

RECORDS AND DESCRIPTIONS OF MICROLEPIDOPTERA (8)

by

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In continuation of my first revisional paper on the subfamily Olethreutinae dealing with the *Lobesia* complex (1954) I now present a revision of the genus *Bactra* Stephens. Chiefly the species from the Malayan region are treated, but also references to some species from other regions are made, as far as these species were available for study. I use this opportunity also to make some amendments to my paper on Meyrick types in the British Museum (1950). Material from New Guinea and of the Sumba Expedition 1948 will be treated in other papers.

The material that served for this revision comprises chiefly the collection of the Leiden Museum (indicated below with "L.M."). A small, but valuable addition from materials from museums in the United States. I am grateful to Dr. Mont A. Cazier, of the American Museum of Natural History (A.M.N.H.), New York, to Dr. J. F. Gates Clarke, of the United States National Museum (U.S.N.M.), Washington, D.C., and to Dr. John G. Franclemont, of the Entomological Department of Cornell University (Cornell Un. Coll.), Ithaca, New York, for their kind permission to select and to study these materials. Furthermore, Professor Dr. E. M. Hering kindly entrusted me with an important collection of Palaearctic *Bactra* species from the Zoologisches Museum der Humboldt Universität, Berlin, Germany. I am very grateful for the permission to retain certain duplicates from the above mentioned collections for the Leiden Museum.

The genus *Bactra* Stephens, 1834, equals *Lobesia* Guenée in the difficulties it caused to its students. As easy as it is to recognize a species as a member of this genus, as difficult it was to identify the species. For a long time the classical authors regarded numerous species occurring throughout the world, from the United States to New Zealand, as a single cosmopolite species, *Bactra lanceolana* Hübner. Lord Walsingham was the first to doubt this; he advised to discriminate at least different "varieties". Later Meyrick broke with the tradition altogether and described a considerable number of species. But he neglected to examine the genital characters, so that it is no wonder that a sad confusion resulted.

To a diligent student of genital characters *Bactra* does not present any serious problems. These characters are clear-cut and constant in the two sexes, and provide an excellent instrument for identification of otherwise obscure and variably coloured and marked species. However, the necessity to dissect almost every specimen makes the investigation time-consuming. For even males in this genus seldom offer tangible characters of external structure which might help the taxonomist, contrary to the situation in *Lobesia*. However, after the material is separated on account of the characters of the genitalia it is often possible to detect some specific characters of colouring, markings, length and shape of the palpi, etc. To ascertain the width of variation of such characters more research will be necessary; to-day the study of the genitalia still remains the only trustworthy means for identification.

On account of the male genital characters the genus can easily be divided into four groups. I propose subgeneric status for these categories, as is set out below.

The determination of intergeneric relationships in the Olethreutinae is rather problematic as our present knowledge of the genitalia is so lacunary. Still the attribution of *Bactra* to the tribe Olethreutini by Heinrich (1926), in spite of the absence of a thoracic crest, seems to be correct. Without great difficulties *Bactra* can be placed in the *Endothenia* group of genera, with the remarkable spinose, hooked uncus in the males, and a single, reduced signum in the females. *Lobesia*, though differing in structure, seems also to be allied rather closely, as also is *Synthozyga* Lower, a recently re-established genus (Diakonoff, 1954) of the Indo-Australian region which I hope to revise next.

On the other hand the genus *Epibactra* Ragonot, 1894, with the only species *sareptana* Herrich-Schäffer, 1861, appears not only to be distant from *Bactra*, but even to belong to the tribe Eucosmini. *Parabactra* Meyrick, 1910, with a bilobed uncus, seems to be distant as well.

Bactra Stephens, 1834 (figs. 1-2, 11-13)

- Tortrix* (partim) Hübner, 1796, Samml. europ. Schmett., vol. 7, Tortr., t. 13, f. 80.
Tortrices fascianae (partim) Haworth, 1811, Lep. Brit., p. 459.
Tortrices inopianae (partim) Haworth, 1811, l.c., p. 468.
Ancylis (partim), Hübner, 1825, Verz. bek. Schmett., p. 376.
Aphelia Stephens, 1829, Syst. Cat. Brit. Ins., vol. 2, p. 180 (nec *Aphelia* Hübner, 1826), nom. praeocc.—Wocke, in Staudinger & Wocke, 1871, Catal. Lep. Eur., p. 251.—Walshingham, 1907, Faun. Haw., Microl., p. 687.—1914, Biol. Centr.-Amer., Het., p. 240.—Fernald, 1908, Gener. Tortr., p. 23, 58.—Fletcher, 1929, Mem. Agr. Ind., Ent., vol. 11, p. 18.—Praeoccupied. Type of the genus: *Tortrix plagana* Haworth, 1834 = *Bactra lanceolana* (Hübner, 1796), according to Fernald, 1908, p. 23.
Phoxopteryx (partim) Treitschke, 1830, Schmett. Eur., vol. 8, p. 231.
Phoxopteryx (partim), nom. emend., Duponchel, 1834, Hist. nat. Léop., p. 339.—Sodoffsky, 1837, Bull. Soc. Nat. Mosc., vol. 10, p. 93.

Bactra Stephens, 1834, Ill. Brit. Ent., Haust., vol. 4, p. 124 (nom. nov. pro *Aphelia* Stephens, 1829, nec Hübner, 1826).—Curtis, 1836, Brit. Entom., vol. 13, p. 599-600.—Wilkinson, 1859 (partim), Brit. Tortr., p. 115.—Stainton, 1859 (partim), Manual, vol. 2, p. 226.—Fernald, 1882, Trans. Amer. Ent. Soc., vol. 10, p. 28.—Fernald in Dyar, 1902, List N. Amer. Lep., p. 449.—Gener. Tortr. 1908, p. 23, 27, 31, 58.—Zeller, 1875, Verh. zool.-bot. Ges. Wien, vol. 25, p. 40.—Meyrick, 1885, Trans. New Zeal. Inst., vol. 17, p. 142. — 1895, Handb. Brit. Lep., p. 456. — 1909, Journ. Bomb. Nat. Hist. Soc., vol. 19, p. 582. — 1910, Trans. New Zeal. Inst., vol. 43, p. 89. — 1911, Proc. Linn. Soc. N.S. Wales, vol. 36, p. 225, 252-253. — 1911, Trans. Ent. Soc. Lond., p. 689. — Walsingham, 1897, Proc. Zool. Soc. Lond., p. 121. — 1900, Ann. Mag. Nat. Hist., ser. 7, vol. 6, p. 333-334. — 1907, Fauna Haw., Microl., p. 687. — 1908, Proc. Zool. Soc. Lond. 1907, p. 1001-1002. — 1914, Biol. Centr.-Amer., Het., p. 240. — Rebel, in Staudinger & Rebel, 1901, Catal. Lep. Pal. Faun., vol. 2, p. 113. — Kennel, in Spuler, 1907, Schmett. Eur., vol. 2, p. 273. — 1910, Pal. Tortric., p. 470, t. 2, fig. 2. — Forbes, 1923, Lepid. New York, p. 470. — Heinrich, 1926, U.S. Nat. Mus. Bull. 132, p. 76, 81-82, t. 8, f. 44-46. — Fletcher, 1929, Mem. Agric. Ind., Ent., vol. 11, p. 30. — Lhomme, 1946, Cat. Lep. Fr. & Belg., vol. 2, p. 381. — Diakonoff, 1950, Bull. Brit. Mus. Ent., vol. 1, p. 285. — Type of the genus: *Tortrix plagana* Haworth, 1834 (= *Tortrix lanceolana* Hübner, 1796), designated by Curtis, 1836, Brit. Ent., vol. 13, p. 599.

Grapholitha Aphelia, Herrich-Schäffer, 1849, Syst. Bearb. Lep. Eur., vol. 4, p. 243 (subgenus). — Heinemann, 1863, Schmett. Deutschl., Kleinschm., vol. 1, p. 134.

Sericoris (*Aphelia*) Snellen, 1882, Vlind. Nederl., vol. 2, p. 299-300 (subdivision of *Sericoris*).

Leptia Guenée, 1845, Ann. Soc. ent. France, ser. 2, vol. 3, p. 169. — 1845, Index method., p. 35. — Walsingham, 1907, Fauna Haw., Microl., p. 687. — 1914, Biol. Centr.-Amer., Het., p. 240. — Fernald, 1908, Gener. Tortr., p. 31, 58. — Fletcher, 1929, Mem. Agr. Ind., Ent., vol. 11, p. 30, 124. — Type of the genus *Tortrix lanceolana* Hübner, by monotypy.

Chiloides Butler, 1881, Ann. Mag. Nat. Hist., ser. 5, vol. 7, p. 392. — Meyrick, 1885, Trans. New Zeal. Inst., vol. 17, p. 142. — Fernald, 1908, Gener. Tortr., p. 44, 58. — Fletcher, 1929, Mem. Agr. Ind., Ent., vol. 11, p. 30, 46. — Type of the genus: *Chiloides straminea* Butler, 1881, by monotypy.

Noteraula Meyrick, 1892, Trans. New Zeal. Inst., vol. 24, p. 217. — Fernald, 1908, Gener. Tortr., p. 46, 58. — Walsingham, 1907, Faun. Haw., Microl., p. 688-689. — 1914, Biol. Centr.-Amer., Het., p. 240. — Fletcher, 1929, Mem. Agr. Ind., Ent., vol. 11, p. 30, 149. — Type of the genus: *Noteraula straminea* Meyrick, 1892 (nec Butler, 1881) = *Bactra noteraula* Walsingham, 1907, Fauna Haw., Microl., p. 689.

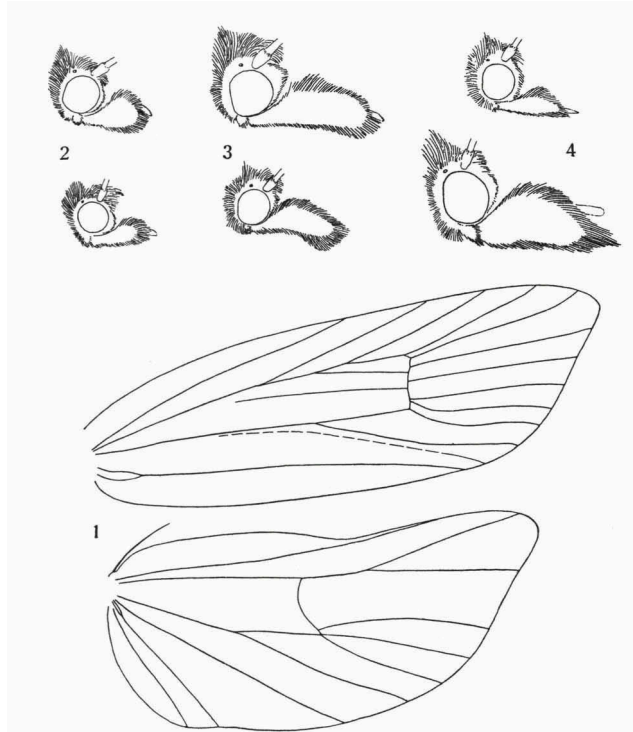
Bracta (lapsus) Pierce, 1922, Genit. Brit. Tortr., p. 40. — Fletcher, 1929, Mem. Agr. Ind., Ent., vol. 11, p. 30.

Head with appressed scales. Ocellus posterior. Proboscis developed. Antenna about 1/2, ciliate in male, scape normal. Palpus moderate, seldom rather long (e.g., *straminea*) porrect or subascending, median segment strongly dilated by roughly projecting scales above and beneath, terminal segment short, often entirely concealed in scaling of median segment in male, somewhat more exposed in female. Thorax without crest. Posterior tibia without modified hair-pencils.

Fore wing (fig. 1) narrow, lanceolate, more or less pointed, termen oblique, hardly sinuate. The shape of the wing, however, is subject to variation within a single species (e.g., *lanceolana*). 12 veins, all separate. 2 from cell

somewhat before $2/3$, more remote from 5 than from 4, 7 to termen, 10 slightly closer to 9 than to 11, 8 and 9 moderately approximated; parting vein from between 11 and 10, to above base of 7. Hind wing with 8 veins, 3, 4 and 5 separate, approximated at base, more or less equidistant. 6 and 7 stalked. No modified scaling.

The male genitalia provide, except for excellent specific characters, also well-defined subgeneric peculiarities; the armature of the uncus is unique and serves even as a generic character.



Figs. 1-4. Heads and wing neuration of genus *Bactra*. 1, *Bactra (Bactra) lanceolana*, wing neuration, male; 2, head, male (above), female (below); 3, *Bactra (Noteraula) noteraula*, head, male (above), female (below); 4, *Bactra (Chiloides) straminea*, head, male (above), female (below).

Tegumen broad and short, triangular or rounded. Uncus developed, short and stout, curved, hook set along edges with a dense palisade of spines. Socii developed, usually small and rounded. Gnathos membranous and indistinct, mostly not differentiated at all. Tuba analis membranous, often undeveloped. Valva well-developed and often modified, with an elongate cucullus of diverse size, more or less covered with hairs and bristles, especially towards apex, seldom with a marginal row of stout spines; sacculus usually bulbate,

complicated, with a diverse array of bristles and spines of which the central series or cluster represents the Spc_2 ; sometimes a valvula, i.e., a long lobe or arm, is present between the cucullus and the sacculus, mostly dilated at apex and with a marginal palisade of equal spines, representing the spine cluster Spc_1 . Vinculum and juxta of diverse shape, well-developed. Aedoeagus stout, often curved. Cornuti sometimes present, a series of spines.

Female genitalia are moderately modified and offer adequate specific characters, but they are less suited for the discrimination of subgenera than are the male genitalia.

The forms that I consider to be primitive have little modifications. The distal portion of the ductus bursae (colliculum) is not or hardly sclerotized; the lamella postvaginalis possesses delicate structures that are of importance for identification of species. In transitional forms there is a stronger colliculum. In more specialized species, finally, besides the well-developed colliculum there is a more or less extensive lodix, formed by sclerites of the ventro-caudal portion of the eighth sternite. A cestum, represented as a sclerite in the wall of the ductus bursae below the colliculum is sometimes present in these more specialized forms. The signum is single, a small sclerite in the wall of the corpus bursae, with an embossed, retinate or denticulate surface. Sometimes the signum is absent.

Type of the genus: *Bactra plagana* (Haworth, 1811) = *Tortrix plagana* Haworth, 1811 = *Ancylis lanceolana* Hübner, 1796.

1. Subgenus **Bactra** Stephens, 1834, status nov. (figs. 1-2, 11)

Bactra Stephens, 1834, Ill. Brit. Ent. Haust., vol. 4, p. 124.

Aphelia Stephens, 1829, nec Hübner, 1826 (praeocc.), Syst. Cat. Brit. Ins., vol. 2, p. 180.

A separated lobate valvula, crowned with the modified spine-cluster Spc_1 , absent. Sacculus with the spine-cluster Spc_2 , usually formed by a group of 3-4 stout spines. Cucullus developed. Aedoeagus short, without cornuti. Sterigma little modified, hardly sclerotized. Colliculum absent.

Palaeartic region, India, New Guinea.

Type of the subgenus: *Tortrix lanceolana* Hübner.

Bactra (Bactra) lanceolana (Hübner, 1796) (figs. 1-2, 11-13)

Tortrix lanceolana Hübner, 1796, Samml. europ. Schmett., vol. 7, Tortr., t. 13, f. 80.

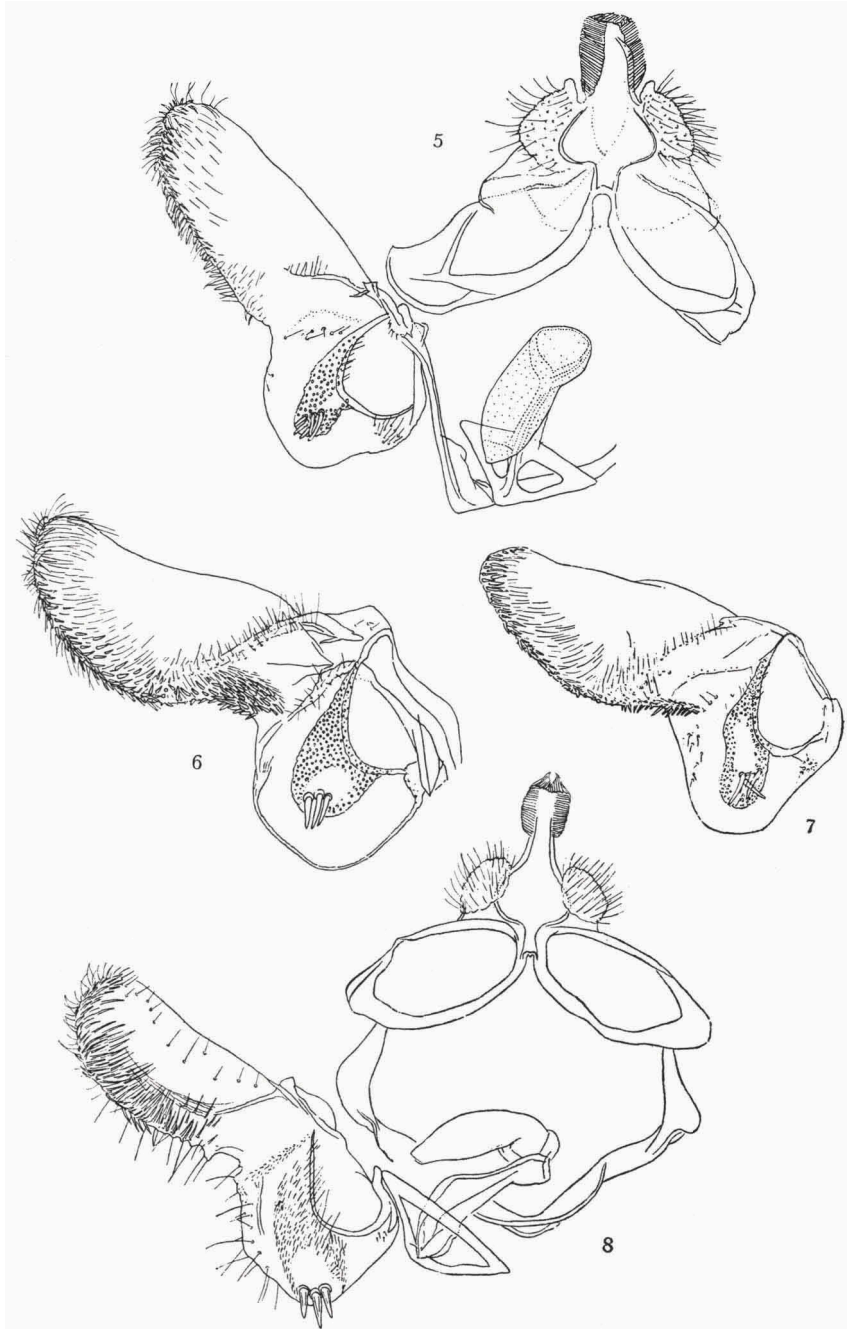
Ancylis lanceolana, Hübner, 1825, Verz. bek. Schmett., p. 376.

Phoxopteryx lanceolana, Treitschke, 1830, Schmett. Eur., vol. 8, p. 232.

Phoxopteryx lanceolana, Duponchel, 1834, Hist. nat. Léop., p. 239, t. 253, f. 1.

Tortix (Aphelia) lanceolana, Herrich-Schäffer, 1849, Syst. Bearb. Lep. Eur., vol. 4, p. 243. — Suppl. 1849, p. 317.

Bactra lanceolana, Wilkinson, 1859, Brit. Tortr., p. 115. — Stainton, 1859, Manual, vol. 2, p. 226. — Fernald, 1882, Trans. Amer. Ent. Soc., vol. 10, p. 28.



Figs. 5-8. Male genitalia of subgenus *Bactra*. 5, *furfurana*, type I; 6, valva of *furfurana*, type II, no. 1857; 7, valva of *furfurana*, type II, no. 1834; 8, *robustana*.

Grapholitha (Aphelia) lanceolana, Heinemann, 1863, Schmett. Deutschl., Kleinschm., vol. 1, p. 134.

Tortrix dibeliana Hübner, 1800, Samml. Europ. Schmett., vol. 7, Tortr. p. 272.

Tortrix pauperana Haworth, 1811, Lep. Brit., p. 469.

Tortrix expallidana Haworth, 1811, Lep. Brit., p. 469.

Tortrix egenana Haworth, 1811, Lep. Brit., p. 469.

Tortrix egestana Haworth, 1811, Lep. Brit., p. 470.

Tortrix lanceana Frölich, 1828, Ent. Tortr. Würt., p. 98.

Bactra nigrovittana Stephens, 1852, List Brit. Anim., vol. 10, p. 99.

