

DESCRIPTIONS OF SYNTYPES OF *BRUMPTOMYIA BRUMPTI*  
(LARROUSSE, 1920) (DIPTERA: PSYCHODIDAE – PHLEBOTOMINAE)

Commemorating the 80th birthday of  
Professor Amilcar Vianna Martins

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*The male and female of Brumptomyia brumpti (Larrousse, 1920), the type species of the genus Brumptomyia França & Parrot, 1921 (Diptera: Psychodidae – Phlebotominae) are redescribed from syntypes in the British Museum (Natural History).*

Key words: Diptera – Psychodidae – Phlebotominae – *Brumptomyia* – *brumpti* – morphological descriptions  
– male and female syntypes

*Brumptomyia brumpti* (Larrousse, 1920), the type species of the genus *Brumptomyia* França & Parrot, 1921 (Diptera: Psychodidae – Phlebotominae) was described (Larrousse, 1920) from 12 males and four females collected, in 1914, in Albuquerque Lins (now known as Lins) in the Brazilian state of São Paulo. The type material was deposited in the Department of Parasitology, Faculty of Medicine, Paris, France (Barretto, 1947). Some of the type material was later given to other institutions or to individuals interested in sand fly taxonomy. A male and female of the type series was donated to the late Professor Robert Newstead; both specimens were later acquired by the British Museum (Natural History) – BM(NH).

The original descriptions of *B. brumpti* conformed with the conventions of the time and, especially with regard to the female, are inadequate by present standards. Later students with access to all or part of the type series (Nitzulescu, 1930; Costa Lima, 1932; Galliard, 1934) gave summary redescriptions and alluded only to selected morphological features. No additional studies on the type material of *B. brumpti* have been published for more than 50 years. On recent visit to BM(NH), opportunity was taken to make a detailed examination of two syntypes (one male, one female). The redescriptions given herein are based on these two specimens. Because both were remounted

in 1970, the redescriptions are preceded by notes on the present condition of the BM(NH) syntypes.

The introductory bibliographic citations refer only to works by authors who had access to type material.

*Brumptomyia brumpti* (Larrousse, 1920)

*Phlebotomus Brumpti* Larrousse, 1920 – *Bulletin de la Société de Pathologie Exotique*, 13: 659-660 (♂, ♀), 661 (Fig. 4A – ♂ antenna, Fig. 4B – ♂ palp, Fig. 5 – ♂ wing, Fig. 6 – ♂ genitalia). Type locality: Albuquerque Lins, State of São Paulo, Brazil, collected by Professor E. Brumpt, May 15th-20th, 1914). Type material: Laboratoire de Parasitologie, Faculté de Médecine, Paris, France.

*Phlebotomus brumpti* Larrousse, 1921 – “Étude systématique et médicale des Phlébotomes”: 64 (taxonomy), 69 (♂ & ♀, Figs 17-19), 74 (♂ in key). Nitzulescu, 1930 – *Annales de Parasitologie Humaine et Comparée*, 8: 388-391 (♂), 389 (Figs 3 & 4: ascoids of ♂ & ♀), 390 (Fig. 5: ♂ paramere and aedeagus), 391 (Fig. 7 – ♂ terminalia; Fig. 8 – ♂ inner basal tuft of basistyle). Costa Lima, 1932 – *Memórias do Instituto Oswaldo Cruz*, 25: 33-35 (♂ & ♀), 53 (♂ in key), Plate X (Fig. 49 – ♂ wing; Fig. 51 – ? ♀ wing), Plate XIV (Figs 77-80 – ? ♀ spermathecae), Plate XXIII (Figs 116 & 117 – ♂ genitalia). Galliard, 1934 – *Annales de Parasitologie Humaine et Comparée*, 12: 196-197 (♂, ♀), 197 (Fig. 1a – ♂ cibarium, Fig. 1b – ♀

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cibarium, Fig. 1c — ♂ pharynx, Fig. 1d — ♀ spermatheca).

