POLSKA AKADEMIA NAUK
INSTYTUT ZOOLOGICZNY, ODDZIAŁ W KRAKOWIE

ACTA ZOOLOGICA CRACOVIENSIA

Tom VI Kraków, 15 VIII 1961 Nr 9

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Studies on the *Crambidae (Lepidoptera)*. Part XXXII. Revision of the *Crambus argyrophorus* BUTL. — group

Materiały do znajomości *Crambidae (Lepidoptera)*. Część XXXII. Rewizja grupy *Crambus argyrophorus* BUTL.

Материалы к познанию *Crambidae (Lepidoptera)*. Част XXXII. Ревизия групы *Crambus argyrophorus* BUTL.

Crambus argyrophorus BUTL. and allies have hitherto been a rather little known group among *Crambidae*. This group comprises several East Palaearctic and Oriental species, the relationships of which have hitherto been rather obscurely understood. The recent paper of OKANO (1960) has thrown some light on the group under consideration, however, OKANO treats only the Japanese species. He described in his paper two new species close to *C. argyrophorus* BUTL. and *C. virgatellus* WLM., namely, *C. pseudargyrophorus* OKANO and *C. kazukaiensis* OKANO. In addition, OKANO gave a diagnosis of *C. argyrophorus* BULT. and *C. virgatellus* WLM. and figured their genitalia.

C. argyrophorus BUTL. has hitherto been considered to be a species distributed in Japan, China, Korea and India. However, in spite of a study of a series of specimens from China, Burma and India, determined as *Crambus argyrophorus* BUTL., I have not found any example of this species. The true *C. argyrophorus* BUTL. occurs only in Japan. The specimens from China, India belong to apparently new species, which are described below. Such a confusion of several species was due to the striking external similarity that is observed in some species of the group under consideration. In fact, some species appear to be practically indistinguishable on their facies from each other, being quite easily separable by the genitalia of both sexes. On the other hand, some other spe-

cies which are perfectly distinct on their facies, have their genitalia very similar to each other. So far, I have found 13 species of this group, which seem to be rather close to each other. Of these, five species are described as new to science. However, our knowledge of the group discussed is still incomplete and further investigation is needed.

The external characters of the species of the *C. argyrophorus* BUTL.-group are, in most instances, typical of the genus *Crambus* F. s. str. In the forewing, there is an angled subterminal fascia, which consists of two lines; of these the outer line is usually brown or yellowish, and the inner line is steely, silvery or whitish. The apical area shows a typical pattern consisting of a white triangle filled with brown, or yellowish-brown. The silvery, longitudinal stripe is always present. It is prolonged by more or less distinct white markings, which, in some instances, are confluent with each other and reach up to the termen. The silvery stripe is, in most instances, distinctly remote from the costal margin, but in a few species it touches the costal margin. The inner edge of the stripe forms a more or less well defined tooth. Ocelli fully developed. Frenulum of the female double. R_1 in the forewing runs freely. Face barely protruding forward beyond the eye, broadly rounded, white, or whitish, tinged with yellowish or beige. Labial palpi about three and one half the length of the diameter of the eye, brown or ochreous-brown at sides, whitened at base and from above. Vertex white, or whitish. Patagia brown at sides and white centrally. Tegulae and thorax concolorous with ground colour of forewing, which is brown, ochreous-brown, or yellowish.

The male genitalia are characterized by very slender uncus and gnathos, a peculiar bridge-shaped fultura superior; the vinculum is well developed, triangular; the juxta-plate is long, bilobed; the valva is long, provided with more or less distinct, dentate folds; the aedeagus is slender, with one slender cornutus, and, in many instances, with several additional, small cornuti with circular bases; in many species, the terminal portion of the aedeagus is lightly sclerotized with two heavily sclerotized, long stripes, one of which is much longer than the other, and is provided terminally with a single or double, minute tooth.

The female genitalia, in most species, have the ostium pouch heavily sclerotized, bulbose; anterior apophyses lacking. Ductus bursae in most instances looped, with terminal portion heavily sclerotized; its ventral side is more or less inbent and forms a longitudinal ridge, the margins of which are in form of two ribs. This structure, observed in the lateral view, is like a heavily sclerotized stripe. Bursa copulatrix with two proportionately large signa.

In some species, namely, *C. nivellus* (KOLL.), *C. athamas* sp. n., *C. bipartellus* SOUTH and *C. virgatellus* WLM., one can observe gradual changes in the forewing pattern. The subterminal markings show reduction. Thus, in *C. bipartellus* SOUTH, one can detect specimens with the subterminal pattern fully developed, and, in others, the terminal border of the basal silvery stripe and the subterminal line are more or less reduced, and the white subterminal spots

prolonging the basal stripe are confluent with it. In *C. virgatellus* WLM., I have observed only few specimens with the subterminal fascia slightly defined. Most of the specimens of this species shows the forewing divided into white costal part and the brown dorsal part, however, the dorsum is more or less whitened. The complete reduction of the subterminal pattern one can observe in *C. nivellus* (KOLL.), which shows considerable similarity to the preceding species. *C. nivellus* (KOLL.) shows no trace of the subterminal pattern and the dorsum is always bordered with a white, narrow stripe. It arises a question, which species of the group in question is evolutionally more primitive, that whith the pattern fully developed and similar to that in most species of the genus *Crambus* F. s. str., or, that with the pattern practically transformed into three longitudinal stripes, two of which are silvery-white and the third one is brown. Judging by the genitalia, there might be supposed a few evolutionary lines whitin the group under consideration as some its members show their genitalia atypical of the group. Thus, *C. bipartellus* SOUTH has the male genitalia very distinct from those in all other species of the group, but its female genitalia are rather typical of the group. The male and female genitalia in *C. nivellus* (KOLL.) show some specializations lacking in any other species of the group in question, namely, transformed costa and bifurcated tip of the gnathos in the males and two long spines at the base of the ostium pouch in the females. The species with most primitive genitalia is *C. argyrophorus* BUTL., from Japan. Its female genitalia shows quite simple armature, with ductus bursae lightly sclerotized and not looped. The male genitalia of this species show also few specializations (discussion see below). The closest to *C. argyrophorus* BUTL., is *C. coryolanus* sp. n. from India and *C. narcissus* sp. n. from China. These species are strikingly similar in facies to *C. argyrophorus* BUTL., but have their genitalia more specialized. It is noticeable, that two other species which appear very similar externally to *C. argyrophorus* BUTL., have their genitalia highly specialized and quite similar to those in the species very distinct on facies from *C. argyrophorus* BUTL. These are *C. pseudargyrophorus* OKANO and *C. kazukaiensis* OKANO. — Judging by the zoogeographical evidence, *C. nivellus* (KOLL.) seems to be a species younger evolutionally from the remainder of the group. Thus, we may consider the reduction of the pattern of the forewing to be a more recent character. In general, the centre of distribution of the species of the genus *Crambus* F. s. str. seems to be North America. Thus, one can suppose, that the Indian species are proportionately young and came from China. The group in question seems to be very old as no species close to *C. argyrophorus* BUTL., or to other species of its group, has as yet been found in the Nearctic Region. Thus, one can suppose, that *C. argyrophorus* BUTL. - group derived in the East Palaearctic Region from a hypothetical ancestral species, which came from America. However, the group has transformed rather quickly giving a cluster of species very characteristic and quite different among the members of the genus *Crambus* F. s. str.

