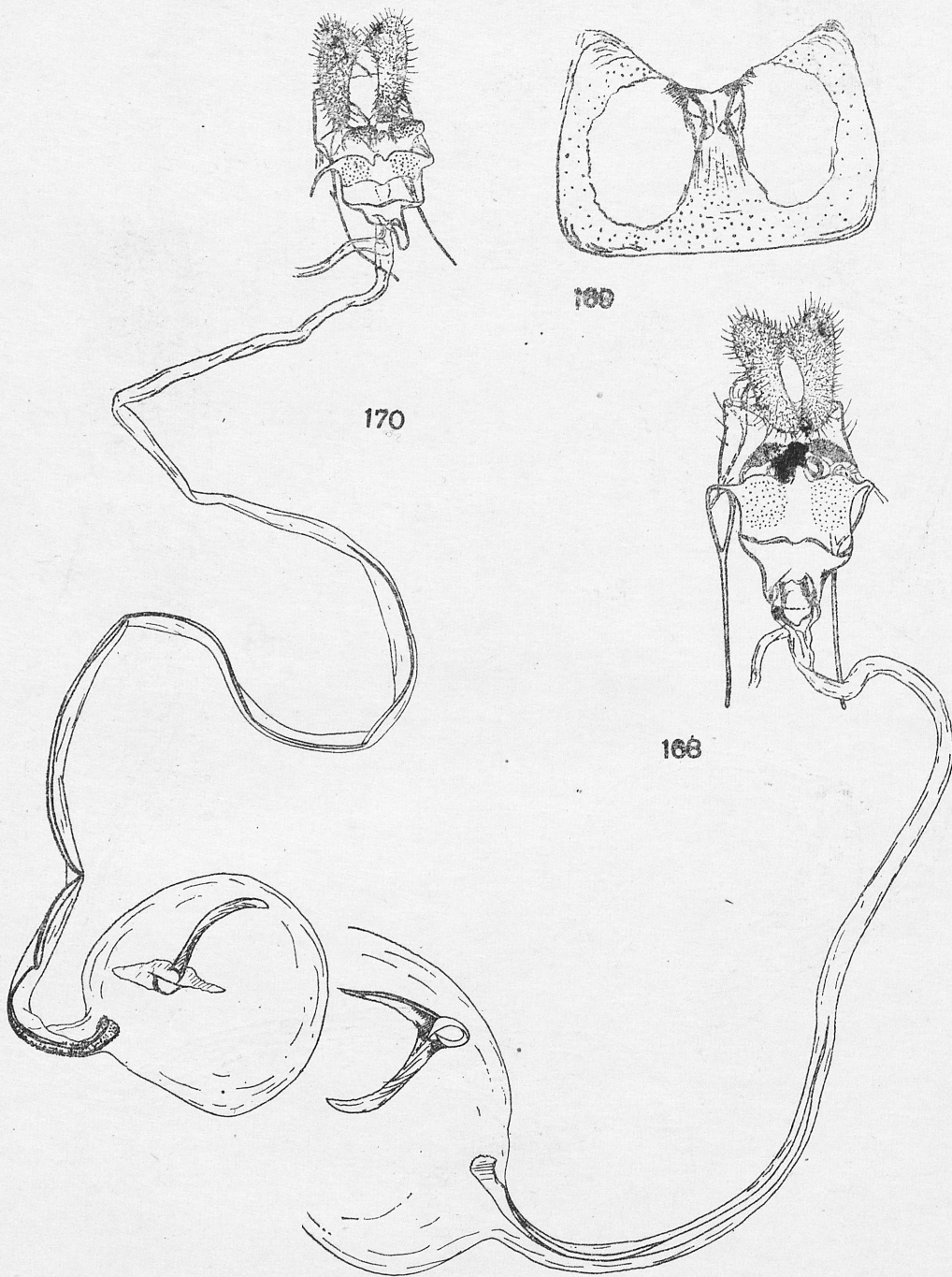
Figs. 158—160. Female genitalia of *Archips* HBN.: 158 — *A. asiaticus* (WALS.), „Zo-cé, Chine”, G. Sl. 10413, 159 — *A. audax* sp. nov., paratype, „Japonia: Honshyu, Hoshino, 400 m, Nara Pref., 8. VI. 1970, Józef RAZOWSKI leg.”, G. Sl. 12674, 160 — eighth sternite of same specimen



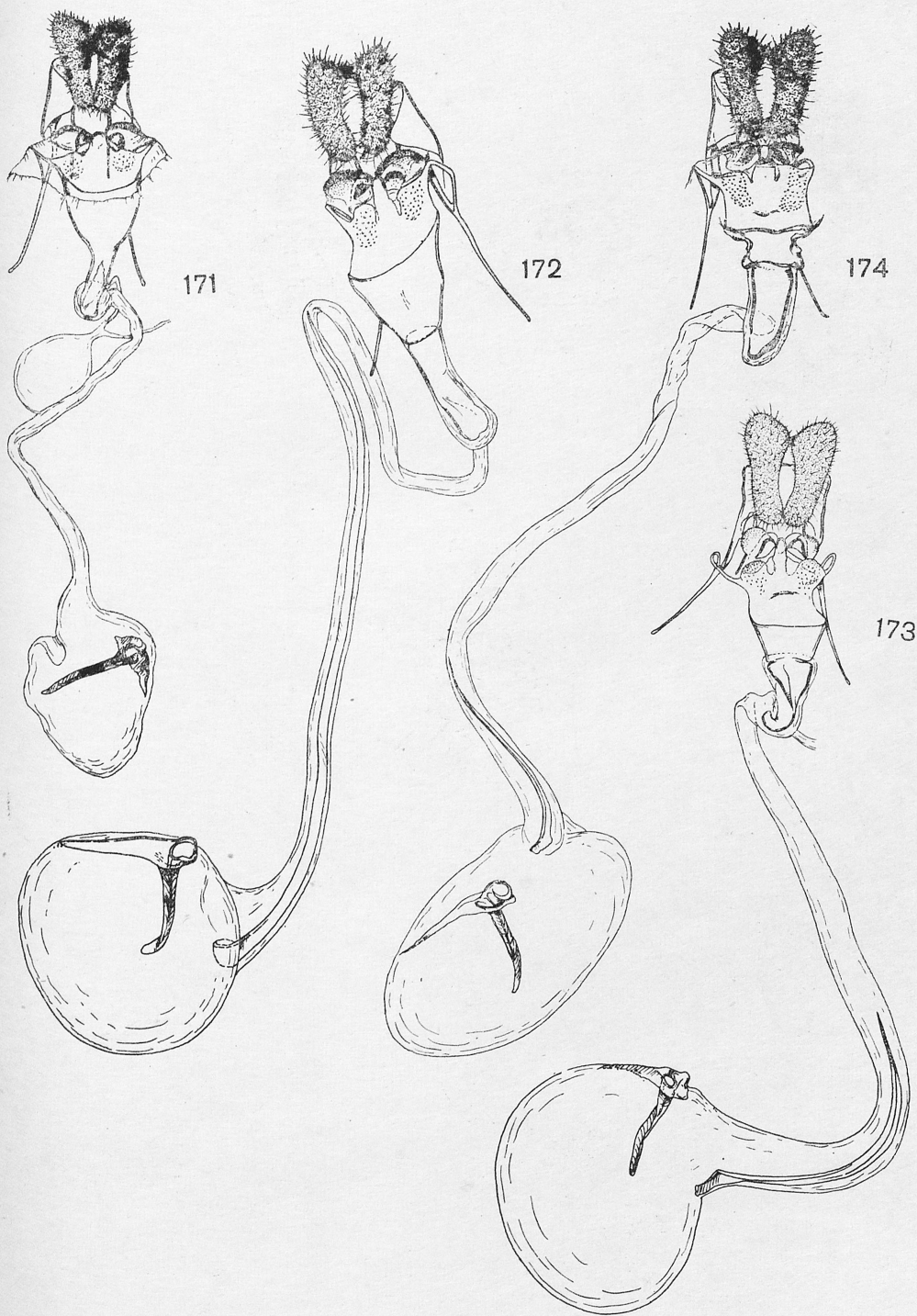
Figs. 161—163. Female genitalia of *Archips* HBN.: 161 — *A. tharsaleopus tharsaleopus* (MEYR.), „West Tien-mu-shan, Prov. Chekiang, 29. VI. 1932, H. HÖNE”, G. Sl. 20673, 162 — eighth sternite of same specimen, 163 — *A. tharsaleopus yunnanus* ssp. nov., paratype, „Li-kiang (China), Provinz Nord-Yunnan, 29. VII. 1935, H. HÖNE”, G. Sl. 20637