The two BM(NH) syntypes of *B. brumpti* were originally mounted on the same microscopic slide but were remounted separately in Berlese fluid by Dr D. J. Lewis on July 31st, 1970. The two slides each bear a white circular (0.8 cm diameter) label with a 0.1 cm blue rim, printed: "SYN-/TYPE".

The slide with the male bears three small circular coverslips and half of such a coverslip: a) head and its appendages, complete apart from all flagellomeres of one antenna; b) ? (nothing could be found beneath this coverslip); c) all flagellomeres of one antenna and two complete legs; d) thorax (with two legs missing) and abdomen, attached to each other and mounted in lateral view. In addition to older labels, this slide has a white, rectangular label, in the handwriting of Dr D. J. Lewis, affixed to the right hand side: "Brazil: Albuquerque/Lins/*Brumptomyia/brumpti* (Larrousse)/Removed on 31.vii.1970/from slide bearing/"♀" and with "♂" in the bottom right hand corner.

The slide with the female bears four small circular coverslips: a) incomplete head, with both eyes damaged, one antenna lacking flagellomeres, the other antenna with flagellomeres I-IV only, one palp complete, the other palp (together with the maxilla and mandible from this side of the head) lacking, labrum detached from the head, cibarium and pharynx *in situ*; b) thorax mounted in lateral view with legs (all but one complete) and wings attached; c) mandible, maxilla and palp from one side of the head; d) abdomen mounted in lateral view, with the spermathecae and their ducts clearly visible.

The ringing material around coverslip b) of the slide with the female was chipped away to obtain a clearer view of the wing tips.

#### *Description of syntype male (Fig. 1)*

Large, auburn coloured sand fly, without marked contrast between the coloration of the mesonotum and pleura; interocular suture complete.

Head height, including clypeus: 0.40mm; maximum width of head: 0.39mm; eye height: 0.25/0.25mm; eyes separated by a space of 0.11mm, equivalent to the diameter of six eye

facets. Clypeus: 0.11mm long. Labrum, from the distal margin of the clypeus: 0.02mm long. Total length of flagellomeres: 2.20/2.17mm. Lengths of flagellomeres: I — 0.34/0.34mm, II — 0.19/0.20mm, III — 0.19/0.20mm, IV — 0.19/0.18mm, V — 0.18/0.17mm, VI — 0.17/0.16mm, VII — 0.15/0.15mm, VIII — 0.14/0.14mm, IX — 0.14/0.13mm, X — 0.13/0.13mm, XI — 0.12/0.12mm, XII — 0.10/0.10mm, XIII — 0.09/0.08mm, XIV — 0.07/0.07mm. Ascoids, all with a short posterior spur, paired on flagellomeres I-XI. On flagellomere II, the inner ascoid arises at 0.04mm from the proximal articulation, is 0.12mm long, and has a posterior spur 0.02mm in length. The outer ascoid of flagellomere II arises at 0.05mm from the proximal articulation, is 0.12mm long, and has a posterior spur 0.01mm in length. Ascoids arise at different levels only on flagellomeres I-III. Palpal length 0.64/0.66mm, with palpomere 5 extending beyond the middle of flagellomere III. Lengths of palpomeres: 1 — 0.03/0.03mm, 2 — 0.10/0.10mm, 3 — 0.13/0.14mm, 4 — 0.10/0.10mm, 5 — 0.28/0.29mm. Palpal formula: 1-(2-4)-3-5, with 5 longer than 3+4 or 2+3, and almost as long as 2+3+4. Palpal sensillae (Newstead's scales) not visible. Cibarium unarmed, and with a strongly defined posterior bulge; pigment patch not visible; cibarial arch incomplete. Pharynx 0.19mm long, 0.05mm at its broadest, with oblique and transverse folds posteriorly.

