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A STUDY ON THE *MYCETOPHILA RUFICOLLIS* GROUP (DIPTERA: MYCETOPHILIDAE) FROM CHINA

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Abstract The Chinese *Mycetophila ruficollis* group is reviewed. Here 10 species are listed, and 6 species are described as new to science, and 3 known species are redescribed.

Key words Diptera, Mycetophilidae, *Mycetophila ruficollis* group, new species, China

Although the genus *Mycetophila* Meigen, 1803, is the largest genus with typical characters of the family Mycetophilidae, it is one of the genera which have many taxonomic problems even in very common and seemingly clearly defined species. So it must be subjected to a profound study.

It has been realized that the material of *Mycetophila ruficollis* Meigen belonged to a group of sibling species, separable at present only on details of the structure of the male genitalia. This is, on the basis of known criteria, undoubtedly a monophyletic group relatively isolated and easily recognized within the genus *Mycetophila*, being characterized by the absence of ventral bristles on the middle tibia, the long vein *tb* (= 'M before *r-m*' of Lastovka and earlier authors) with 8 of more setulae below (in contrast to the bare of this part in the *fungorum* group), palpal segments relatively narrow, central spot of wings usually present.

The diagnostic characters of the hypopygium are as follows: Gonocoxopodites (ventral view) shows the form of a posterior margin (fig. 1A), and posterior (fig. 1B) and anterior (fig. 1C) impressions. Basistyle (ventral view) bears distally strong spines (fig. 2D) which have characteristic shape and size, and are numbered 1~4 from the inner to the lateral margins. Dististyle (dorsolateral view) has the structures of the basal angle (fig. 3E), and the basal (fig. 3F), lateral (fig. 3G) and posterior (fig. 3J) margins, and two processes at the lateral end of the posterior margin, the proximal posterior (fig. 3H) and the distal posterior process (fig. 3I). Intromittent organ (dorsal view) shows a median penis tube (fig. 4K), slightly sclerotized lateral rim (fig. 4L), penis sheath (fig. 4M) and thecal apodemes (fig. 4N).

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This group includes over 30 closely related but well characterized species in the world. It is the most widely distributed representative of the family, occurring in the Holarctic, African and Oriental regions, Lastovka (1972) revised the Holarctic species of the group, totally 4 new species and 7 known species were included. Lastovka & Kidd (1975) reported 1 new species from Europe. All records of *lineola* from the Oriental and African regions may be different species. Two species have hitherto been reported from China by Lastovka, they are *M. idonea* Lastovka (Tibet) and *M. strobli* Lastovka (Ma-lien-ting-c').

The types of new species are deposited in Zhejiang Forestry College and China Agricultural University respectively.