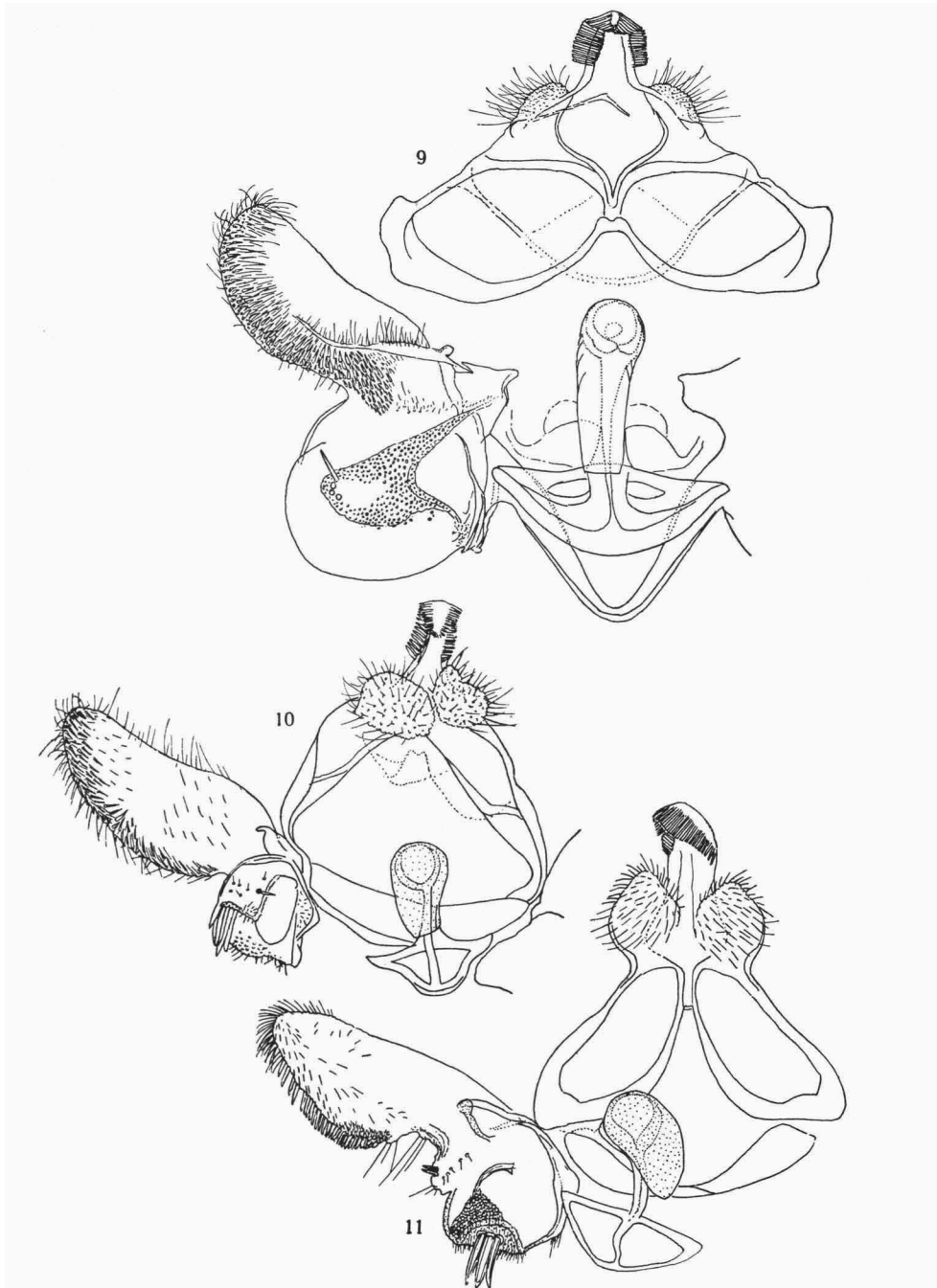
Bactra (Aphelia) egenana Kennel, 1900, non Haworth, 1811, Iris, vol. 13, p. 264. Syn. nov.

A considerable number of names have been regarded as synonyms of the present species which is very variable as to the size, the shape of the wing, the colouring and the markings. It is not my intention to present in this issue a complete and critical list of these synonyms, since I am chiefly concerned with the Southern Asiatic species. However, I would like to linger on the following two points.

(1). Through the kindness of Prof. Dr. E. M. Hering, of Berlin, I received for study, among other valuable material, cotypes of two Palaearctic species of *Bactra* that were described by Kennel. These two species, *egenana* Kennel and *fumosana* Kennel apparently have never been recaptured, nor was their type material restudied since the description in 1900. Consequently their identity remained rather obscure, in spite of the nice coloured reproductions in Kennel's well-known monograph. The group of species concerned, however, is so variable, that even excellent coloured drawings do not help very much to characterize them.

I regard *fumosana* to be a distinct species, as will be set out below. The name "*Bactra (Aphelia) egenana*" Kennel, however, is invalid by more than one reason. First, it is a homonym of *Bactra egenana* (Haworth, 1811); it is remarkable that this homonymy seems not to have been noticed earlier. Second, it is a synonym of *Bactra lanceolana*, since the genitalia of one of the two female cotypes at hand appear to be identical with those of *lanceolana*. Thus Kennel's name is added to the list of synonyms at the head of this chapter. I use this opportunity also to designate a lectotype for *egenana* Kennel, below.

(2). Curtis (1836, p. 599) designated *Tortrix plagana* Haworth, 1834, as the type of the genus *Bactra*. Fernald (1908, p. 23) confirms this and casually gives the synonymy *plagana* Haworth = *lanceolana* Hübner. Now Haworth attached the name *plagana* to a colour form of a *lanceolana*-like species with a dark longitudinal median streak from base to apex ["(The broad-streaked Drab) ... *plaga maxima centrali nigricante, a basi ad marginem posticum*"]. The size is $7\frac{1}{2}$ lines. Wood depicts this "*plagana*" on t.



Figs. 9-11. Male genitalia of subgenus *Bactra*. 9, *loeligeri* spec. nov.; 10, *graminivora*; 11, *lanceolana*.

33, f. 993, at "normal size", which is 14½ mm. Apparently this "forma" is identical with *nigrovittana* Stephens, 1852 (which is regarded by Kennel as the generatio aestiva, apparently without the slightest reason).

When studying the genitalia of ample material of *lanceolana* and *furfurana* I noticed that the above mentioned form can be found in both these species! In *furfurana* the specimens usually are slightly smaller than in *lanceolana*, and agreeing with the size of Haworth's *plagana* and Wood's figure of it. Several specimens devoid of the typical more or less retinate strigulation of *furfurana*, but with the longitudinal brown stripe, were arranged under *lanceolana* in several Dutch collections. Only the study of the genitalia revealed their true nature.

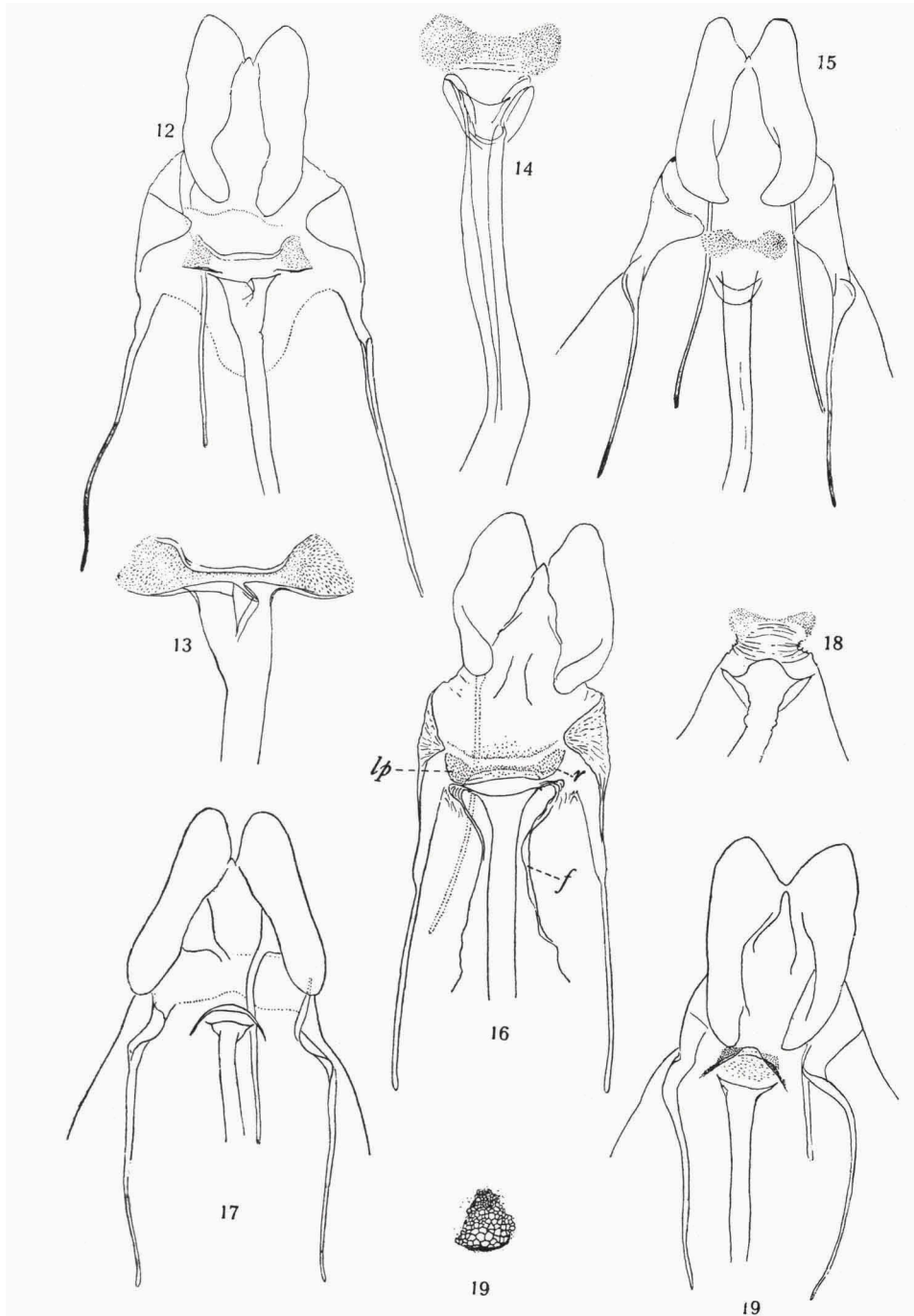
It is therefore not impossible that Haworth's *plagana* is a synonym of *furfurana* and not of *lanceolana*, a point for study by British taxonomists, easily enough to investigate if Haworth's types might still be available. If *Bactra furfurana* might appear to be identical with *Tortrix plagana* this fortunately would bring along no serious complications, since *furfurana* is closely allied, and without any doubt congeneric, with *lanceolana*. It is remarkable, furthermore, that Kennel altogether omits the name *plagana* Haworth in his monograph, and ascribes a few other synonyms of *lanceolana* to wrong authors (Rebel copies Kennel in the Staudinger & Rebel Catalogue).

Male genitalia (fig. 11) characteristic by a robust, rather short uncus which is angularly bent downward at the top, and especially, by the strong socii which have sclerotized bases and often appear to be erect and to flank the uncus. Valva emarginate ventrally, costa moderately curved; sacculus bulbous, the sclerotized and punctulate part occupying its ventral half, crowned with 4-5 strong spines. (Numbers of genital slides examined are cited below).

Female genitalia (figs. 12, 13). Ostium, a rather deep funnel with delicate wall (deeper than in *robustana*). Aciculate structure of the lamella postvaginalis shaped as a transverse band which is dilated into subtriangular or somewhat rounded lateral fields, each clearly bordered below by a small horizontal fold; the band is narrowed in the middle and bordered by a rather strong horizontal fold above. Ductus bursae tapering, rather narrow, with a delicate wall. The eighth tergite with the anapophyses distinctly sclerotized, brownish, stronger than in the other two species. (Numbers of genital slides examined are cited below).

There was much confusion about the few Palaearctic species of *Bactra*. Therefore I wish to use this opportunity to describe and to figure their genitalia, as these are decisive for the identification of the species.

Material studied, from the Zoologisches Museum der Humboldt Univer-



Figs. 12-19a. Female genitalia of subgenus *Bactra*. 12, *lanccolana*; 13, sterigma of the same; 14, *robustana*, sterigma; 15, the same, less magnified; 16, *fumosana*; 17, *furfurana* (Holland); 18, sterigma of the same; 19, *furfurana* (Sumatra); 19a, signum of the same.

sität, Berlin. *Bactra lanceolana*. Spain, Ildefonso, Coll. Staudinger, 10.VII. 2 ♂, gen. no. 1886. France, Teniet et Haad, 1892 (V. de B.), Coll. Staudinger, 1 ♀, gen. no. 1901. Province d'Oran, 1894, same collector and collection, 1 ♀, gen. no. 1902. Algeria, Atlas Mountains, Biskra, 1884, Coll. Staudinger, 1 ♀, gen. no. 1889. Asia Minor, Kurdistan, Diarbekir, Coll. Staudinger, 1 ♀, gen. no. 1917.

"*Bactra egenana*": lectotype, ♀, hereby designated: "Guelma, C. d. P.", "ex collect. Staudinger", "*Bactra egenana* Kenn. type". "Origin." Genitalia no 1882. Paratype: ♀, "26/6", "Origin.", "*Bactra egenana* Kenn. type".

Material studied in the Rijksmuseum van Natuurlijke Historie, Leiden. "Germania", coll. van Vollenhoven, 2 ♂, 1 ♀. Ober-Harz 3. VIII. 1890, coll. Führbringer, 1 ♂, genitalia no. 1858. "Hungaria", coll. Heylaerts, 2 ♂, coll. Snellen, 2 ♀. "Austria", 1 ♀. Holland, Rotterdam, 12. V. 1867, 1 ♂, gen. no. 1836; 10.VIII. 1867, 1 ♂; 19.VII. 1868, 1 ♀, gen. no. 1911. Rotterdamsche plassen, 9.VI.1866, 2 ♂, 10.VIII.1867, 1 ♂. Rijen, 3.VIII. 1894, 1 ♀, gen. no. 1913. Lochem, 19.VI. 1896, 1 ♂ (all collected by P.C.T. Snellen). Overveen, 22.VIII. 1928, 1 ♀, gen. no. 1912 (G. A. Count Bentinck). Hollandse Rading, 20.V. 1937, 1 ♂, gen. no. D. 291; 31.V. 1937, 1 ♂, gen. no. 1895; 20.VII.1937, 1 ♂, gen. no. D. 290; 7.VI.1946; 1 ♀, gen. no. D. 565, 1 ♂, gen. no. 1903. Kortenhoef 18.VI.1947, 1 ♀, gen. no. 1900. Huizen, 22.VI.1951, 1 ♀ (C. Doets). Breukelen, 25.V.1934, 2 ♂, gen. nos. 1849 and 1850. Den Haag, 27.V.1934, 1 ♂, gen. no. 1848 (A. Diakonoff).

Bactra (Bactra) furfurana (Haworth, 1811) (figs. 5-7, 17-19, 19a)

Tortrix furfurana Haworth, 1811, Lep. Brit., p. 466.

Bactra furfurana, Wilkinson, 1859, Brit. Tortr., p. 147. — Zeller, 1875, Verh. zool.-bot. Ges. Wien, vol. 25, p. 41. — Fernald, 1882, Trans. Am. Ent. Soc., vol. 10, p. 29.

Grapholitha (Aphelia) furfurana, Heinemann, 1863, Schmett. Deutschl., Kleinschm., p. 135.

— *acutana* Eversmann, 1844, Faun. Lep. Volgo-Ural., p. 529 (non binom.).

Phoxopterus lamana Zeller, 1846, Isis, vol. 30, p. 257.

Tortrix (Aphelia) scirpana Herrich-Schäffer, 1849, Syst. Bearb. Schmett. Eur., vol. 4, p. 243.

Tortrix (Aphelia) pauperana Herrich-Schäffer, 1849 (nec Haworth, 1811), Suppl. p. 302.

Sciaphila canuisana Millière, 1874, Rev. & Magas. Zool., ser. 3, vol. 2, p. 247; Ann. Soc. ent. Cannes 1875, t. 1, f. 6.

The general opinion is that this species is less numerous than *lanceolana*. However, this might not be true, because the small, variably coloured *lanceolana*-like forms of *furfurana* are attributed to the former species and put in collections in the wrong place.

The actual character of these forms is puzzling. Smaller specimens without any markings in the fore wing, or with the usual *lanceolana*-like crescentic

or triangular dark mark on the lower angle of cell, and finally, smaller specimens with the dark brown longitudinal suffused streak from base to apex of wing belong here. Usually they are attributed to *lanceolana*, till the study of their genitalia surprisingly shows that they belong to *furfurana*.

Actually the male genitalia of this "form" (type II) (fig. 7) show a rather constant and almost reliable difference of structure from the genitalia of *furfurana* proper (figs. 5-6), so that I was tempted to regard it as a separate species. However, I could find no corresponding females that sufficiently and constantly differ from those of *furfurana*; besides, the differences of the males are rather slight. They are indicated below. Perhaps a study of much more extensive material than that which was available to me would provide more solid ground for the separation of this form, and I would like to recommend this subject to other workers chiefly concerned with the study of the Palaearctic fauna. But for the time being I prefer not to make changes in the conception of the species *furfurana*.

Male genitalia (figs. 5-7) of two distinct types, almost so distinct as to suggest a specific separation, as is said above. Uncus rather long, gradually curved, more slender than in *lanceolana*, socii weak, as in *robustana*. Valva with the cucullus portion moderately narrowed and gently sinuate, marginal series of bristles narrow; there is no ridge across the disc, originating from the processus dorsalis; sacculus large, spheroid, the punctulate central portion small as compared with the entire sacculus, not reaching its ventral margin.

In type I (fig. 5) the marginal row of bristles on the ventral edge of the cucullus becomes obliterate on the border of the sacculus; there is no harpe (ridge from the processus basalis across the disc of the valva); the punctulate base of Spc_2 is abruptly narrowed, Spc_2 with 10 or more spines.

In type II (figs. 6-7) the marginal row of bristles on the cucullus is more developed, reaching beyond the border of the sacculus, and instead of becoming obliterate there, is dilated or forms a somewhat separated dense patch; punctulate base of Spc_2 is broader, with top rounded, Spc_2 formed by 3-5 spines.

Female genitalia (figs. 17-19, 19a). Ostium funnel-shaped and about of the same shape as in *lanceolana* but less sclerotized; ductus bursae narrower, tapering; lamella postvaginalis with a fold shaped like a lid over the ostium, wall of the ostium with fine horizontal folds, but without any aciculae; membrane above the lid-like fold with small wrinkles at the sides.

Material studied, in the Zoologisches Museum der Humboldt Universität, Berlin. Guelma, Spain, 1 ♀, gen. no. 1904. "Ex coll. Staudinger", 1 ♂, gen. no. 1898. Jordan, 2. VIII. 1898, Bach., 1 ♀, gen. no. 1905. Margelan, Central Asia, 1880, Hbhr., 1 ♀, gen. no. 1899. Thian. or., Hbhr., 1896 1 ♂,

gen. no. 1891. "Changai" (= Shanghai, S. China?), 2 ♂, gen. no. 1888.

Material studied in the Rijksmuseum van Natuurlijke Historie, Leiden. "Anglia", 2 ♂, gen. nos. 1908 and 1909. "Ragonot", 2 ♂. "*Aphelia lanceolana* sec. Zeller, Hungaria", 1 ♂, gen. no. 1907. Holland: Delfshaven 11. VII. 1881, 1 ♀, gen. no. 1831. Venlo, 10. VI. 1898, 1 ♀, gen. no. 1910. Dordrecht, 10. VII. 1874, gen. no. 1857 (P. C. T. Snellen). Breda, 14. VI., 1 ♂, gen. no. 1832 (Heylaerts). Overveen, 23. III. 1928, 1 ♂, gen. no. 1834 (G. A. Count Bentinck). Hilversum, 10. VI. 1937, 1 ♂; 21. VI. 1939, 1 ♂, gen. no. D. 389; 14. VI. 1951, 1 ♀, gen. no. 1914. Hollandse Rading, 14. VI. 1939, 1 ♂, gen. no. 1843. Kortenhoeft, 21. VII. 1937, 1 ♀. Blaricum, 20. IX. 1939, 1 ♀, gen. no. 1815 (C. Doets). Nuenen, 3. VI. 1937, 1 ♀, gen. no. 1835 (H. Neijts). Leersum, 1 ♀, 6. VI. 1937, gen. no. 1846. Ouddorp, Goeree, 18. VI. 1934, 2 ♂, gen. nos. 1844 and 1845 (A. Diakonoff).

Central West Sumatra, Fort de Kock, 920 m, X. 1920, 1 ♀, gen. no. 1584; VI. 1921, 1 ♀, gen. no. 1541 (fig. 19) (E. Jacobson). This is the most southern report of the species.

Bactra (Bactra) robustana (Christoph, 1872) (figs. 8, 14-15)

Aphelia robustana Christoph, 1872, Horae Soc. ent. Ross., vol. 9, p. 13, t. 1, f. 10.

Bactra robustana, Rebel, in Staudinger & Rebel, 1901, Catal. Lep. Pal. Faun., vol. 2, p. 113. — Kennel, 1910, Palaearkt. Tortr., p. 472, t. 18, f. 72. — Kloet & Hincks, 1945, Checklist Brit. Ins., p. 124. — Vári, 1951, Entom. Berichten, vol. 13, p. 198. — Bentinck, 1951, Tijdschr. v. Entom., vol. 94, p. 334.

Bactra scirpicolana Pierce, 1935, Entomologist, p. 148-149. — Bentinck, 1936, Tijdschr. v. Entom., vol. 79, p. XXVII. — L.c., p. 201.

Grapholitha (Bactra) scirpicolana, Bentinck, 1936, l.c., p. 209.

Bactra grisea Djakonov, 1929, Rev. Russe Entom., vol. 23, p. 164, figs. 21-22. Syn. nov.

This species fits well in the wide range of variation of *B. lanceolana* as to its colouring and shape of wing; superficially it can be separated only by the larger size of the female, and, less easily, by somewhat lighter colouring, but the male is similar to *lanceolana* also in this respect, and might be distinguished only, and perhaps not always, by its rather dark grey colour and finely mottled appearance. Another indication as to the identity of *robustana* is the habitat: salt marshes and sea coasts, since the food plant is *Scirpus maritima*. Although the connection with this food plant was known for a considerable time, the identity of *robustana* was not clarified till Pierce described the species in England under the name of *scirpicolana* and indicated the differences of the genitalia, while, quite recently the fact that *scirpicolana* and *robustana* are the same became more generally known. I am not certain who was the first to stipulate this synonymy, but the first published statement thereof apparently is by Kloet & Hincks. The stray remarks on this synonymy are concealed in local literature, therefore I am not certain that my above list of citations is complete.