Thorax, measured from the anterior edge of the mesonotum to the posterior margin of the scutellum: 0.56mm. Mesonotum light chestnut, pleura and coxae only slightly paler. Pleura with 13/12 upper and 4/3 lower episternal setae. Wing length: 2.19mm; maximum wing width: 0.73mm; ratio of wing length: maximum width — 3.00:1. Lengths of wing sections:  $R_2$  (*alpha*) — 0.53mm,  $R_{2+3}$  (*beta*) — 0.28mm,  $R_{2+3+4}$  (*gamma*) — 0.32mm,  $R_1$  tip (*delta*) — 0.13mm. Wing pattern: *alpha* > *gamma* > *beta* > *delta*, with *alpha* 1.89X *beta*, *beta* 0.88 of *gamma*, and *delta* 0.25 of *alpha*. Lengths of femora, tibiae and basitarsi: foreleg — 0.81/0.86mm, 1.10/1.12mm, 0.63/0.65mm; midleg — 0.80/0.83mm, 1.28/1.31mm, 0.74/0.71mm; hindleg — 0.95/0.95mm, 1.57/1.51mm, 0.80/0.81mm. Hind femora unarmed.

Abdomen, excluding genitalia: 1.16mm long. Tergites and sternites pale brown, basistyle slightly darker. Dististyle: 0.38mm long, with five spatulate spines — one terminal (0.12mm