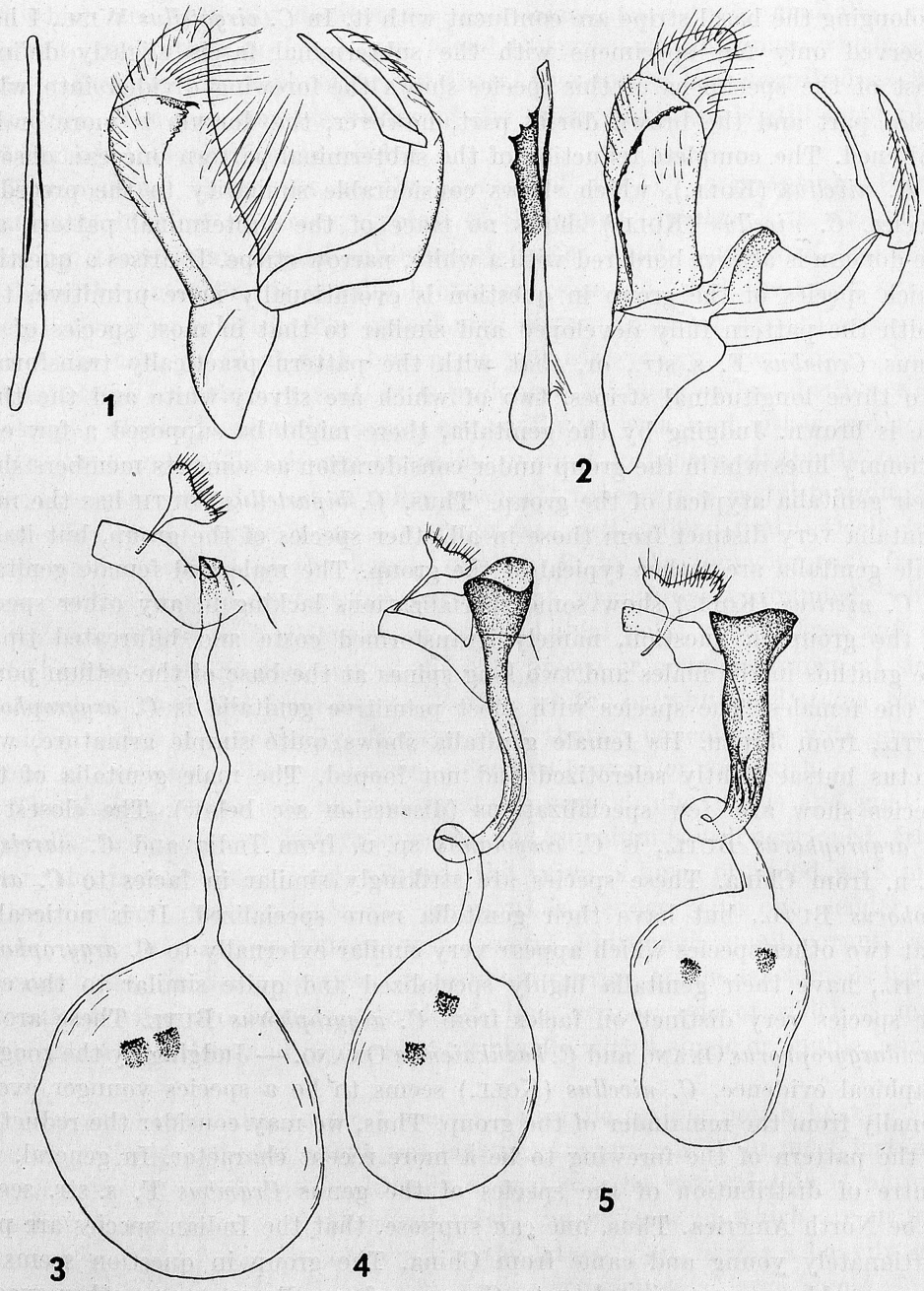


Fig. 1. *Crambus argyrophorus* BUTL. Male genitalia. Japan. GS-497/BŁ.
Fig. 2. *Crambus coryolanus* sp. n. Holotype. Male genitalia. Darjeeling. GS-1031/BŁ.
Fig. 3. *Crambus argyrophorus* BUTL. Female genitalia. Japan. GS-700/BŁ.
Fig. 4. *Crambus coryolanus* sp. n. Female genitalia. Typoid. Darjeeling. GS-1949/BŁ.
Fig. 5. *Crambus narcissus* sp. n. Female genitalia. Typoid. China. GS-1973/BŁ.

SYSTEMATICAL REVIEW OF SPECIES

Crambus argyrophorus BUTL.

Crambus argyrophorus BUTLER, 1878, Ill. Typ. *Lep. Het.* 2: 61, pl. XI, f. 5.

Length of forewing 7,5—10 mm., maximal width 2,2—2,5 mm. Apex rounded, termen slightly concave below apex, barely oblique. Ground colour glossy brown to brown-ochreous. Subterminal fascia well defined, inner line steely, outer line brown, uniformly coloured in its total course; costal portion followed by a brown, oblique streak. Apical triangle present. Subterminal area below the angle of the subterminal fascia is white with a brown patch at termen. Terminal streaks well defined, six in number. Termen bordered with brown. Basal stripe with apical portion well delineated with brown, tapering to a point; ventral tooth distinct. The tip of the basal stripe is well remote from the subterminal fascia. The white spot prolonging the basal stripe is more or less distinctly, longitudinally divided by few yellowish streaks. Hindwing glossy, light greyish with fringes glossy white.

Male genitalia. Uncus slightly bent, with apex pointed. Gnathos straight, rather longer than uncus. Fultura superior slightly developed. Valva with costa simple; ventral fold narrow to midway from base, thence dilated, with serrations, apex provided with a spine. Aedeagus very slender, barely shorter than the total armature, with dorsal strengthenings in terminal two-fifths. A single, slender cornutus is present.

Female genitalia. Ostium pouch barely broader than ductus bursae, small. Ductus bursae without any loop, lightly sclerotized throughout. Bursa copulatrix round, very large, two signa are present.

As far as I know, this species is distributed only in Japan. All the data on the distribution of this species in the Continental Asia are misidentifications of other species of the group under consideration. The specimens published by CARADJA, in 1910: 114, as *C. argyrophrous* BUTL., from Kasakewitsh, Amur lack in the CARADJA collection. The specimens published by CARADJA, in 1927: 395, are referable to *C. narcissus* sp. n. The specimens cited by CARADJA and MEYRICK, in 1935: 23, as *C. argyrophorus* BUTL., are referable to *C. nigriscriptellus* SOUTH. In 1933: 140, CARADJA and MEYRICK cited *C. argyrophorus* BUTL. from Lofao-shan, Lung-tao-shan and Tsa-hyen-shan. Unfortunetaly I have not found any of that series in the CARADJA collection. The specimens in the mentioned paper belong obviously to other species, most probably, to *C. narcissus* sp. n.

Material examined. Holotype, male, from Japan, coll. Brit. Mus. (N. H.) 3♂♂ and 2 ♀♀ from Fujisawa, Yokohama, Osaka, Kobe—Japan.

Crambus coryolanus sp. n.

Crambus argyrophorus BUTLER, HAMPSON, 1896, Proc. zool. Soc. Lond. 1895: 936 (in part).

This species appears to be practically indistinguishable externally from the preceding species. In size it agrees with *C. argyrophorus* BUTL. Male and female genitalia perfectly distinct from those in *C. argyrophorus* BUTL.

Male genitalia. Uncus and gnathos rather narrower than in *C. argyrophorus* BUTL. Gnathos with terminal portion slightly swollen. Fultura superior distinct, narrow, smooth. Valva in general armature similar to that in the preceding species, but with ventral fold serrate and without apical spine. The subterminal fold serrate and reaching the costal margin of valva. Aedeagus wider than that in the preceding species, with apical two-fifths heavily sclerotized and provided with several spines at ventral side. Cornutus much shorter than that in *C. argyrophorus* BUTL.

Female genitalia. Ostium pouch bowl-shaped, heavily sclerotized, with mouth broadly opened. Ductus bursae narrow, with terminal half heavily sclerotized. Basal half lightly sclerotized, with a loop. Bursa copulatrix rather round, proportionately smaller than that in the preceding species. Two signa are present.

The new species is described from one male and ten female specimens from India.

Material examined. Holotype — ♂: „Darjeeling. VII. 1886. H. J. ELWES", GS-1031/BŁ., coll. Brit. Mus. (N. H.); typoids — 1 ♀: „Tonglo, Sikkim. 10.000 feet. VII. 1886. H. J. ELWES" (ROTHSCHILD Bequest), GS-1434/BŁ., author's coll.; 1 ♀: „Sikkim... 1879. J. G. PILCHER", GS-1030/BŁ., coll. Brit. Mus. (N. H.); 1 ♀: „Sikkim. 7000 feet. VI. 1895. J. G. PILCHER", GS-1568/BŁ., coll. Brit. Mus. (N. H.); 1 ♀: „Assam, Shilong. H. M. PARIS. B. M. 1923 — 247", GS-1278/BŁ., coll. Brit. Mus. (N. H.); 1 ♀: Gopaldhara (STEVENS)", GS-1270/BŁ., coll. Brit. Mus. (N. H.); 3 ♀♀: „Darjeeling. MÖLLER", GS-1949/BŁ., coll. Muz. G. ANTIPA, Bucarest; 1 ♀: „Darjeel [ing] 1898", coll. Muz. G. ANTIPA, Bucarest; 1 ♀: „Khasis. Nat. Coll.", coll. Muz. G. ANTIPA, Bucarest.

Crambus narcissus sp. n. ♀

Crambus argyrophorus BUTLER, CARADJA, 1927, Mem. Secț. Stiinț. Acad. Rom. (3) 4: 395.

In facies nearly indistinguishable from the two preceding species, slightly differing in that the apex of the forewing is somewhat more pointed, the termen is straight and the forewing fringes are brownish, whitened at bases.

Female genitalia. In general similar to those in *C. coryolanus* sp. n., but with ductus bursae distinctly broader.

This new species is described from 12 female specimens from China. They were misidentified and published by CARADJA as belonging to *C. argyrophorus* BUTL. (see above synonymy).