Key to Species of *Mycetophila ruficollis* group from China

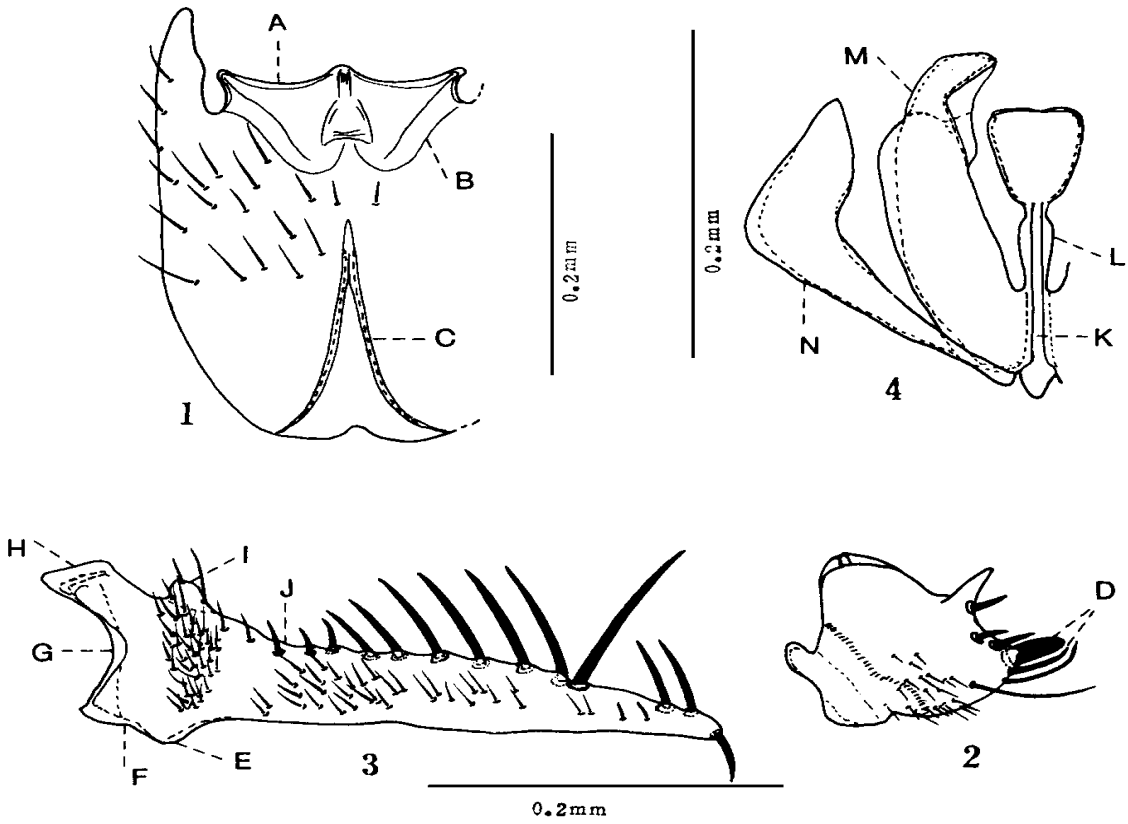
1. Second spine of basistyle several times wider than the first; basistyle distinctly wider than long (fig. 30) ····· *perpauca* Lastovka
   Second spine of basistyle at most twice the width of first; basistyle about as wide as long ····· 2
2. Posterior margin of gonocoxopodites with rounded lobe in middle ····· 3
   Posterior margin of gonocoxopodites with triangular lobe in middle ····· 4
3. Posterior processes of dististyle wide and short (fig. 15); posterior margin of basistyle with a bud (fig. 14) ····· *furvusa* sp. nov.
   Posterior processes of dististyle narrow and long (fig. 23); posterior margin of basistyle without bud (fig. 22) ····· *chandleri* sp. nov.
4. Posterior margin of dististyle greatly sinuate ····· 5
   Posterior margin of dististyle nearly straight ····· 6
5. Spines of basistyle slender, forming two groups (fig. 6); distal posterior process of dististyle small and indistinct (fig. 7) ····· *curvicaudata* sp. nov.
   Spines of basistyle strong and wide, not forming groups (fig. 10); distal posterior process of dististyle long and distinct (fig. 11) ····· *fortisa* sp. nov.
6. Dististyle with lateral margin deeply notched ····· 7
   Dististyle with lateral margin at most only slightly notched ····· 8
7. Posterior margin of basistyle with a strong bud, spines nearly straight (fig. 2); basal posterior process of dististyle with basal acute angle (fig. 3) ····· *angularisa* sp. nov.
   Posterior margin of basistyle without bud, spines curved (fig. 18); basal posterior process of dististyle with distal acute angle (fig. 19) ····· *ichneumonea* Say
8. Basal posterior process of dististyle short, posterior margin with slender spines (fig. 27); spines of basistyle slender ····· *meridionalisa* sp. nov.
   Basal posterior process of dististyle long, posterior margin with strong spines; spines of basistyle strong ····· 9
9. Distal process of dististyle short and wide (fig. 35); distance between 3rd and 4th spines of basistyle much shorter than distance between 2nd and 3rd spines (fig. 34) ····· *strobli* Lastovka
   Distal process of dististyle long and slender, distance between any two adjacent spines of basistyle nearly equal ····· *idonea* Lastovka

1. Mycetophila angularisa, sp. nov. (Figs. 1~4)

Male: Head darkish brown. Antennae brownish yellow on basal segments, the flagellum

yellow. Palpi yellow, with the third segment broadest. Mesoscutum brownish, with three separate brown strips. Scutellum brown, brownish apically. Pleura mainly brownish. Legs including coxae yellow, but fore femur brownish. Abdomen brownish, genitalia yellow. Wing clear yellowish, with central spot; cross vein *r-m* twice as long as stalk of median fork. Long basal cross vein *tb* with 8～12 setulae below.