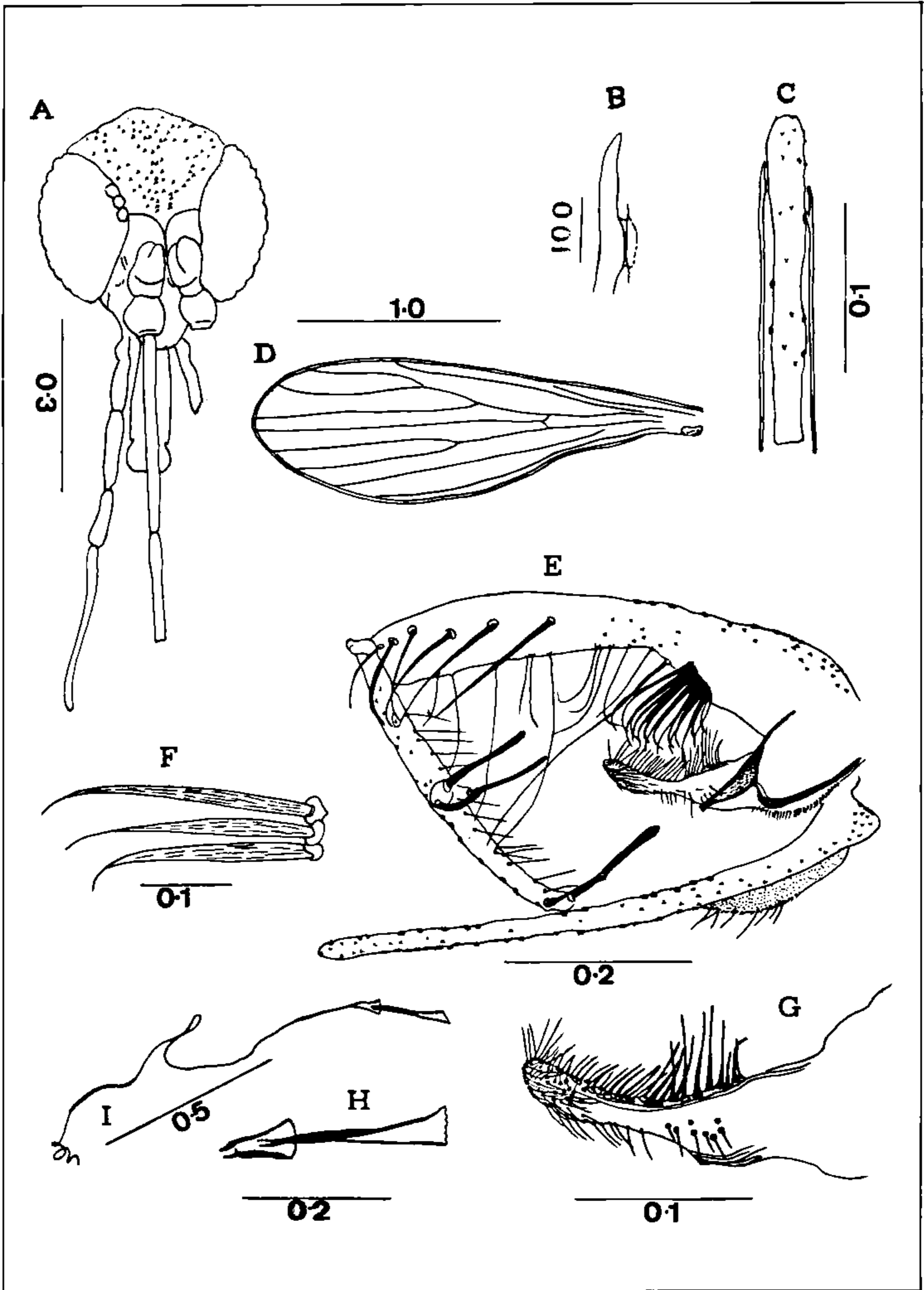


Fig. 1: *Brumptomyia brumpti* (Larrousse, 1920), syntype ♂ in BM(NH) – A: head and appendages; B: posterior spur of ascoid on flagellomere II; C: flagellomere II; D: wing; E: terminalia in lateral view; F: setae of the inner basal tuft on the basistyle; G: inner aspect of the paramere; H: genital apodeme and sperm pump; I: genital pump and filaments. Scale lines in mm.



long), one subterminal (0.07mm long) at 0.34mm from the proximal articulation, paired median spines borne on a common tubercle, situated at 0.19mm from the proximal articulation, and a single spine arising at 0.20mm from the base. Basistyle: 0.54mm long, with a longitudinal row of six curved spines in the distal half, and a prominent inner basal tuft composed of 17/18 spiniform curved setae, each seta arising from a moderately chitinized socket. Paramere, measured along the dorsal surface to the level of the dorsal part of the aedeagus: 0.11mm long – narrowly digitiform with a slight upward curve, densely covered with fine setae distally, and with a row of spiniform setae along the dorsal margin, the more proximal of these being stouter. Aedeagus strongly chitinized, conical in shape, 0.07mm long along the ventral margin and 0.04mm wide basally (excluding a fine dorsal extension). Genital apodeme 0.23mm long; sperm pump 0.10mm long. Genital filaments fine and very long, with simple tips, and measuring 1.41mm in length (or 4.56X the combined lengths of the genital apodeme and sperm pump). Lateral lobe cylindrical, 0.63mm long (or 1.11X the length of the basistyle).

*Description of syntype female (Fig. 2)*

Large, auburn sand fly, with general coloration like that of the male; interocular suture complete.

Head height, including clypeus: 0.42mm; eye height: 0.33mm; maximum width of head, and space between the eyes, not measureable. Clypeus: 0.12mm long. Labrum, from the distal margin of the clypeus: 0.24mm long. All flagellomeres of one antenna, and flagellomeres V-XIV of the other, missing. Lengths of flagellomeres: I – 0.31mm; II – 0.16mm; III – 0.15mm. Ascoids, all with a posterior spur, paired on flagellomeres I-IV, arising at different levels on I-III but at the same level on IV. On flagellomere II, inner ascoid arising at 0.03mm from the proximal articulation, 0.13mm long, with a posterior spur less than 0.01mm (approximately 0.005mm long); outer ascoid arising at 0.05mm from the proximal articulation, 0.13mm long, with a posterior spur less than 0.01mm long. Palpal length: 0.83/0.80mm, with the distal tip of palpomere 5 extending beyond the tip of flagellomere IV. Lengths of palpomeres: 1 – 0.05/0.05mm; 2 – 0.13/0.13mm; 3 – 0.16/0.13mm; 4 – 0.14/0.14mm;