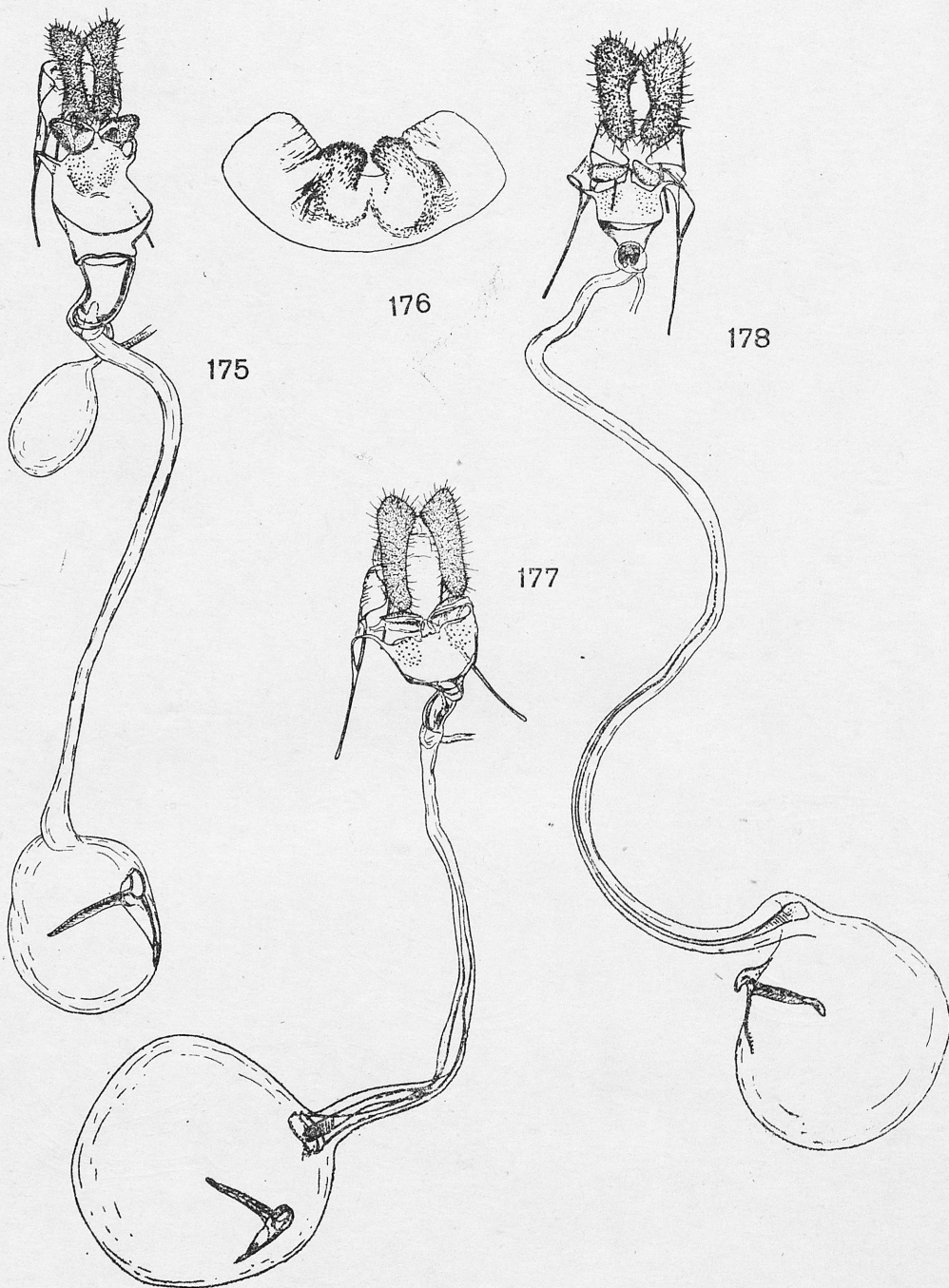
Figs. 164—167. Female genitalia of *Archips* HBN.: 164 — *A. ingentanus* (CHR.), „Japan, Honsyu, Sizuoka, Hatanagi, 19—21. VII. 1969, S. MORIUTI”, G. Sl. 12692, 165 — eighth sternite of same specimen, 166 — *A. enodis* sp. nov., paratype, „West Tien-mu-shan, Prov. Chekiang, 31. VII. 1932, H. HÖNE”, G. Sl. 20670, 167 — eighth sternite of same specimen