Proepisternum and mesepimeron with 4 setae. Middle tibia with 3*a*, 5 strong *d* (2 weaker basal to them), 2 strong preapical *p* with 2 short basal to them. Hind tibia with 5*a*, 5 strong *d* (1 weaker basal to them), 9*p* on apical two-thirds. Wing length 4.4～4.9mm. The male genitalia are shown in Figs. 1～4.



Figs. 1-4. *Mycetophila angularisa*, sp. nov.

1. gonocoxopodites, ventral view; 2. basistyle, ventral view; 3. dististyle, dorsolateral view; 4. intromittent organ, dorsal view. A-posterior margin, B-posterior impression, C-anterior impression, D-spines 1 and 2, E-basal angle, F-basal margin, G-lateral margin, H-proximal posterior process, I-distal posterior process, J-posterior margin, K-penis tube, L-rim of penis tube, M-penis sheath, N-thecal apodeme.

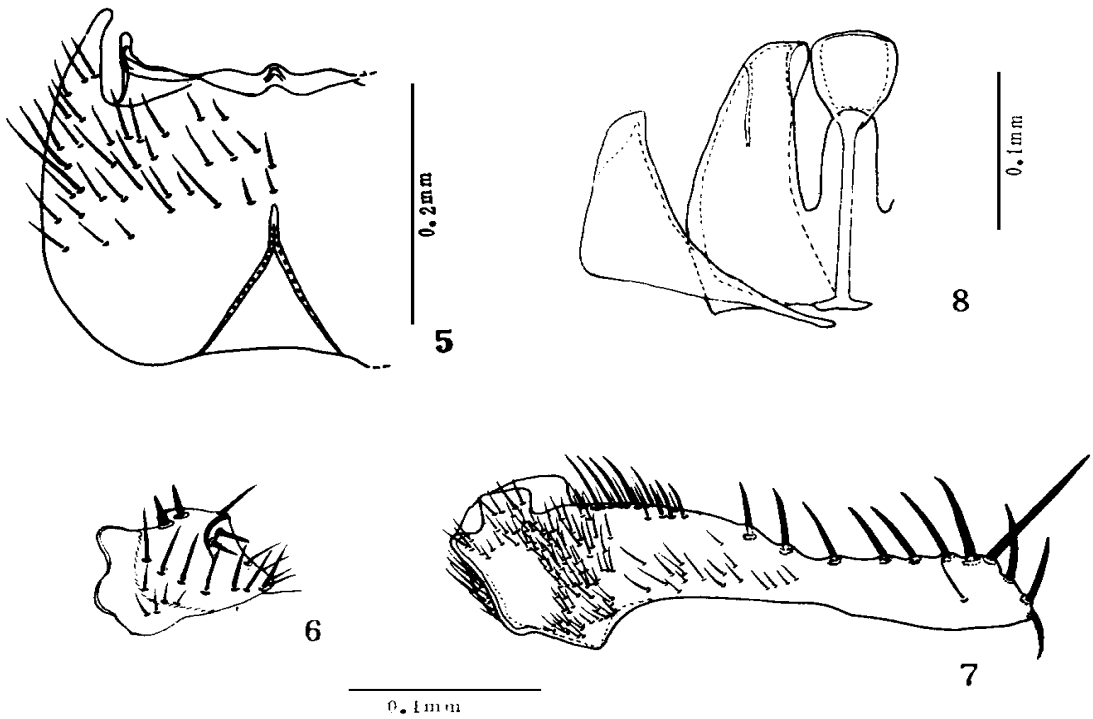
Female: Coloration as in male. Wing length 5.4mm. Long basal cross vein *tb* with 17 setulae below.

Holotype♂, paratypes 1♂, 1♀, 20km southwest Minjiang, Songpan, Sichuan, 24-VI-1990, Morse, Yang Lianfang and Li Youwen.