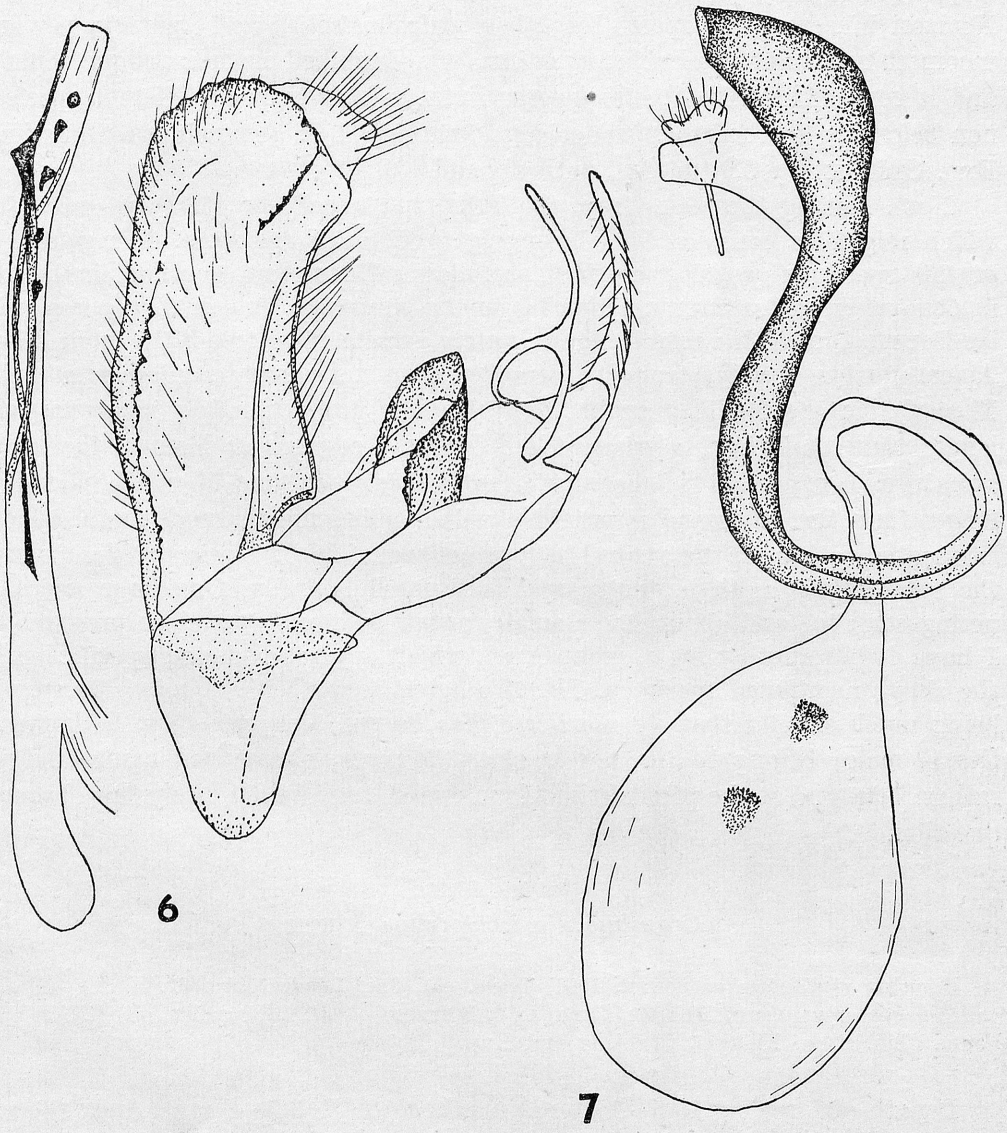


Fig. 6. *Crambus pseudargyrophorus* OKANO. Male genitalia. Japan. GS-1834/BŁ.
Fig. 7. *Crambus pseudargyrophorus* OKANO. Female genitalia. Japan. GS-2024/BŁ.

Material examined. Holotype — ♀: „Szetschwan Tatsienlu. Exp. STÖTZNER", GS-1942/BŁ., coll. Muz. G. ANTIPA, Bucarest; typoids — 3 ♀♀ with no labels, from a series from the STÖTZNER expedition, one of these with no abdomen, another GS-1967/BŁ., coll Muz. G. ANTIPA Bucarest; 2 ♀♀: „Omei. 10. VII 31 4000 [feet]", one with no abdomen, the other GS-1997/BŁ.,

coll. Muz. G. ANTIPA, Bucarest; 1 ♀: „23. VII" [Exp. STÖTZNER], coll. Muz. G. ANTIPA, Bucarest; 1 ♀: „28. IV", „Szetschwan, Tatsienlu. Exp. STÖTZNER", with no abdomen, coll. Muz. G. ANTIPA, Bucarest; 1 ♀; „Szetschwan, Omissien. Exp. STÖTZNER", „*niveirostralis*", „Paratypus", GS-554/BL., coll. Magyar Nemzeti Muzeum, Budapest (the labels „*niveirostralis*" and „paratypus" are incorrect as *Crambus niveirostralis* CAR. was described from a unique female and is conspecific with *C. atrosignatus* ZELL., which is quite different species, non belonging to the group under consideration); 1 ♀: „Szetschwan, Omissien. Exp. STÖTZNER", GS-494/BL., author's coll.

Note. Among the series from the STÖTZNER expedition, there is one male which might be considered as belonging to *C. narcissus* sp. n. The genitalia of this specimen are characterized as follows: Uncus and gnathos similar as in *C. nigriscriptellus* SOUTH. Valva in general similar to that in *C. nigriscriptellus* SOUTH, but with ventral edge minutely serrate from two-fifths from base. Apical portion of valva truncate, provided with a series of irregular serrations. The subapical fold with a serrate flap, which is proportionately narrower and longer than that in *C. nigriscriptellus* SOUTH. Aedeagus as long as the total armature, bent, with two heavily sclerotized stripes, one of which is much longer than the other and is provided with a subterminal, small tooth, which is situated rather on the ventral side of aedeagus. In *C. nigriscriptellus* SOUTH the subterminal tooth is double and is situated laterally. One large and tapering cornutus and about seven small cornuti on round bases are present. — I have found another male, from Omei, which appears to be conspecific with the above mentioned specimen. The two agree in size with *C. narcissus* sp. n., being much smaller than *C. nigriscriptellus* SOUTH. Very possibly, both mentioned males belong to the new species, however, the available material is rather little, and at the present time I am unable to solve definitely this obscure question.

Crambus nigriscriptellus SOUTH

Crambus nigriscriptellus SOUTH, 1901, Trans. ent. Soc. Lond. 1901: 392.
Crambus argyrophorus BUTLER, CARADJA & MEYRICK, 1935, Materialien einer Microlep. Fauna Chin. Prov. Kiangsu, Chekiang und Hunan: 23.

Length of forewing 10,5—15 mm., maximal width 3,5—4 mm. Apex rather rounded, termen straight, barely oblique. Basal stripe rather similar to that in *C. argyrophorus* BUTL. with ventral tooth distinct. The light patch prolonging the basal stripe is, however, not white, but yellowish. Forewing rather less expanding terminad than in *C. argyrophorus* BUTL. Subterminal fascia rather well defined, from costal margin to dorsal margin, forming a tooth-like projection at dorsum; outer line concolorous with the ground colour, inner line white (steely in *C. argyrophorus* BUTL.). Dorsum slightly lightened. Fringes light brownish, glossy, with bases white.

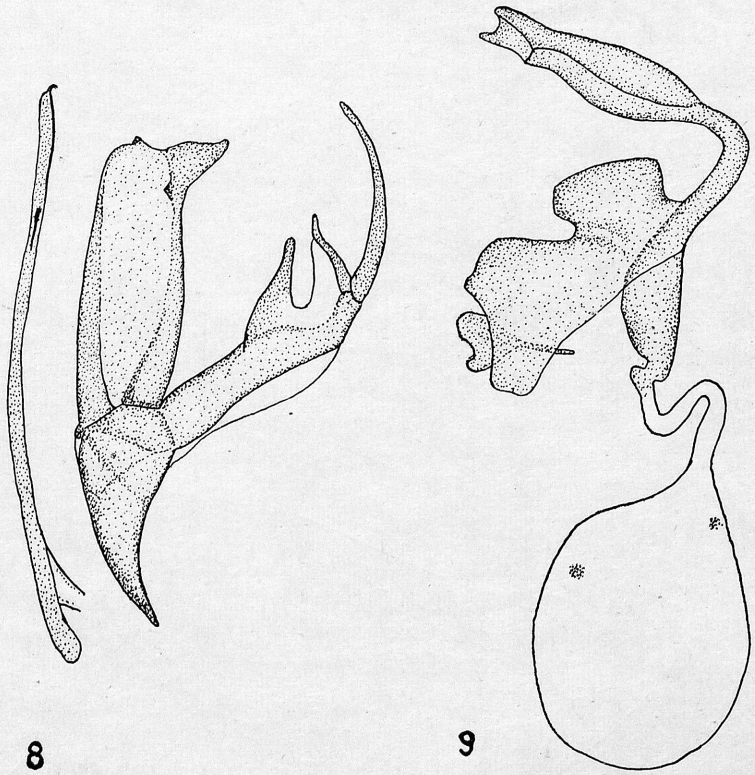


Fig. 8. *Crambus kazukaiensis* OKANO. Male genitalia. After OKANO.
Fig. 9. *Crambus kazukaiensis* OKANO. Female genitalia. After OKANO.

Male genitalia. Uncus and gnathos strongly bowed; the latter much thinner than the former, slightly expanding terminally, with tip rounded. Fultura superior large, with terminal and ventral margins folded and wavy. Valva with costa straight or slightly concave. Ventral fold not developed or slightly defined. Apical margin irregularly dentate with a large, tooth-like projection. The dentations are rather variable. An apical-dorsal dentate fold is present; variable in size. Aedeagus slender, bowed, with two heavily sclerotized stripes. The longer stripe is provided terminally with a small, double tooth, situated laterally. One typical long cornutus and several small cornuti on round bases are present.

Female genitalia. Ostium pouch bulbose, heavily sclerotized, similar to that in *C. hemileucalis* HMPS., *C. sinicolellus* CAR. or *C. athamas* sp. n. Ductus bursae proportionately wide, heavily sclerotized, with basal part concho-spiral, heavily sclerotized to near bursa copulatrix. The latter proportionately rather small, rather round. Two signa are present.

The type of this species is a female from Wa-shan. However, this female was not selected to the type-collection in the British Museum (N. H.), being probably overlooked. I have found the type among the *Crambus argyrophorus*

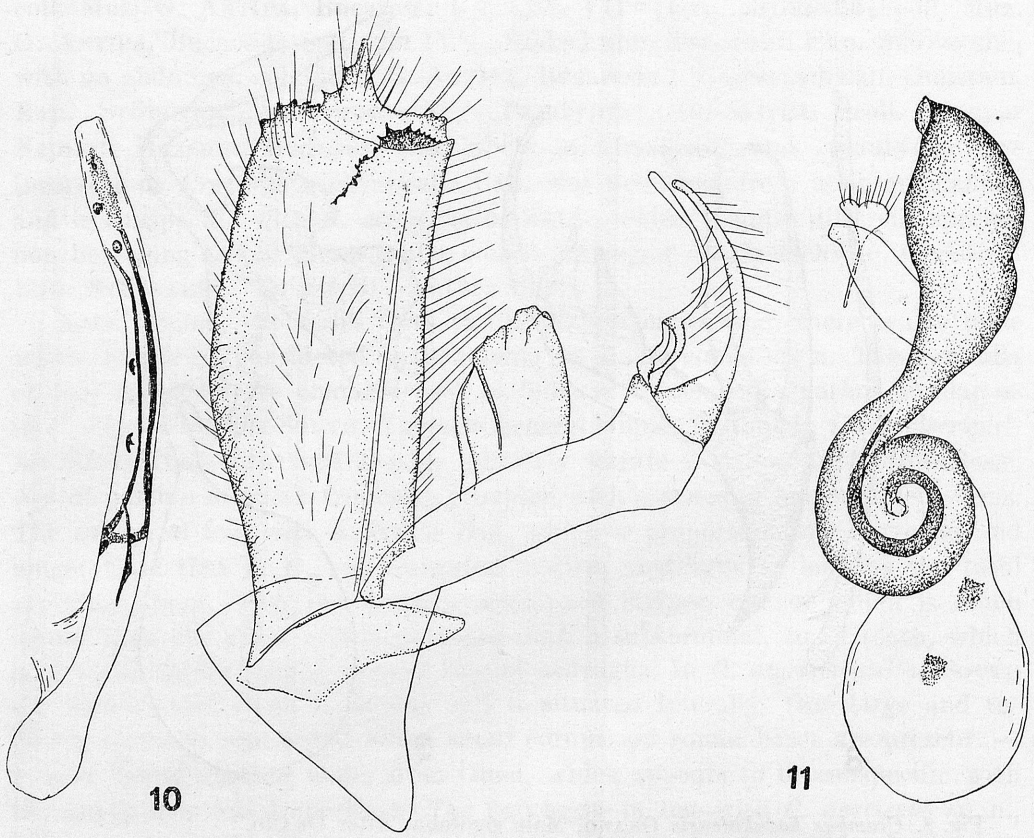


Fig. 10. *Crambus nigriscriptellus* South. Male genitalia. China. GS-1707/Bł.
Fig. 11. *Crambus nigriscriptellus* South. Female genitalia. China. GS-1976/Bł.