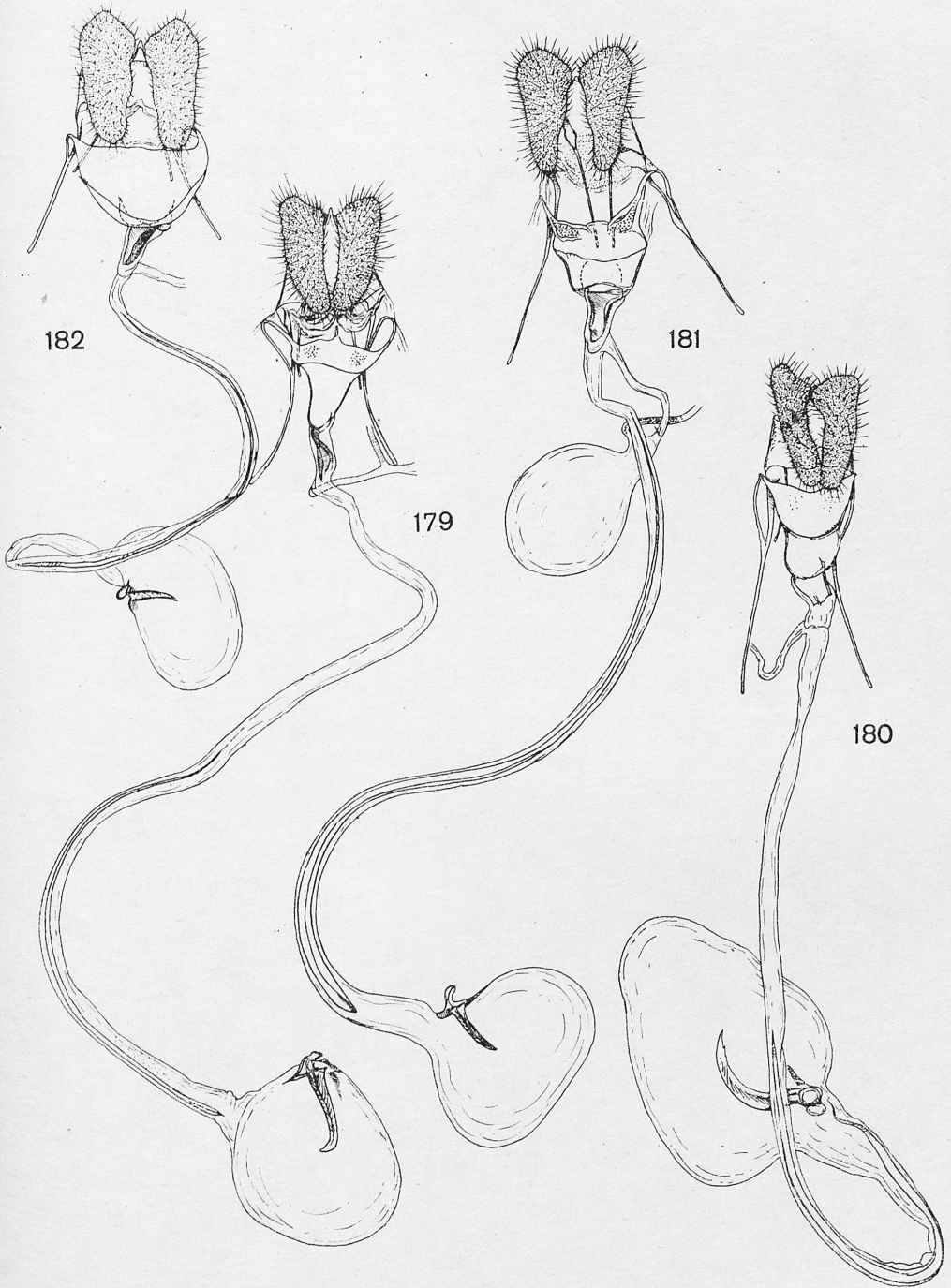
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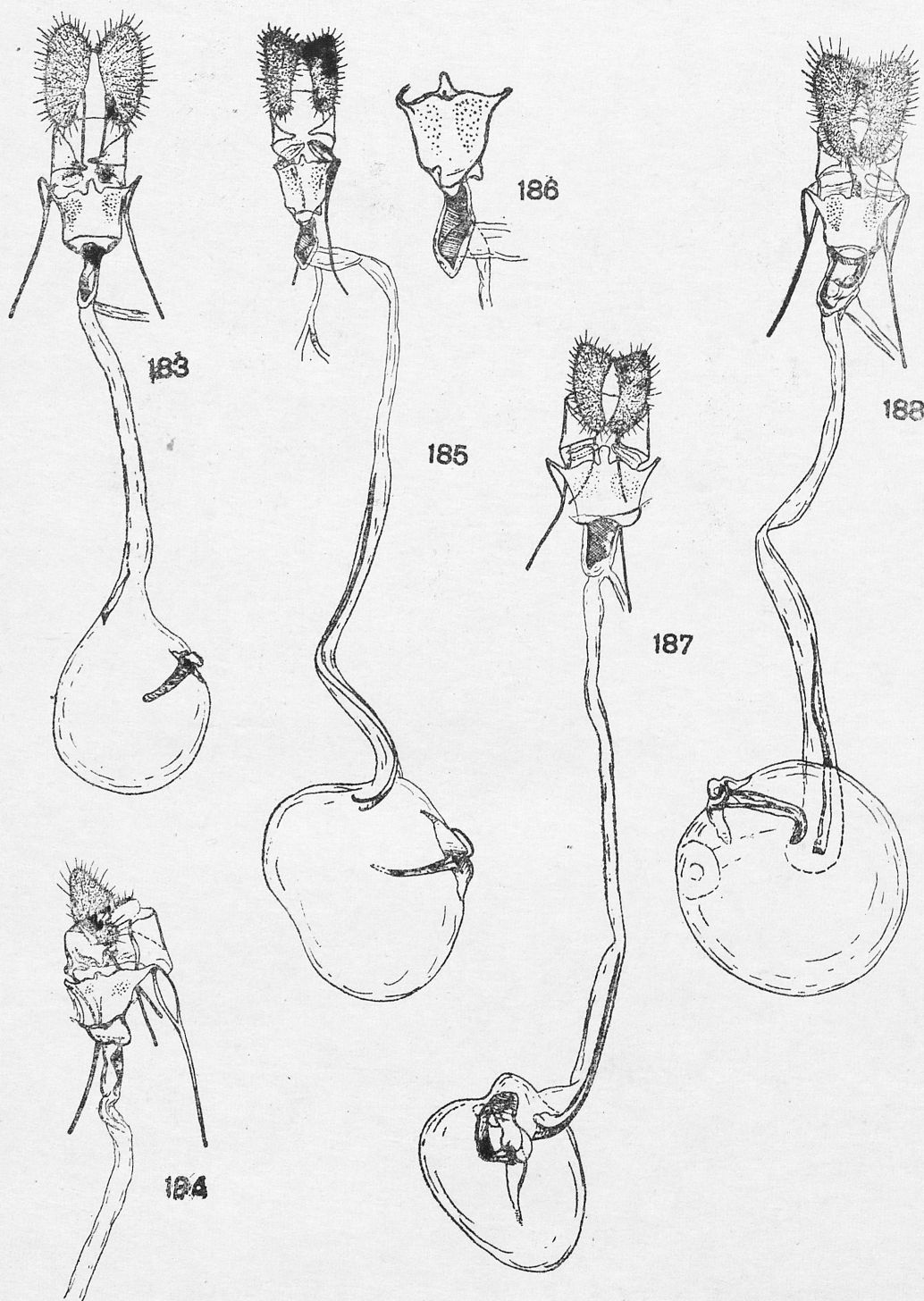
Figs. 171—174. Female genitalia of *Archips* HBN.: 171 — *A. oporanus* (L.), „Warszawa, 3. IX. 1958”, G. Sl. 12627, 172 — *A. decretanus* (TREIT.), „Hamburg, 11. VII. 1887, *Mirica gale*, SBR.”, G. Sl. 12632, 173 — *A. podanus* (SCOP.), „Stemplew, Z.[iemia] Kaliska, 10. VII. 1923, Coll. Hr. S. TOLLA”, G. Sl. 12631, 174 — *A. breviplicanus* (WALS.), „Manchuria, Hsiaoling (Prov. Kirin), 29. VIII. 1939”, G. Sl. 12639



