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Systematic notes on Holarctic Blephariceridae (Diptera)

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Abstract. Taxonomic and nomenclatorial notes on Holarctic Blephariceridae are presented. Several Asian species previously placed in *Bibiocephala* Osten-Sacken and *Dioptopsis* Enderlein, respectively, are assigned to *Agathon* von Röder. *Bibiocephala* is redefined and restricted. The synonymy of *Amika* Kitakami with *Bibiocephala* is confirmed. *Liponeura jezoensis* Matsumura is a synonym of *Bibiocephala infuscata* Matsumura. *Parablepharocera* Kitakami is suppressed as a synonym of *Blepharicera*. Several species of the genus *Blepharicera* Macquart are redescribed, most from types; *B. pusilla* sp. n. (Malaysia), *B. tanidai* sp. n. (Japan) and *B. macropyga* sp. n. (China: Hainan) are named. *B. tertia* Kaul is synonymised with *B. asiatica* Brodsky. *P. alhnicola* (Kaul) and *B. rahlaea* (Kaul) are doubtful species. *Asiobia* Brodsky is a new synonym of *Neohapalothrix* Kitakami, *N. acanthonympha* (Brodsky) (comb. n.) is a probable synonym of *N. manshukuensis* (Mannheims). *Manaliella* Kaul is synonymised with *Horaia* Tonnoir. *Horaia manaliella* (Kaul) (comb. n.) is a doubtful species. Larvae originally described as those of *H. manaliella* are actually of another tribe, probably of some species of *Philorus*.

Key words. Diptera, Blephariceridae, holarctic fauna, taxonomy, nomenclature, new species, new synonyms.

Introduction

During the preparation of a manuscript for the Catalogue of the Palaearctic Diptera (edited by Soós et al.) the need for several taxonomic and nomenclatorial changes in the family Blephariceridae was noticed. These are here proposed and discussed. The morphological terminology follows Hogue (1981, 1987), Hogue & Georgian (1986), and Hogue & Bedoya (1989).

Material and Methods

The present study is partly based on literature research, but mainly on actual study of specimens (dry or in alcohol) in my collection or borrowed from the following institutions:

BMNH	British Museum, Natural History, Entomology, London, U. K.; Dr. A. M. Hutson, Dr. P. S. Cranston.
FESC	Far Eastern Scientific Centre, Academy of Sciences, Vladivostok; USSR; Dr. I. M. Levanidova.
HUS	Hokkaido University, Sapporo, Japan; Prof. S. Takagi.
IVTZ	Instituut voor Taxonomische Zoölogie, Zoölogisch Museum, University of Amsterdam; Dr. Theowald van Leeuwen.
MCZ	Museum of Comparative Zoology, Harvard University, Cambridge, Mass., USA; Dr. M. Thayer.
NHMW	Naturhistorisches Museum Wien, Austria; Dr. R. Lichtenberg.
USNM	United States National Museum, Smithsonian Institution, Washington, D. C., USA; Dr. W. Mathis.
ZFMK	Zoologisches Forschungsinstitut und Museum Alexander Koenig, Bonn, Germany; the late Dr. B. Mannheims and Dr. H. Ulrich.

Full label information is only provided for type specimens, while brief summary information is only presented for other material, especially common taxa used only for comparison.

Results

1. Genus *Agathon* von Röder

Agathon von Röder, 1890, Wien. ent. Ztg. 9: 230; monotypic; type species: *A. elegantulus* von Röder, 1890.

Hogue (1987) transferred American species misplaced in *Dioptopsis* to the present genus, which he called difficult to characterize. I only have doubts about the inclusion of *A. comstocki* (Kellogg) and *doanei* (Kellogg) which resemble the other species only in plesiomorphisms.

The remaining species share the following apomorphic similarities: long to very long, essentially parallel and widely and deeply separate male cerci; trapezoidal apodeme of sperm pump widest anteriorly, with mid-dorsal crest. Outer male gonostyle complex, deeply divided into dorsal and ventral lobes.

Other characters variable. Distinction of Asian females and pupae presently difficult or impossible. Larvae: head capsules entire (*A. elegantulus*) or incompletely divided. Antennae with three, two (*A. elegantulus*) or indistinct (*A. markii* (Garrett)) segments. Dorsum simple or with spines. Last body division with paired hard curved process in some Japanese species. Dorsal prolegs of Japanese larvae with anterior subterminal knobs, appearing angled.

The following new combinations in *Agathon* are proposed from literature data or from personal study (asterisks):

A. bilobatoides (Kitakami) (Japan)
**A. decorilarva* (Brodsky) (USSR)
**A. eoasiaticus* (Brodsky) (USSR)
A. iyaensis (Kitakami) (Japan)
**A. japonicus* (Alexander) (Japan)
A. kawamurai (Kitakami) (Korea), incl. ssp. *ezoensis* (Kitakami) (Japan)
**A. montanus* (Kitakami) (Japan), incl. ssp. *bispinus* (Kitakami) (Japan)

Remarks: Males in the genus *Asioreas* Brodsky, 1972 have similar cerci; however, outer gonostyles are undivided, sperm pump without anteriorly widened apodeme. Brodsky (1972, 1976) listed the included species.

2. Genus *Bibiocephala* Osten-Sacken

Bibiocephala Osten-Sacken, 1874, Rep. U. S. Geol. Geogr. Surv. Territ. 7 (1873): 564; monotypic; type-species: *B. grandis* Osten-Sacken, 1874.

Amika Kitakami, 1950, J. Kumamoto Women's Univ., 2: 37; type-species (by original designation): *Liponeura infuscata* Matsumura, 1916.

The long-established generic synonymy (Alexander 1958) is confirmed from fresh material of both type species in my collection. *Amika* (e. g., Furuya 1985) should no longer be used. After transfer of several species to *Agathon* and *Asioreas*, respectively, only the American type species and the Asian *B. infuscata* Kitakami, *B. infuscata minor* Kitakami, *B. komaensis* Kitakami and *B. maxima* Brodsky remain in *Bibiocephala*.

Species of *Bibiocephala* share the following derived characters (from existing descriptions and personal observations of *B. grandis* and *infuscata*; information on the remaining nominal taxa in the Palaearctic Region incomplete; their specific status

also requires further study): — dense short setation on strongly sclerotised last male tergite; — strongly pilose head with remarkably short antennae; — strongly curved fore femora; — particular hairy lobes on last female segment.

2.1. *Bibiocephala infuscata* (Matsumura, 1916)

Liponeura infuscata Matsumura, 1916, Thousand Insects of Japan, Add. 2: 413.
Liponeura jezoensis Matsumura, 1931, Six thousand illustrated insects of Japan-Empire: 407. New synonymy.

Some characters which are simple and normal in *B. infuscata* are strongly derived in *B. grandis*: ventral bridge partly inverted, phallus rods and lateral aedeagal tines almost semicircularly curved; spermathecae elongate, flask-like, with long coiled ducts (Hogue 1982)

Liponeura jezoensis Matsumura has been overlooked except by Alexander (1958). Whether the reference is indeed the original description is unconfirmed: the species was not indexed as new taxon in that work (Matsumura 1932). However, no earlier description was located. Matsumura (1931) identified *L. jezoensis* mainly by its only slightly dark transparent wings, as opposed to infuscate and not transparent in *infuscata*, although only in females; the original description said *jezoensis* occurred near Sapporo and was rare.

Material: 1 pinned ♀, genitalia now in microvial on specimen pin, here designated lectotype, in coll. Matsumura, Hokkaido University, Sapporo, labelled: Sapporo Matsumura/*Liponeura jezoensis* det. Matsumura/Type Matsumura/Lectotypus *Liponeura jezoensis* Matsumura design. P. Zwick 1989/*Bibiocephala infuscata* (Matsumura) det. P. Zwick 1989.

The type female has pale clear wings but does not differ structurally from *B. infuscata*, of which I have examined numerous pharate specimens from several localities in Honshu. Note the distinctive spinulose finger-shaped processes of the finely pilose oviscapt (Fig. 1); the corresponding structure on the setose oviscapt of *B. grandis* is not nearly as developed.

3. Genus *Dioptopsis* Enderlein

Dioptopsis Enderlein, 1937, Mitt. dt. ent. Ges., 7 (1936): 43; monotypic, type species: *Philorus djordjevici* Komárek.

The genus was originally mainly identified by a vestigial vein M_{3+4}, which was inadequate: several American *Agathon* were for some time misplaced in *Dioptopsis*, and the European *Liponeura bilobata* Loew also has similar venation.

True *Dioptopsis* are European endemics. Males of the three species, *D. djordjevici*, *vernus* Giudicelli, and *sardous* Zwick, have very wide, pouch-like tegmina resembling the European genus *Liponeura*, its probable sister group. In both genera, the membrane between the two larval antennal segments is extended so that the long antennae appear to consist of a single, medially soft segment. Interestingly, *Agathon markii* (Garrett) has rather similar larval antennae. In other characters, *Dioptopsis* and *Liponeura* are distinct (Zwick 1968).

The name of the type species was spelt *Đorđevići* or *Djordjevići*, respectively, in the original description (Komárek 1932). The first spelling was evidently a lapsus calami, Komárek subsequently (Komárek and Vimmer 1934) used only the second. Even this

spelling included a diacritic mark, requiring amendment. The spelling *djordjevici* by Enderlein (1937) satisfies the requirements of the International Code of Zoological Nomenclature. It is a justified amendment taking authorship and date of the original incorrect spelling.

4. Genus *Blepharicera* Macquart

Blepharicera Macquart, 1843, Annls Soc. ent. Fr. (2) 1: 61; monotypic, type species *Blepharicera fasciata* (Westwood, 1842).

Parablepharocera Kitakami, 1931, Mems Coll. Sci. Kyoto imp. Univ. (B), 6: 97; type species (original designation): *Blepharocera shirakii* Alexander, 1922. New synonymy.

Blepharicera needs revision. The genus is probably best defined by the following derived characteristics: — Middle coxa with setose median outgrowth, middle trochanter covered by short setae (may be indistinct in males; in the small *B. japonica*, trochanter modified, but no coxal outgrowth). — Long black setae on base of hind basitarsus (absent in the group called *Parablepharocera*) have sometimes been mistaken for tibial spurs. True tibial spurs lacking in some males, females normally with one large and one very small spur on hind tibia, both pale and inconspicuous. — Female frons with brush-like or band-like patches of setae (not expressed in all species, possibly restricted to some derived subgroup including *Parablepharocera*).