Butl. — material in the main collection of the British Museum (N. H.). This female is obviously conspecific with a female from the Caradja collection, labelled „*Crambus nigriscriptellus* South — cotype". The label is incorrect as there were no typoids of the species under consideration, and *Crambus nigriscriptellus* South was described from a unique female. A series of male and female specimens of this species from the Caradja collection were published by Caradja and Meyrick, in 1935: 23, as a „great local form" of *C. argyrophorus* Butl.

Material examined. Holotype — ♀: Wa-shan, GS-1509/Bł., coll. Brit. Mus. (N. H.); a series of male and female specimens from China, coll. Muz. G. Antipa, Bucarest.

Crambus athamas sp. n.

Length of forewing 11 mm., maximal width 3 mm. Apex pointed, termen nearly straight, slightly oblique. Forewing glossy, ground colour brown. Basal stripe confluent with the subterminal white markings, reaching the termen;

well separated from the costal margin by a brown stripe; ventral tooth completely reduced. A tiny brown streak at ventral margin defines a part of terminal border of the proper stripe. Subterminal fascia practically invisible. Dorsum brown. Fringes white with brown ends. Termen bordered with a narrow, brown line. Hindwing glossy light greyish with fringes white.

Male genitalia. Superficially similar to those in *C. nigriscriptellus* SOUTH, but distinct on the following characters: valva with costal-terminal angle broadly notched, with no serrations; apex produced in serrate triangle; subapical-ventral area provided with a semicircular, minutely toothed fold; subapical-subcostal fold triangular, with no serrations. Aedeagus nearly straight, the submedian cornutus proportionately short. Vinculum proportionately narrow. Valva rather long and narrow in relation to that in *C. nigriscriptellus* SOUTH.

Female genitalia. Ostium bursae bulbose, heavily sclerotized, similar to that in *C. nigriscriptellus* SOUTH, narrower than in *C. sinicolellus* CAR. Ductus bursae decidedly narrower than in *C. nigriscriptellus* SOUTH, with spirals less regular.

The new species resembles somewhat *C. nivellus* (KOLL.) and *C. bipartellus* SOUTH, however, it is perfectly distinct on the presence of a costal brown stripe. *C. athamas* sp. n. is described from one male and three female specimens from Khasis Hills, Assam.

Material examined. Holotype — ♂: „Khasis Hills, Assam", GS-1013/BŁ. [det. as *C. nivellus* (KOLL.) in the ROTHSCHILD Bequest], coll. Brit. Mus. (N. H.); typoids — 1 ♀: „Khasis Hills, Assam. C. F. H. VI. [18]94" (ex coll. MEYRICK), GS-1494/BŁ., coll. Brit. Mus. (N. H.); 1 ♀: „Khasis. IX. 1894. Nat. Coll.", GS-1981/BŁ., coll. Brit. Mus. (N. H.); 1 ♀: Khasis Hills. 1891. Nat. Coll.", GS-1009/BŁ., author's coll.

Crambus pseudargyrophorus OKANO

Crambus pseudargyrophorus OKANO, 1960, Trans. lep. Soc. Jap. 11 (1): 8, f. 1, 5, 8.

Length of forewing 10,5—12 mm., maximal width 3,6—4,4 mm. Similar to *C. argyrophorus* BUTL., but larger with the forewing pattern better marked.

Male genitalia somewhat similar to those in *C. virgatellus* WLM., but not identical as stated by OKANO, 1960: 8. Fultura superior much narrower than in *C. virgatellus* WLM. and with ventral margins minutely serrate. Valva with apical-dorsal angle less produced than in *C. virgatellus* WLM. and distinctly bordered from the remainder of valva. Ventral fold in *C. pseudargyrophorus* OKANO runs near the ventral margin of the valva, whilst in the second species it runs obliquely and nearly touches the subapical, serrate fold. Vinculum shorter than in *C. virgatellus* WLM. Aedeagus with rather large subterminal tooth situated ventrally; this tooth in *C. virgatellus* WLM. is rather small. One long cornutus and five small cornuti on round bases are present; in *C. virgatellus*

WLM. there is one moderate cornutus and two very short cornuti without broad bases.

Female genitalia. Ostium pouch proportionatelly smaller than in *C. hemileucalis* HMPS. and allies. Ductus bursae with cephalic two-fifths lightly sclerotized, broadly looped. Bursa copulatrix proportionately large. In *C. virgatellus* WLM. the dorsal margin of the ostium bursae orifice is bifurcate, ostium pouch is longer and narrower and the loops of the ductus bursae are much smaller than in the species under consideration.

C. pseudoargyrophorus OKANO was described from two males and one female from North Honshu, Japan, all in coll. Okano.

Material examined. One male and two females from Hondo, Siga Pref., GS-2024/BŁ., GS-1834/BŁ., coll. Zoologische Sammlung des Bayerischen Staates, München, and author's coll.

Crambus sinicolellus CARADJA

Crambus sinicolellus CARADJA, 1926, Dtsch. ent. Zeit. „Iris" 40: 168.

Length of forewing 11 mm., maximal width 3,4 mm. Apex narrowly rounded. Termen nearly straight, barely oblique. Forewing superficially white, ground colour strongly reduced. Basal stripe proportionately broad and tapering to a point, which is distinctly distant from the subterminal fascia; ventral tooth very well defined, sending an oblique streak to dorsal margin. Dorsum broadly whitened. Subterminal fascia distinct; outer line brown, inner line silvery. Apical triangle distinctly marked. Fringes light brown, glossy, apical portion white at bases. Hindwing typical of the group.

Male genitalia. Uncus and gnathos strongly bowed, rather similar to those in *C. nigriscriptellus* SOUTH, or *C. athamas* sp. n. Fultura superior with terminal portion obliquely truncate and distinctly minutely serrate. Valva with costa slightly strenghthened with a feeble list. Ventral fold reduced, slightly toothed. Ventral-apical margin distinctly toothed, dorsal-apical margin obliquely truncate. An oblique, irregularly toothed fold from middle of dorsal-apical margin. Aedeagus with two typical — heavily sclerotized stripes, the longer of which is terminated by a distinct tooth, situated dorsally. Such a position of this tooth is a very important character, not met with in any other species of the group under consideration. One typical long cornutus and several small cornuti are present.

Female genitalia. Ostium pouch bulbose, proportionately very broad. Ductus bursae with caudal half heavily sclerotized; cephalic half lightly sclerotized; this character separates this species from allies; cephalic portion of ductus bursae distinctly looped. Bursa copulatrix proportionately large, rather round. Two typical signa are present.

C. sinicolellus CAR. was described from a unique male specimen taken in Shanghai. I have found in the CARADJA collection four male and female spe-

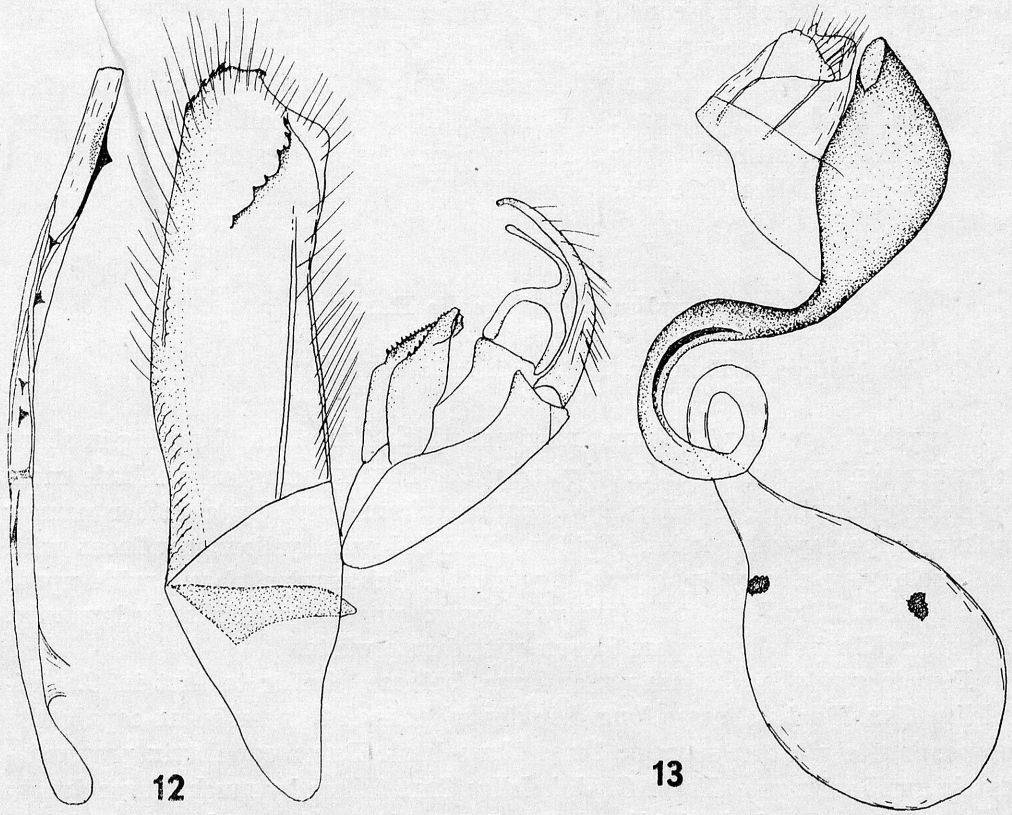


Fig. 12. *Crambus sinicolellus* Car. Male genitalia. Holotype. China. GS-1690/Bł.
Fig. 13. *Crambus sinicolellus* Car. Female genitalia. China. GS-1691/Bł.

cimens apparently conspecific with the above type. These specimens were cited by Caradja and Meyrick, in 1935. In the collection of Dr. H. G. Amsel there is a female labelled „*Crambus sinicolellus* Car. Paratypus". This label is, however, incorrect, as there were no paratypes of the species in question. In addition, the mentioned female is not conspecific with *C. sinicolellus* Car.