B. robustana is rather rare in the Dutch collections as far, because of its local distribution. Peculiar is that males are so much rarer than females.

Bactra grisea Djakonov, 1929, described after a single male specimen from the Crimea, must be a synonym of *robustana*. While the original description of the colouring and markings disagrees only in the ground colour being white, instead of sordid creamy, as in the specimens of *robustana* studied by me, the careful drawings of the genitalia show beyond doubt that *grisea* is conspecific with *robustana*.

The male genitalia (fig. 8) are intermediate between those of *lanceolana* differing by the longer and more gradually bent uncus and by not sclerotized bases of the socii, and those of *furfurana* which has a less sclerotized sacculus, with the Spc_2 not marginal, but discal.

♂ 17 mm. Head pale ochreous-tawny, more or less clouded with fuscous, palpus blackish-fuscous externally except base of median and entire basal segment which are whitish. Antenna pale ochreous suffused with dark fuscous towards base. Thorax fuscous-grey, densely mottled with fine ochreous-whitish dots, dots on tegulae similar, but larger. Abdomen fuscous-grey.

Fore wing narrow, elongate, broadest at $3/4$, costa gently curved towards extremities, almost straight in the middle, apex rounded-pointed, not prominent, termen gently concave on upper half. Evenly rather dark fuscous-grey, whitish-ochreous ground colour much reduced, so as to form numerous small dots giving rise to irregular mottling all over the wing, confluent to pale lines between veins and along fold, dotting along dorsum, strigulation along costa and a pale line along termen which is irregularly serrate anteriorly. Dark markings blackish, well-defined: a big crescentic spot on lower angle of cell, a transverse series of irregular elongate interneural marks halfway towards termen, and another series of rounded, subterminal marks, becoming larger towards apex (largest spot in apex). Cilia rather dark grey, with a dark fuscous basal line that is tipped with whitish, and with a series of faint paler lines.

Hind wing rather dark grey, becoming paler towards base. Cilia pale grey with a darker subbasal, and a paler antemedian line.

Male specimen redescribed, from Denmark, Copenhagen, Amager, bred from a stem of *Scirpus maritima* (Fr. Gudman Z., Berlin Museum Collection).

Another male, from Holland, Amsterdam, collected in a light trap 14.VI. 1937, genitalia slide no. 1847 (A. Diakonoff) is much less obscured, with the fuscous-grey colouring forming a mottled pattern on whitish-ochreous ground colour; upper posterior part of cell and veins originating from there finely and distinctly lined with fuscous-grey. The entire fore wing has this very

finely mottled appearance. The hind wing is darker grey than in the preceding specimen. A third male, probably from the type locality (label undecipherable) is intermediate, with the colouring of the Dutch specimen, but with a distinct crescentic spot, centred by a whitish dot. Finally, a male from England, Hayling, Sussex, bred from *Scirpus maritima* VI.1889 (Fletcher), genitalia slide no. 2450 B.M. (in the British Museum), resembles the male from Denmark, but has the tornal portion of the wing (as far as the line from apex to $\frac{1}{3}$ of dorsum) suffused with ochreous.

♀ 16-22.5 mm (specimen redescribed, 22 mm). Head and palpus ochreous-whitish, mixed with fuscous, base of palpus white. Thorax ochreous-whitish, mixed with fuscous. Fore wing long and narrow, broadest at $\frac{3}{4}$, costa gently curved, more so towards base, apex pointed but hardly produced, termen hardly concave above, rather oblique.

Ground colour whitish, reduced to irregular dots and strigulae along upper third of wing and to a series of marginal dots along dorsum. Upper third of wing suffused with ochreous-tawny and strewn with minute dark dots (tips of scales), ochreous colour more distinct towards apex. Lower $\frac{2}{3}$ of wing with a cloudy deep coffee-brown suffusion which becomes continuous on central third of wing, so as to altogether obscure the other colour and to form a dark streak from base to apex, which streak is suffused below and sharply edged above; interneural spaces towards termen, and tornal area less obscured with dark brown. Cilia ochreous-whitish, suffused with fuscous, a sharp antemedian brown line, base whitish.

Hind wing fuscous with bronze gloss becoming somewhat paler towards base. Cilia whitish, glossy, with fuscous tips and a subbasal band.

Female specimen redescribed, from Russia, Sarepta (typical locality), from the Christoph collection (Walsingham Collection, in the British Museum). Genitalia slide no. 2458 B.M.

This is the typical colouring. A female from England, Hayling Island, Sussex, bred VI. 1889 from *Scirpus maritima* (Fletcher), has the ochreous-tawny suffusion replaced by a greyish-fuscous, while the dark brown colouring extends over $\frac{2}{3}$ of wing. The females from Holland, all from South Holland, Numansdorp, bred in July from *Scirpus maritima*, are either unicolorous light greyish-fuscous with darker apex and termen, or greyish-fuscous with a suffused dark brown median streak from base to apex.

Other material studied: 1 ♀, Russia, Taganrog, "31 M", 1875; 1 ♀, "Bogda", genitalia slide no. 1916; 1 ♀, Diarbekir, Asia Minor, genitalia slide no. 1917. 1 ♀, Grobin Rolow, 15 Aug. 1928 (Dr. O. Brehm).

Male genitalia intermediate between those of *lanceolana* and those of *furfurana* but nearer to those of the latter. Tegumen, uncus, and socii are

similar to those in *furfurana*. Valva more constricted than *furfurana*, constriction shorter than in *lanceolana*, cucullus with a rather straight costa, and gradually bordered ventral edge, marginal band of bristles broader than in *furfurana*, stopping abruptly at the emargination, disc above this entirely naked; sacculus similar to that in *lanceolana*, bulbous, the conical central portion, which is punctulate and finely haired, is larger than in both the other species, reaching to margin, crowned with 3-4 stout spines. Other, minor, differences become evident when comparing figs. 5-8 and 11. (Numbers of genital slides are cited below).

Female genitalia (figs. 14-15). Ostium shaped as a short funnel, somewhat more robust than in *furfurana*, this funnel enveloped below by a thin fold; finely wrinkled and acicular structure above the ostium shaped like a simple transverse band, sometimes narrowed or bent down in middle. Upper half of ductus bursae rather broad and straight.

Bactra (Bactra) fumosana Kennel, 1900 (fig. 16)

Bactra (Aphelia) fumosana Kennel, 1900, Iris, vol. 13, p. 263.

Bactra fumosana, Kennel, 1910, Palaearkt. Tortr., p. 472-473, t. 18, f. 73a. — Rebel, in Staudinger & Rebel, 1901, Catal. Lep. Pal. Faun., vol. 2, p. 113.

I owe the privilege of examining the type specimen of this species to Professor Dr. E. M. Hering, of Berlin. After some hesitation I am compelled to regard this as distinct from *robustana* and intermediate between *robustana* (to which it is rather similar superficially), and *lanceolana*, to which it is nearest in genital characters of the female, as will be clear after the study of figs. 12-13, 14-15, and 16. The male genitalia might provide additional characters for separation of this species, but they are unknown as far.

The type specimen is very similar to *robustana*, but is entirely suffused with rather bright yellowish-fulvous, with a fuscous shadow on the lower $\frac{2}{3}$ of the wing showing through this suffusion. In Kennel's figure this colouring is not sufficiently prominent; at the other hand the type specimen shows no trace of the pinkish suffusion, depicted by Kennel, which, however, might be due to discolouring of the type specimen since.

The type of *fumosana* is labelled: "Margelan, 84, Hbhr", "Origin.", "*Bactra fumosana* Kennel. Type", "Ex collect. Staudinger" (in the Berlin Museum). Genitalia slide no. 1883.

The type locality is Margelan, province Ferghana, Central Asia.

Male genitalia are unknown.

Female genitalia. Ductus bursae weak, dilated into a funnel-shaped ostium bursae; this portion of the ductus bursae is flanked by a distinct fold (fig.

16, *f*) that is decidedly absent in *lanceolana*, as well as in *robustana*. The structure of the lamella postvaginalis (fig. 16, *lp*) (being the wall dorsad from the ostium bursae) resembles most that of *lanceolana*, but its lateral extremities are not truncate, with a well-defined rim (absent in *lanceolana*) (fig. 16, *r*). The lamella postvaginalis in *robustana* (figs. 12, 13) shows only two pileate tumescences, without distinct edges to them.

Bactra (Bactra) loeligeri spec. nov. (fig. 9)

♂ 18 mm. Head whitish-ochreous, roughish on vertex. Antenna whitish-ochreous, infuscated towards base. Palpus strongly dilated, brushy along edge; whitish-ochreous, a dark fuscous, well-defined, elongate spot extending along dorsal half of median segment from base to marginal cilia, cilia of lower angle infuscated; terminal segment short, exposed halfway, infuscated externally and dorsally. Thorax whitish-ochreous, suffused with pale brownish-fuscous. Abdomen whitish-ochreous. Legs whitish-ochreous, suffused, and tarsi ringed, with fuscous.

Fore wing considerably dilated, broadest at $3/4$, costa gently curved throughout, apex rather strongly pointed, termen gently sinuate, oblique, glossy. Whitish-ochreous, markings fuscous-brown, with some edges finely suffused with light tawny. Anterior third of costa with short, subtriangular marks, beyond $1/3$ becoming slender oblique streaks that reach to vein 8; the streak on middle of costa broader, dark fuscous-brown, with end gently curved upwards; a broad streak of dark brownish-fuscous suffusion occupying about median third of wing breadth and extending from just beyond base to beyond end of cell, extended at $1/4$ of wing length by a rectangular, downward prominence, and forming a semi-ellipsoid dark rather large patch around lower angle of cell; three well-defined interneural striae, dark and straight, connecting the above mentioned suffusion with apex and termen, running between veins 5 and 6, 6 and 7, and 7 and 8, respectively, interspaces slightly shaded with greyish, this shade extended as a well-defined broad tawny bar over apex and apical cilia; an incomplete brownish line along posterior half of vein 1c; short interneural dark markings along termen, from below vein 5 to tornus; a short mark between veins 2 and 3, halfway between cell and termen; dorsal portion of wing faintly suffused with light brownish, dorsal edge with a series of triangular dots obscured by irroration. Cilia dull whitish-ochreous, with indication of three narrow parting fuscous lines.

Hind wing pale fuscous, with a faint purplish tinge; towards dorsum becoming whitish; extreme apex infuscated. Cilia whitish-ochreous, with greyish-silvery gloss; a fuscous subbasal line along costa, around apex and along upper portion of termen.

Uncus (fig. 9) rather long. Vinculum broad, projecting downwards in the shape of a V. Valva of the type of *B. furfurana*, but with a strongly extended and rounded sacculus.

Female unknown.

Siberia, holotype, ♂, "Amur", "*Aphelia Lanceolana*", "ex collect. Staudinger", genitalia slide no. 1892 (fig. 9). Paratype, ♂, "Ussuri", "ex collect. Staudinger", gen. no. 1890. A robust species, resembling *lanceolana* but with more dilated and pointed fore wings. The three interneural apical lines are conspicuous.

Type locality: Siberia, Amur region.

Dedicated to Dr. A. Loeliger of Leiden, for services rendered to Microlepidopterology.

Bactra (Bactra) graminivora Meyrick, 1922 (fig. 10)

Bactra graminivora Meyrick, 1922, Exot. Microlep., vol. 2, p. 521 (♂ ♀, Bengal). — T. B. Fletcher, 1932, Life-histories of Indian Microlep., ser. 2, p. 24, pl. 14, 15, figs. a-d, (biology, food plant). — Diakonoff, Bull. Brit. Mus., Entom., vol. 1, p. 287, pl. 6, fig. 24, pl. 7 figs. 34, 36 (lectotype design., genit. ♂ ♀ descr.).

I use this opportunity to reproduce a drawing of the male genitalia of this species, that might be clearer than my figure of 1950 cited above, which is after a photograph. The present figure is after the genitalia no. 1922 of a specimen from Karachi (Swinhoe), named "*B. lanceolana* Hb." (A. M. N. H.).

This species belongs to a group of species of the subgenus *Bactra* that are not Palaearctic but have a tropical Asiatic distribution. This group is somewhat modified. I have another closely related species from New Guinea (that will be described elsewhere). As can be seen from fig. 6, the sacculus of this group is strongly separated, and Spc_2 forms a marginal dense cluster of usually strong spines. But there is no trace of a separate valvula.

Bactra (Bactra) metriacma (Meyrick, 1909, p. 583), is, in my opinion, an intermediate form between the type of the male genitalia of *lanceolana*, and that of those of *graminivora* (see figure in: Diakonoff, 1950, pl. 5, fig. 19).

2. Subgenus ***Noteraula*** Meyrick, 1892, status nov. (figs. 3, 20-21)

Noteraula Meyrick, 1892, Trans. N. Zeal. Inst., vol. 24, p. 217. — Fernald, 1908, Genr. Tortr., p. 46, 58. — Walsingham, 1907, Faun. Haw., Microl., p. 688-689. — 1914, Biol. Centr.-Amer., Het., p. 240. — Fletcher, 1929, Mem. Agr. Ind., Ent., vol. 11, p. 30, 149.

A separate lobate valvula, crowned with the modified spine-cluster Spc_1 , absent. Sacculus with the spine-cluster Spc_2 , formed by a long transverse series of strong spines. Aedoeagus short, without cornuti. Sterigma, a

sclerotized and curved fold above the ostium bursae. Colliculum present, tubular.

Type of the subgenus: *Bactra straminea* Meyrick, 1892 nec Butler, 1881 = *Bactra noteraula* Walsingham, 1907.

Distribution: New Zealand.

Bactra (Noteraula) noteraula Walsingham, 1907 (figs. 3, 20-21)

Bactra noteraula Walsingham, 1907, Fauna Haw., vol. 5, p. 689 (new name for *B. straminea* Meyrick nec Butler, 1881), Trans. N. Zeal. Inst., vol. 17, p. 142 (New Zealand, partim).

Noteraula straminea Meyrick, 1891 (nec Butl., 1881), Trans. N. Zeal. Inst., vol. 24, p. 217 (New Zealand only).

Meyrick (1885) considered *Chiloides* to be distinct from *Bactra* by the separation of the veins 3 and 4 in the hind wings, and by the longer palpi. However, he thought that the New Zealand species is conspecific with the Hawaiian *straminea*. Walsingham (1907) drew attention to the constant difference of the ciliations of the male antennae: "in the Hawaiian examples they are uniformly shortly biciliate, whereas the New Zealand examples are biciliate from 1-1½, the joints having also a more dentate appearance..." and suggested that the New Zealand species "should bear at least the varietal name *Bactra noteraula* (n.n.)". *Bactra straminea* of Hawaii he also regarded as a "geographical and local race" of the European *Bactra lanceolana*.

Male genitalia (fig. 20). Tegumen erect-triangular, socii small. Cucullus rather slender; sacculus short, not much swollen, Spc₂ well-developed as a transverse series of very strong spines. (Slides no. 1855, no. 1861, figured).

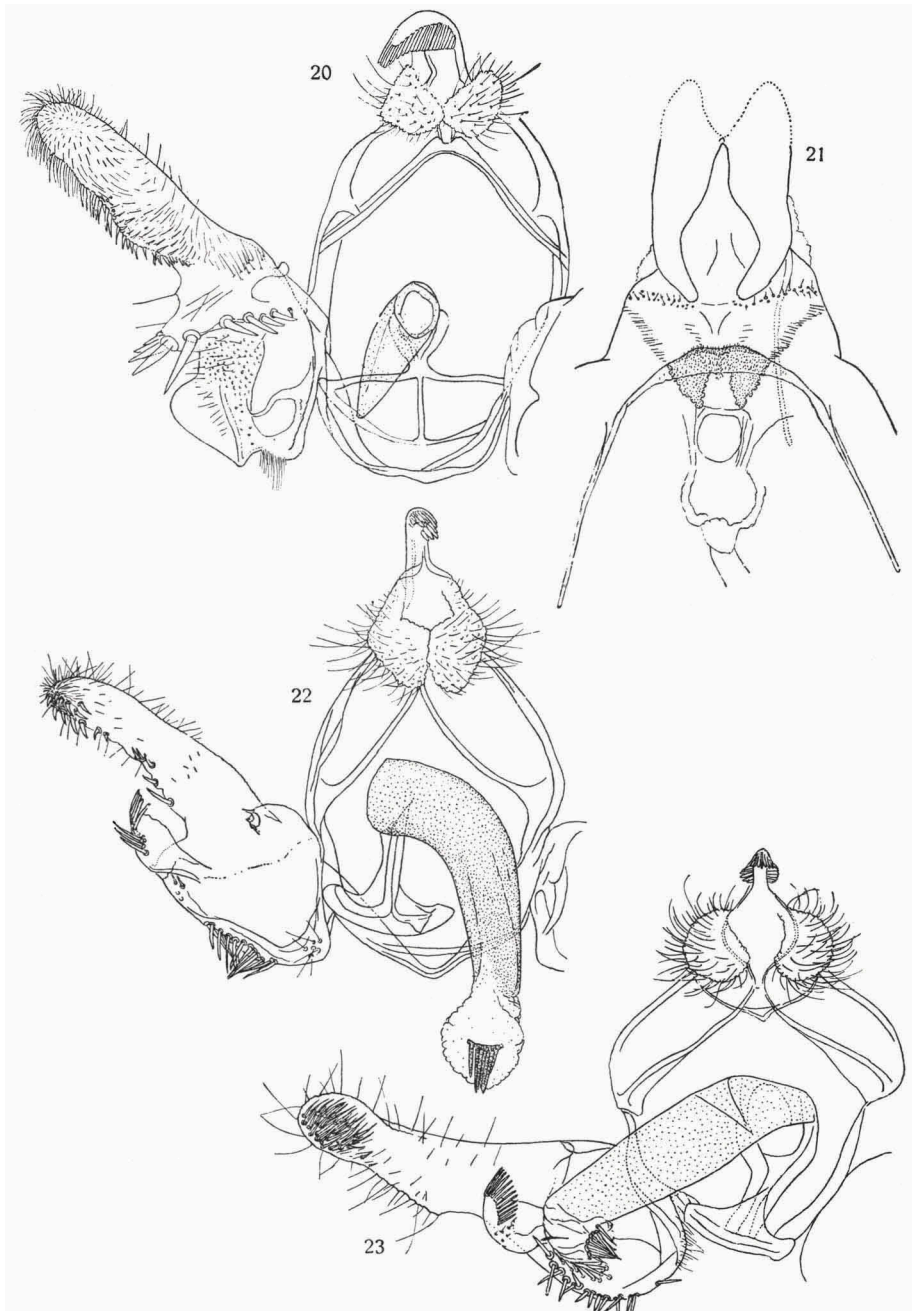
Female genitalia (fig. 21). Sterigma modified and sclerotized, perforated by a rather large ostium bursae, above which (i.e., caudad from which) are developed two subtriangular thickenings. (Slide figured: no. 1861).

Material studied. New Zealand, Otaki, 24.II.1883, Meyrick leg., 1 ♂, gen. no. 1855. Taranaki, 27.II.1883, same collector, 1 ♂, gen. no. 1856. Nelson, 22.I.1886, same collector, 1 ♀, gen. no. 1861 (Meyrick Collection in the British Museum).

3. Subgenus ***Chiloides*** Butler, 1881, status nov. (figs. 4, 24-25)

Chiloides Butler, 1881, Ann. Mag. Nat. Hist., ser. 5, vol. 7, p. 392. — Meyrick, 1885, Trans. New Zeal. Inst., vol. 17, p. 142. — Fernald, 1908, Gener. Tortr., p. 44, 58. — Fletcher, 1929, Mem. Agr. Ind., Ent., vol. 11, p. 30, 46.

A separated, lobe-like valvula present, crowned with a modified spine-cluster Spc₁. Sacculus mostly extended, with a diversely arranged armature of spines, representing the spine-cluster Spc₂. Cucullus developed in a free,



Figs. 20-23. Genitalia of subgenera *Noteraula* and *Chiloides*. 20, *Bactra (N.) noteraula*, male; 21, the same, female; 22, *B. (Chiloides) patris* spec. nov., male; 23, *B. (C.) angulata* spec. nov., male.

more or less slender, arm. Aedoeagus of variable length, usually moderate or long, curved, often with cornuti. Sterigma and lodix modified and sclerotized. Colliculum tubular, of variable length and sclerotization.

Type of the subgenus: *Chiloides straminea* Butler, 1881 (Hawaii).

Circumtropical region, southern Europe, southern part of North America.