First instar larvae of Blepharicerinae bear characteristic paired dorsal setae at the pseudopod base (Zwick 1977, Hogue 1978). Second and later instar larvae of Blepharicerini normally possess distinct dorsal pseudopods which then carry these geminate (dorso-pseudopodal) setae (Hogue 1978). *Blepharicera* and *Tianshanella* are the only Blepharicerini without dorsal pseudopods. Presumably, they are secondarily reduced. In *Blepharicera*, the geminate setae occur on the anterolateral angles of the trunk segments, which may be extended, "simulating" (Hogue 1987) dorsal pseudopods. In the *B. micheneri*-complex and in the Japanese complex called *Parablepharocera*, the posterior corner of each abdominal segment is also more or less pointed or fingershaped.

Although the last character is problematic, the others suggest *Blepharicera* is monophyletic. It includes several species groups (Hogue 1987). The archaic Oriental (*B. pusilla*) and East American (*B. tenuipes*-group) species with simple ventral bridge, simple posteriorly directed, essentially straight aedeagal rods and aedeagal tines with a canal do not seem to form a monophyletic cluster; *B. pusilla* seems to be isolated, perhaps together with the incompletely known *B. apoensis*.

In the remaining species, the aedeagal tines lack a canal, or it is incomplete. Species sharing a syndrome of derived characters, i. e. a rotated male ventral bridge and associated hypopygial structures, plus correspondingly long ducts of the female receptacles, form a monophyletic derived entity which I call the *fasciata*-group. It includes the Nearctic *B. ostensackeni* Kellogg, the so-called *Parablepharocera*, and all remaining Palaearctic and Oriental species. Although the interrelations between individual species of the *fasciata*-group are as yet unknown, it is clear that *Parablepharocera* is part of it, instead of being the sister group of all other *Blepharicera*. Recognition of a separate genus or subgenus for these Japanese species (even if they are in fact closely interrelated) would turn *Blepharicera* into a paraphyletic taxon. This is not admissable, *Parablepharocera* should be suppressed

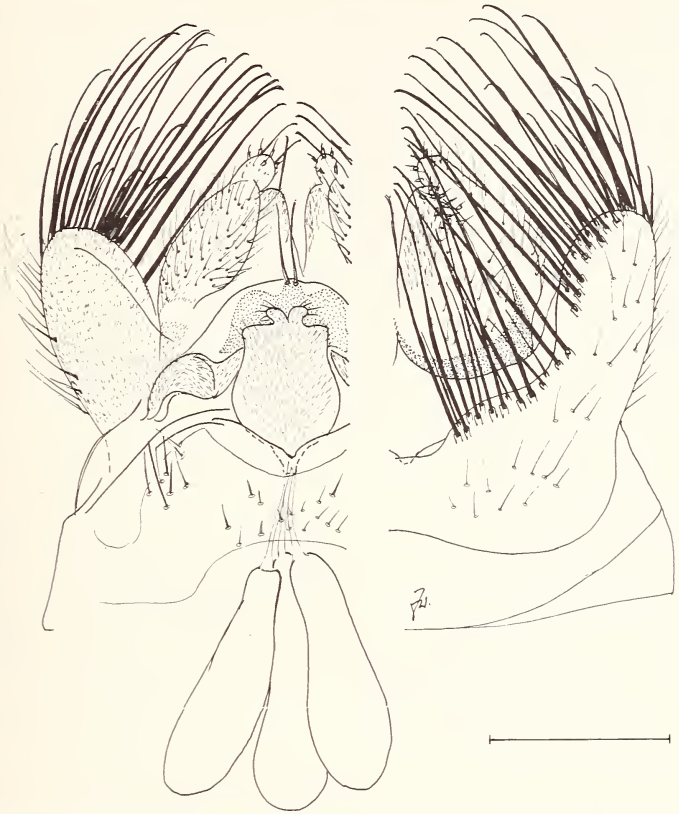

Fig. 1: *Bibiocephala infuscata*, female abdominal tip in ventral (left) and dorsal (right) views; from the lectotype of *B. jezoensis*. The scale line is 0.5 mm.

as synonym of *Blepharicera* but may be classified as the *shirakii*-subgroup within the *fasciata*-group.

The western Nearctic *micheneri*-group shows various degrees of elongation and rotation of the intromittant organs and of elongation of receptacular ducts. It may be a grade, with *B. jordani* Kellogg being most similar to members of the *fasciata*-group.

Some Old World species are inadequately described, e. g., from females only, despite the fact that specific characters of this sex have never been properly established. The opposite sex is required but there is no material. Also, not all types are presently available. A complete revision is therefore impractical. The following notes are a first contribution towards it. Specific identification of the very uniform larvae and pupae is not attempted, except for one very exceptional new species.

4.1. *Blepharicera pusilla* sp. n. (Figs. 2a–g, 3)

Material: ♂ holotype (dissected from pupa), 2 ♀ paratypes (dissected from pupae), 3 L_4, 1 L_3 17. VII. 1969; 2 pupae, 12 L_4, 2 L_3, 4. IX. 1969: MALAYSIA, station 2 on Gombak River,

15.5 miles from Kuala Lumpur, Lendong Road, (J. Bishop leg.; presently in my collection in the Limnologische Flußstation Schlitz).

Small, maximum wing length 4.4 mm. General structure typical, venation typical. Antennae 15-segmented, scape and pedicel a little longer than flagellar segments. Flagellomeres approximately cylindric, almost twice as long as wide. Last segment easily twice as long as wide, a little longer than penultimate. Palpi 5-segmented, segment 5 hardly longer than segment 4 in female; palpus tip missing in male. Eyes, mouthparts and legs sexually dimorphic.

Male: eyes bisected, upper portion with large facets, one third the size of lower portion. Upper portions of eyes meet for a long distance on vertex; ocelli on a small cone. Rostrum very short, mandibles and hypopharynx reduced. Legs long and slender, appendix of middle coxa small, trochanter hardly modified. No tibial spurs. Setation at base of hind tarsus dense, long. Claws slender, gently bisinuous, tip thin, almost straight, few setae on gently swollen base.

Genitalia: Genital capsule wide and short, distal margin sinuous, continuous with soft sail-shaped inner portion of gonostyle, anterior edge of gonostyle sclerotized, hard. Outer portion of gonostyle in dorsal view with narrow base and wide, rhomboid distal portion. In side view, outer gonostyle of uniform width but bent downward and with ventral point near midlength. Inner skeleton: gonites and ventral bridge very wide; large vesica with huge vertical apodeme anteriorly. Phallus rods simple, thick, short, almost straight. Aedeagal tines very stout, curved mediad; their common lumen arises medially, ventrally from phallus rods. Lumen after a short distance divided into separate tubes which curve first outwards and then mediad. Tubes widened near midlength, forming a striate cavity. What appears to be an outer hull of aedeagal tines arises far laterally on gonites, tines broadly connected medially. From this median connection two brownish little horns appear to rise, between phallus rods. Apices of aedeagal tines obliquely truncate, widely open. In side view, aedeagal tines first lie flat and then rise obliquely. Tegmen very short, simply triangular. Its blunt hook-shaped tip in side view curves against a conical process on upper side of subanal pouch. Cerci simple, triangular, separated by wide, V-shaped notch.

Female: eyes widely separate, almost simple, a seam-like strip of slightly larger ocelli along upper edge is easily overlooked. Ocelli not on a cone. Rostrum about as long as head high, mandibles and hypopharynx well developed, serrate. Facial setation inconspicuous, many scattered hairs. Appendage of middle coxa well developed, setation of trochanter only slightly enhanced. Hind tibia and metatarsus like in male, no spurs. Tarsal claws very large, almost semicircularly curved, tip slightly sinuous. Basal heel of claws with fine basal setae and terminating in two slender spines.

Genitalia: General structure not distinctive. Spermathecae large, elongate, pear-shaped, longer than short straight ducts.

Pupa: Oval, 2.6—3.8 mm long. Light brown, integument smooth, moderately shining; granules fine, very sparse, light, only on abdomen. Sharp edge separating moderately convex upper surface from flat lower side resting on substratum along entire circumference. Abdominal segment 2 not reaching substratum. Cephalic sclerite visible in front of respiratory organs. Respiratory organs widely separate,

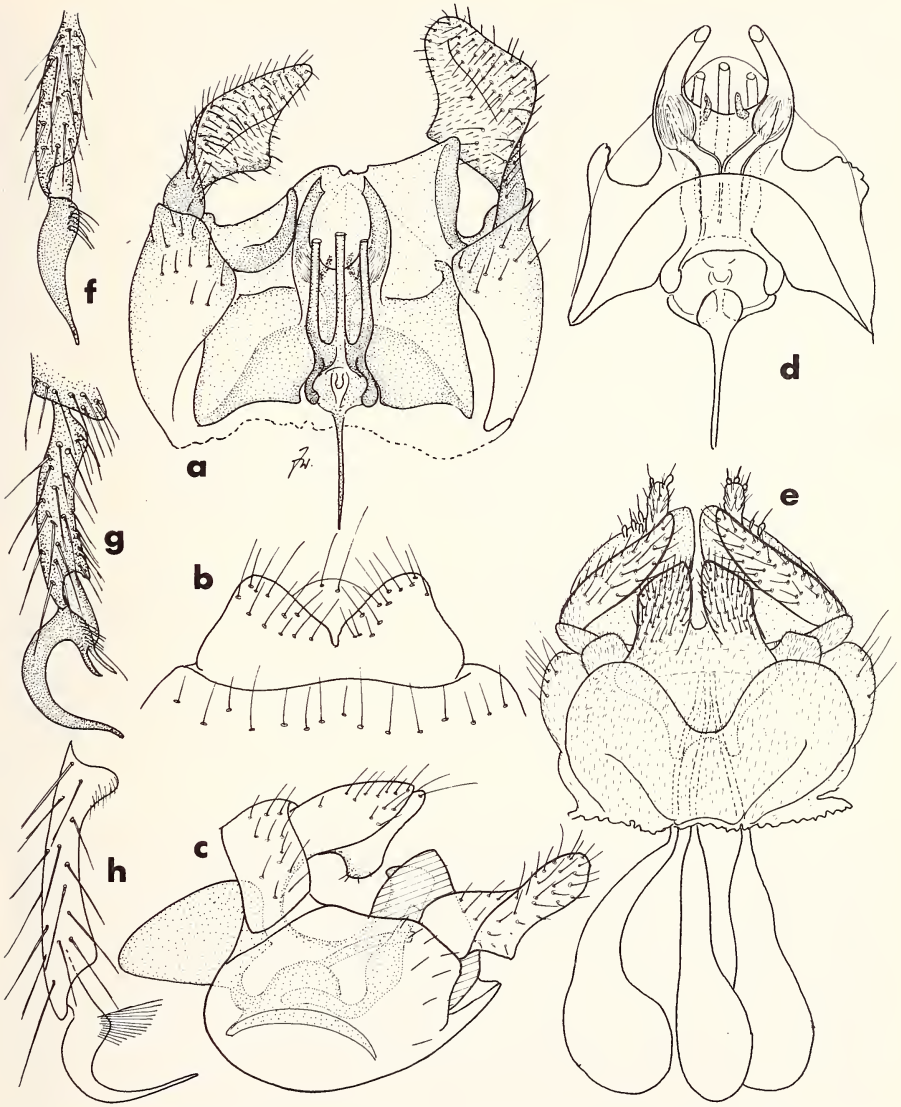

Fig. 2: *Blepharicera pusilla*, male genitalia in dorsal view (a), 10th tergite (b) removed; c, intact genitalia in lateral view, inner dististyle shown in hatching; d, dorsal view of phallus complex and ventral bridge; e, female genitalia, ventral view; posterior pretarsus of male (f) and female (g). *Blepharicera apoensis*, pretarsus of hind leg (h); from the slide of a female paratype.

consisting of four apically pointed lamellae, successively shorter from front to rear. Lamellae 1 and 4 widely separate, base of first lamella medially extended and curved back, but not fused with base of last lamella. Lamellae 2 and 3 distinctly narrower and more delicate than outer lamellae, fairly exposed. Attachment disks on abdominal segments 3 to 5.