Examined material. Holotype — ♂: „Shanghai. VIII. 1918", GS-1690/Bł., coll. Muz. G. Antipa, Bucarest; 4♂♀ from Lungtan ad Nanking, China, coll. Muz. G. Antipa, Bucarest.

Crambus achilles sp. n. ♀

Superficially similar to the preceding species, but perfectly distinct on female genitalia. From *C. sinicolellus* Car. separable by the decidedly narrower forewing and narrower basal stripe.

Female genitalia perfectly distinct from those in allied species by the very broad orifice of the ostium pouch. Ostium pouch very broad with caudal orifice vertically truncate. Ductus bursae rather broad, heavily sclerotized in

two-thirds its length, concho-spiral. Bursa copulatrix decidedly elongate. Two typical signa are present.

This new species is described from a unique female specimen labelled: „West Tienmushan, Chekiang. 29. V. 1932", GS-668/Bł., coll. Dr. H. G. Amsel, Karlsruhe. As mentioned above, this specimen bears also an incorrect label: „*Crambus sinicolellus* Car. Paratypus".

Crambus hemileucalis Hampson

Crambus hemileucalis Hampson, 1896, Moth India 4: 16.

Length of forewing 11,5 mm., maximal width 4 mm. The forewing in shape is rather similar to that in *C. nigriscriptellus* South, being only a little more expanding terminad. Basal stripe separated from costa by a rather narrow yellow stripe; apical portion slightly delineated with yellow, confluent with the prolonging silvery spot reaching termen. Subterminal fascia with upper part ill-defined, yellow, and lower part brown outwardly and steely inwardly. Fringes white but lower part brown with bases white.

Female genitalia. Ostium pouch large, bulbose, similar to that in *C. sinicolellus* Car. Ductus bursae long, heavily sclerotized to near bursa copulatrix, proportionately rather narrow; three times bent. Bursa copulatrix proportionately small; elongate. From *C. sinicolellus* Car. differs by much longer ductus bursae. From *C. nigriscriptellus* South separable by ductus bursae which in that species is much wider, concho-spiral and in the species under consideration the loops of ductus bursae are quite irregular. In *C. athamas* sp. n. ductus bursae is only twice looped and shorter and the ostium pouch is smaller and narrower than in *C. hemileucalis* Hmps.

C. hemileucalis Hmps. was described from a single female specimen from Manipur, India As far I know, no further examples of this species have as yet been found. The holotype of *C. hemileucalis* Hmps. I have found in the Rothschild collection at the Tring Museum. The exact location of this specimen has not hitherto been known. It bear the following labels: „Mao Manipur. 5700 ft. Doherty", „*Crambus hemileucalis* Hmps. type ♀", „Rothschild Bequest B. M. 1939—1", GS-1019/Bł., coll. Brit. Mus. (N. H.).

Crambus hyacinthus sp. n. ♂

Length of forewing 12,5 mm., maximal width 4,2 mm. Apex narrowly rounded, termen rather distinctly concave below apex. Ground colour brownish-ochreous, rather glossy. Basal stripe proportionately narrow, well remote from costal margin; ventral tooth well defined; terminal portion confluent with subterminal white patch. Subterminal fascia running near termen; ill-defined;

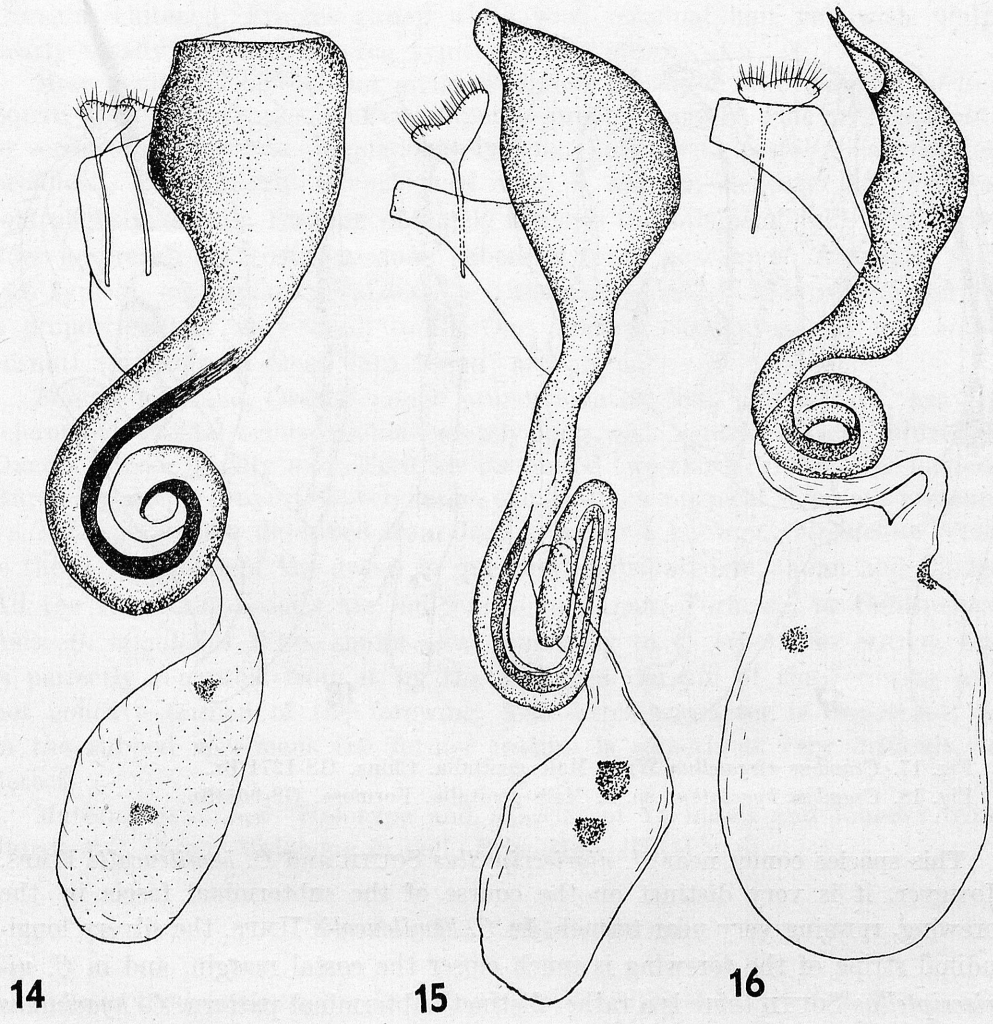


Fig. 14. *Crambus achilles* sp. n. Female genitalia. Holotype. China. GS-668/Bł.
Fig. 15. *Crambus hemileucalis* Hmps. Female genitalia. Holotype. India. GS-1019/Bł.
Fig. 16. *Crambus virgatellus* Wlm. Female genitalia. China. GS-1043/Bł.

inner line white, outer line brown, nearly amalgamated with ground colour. Fringes glossy, light brown. Hindwing glossy whitish with fringes white.

Male genitalia. Uncus and gnathos similar to those in *C. nigriscriptellus* South and allies. Fultura superior with ventral margins delicately wavy. Valva with costa concave. Ventral fold distinct, irregularly toothed. Apical portion of valva lightly sclerotized, rather well bordered from the remainder. Terminal-ventral area more heavily sclerotized, projected, serrations lacking. Aedeagus shorter than the total armature, slightly curved. One, rather broad, heavily sclerotized stripe terminated by a rather large, minutely serrate, ventral tooth. One long, tapering cornutus and six proportionately very small cornuti on round bases are present.