5 – 0.35/0.35mm. Palpal formula of one palp: 1-2-4-3-5, with 5 longer than 3+4 or 2+3. Other palp anomalous, with palpomere 3 almost completely fused to 2, and with a palpal formula of 1-(2-3)-4-5. Palpal sensillae (Newstead's scales) visible only on one palpomere 3, in a fairly compact group lying 0.03-0.09mm from the proximal articulation. Labrum with three pairs of distal peg sensillae; mandible with an oblique serrated edge (0.04mm long) and a lateral row (0.01mm long) of fine denticles; maxilla with three large terminal teeth, and a row of 12 lateral denticles reaching a depth of 0.07mm. Cibarium with a strongly defined posterior bulge, and with four unevenly arranged longitudinal rows of horizontal teeth, the posterior tooth in each row more prominent than the others, and with clusters of fine lateral denticles on each side. Pigment patch pale, roughly tongue shaped; cibarial arch complete, reaching almost to the same level as the teeth, and flared laterally; salivary pump rather small, 0.02mm long, 0.02mm wide. Pharynx 0.17mm long, 0.07mm at its broadest, posteriorly with curved transverse folds bearing numerous minute denticles.

Thorax, measured from the anterior edge of the mesonotum to the posterior margin of the scutellum: 0.61mm long. Mesonotum light chestnut in colour, pleura and coxae only slightly paler. Pleura with 5/12 upper and 2/3 lower episternal setae. Wing length: 2.42mm; maximum wing width: 0.85mm; ratio of wing length: maximum width – 2.85:1. Lengths of wing sections:  $R_2$  (*alpha*) – 0.71mm;  $R_{2+3}$  (*beta*) – 0.26mm;  $R_{2+3+4}$  (*gamma*) – 0.37mm;  $R_{1\text{ tip}}$  (*delta*) – 0.11mm. Wing pattern: *alpha* > *gamma* > *beta* > *delta*, with *alpha* 2.73X *beta*, *beta* 0.70 of *gamma*, and *delta* 0.15 of *alpha*. Lengths of femora, tibiae and basitarsi: foreleg – 0.91/0.90mm, 1.17/1.14mm, 0.65/0.64mm; midleg – 0.88/0.88mm, 1.30/1.29mm, 0.70/0.72mm; hindleg – 0.98/0.92mm, 1.52/1.52mm, 0.81/0.81mm. Hind femora unarmed.

Abdomen 1.60mm long, pale brown in colour. Genital fork 0.17mm long, weakly chitinized. Spermathecae situated about the same level as the stem of the genital fork, elongate and roughly carrot shaped, 0.08/0.08mm long, 0.02/0.02mm wide at the distal end, narrowing progressively towards the junction with the duct, with about 45 well defined annulations, the distal one not noticeably larger than the others. Spermathecal