Larva: L_3 approximately 3.4, mature L_4 up to 4.6 mm long. Sand-coloured, matt. Indistinctly raised granular areas medially on abdominal segments 2—6. Body flat, wide, with deep constrictions. Head capsule flat, deeply divided, eyes well visible. Anterior edge of head crest-shaped, with small processes above mandible insertions. A median extension at labrum, with two setae. Lower part of labrum fairly wide, densely covered with long, almost spatula-shaped setae. Antennae about as long as median frontal sclerite, bisegmented; pale membraneous area between segments in L_3 near base, near middle in L_4. Six pairs of simple ventral prolegs, rough sole occupying about half length. Upper face of prolegs apically covered with fine and moderately long hairs. No dorsal prolegs. Last body segment deeply separated from preceding, slightly divergent sides terminating in wart-like rudiments of 7th proleg. Posterior edge of last segment medially arched, with two setae. Ventral suckers, gills (with 5 and 7 filaments in L_3 and L_4, respectively) and so-called anal gills normal.

Mandibles unique in the family, long and slender, pale, lightly sclerotized. Inner mandibular tooth normal, outer two modified into comb-like rakes. The first consists of ca 20 slender down-curved processes forming a longitudinal row between inner tooth and outer rake. Outer rake consisting of about five slender processes, pointing mediad.

Affinities: *B. pusilla* is the only Old World *Blepharicera* whose inner male genitalia are not rotated but remain in the primitive position. As explained before, American species similar in this respect are symplesiomorphic, but probably not closely related. Close relatives of *B. pusilla* are unknown (except, by the similarity of female claws, perhaps the inadequately known *B. apoensis*). In particular, larval mandibles are exceptional. First instar *Liponeura* have serrate mandibular edges (Arens 1987) and mandibular serrations are also known for large larvae of *Nesocurupira* (Stuckenberg 1970, Zwick 1977), but structures are quite different. Serrations are not nearly as deep as in *B. pusilla*, they are never bent, and in particular, all point mediad, as normal, while the two rakes of *B. pusilla* stand at almost right angles.

4.2. *Blepharicera apoensis* (Alexander, 1952) (Fig. 2h)

Blepharocera apoensis Alexander, 1952, Bull. Brooklyn ent. Soc. 47: 92.

The holotype should be in the Museum of Comparative Zoology, Cambridge, Massachusetts but is not (M. Thayer, in litt.). One wing, one hind leg and an antenna on a slide labelled female paratype in the collection of the late Dr. C. P. Alexander (USNM) were studied. The description gives Philippines (Mindanao), Mainit R., Mount Apo as type locality; the type was "believed to be a male but without dissection this cannot be fully determined" (Alexander 1952).

Wing over 6.5 mm long, very base lacking; venation typical. No tibial spurs. Basal setae on hind tarsus very dense, resembling little spurs. Last tarsal segment with dense fine setation on distinct epicondylus. Tarsal claw very long, curved at an almost right angle, apex very long and thin, base swollen and covered with long setae, growing successively shorter towards tip. Antenna cleared, distorted, basal segments ca. three times as long as wide, distal ones shorter. Segment 5 longest, about 1.5 times longer than each of segments 13—15, which are similar.

The resemblance of the tarsal claw with *B. pusilla* sp. n. is striking but *B. apoensis* is too insufficiently known to safely recognize its affinities.

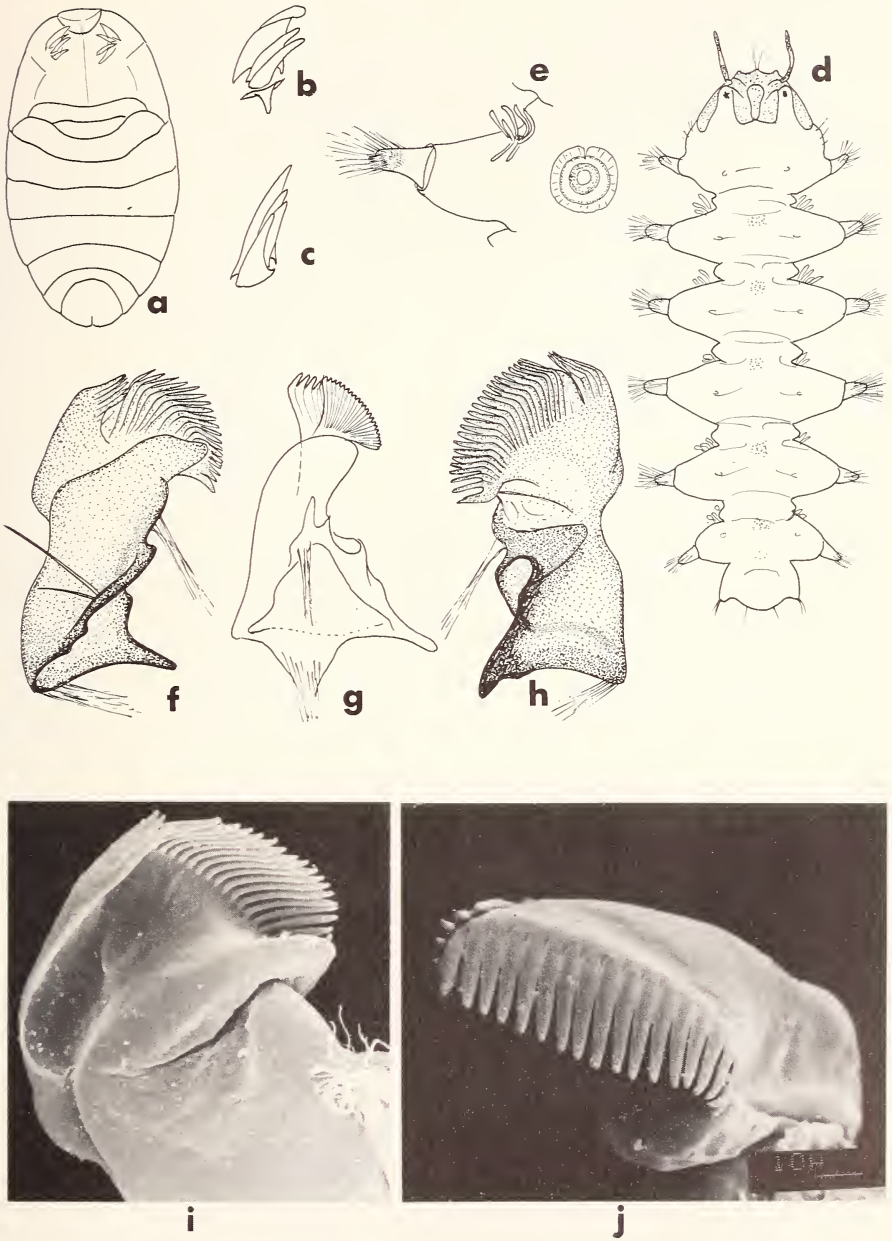

Fig. 3: *Blepharicera pusilla*: a, pupa; b, c left pupal gills in dorsal (b) and posterior (c) views; d, last instar larva; e, right side of 3rd body division, ventral view; f—h, last instar larva, mandible in posterior, medial and lateral views, respectively; i, j: the same in oblique posterior and apical views, respectively; to same scale; courtesy of W. Arens.

4.3. The *fasciata*-group

4.3.1 The *shirakii*-subgroup

4.3.1.1. *Blepharicera shirakii* (Alexander, 1922) (Fig. 4d)

Blepharocera shirakii Alexander, 1922, Insecutor Inscit. menstr. 10: 22.

Material: 2 ♂, 1 ♀, 1 pupa, 1 larva, without locality labels, from coll. Kitakami in USNM.

The type of this species should be in the Alexander collection but was not located (Dr. W. Mathis, in litt.). My interpretation of the name relies on specimens in USNM, identified by S. Kitakami. For a general description see Alexander, 1922. The antennae are setiform and long, most flagellar segments are about five times as long as wide. Segment 15 is much smaller than the others, about twice as long as wide, oval. Upper portion of male eyes very small, flat frontal strip carrying ocelli distinctly wider than one single upper section of eye.

Male genitalia: very elongate, 9th sternum with slender, narrow angular anterior extension housing very long re-curved phallus rods and aedeagal tines. Phallic complex and associated sclerites completely inverted, as in the type-species of the genus. Apodeme truncate, its anteriorly directed edge very wide. Apex of tegmen obtusely narrowed, with raised median crest ending in a recurved slender spine. Inner gonostyle normal, with separate anterior member. Outer gonostyle divided to about midlength, dorsal lobe strongly setose, straight, narrowed towards apex, of somewhat sinuous irregular form, with median longitudinal crest. Ventral gonostyle lobe soft, finely pilose, without setae, forming a gently down-curved appendage with narrow apex. Ventral lobe only slightly longer than dorsal. Cerci simple, separated by V-shaped notch. Anal cone visible in this notch, with a number of sclerotized triangular asperities arranged in transverse rows on lightly sclerotized upper face. Similar structures present in *B. esakii* and *B. tanidai*, see Figs 4b and 5e.

Female, pupa and larva as described by Kitakami, 1931; present female not examined in detail.

4.3.1.2. *Blepharicera esakii* (Alexander, 1924) (Figs. 4a–c)

Blepharocera esakii Alexander, 1924, Insecutor Inscit. menstr. 12: 52.

Material: 1 wing on slide, incorrectly labelled holotype: Japan, Mt. Rao (?; difficult reading), 500 ft, May 7, 1922, beside stream in thick forest, Esaki. — Additional material: 1 ♀ on slide, labelled (data in parenthesis added according to kind information of K. Tanida): Japan, Honshu, (Niigata), Kurokawa-Echigo, 200 m, V-31-1955, Kintaro Baba; 1 ♀ wing on slide, Japan, Shikoku, (Ehime), Omogo-kei, 700 m, V-11-1952, R. Ishikawa (all slides in coll. Alexander, No. 2562, USNM); all females labelled as "metatypes". 1 ♂, 1 ♀, 1 pupa, 1 larva without locality labels, from coll. Kitakami in USNM.