Remarks: This species is well characterized especially by the form of the basistyle and the intromittent organ. The most similar species, as far as the characters of the genitalia are concerned, is the Japanese *perpauca* Lastovka.

2. Mycetophila curvicaudata, sp. nov. (Figs. 5~8)

Male: Head yellowish brown. Antennae yellowish brown on basal segments, the flagellum yellow. Palpi yellow with the third segment broadest. Mesoscutum yellowish brown. Scutellum and pleura yellowish brown. Legs including coxae brownish yellow. Abdomen brown, genitalia yellowish brown. Wing clear yellow, with central spot; cross vein *r-m* a little longer than stalk of median fork. Long basal cross vein *tb* with 13~15 setulae below.



Figs. 5-8 *Mycetophila curvicaudata*, sp. nov.
5. gonocoxopodites, ventral view; 6. basistyle, ventral view; 7. dististyle, dorsolateral view; 8. intromittent organ, dorsal view.

Proepisternum and mesepimeron with 4 setae. Middle tibia with 5*a*, 6 strong *d* (1 weaker basal to them), 2 strong preapical *p* with 2 short basal to them. Hind tibia with 6*a*, 5 strong *d* with 1 short basal to them, 8*p* on apical two-thirds. Wing length 4.0~4.3mm. The male geni-

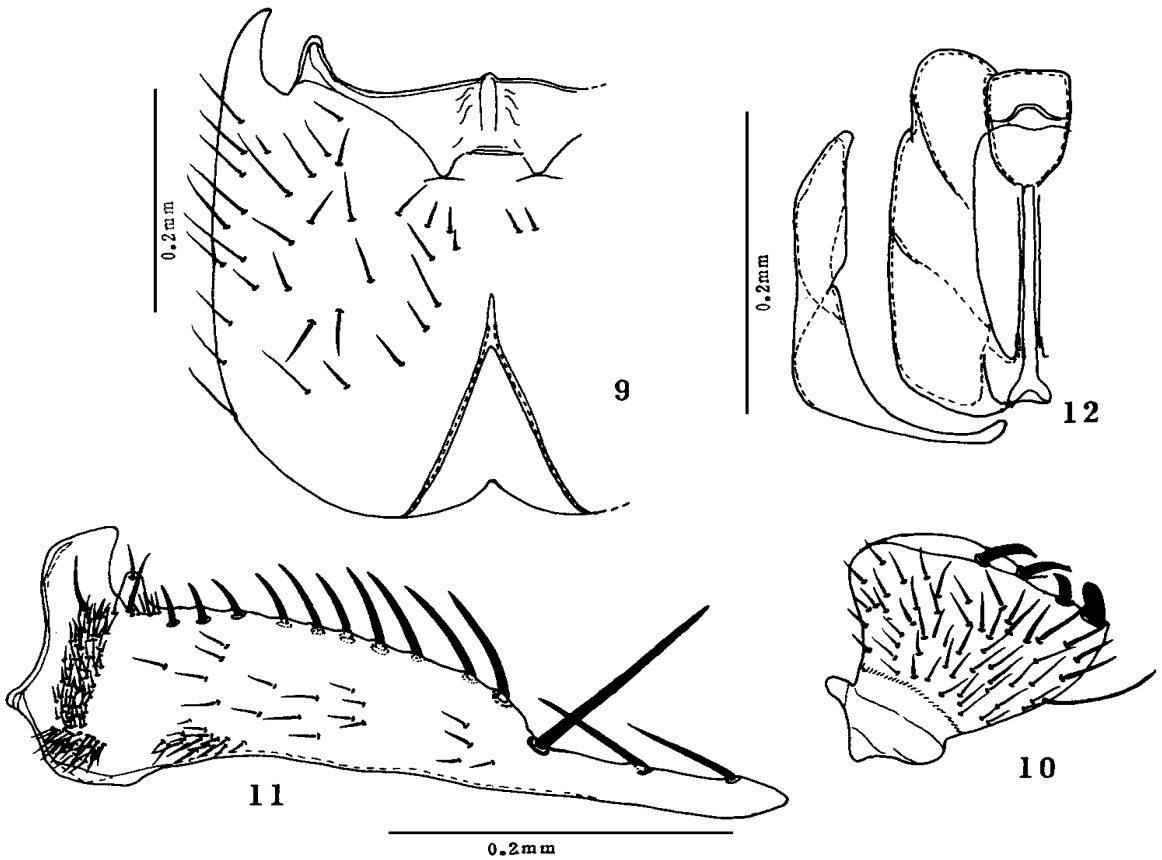
talia are shown in Figs. 5～8.