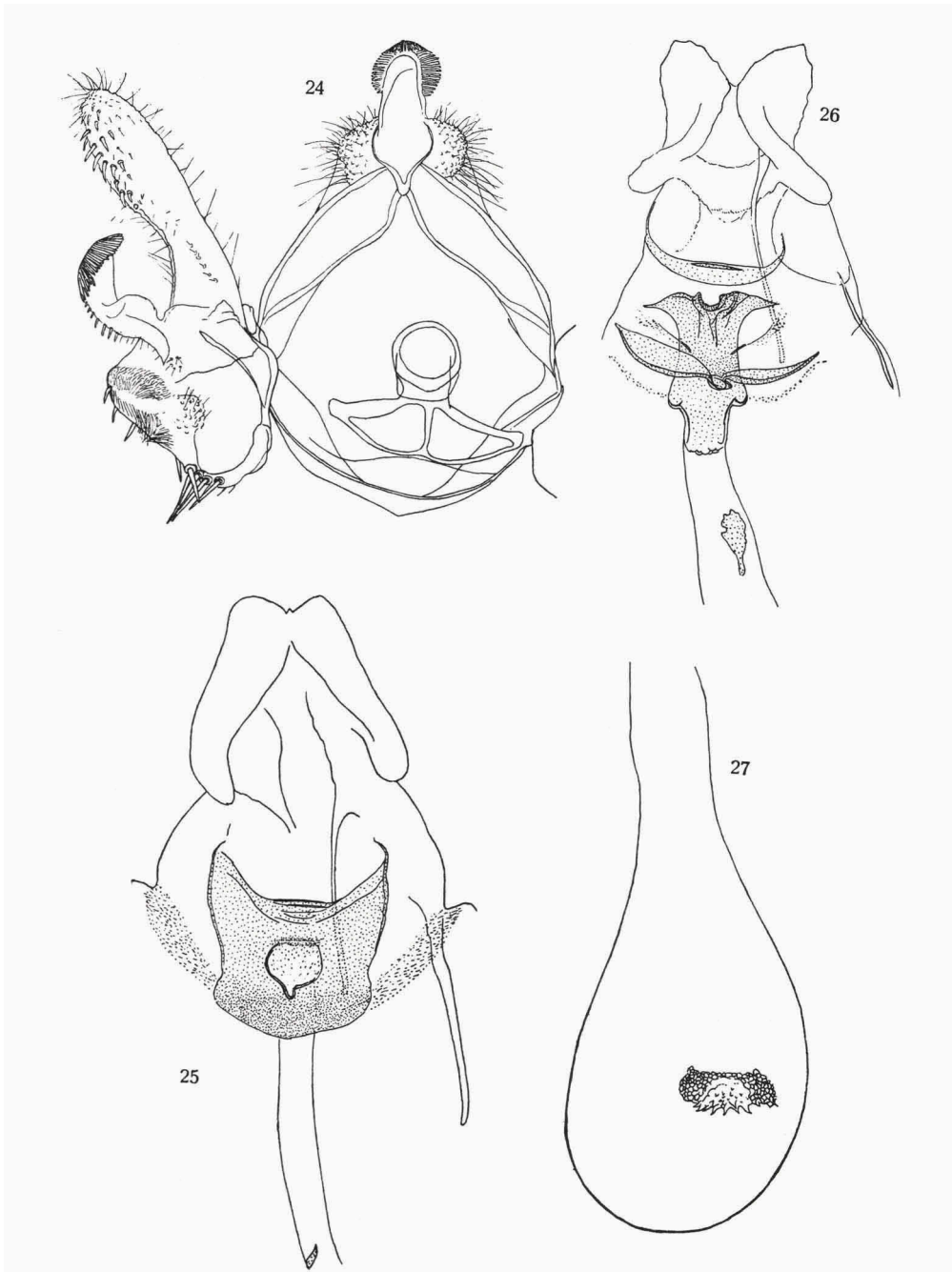
Most tropical species belong to this subgenus. The group is well-defined, and so strongly separated from the foregoing subgenera that the extremes seem to belong to distinct genera. However, there are transitional forms with less specialized median part of the valva, forming but a short process (valvula) so that the group is better off with the status of a subgenus.

There is a distinct evolutionary series from species with short aedoeagus and little sclerotized sterigma to robust species with long, curved, and sclerotized aedoeagus and a corresponding strongly sclerotized tubular ductus bursae.

***Bactra (Chiloides) angulata* spec. nov.** (figs. 23, 26-27)

♂ 11-11.5 mm (holotype 11.5 mm), ♀ 11.5-14.5 mm (allotype 14.5 mm). Head whitish touched with tawny, laterally mixed with a few dark fuscous scales behind or around ocellus. Antenna tawny, finely ringed with dark fuscous. Palpus triangularly dilated; in ♂ moderate, roughish along upper edge and at apex, terminal segment partially concealed; in ♀ moderately long, roughish also along lower edge of median segment, terminal segment almost entirely concealed; in ♂ and ♀ whitish, touched with tawny, from beyond base to below top of median segment suffused with blackish, upper edge of this colour well-defined, oblique. Thorax whitish, touched with ochreous or tawny, shoulder with a dark fuscous spot, apex with a faint fuscous suffusion, edged on both sides by a short dark marginal streak. Abdomen white, touched with tawny or fuscous, in the holotype with apex suffused with fuscous. Legs whitish, touched with fuscous or tawny, anterior leg infuscated, median slightly suffused with fuscous.

Fore wing elongate-subovate, rather narrow, broadest in the middle; costa considerably curved throughout, apex moderately pointed, termen in ♂ moderately convex, in ♀ less convex, sometimes gently concave in middle, rather oblique. Whitish partially mixed with dark leaden grey. In dark specimens (also in the holotype) markings blackish-brown, suffused, especially anteriorly, with light fuscous-tawny, well-defined; in pale specimens markings light fuscous. Male. Costa to before apex suffused with leaden-grey, becoming paler, and interrupted by white transverse strigulae posteriorly; two suffused dark leaden streaks between cell and termen, parallel to termen, from middle of wing to above tornus, attenuated downward, interconnected above; basal patch large, reaching to 1/3 of wing length



Figs. 24-27. Genitalia of subgenus *Chiloides*. 24, *straminea*, male; 25, the same, female; 26, *angulata* spec. nov., female; 27, the same, bursa copulatrix with signum.

at its lower $\frac{2}{3}$ (in fold), its edge considerably convex throughout but more oblique above fold than below it, from $\frac{1}{4}$ of costa to $\frac{2}{3}$ of dorsum, serrulate throughout, brownish-black; basal patch itself more or less suffused with light fuscous-tawny, becoming paler towards base, dark brown bars on costa; some dark brown dots along fold from beyond base of wing to edge of basal patch, forming an indistinct wedge with top basal, space between dots filled with leaden-grey; a rather narrow blackish-brown streak from before middle of costa to lower edge of cell, where its extremity is dilated and extended so as to form the usual triangular spot which is almost blackish; this streak running parallel to upper portion of edge of basal patch; space between these markings suffused below costa and along third fourth of wing breadth with leaden-grey, and traversed by an interrupted line of dark brown irroration, running halfway between and parallel to upper portion of the edge of basal patch and transverse streak, and becoming obliterate below fold; four very oblique fuscous-tawny transverse streaks on costa, becoming dark brown above, attenuated below, interconnected by leaden-grey suffusion below costa; third streak longest, fourth well before apex, short; all dark brown costal markings alternating with dark leaden-grey bars, becoming narrower posteriorly, two ultimate bars almost black, small, vertical; a wedge-shaped mark with point directed towards base, along middle portion of vein 7; a subtriangular blackish mark with top down, occupying about lower half of apex, but not quite reaching edge of wing; a blackish dot on termination of vein 6 and an irregular dark brown streak along termen from vein 5 to tornus, attenuated downward; all veins beyond cell, and vein 1c throughout, finely and distinctly streaked with brown; an irregular series of rather large brown dots along dorsum; cilia light grey with darker tips and a dark grey subbasal line. In pale specimens leaden-grey markings altogether absent, other markings are light fuscous, instead of dark brown, less defined, but more interconnected, e.g., the posterior markings, forming an almost continuous fascia from the lower angle of cell to apex. Female. All specimens paler, intermediate between the described male holotype and the paratypes; however, always distinct are: edge of basal patch and the characteristic angulate fascia formed by the transverse fascia and by the streak from the lower angle of cell to apex.

Hind wing pale fuscous, with a silken gloss, in pale males, and in all females, whitish, only touched with fuscous; cilia concolorous, sometimes slightly darker towards apex.

Tegumen (fig. 23) rather low and broad. Uncus small, rounded. Socius rather large, rounded. Valva with a narrow cucullus, with a small clavate, rounded top, bristly only on this top; valvula well-developed, but rather

small, reaching $1/3$ towards top of cucullus; sacculus rounded, not isolated, beset with a marginal row of short spines (Spc_2), with a submarginal patch of hairs. Juxta small, caulis rather long. Aedoeagus rather long, little curved. Cornuti, a patch of strong spines (slides no. 1859, holotype; no. 1606, paratype, figured).

Lodix (fig. 26), two semiellipsoid plates, with an emargination in between. Colliculum with acute lateral angles and a furrow in the middle of upper rim, with rounded lateral dilatations below the middle. Cestum present. Signum (fig. 27) distinct, resembling a compressed basket. (Slides no. 1614, allotype; no. 1615, figured, and no. 1825, paratypes).

Central Java, Telawa near Semarang, 40 m, teak forest, 4.VI.1953, ♀, gen. no. 1704. East Borneo, Balikpapan, Mentawi River, 50 m, October 1950, holotype, ♂, gen. 1859; paratype, ♂, gen. no. 1606; paratype, ♂, Balikpapan, Wain River, 50 m, November, 1950: allotype, ♀, gen. no. 1815; paratype ♀, gen. no. 1814; paratype ♀, gen. no. 1935; paratypes, ♂, ♀ (A. M. R. Wegner) (L.M.). North Moluccan Islands, Halmahera Island, Tolewang, 50 m, 12-25 October, 1950, paratype, ♀ (native collector). Palau Islands, Koror Island, 30.XI.1947, paratype, ♂, gen. no. 1936. Babelthuap Island, Ulimang, 19.XII.1947, paratype, without abdomen (Pacific Science Board, Entomological Survey of Micronesia, H. S. Dybas) (U.S.N.M.). 6 ♂, 6 ♀.

Type locality: East Borneo, Balikpapan, Mentawi River.

A small species with sharp, rather uniform markings; especially characteristic is the pale triangular area along the posterior half of the costa, limited by the transverse fascia, and the more or less continuous stripe running from the lower angle of the cell to the apex. Judging from the genitalia, allied to the Javanese *patris* nov. and, less closely, to the Hawaiian *straminea* Butler.

***Bactra (Chiloides) patris* spec. nov. (fig. 22)**

♂ 11.5 mm. Head light fulvous-tawny, face sordid whitish, tuft on vertex laterally mixed with dark fuscous. Antenna pale fulvous, scape mixed, flagellum finely ringed, with dark fuscous. Palpus moderate, strongly dilated, roughish only towards its lower angle, terminal segment partially concealed; pale fulvous-tawny, with a minute lateral purplish-black line from base, and a purplish or fuscous oblique transverse blotch across the median segment to its lower projecting angle. Thorax pale tawny, mottled with sparse pale fuscous dots, shoulder with a dark fuscous suffusion. Abdomen greyish-white, glossy. Anterior and median legs pale fulvous-tawny, infuscated, posterior leg ochreous-whitish.

Fore wing moderately broad, broadest in the middle, hardly narrowed thence, with costa rather curved along anterior half, hardly curved along posterior half, apex moderately pointed, termen straight, oblique. Whitish, partially suffused with pale fulvous-tawny, rather densely irrorated with dark purplish-fuscous, markings deep brown. Basal patch occupying slightly more than $1/3$ of wing, its edge from $1/4$ of costa to rather before $1/2$ of dorsum, considerably convex, undulate and oblique above fold, almost vertical below fold; this edge narrow above, extended into a subrhomboidal, somewhat irregular dark brown patch in fold, almost obliterate below fold; basal patch coarsely irrorated and transversely strigulated with dark purplish-fuscous, along costa and along fold suffused with lilac-fulvous, above and below fold, with pale tawny-fulvous; costa suffused with rather dark grey to well before apex, barred with wedge-shaped dark brown marks alternating with narrow transverse strigulae; space between basal patch and transverse fascia suffused with dark lilac-grey and retinate with fuscous below costa and in the middle of wing, irrorated with fuscous on dorsum, above cell and above dorsum suffused with pale fulvous-tawny; transverse fascia dark brown, straight, from middle of costa towards tornus but not reaching this, constricted in its middle, posteriorly with a blunt tooth above the constriction, and with a long acute tooth below it; lower extremity of central fascia acutely attenuated; a regularly semicircular narrow dark brown line almost connected with the acute tooth of the central fascia, running slightly above the middle of the wing towards termen and along termen to tornus; this narrow brown line, together with the lower portion of the posterior edge of the transverse fascia, limiting a large circular ocellus of ground colour, open above and below, and occupying almost $2/3$ of wing breadth; four posterior costal dots emitting narrow light brown lines: first and second parallel, very oblique, third less oblique, longer, reaching apical dark suffusion, fourth line short, little oblique; an almost white patch on costa before apex, finely parted by a transverse blackish curved line; a streak of blackish suffusion from towards lower angle of cell to apex, occupying upper half of termen and partially obscuring the above mentioned circular ocellus; veins beyond cell and vein *lc* minutely streaked with brown; a series of irregular brownish dots along dorsum; ground colour less obscured and almost white in a streak along upper portion of cell from edge of basal patch to before apex; this light streak traversed by the transverse fascia and by the brown line from the penultimate costal wedge-shaped mark. Cilia rather dark fuscous-grey, with pale base and three darker grey lines, the first, subbasal, the third, apical.

Hind wing glossy, whitish, touched with grey, towards apex faintly tawny

tinged, in apex with a trace of fulvous tinge. Cilia concolorous, with a grey antemedian shade.

Tegumen (fig. 22) higher than in *angulata*, uncus smaller and longer. Socius somewhat more elongate. Valva with an outwards-curved cucullus, beset with spines at the top and along the ventral edge. Sacculus somewhat larger, more quadrate, Spc_2 more compact, with longer spines; valvula itself shorter, but reaching almost to the middle of cucullus owing to the longer sacculus, with a short band of apical spines turned inward, and a group of 3-4 subapical, distad-directed spines. Aedoeagus perhaps slightly longer, cornuti also longer, than in *angulata* (Slide no. 1563, holotype).

Female genitalia unknown.

E a s t J a v a, Pasuruan, 5 m, 18.X.1940. (A. Diakonoff), holotype, ♂, gen. no. 1563 (L.M.).

The present species is closely allied with *angulata* nov., differing by the pale fulvous tinge, by the dentate transverse fascia, by the round ocellus, by the more extended basal patch on the dorsum, and by the male genitalia. Judging from the genitalia it is also allied with *straminea* Butler.

Bactra (Chiloides) straminea (Butler, 1881) (figs. 4, 24-25)

Chiloides straminea Butler, 1881, Ann. Mag. Nat. Hist., ser. 5, vol. 7, p. 393, no. 25 (Hawaii). — Meyrick, 1885, Trans. N. Zeal. Inst., vol. 17, p. 142 (part.). — Walsingham, 1907, Fauna Haw., vol. 1, p. 687-688, pl. 11, fig. 5 (Hawaii).

Distribution: Hawaiian Islands.

Parasite (larval): *Cremastus hymeniae* Vier. (Braconidae).

This species has for a long time been regarded (by older authors) as identical with the European *Bactra lanceolana*. *B. straminea* is extremely variable as to its size — most variable, in fact, of all the *Bactra* species known to me. Smaller specimens rather resemble *lanceolana* indeed, and agree with Walsingham's figure (l.c.) but larger and largest ones considerably exceed the size of the largest *lanceolana* specimens. The females are especially large (up to 30 mm) and most of them possess the longitudinal median shade, spread over the normal markings. Probably, Meyrick as well as Walsingham were not acquainted at the time with the largest Palearctic species, *Bactra robustana*, or confounded it with *lanceolana*. This species resembles *straminea* most.

Walsingham accurately describes the variability of *straminea*, and states that the only point of difference with *lanceolana* is the longer terminal joint of the palpi; however, he regards *straminea* to be a "geographical and local race" of *lanceolana*.

Tegumen (fig. 24) moderately high. Uncus strong. Socius rather large.

Valva with cucullus narrowly elongate (in larger specimens cucullus slightly broader and less clavate than in smaller), with marginal bristles becoming rather strong towards its middle (proximad), and with small discal bristles on its lower half; valvula moderate, with the apical comb of bristles, and with a series of smaller subapical bristles descending along ventral edge of valvula; sacculus moderate, less than $1/2$, covered with small hairs, a marginal series of spines from top to above base, and a cluster of stronger spines, more discally, towards base. Aedoeagus curved, short. (Slide figured no. 1853).

Sterigma (fig. 25) formed by a large inverted-trapezoid plate with a subcardiform opening in the middle, being the ostium bursae. (Slide figured no. 1866).

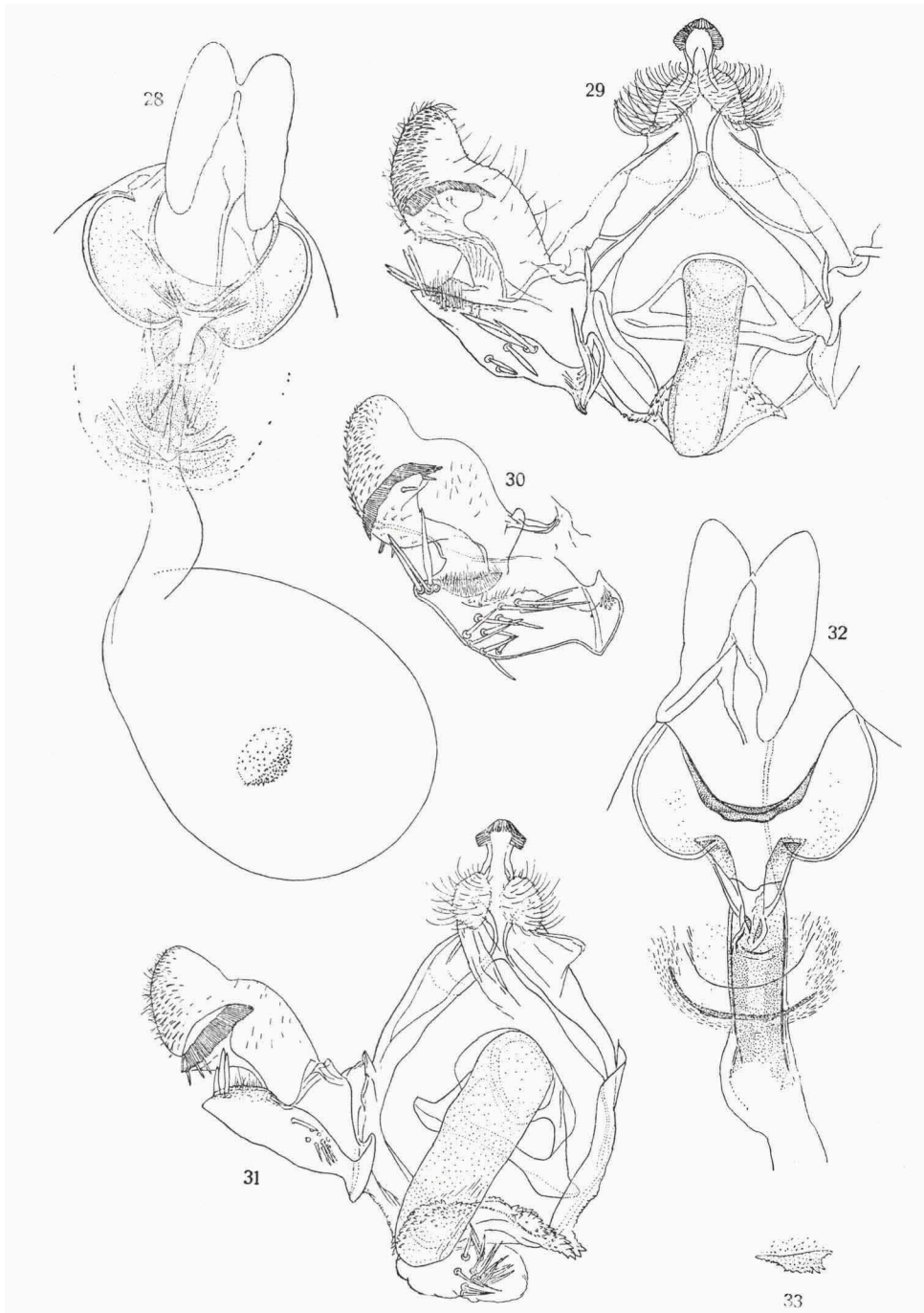
Material studied. H a w a i i a n I s l a n d s. Maui, Haleakala, 5000 feet, V. 1896, 1 ♂, genitalia no. 1870; 1 ♂, gen. no. 1875; X. 1896, 1 ♀, gen. no. 1852. Hawaii, Kona, 2000 feet, IX. 1892, 1 ♂, gen. no. 1862; 3000 feet, IV. 1896, 1 ♂, gen. no. 1854; 1 ♂, gen. no. 1873; 21. VIII. 1892, 1 ♂, gen. no. 1871; 3500 feet, 21. VII. 1892, 1 ♂, gen. no. 1853. Molokai, 3000 feet, 16. IX. 1893, 1 ♂, gen. no. 1872. Oahu, N.W. Koola Range, VII. 1901, 1 ♂, gen. no. 1874; Honolulu, VI. 1900, 1 ♀, gen. no. 1868. Kauai, Kaholuamano, 4000 feet, IV. 1895, 1 ♀, gen. no. 1867; VI. 1894, 1 ♀, gen. no. 1869. 3500 feet, 25. IV. 1919, Begonia, 1 ♀, Mt. Kilauea, VIII. 1895, 1 ♀, gen. no. 1866. (all collected by Perkins, from Walsingham Collection, British Museum). Hawaii, 1899, 1 ♂, gen. no. 1876; 1 ♂, gen. no. 1877 (Blackburn, same collection). Hawaii, Kilauea, at light, 20. V. 1915, 1 ♂, gen. no. 1947. Kauai, 1500 feet, 1 ♂, gen. no. 1945 (August Busck) (U. S. N. M.).