The type should be in the Alexander collection but was not located (Dr. W. Mathis, in litt.); in the description, type locality and date are given as Yumoto, Shimotsuke-no-kuni, 5, 820 ft, 23 vii 1923 (Honshu, Tochigi: Tanida in a letter): the above slide cannot be of the type. Specimens labelled metatypes by Alexander have no type status. Their presence suggests that the type was lost before the collection was given to the USNM.

For a general description, see Alexander 1924. Very similar to preceding species but flagellar segments only about twice as long as wide, except 15th about four times

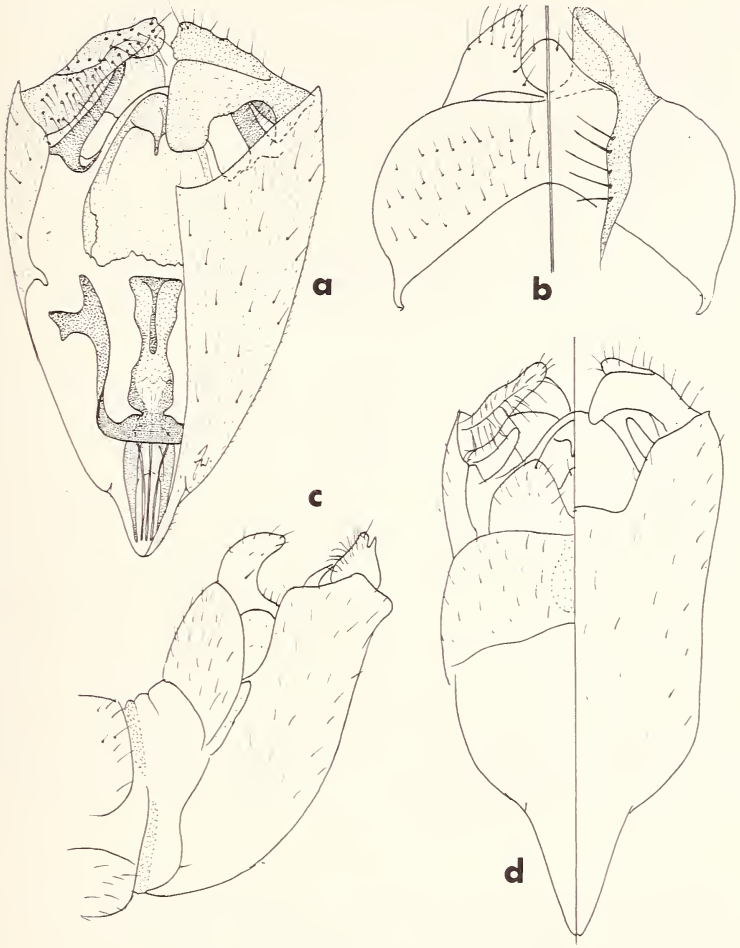

Fig. 4: *Blepharicera esakii*, male genitalia: a, combined dorsal (left side; tergite 10 removed) and ventral (right) views; b, tergite 10, dorsal (left) and ventral (right) views combined; c, abdominal tip in side view. *Blepharicera shirakii*, male genitalia: d, combined dorsal (left) and ventral (right) views.

as long as wide and longer than any other. Upper portions of male eyes fairly large, in dorsal view each about as wide as the dorsally visible part of the lower portion of eyes, and almost wider than the frontal strip between the eyes. The upper portion of eyes almost touches the ocelli.

Male genitalia: elongate, basal extension not as long as in *B. shirakii*. Phallic complex, tegmen and inner gonostyle similar. Outer gonostyle even more sinuous and less regular in form, longitudinal crest distinctly sinuous, apex a little overhanging and downcurved. Setose dorsal lobe of same length as finely pilose soft ventral lobe. The latter rises from a narrow base and is ax-shaped, with rectangular bend near middle.

10th tergite lobes acutely pointed, separated by deep, U-shaped notch and conspicuously curved back in side view.

Female genitalia not comprehensively studied, no obvious distinctive characters. Seminal receptacle and its duct very similar to *B. fasciata*, see Fig. 7a—c. Pupa and larva not studied in detail.

4.3.1.3. *Blepharicera tanidai* sp. n. (Fig. 5)

Material: JAPAN, Honshu, Ishikawa, Mt. Hakusan Area: ♂ holotype, 6 ♀ paratypes, Koaka-dan; 1 pharate ♂ dissected from pupa, Tôchu-dan; all leg K. Tanida and P. Zwick, Sept. 1980. Holotype and 2 paratypes in the Osaka Museum of Natural History, remainder in coll. P. Zwick.

Wings of males 6.5—7.0 mm long. Very similar to both preceding species. Antennae resemble *B. shirakii* but are a little bit heavier and the last segment is even shorter and pyriform; other flagellomeres 5—6 times longer than wide. The upper portion of eyes is intermediate between the two other species.

Male genitalia generally similar to *B. esakii* and *B. shirakii*, but clearly different in the following: genital capsule relatively stout, basal extension even shorter than in *B. esakii*. Outer gonostyle basally bare, flat, simple, its distal half raised as a large anterior swelling, apex a little overhanging and downcurved. Dorsal lobe shorter than ventral. Ventral lobe smooth, not pilose, base long and narrow, apex ovoid, downcurved. Apex of tegmen broad, distally slightly enlarged, membraneous, onion-shaped, striate. In the middle of this section is a wide, ax-shaped flat sclerite.

Pupa similar to *B. shirakii*, no distinctive characters noticed. Females and larvae not definitely known, specimens taken with the types at Shiromine are not distinctive, and not necessarily conspecific.

Note: Named for Dr. Kazumi Tanida, now of Osaka, who very kindly helped me with my collections in the Mt. Hakusan area.

4.3.2. **The *faciata* subgroup**

4.3.2.1. ***Blepharicera indica*** (Brunetti, 1911) (Figs. 6a—e, 7e)

Blepharocera indica Brunetti, 1911, Rec. Indian Mus. 4: 316.

Material: AFGHANISTAN: A 863, Paghman (68° 57' E/34° 36' N), 15. VII. 60, 2 ♂, 2 ♀ (K. Lindberg; P. Nielsen det. 1962: *B. fasciata*! ZFMK); Prov. Kadaghan, Salang-Paß, (69° E/35° 40' N), 2400 m, 11. VII. 1971 (Vartian leg., my coll.). — PAKISTAN (leg. F. Schmid unless otherwise indicated; compare Schmid 1958 for locality information and maps; ZFMK, Bonn): Cachemire et Jammou: Satpura-Tso (9000 ft), 24. IX. 53, 1 ♂, 13 ♀; Dalti (9000 ft), 7. IX. 1954, 1 ♂, 1 ♀; Yasin (8100 ft), 3. IX. 1954, 13 ♂, 6 ♀; Katchura-Tso (Katzarah Tso according to Schmid 1958) (7500 ft), 5. X. 53, 1 ♀; Surgun (6874 ft), 29.—30. VII. 1953, 2 ♂, 1 ♀; Gulmiti (6000 ft), 29. VII. 1954, 1 ♂; Shardi (6130 ft), 1.—10. VIII. 1953, 5 ♂, 2 ♀; North West Frontier Province: Kaghan (6686 ft), 27.—29. VI. 1953, 4 ♂, 1 ♀; Mahandri (5153 ft), 28. VI. 1953, 1 ♀; Muquam, 16. V. 1954, 1 ♂; Belouchistan: Central Zarghun (a forest at one day's walking distance E of Quetta), 7000—9500 ft, Urak, 1.—3. V. 53, 1 ♀. — SRI LANKA, (N. C. P.), Polonnaruwa, 18.—21. III. 1954, 3 ♂, 2 ♀ (F. Schmid).

Male: Portions of eye separated by distinct suture, upper portions almost as large as lower; see below for variation. Genitalia: outer gonostyle normally distinctly more slender than in *B. asiatica;* apically not distinctly notched, but setal arrangement sug-

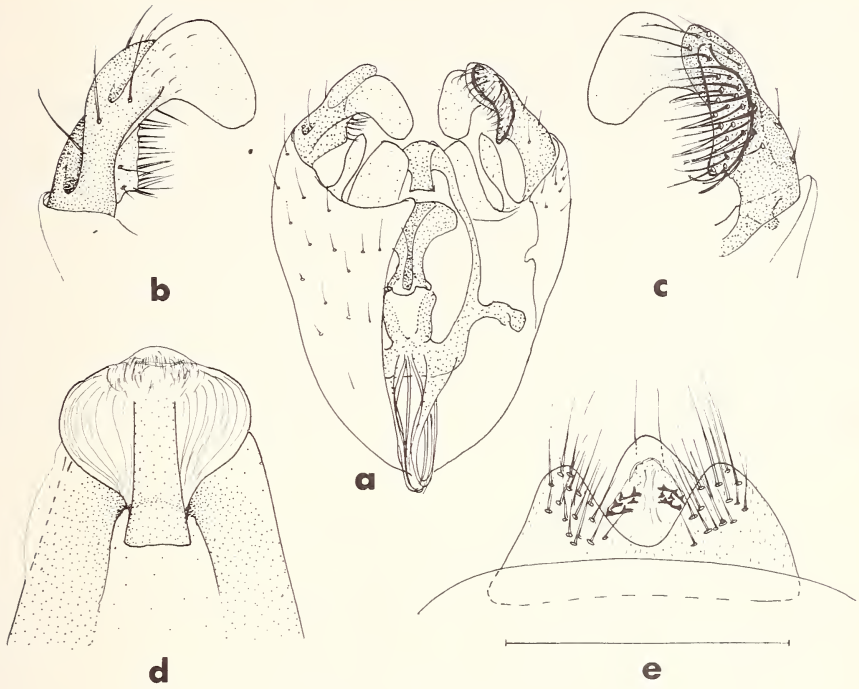

Fig. 5: *Blepharicera tanidai*, male genitalia: a, combined dorsal, (right, tergite 10 removed) and ventral (left) views; b, outer gonostyle, ventral view; c, outer gonostyle, dorsal view; d, apex of tegmen, dorsal view; e, cercal complex, dorsal view. The scale line (for Figs. b—e) is 0.3 mm.

gesting a faint notch. Very narrow cleft separating cerci, their distal edges forming a more or less straight transverse line. Because aspect varies with position of parts, reliable distinction from *B. asiatica* requires study of tegmen. Apex of tegmen well sclerotized, shaped like a blunt arrowhead, with clear-cut lateral edges. A very distinct median crest basally merging with general surface of tegmen, no free point. In side view, the tegmen apex resembles a simple finger, with downcurved sclerotized anterior shield.