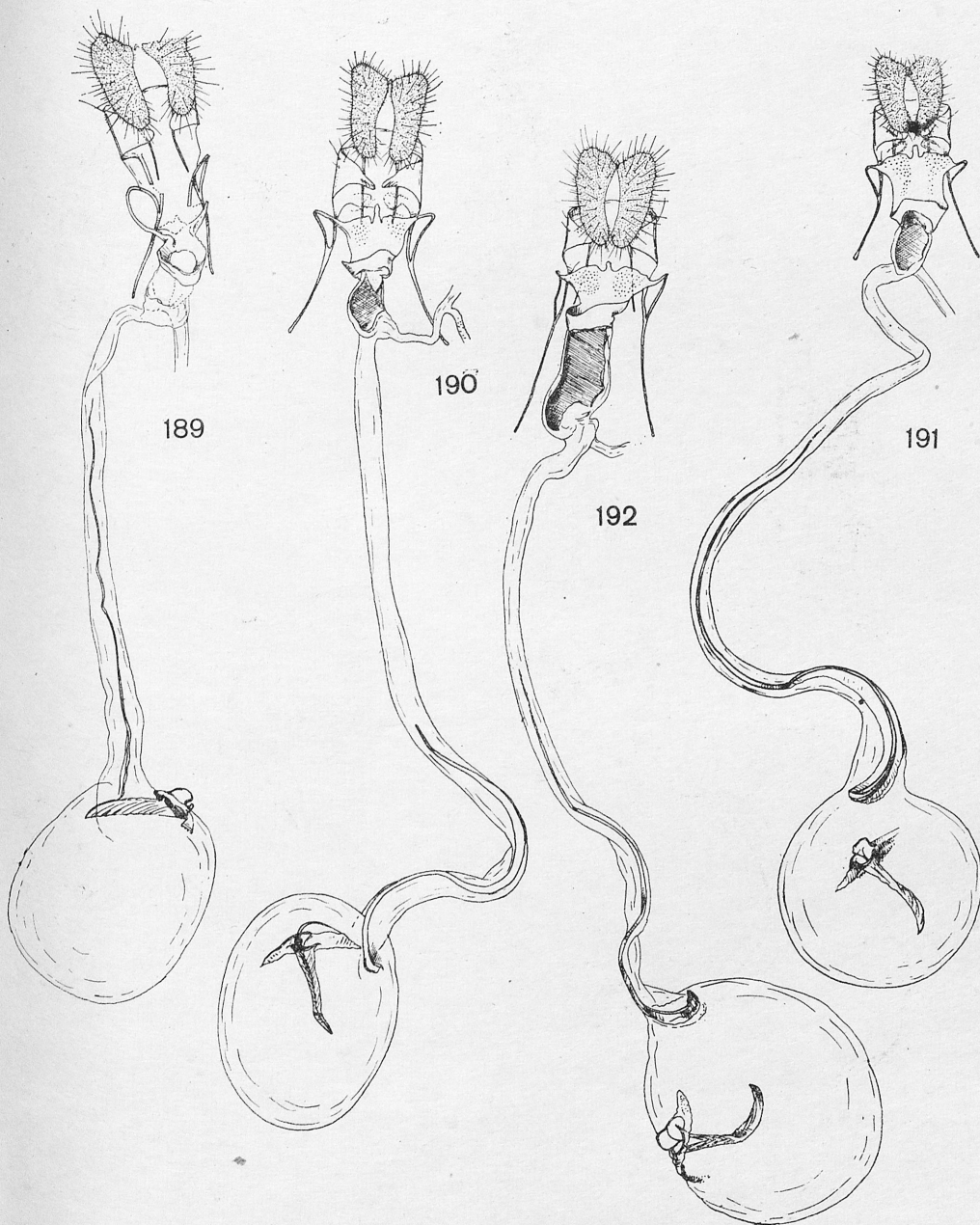
Figs. 175—178. Female genitalia of *Archips* HBN.: 175 — *A. semistructus* (MEYR.), „Japan, Honsyu, Izumi: Daisentyoo (Sakai), 26. VI. 1955, MORIUTI”, G. Sl. 12644, 176 — eighth sternite of same specimen, 177 — *A. insulanus* KAW., „Amami, Nase, 30. IV. 1966, A. MUTUURA”, G. Sl. 12643, 178 — *A. strojny* sp. nov., paratype, „Hoengshan prov. Hunan, 4. IV. 1933, HÖNE”, G. Sl. 20688



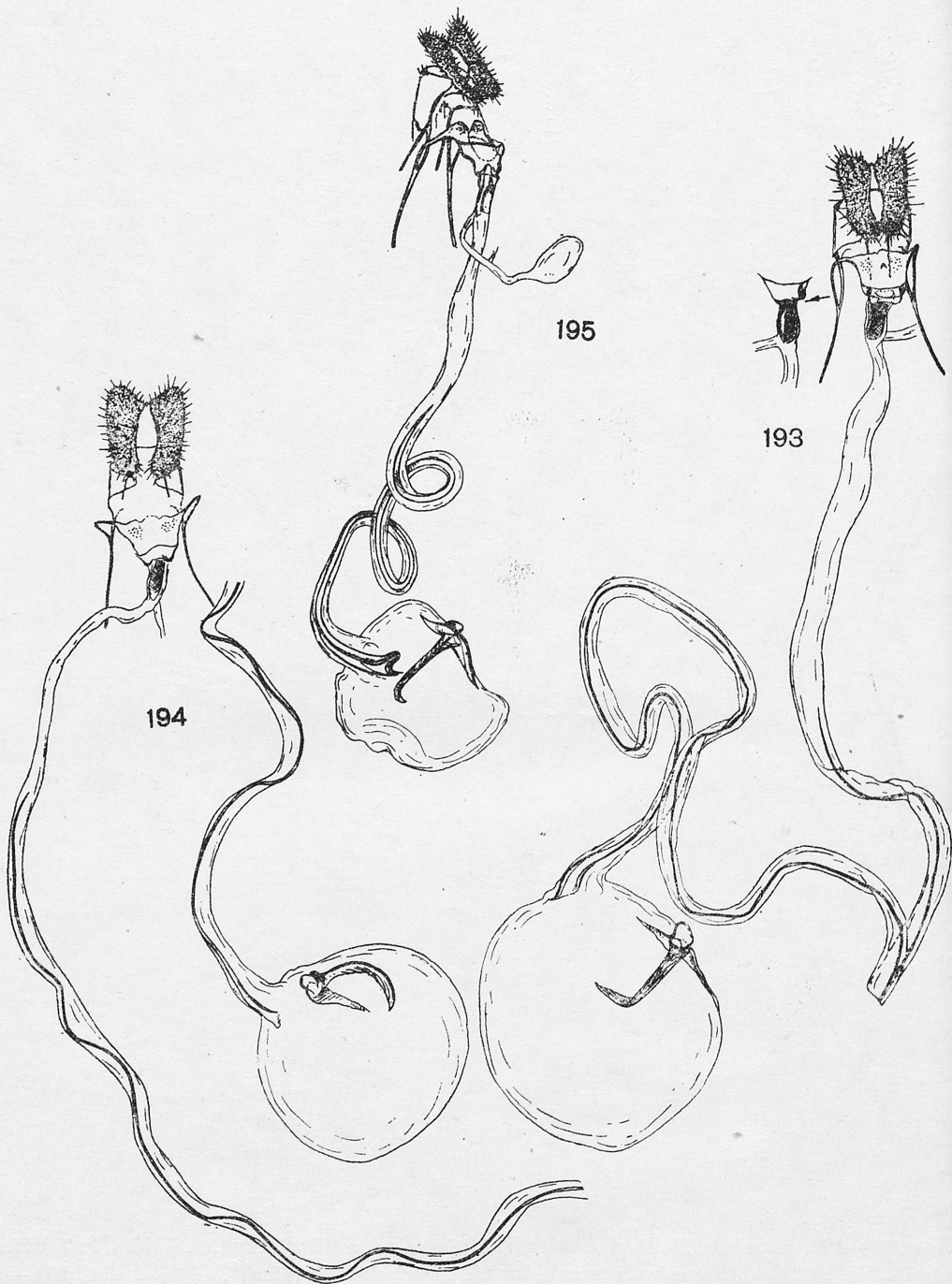
Figs. 179—182. Female genitalia of *Archips* HBN.: 179 — *A. peratratus* YAS., paratype, „Japan, Honsyu, Izumi: Makinoosan, 23. IV. 1960, T. SAITO”, G. Sl.: 12661, 180 — *A. formosanus* (KAW.), allotype, 181 — *A. pulcher* (BUTL.), „[Japan, Tokyo, Asakawa], Bred... 16. VI. 1958, T. KODAMA”, G. Sl. 12689, 182 — *A. abiephagus* YAS., paratype, „Japan, Honshyu, Sinano, Mauza, 27. VII. 58, T. YASUDA”, G. Sl. 12686