***Bactra (Chiloides) truculenta* Meyrick, 1909 (figs. 28-30)**

Bactra truculenta Meyrick, 1909, Journ. Bombay Nat. Hist. Soc., vol. 19, p. 586 (♂, India: North Coorg). — 1922, Exot. Microl., vol. 2, p. 521 (differences from *graminivora* Meyr.). — Meyrick, in Caradja, 1934, Iris, vol. 48, p. 33 (Canton). — 1935, Mater. Microl. chin. Prov., p. 57 (Shanghai). — T. B. Fletcher & Ghosh, 1920, Report Proc. 3rd Ent. Meet. Pusa, p. 363, 367, 394 (Larvae boring in *Cyperus rotundus*). — T. B. Fletcher, 1921, Mem. Agric. Ind., Ent., vol. 6, p. 53 (recorded from Palni Hills, Coimbatore, Pusa and Peshawar; food plant: *Cyperus rotundus*). — Swezey, 1927, Proc. Haw. Ent. Soc., vol. 6, p. 349 (Hawaii) (Recovery of artificially introduced material from the Philippines). — Diakonoff, 1950, Bull. Brit. Mus. Nat. Hist., Ent., vol. 1, p. 289, pl. 5 fig. 16, pl. 7 fig. 30 (lectotype ♂ design., genit. ♂ ♀ descr. and fig.; recorded from North Coorg, Coimbatore, Calcutta, Pusa, Gudjarat, Ceylon, South Andaman Islands and Shanghai; syn.: *scythrope* Meyr., *geraropa* Meyr.).

Bactra scythrope Meyrick, 1911, Proc. Linn. Soc. N. S. Wales, vol. 36, p. 284 (♀, Timor: Dilli). — Diakonoff, 1910, Bull. Brit. Mus. Nat. Hist., Ent., vol. 1, p. 289 (lectotype ♂ design., syn. of *truculenta*; Timor Island, Dilli; Sunta Island, near Timor).

Bactra geraropa Meyrick, 1932, Exot. Microl., vol. 4, p. 147 (♀, Formosa: Taihoku). — Diakonoff, 1950, Bull. Brit. Mus. Nat. Hist., Entom., vol. 1, p. 287, 289 (lectotype ♀ design., syn. of *truculenta*).



Figs. 28-33. Genitalia of subgenus *Chiloides*. 28, *truculenta*, female; 29, the same, male, no. 1561; 30, the same, valva of no. 1566; 31, *venosana*; 32, the same female; 33, the same, signum.

Literature on economic importance. — Williams, 1922, Haw. Planters Rec., vol. 26, p. 173-177 (bionomics in the Philippines). — Fullaway, 1927, Haw. Rept. Bond Agric. & Forestry 1925-1926, p. 39-46. — Swezey, 1929, Proc. Haw. Ent. Soc., vol. 7, p. 271-273. — 1928, Ann. Rept. Comm. Exp. Sta. Haw. Sugar Planters Ass. 1927-1928, p. 15-25. — Swezey & Pemberton, 1932. — Ibidem, 1930-1931, p. 19-32. — Pemberton, 1933, ibidem, 1932, p. 18-22. — Ibidem, 1938, p. 19-29 — 1936, Rept. Comm. Sci. Industr. Res. Austral., Entom., vol. 10, p. 22-30. — Summons, 1936, Ann. Bull. & Rept. Dept. Agr. Fiji, 1935, p. 19-22.

Distribution: India, Ceylon, Andaman Islands, South China, Formosa, Timor, Hawaii, Australia?, Fiji?

Food plant: *Cyperus rotundus*, India and Philippine Islands.

Parasites: (of eggs): *Trichogramma minutum* Riley, *T. spec.*, (of larvae): *Cremastus blackburni* Cam.

The following is a redescription of a male and a female from Buitenzorg, West Java.

♂ 10-18 mm. Head pale tawny mixed with fuscous, more so laterally; face with roughly projecting scales above. Antenna ochreous-whitish, finely ringed with greyish-fuscous. Palpus rather long, moderately dilated, roughish along edges, below with a long but truncate tuft at apex of median segment, terminal segment moderately long, narrowed, drooping and appressed to the marginal scales of the median segment, therefore not quite exposed; tawny-whitish; lower half of median segment suffused with grey, upper half with a narrow basal obliquely transverse blackish line, and with a median, equally oblique blackish fascia continued across this segment to the top of apical tuft below, a suffused dark grey submarginal dot above; terminal segment whitish-tawny, grey below except at apex. Thorax whitish-tawny, with suffused fuscous transverse bands: anterior, median, and posterior; patagia irrorated with fuscous; metathorax whitish. Abdomen fuscous, basal segment whitish.

Fore wing moderately broad, subovate-truncate, with costa curved throughout but less so in the middle, apex somewhat produced, obtusely pointed, termen moderately oblique, concave at $1/3$, rounded below. Tawny-whitish, suffused along costa as far as vein 9, and before termen between veins 7 and 3, with fuscous-grey. Costal strigulae rather large, broad and dark fuscous on costal edge, brown in disc; edge of basal patch indicated by dark fuscous irroration forming a triangular patch in fold well before $1/3$ of wing, with an acute point posteriorly, connected with dorsum by a vertical narrower fascia. Transverse fascia formed by the fourth costal strigula which is somewhat irregularly undulate and slightly convex, in the middle of cell abruptly dilated so as to form the typical mark on end of cell, being V-shaped, with the anterior branch thick and truncate, the posterior attenuated and slightly produced terminad at the end; this mark enclosing a small dot of

pale ground colour; apical mark almost blackish, well-defined, formed along posterior portion of veins 6 and 7, acute anteriorly, its posterior, marginal portion abruptly bent upward, to apex; fifth costal mark broadest, reaching halfway towards apex; this mark followed on costa by a narrow strigula; three following costal markings forming rather large triangular dots on costa; second of these continued across wing and margin so as to form terminal fascia that is narrow and well-defined, deep brown; ocellus indicated by an inwards-oblique oval dot below and beyond mark on end of cell, which is almost entirely encircled by a fine line. Cilia whitish-tawny, except in tornus, with some four deep fuscous lines interconnected by fuscous irroration, first line antemedian, last apical; cilia before apex suffused with blackish.

Hind wing light fuscous with a distinct purple-violet gloss, in certain lights with a pale golden gloss. Cilia tawny-whitish, basal half around apex and along upper half of termen pale tawny; an antemedian and a subapical faint fuscous lines.

♀ 13.5-20 mm. Head and thorax deeper fulvous-tawny, thorax, except on tegulae, clouded with fuscous. Palpus longer, more dilated, edge of median segment with a rather smooth but dense fringe of hair-scales forming a pointed tuft below, terminal segment concealed.

Fore wing rather elongate and narrow, costa gently curved towards extremities, apex pointed, termen sinuate and oblique. Pale ochreous, partially suffused with light tawny, markings dark brown. Costal strigulae narrow, but well-defined; all veins and edges of cell narrowly streaked with dark brown. Three conspicuous dark brown markings more or less suffused with light tawny: a subrhomboidal transverse mark across the middle of fold, a larger, almost semicircular mark on end of cell, extending beyond its lower angle, edge well-defined posteriorly, and a short streak or patch along posterior half of vein 7, terminating in apex; dark transverse strigulae scattered over the wing, sometimes forming with the above mentioned markings a retinate pattern.

Hind wing greyish-fuscous with faint bronze-prismatic gloss.

Another female specimen, from Probolinggo, East Java, with costal strigulae very short, the whole wing devoid of transverse strigulation, but with more pronounced light tawny suffusion, except a pale streak from upper angle of cell to costa just above apex; three brown marks paler, but more extended, so as to be almost interconnected, the median mark enclosing an almost white dot just beyond cell; cilia along upper half of termen with almost white base thus forming a narrow line preceded by a contrasting brown marginal line along termen (specimen with gen. no. 1567).

Tegumen (fig. 29) and signum moderate, socius rather small. Valva (figs.

29, 30) with a clavate cucullus that is rather short, with a broad, obliquely rounded top with small and short bristles, and with a rounded prominence in the middle of costal (dorsal) edge; valvula rather long and slender, with a large flattened top with the comb of bristles; some 3 bristles below this comb; sacculus over $1/2$, constricted just above base and with a hairy area under the top at the base of valvula; about 5 strong apical bristles and an oblique group of some 10-15 bristles across the middle of marginal portion of sacculus. Juxta strong, triangular. Aedoeagus robust, moderately curved. Cornuti, a sheaf of spines. Vinculum with a triangular, submembraneous flap, covered with small teeth. (Slides figured no. 1566, fig. 26; no. 1561, fig. 25).

Female genitalia (fig. 28) sclerotized. Lamella antevaginalis (or lodix) shaped as a semioval plate at each side, with conspicuously thickened rims. A small triangular sclerite flanking the ostium bursae at each side. The upper portion of the ductus bursae shows two longitudinal sclerites. (Slide figured no. 1551).

The genitalia are very similar to those in *B. venosana* Zeller. For differences I refer to the description of that species.

This is the most common species of *Bactra* in the eastern part of South Asia. The larva feeds in stems of *Cyperus rotundus*, the so-called "nut grass", a plant which is regarded as an undesirable weed in some tropical countries. Therefore this species has acquired a unique position among its congeners by having been regarded a useful insect! While all other species seem to be of no economic importance so far, *B. trunculenta* was introduced from the Philippine Islands (where it is common in nut grass) to Hawaii, in order to control the vegetation of *Cyperus rotundus*. Williams (1922) suggested this importation which has been carried into effect subsequently. In 1926 Fullaway reported that the introduced species has been established on nut grass on Kauai Island. However on Mani island the measure has not proved of much value in destroying nut grass, except in a few areas. In three localities 68-78% of the eggs of the moth were parasitized by *Trichogramma* sp. and *T. minutum* Riley, and a larva by *Chelonus blackburni* Cam. (Braconidae) (Swezey). In 1931 (Swezey & Pemberton) the species was scarce in Hawaii.

In spite of these disappointing results the species was introduced from Hawaii in Fiji (1935) and in Australia (1936). In 1941 results in Australia were "negligible due to parasites". So turned this unexpected economical success of *B. trunculenta* to nothing.

Material studied. I n d i a, Calcutta, "*Bactra lanceolana* Hbn." (Swinhoe), 1 ♂, gen. no. 1924 (A.M.N.H.). W e s t J a v a, Batavia, sea level, 1880, "*Grapholitha Lanceolana venosana* Zell." (Snellen Coll.), "M 118" (Meyrick's

label), gen. no. 1548, 1 ♂. Buitenzorg, 250 m, 1894, "*venosana* Zell., det. Sn.", "M 109" (Meyrick's label, 1 ♀ (collector unknown). 3.V.1947, gen. no. 1622, 1 ♂; gen. no. 1636, 1 ♀ (A. Diakonoff). The same locality 4.VII.1948, gen. no. 1596, 1 ♀; 9.VII.1948, gen. no. 1643, 1 ♂; 24.VIII, 19, 28. IX, 8.X.1948, 16.I, 13.VII, 8.VIII.1949, 2 ♂, 5 ♀; 7.IX.1949, gen. no. 1542, 1 ♀; 12.II, 26.V.1950, 2 ♀; 6.IV, 20.XII.1951, 2 ♀; 10.IV.1952, 1 ♀; 31.V.1952, gen. no. 1635, 1 ♀; 6.VIII.1952, 1 ♂ (F. C. Drescher). The same locality, 26.VI.1949, gen. no. 1593, 1 ♀; 12.XII.1949, 1 ♀; 15.II.1950, 1 ♀ (E. J. Beeltje). The same locality, 12.IV.1951, 1 ♂ (Liem Swie Liong). Gobang, 20 km of Buitenzorg, 125 m, 15.VI.1948, gen. no. 1597, 1 ♂; 23.VI.1948, 1 ♀; 27.VI.1948, gen. no. 1637, 1 ♀ (G. F. Mees). Mt. Gedé-Pangrango, Tjibodas, 1400 m, IX.1948, gen. no. 1657, 1 ♂; X.1948, gen. no. 1654, 1 ♂; VIII.1949, 1 ♀ (A. M. Neervoort). Central Java, Pekalongan, sea level, "*venosana* Zell., det. Sn.", gen. 1564, 1 ♂ (Van Deventer). East Java, Rembang, low country, "*Graphol.*" (Snel-len's label), gen. no. 1550, 1 ♀; gen. 1551, 1 ♀ (figured) (collector unknown). Pasuruan, 5 m, 7.IX.1939, 1 ♀; 15.V.1940, gen. no. 1626, 1 ♂; gen. no. 1628, 1 ♂; gen. no. 1629, 1 ♂; 17, 18.V.1940, 3 ♀; 18.V.1940, gen. no. 1603, 1 ♂; 18.V.1940, gen. no. 1625, 1 ♂; 22.V.1940, gen. no. 1630, 1 ♂; 3.VI.1940, gen. no. 1621, 1 ♂; gen. no. 1627, 1 ♂; 4.VI.1940, gen. no. 1604, 1 ♂; gen. no. 1653, 1 ♀; 10.VII.1940, gen. no. 1634, 1 ♂; 24.X.1940, 1 ♀, bred from pupa in *Cyperus rotundus* L.; 21.I.1941, gen. no. 1620, 1 ♂; 10.III.1941, gen. no. 1658, 1 ♂; III.1941, 3 ♂; III.1941, 1 ♂ bred from pupa in *Cyperus rotundus* L. Probolinggo, 5 m, 22.X.1940, gen. no. 1567, 1 ♀, bred from pupa in *Cyperus rotundus* L., Situbondo, low country, 12.III.1941, gen. no. 1565, 1 ♀. Tretes, 900 m, 13.III.1940, gen. no. 1582, 1 ♀ (A. Diakonoff). South Borneo, Sampit, 0-50 m, 20.II.1950, 2 ♀; gen. no. 1535, 1 ♀; gen. no. 1536, 1 ♀; gen. no. 1619, 1 ♀ (W. Buyn). Kisar Island (Lesser Sunda Islands), 1898, gen. no. 1542, 1 ♀ (K. Schädler). Philippine Islands, Mindanao, Zamboanga, 15.VIII.1952, gen. no. 1817, 1 ♂, (L. D. Brongersma) (all L. M.). Luzon, Mt. Makiling (Baker), 1 ♀, gen. no. 1942; 1 ♀, gen. no. 1995. Los Baños (Baker), 1 ♀, gen. no. 1943 (U.S.N.M.). Province of Pangasinan, Babasit, 13.III.1945 (J. G. Franclemont), 1 ♂, gen. no. 1996 (Cornell Un. Coll.). Hawaiian Islands, Oahu, Manoa, 27.VI.1927, gen. 1818, 1 ♂. Molokai, Kaunakakai, 6.VI.1932, gen. no. 1821, 1 ♀; gen. no. 1824, 1 ♀. Kauai, Makaweli, 21.III.1928, gen. no. 1820, 1 ♀ (O. H. Swezey). Caroline Islands, Kusaie Island, Mutunlik, 26.I.1953 (J. F. Gates Clarke), 1 ♂, gen. no. 1927. Truk Island, Moen, 0-100 feet, 31.VII.1946, at light (Townes), 1 ♀, gen. no. 1986 (U.S.N.M.). 38 ♂, 43 ♀.

Bactra (Chiloides) venosana (Zeller, 1847) (figs. 31-33)

Phoxopterus venosana Zeller, 1847, Isis, p. 738.

Aphelia venosana, Herrich-Schäffer, 1849, Syst. Bearb., vol. 4, p. 244.

Bactra venosana, Rebel, in Staudinger & Rebel, 1901, vol. 2, p. 113. — Kennel, in Spuler, 1910, Schmett. Eur., vol. 2, p. 273. — Kennel, 1910, Pal. Tortr., p. 472, t. 18, fig. 73.

Distribution: Southern Europe.

This species occurs in Southern Europe and in the islands of the Mediterranean. It appears to be very closely related to the tropical, South-Asiatic, *truculenta* Meyr. The relation is so close, that the male genitalia are almost alike, except for the armature of the sacculus (figs. 29-31); the female genitalia are somewhat more different (figs. 28-32).

This narrow-winged species is sufficiently characterized by the descriptions of the above-mentioned authors and by the figure of Kennel.

Male genitalia (fig. 31) very similar to those of *truculenta*. Valva with cucullus somewhat narrower; valvula with a shorter stalk; sacculus with apical spines much shorter, a row of marginal rather small spines of various sizes (instead of an oblique patch, as in *truculenta*). Juxta, vinculum, and aedeagus similar to those in *truculenta*. (Slide figured no. 1837).

Female genitalia (fig. 32) show more obvious differences. Lamella antevaginalis is shaped differently. Colliculum is much more robust, ductus bursae being broader. Signum, fig. 33. For minor differences may be referred to figs. 28 and 32. (Slide figured no. 1841).

Material studied: Palermo (Sicily), 1 ♂, gen. no. 1837. Gallia meridionalis, Cannes, Ragonot, 1 ♂, gen. no. 1838, and 3 more males. Gallia mer., Alpes maritimes, Constant, 1 ♀, gen. no. 1841; 1 ♀, gen. no. 1840, (L.M.).

Bactra (Chiloides) coronata Diakonoff, 1950 (figs. 34-36)

Bactra coronata Diakonoff, 1950, Bull. Brit. Mus. Nat. Hist., Entom., vol. 1, p. 286, pl. 5, fig. 17. (Java, ♂).

Distribution: Java.

♂ 11-14.5 mm. A distinctly marked male specimen, homotype, 14.5 mm, may be redescribed as follows. Head whitish-ochreous, considerably mixed with rather dark fuscous. Antenna brownish, with scape whitish-ochreous. Palpus rather long, moderately dilated posteriorly, the edge of median segment being much more oblique than in other species, and the palpus having a more elongate-depressed shape; median segment with closely appressed scales, its edge smooth above, lower angle with a short and hardly roughened tuft; terminal segment rather robust, and short, little pointed, its upper edge



Figs. 34-38. Genitalia of subgenus *Chiloides*. 34, *coronata*, male; 35, the same, female; 36, the same, signum; 37, *limitata* spec. nov., male; 38, the same, female.

exposed, its lower edge concealed, rather dark fuscous-grey, with the base and the posterior edge of median segment, except below, ochreous-whitish, terminal segment greyish, suffused with fuscous-grey at base, tip ochreous-whitish. Thorax whitish-ochreous, irrorated and spotted with fuscous, meta-thorax whitish. Abdomen glossy, pale fuscous, venter fuscous-whitish. Legs whitish-ochreous with a strong golden gloss, anterior and median legs rather infuscated, ringed with pale ochreous.

Fore wing rather broad, elongate-subtruncate, costa moderately curved throughout, more curved before apex, apex rather pointed, slightly projecting, termen sinuate, not very oblique. Whitish-ochreous, partially with minute transverse dark fuscous-grey irroration, markings coffee-brown, well-defined, along costa almost blackish-fuscous. Costa, from base and as far as upper edge of cell, and the course of vein 9, irrorated with dark fuscous-grey, and along anterior half of costa, irrorated narrowly with pale tawny, tinged pinkish; costa with some seven blackish-fuscous distinct oblique strigulae, alternating with minute markings; transverse fascia (being the eighth costal strigula) on middle of costa, tolerably oblique to just above cell, bent and horizontal thence, reaching vein 9; this streak narrow, coffee-brown; four strigulae on costa beyond middle, rather narrow, hardly traversing vein 9, two posterior of these strigulae somewhat less oblique; a rounded patch in fold before $1/3$ of wing length, extending over central third of wing breadth, well-defined posteriorly, its posterior upper portion rectangularly incised; a large, angularly bent patch on end of cell, its anterior portion broad, oblique, from below termination of seventh costal mark towards tornus, occupying central half of wing breadth; this patch above with a moderate horizontal strigula along upper edge of cell, the patch constricted below this edge; lower portion of patch with a triangular tooth in the middle of posterior edge, anterior edge gently convex; posterior rising half of the angulate patch slender, gently curved apicad (in left wing interrupted); angulate patch on end of cell preceded by a moderate triangular spot on base of vein 2, and by two dark dots in an oblique series above this triangular spot, half way between subbasal round patch and angular patch; a small elongate pretornal mark beyond and below angle of cell, nearer to this angle than to tornus, its lower edge curved parallel to tornal edge of wing; a moderate, outwards-oblique mark across middle of vein 7; a round dot in apex; two vertical lines between these markings, anterior line connected with a well-defined terminal attenuated fascia, truncate above, extending from the middle of termen to tornus; a broad streak of rather sparse minute transverse dark grey irroration along fold between the above mentioned markings, and more or less filling the terminal area; base of wing suffused with fuscous;

a row of dark fuscous dots along dorsum. Cilia dark fuscous irrorated with ochreous-whitish, a dark fuscous subbasal fascia, base ochreous-whitish.

Hind wing glossy pale fuscous-grey, irregular spots of fuscous irroration along termen and in apex, veins finely streaked fuscous-brown. Cilia ochreous-whitish, with a pale ochreous base and a fuscous antemedian fascia.

Often markings partially reduced; sometimes the fourth costal streak is connected with the rounded discal patch and this patch with dorsum, thus indicating the edge of the basal patch (e.g., in nos. 1623, 1644); often the terminal fascia connected above with the mark on the middle of vein 7 (e.g., in nos. 1518, 1609, 1623, etc.), or the pretornal mark connected by a fine line with the terminal line in tornus, the mark on vein 7, the terminal fascia, and the pretornal mark forming together a spiral (1609).