Note: In one male from Muquam the median crest seems to fork towards the lower free end and the apical tegminal plate appears bifid. Probably an individual aberration or malformation.

Female: upper portion of eyes distinctly larger than in males, although distinctly smaller than in females of *B. asiatica*. Lower edge forms a curved line above antennae. Frontal strip between eyes wider than anterior ocellus, this clearly visible in facial view. However, some females have large upper portions of eyes; they can be separated from *B. asiatica* only by genitalia: Anterior edge of oviscapt about one third the maximum width. Distal lobes convergent, narrowed towards tip, but not as slender as in *B. fasciata*. Genital fork similar to *B. asiatica*, but anterior margin not as projecting, notch very small, although always distinct. Spherical spermathecae

with or without sclerotized nipple. Pale spermathecal duct coiled at some distance from spermatheca, diameter uniform.

Notes: The light scutellum of *B. indica* distinguishes it from the sympatric *B. asiatica*. This agrees with Brunetti's (1911) and Tonnoir's (1931) description of the female type specimens and is one reason to refer the name *indica* to the present species. Unfortunately, many of the details provided by Tonnoir are not specific. The illustration of the oviscapt is not in conflict with my interpretation; internal genital characters have not been described. Tonnoir shows a female with relatively small upper portion of eyes; among the Indian taxa, I have observed such females only in the present species. The only conflicting detail is the short last palpal segment of the types. Kaul (1971) uses this to identify *B. indica* but has apparently never seen specimens. Similarly, I have not seen a single Indian female of *Blepharicera* with such short palpal segment and wonder about the correctness of the description. The types should be in the Zoological Survey of India, Calcutta, but (like other material in this institution) have not been located (Dr. Adam, in litt.).

4.3.2.2. *Blepharicera asiatica* (Brodsky, 1930) (Figs. 6f—g, 7d)

Blepharocera asiatica Brodsky, 1930, Zool. Anz. 90: 135.
Blepharocera kuenlunensis Lackschewitz, 1935, Wiss. Erg. niederl. Exped. Karakorum 1: 391. New synonymy.
Blepharocera tertia Kaul, 1971, Orient. Ins. 5: 419. New synonymy.

Material studied: ♂ holotype of *B. kuenlunensis* labelled: 3600—1850 m, 7.—12. X. 1929 / Sanju pass to Sanju bazar / Nederlandsche Karakorum Expeditie J. A. Sillem leg. / *Blepharocera kuenlunensis* n. sp. Typus! Dr. P. Lackschewitz (handwritten red label) (IVTZ, Amsterdam, genitalia in microvial on specimen pin). — Additional material: USSR: several adults, pupae and larvae, Zailijskij Ala-tau, VII 1930 (K. Brodsky leg. and det. *B. asiatica*; from the type locality, the Issyk R., see Brodsky 1972; in my coll.). — PAKISTAN (leg. F. Schmid unless otherwise indicated; see Schmid 1958 for locality information and maps; ZFMK, Bonn): Cachemire et Jammou: Kashmir, Wojil Bridge, 5000 ft, 24. IX. 1930, 9 ♂, 1 ♀ (S. R. Christophers, B. M. 1930-591; Edwards det. *B. indica*; BMNH; 1 additional ♂ in USNM); Rampur, 15. VI. 1954, 5 ♂; Muzaffarabad (3250 ft), 16.—21. VI. 1953, 1 ♂; Shigar (7700 ft), 1. X. 1953, 1 ♂; Satpura Tso (9000 ft), 24. IX. 1953, 2 ♂; Gilgit (74° 20' E/35° 50' N), 9.—27. VII. 1954, 2 ♂; Katchura-Tso, (Katzarah Tso according to Schmidt 1958) (7500 ft), 5. X. 1953, 1 ♂, 3 ♀; Gulmiti (6000 ft), 29. VII. 1954, 5 ♂; Doian (5000 ft), 31. V. 1954, 2 ♂; Kar Gah, 4. VII. 1954, 1 ♂, 2 ♀; Astor (7150 ft), 30. V. 54, 1 ♀ North West Frontier Province: Kaghan (73° 30' E/35° 50' N), (6686 ft), 27.—29. VI. 1953, 1 ♂; Kawai (4800 ft), 24. VI. 1953, 13 ♂, 4 ♀; Khoghozi (5180 ft), 3.—5. X. 1954, 5 ♂, 10 ♀; Rumbur (7203 ft), 16. XI. 1954, 4 ♂; Salf-ul-Maluk Sar (11 000 ft), 1.—3. VII. 1953, 4 ♂, 2 ♀; Balakot, 12. X. 53, 1 ♀; Muquam, 26. V. 1953, 8 ♂, 1 ♀; Reshun, 4. X. 1954, 1 ♂; Djanni, 3. V. 1953, 3 ♂; Belouchistan: Central Zarghun (forest at a day's walk E of Quetta) (7000—9500 ft), Urak, 1. V. 1953, 1 ♂. — INDIA: Ritani 29. IX. Kumaon 7500 ft Muktesar Sept. 1922 Fletcher coll./India pres. by T. B. Fletcher B. M. 1925-546 / "*Blepharocera* sp. n. / damaged ♂ returned. Road fr. Bhintol to Muktesar 5500 ft at right waterfall. Note midcoxa 11. IX. 22". — SRI LANKA: Central Province, Kurundu-gaha-ela, 1500 ft, 12. I. 1954, 1 ♂, 1 ♀ (F. Schmid, coll. Zwick).

Uniformly dark brown. An unfaceted narrow strip between portions of male eye. Upper part with large facets distinctly smaller than lower part in specimens from Tien Shan (type locality of *B. asiatica*) and in the type of *B. kuenlunensis*. In the remaining material it is large, almost larger than lower part, as in the description of

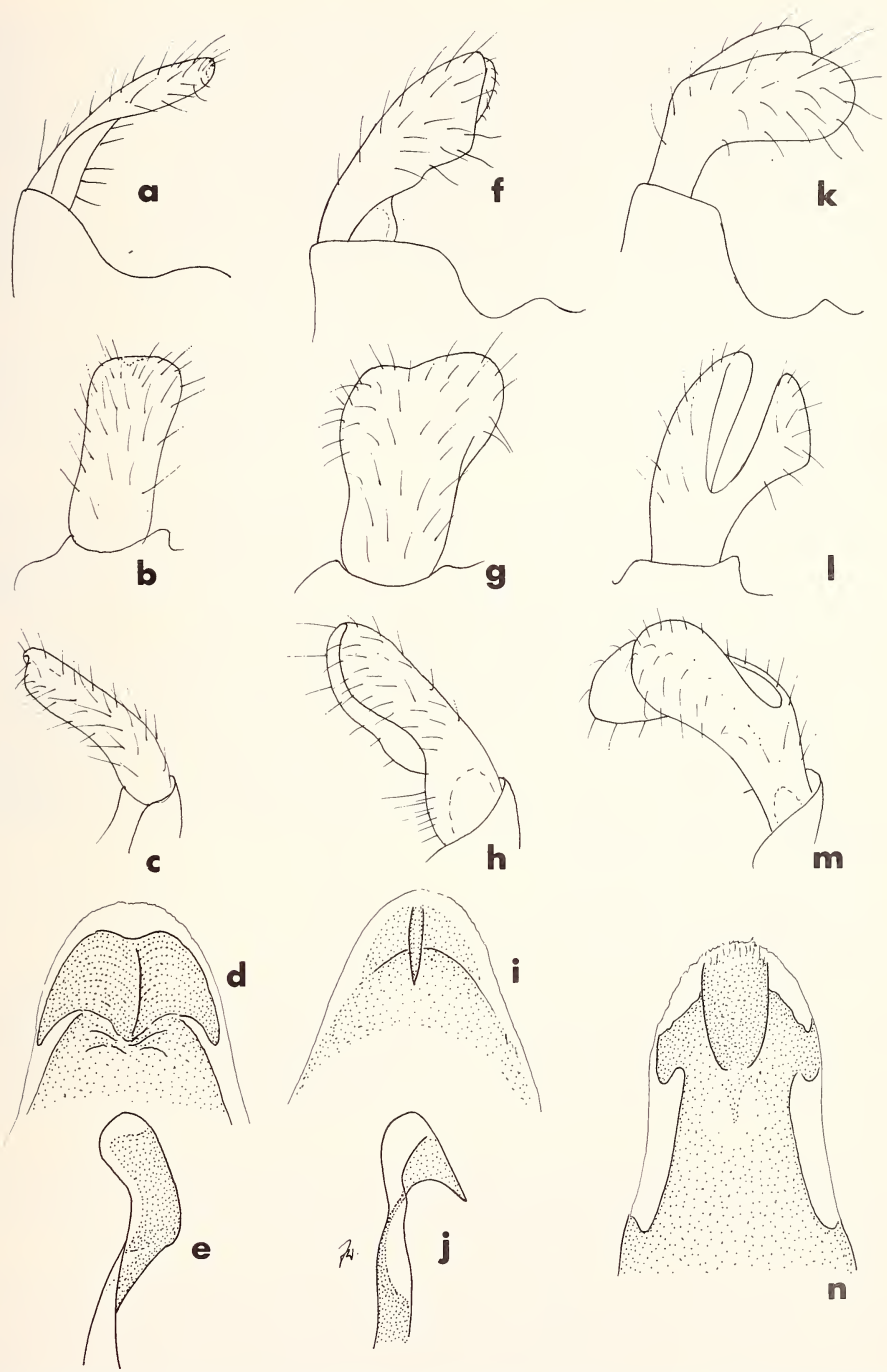

Fig. 6: *Blepharicera indica* (a—e), *B. asiatica* (f—j), *B. fasciata* (k—n): outer lobe of right male gonostyle in dorsal, medial and ventral views, respectively (top 3 lines); dorsal (d, i, n) and lateral (e, j) views of tip of tegmen.

B. tertia. Distinction of geographical races may later become possible. Females have large upper portions of eye, lower edge appearing like a straight transverse line projecting medially distinctly beyond antennal insertions. Frontal strip between eyes narrower than anterior ocellus, which is not clearly visible in frontal view. *B. asiatica* is sympatric with *B. indica*, which has a pale scutellum. Safe identification requires study of genitalia and is possible in both sexes.

Male tegmen conical in dorsal view, poorly sclerotized, with sharply pointed median crest clearly visible in illustrations (Lackschewitz 1935; Brodsky 1972). In side view, it projects as acute spine. In the specimens from Tien Shan, spine more downcurved than in Fig. 6j, almost parallel to plate.

Outer male gonostyle usually distinctive, distally widened, notched. Dorsal lobe larger and with shorter and stouter setae than soft ventral lobe. There is some variation, e. g. one specimen from Salf-ul-Maluk Sar has slender gonostyles resembling *B. indica* but a typical tegmen. Cerci simple, essentially triangular, separated by a V-shaped notch.