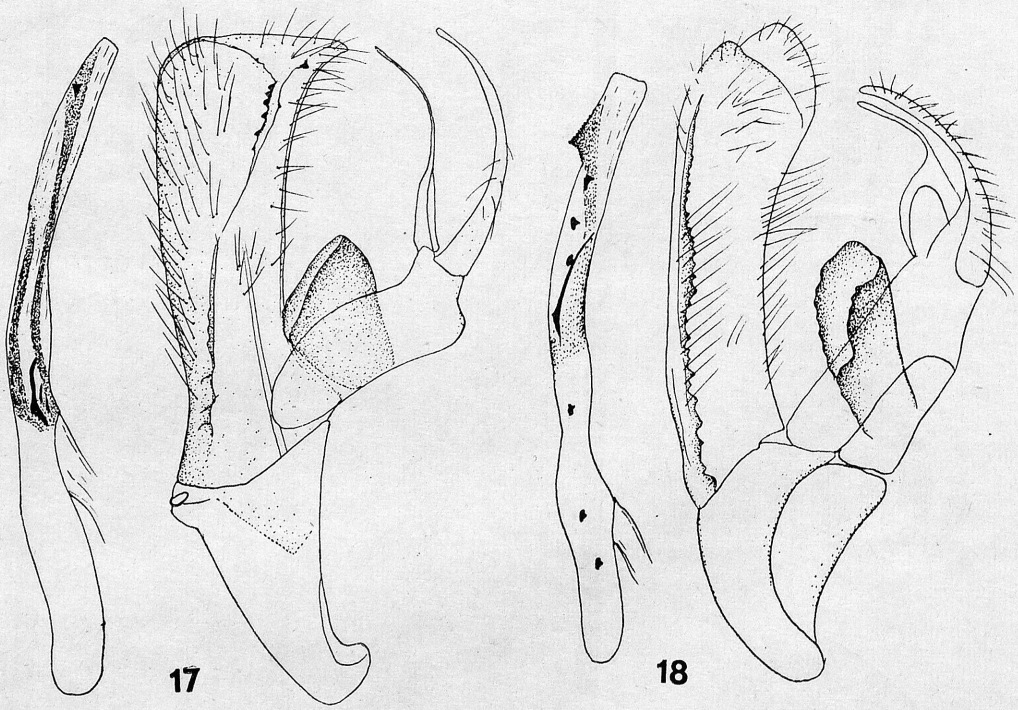


Fig. 17. *Crambus virgatellus* WLM. Male genitalia. China. GS-1271/BŁ.
Fig. 18. *Crambus hyacinthus* sp. n. Male genitalia. Formosa. GS-965/BŁ.

This species comes near *C. nigriscriptellus* SOUTH and *C. hemileucalis* HMPS. However, it is very distinct on the course of the subterminal fascia in the forewing, running very near termen. In *C. hemileucalis* HMPS. the silvery longitudinal stripe of the forewing is much closer the costal margin, and in *C. nigriscriptellus* SOUTH there is a rather distinct subterminal pattern. *C. hyacinthus* sp. n. is described from a unique male specimen from Formosa. It bears a label: „Formosa. 7500 ft. 8. V. 1909. A. E. WILEMAN". GS-967/BŁ., coll. Brit. Mus. (N. H.).

Crambus virgatellus WILEMAN

Crambus virgatellus WILEMAN, 1911, Trans. ent. Soc. Lond. 1911: 353, pl. XXXI, f. 19.
Calamotropha virgatella WILEMAN, BŁESZYŃSKI, 1959, Tinea 5: 274, pl. XXXVI, f. 5.

Length of forewing 9,5-12 mm., maximal width 3-3,8 mm. Apex rather pointed, termen oblique, rather straight; costal margin in most instances more curved than in other species of the group under consideration. Costal half of forewing white. Terminal portion of basal stripe ill-defined. Ventral tooth absent. Subterminal fascia ill-defined, with costal portion yellowish and lower portion with inner line steely and inner line amalgamated with ground colour.

Dorsum whitened. Fringes glossy white with terminal half yellowish. Palpi nearly totally white. Hindwing typical of the group.

Male genitalia. Uncus and gnathos similar to those in *C. nigriscriptellus* SOUTH and allied species. Fultura superior proportionately wide with no folds or serrations. Vinculum proportionately long. Valva with costal-apical portion produced. Costa feebly strengthened with a narrow, delicate list. Ventral fold slightly serrate, running obliquely towards the subapical fold. The latter does not reach the costa. A small subcostal tooth near apex. Aedeagus with two typical, heavily sclerotized stripes, the longer of which is terminated by a proportionately very small tooth. One moderate cornutus and two small cornuti with normal bases (not broad) are present.

Female genitalia. Ostium pouch proportionately long and narrow, heavily sclerotized; caudal orifice proportionately long with ventral margin bifurcate. Ductus bursae heavily sclerotized for its caudal two-thirds; irregularly looped. Bursa copulatrix proportionately large, elongate. Two typical signa are present.

This species was described from Japan. As far I know, *C. virgatellus* WLM. is the only species of the group in question, distributed in Japan and China. All the remaining species are indigenous to Japan, Formosa, or Continental Asia. *C. virgatellus* WLM. shows some similarity to *C. bipartellus* SOUTH, but is perfectly separable from it by the whitened dorsum of the forewing and not concave termen of the forewing. The latter character is important, as in the rubbed specimens the former feature is sometimes very difficult to detect.

Material examined. Holotype and a series of 14 males and females from Japan and China. Holotype in coll. Brit. Mus. (N. H.).

Crambus kazukaiensis OKANO

Crambus kazukaiensis OKANO, 1960, Trans. lep. Soc. Jap. 11 (1): 10, f. 2, 6, 9.

I have had no opportunity to examine any specimen of this species. The following data are after the original description of OKANO. — Length of forewing 11 mm. In facies rather similar to *C. argyrophorus* BUTL. and *C. pseudargyrophorus* OKANO, but perfectly distinct on male and female genitalia. According to the original description, *C. kazukaiensis* OKANO is separable from *C. argyrophorus* BUTL. and *C. pseudargyrophorus* OKANO as follows: „Forewing wider, white, yellowish brown on costal area and along submedial fold; basal stripe wider, below without distinct tooth".

Male genitalia with gnathos twice shorter than uncus. Fultura superior strongly elongate. Vinculum more elongated than in allied species. Valva with no serrated folds. A small process at apex near ventral angle. Another process below costa at four-fifths of valva. Apical-dorsal angle strongly produced. Aedeagus very slender, terminated by a small hook. A single moderate cornutus is present. No heavily sclerotized stripes present.

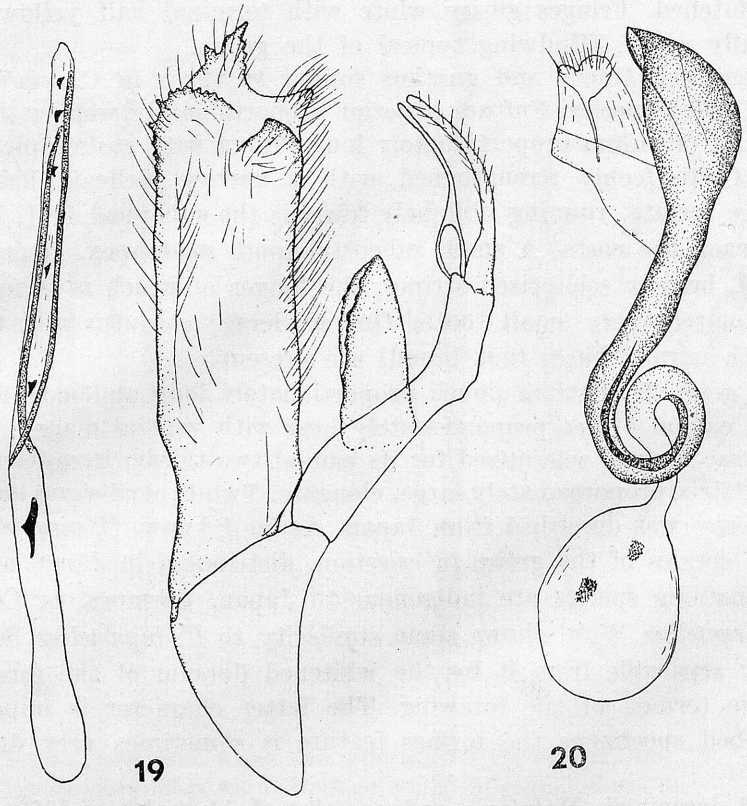


Fig. 19. *Crambus athamas* sp. n. Male genitalia. Holotype. India. GS-1013/Bł.
Fig. 20. *Crambus athamas* sp. n. Female genitalia. Typoid. India. GS-1987/Bł.

Female genitalia. Ostium pouch strongly elongate with dorsal margin of the cuadal orifice notched. Ductus bursae heavily sclerotized to near bursa copulatrix; forms three semiloops. Subgenital plate unlike that in other species of the group under consideration, broad with a broad ventral projection.

C. kazukaiensis OKANO was described from one specimen of each sex from North Honshu, Japan. They are in the collection of OKANO, Morioka.

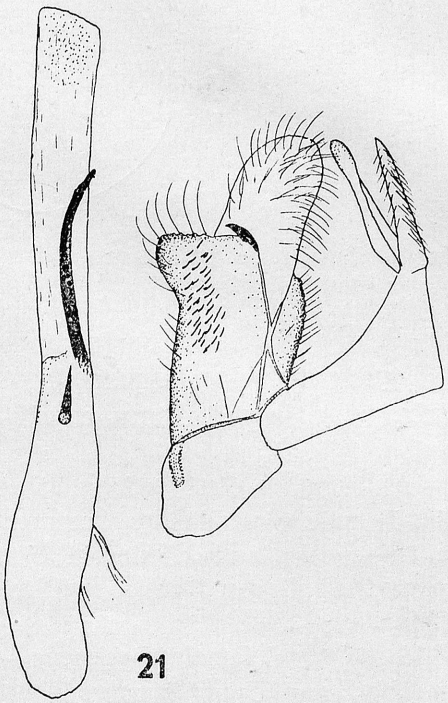
Crambus bipartellus SOUTH

Crambus bipartellus SOUTH, 1901, Trans. ent. Soc. Lond. 1901: 393.
Crambus bipartitellus [Sic!] SOUTH, CARADJA, 1925, Mem. Secț. Stiinț. Acad. Rom. (3) 3: 298.

Length of forewing 9—11 mm., maximal width 3—3,4 mm. Apex acuminate, termen rather distinctly concave below apex. The white pattern prolonging the white-silvery stripe in the forewing is well developed and, in some instances, confluent with the stripe. Brown markings in the outer area

of the forewing are more or less reduced. Some specimens are similar to *C. virgatellus* WLM., but they are easily separable by the concave termen, which is straight in *C. virgatellus* WLM. In addition, in *C. virgatellus* WLM. the dorsum of the forewing is more or less distinctly bordered with white, whilst in the species under consideration the dorsum is brown or yellowish-brown. The figure of SOUTH of *C. bipartellus* SOUTH is rather incorrect as showing the termen of the forewing convex and not concave. The type of *C. bipartellus* SOUTH is a specimen with the subterminal pattern reduced that is rarely met with in this species. Fringes brown, apical portion white at bases.