Female: Coloration as in male. Wing length 3.8～4.1mm. Long basal cross vein *tb* with 13～15 setulae below.

Holotype ♂, Jiugongshan (1550mm), Tongshan, Hubei, 13-VI-1984, Yang Chikun. Paratypes 1♀, the same data as holotype; 2♂♂, 3♀♀, Moganshan, Zhejiang, 18-IV-1992, Wu Hong.

Remarks: This species is similar to *idonea* Laštovka, but differs from the latter by the form of the body, and the shape of basistyle and dististyle.

3. Mycetophila fortisa, sp. nov. (Figs. 9～12)



Figs. 9-12 *Mycetophila fortisa*, sp. nov.
9. gonocoxopodites, ventral view; 10. basistyle, ventral view; 11. dististyle, dorsolateral view; 12. intromittent organ, dorsal view.

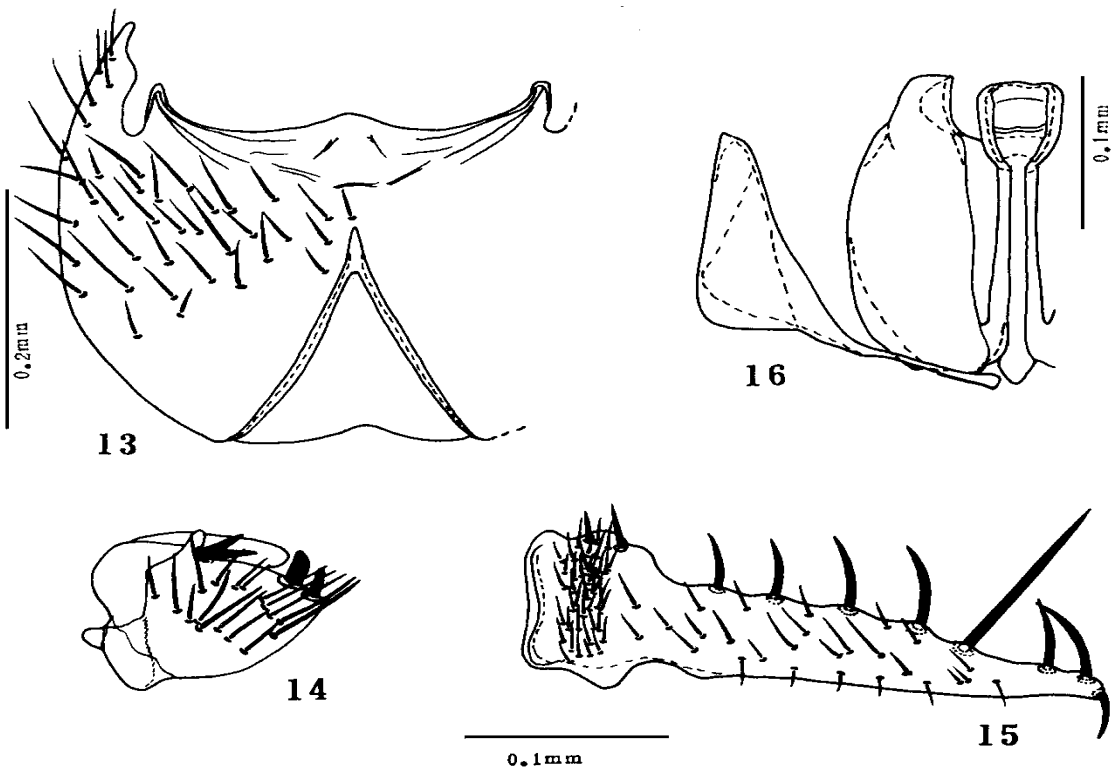
Male: Head brown. Antennae brownish on basal segments, the flagellum brown. Palpi brownish, with the third segment broadest. Mesoscutum brown. Scutellum and pleura mainly brown. Legs including coxae yellowish brown. Abdomen darker brown, genitalia yellow. Wing clear yellowish, with central spot; cross vein *r-m* a little longer than stalk of median fork. Long basal cross vein *tb* with 14～17 setulae below.