Female genitalia: anterior edge of oviscapt about half as wide as greatest width; distal lobes heavy, rounded. Genital fork wide, anterior margin extending distinctly in front of lateral spine-like extensions, with large semicircular median notch. Spermathecae spherical, with small sclerotized nipple. Each duct of uniform width, strongly coiled section at some distance from receptacle dark.

Notes: The many pinned specimens in ZFMK were not distinguished from *B. indica* by the late B. Mannheims, who labelled several specimens of both species as *B. indica*. Types of *B. tertia* should be in the Zoological Survey of India, Calcutta, but were not located by the curator (Dr. Adam, in litt.). The original illustration shows the distinctive wide lobed form of the gonostyle but information on other important details, like tegmen structure, is not available. It appears that Kaul was not aware of the description of *B. asiatica*.

4.3.2.3. ***Blephariceraalhnicola*** (Kaul, 1984).

Blepharocera alhnicola Kaul, 1984, J. Bombay Nat. Hist. Soc. 81: 16.

Doubtful name based on single female from India, Himachal Pradesh, Parini (Kulu valley), 2000 m. In the original description it is only compared to species named by Kaul; *B. asiatica* and *B. indica* are not considered. Details described permit no specific identification; dark brown dorsal side suggests identity with *B. asiatica*. Type not seen.

4.3.2.4. ***Blephariceraahlaea*** (Kaul, 1984)

Blepharocera rahlaea Kaul, 1984, J. Bombay Nat. Hist. Soc. 81: 164.

Doubtful name based on single male from India, Himachal Pradesh, Rhala (Kulu valley), 3200 m. Not compared to *B. asiatica* and *B. indica*, gonostyles resemble the former; tegmen not described. Long spine-like processes below gonostyles suggest gross inaccuracy, or description from damaged specimen (detached, rolled dorsolateral corners of genital capsule). Specific identification not possible; dark colour also suggests identity with *B. asiatica*. Type not seen.

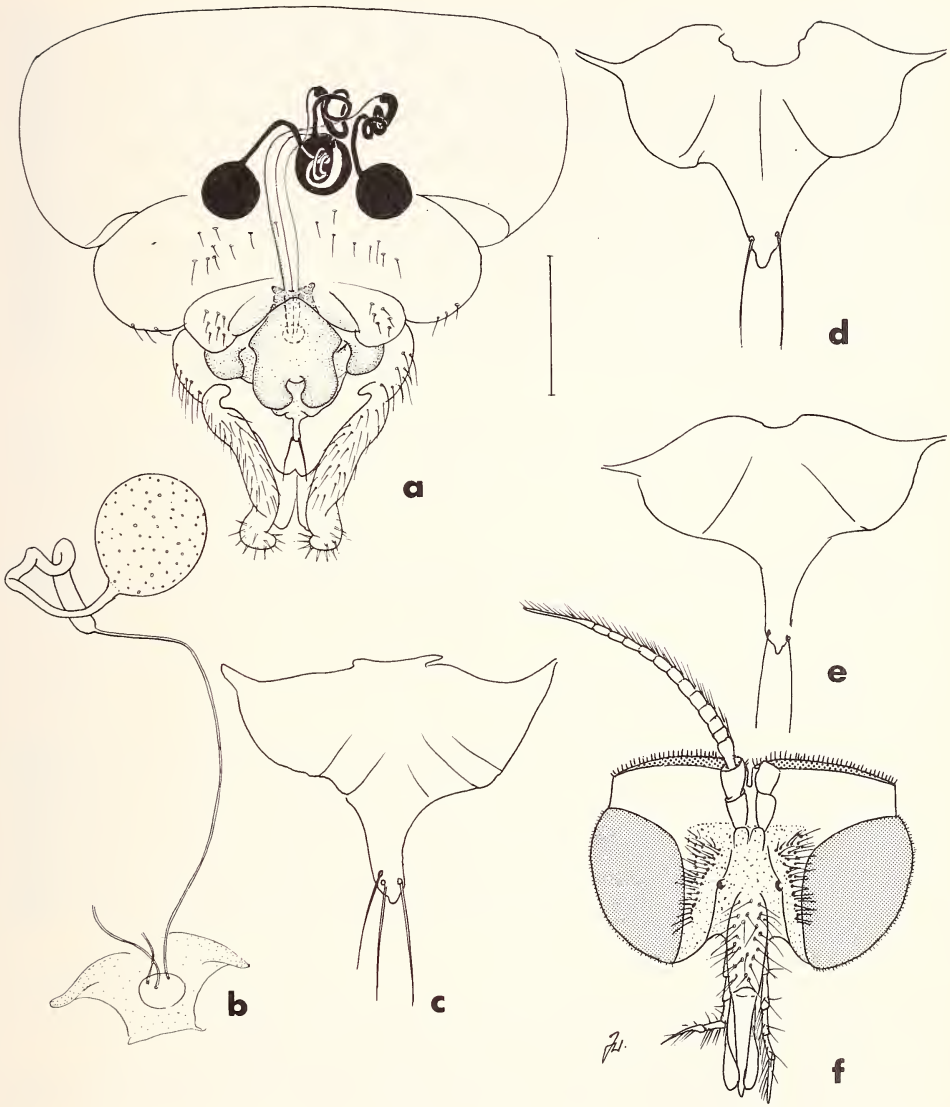

Fig. 7: *Blepharicera* spp., females. — *B. fasciata* from Chios: a, cleared genitalia in ventral view, scale line is 0.3 mm; b, detail of one receptacle; c, genital fork; presence of 3 setae is an individual aberration. — Genital forks of *B. asiatica* (d; from Rampur) and *B. indica* (e, from Polonnaruwa). — *B. tetrophthalma*, head of holotype, f.

4.3.2.5. ***Blepharicera fasciata*** (Westwood, 1842) (Figs. 6k—m, 7a—c)

Asthenia fasciata Westwood, 1842, Mag. Zool. Anat. comp. 12: no. 94.

Only some comparative notes on this well-described species are required. No suture, but a narrow area with intermediate facets between large upper and small

lower facets in male eyes, except in *B. fasciata gynops* Zwick, from Sardinia, with separate small upper portion of eyes. Male gonostyle deeply divided into similar anterior and posterior lobes, see Mannheims (1935). Fig. 6n is a less schematical illustration of the tegmen with its arrow-head-shaped apex and the wide blunt median portion. In side view, the apex resembles *B. indica*. Cerci simple, not distinctive, much like in *B. asiatica*.

Female head resembles *B. asiatica*, except last palpal segment of *B. asiatica* usually distinctly longer than penultimate segment. Female genitalia: front edge of oviscapt very narrow, about 0.3 times maximum width. Apical lobes distinctly narrowed, slender, medially converging. Genital fork triangular, lateral extensions almost level with entire anterior edge which is not notched. Long duct of spherical spermathecae with dark coiled section where it is distinctly widened, and then abruptly reduced to very small diameter.

B. fasciata is the only European species of the genus, its eastern limits are in Iran (Zwick 1978), its range does not seem to overlap with other *Blepharicera* species. Abundant in southern Europe; only material from the northern border of distribution listed here:

Material: Austria, Böhmerwald: 1 ♀, Austria sup., Hammern, 13. 8. 1872, Mik (NHMW). Germany: 8 larvae, 3 pupae, Bayerischer Wald, Ilz at Kalteneck, 19. 6. 1985 (leg. T. Pitsch, my coll.).

4.3.2.6. *Blepharicera autumnalis* (Kaul, 1971)

Blepharocera autumnalis Kaul, 1971, Orient. Ins. 5: 423.

I have not seen this problematic but possibly distinct species, types have not been located in the Zoological Survey of India, Calcutta (Dr. Adam, in litt.). The description omits important details of male genitalia; illustration of gonostyles resembling *B. asiatica*. Strong facial setation may be distinctive. However, it is shown right across antennal segments, rendering accuracy of the figure doubtful. Normal brush-shaped patches of frontal setae are shown for the female of *B. autumnalis*; conspecifity with male remains to be established.

4.3.2.7. *Blepharicera tetrophthalma* (Edwards, 1933) (Fig. 7f)

Blepharocera tetrophthalma Edwards, 1933, J. Fed. Malay States Mus. 17: 248.

Material: female holotype, female paratype, Tampassuk R., Mt. Kinabalu, Borneo (BMNH).

Complete redescription not attempted. *B. tetrophthalma* has band-shaped setation on the female frons, a very wide bare strip separating different portions of the eyes and setiform anntenae with a fringe-like row of setae medially. Genitalia not examined, male unknown, no fresh material.

4.3.2.8. *Blepharicera dimorphops* (Alexander, 1953) (Fig. 8a–c)

Blepharocera dimorphops Alexander, 1953, Bull. Brooklyn ent. Soc. 48: 101.

Material: male holotype and female allotype (each on a slide, No. 9451, in the Alexander collection, USNM): CHINA, Fukien, Ta-Chu-Lan, 4500', VI-25-'48 (Jós. Fu).

Male: wing-length 4.5 mm, venation typical. Eyes undivided, simple, only about 20 large ocelli in upper inner corner of eye, no suture. Antennae stout, first five segments about as long as wide, more distal segments successively more elongate. Segment 10 almost 1.5 times as long as wide, segment 15 elongate oval, at least twice as long as wide and almost twice as long as segment 14. Rostrum of male very short, much shorter than palpi. Palpus segments slender, segment 2 about twice, segments 3 and 4 about three times as long as wide, segment 5 about twice as long as segment 4, soft, whip-like. No tibial spurs, claws simple, very few hairs at their slightly enlarged bases.