Male genitalia. Uncus nearly straight, slightly tapering to a point. Gnathos rather straight with apex slightly swollen. No distinct fultura superior present. Valva with basal-dorsal heavily sclerotized fold. Ventral-basal portion of valva heavily sclerotized with terminal, large projection and dorsal-terminal spine; besides normal hair, numerous short, stout bristles are present. Cucullus rounded, with no differentiations. Aedeagus armed with a very long, curved, terminal spine. A single, tapering moderate cornutus is present.



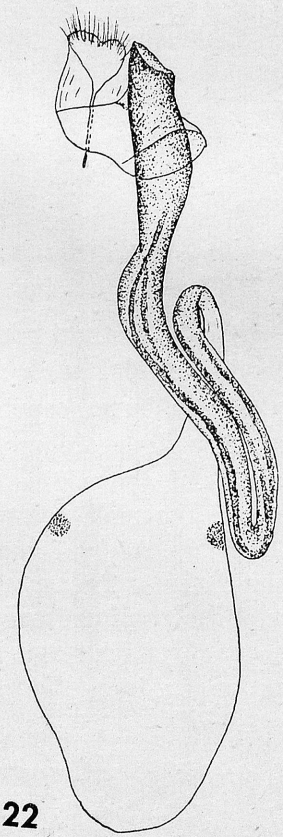


Fig. 21. *Crambus bipartellus* SOUTH. Male genitalia. China. GS-977/BŁ.
Fig. 22. *Crambus bipartellus* SOUTH. Female genitalia. China. GS-1032/BŁ.

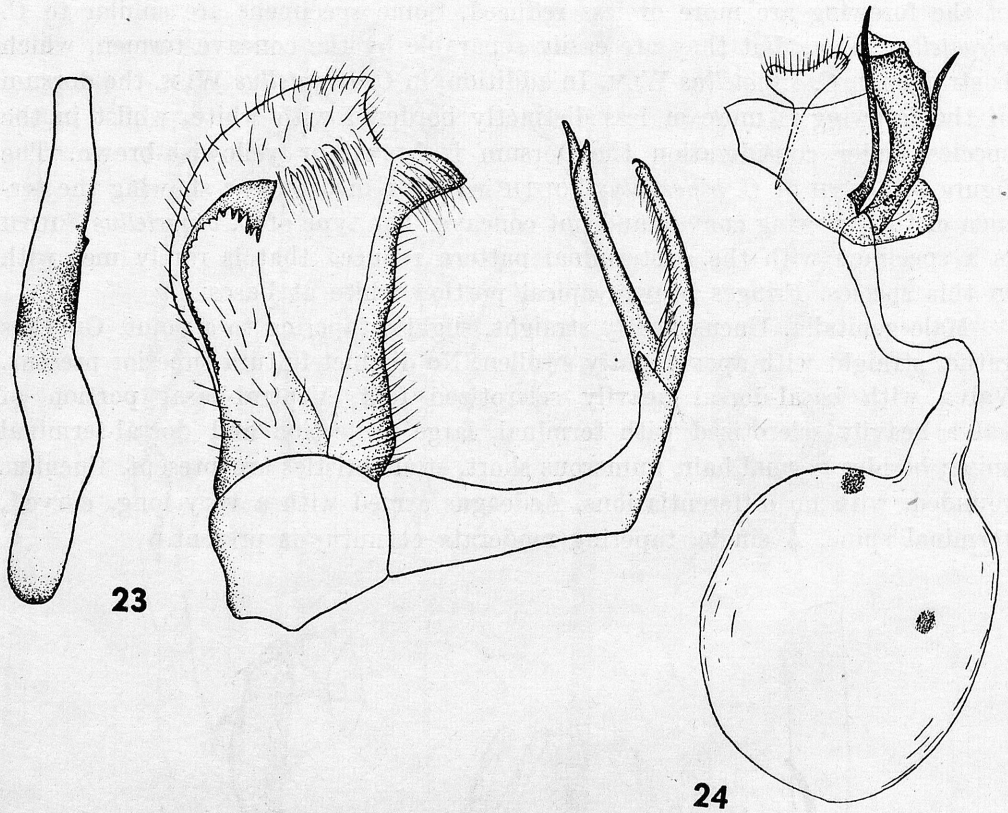


Fig. 23. *Crambus nivellus* (KOLL.) Male genitalia. India. GS-685/BŁ.
Fig. 24. *Crambus nivellus* (KOLL.) Female genitalia. India. GS-1026/BŁ.

Female genitalia. Ostium pouch slightly wider than ductus bursae, heavily sclerotized, with caudal orifice obliquely truncate. Ductus bursae heavily sclerotized to near bursa copulatrix, twice looped. Bursa copulatrix rather large, ovate. Two signa are present.

As is mentioned above, this species is rather distinct from other members of the group, on its male genitalia. Female genitalia are, however, perfectly typical of the group. As far I know, this species is distributed in Western China and in Upper Burma. The specimens from Upper Burma seem to be rather lighter than those coming from China.

Material examined. A series of 12 male and female specimens — including the holotype, male; from Western China and Upper Burma.

Crambus nivellus (KOLLAR)

Chilo nivellus KOLLAR, 1844, Hüg. Kaschm. 4: 495.
Crambus nivellus KOLLAR, HAMPSON, 1896, Proc. zool. Soc. Lond. 1895: 936.
Crambus todarius BUTLER, 1883, Proc. zool. Soc. Lond. 1883: 173.
Crambus aurivittatus MOORE, 1888, Desc. Ind. Lep.: 226.

Length of forewing 9,3—11 mm., maximal width 2,8—3,2 mm. Apex decidedly acuminate, termen slightly concave below apex, rather oblique. Costal half of forewing silvery-white. No trace of any pattern in outer area, except for terminal dark streaks. Termen narrowly bordered with brown. Dorsum bordered with a silvery-white stripe. Fringes glossy white, lower portion brown-golden at bases. Hindwing lighter than in other species of the group in question.

Male genitalia. Uncus rather curved, with a small, terminal hook. Gnathos longer than uncus, with apex bifurcate. No distinct fultura superior present. Valva with a heavily sclerotized costal fold, which is distinctly bordered from the remainder of valva. Ventral fold serrate, curved, dilated at terminal portion. Apical part of valva tapering to a point; apical-dorsal margin distinctly inbent. Vinculum proportionately shorter and broader than in other species of the group. Aedeagus unarmed, with an oblique, heavily sclerotized ring in the middle.

Female genitalia. Ostium pouch funnel-shaped, heavily sclerotized, expanding caudad; with two long thorns at base. Ductus bursae lightly sclerotized throughout, without loop. Bursa copulatrix proportionately large, round. Two signa are present.

As far I know, *C. nivellus* (KOLL.) is known only from India. This species is rather distinct on the genitalia from other members of its group, but it is rather similar externally to *C. virgatellus* WLM. The latter has, however, the termen of the forewing excurved, and a trace of the subterminal fascia is to be detected.

Material examined. A series of 18 males and females from India, including the types of *C. todarius* BUTL. and *C. aurivittatus* MOORE, coll. Brit. Mus. (N. H.). I was unable to state the location of the type of *C. nivellus* (KOLL.).

REFERENCES

BŁESZYŃSKI S. 1959. Studies on the *Crambidae*. Part xix. Notes on Some Japanese Species of the Generic Group *Crambus* F. Tinea, Tokyo, **5**: 273—276, pl. xxxvi.

BUTLER A. G. 1878. Illustrations of typical specimens of *Lepidoptera Heterocera* of the British Museum. 2. London, X + 62 pp., pls. xxi—xl.

BUTLER A. G. 1883. On a Collection of Indian *Lepidoptera* received from Lieut.-Colonel Charles SWINHOE; with numerous Notes by the Collector. Proc. zool. Soc. Lond., London, **1883**: 144—175, pl. xxiv.

CARADJA A. 1925. Ueber Chinas Pyraliden, Tortriciden, Tineiden nebst kurze Betrachtungen, zu denen das Studium dieser Fauna Veranlassung gibt. Mem. Secț. Ştiinț. Acad. Rom., Bucarest, (3) **3**: 257—383, 2 pls.

CARADJA A. 1926. Nachträge zur Kenntnis ostasiatischer *Pyraliden*. Dtsch. ent. Zeit. „Iris", Dresden, **40**: 168—170.

CARADJA A. 1927. Die Kleinfalter der Stötzner'schen Ausbeute, nebst Zuträge aus meiner Sammlung. (Zweite biogeographische Skizze: „Zentral Asien"). Mem. Secț. Ştiinț. Acad. Rom., Bucarest (3) **4**: 361—428.

Caradja A. & Meyrick E. 1935. Materialien zu einer Microlepidopteren Fauna der Chinesischen Provinzen Kiangsu, Chekiang und Hunan. Berlin, 96 pp.

Hampson G. F. 1896. The Fauna of British India including Ceylon and Burma. London, xxviii + 594 pp.

Hampson G. F. 1896. On the classification of the *Schoenobiinae* and *Crambinae*, two Subfamilies of Moths, of the Family *Pyralidae*. Proc. zool. Soc. Lond. **1895**: 897—974.

Kollar V. & Redtenbacher L. 1844. Aufzählung und Beschreibung der von Freihern Carl v. Hügel auf seiner Reise durch Kaschmir und das Himaleygebirge gesammelten Insecten. 4 Band II Abt. Stuttgart, pp. 393—564; 582—586 Register, 28 pls.

Leech J. H. 1901. *Lepidoptera Heterocera* from China, Japan and Corea. Part V. With descriptions of new species by Richard South. Trans. ent. Soc. Lond., London, **1901**: 385—514, pls. xiv—xv.

Moore F. 1888. Descriptions of New Indian Lepidopterous Insects from the collection of the late Mr. W. S. Atkinson. *Heterocera* continued *(Pyralidae, Crambidae, Geometridae, Tortricidae, Tineidae)*. Calcutta, pp. 199—299, pls. vii—viii.