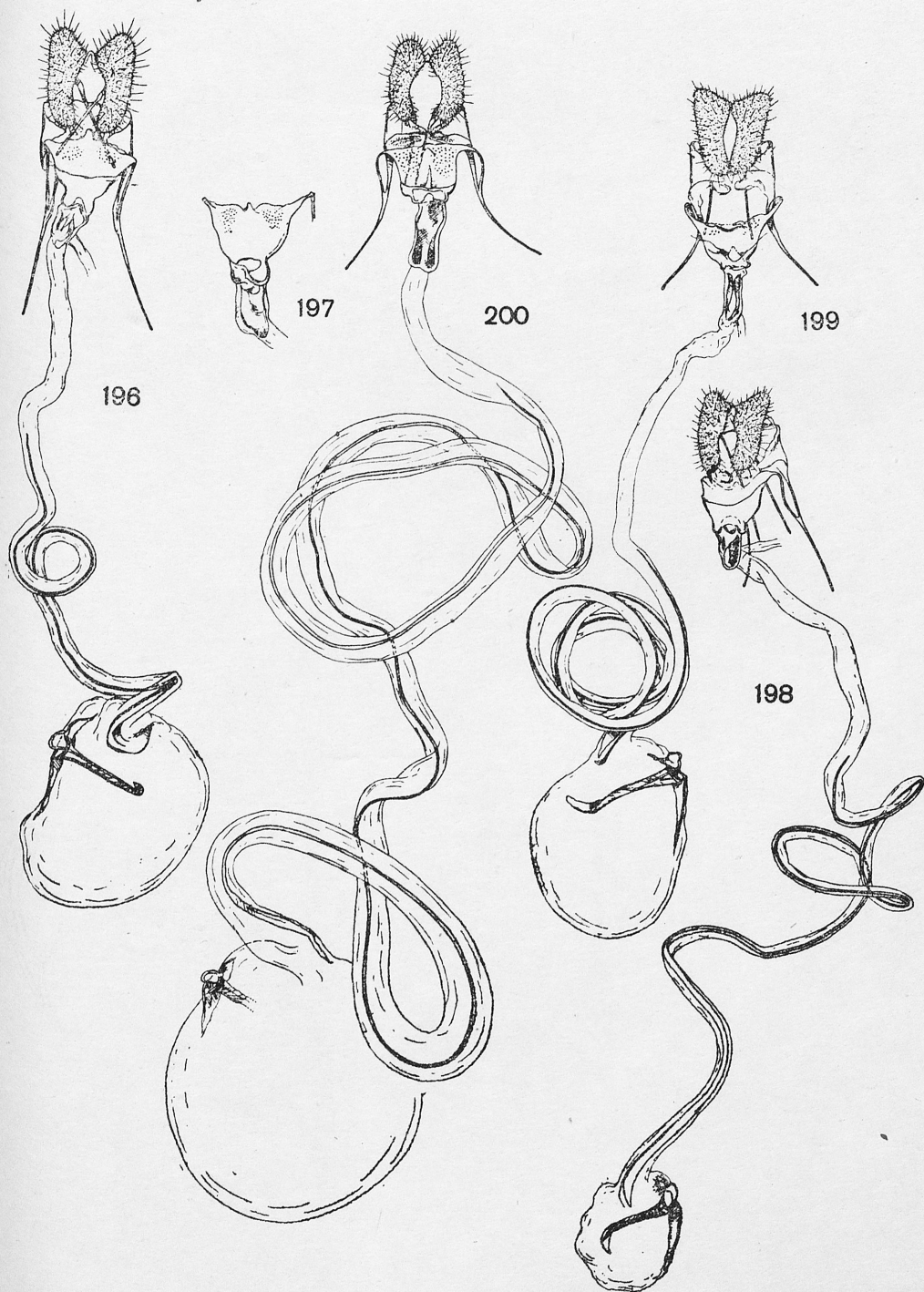
Figs. 183—188. Female genitalia of *Archips* HBN.: 183 — *A. inanis* sp. nov., holotype, 184 — *A. atrolucens* DIAK., „Buintenzorg, VIII. 1919, W. Roepke”, G. Sl. 64 [DIAKONOFF], 185 — *A. euryplinthus* (MEYR.), holotype, 186 — sterigma and antrum of same specimen, 187 — *A. subsidiarius* (MEYR.), „Kashmir, 5200 ft., Shrinagar, 19. VI. 1923, FLETCHER coll.”, G. Sl. 19899 [BM], 188 — same species, ” 15. VI. 1965, Kabul, 1900 m, KASY & VARTIAN



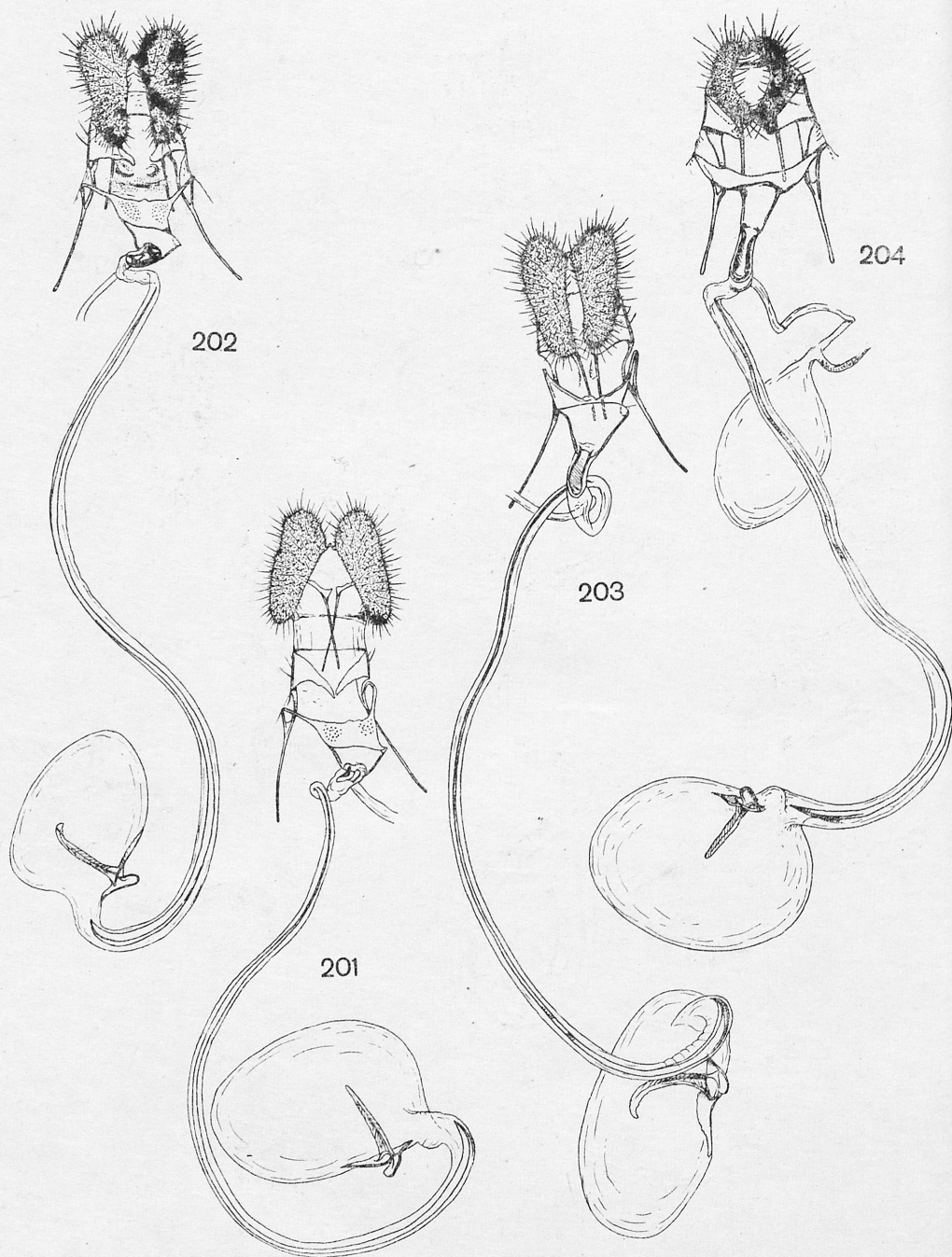
Figs. 189—192. Female genitalia of *Archips* HBN.: 189 — *A. solidus* (MEYR.), „Sikkim, P. 7. VII. 89; 18. VI.”, 190 — *A. termias termias* (MEYR.), „Darjeel.[ing], MÖLL.”, G. Sl. 10294, 191 — *A. compitalis* sp. nov., paratype, „West Tien-mu-shan, Prov. Chekiang, 30. IX. 1932, H. HÖNE”, G. Sl. 20661, 192 — *A. limatus limatus* sp. & ssp. nov., paratype, „Tapaishan im Tsinling, Sued-Shensi (China), 25. VI. 1935, H. HÖNE”, G. Sl. 20655