Genitalia: torn, compare Fig. 8. Outer gonostyle deeply divided into two unequal lobes, hard dorsal one distinctly narrower and shorter than soft ventral lobe. Inner

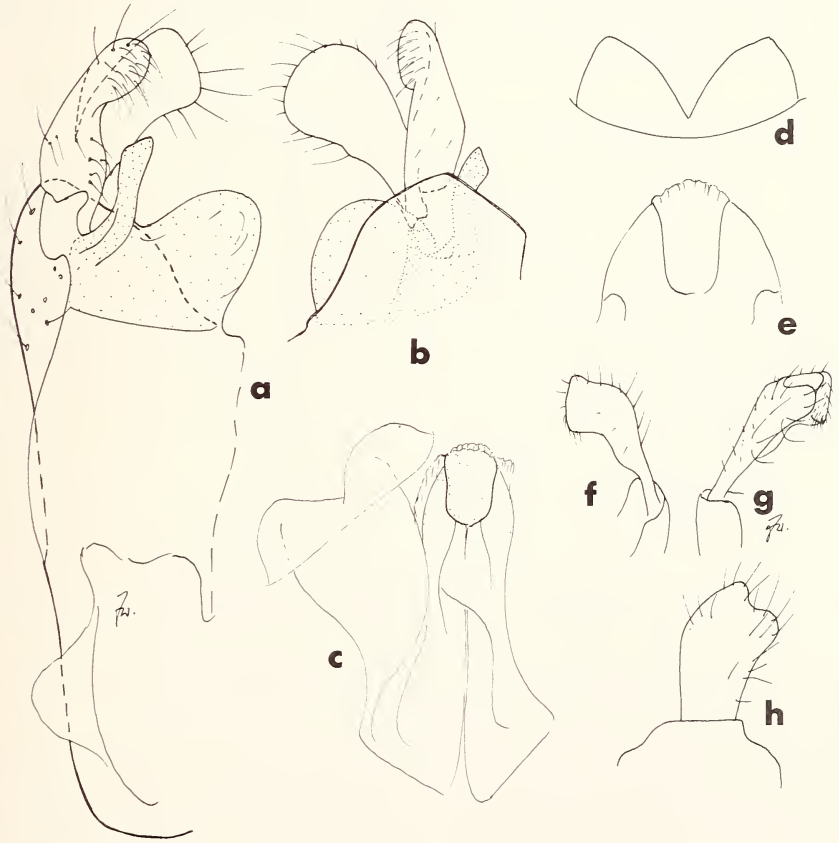

Fig. 8: *Blepharicera dimorphops*, male genitalia (from the type slide): right half of genitalia in oblique dorsal view, inner lobe of gonostyle in stippling; b, left gonostyle, seen from outside, flattened in preparation; c, tegmen, dorsally, with indication of attached sclerites and lobes of 10th tergite. *Blepharicera thurmanae*, male genitalia, from a syntype: 10th tergite lobes (d) and tip of tegmen (e) in dorsal view; right gonostyle in ventral (f), dorsal (g) and outer (h) views.

genital skeleton distorted, apparently similar to *B. fasciata*. Apex of tegmen damaged, apparently with shovel-like wide median part. Apical sclerotization forms no pronounced angles and no arrow-head pattern.

Female: wing-length 6.2 mm. Head very similar to *B. fasciata*, not distinctive. Palpi slender but last segment not whip-like, only 1.5 times as long as segment 4. Antennae slender, setiform, all flagellar segments distinctly longer than wide, segment 5 about twice as long as wide. Segment 14 about 4 times as long as wide, segment 15 about 2.3—2.7 times longer than segment 14, asymmetrical. Two very unequal, pale, smooth spurs on hind tibia, larger spur as long as tarsus wide. Setation at base of first tarsal segment dense but very short. Claws gently curved, 1—2 large hairs at base. Details of genitalia not recognizeable in preparation; spermathecae spherical, long coiled ducts sclerotized some distance from receptacles.

Notes: The dimorphic eyes resemble *B. fasciata*, of which the male gonostyle also reminds. The relatively larger dorsal outer gonostyle lobe, and the widened spermathecal duct of *B. fasciata* will permit distinction.

4.3.2.9. *Blepharicera thurmanae* (Alexander, 1953) (Figs. 8d—h)

Blepharocera thurmanae Alexander, 1953, Bull. Brooklyn ent. Soc. 46: 102.

Material: 5 ♂, 1 ♀ syntypes, Chiengmai, Thailand. (USNM); in alcohol, 1 ♂ cleared in KOH.

Small, male wings 3.5—3.8 mm. Male characters only distinctive in combination. Very small upper portion of eye, like *B. fasciata gynops*, tegmen also very similar. Outer gonostyle very narrow basally, quite wide apically, with distinct notch. Apex clearly curved posteriorad, distal edge of posterior lobe appearing to form a small, inwardly folded lobe. Cerci simple, not distinctive, resembling *B. asiatica*.

Female syntype lacks head and wings, genitalia not examined.

4.3.2.10. *Blepharicera japonica* (Kitakami, 1931) (Fig. 9)

Blepharocera japonica Kitakami, 1931, Mem. Coll. Sci. Kyoto Univ. (B) 6: 103.

Material: 1 ♂, 1 P, 1 L_4, from coll. Kitakami in USNM, no locality labels. 2 ♂ on slides, Japan, Honshu, Kurokawa-Echigo, R. Kanomatsu, 200 m, leg. K. Baba, Aug. 18-1954 and VII-10-55, respectively (Preparations 10006, Alexander coll., USNM). Numerous pharate adults, pupae and larvae, Yoshino R., Shiromine, SE of Kyoto, Aug. 1980 (P. Zwick).

Material identified by Kitakami served to identify this species, of which types were not available. In the absence of similar species in Japan this poses no problems. For a general description see Kitakami (1931).

B. japonica does not exhibit all characters listed above as typical of the genus. However, male genitalia are very similar to *B. fasciata* and its close relatives, suggesting missing structures are secondarily reduced in this very small species. For instance, both sexes have widely separate simple eyes and reduced frontal setae. Mandibles and hypopharynx reduced in both sexes, rostrum of male even shorter than of female. Palpus tips different between sexes. No appendage to mesocoxa noticed, but middle trochanter modified, at least in female (Fig. 9h).

Male genitalia: gonites and associated structures inverted, phallus rods and aedeagal tines very long. Tip of tegmen blunt, flat, with vestigial arrow-head-pattern

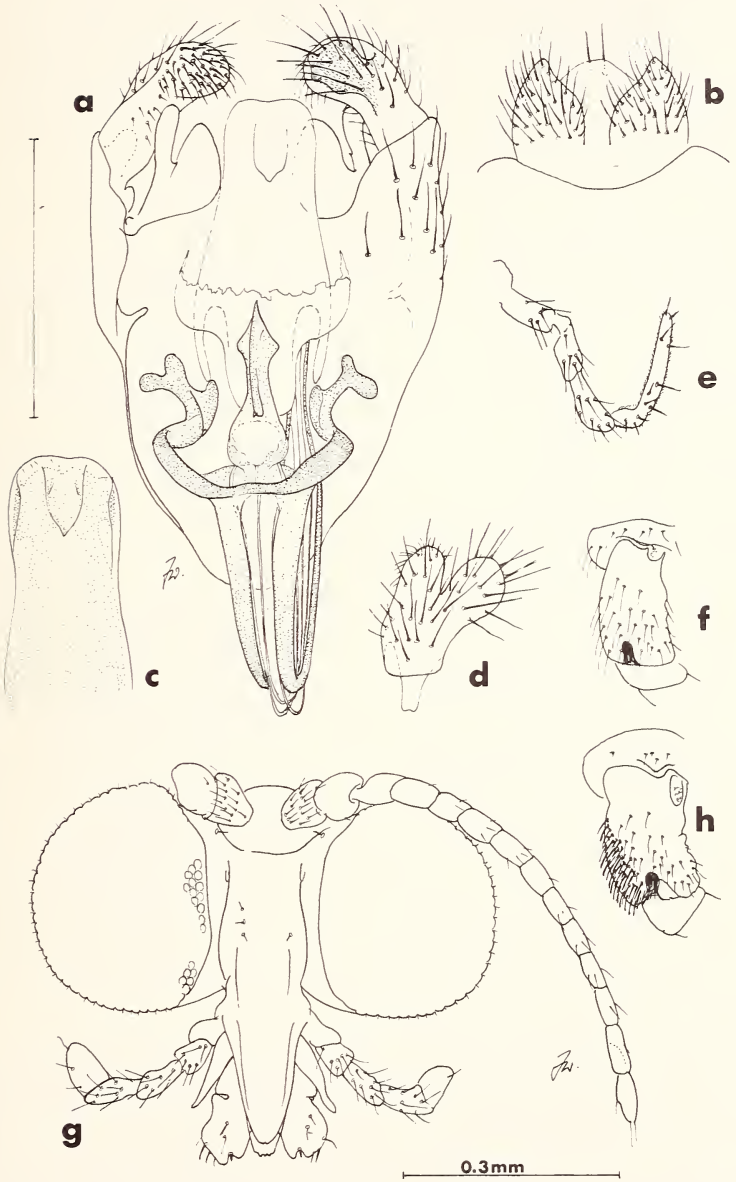

Fig. 9: *Blepharicera japonica*, male: genitalia in dorsal view (a), 10th tergite lobes (b) removed; c, tip of tegmen; d, outer view of right gonostyle; e, left maxillary palpus; f, left middle trochanter; female: g, head; h, left middle trochanter.

and raised median cuneiform portion. Inner gonostyle normal, with erect anterior process. Outer gonostyle bilobed, dorsal lobe rounded, blunt, setose, as usual; a little bit larger than soft ventral lobe which has a slightly irregular, somewhat angular contour. Cerci a little bit pointed in pharate specimens, separated by deep notch.

Female genitalia: very similar to *B. fasciata*. The only clear difference is that the slightly swollen distal portion of the spermathecal duct is not abruptly but gently narrowed towards the hyaline basal section.

4.3.2.11. ***Blephariceramacropyga*** sp. n. (Fig. 10)

Material: male holotype: CHINA, Hainan Id., Ta Han, VI-7-1935, A. L. Melander collection 1963. — Additional material: one possibly conspecific female with the same labels as the male (both USNM).

Wing-length 4.0 mm, generally similar to *B. fasciata*. Uniformly brownish, banding of abdomen indistinct. Legs slightly lighter, yellowish-brown. Facial setae and setae on scutellum blackish. Wing venation normal. Haltere long, brown. Male mouthparts reduced, as usual. Upper portion of eyes with large facets occupies about one third of total eye surface, separated from lower portion by narrow line. Female head similar to *B. fasciata*, except strong contrast between silvery white bare band below eyes and velvety black lower part of frons. Usual patch of frontal setae black. No tibial spurs in male, very unequal pale metatibial spurs in female. Basal setation on tarsal segment 1 strong, resembling spurs. Claws simple, similar to *B. fasciata*. Finger-shaped coxal process of middle leg well developed, also in male.

Male genitalia: sclerotization of genital capsule medially divided by a large soft keel, its outer edges sclerotized, band-like. Keel accomodates very long phallus rods and aedeagal tines forming an almost complete circle inside genitalia and projecting distinctly beyond apex of very slender tegmen. Cerci simple in dorsal view, tilted anteriorly. Sclerotized bands on their posterior face in frontal view forming two horn-like setose projections separated by circular notch, through which tegmen is seen. In side view, the same sclerotized bands form a flat trough with raised posterior edge, then curve down and eventually merge to form the tegmen; no deep subanal pouch. Tegmen almost parallel-sided, very long, small triangular tip hardly prominent in side view. Inner gonostyle a simple slender curved process. Outer gonostyle simple, medially inflexed and apically widened, undivided; remarkable for a strong medio-basal process beset with black warts.

Female genitalia resemble *B. fasciata*, no clear-cut distinctive characters.

Affinities: The simple inner gonostyle, the spoon-shaped, wart-bearing outer gonostyle, the complicated structure of the subanal pouch with its two setose processes, and the large ventral keel of the male genitalia are all exceptional. *B. macropyga* seems to represent the most derived branch of the highly evolved group with rotated genital sclerites, and not a separate phyletic line requiring a separate subgenus.