Proepisternum with 4 setae. Mesepimeron with 5 setae. Middle tibia with 3*a*, 5 strong *d* (1 weaker basal to them), 3 strong preapical *p* with 3 short basal to them. Hind tibia with 8*a*, 5 strong *d* (1 weaker basal to them), 14*p* on apical two-thirds. Wing length 4.1mm. The male genitalia are shown in Figs. 9～12.

Holotype ♂, Gutianshan (500m), Kaihua, Zhejiang, 23-X-1992, Wu Hong.

Remarks: This species is similar to *strobli* Lastovka and *ruficollis* Meigen. It differs from *strobli* by the shape of dististyle and intromittent organ, from *ruficollis* by the form of gonocoxopodites and basistyle.

4. Mycetophila furvusa, sp. nov. (Figs. 13～16)



Figs. 13-16. *Mycetophila furvusa*, sp. nov.
13. gonocoxopodites, ventral view; 14. basistyle, ventral view; 15. dististyle, dorsolateral view; 16. intromittent organ, dorsal view.

Male: Head brown. Antennae brownish on basal segments, the flagellum brownish yellow. Palpi brownish, with the third segment broadest. Mesoscutum brown. Scutellum brownish. Pleura mainly brown. Legs including coxae yellow. Abdomen dark brown, genitalia brownish yellow. Wing clear yellowish, with central spot; cross vein *r-m* a little longer than stalk of median fork. Long basal cross vein *tb* with 19 setulae below.

Proepisternum with 4 setae. Mesepimeron with 6 setae. Middle tibia with 4*a*, 5 strong *d* (1 weaker basal to them), 2 strong preapical *p* with 4 short basal to them. Hind tibia with 8*a*, 7

strong *d* (1 weaker basal to them), 10*p* on apical two-thirds. Wing length 4.3mm. The male genitalia are shown in Figs. 13～16.

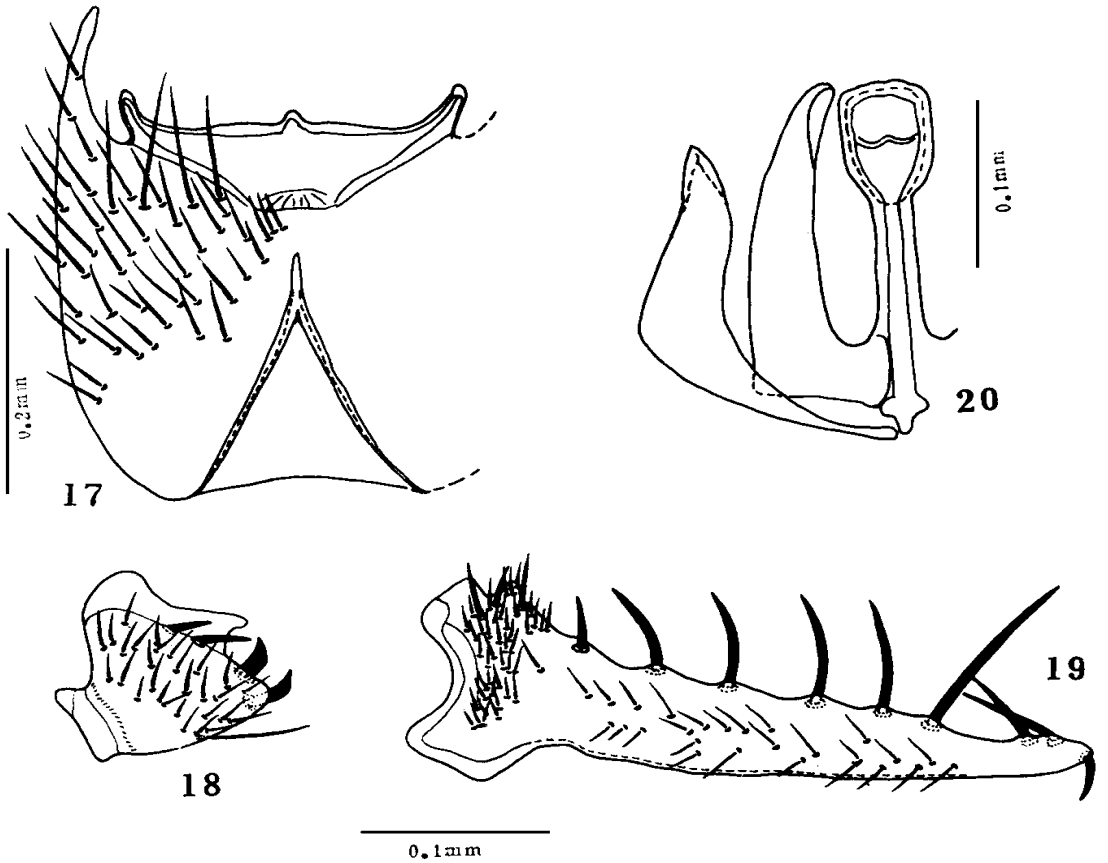
Holotype ♂, Wulingshan (1700m), Xinglong, Hebei, 26-VIII-1973, Yang Chikun.