Tegumen (fig. 34) low and broad. Uncus moderate. Socius moderate, with very long hairs. Valva rather narrow, cucullus broadest in the middle, having a prominence in the middle of its dorsal edge, its top rounded, without any spines; valvula $\frac{2}{3}$ of cucullus, with a long apical comb of spines, and with a projecting outer angle at base; sacculus moderate, $\frac{1}{3}$ of valva, with a crown of long, marginal spines. Aedoeagus curved, moderate. Cornuti absent. (Slide figured no. 1609; 1514, homotype; furthermore 1515, 1518, 1549, 1581, 1623, 1631, 1632, 1641, 1642, 1644, 1645, and 1656).

♀ 12-15 mm. Neallotype, 14.5 mm. Head and thorax as in male, but somewhat brighter ochreous and less irrorated with fuscous. Palpus slightly longer than in male, tuft of median segment a trifle more pointed, whitish-ochreous, mixed with fuscous. Abdomen pale fuscous-grey.

Fore wing shaped as in male. Whitish-ochreous, irrorated and slightly suffused with pale tawny. Markings fuscous-brownish, ill-defined. Costal markings more slender and less conspicuous than in male. Discal patch in fold representing the remainder of the basal patch, not rounded but more or less triangular, with top directed distad; transverse fascia reduced to a triangular moderate patch on end of cell, deeply excavated from above; terminal fascia as in male, with indications of connections with the mark on vein 7 and with the pretornal spot, which is small, but present; a rather large dark fuscous spot in apex extended by a suffusion between veins 6 and 7, reaching almost halfway towards cell. Cilia paler than in male, with four longitudinal lines, subbasal line dark fuscous.

Hind wing and cilia similar to those in male.

Lodix (fig. 35), two large oval sclerotized plates. Ostium bursae with a regularly semicircular narrow rim. Colliculum, a rather short, narrow tube. Signum (fig. 36), scobinate, basket-shaped (Slide no. 1694, neallotype; 1613,

figured; furthermore 1553, 1591, 1595, 1601, 1612, 1613, 1638, 1639, 1640, 1646).

West Java, Bandung ("Bandong"), 750 m, 1910, male, holotype (in the British Museum). Gobang, 20 km of Buitenzorg, 125 m, 9.VII.1948, gen. no. 1594 (G. F. Mees), female, neallotype. Buitenzorg, 125 m, 12.VIII.1949 (F. C. Drescher), male, homotype, redescribed above (L.M.).

Other material studied. West Java, Batavia, 1888, 1 ♂, genitalia no. 1549 (Snellen Collection, presumably M. C. Piepers leg.). Buitenzorg, 125 m, 17.IX.1948, gen. no. 1515, 1 ♂; 23.IX.1948, gen. no. 1642, 1 ♂; 27.IX.1948, gen. no. 1591, 1 ♀; 26.VI.1949, 1 ♀ (F. C. Drescher). The same locality, 22.IX.1948, gen. no. 1644, 1 ♂ (Liem Swie Liong). The same locality, 9.IX.1948, gen. no. 1641, 1 ♂; 26.IX.1948, gen. no. 1518, 1 ♂; 26.IX.1948, gen. no. 1639, 1 ♀ (E. J. Beeltje). Gobang, 20 km of Buitenzorg, 125 m, 21.VI.1948, gen. no. 1645, 1 ♂; 23.VI.1948, gen. no. 1656, 1 ♂; 5.VII.1948, gen. no. 1640, 1 ♀ (G. F. Mees). Mount Gedé-Pangerango, Tjibodas, 1400 m, VIII.1948, 1 ♀ (A. M. Neervoort). Central Java, Pekalongan, sea coast, gen. no. 1623, 1 ♂ (Snellen Collection, van Deventer leg., identification label: "*venosana* Zeller, Det. Sn."); gen. no. 1553, 1 ♀ (the same collection and collector, identification label "*Cana grandaevana* Zeller, Det. Sn.", and Meyrick's label "M 108"). East Java, Pasuruan, 5 m, in light trap, 18 and 29.V.1940, 3 ♂; 22.VI.1940, gen. no. 1632, 1 ♂; 8.VII.1940, gen. no. 1631, 1 ♂; 21.I.1941, 1 ♂; 22.II.1941, gen. no. 1601, 1 ♀. Situbondo, low country, 12.III.1941, 1 ♀ (A. Diakonoff). Nongkodjadjar, 1300 m, in light trap, 17.IV.1940, no. 1581, 1 ♂ (A. M. R. Wegner). East Borneo, Balikpapan, Mentawi River, 50 m, X.1950, gen. nos. 1612, 1613, and 1646, 3 ♀; Wain River, 50 m, XI.1950, gen. nos. 1605 and 1609, 2 ♀ (A. M. R. Wegner) (L.M.). Philippine Islands, Luzon, Dau, Pampanga, 9.II.1945 (J. G. Franclemont), 1 ♀, gen. no. 1998 (Cornell Un. coll.). 19 ♂, 13 ♀.

The present species is somewhat less variable as to its markings than several other species; the discal markings are mostly present, interconnected by the grey irroration forming a longitudinal streak. The typical feature is the presence of the small pretornal dot, beyond and below the lower angle of cell, well or not connected with tornus by a narrow curved line. More extensive collecting would very probably prove that *coronata* is widely distributed in the area in question.

Bactra (Chiloides) limitata spec. nov. (figs. 37-38)

♂ 19 mm, ♀ 16.5-19 mm (allotype 18.5 mm). Head and thorax ochreous-whitish touched with tawny, in one paratype (♀) head and thorax suffused

with pale tawny; metathorax white. Antenna light ochreous, ringed with whitish; in male slightly thickened, ciliations rather long (about 1). Palpus rather long, slightly roughish along posterior edge of median segment, terminal segment slender, not concealed; ochreous-whitish, slightly mixed (in male) or faintly suffused across the middle of median segment with light fuscous; in one paratype (♀) palpus not infuscated, in another paratype (♀) the median and also the terminal segments are infuscated. Abdomen white, from its middle to apex becoming touched with pale ochreous.

Fore wing moderately broad, broadest beyond $2/3$, costa gradually but moderately curved throughout, in female very gently impressed at $3/4$; apex tolerably pointed, termen gently sinuate, oblique. Ochreous-whitish, partially with moderate fuscous irroration, females mostly suffused throughout with light fulvous, except along costa posteriorly. Markings light brownish-fuscous and fulvous, rather scarce. Male. Costa with some 10 or 11 fine oblique, more or less undulate brownish lines alternating with similar, but shorter marks, the lines becoming longer along the median third of costa, so that none of them reaches vein 8; a series of parallel similar but shorter and thicker marks forming a continuation of costal marks in a series above cell; a narrow streak of hardly obscured ground colour extending along upper half of cell from beyond base to just above apex; a streak of irregular coarse dark fuscous dotting, interconnected with finer irroration, from beyond base, along lower half of cell, extending below as far as vein 1b, forming a darker suffusion on end of cell; area of brownish suffusion mixed with dark grey before termen, anteriorly confluent with preceding irrorated streak, rather distinctly limited above and below by the course of veins 7 and 2, respectively; veins in this irrorated area narrowly and sharply streaked with fuscous, also (and especially distinctly) the parting vein in cell, and vein 7 forming together a continuous dark line; a brown terminal fascia from apex to tornus, interrupted twice below; a series of some 10 rather regular and distinct dots along dorsum from beyond base. Cilia in lower half of apex and along termen sordid pale ochreous, with a pale base, elsewhere densely irrorated with fuscous, having a dark appearance and contrasting with the ground colour of the fore wing, cilia along costa and in upper half of apex ochreous-white. Female with the costal streaks reduced, and light fulvous, instead of brownish; the entire wing suffused with light fulvous, except along posterior half of costa, this suffusion brighter in a longitudinal streak along lower half of cell extending below to above fold, and along terminal area limited by the course of veins 7 and 2 respectively; fuscous markings absent, except some three transverse marks along anterior third of fold from beyond base, an ill-defined fuscous suffusion on lower angle of cell, some small dots

along dorsum, and a narrow terminal streak; sparse dark scales sprinkled on terminal area; terminal veins scarcely marked. Cilia as in male but also touched with fulvous, especially in tornus.

Hind wing glossy whitish touched with ochreous, more clearly so in apex, faint small patches of fuscous suffusion in apex and along upper portion of termen.

Tegumen (fig. 37) broad, moderately high. Uncus rather broad. Socius moderate, somewhat elongate. Valva with cucullus broad, clavate and sinuate, bristled at top only; valvula with a broad comb of spines, separate larger spines also ventrally and (in holotype) at top; sacculus broad, but less than 1/2 of valva in length, a single spine at top, a transverse ridge below this, no other spines. (Slide no. 1546, holotype).

Lodix (fig. 38), two weak, semioval folds with a small lobe in between; colliculum, a strong straight tube, somewhat clavate below, with punctulate wall, above forming a broad fold turned dorsad, representing the ostium bursae. Cestum, a small plate. Signum with a retinate wall. (Slides: no. 1547, paratype; no. 1588, allotype, figured).

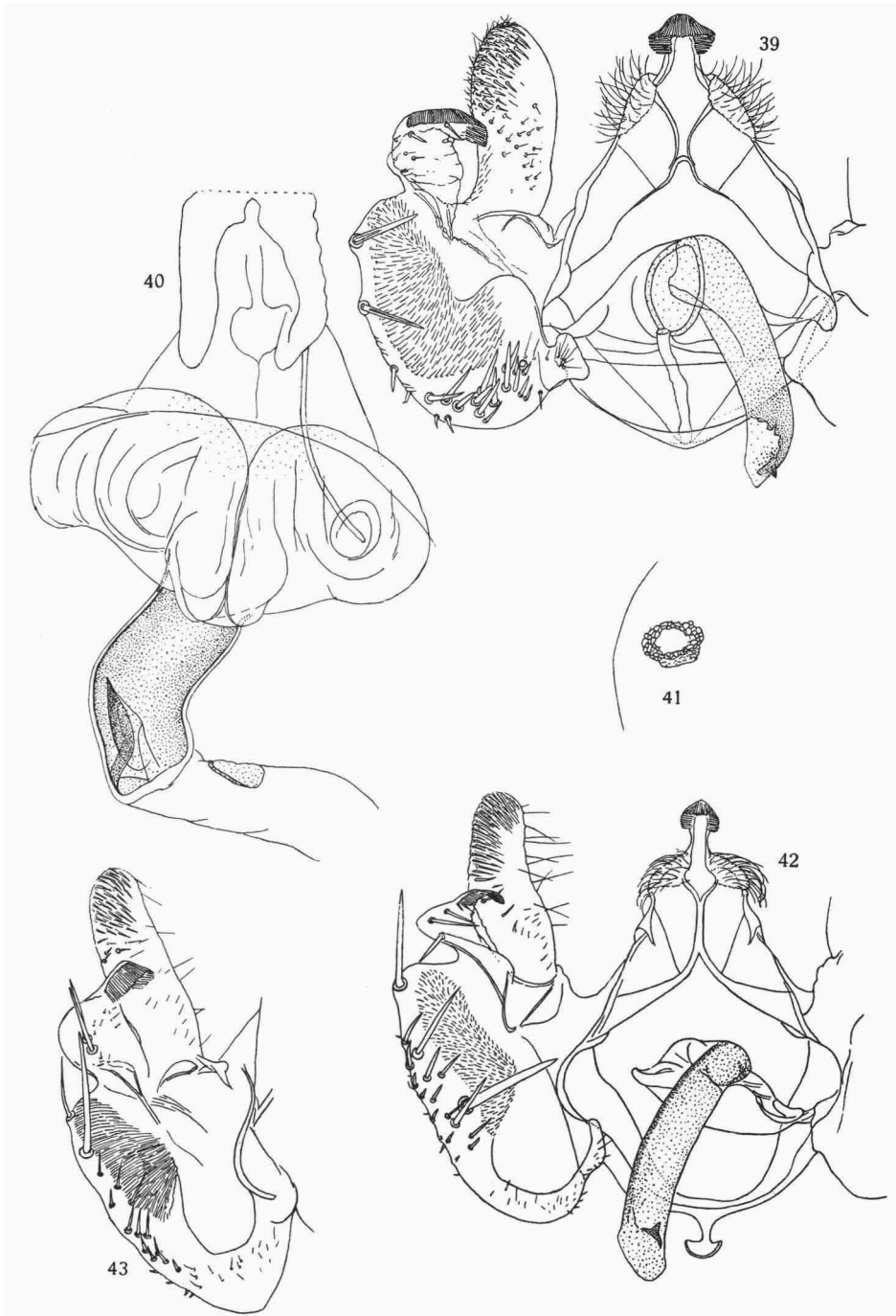
West Java, Preanger District, 5000 feet, Sijthoff, male, holotype, gen. no. 1546; female allotype, gen. no. 1588; female paratype, gen. no. 1547, with Meyrick's label "M 110", two female paratypes. All from Snellen's collection, in the Leiden Museum. 1 ♂, 1 ♀ from the same locality and collection, apparently retained by Meyrick after identification, in the British Museum.

The species was erroneously identified by Meyrick as *B. leucogama* Meyr. (cf. below). It differs by a larger cucullus and less developed, and armed, sacculus in the male, and by a longer colliculum joined with the ostium bursae in the female. Superficially *limitata* is rather well characterized by the pale colour, the sparse markings, the pale fulvous suffusion in the females and by the contrasting dark cilia.

All the material was collected by Sijthoff in about 1880-1890; it is somewhat bleached. Curiously enough, in spite of vigorous collecting in the same region during several years I was not able to recapture the species.

***Bactra (Chiloides) excelsa* spec. nov.** (figs. 42, 44)

♂ 12-13.5 mm (holotype 12 mm). Head, thorax tawny-whitish. Antenna fuscous, scaled and ciliate with glossy whitish. Palpus almost spatulate: narrow at base, abruptly dilated, top of median segment rounded, its posterior and especially its lower edges with a fringe of roughish hairs; tawny-whitish with some sparse dark irroration in an oblique transverse band across the middle of median segment. Abdomen silvery whitish-grey. Legs whitish,



Figs. 39-43. Genitalia of subgenus *Chiloides*. 39, *leucogama*, male; 40, the same, female; 41, the same, signum; 42, *excelsa* spec. nov., male; 43, *monochorda*, valva.

anterior and median legs moderately infuscated, banded with whitish, with a golden gloss.

Fore wing rather narrow, sublanceolate; costa curved throughout but less curved along its median third, apex pointed, termen straight above, slightly convex below, oblique. Ochreous-whitish, glossy, markings pale olive-tawny and dark fuscous. Costa throughout with rather large, very oblique darker fuscous streaks, extended along costal edge and appearing almost horizontal, these streaks alternating with dots of the same colour; continuations of these markings running less obliquely across wing to upper edge of cell are paler, light tawny, slightly irrorated with brownish. Basal patch indicated by an inwards-oblique transverse dark fuscous patch across fold at $1/3$ of wing length, extending from lower edge of cell to vein 1b; anterior edge of patch suffused, continued by sparse and coarse dark fuscous irroration to before base of wing; posterior edge of patch rather well-defined, rectangularly indent in fold; central fascia represented by a rather broad, transverse, moderately inwards-oblique pale olive-tawny patch, ill-defined below costa, sharply limited below by vein 1b; middle third of posterior edge of this patch extended posteriorly so as to form the usual angulate mark around lower edge of cell, extreme edge of the inner side of angulation suffused with dark fuscous; streak between basal patch and central fascia rather narrow and ill-defined, but continuous, outwardly oblique along its upper third, gently inwards-oblique along its lower $2/3$; the usual cuspidate mark in apex, dark fuscous, continued as a brownish terminal line; about the seventh costal mark continued by a broadly sinuate line across wing and merging in terminal streak below its middle, the eighth costal mark with a short similar streak, soon merging in the streak of the ultimate (ninth) costal mark, which traverses the wing before apex in a regular bow and merges in terminal fascia above its middle; terminal veins from 7 to 1c distinctly marked with fuscous; dorsum with a row of dark fuscous dots, more or less coalescent and forming short streaks along dorsal margin. Cilia pale fuscous with a dark fuscous antemedian fascia and pure white basal third.

Hind wing whitish-grey, posterior $2/3$ pale fuscous; veins finely darker fuscous. Cilia whitish-grey with a broad fuscous subbasal shade, except along dorsum.

Variable species. One Buitenzorg specimen rather suffused with pale ochreous-tawny, with a broader fore wing; both Buitenzorg specimens with dark markings almost purple-black instead of dark fuscous, with a white dot beyond cell, and with veins 5-7 broadly suffused with blackish; hind wings rather dark fuscous-grey throughout.

Tegumen (fig. 42) tolerably high. Uncus high. Socius large. Valva with

costa slender, slightly sinuate, not dilated. Valvula short, less than $1/2$ valva, with an apical comb of short spines and some 3 rather long additional spines ventrally, a deep fold in disc of valva at the base of valvula; sacculus very large, with the hairy central field extending over $2/3$ of the length of sacculus, the basal margin of sacculus strong but rather narrow; two very large spines: at apex and in the middle of sacculus, with several smaller spines of very unequal size between these two. Vinculum with a handle-shaped projection. Aedoeagus rather slender, moderately long, curved, sclerotized, with a subapical small tooth at the left side. (Slide 1568, holotype, figured; 1513, 1517, and 1828, paratypes).

♀ 13-13.5 mm. Head with antenna and thorax as in male. Palpus with a longer apical tuft of the median segment below, therefore entire palpus appearing longer; whitish-ochreous sprinkled with dark, a faint and shadowy transverse fuscous median band. Abdomen whitish-ochreous, glossy. Legs as in male.

Fore wing with costa almost straight posteriorly, apex a trifle more pointed, termen longer and more oblique. Glossy ochreous-whitish; dark costal and dorsal markings purplish-black, but minute and ill-defined; posterior veins hardly streaked with dark fuscous; dark blotch in fold indicating posterior portion of basal patch formed by purplish-black irroration, smaller than in male, ill-defined. Pale markings light ochreous, instead of olive-tawny, cloudy, extended all over the wing and ill-defined; streak from end of cell to apex and terminal fascia strongly suffused, light fulvous-ochreous mixed with ferruginous; terminal fourth of wing rather suffused with pale tawny. Cilia ochreous-whitish with a whitish base, but with about five longitudinal suffused purple-blackish almost confluent stripes, thus appearing conspicuously darker than wing.

Hind wing very pale greyish-fuscous, with infuscated edge; cilia pale fuscous with a narrow subbasal shade, cilia opposite apex and upper third of termen darker fuscous throughout.

Lodix (fig. 44) shaped as a large rhomboidal plate with deeply scalloped upper edge and slightly sculptured surface (forming faint transverse corrugations); lower pointed portion of lodix with a pear-shaped somewhat more sclerotized central plate that has a long vertical split in its middle. Colliculum long, sclerotized, with an abruptly curved lower extremity that shows a small and narrow inner sclerite. No cestum. Signum moderate. (Slides no. 1878, allotype, and 1589, figured, paratype).

West Java, Bandung, 750 m, 27.XII.1939, genitalia no. 1568, male holotype (A. Diakonoff). Mount Gedé-Pangerango, Tjibodas, 1400 m, IX.1948, ♂, gen. no. 1828; VIII.1948, ♀, gen. no. 1589 (A. M. Neervoort).

Buitenzorg, 250 m, 13.IX.1948, ♂, gen. no. 1513; 27.IX.1948, female, allotype, gen. no. 1878; 9.IV.1952, ♂, gen. no. 1517 (F. C. Drescher) (L.M.). **M a r i a n a s I s l a n d s.** Guam Island, no. 1466, paratype ♂, gen. no. 1928 (D. T. Fullaway). Guam, Sasa "ex rice, old field", 22.VI.1936, "*Bactra truculenta* Meyr." (determination of the British Museum), paratypes ♂, gen. nos. 1930 and 1931 (O. H. Swezey). Guam, Agana, 25.V.1936 (O. H.

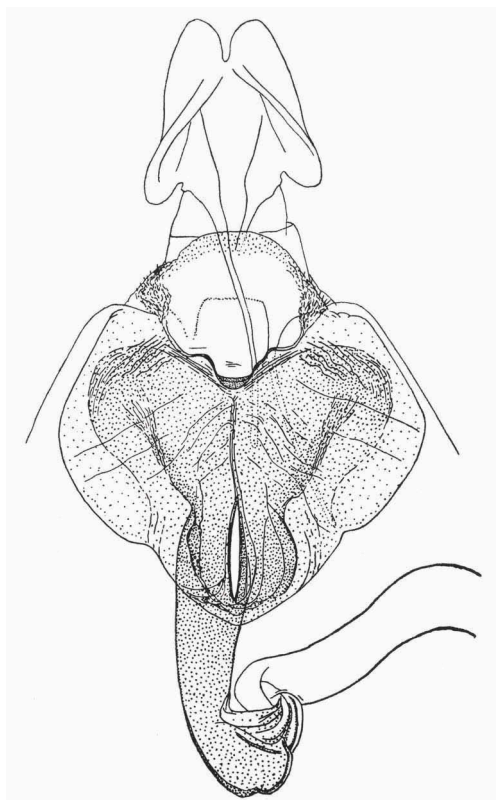


Fig. 44. Female genitalia of *Bactra (Chiloides) excelsa* spec. nov.

Swezey), paratype ♂, gen. no. 1983. **C a r o l i n e I s l a n d s,** Truk Island, 0-33 m, Moen, at light, 31.VII.1946 (Townes), paratype ♂, gen. no. 1863; paratypes, the same locality and collector, 6 ♀, gen. nos. 1988, 1989, 1991, 1992, 1993, and 1994. **T a h i t i,** Papeete, 14.I.1925 (J. M. Clements), paratype ♂, gen. no. 1940 (U.S.N.M.).

Nearest to *B. (C.) monochorda* (Diak.), from Ceylon, but with the male genitalia distinct.