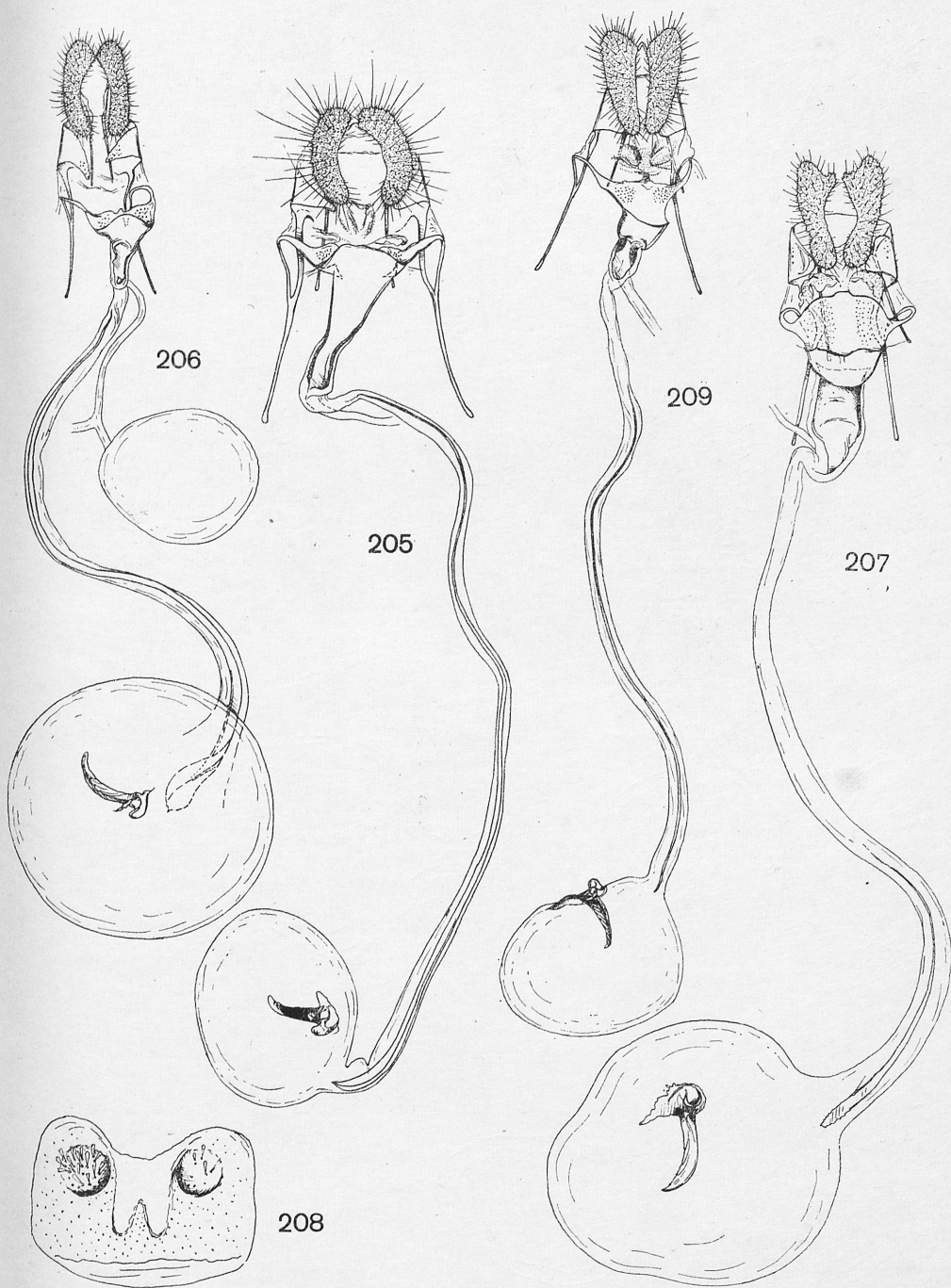
Figs. 193—195. Female genitalia of *Archips* HBN.: 193 — *A. dispilanus* (WALK.), „Sri Lanka, Hakgala, 17. II. 1974, B. GUSTAFSSON”, G. Sl. 12805, 194 — same species, paralectotype of *A. mimicus* WALS., G. Sl. 7861 [BM], 195 — *A. pensilis* (MEYR.), holotype