Remarks: This species is similar to *matsumurai* Lastovka, but the size and form of the body, and the structure of basistyle and intromittent organ are very different.

5. *Mycetophila ichneumonea* Say, New to China (Figs. 17～20)

Mycetophila ichneumonea Say, 1823, p. 16. Type locality: USA, Pennsylvania.

For a list of its synonymy, see Lastovka (1972).



Figs. 17-20 *Mycetophila ichneumonea* Say

17. gonocoxopodites, ventral view; 18. basistyle, ventral view; 19. dististyle, dorsolateral view; 20. intromittent organ, dorsal view.

Male: Head darker brown. Antennae brown on basal segments, the flagellum brownish. Palpi brownish yellow, with the third segment broadest. Mesoscutum brown. Scutellum and pleura mainly brown. Legs including coxae yellow. Abdomen darker brown, genitalia brownish yellow. Wing clear yellowish, with central spot; cross vein *r-m* subequal stalk of median fork. Long basal cross vein *tb* with 14～17 setulae below.

Proepisternum with 4 setae. Mesepimeron with 5 setae. Middle tibia with 4*a*, 4 strong *d* (1

weaker basal to them), 2 strong preapical *p* with 5 short basal to them. Hind tibia with 6*a*, 5 strong *d* (1 weaker basal to them), 14*p* on apical two-thirds. Wing length 4.3mm. The male genitalia are shown in Figs. 17～20.

Female: Coloration as in male. Wing length 3.6～4.5mm. Long basal cross vein *tb* with 14～21 setulae below.

Material examined: 1♂, 8♀♀, Daqingshan Forest Station, Tumot Zuoqi, Inner Mongolia, 23-VIII-1978, Yang Chikun; 2♂♂, 1♀, Yanshi (700m), Xinglong, Hebei, 29-VIII-1973, Yang Chikun.

Distribution: China (Inner Mongolia, Hebei), Japan, Mongolia, Algeria, Austria, Czechia, Slovakia, Spain, Sweden, USA.

Remarks: This is the most widely distributed species and the only member of this group occurring in both Palaearctic and Nearctic regions. The Chinese specimens are a little larger in size.

6. *Mycetophila idonea* Lastovka

Mycetophila ruficollis: Lastovka & Matile, 1969, p. 685.

Mycetophila idonea Lastovka, 1972, p. 279. Type locality: Slovakia, Snina.

For redescription, see Lastovka (1972).

Distribution: China (Tibet), Japan, Iran, Czechia, Slovakia.

7. Mycetophila chandleri, sp. nov. (Figs. 21～24)

Male: Head brown. Antennae yellow on basal segments, the flagellum brownish. Palpi brownish yellow, with the third segment broadest. Mesoscutum brown. Scutellum brownish. Pleura mainly brown. Legs including coxae yellow. Abdomen dark brown, genitalia brownish yellow. Wing clear yellowish, with central spot; cross vein *r-m* a little longer than stalk of median fork. Long basal cross vein *tb* with 18～21 setulae below.