Bactra (Chiloides) monochorda Diakonoff, 1950 (fig. 43)

Bactra monochorda Diakonoff, 1950, Bull. Brit. Mus., Entom., vol. 1, p. 288, pl. 5 fig. 20 (♂, gen. described).

Distribution. Ceylon: Maskeliya.

♂ 11-12 mm. Head pale tawny. Antenna rather dark fuscous. Palpus strongly dilated, lower edge of median segment forming a moderate pointed tuft; pale tawny, an oblique median fuscous transverse fascia, below this fascia some sparse dark irroration, above a single dark fuscous submarginal dot, lower edge of median segment whitish, terminal segment semi-concealed, blackish-fuscous above, pale tawny below. Thorax pale tawny, anterior third (except patagia) whitish-tawny, tegulae and apex of thorax slightly mixed with brown. Abdomen whitish-grey. Legs pale tawny with a golden gloss, partially infuscated except the posterior leg, tarsi ringed with dark fuscous.

Fore wing elongate, lanceolate-subtruncate, rather narrow, with costa curved throughout, but much less so in the middle than at base and apex, apex tolerably pointed, termen almost straight, gently concave below apex, oblique. Pale ochreous; markings lighter and deeper warm brown, subcostal area from base to apex irrorated with leaden-grey. Costa with some 10 well-defined dark brown transverse strigulae alternating with small marks; below costa the strigulae become ochreous-tawny, and the small marks are continued by leaden-grey strigulae. Basal patch extending to $\frac{1}{3}$ of wing length, its edge indicated above by the third costal strigula that runs obliquely as far as upper edge of cell, thence edge of basal patch tolerably vertical and gently convex to just above vein 1b; below this vein edge abruptly bent inwards, thence vertical to wing edge; basal patch evenly suffused with dull pale fuscous, except along costa, and with a dark brown irrorated longitudinal blotch along fold, from beyond base, occupying about $\frac{1}{4}$ of wing breadth, point basad; fourth and especially fifth costal strigulae are thicker than others, below costa suffused with ochreous-tawny, fourth running into fifth along upper edge of cell, fifth extended posteriorly, curved downward and reaching to before lower third of termen; transverse fascia indicated by a broad longitudinal dark brown patch along posterior portion of lower half of cell, from before middle of wing to lower angle of cell, clavate posteriorly, upper edge horizontal and well-defined; irregular dark irroration between preceding mark and the dark blotch on basal patch; a suffused triangular brown spot between veins 1b and 1c, below dark patch on end of cell, sometimes connected with that patch or entirely obscured by ochreous-tawny suffusion, limited posteriorly by vein 1c which is dark brown throughout; veins beyond cell marked with dark brown anteriorly, veins 6 and 7 with a conspicuous blackish-brown streak from beyond cell to apex of wing; dark brown

irroration interconnecting neural streaks; a well-defined, gently undulate dark brown marginal streak along termen; ultimate costal strigula less oblique than others, curved downward to upper $1/3$ of termen; two minute inwardly oblique costal marks before apex; a series of irregular, rather large dorsal spots. Cilia ochreous-whitish with some three suffused dark brown lines, lower of these, antemedian.

Hind wings dull light fuscous, becoming glossy and fuscous-whitish towards base. Cilia fuscous-whitish, with antemedian darker fuscous shade.

The differences of the male genitalia from those of *B. excelsa* are slight but constant, and concern the sacculus (fig. 43). Hairy area on disc of sacculus shorter and more prominent in the middle (more triangularly shaped); the first (uppermost) spine on the margin of sacculus slender (sometimes there are two slender spines), only the second spine being stout and large (it is always the first spine that is stout and large in *excelsa*); the second stout spine sometimes absent, both stout spines smaller and slenderer than in *excelsa*; basal angle of sacculus somewhat more projecting, edge of this portion broader with the row of hairs running more horizontal and not in a curved series parallel to the outer margin of sacculus. Aedoeagus with the apical portion membraneous except a narrow sclerotized dorsal band terminating in the subapical tooth. (Slide figured 1602).

E a s t J a v a, Pasuruan, 5 m, 17.V.1940, gen. no. 1602, ♂, redescribed above; 4.VI.1940, gen. no. 1624, 1 ♂; 23.V.1940, gen. no. 1598, 1 ♂ (A. Diakonoff). Holotype, ♂, from Maskeliya, Ceylon, in the British Museum.

The species is closely allied with *B. excelsa* spec. nov. Apparently this is a vicarious species of lower country. The rather typical features are the three discal dark markings that together form a dark longitudinal stripe, limited above by a pale stripe of the little obscured ground colour.

The female is unknown.

***Bactra (Chiloides) leucogama* Meyrick, 1909 (figs. 39-41)**

Bactra leucogama Meyrick, 1909, Journ. Bomb. Nat. Hist. Soc., vol. 19, p. 584 (Ceylon, ♂, ♀). — Diakonoff, 1950, Bull. Brit. Mus. Nat. Hist., Ent., vol. 1, p. 287, pl. 6, fig. 22, pl. 7, fig. 33 (lectotype designated; genitalia ♂, ♀ figured).

♂ 14 mm, ♀ 16.5 mm. Head and thorax ochreous-whitish, vertex of head, collar, and tegulae suffused with pale tawny. Antenna ochreous-whitish, in male thickened, with tawny rings. Palpus moderate, in female longer, strongly expanded and roughish along apex of median segment, terminal segment smooth, exposed; pale tawny. Abdomen whitish-ochreous. Legs in male light brownish, tarsus brown, pale-ringed, in female legs ochreous-whitish, suffused with pale tawny, tarsus brownish, pale-ringed.

Fore wing moderate, broadest at $5/6$, in male costa moderately curved throughout, in female curved along anterior half, straight posteriorly, apex moderately pointed in male, less pointed in female, termen gently convex, oblique. Glossy whitish-ochreous, bleached and dull in female. Markings formed by dull light tawny suffusion, in female bleached and ill-defined. Male. An ill-defined basal suffusion, not reaching costa and dorsum; small oblique strigulae along costa; a curved suffused transverse fascia beyond $1/4$, indicating edge of basal patch, in fold with a few blackish scales; transverse fascia rather broad, forming on lower edge of cell a large curved suffusion, reaching with its attenuated posterior extremity to $3/4$ of wing length; area between basal patch and transverse fascia parted by a faint suffused streak, distinct only on costa, forming above dorsum a large suffusion; an oblique spot from apex, running basad towards the posterior extremity of the suffusion on lower angle of cell, but not touching this, anteriorly emitting a narrow line running parallel to termen to above tornus, thence connected by a suffused streak with suffusion on lower angle of cell; a slightly darker brown suffused terminal streak from apex to tornus. Cilia (damaged) light tawny, suffused with dark fuscous opposite apex. Female similarly marked, but with markings bleached and hardly recognizable.

Hind wing in male pale fuscous, becoming almost whitish towards base, veins faintly streaked with fuscous on apical third of wing; cilia concolorous, with a pale base. Hind wing in female whitish, cilia white.

Tegumen (fig. 39) moderately high, triangularly narrowed. Uncus moderate, with long spines. Socius rather small. Valva with cucullus hardly clavate, rather long, bristled towards top, haired across disc; valvula moderate, reaching beyond middle of cucullus, with a few ventral spines; sacculus large, longer than $1/2$ of valva, with two huge marginal spines, and with a transverse subbasal patch of short spines, hairy area long, inner edge of sacculus emarginate, forming a rounded subbasal prominence. Aedoeagus rather long, sclerotized, bent at base, with a subapical tooth, cornuti absent. (Slide no. 1543, homotype).

Lodix (fig. 40), a large simple plate, in the middle dilated and with a split, indications of concentric folds at each side of this split. Colliculum, a wide and strong, rather short tube, bent before its end, and with a few sclerotized folds. Cestum, a small plate. Signum (fig. 41), moderate basket-shaped, with a retinate wall. (Slide no. 1544).

South Celebes, Southwest coast, south of Makassar, Takalar, presumably collected in 1890 by M. C. Piepers (Snellen's Collection). Labels in Snellen's hand with the only indication "Celebes, Takalara" also with Meyrick's label "M 129"; 1 ♂, genitalia no. 1543, homotype; 1 ♀, gen. no. 1544.

The species was described from Puttalam, Ceylon; there are slight differences, e.g., in the hind wings of the male being greyish instead of white, and in the valvula not distinctly exceeding $1/2$ of cucullus in length, but these differences are so slight that in my opinion they are inside the individual variation of the species; besides, the available material is too limited for any further conclusions.

Bactra (Chiloides) orbiculi spec. nov. (figs. 45-47)

♂ 14 mm, ♀ 16.5-17.5 mm (allotype 17.5 mm). Head whitish, tufts on vertex touched with pale fuscous. Antenna whitish. Palpus in male strongly dilated, edge of median segment roughish, its upper angle rounded, terminal segment slender, exposed; whitish, basal half of median segment suffused with pale fuscous, edge of suffusion darker fuscous, well-defined, oblique; palpus in female rather long (less than twice the length of head), median segment with long appressed scales at apex, forming an acute tuft below, concealing the terminal segment; whitish, with a rather broad, very oblique transverse blackish streak, suffused below, tuft beyond this streak pale grey. Thorax whitish tinged fuscous in male, tawny-whitish in female. Abdomen whitish in male, light fuscous-grey in female. Legs ochreous-whitish, suffused, and tarsi ringed, with fuscous.

Fore wing moderately broad, in female somewhat broader than in male, broadest at $1/3$, costa curved throughout, apex moderately pointed, terminally sinuate above, moderately oblique. Ochreous-whitish, partially suffused with pale tawny and ochreous-tawny, markings coffee-brown in male, somewhat paler fuscous in (worn) female. Costa with some 9-10 oblique transverse rather slender strigulae, more or less triangularly dilated and deep coffee-brown on costa, becoming pale tawny-fuscous below costa, more oblique and longer posteriorly; costal markings alternating with small transverse costal strigulae; faint pale tawny suffusion forming an ill-defined attenuated streak below basal third of costa and cloudy spots along fold; basal patch indicated by an erect-rounded patch of fuscous irroration slightly before $1/3$ of wing, reaching to the middle of wing breadth, its edge well-defined posteriorly and above, slightly darker fuscous; the sector of this patch above fold regularly rounded and conspicuous; a rounded spot of fuscous suffusion on lower angle of cell, extending almost to vein 2 below, above with a transverse appendage along closing vein; an ill-defined rounded spot of pale tawny-fuscous irroration in fold, between basal patch and the above mentioned spot; lines originating from the four posterior costal marks abruptly zigzagged below costa, so that they run more oblique than the costal marks themselves, and form together an almost continuous subcostal horizon-



Figs. 45-49. Genitalia of subgenus *Chiloides*. 45, *orbiculi* spec. nov., female; 46, the same, signum; 47, the same, male; 48, *contraria* spec. nov., male; 49, the same, female.

tal line, gradually rounded well before apex, traversing wing and continued as a thicker and deep coffee-brown marginal fascia along lower part of termen to tornus; a similar but interrupted and less distinct line, running parallel and inside the above mentioned curve; this line originating from the mark on the middle of costa, running obliquely to above upper angle of cell, thence horizontal, merging in a small deep coffee-brown dot before termen between veins 6 and 7, thence merging in upper extremity of the above mentioned terminal fascia; an elongate horizontal dark brown mark well before tornus, encircled by a narrow brownish line together forming a slender oval ocellus; posterior half of upper edge of cell narrowly brown; a small dot of unobscured ground colour (almost white) edging discoidal vein posteriorly; apex with a small suffused fuscous spot. Cilia ochreous-whitish, with an antemedian deep coffee-brown fascia, beyond this fascia cilia mixed with fuscous. Female (worn) somewhat more suffused with pale tawny, subcostal markings light tawny instead of tawny-fuscous, more suffused and therefore broader, median third of the area between cell and termen somewhat brighter light ochreous-tawny; the characteristic ocellus traceable (other markings worn and disappeared, only a trace of the dorsal spot discernible, the spot on lower angle of cell small but conspicuously dark and well-defined posteriorly).

Hind wing whitish, with a strong golden gloss, touched with ochreous-fuscous, but less so towards base, towards apex with traces of fuscous irroration, in female paratype hind wing similar, in female allotype it is distinctly tinged pale fuscous-tawny, and minutely irrorated with fuscous. Cilia white with a golden gloss, opposite apex slightly infuscated.

Tegumen (fig. 47) low and broad. Uncus with long spines. Socius large. Valva with a narrowed cucullus, valvula long, about $\frac{2}{3}$ of cucullus, with a few strong spines along ventral edge (below the apical crown of spines); sacculus small, less than $\frac{1}{2}$ of the valva, with a longitudinal row of rather sparse short and stout spines, ventral extremity of sacculus pointed, crowned with a curved sheaf of long spines. (Slide 1608, holotype).

Eighth segment (fig. 45) forming a wide sclerotized tube, somewhat narrowed above, with a rounded, weak sclerite at each side below. Ostium bursae wide, with a ventrally projecting high edge. Colliculum connected with ostium bursae, forming a strong tube, wide above, slightly tortuous below the middle. Cestum, a small sclerite. Signum (fig. 46), a moderate finely denticulate convex sclerite. (Slides 1534, allotype, figured; 1618, paratype).

E a s t B o r n e o, Balikpapan, Mentawi River, 50 m, X.1950 (A. M. R. Wegner), holotype, male, gen. no. 1608. S o u t h B o r n e o, Sampit, 0-50 m, 20.II.1950 (W. Buijn), allotype, female, gen. no. 1534, paratype, female, gen. no. 1618. 1 ♂, 2 ♀.

A species of moderate size, pale, with delicate markings; characteristic are the narrow lines encircling the subternal spot and forming an ocellus. Although the females are from another locality than the male, viz., from a more cultivated country, the elevation, and the climate of the two localities are alike. I do not hesitate to place the sexes together, because of the identical ocellus, the costal markings, and the general facies of these insects.

Bactra (Chiloides) contraria spec. nov. (figs. 48-49)

♂ 13 mm, ♀ 10.5-13.5 mm (allotype 13.5 mm). Head very pale tawny-fulvous, face tawny-whitish, in female whole head tawny-whitish. Antenna pale tawny ringed with brownish. Palpus in male rather slender, strongly S-shaped, median segment abruptly dilated, rounded (not triangular), with a rough edge throughout, terminal segment rather slender; very pale tawny-fulvous, median segment with a small fuscous spot at base above, with a broader dark fuscous, moderately oblique median band, and with a small suffused fuscous spot at apex, above the base of terminal segment; palpus in female somewhat longer, strongly dilated posteriorly, median segment tolerably rounded, its posterior edge very rough by loosely spreading hair-scales, reaching top of terminal segment, but not very dense and therefore not concealing this segment; coloured as the male, but with dark markings reduced to sparse blackish irroration, and with the apical spot of median segment absent; terminal segment pale tawny. Thorax pale tawny, in female paler than in male; tegula irrorated with fulvous and brownish scales. Abdomen grey in male, whitish-grey in female, with a silvery gloss. Legs ochreous-whitish with a strong golden gloss, anterior and median legs suffused and tarsi ringed with purplish-fuscous; legs in female paler.

Fore wing in male elongate-oval, broadest just beyond the middle, with costa considerably curved throughout, apex little pointed, termen gently convex, oblique; fore wing in female somewhat longer, thence appearing narrower, with costa a trifle less curved, apex much more pointed, termen straight, almost sinuate. Male, holotype. Whitish, glossy, strongly irrorated with brown and suffused with ferruginous-brown and dark leaden-grey. Costa throughout with strong deep brown transverse strigulae, dilated on costa, alternating with minute lines; basal patch indicated by a very outwards-oblique straight ferruginous-brown line from beyond $1/5$ of costa (from the third costal mark), reaching to upper edge of cell, and by a deep coffee-brown, inwards-oblique transverse spot in fold at $1/3$ of wing length, with outer edge convex, extending from lower edge of cell to vein 1b; this basal patch with its costal fourth suffused with ferruginous-brown, and with three costal streaks (ultimate streak, marginal), plical fourth of basal patch with dark brown trans-

verse marks preceding the above-mentioned inwards-oblique spot, but not reaching base, interspaces filled with ferruginous-brown, so that a wedge-shaped longitudinal patch is formed, with top basad; a small but conspicuous dark brown dot above dorsum well beyond base; transverse fascia formed by a dark brown, ferruginous-suffused rather oblique streak from the sixth costal mark, extended into a ferruginous-brown large suffusion on end of cell, forming projections basad and distad, viz., on upper edge of cell, in the middle of discoidal vein, and just below cell; the lower portion of this patch suffused anteriorly, and becoming light tawny, not reaching dorsum; four posterior costal streaks continued across wing, moderately oblique, and rather thick, three ultimate ones merging in a longitudinal patch of dark fuscous suffusion just below vein 7, extending from halfway between cell and termen to apex; a well-defined, somewhat zigzag terminal dark brown fascia, almost interrupted above the middle; dark leaden-grey suffusion forming continuations of costal markings below costa, and partially filling terminal area; wing between markings strongly irrorated with dark brown and bright tawny; whitish ground colour less obscured and distinct: along second fourth of costa, immediately beyond discoidal vein, and between veins 7 to 9 or to 10; dark brown dotting along posterior $\frac{2}{3}$ of dorsum. Cilia (damaged) apparently dark fuscous. Female, allotype. Ground colour whitish touched with straw colour. Costal markings almost blackish, but strigulae across wing and all irrorations obliterate; where present, it is more yellowish-tawny or almost olive-tawny instead of ferruginous-brown; suffusions fuscous with some yellowish tinge, extended: first occupying two-thirds of basal patch and extending on dorsum to its $\frac{1}{3}$, but dark markings as described in male suffused and ill-defined, except the dark spot in fold, which is also inwardly oblique, and conspicuous, but with an emarginate posterior edge; second suffusion extended along transverse fascia, making it broader than in male, especially on lower half, and reaching dorsum, on end of cell mixed with dark fuscous posteriorly; third suffusion rather mixed with dark fuscous, forming a wedge-shaped (ill-defined) patch along veins 6 and 7 and extending to apex, terminal area moderately suffused with greyish-lilac; terminal fascia formed by a series of interconnected dots; dorsal dots minute, but well-defined, extended from $\frac{1}{4}$ to tornus. Cilia light fuscous irrorated with darker, a narrow subbasal and a similar subapical dark line. Female paratype with similar but reduced markings and with the ground colour almost pure white.

Hind wing in male pale greyish-fuscous with a bronze gloss, in female whitish with a golden gloss; apical area irrorated with fuscous, slightly so in female. Cilia pale grey in male, with a bronze gloss, whitish in female, with a golden gloss.

Tegumen (fig. 48) rather high. Uncus with long spines. Socius large. Valva huge, cucullus moderately dilated, broadest in middle; valvula exceeding $1/2$ of cucullus; sacculus very large, $1\frac{1}{2} \times$ cucullus, densely covered with numerous long spines, arranged lengthwise and in a marginal transverse patch, base of sacculus very broad. Vinculum very long, with a median point. Juxta very strong, but caulis short. Aedoeagus long, slender, sclerotized and curved. (Slide no. 1610, holotype).

Eighth segment (fig. 49) forming a strong conus; anapophyses very short. Lodix, two moderate, sclerotized oval folds. Ostium bursae represented by a quadrate fold. Colliculum tubular, sclerotized, rather narrow. Signum small, denticulate. (Slides no. 1587, allotype; no. 1611, paratype, figured).

East Borneo, Balikpapan, Wain River, 50 m, XI.1950 (A. M. R. Wegner). Male, holotype, gen. no. 1610, female, allotype, gen. no. 1587, female, paratype, gen. no. 1611. 1 ♂, 2 ♀.

A distinctly marked species, with the median portion of the edge of the basal patch forming a conspicuous dark spot, and with a well-defined transverse fascia. Judging from the genitalia very near to *copidotis* Meyr. from Ceylon, but distinct, as a close comparison with the type of that species, in the British Museum, revealed.

4. Subgenus **Nannobactra** nov.

A separate, lobate valvula, crowned by a modified spine-cluster Spc_1 present. Sacculus large, swollen, Spc_1 , an area of stout spines. Cucullus reduced, valva short, rounded posteriorly, with a series of huge marginal thorns. Aedoeagus small, without cornuti. Gnathos and anal tube absent. Sterigma little sclerotized, colliculum weak.

Type of the subgenus: *Bactra phaulopa* Meyrick, 1911.

Indian, Papuan, Pacific regions, and southern part of North America.

The species are small, narrow-winged and extremely similar. The recognition of the females is difficult, but the males can be separated in several distinct species without difficulty with the use of the armature of the sacculus.

Bactra (Nannobactra) phaulopa Meyrick, 1911 (figs. 50-51)

Bactra phaulopa Meyrick, 1911, Proc. Linn. Soc. N.S. Wales, vol. 36, p. 253 (♀, Kei Islands). — Diakonoff, 1950, Bull. Brit. Mus., Entom., vol. 1, p. 288-289, pl. 8, fig. 42 (genit. described and figured).

Distribution: Kei Islands.