5. Genus *Neohapalothrix* Kitakami

Neohapalothrix Kitakami, 1938, Mem. Coll. Sci. Kyoto imp. Univ. (B) 14: 341; monotypic, type species: *N. kanii* Kitakami, 1938.

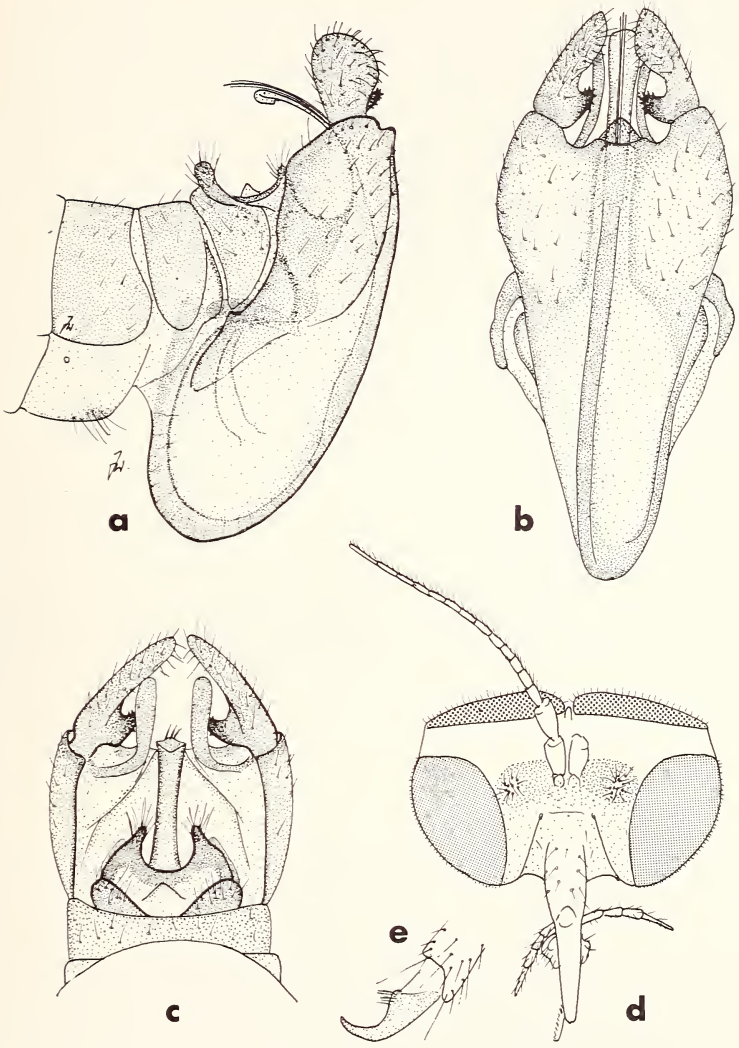

Fig. 10: *Blepharicera macropyga*, male genitalia in lateral, caudal, and dorsal views, respectively; female head (d) and claw of hindleg (e).

Asiobia Brodsky, 1954, Trudy zool. Inst. Akad. Nauk. USSR 15: 245; monotypic, type species: *A. acanthonympha* Brodsky, 1954. — New synonymy; *Neohapalothrix acanthonympha* (Brodsky), new combination.

Material studied: *N. manshukuensis*: 1 ♂, 1 ♀, Ost-Mandschurei, Er-dao-chei-'in-che, 21.—28. 8. 1951, Alin leg., Mannheims det.; gift of the late B. Mannheims from a series of specimens in his collection, ZFMK. — *N. acanthonympha*: several larvae and immature pupae from several streams in Primorye (coll. FESC). — *N. kanii*: 2 larvae, 1 pupa, no locality label (from coll. Kitakami in USNM).

Brodsky (1954) appears unaware of studies by Kitakami (1938) and Mannheims (1938). Illustrations (Kitakami 1938, Brodsky 1954) suggested the generic synonymy now confirmed. Semicircular terminal body division of larvae, displacement of dorsal proleg and ventral pseudopod into same plane (both resting on substratum), elongate anterior osmoregulatory gills, and mid-dorsal spines on pupae are distinctive. Males with remarkable tarsal modifications, undescribed for *N. kanii*.

By the derived wing venation (M_{3+4} absent, R_4 and R_5 largely fused, forming only an apical fork) *Neohapalothrix* seemed to belong to Paltostomatinae (Alexander 1958; Brodsky 1954; Kitakami 1950; Mannheims 1938), now ranked as tribe in the subfamily Blepharicerinae (Zwick 1977). However, *Neohapalothrix* probably belongs to the Blepharicerini (Zwick 1981). Larvae have two lateral appendages to abdominal segments; in *N. acanthonympha*, the large posterior one has a rough sole and can thereby be recognized as the normal ventral pseudopod, while the smaller anterior process corresponds to a dorsal proleg typical of tribe Blepharicerini. In the strongly flattened larvae of *N. kanii* both appendages are similar in size and structure.

Whether *N. manshukuensis* and *N. acanthonympha* are specifically distinct remains to be proven. Specimens of the former were compared to Brodsky's illustrations of the latter, but no differences noticed. The illustration of the right middle tarsus in Brodsky (1954) shows it in an oblique postero-lateral view from the outside. It agrees very well with the male of *N. manshukuensis* before me except what, in that illustration, next to figure 2, looks like a pale spine is in fact a soft flexible flagellum; the small black spine above it (Fig. 10/3 of Brodsky 1954) lacking in my specimen. The largely hollow segments 1 and 2 are staggeringly complex, but this is only apparent in full side view (Fig. 11).

6. Genus *Horaia* Tonnoir

Horaia Tonnoir, 1930, Rec. Indian Mus. 32: 193. Monotypic, type species: *H. montana* Tonnoir, 1930.
Manaliella Kaul, 1976, Orient. Ins. 10: 25. Monotypic, type-species: *M. manaliella* Kaul, 1976. — New synonymy.

Manaliella (in the tribe Apistomyiini) is based on a male holotype and a female allotype, both dissected from pupae. A larva without type status was associated with it. In the original description, *Manaliella* is said to differ from *Horaia* in wing venation and genitalia but differences are not explained and not apparent to me, except evident (hypoproct shown as part of male tergite 10) or probable (projecting apices of aedeagal tines not shown) inaccuracies in Kaul's figure. In the illustration of the *Manaliella* pupa the mesothorax is labelled as head, but otherwise it agrees with pupae of *Horaia* (Tonnoir 1930, 1932). No doubt the two genera are synonyms.

Unfortunately, no species of *Horaia* is adequately described. Species distinction in Apistomyiini requires accurate and detailed figures of genitalia, including details of tegmen, gonite, ventral bridge, aedeagus, sperm pump, etc. Therefore, the new species is a species inquirenda, it becomes *Horaia manaliella* (Kaul, 1976), new combination.

The presumed larvae of *H. manaliella* are evidently misassociated; Kaul's figures show dorsal prolegs distinctive of another tribe, Blepharicerini. This larva is certainly some *Philorus*, resembling *P. horai* (Tonnoir), *P. asiaticus* Brodsky, and some

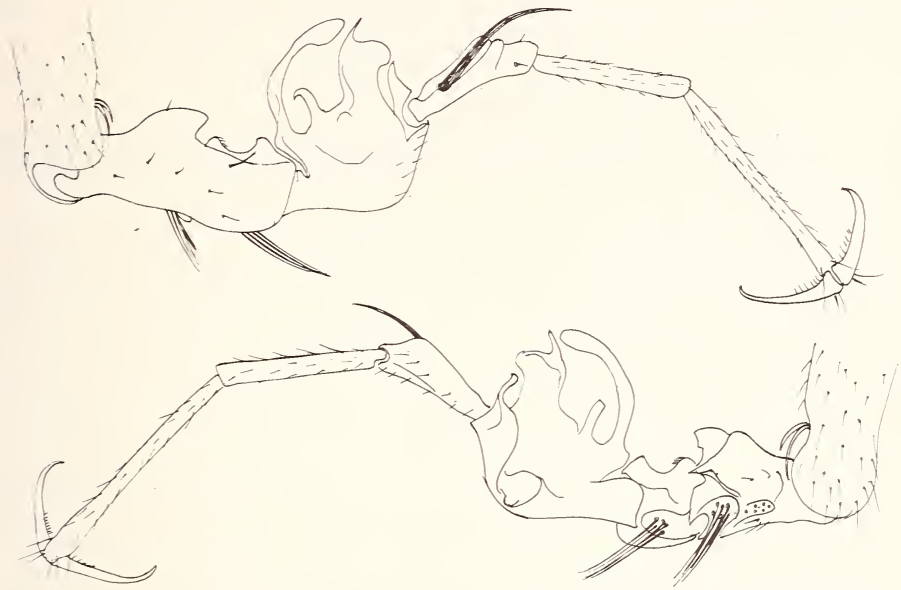

Fig. 11: *Neohapalothrix manshukuensis*, slide-mounted left middle tarsus of the male, from the outer (top) and inner (bottom) side.

unidentified larvae (Agharkar 1914) in the arrangement of dorsal spines; all are from the Northwestern Himalaya.

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Zusammenfassung

Taxonomische und nomenklatorische Bemerkungen über holarktische Blephariceridae werden vorgelegt. Mehrere früher zu *Bibiocephala* Osten-Sacken bzw. *Dioptopsis* Enderlein gestellte asiatische Arten werden *Agathon* von Röder zugeordnet. Die Synonymie von *Amika* Kitakami mit *Bibiocephala* wird bestätigt. *Liponeura jezoensis* Matsumura ist Synonym von *Bibiocephala infuscata* Matsumura. *Parablepharocera* Kitakami wird als Synonym von *Blepharicera* Macquart unterdrückt. Mehrere *Blepharicera*-Arten werden redeskribiert, meist nach Typen; *B. pusilla* sp. n. (Malaysia), *B. tanidai* sp. n. (Japan) und *B. macropyga* sp. n. (China: Hainan) werden benannt. *B. tertia* Kaul wird unter *B. asiatica* Brodsky eingezogen. *B. alhnicola* Kaul und *B. rahlaea* Kaul sind unsichere Arten. *Asiobia* Brodsky ist neues Synonym von *Neohapalothrix* Kitakami, *N. acanthonympha* (Brodsky) (comb. n.) ist wahrscheinlich ein Synonym von *N. manshukuensis* (Mannheims). *Manaliella* Kaul wird mit *Horaia* Tonnoir synonymi-

siert. *Horaia manaliella* (Kaul) (comb. n.) ist eine unsichere Art; ursprünglich als ihre beschriebene Larven gehören einer anderen Tribus, wahrscheinlich einer *Philorus*-Art, an.

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