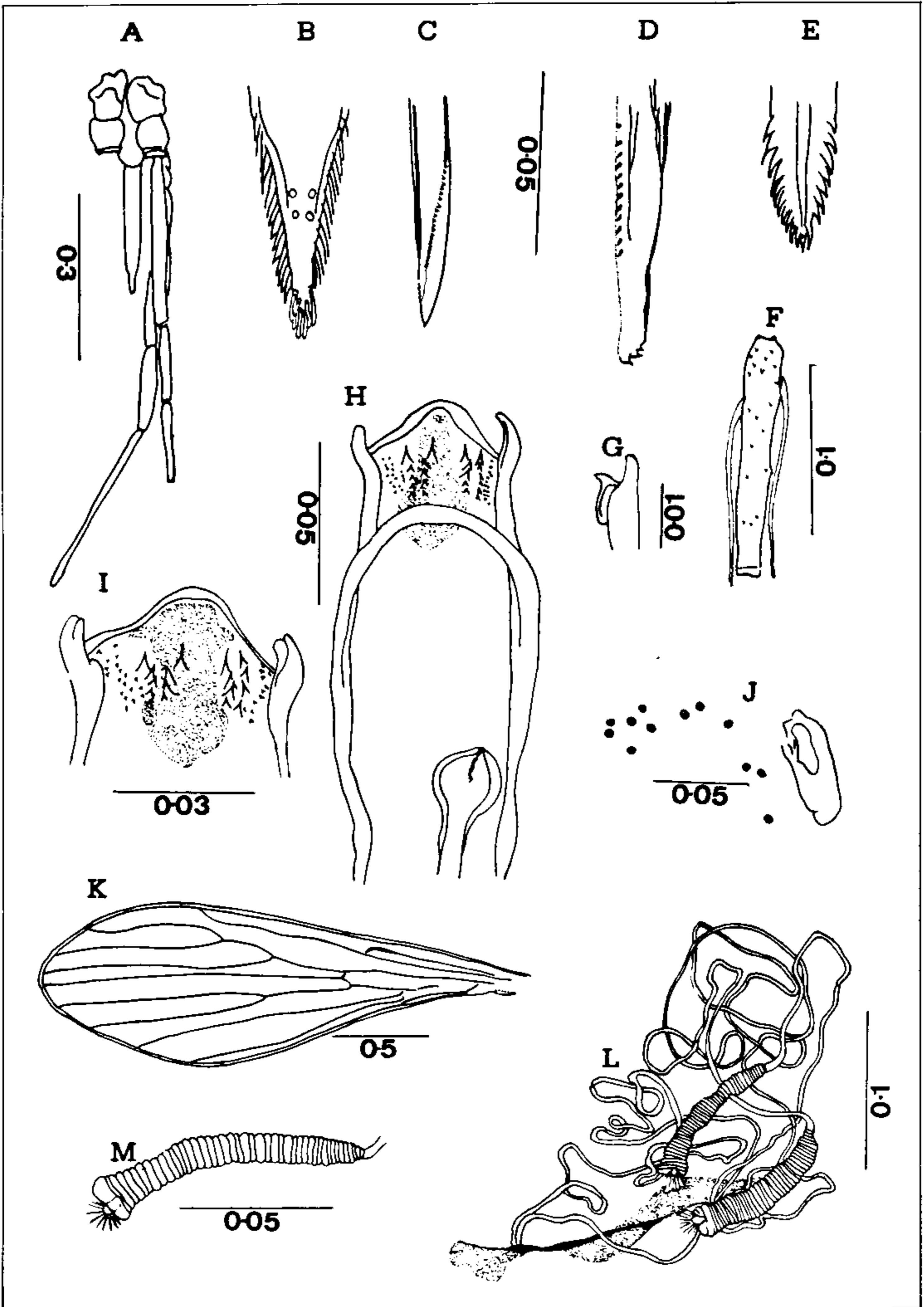


Fig. 2: *Brumptomyia brumpti* (Larrouse, 1920), syntype ♀ in BM(NH) – A: head appendages; B: tip of labrum; C: tip of mandible; D: tip of maxilla; E: tip of hypopharynx; F: flagellomere II; G: posterior spur of ascoid on flagellomere II; H: cibarium; I: cibarial armature; J: arrangement of upper episternal setae; K: wing; L: spermathecae, spermathecal ducts and genital fork; M: spermatheca. Scale lines in mm.

ducts very narrow and long, at least 0.93/1.19mm in length (10.33/13.22X the lengths of their respective spermathecae). Common duct lacking. Lengths of spermathecae and ducts about 6.0/7.5X the length of the genital fork.

#### DISCUSSION

The syntype male of *B. brumpti* in BM(NH) agrees reasonably well with the original description and illustrations of Larrousse (1920). The original description of the male made no reference to the longitudinal row of spines in the distal half of the basistyle (now regarded as a characteristic of the genus *Brumptomyia*) or to the inner basal tuft of setae on the basistyle, though the latter was shown in the accompanying figures.

The original description of the female was brief:

“Taille: légèrement plus petite que ♂.

“Antennes: segment III = IV + V. Epines géniculées semblables à celles du ♂.

“Palpes: comme chez les ♂, même formula, 1.(2.4).3.5.

“Aile: même desposition des nervures que chez le ♂.”

From the foregoing, it is clear that the definition of *B. brumpti* rests on the description of the male, the female being described by comparison with corresponding characters in the male. It was subsequently shown (Nitzulescu, 1930) that the males studied by Larrousse (1920) comprised two species of *Brumptomyia*, and it is possible that the females described in 1920 were not conspecific.