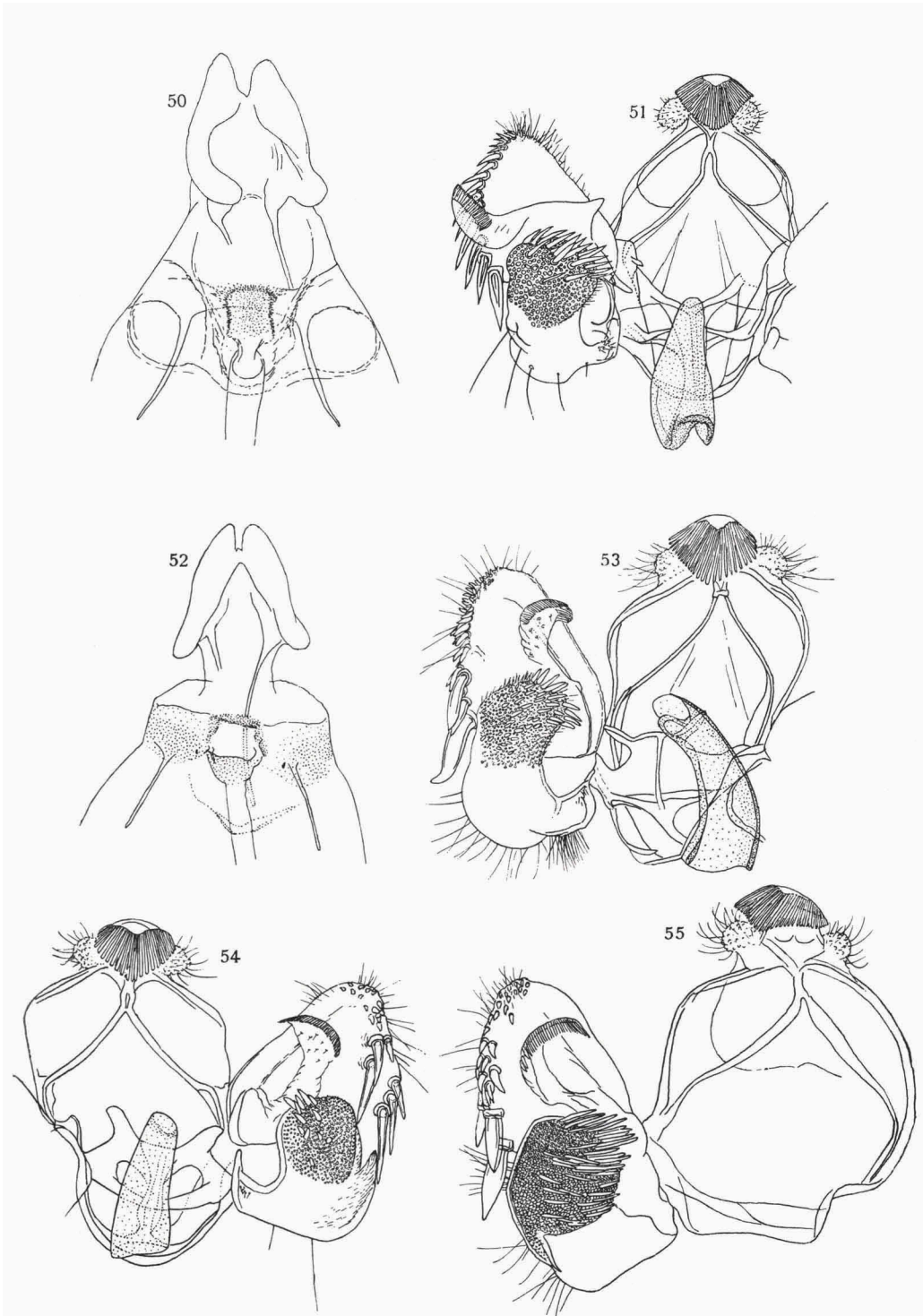
Type locality: Kei Islands.

West Java, Buitenzorg, VII.1919, 1 ♀, gen. no. 2028 (W. Roepke). Buitenzorg, 250 m, 25.III.1949, gen. no. 1580, 1 ♀; 18.VIII.1949, gen. no. 1516, 1 ♀; 1.VI.1950, 1 ♀; 26.XII. 1951, 1 ♂ (F. C. Drescher). The

same locality, 11.I.1950, 1 ♀; 16.I.1950, gen. no. 1579, 1 ♀ (E. J. Beeltje). The same locality, 2.XI.1949, 1 ♀ (G. J. Imbert). The same locality, 26.IX.1948, 1 ♀; 3.VIII.1948, 1 ♀ (A. Diakonoff). Mount Gedé-Pangrango, Tjibodas, 1400 m, IX.1948, gen. no. 1827, 1 ♂; 10.XI.1948, gen. no. 1519, 1 ♀; gen. no. 1566, 1 ♂; VIII.1949, 1 ♀ (A. M. Neervoort). Bandung, 750 m, 24.XII.1939, gen. no. 1570, 1 ♀ (A. Diakonoff). 15.XII.1949, gen. no. 1569, 1 ♀ (L. J. Toxopeus). Central Java, Semarang, low country, 1879 (Snellen Collection), gen. no. 1552, 1 ♀. East Java, Pasuruan, 5 m, 1.VII.1939, gen. no. 1574, 1 ♂; 9.I.1940, gen. no. 1556, 1 ♂; 4.VI.1940, gen. no. 1555, 1 ♂; 6.VI.1940, 1 ♂; 7.VI.1940, gen. no. 1577, 1 ♂; 11.VI.1940, 1 ♂; 25.VI.1940, gen. no. 1554, 1 ♂; 1.VII.1940, gen. no. 1573, 1 ♂; 23.IX.1940, gen. no. 1557, 1 ♀; 21.I.1941, gen. no. 1575, 1 ♂; III.1941, 1 ♂; gen. no. 1578, 1 ♀; 10.III.1941, gen. no. 1572, 1 ♂. Malang, Sugar Estate Gempol, 300 m, bred from leaves of an unknown plant, 28.II.1941, 1 ♀; gen. no. 1560, 1 ♀. Mount Ardjuno, Tretes, 900 m, 25.VII.1939, gen. no. 1559, 1 ♂ (A. Diakonoff). Tengger Mountains, Nongkodjadjar, 1300 m, 25.IV.1940, gen. no. 1667, 1 ♂ (A. M. R. Wegner). West Central Sumatra, Fort de Kock, 920 m, XI.1920, 1 ♂; gen. no. 1538, 1 ♂; V.1921, gen. no. 1539, 1 ♂; VI.1921, gen. no. 1599, 1600, 2 ♂; VII.1921, sex? (hind wings and abdomen missing); 1925, gen. no. 1540, 1 ♀ (E. Jacobson). South West Celebes, Makassar, low country, gen. no. 1545, 1 ♀, "*Grapholitha*". (in Snellen's handwriting; Snellen's collection). North Moluccan Islands, Halmahera, Toluwang, 50 m, 12-25.X.1951, 2 ♂, 6 ♀; gen. nos. 1585, 1586, 2 ♀; gen. no. 1826, 1 ♂ (native collector) (L.M.). Philippine Islands, Luzon, Mt. Makiling (Baker), 1 ♀, gen. no. 1944 (U.S.N.M.). Average male and female from Buitenzorg, West Java, may be redescribed as follows.

♂ 14.5 mm. Head pale ochreous, side tufts, on vertex, extending beyond bases of antennae in front, thus giving rise to a deep central furrow, suffused with pale fulvous, mixed with a few dark grey scales. Palpus pale fulvous, terminal segment strongly dilated, with brushy edge, suffused with blackish, inside pale fulvous; terminal segment short, concealed, visible only from above, blackish. Thorax pale ochreous suffused with pale fulvous strewn with blackish scales. Abdomen fuscous-grey, glossy, anal tuft pale ochreous. Legs pale ochreous, ringed and suffused with fuscous.

Fore wing narrowly elongate, costa gently curved throughout, apex rather pointed, termen faintly convex, considerably oblique. Whitish-ochreous, lower half, terminal area and a rather narrow, outwards-convex oblique transverse fascia in the middle formed by dark fuscous suffusion, touched with tawny. Costal markings blackish-brown, subtriangular, rather thick,



Figs. 50-55, Genitalia of subgenus *Nannobactra* nov. 50, *phaulopa*, female; 51, the same, male; 52, *minima*, female; 53, the same, male; 54, *oceani* spec. nov., male; 55, *hostilis* spec. nov., male.

from base to apex. A deep brown irregular patch in fold at $1/3$ of wing length, with dentate upper and lower edges; a longitudinal deep brown mark below lower angle of cell; veins and extreme terminal edge marked with deep brown. Cilia, blackish with a pale tawny-ochreous base and similar narrow postmedian and apical bands, in tornus pale fulvous.

Hind wing fuscous-greyish, suffused with brownish posteriorly, with a bronze gloss; cilia fuscous-grey, with a pale basal line, on costa touched with pale ochreous. (Specimen redescribed gen. no. 1580).

♀ 10.5 mm. Head whitish, palpus whitish, median segment dilated, posteriorly, externally finely irrorated with blackish on basal half, terminal segment exposed, light fuscous. Thorax ochreous-whitish, on tegulae dotted with fuscous. Abdomen greyish-white with golden gloss, anal tuft white.

Fore wing narrowly elongate, costa gently curved at extremities, straight in the middle, apex pointed, termen straight, considerably oblique. Paler than female, costal markings extended across wing by more or less parallel and concentric pale tawny loops and transverse strigulae. Hind wing paler than in female.

The male genitalia (fig. 50) clearly show the characteristics of the subgenus. Tegumen rather low. Valva short, cucullus rounded, armed along the edge with a single row of spines, these spines becoming huge downward; valvula rather long, with the usual crown of bristles; sacculus $1/2$, strongly thickened, especially at the top, which is densely covered with strong spines. Aedoeagus rather long, little curved. (Genitalia slide figured no. 1574).

Female (fig. 51) with lamella postvaginalis forming a weak pileate subquadrate plate or prominence, larger than ostium bursae which is rounded and small. Distinct sclerotizations on both sides of sterigma. (Genitalia slide figured no. 1578).

Although the type specimen is a female, the female genitalia in this species are sufficiently characteristic to make the identification certain.

***Bactra (Nannobactra) minima* Meyrick, 1909 (figs. 52, 53)**

Bactra minima Meyrick, 1909, Journ. Bombay Nat. Hist. Soc., vol. 19, p. 586 (♂ Barberyn Island, Ceylon). — Diakonoff, 1950, Bull. Brit. Mus., Entom., vol. 1, p. 288, pl. 6, fig. 25 (lectotype designated, gen. ♂ described and figured).

Bactra phaeopsis Meyrick, 1911, Proc. Linn. Soc. N. S. Wales, vol. 36 p. 254 (♂ ♀, Sudest Island, New Guinea). — Diakonoff, 1950, Bull. Brit. Mus., Entom., vol. 1, p. 288, pl. 6, fig. 28 (gen. ♂), pl. 8, fig. 41 (gen. ♀). (Lectotype designated, gen. ♂, ♀ described and figured). Syn. nov.

Distribution: Ceylon, Barberyn Island; New Guinea, Sudest Island.

♂ 11 mm. Head and palpus whitish, median segment of palpus with an oblique blackish transverse suffusion, from the middle of internal side to

external angle, terminal segment exposed, with blackish posterior half. Thorax whitish, touched with pale ochreous, legs whitish, infuscated and dark-ringed. Abdomen greyish-white, glossy.

Fore wing elongate, narrow, not distinctly dilated, broadest at $\frac{3}{4}$, costa very gently curved throughout, somewhat more so along posterior third, apex pointed, termen gently convex, oblique. Whitish, touched with ochreous, strewn with a few pale tawny scales, markings blackish-fuscous. Transverse strigulation and dotting more prominent on dorsal half of wing; costal markings conspicuously dark, anteriorly confluent along costal edge, before apex getting ill-defined; a transverse mark on fold before its middle, with an acute point directed outwards, followed by an acutely triangular mark on end of cell, first mark preceded and followed by dark irroration, more or less connected with transverse dark irroration along dorsum; a submarginal terminal streak of blackish-fuscous irroration, appearing serrulate posteriorly. Cilia whitish touched with ochreous, suffused with grey except at base.

Hind wing silvery-greyish, veins narrowly streaked with fuscous. Cilia grey with a narrow pale base.

In specimen from Rota Rota plical markings entirely confluent with dorsal, giving rise to a characteristic pattern.

Specimen redescribed is from Colonia, Ponape, 14. I. 1953, gen. no. 1941 (U.S.N.M.).

♀ 14 mm. Fore wing entirely suffused with light tawny, costal markings small, terminal minute; dorsal markings also rather reduced, connected by narrow transverse strigulae with a small semioval spot just below fold before its middle. Hind wing somewhat darker and more fuscous than in male. Otherwise similar to male. (Specimen redescribed from Agat, Guam, gen. no. 1929).

Extremely similar to the preceding species, and constantly differing only in genital characters.

Valva (fig. 53) with cucullus broadly rounded, along the edge covered with several rows of small bristles that abruptly increase in size below middle of cucullus so as to form a double series of spines, the ultimate of which has a sinuate shape with an outwards-curved point. (Slide figured no. 1987)

Lamella postvaginalis (fig. 52) is smaller and broader, ostium bursae markedly larger and wider than in the preceding species, sclerotizations on each side of ostium less extended. (Slide figured no. 1933).

British Solomon Islands, New Georgia Island, Munda Pt. Area, 31.III.1944 (J. G. Franclemont) (Cornell Un. Coll.), 1 ♂, gen. no. 1999. Marianas Islands, Guam Island, Agat, ex nutgrass, 10. V. 1936 (O. H. Swezey), 1 ♂, gen. no. 1932; 1 ♂, gen. no. 1933; 1 ♂, gen. no.

"Clarke 9495". Guam Island, 2 ♀, gen. nos. 1929 and 1984 (D. T. Fullaway). Ponape Island, Colonia, 14.I.1953, 1 ♂, gen. no. 1941. Rota Rota, 20.VII. 1946, at light (Townes), 1 ♂, gen. no. 1987, 1 ♀, gen. no. 1990 (U.S.N.M.).

Bactra (Nannobactra) hostilis spec. nov. (figs. 55, 56)

♂ 16 mm. Head sordid ochreous-white, palpus strongly dilated triangularly, blackish, basal segment and upper edge of median white, terminal segment exposed, white with apical half black. Thorax light greyish-fuscous, with three transverse pairs of darker fuscous, cloudy spots. Abdomen greyish-white, glossy. Legs whitish, suffused and ringed with bronze-grey.

Fore wing rather narrow, gradually dilated, broadest at $3/4$, costa almost straight, gently curved along apical fourth, apex pointed, termen gently convex, oblique. Ochreous-white, suffused with pale tawny and greyish-fuscous, irrorated with dark fuscous. Pale tawny irroration extending over the whole wing except along lower edge and end of cell where the unobscured ground colour forms pale streaks; costal markings dark fuscous, broad but short, i.e., not extended across wing and hardly reaching halfway towards upper edge of cell; a conspicuous irregular marbling of dark fuscous along fold from beyond base of wing to end of cell, markings irregular, transverse, confluent with dark irregular patches along dorsum, a well-defined isolated dark fuscous spot along posterior portion of lower edge of cell, extending well beyond the lower angle of cell; veins very narrowly marked with dark fuscous, a serrate dark fuscous terminal line; light tawny suffusion tending to form curved parallel transverse streaks before apex, adjacent to dark costal markings; apex suffused with light tawny. Cilia whitish, with light base and a series of partially interrupted blackish bands irrorated with whitish (white tips of scales).

Hind wing rather dark fuscous-grey with faint purplish gloss in certain lights, darker fuscous in apex. Cilia silvery-grey, a faint subbasal shade.

Cucullus (fig. 55) with a blunt top, marginal spines small and irregular apically, below the middle of margin forming two irregular rows, outer row of smaller spines, inner row ending in two big straight spines, much bigger than the other; sacculus with bulbous portion big, covered with rather long spines. (Slide figured, holotype, no. 1939).

♀ 18 mm. Head whitish-ochreous. Antenna whitish-ochreous, flagellum infuscated. Palpus strongly dilated, median segment at apex roughish above and beneath, terminal segment moderate, slender, partially exposed; whitish-ochreous, lower angle of median segment suffused with dark grey, this suffusion extended across segment as a narrow fascia running to the middle of its upper edge; terminal segment light fulvous, Thorax whitish-ochreous

touched with greyish. Legs ochreous-whitish, anterior and median legs moderately suffused and ringed with fuscous. Abdomen whitish tinged grey.

Fore wing long and narrow, costa gently curved at base and along posterior third, straight in middle, apex obtusely pointed, termen gently convex, oblique. Whitish-ochreous, partially suffused with brighter light tawny-ochreous, sparsely marked with dark fuscous. Some 16 or 17 very short dark marks along costa, anteriorly broader, the one on the middle of costa fasciate, preapical marks transverse, linear, oblique; a dark fuscous strigula along discoidal vein, hardly perceptible except on lower angle of cell, where it is dilated into a subtriangular shadow; light tawny-ochreous suffusion extending along anterior $\frac{2}{3}$ of dorsum and reaching slightly above fold;



Figs. 56-57. Female genitalia of subgenus *Nannobactra* nov. 56, *hostilis* spec. nov. 57, *oceani* spec. nov.

similar suffusion occupying terminal area, above extending as far as the course of vein 8, anteriorly reaching halfway towards cell; a less distinct small tawny-ochreous patch in lower half of cell posteriorly; a series of small dark dots along dorsum; termen sparsely irrorated with dark fuscous scales, tending to form small dots on ends of veins. Cilia pale tawny-fuscous, with numerous fine and ill-defined darker fuscous lines, and with an ochreous-whitish basal streak.

Hind wing pale fuscous, scarcely touched with yellowish, with a golden, and a faint purplish gloss in certain lights.

Eighth abdominal segment (fig. 56) conical, markedly sclerotized throughout, especially along its caudal edge ventrally. Anapophyses short, rather slender, postapophyses slender and long. Ostium bursae big, cup-shaped, with slightly sclerotized walls, lamella postvaginalis pileate, and shaped like a

rounded transverse fold with a small similar fold at each side. (Slide figured, allotype, no. 1937).

Although differently coloured than the above described male, the size, the shape of the fore wing, the colouring and the shape of the palpi, and the identical collecting locality of the female specimen strongly suggest that the sexes belong together.

J a p a n, Honshiu, Funakoshi, Yokosuka, holotype, ♂, 11.IX.1953, genitalia no. 1939; allotype, ♀, 13.VIII.1952, gen. no. 1937 (H. Inoue) (U.S. N.M.). This is the largest species of the subgenus known to me. Differs from *phaulopa* by a double row of marginal spines on the sacculus, from *minuta* by the ultimate spine of the inner row being straight and not sinuate; female differing from both these species by a sclerotized eighth segment.

Bactra (Nannobactra) oceani spec. nov. (figs. 54, 57)

♂ 12 mm. Head and palpus whitish, touched with ochreous, terminal segment of palpus exposed, tipped with black. Thorax ochreous-white. Abdomen whitish-grey, glossy. Legs whitish, ringed and suffused with dark grey.

Fore wing elongate-ovate, rather narrow, costa gradually but faintly curved at the extremities, almost straight in the middle, apex tolerably pointed, termen gently convex, oblique. Whitish, irrorated with greyish-fuscous, other markings greyish-fuscous, reduced to fine irregular irroration on basal half of wing, except the rather conspicuous dark grey marginal dots along dorsum; greyish markings on apical half of wing formed by suffused strigulae, being continuations of costal markings, and running obliquely across wing; anterior of these strigulae most distinct, running from costa obliquely to cell, thence forming a loop around posterior half of cell, to its lower angle; a suffused greyish-fuscous patch between veins 9 and 5, extending from half-way between cell and termen, and obscuring apex; indication of an interrupted terminal dark line. Cilia (damaged) whitish, mixed with fuscous.

Hind wing fuscous-grey, becoming darker fuscous on apical half, veins faintly darker. Cilia whitish, with a grey subbasal shade.

Cucullus (fig. 54) obtuse, marginal spines arranged in irregular rows along the upper third of the edge, thence an inner series of two or three big spines, and an outer series of some four big spines, first and fourth of these much smaller than the other. Sacculus strongly sclerotized basally, its bulbous portion smaller than in *minuta* or in *phaulopa*, beyond this portion a stout, tooth-like structure. Aedoeagus shorter than in the two preceding species. (Slide figured, holotype, no. 1985).

♀ 16 mm. Head, thorax whitish-ochreous. Palpus rather slender, moderately dilated; light ochreous, median segment with a dark fuscous apical, and

a smaller median spot. Legs pale golden-ochreous, anterior and median legs, and tarsus of posterior leg infuscated, except on articulations of segments. Abdomen whitish touched with grey.

Fore wing sublanceolate, rather narrow, broadest at $4/5$, costa gently curved throughout, apex tolerably pointed, termen convex, considerably oblique. Whitish-ochreous, irrorated, strigulated, and marked with dark fuscous. Costa with a dense series of oblique transverse marks, alternating with minute marginal strigulae; dark fuscous irroration condensed along dorsum, across end of cell, and on termen; this terminal irroration extending between veins 3 and 7, and reaching apex; a row of darker marginal spots along termen, on ends of veins. Cilia (damaged) whitish-ochreous, mixed with fuscous.

Hind wing light fuscous, becoming paler at base; with a distinct purplish gloss. Cilia whitish-fuscous, a deeper fuscous subbasal shade.

Eighth abdominal segment (fig. 57) sclerotized not throughout, but along its anterior edge only, which forms a very strong ring around the ovipositor. Ostium bursae shaped as a big dilatation of this ring. Lamella postvaginalis shaped like a large bowed prominence, with pileate surface; ventral wall of the ostium not pileate, neither sclerotized. An ill-defined, rounded sclerite at each side of the ring, above ostium bursae. Both pairs of apophyses long and slender. (Slide figured, allotype, no. 1938).

Fiji Islands, Nadi, at light, July, holotype, ♂, genitalia no. 1985; allotype, ♀, the same, gen. no. 1938 (J. Illingworth) (U.S.N.M.). 2 specimens. Differs from all Asiatic species of the subgenus by the presence of a tooth at the external side of the base of the sacculus. In that respect it is nearest to *B. (N.) albipuncta* (Heinr.) from the southwestern United States (Utah, Colorado, Arizona).

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