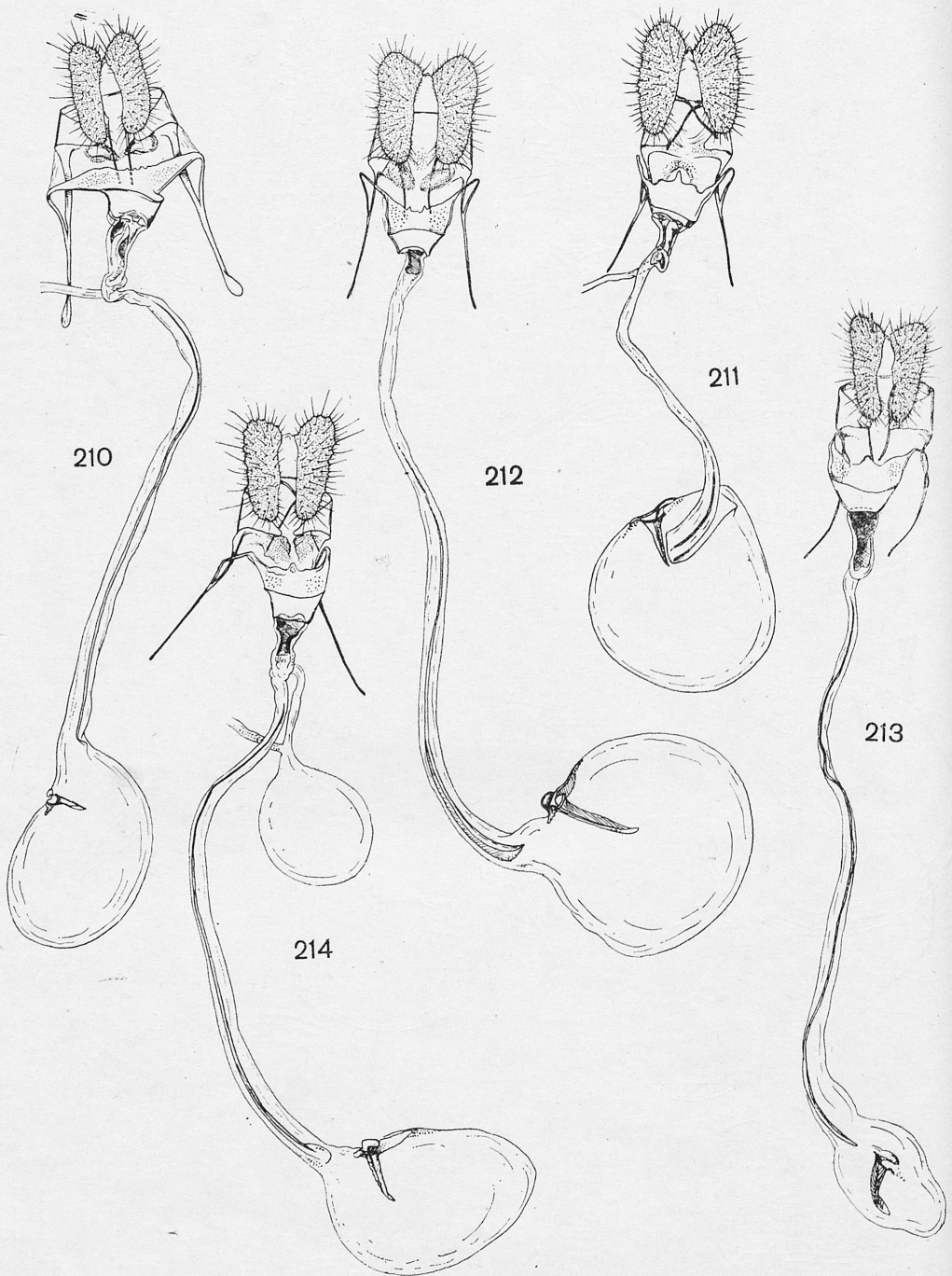
Figs. 196—200. Female genitalia of *Archips* HBN.: 196 — *A. machlopi* (Meyr.), „Tjibodas, Java occ., Gedeh, 1890, ♀”, G. Sl. 114 [DIAKONOFF], 197 — sterigma and antrum of same species lectotype, 198 — *A. micaceanus* (WALK.), holotype, 199 — same species, allotype of *A. micaceanus* (WALK.), holotype, 199 — same species, allotype of *Cacoecia eucroca* DIAK., „China, Canton, 28. X. 56, on *Citrus*, leg. S. K. LIU, Nr. 21 ♀”, G. Sl. 2398 [RNH], 200 — *A. seminubilus* (Meyr.), allotype, Tonkin



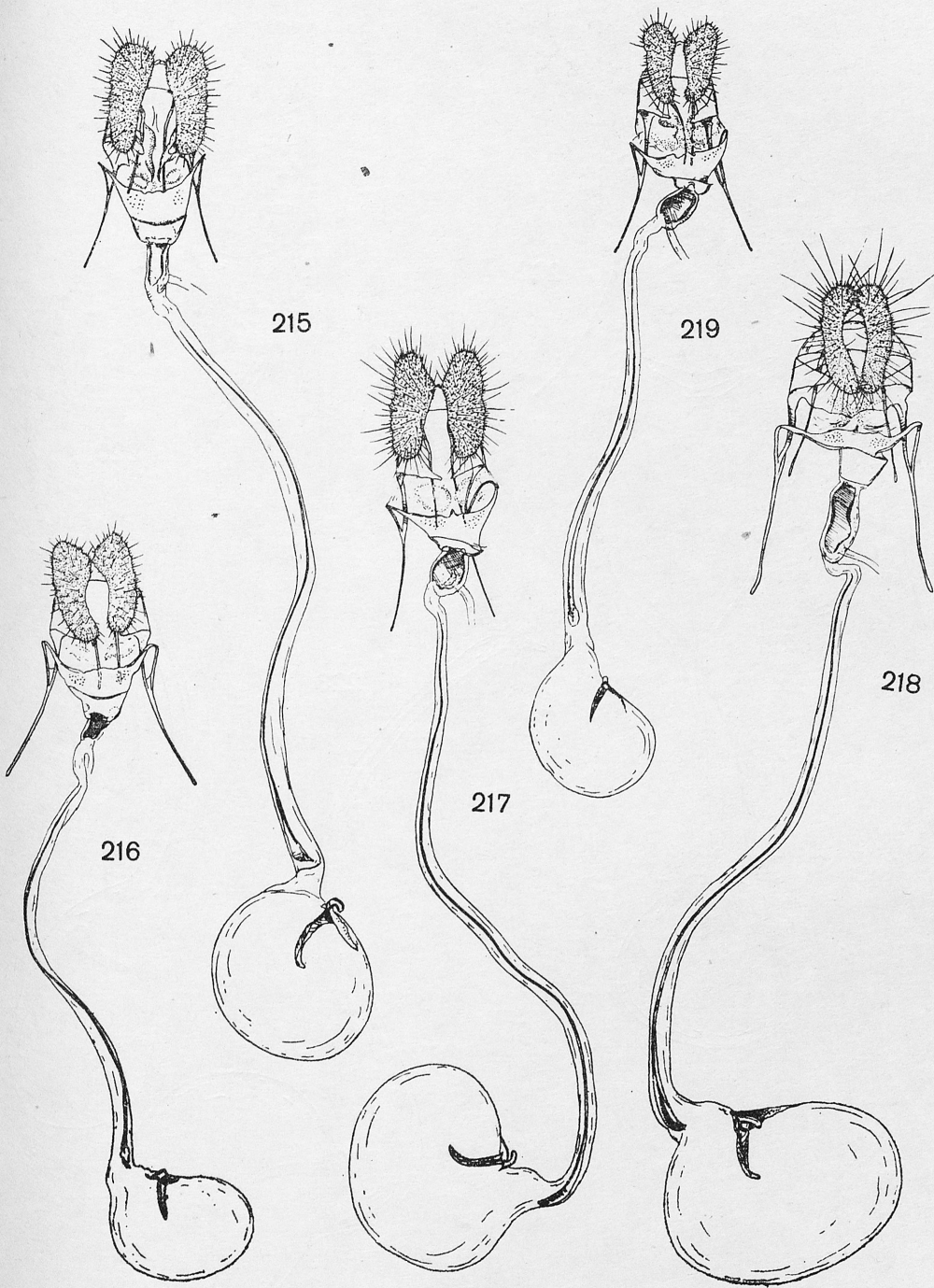
Figs. 201—204. Female genitalia of *Archips* HBN.: 201 — *A. issikii* KOD., „Japan, Nara, Kasugayama, T. KODAMA, 26. VI. 1958”, G. Sl. 12649, 202 — *A. fumosus* KOD., „Asahigawa, Hokkaido, S. SUZUKI, 26. VI. 1965 Coll., Papat. 8. VI., Em. 9. VIII. Host *Abies sachalinensis* MASTERS”, G. Sl. 12672, 203 — *A. viola* FALK., „Japan, Honsyu, Kii: Natsan, 31. VI. 1957”, G. Sl. 12645, 204 — *A. crataeganus* (HBN.), „Mülhousen (Elsass), 13. VI. 1942, Ch. FISCHER leg.”, G. Sl. 12634