Nitzulescu (1930) was primarily concerned with the validity of *B. troglodytes* (Lutz, 1922). When these studies were made, the type series of *B. brumpti* in the Paris collection consisted of seven males and one female. Nitzulescu (1930) referred to five of the males as “type à pénis triangulaire”. His illustrations of the paramere and aedeagus, and of the general appearance of the genitalia of this form, closely agree with the syntype male of *B. brumpti* studied in BM(NH) and illustrated herein. The illustration of the setae forming the inner basal tuft of the basistyle of “type a pénis triangulaire” (Nitzulescu, 1930, Fig. 8) is, however, misleading in that it portrays the tufts from both basistyles superimposed. The BM(NH) syntype male has 17/18 spiniform setae in the

inner basal tuft. The number of setae in the inner basal tuft is of taxonomic value: *B. avellari* (Costa Lima, 1932), the species most closely related to *B. brumpti*, has an inner basal tuft with about 12 spiniform setae (Mangabeira, 1942).

In the most recently published keys for the identification of males of *Brumptomyia* (Fraiha et al., 1970; Forattini, 1973), *B. brumpti* and *B. avellari* were separated from one another on the shape and setation of the parameres. The shape of the paramere of *B. brumpti* depends on the angle at which the genitalia were mounted. The BM(NH) syntype male has a digitiform paramere (Fig. 1G). But in other material examined, at BM(NH) and in the Belo Horizonte reference collection, specimens conforming with *B. brumpti* in all other respects, have parameres with the more thumb like profile ascribed to *B. avellari*. Differences in the setation of the parameres of the two species are the most useful means of separating them. Particular attention should be given to a group of elongate spines in a median position on the dorsal surface (present in *B. brumpti*, lacking in *B. avellari*).

Two specimens of the type series of *B. brumpti*, called “type à pénis cylindrique” by Nitzulescu (1930), were later described by Costa Lima (1932) under the name *Phlebotomus nitzulescui*. *B. brumpti* and *B. nitzulescui* differ in the general appearance of the genitalia, the form of the inner basal tuft of the basistyle, the shape and setation of the paramere, the size of the genital apodeme, and the shape of the aedeagus.

The so-called syntype female of *B. brumpti* in BM(NH) might be the female of this species but, equally well, could be that of *B. nitzulescui*. Galliard (1934) studied the only type female then remaining in the Paris collection. He showed (Galliard, 1934, Fig. 1b) that the cibarium has only two teeth in each of the outer longitudinal rows, that the inner longitudinal rows each contain five teeth, with the most posterior larger than and well separated from the rest, and that a small pigment patch lies posterior to the two larger teeth. This arrangement differs from that of the BM(NH) specimen (Figs. 2H & I herein).

The dimensions of the spermathecae of the Paris female were not given in the text of



Galliard (1934) but, from the scale line provided (Galliard, 1934, Fig. 1d), it can be estimated to be 50 $\mu$ m long (including the terminal knob) and 17 $\mu$ m wide at its broadest. Galliard (1934, p. 198) described the spermathecae in the following words: "Elles ne sont pas annelées, mais la surface en est lisse et légèrement plissée". The spermathecae of the BM(NH) "syntype" female are much longer and have about 45 well defined annulations.

There can be little doubt that the BM(NH) "syntype" of *B. brumpti* is different from the female examined by Galliard (1934). Which of the two forms truly represent the female of *B. brumpti* can be established only by rearing material in the laboratory.

#### RESUMO

**Descrição de sinotipos de *Brumptomyia brumpti* (Larrousse, 1920) (Diptera: Psychodidae – Phlebotominae)** – É apresentada a redescricao de sinotipos macho e fêmea de *Brumptomyia brumpti* (Larrousse, 1920), a espécie típica do gênero *Brumptomyia* França e Parrot, 1921 (Diptera: Psychodidae – Phlebotominae).

Palavras-chave: Diptera – Psychodidae – Phlebotominae – *Brumptomyia* – *brumpti* – redescricões morfológicas

#### ACKNOWLEDGEMENTS

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(Natural History) provided space and facilities in the Museum. Dr A. J. Shelley – Medical Diptera Section, Department of Entomology, BM(NH) – made all arrangements to examine material in the museum's collection.

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