Okano M. 1960. Notes on some Japanese *Crambinae (Pyralididae)*. (2). Trans. lep. Soc. Jap., Tokyo, **11** (1): 8—11.

South R., see Leech J. H.

Wileman A. E. 1911. New and Unrecorded Species of *Lepidoptera Heterocera* from Japan. Trans. ent. Soc. Lond., London, **1911**: 189—407, pls. xxx, xxix.

STRESZCZENIE

Autor omawia 14 gatunków z grupy *Crambus argyrophorus* Butl. Pięć gatunków zostało opisanych jako nowe, są to *Crambus coryolanus* sp. n. z Indii, *C. narcissus* sp. n. z Chin, *C. athamas* sp. n. z Indii, *C. achilles* sp. n. z Chin i *C. hyacinthus* sp. n. z Formozy.

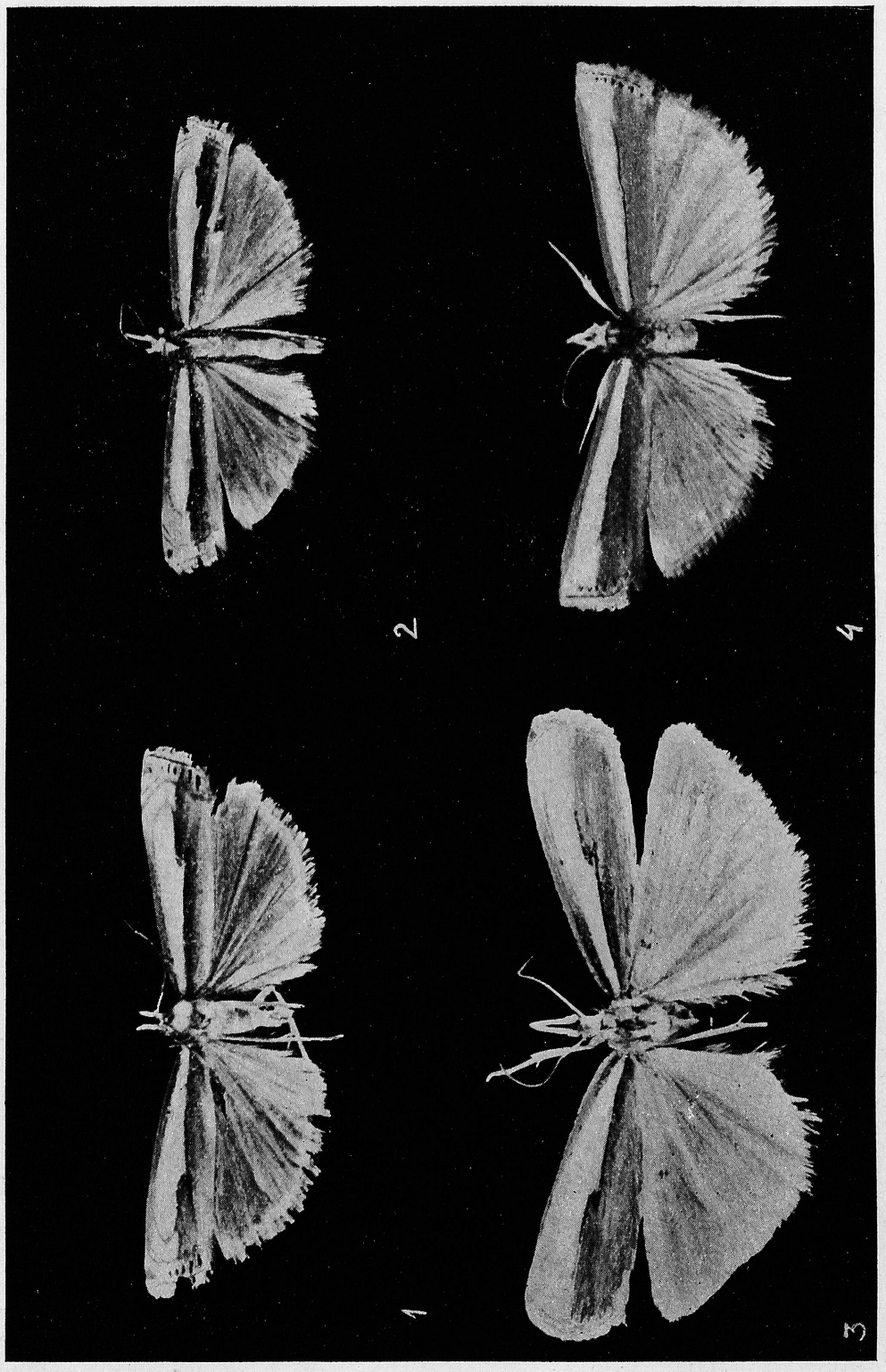
РЕЗЮМЕ

Автор описывает 14 видов из группы *Crambus argyrophorus* Butl. Из них пять видов описаны как новые, *Crambus coryolanus* **sp. n.** из Индии, *C. narcissus sp. n.* из Китая, *C. athamas* **sp. n.** из Индии, *C. achilles* **sp. n.** из Китая и *C. hyacinthus sp.* n_5 из Формозы.

PLATES

Plate LXXII

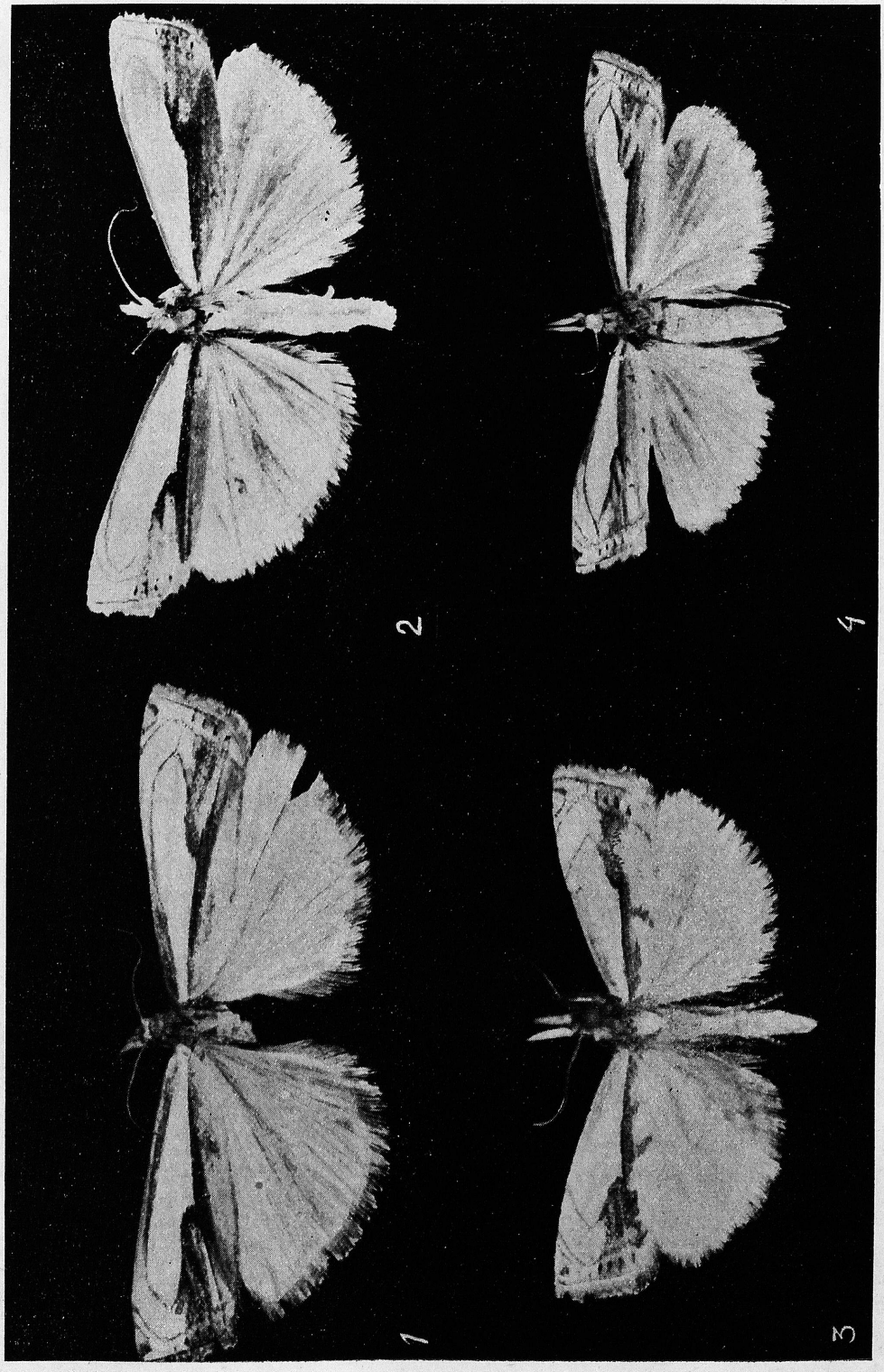
Fig. 1. *Crambus coryolanus* sp. n. Female. Typoid. India.
Fig. 2. *Crambus narcissus* sp. n. Female. Typoid. China.
Fig. 3. *Crambus hyacinthus* sp. n. Male. Holotype. Formosa.
Fig. 4. *Crambus athamas* sp. n. Male. Holotype. India.



Auctor phot.
St. Bleszyński

Plate LXXIII

Fig. 1. *Crambus nigriscriptellus* SOUTH. Female. India.
Fig. 2. *Crambus hemileucalis* HMPS. Female. Holotype. India.
Fig. 3. *Crambus sinicolellus* CAR. Holotype. China.
Fig. 4. *Crambus achilles* sp. n. Female. Holotype. China.



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Nakład 800+100 egz. — Ark. wyd. 1,75. — Ark. druk. $1^{12}/_{16}$ — Papier ilustr. kl. III 80 g 70×100
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