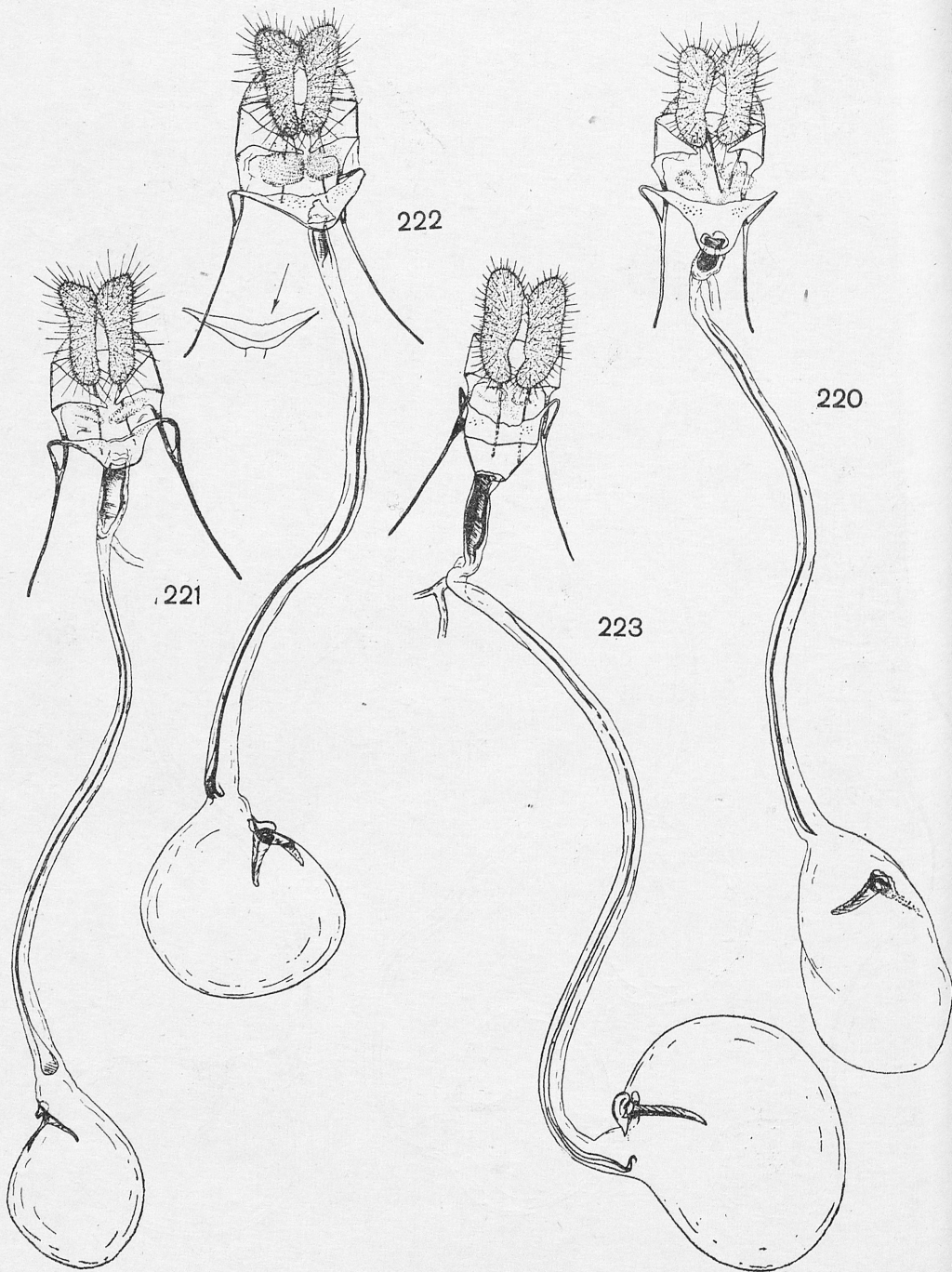
Figs. 205—209. Female genitalia of *Archips* HBN.: 205 — *A. endoi* YAS., „Japan - Akita, Yaata (pupa), 14. VI. 1955 leaves rolled of *Pyrus simonii*; 20. VI. 1955 (emergence)”, G. Sl. 12647, 206 — *A. xylosteanus* (L.), „Poznań - Dębina, 7. VII. 35, M. R. LEWANDOWSKI”, G. Sl. 12638, 207 — *A. inopinatus* (KENN.), „Manchuria, Hsiaoling (Prov. Kirin), 19. VIII. 1939”, G. Sl. 12606, 208 — eighth sternite of same specimen, 209 — *A. nigricaudanus* (WALS.), „Japan, Honsyu, Wakayama Katuura, T. FODAMA”, G. Sl. 12659



Figs. 210—214. Female genitalia of *Archips* HBN.: 210 — *A. fuscocupreanus* WALS., „Japan, Aomori, Hirosaki (larva). 12. VI. 1955. Leaves rolled of *Malus pumila*, 22. VI. 1955 (Emergence)”, G. Sl. 12663, 211 — *A. rosanus* (L.), „Jamy p[owiat] Grudziądz, 26. VI. 1931, S. TOLL leg.”, G. Sl. 12666, 212 — *A. rudy* sp. nov., holotype, 213 — *A. infumatanus* (ZELL.), „St. Louis, RILEY, [18]71; *Infumatana* Z.”, G. Sl. 7866 [BM], 214 — *A. fervidanus* (CLEM.), „Larva on oak, Chelsea, Que, 20. VII. 08, A. GIBSON”, G. Sl. 21423



Figs. 215—219. Female genitalia of *Archips* HBN.: 215 — *A. cerasivoranus* (FITCH), „Norway Bay, Que, 5. VII. 1937, Ed. G. LESTER”, G. Sl. 21423, 216 — *A. rileyanus* (GROTE), „Iowa”, G. Sl. 19805 [BM], 217 — *A. argyrosipilus* (WALK.), „Norfolk, Ont., July 12, 1932, J. A. POWELL”, G. Sl. 21421, 218 — *A. magnolianus* (FERN.), „C. U. Exp. No. 292 Sub. 22. June”, G. Sl. 21415, 219 — *A. georgianus* (WALK.), „Emerged New Lisbon, N. J., July 4, 1945, E. P. DARLINGTON”, G. Sl. 21419



Figs. 220—223. Female genitalia of *Archips* HBN.: 220 — *A. griseus* (ROB.), „Sta Study Insects Tuxedo, N. Y., 9—VII. 1928”, G. Sl. 21417, 221 — *A. negundanus* (DYAR), „Aveme, Man., A. CRIDDLE, 3. VIII. 1924; *Acer negundo*”, G. Sl. 21404, 222 — *A. semiferranus* (WALK.), „Sta Study Insects Tuxedo, N. Y., 9. VII. 1928”, G. Sl. 21402, 223 — *A. purpuranus* (CLEM.), „Montreal, P. Q., 11. VII. 38, A. C. SHEPPARD”, G. Sl. 21412

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STRESZCZENIE

Praca stanowi rewizję rodzaju *Archips* HÜBNER. W części ogólnej omówiono morfologię i bionomię wszystkich stadiów oraz uzasadniono przyjęty system i próbę wyjaśnienia filogenezy poszczególnych grup gatunków. W części systematycznej scharakteryzowano 75 gatunków, a 10 gatunków i 2 podgatunki opisano jako nowe. Szereg gatunków zostało zsynonimizowanych podobnie jak rodzaj *Archippus* FREEMAN i podrodzaj *Pararchips* KUZNETSOV.

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