Proepisternum with 3 long setae. Mesepimeron with 4～5 setae. Middle tibia with 3*a*, 5 strong *d* (1 weaker basal to them), 2 strong preapical *p* with 3 short basal to them. Hind tibia with 5*a*, 5 strong *d* (1 weaker basal to them), 7～9*p* on apical two-thirds. Wing length 3.3～3.8mm. The male genitalia are shown in Figs. 21～24.

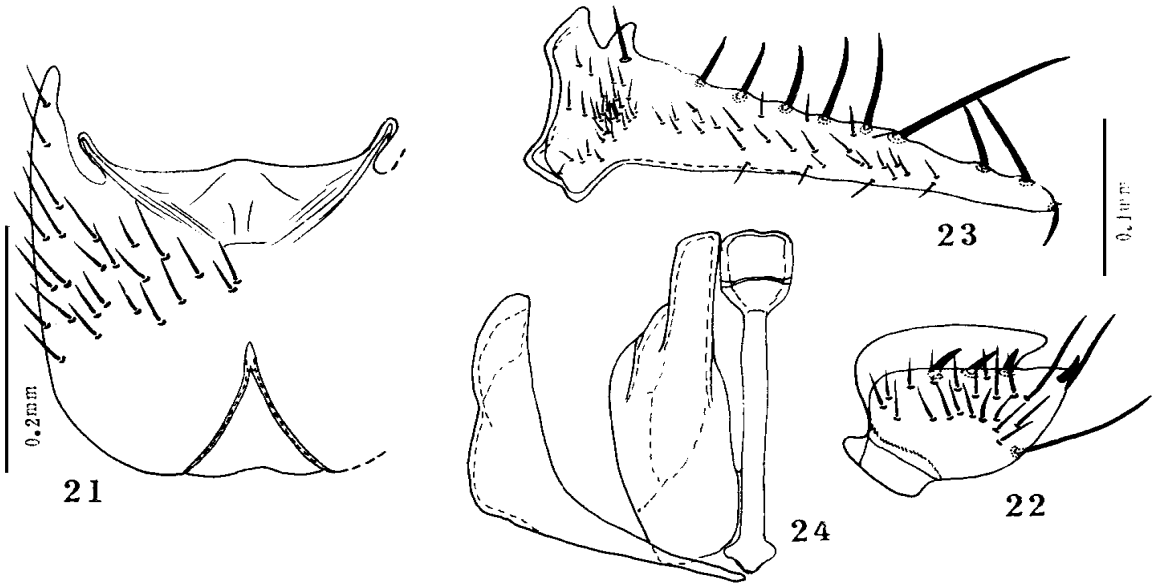
Female: Coloration as in male. Wing length 3.8mm. Long basal cross vein *tb* with 16 setulae below.

Holotype♂, Wudangshan, Hubei, 29-V-1984, Yang Chikun. Paratypes 1♂, Moganshan (380m), Zhejiang, 2-V-1991, Wu Hong; 1♀, Moganshan, Zhejiang, 18-IV-1992, Wu Hong; 1♂, Lazikou (1700m), Diebu, Gansu, 12-VIII-1980, Yang Chikun.

Remarks: This species is similar to *matsumurai* Lastovka and *furvusa* sp. nov., but can be

separated from them by the form of the body and the structure of basistyle and intromittent organ.

This species is named in honor of P. Chandler.



Figs. 21-24 *Mycetophila chandleri*, sp. nov.
21. gonocoxopodites, ventral view; 22. basistyle, ventral view; 23. dististyle, dorsolateral view; 24. intromittent organ, dorsal view.

8. Mycetophila meridionalisa, sp. nov. (Figs. 25~28)

Male: Head yellow brown. Antennae yellow on basal segments, the flagellum brownish yellow. Palpi brownish yellow, with the third segment broadest. Mesoscutum yellow brown. Scutellum and pleura mainly yellow brown. Legs including coxae yellow. Abdomen brown to darker brown, genitalia yellow. Wing clear yellowish, with central spot; cross vein *r-m* subequal stalk of median fork. Long basal cross vein *tb* with 8~11 setulae below.

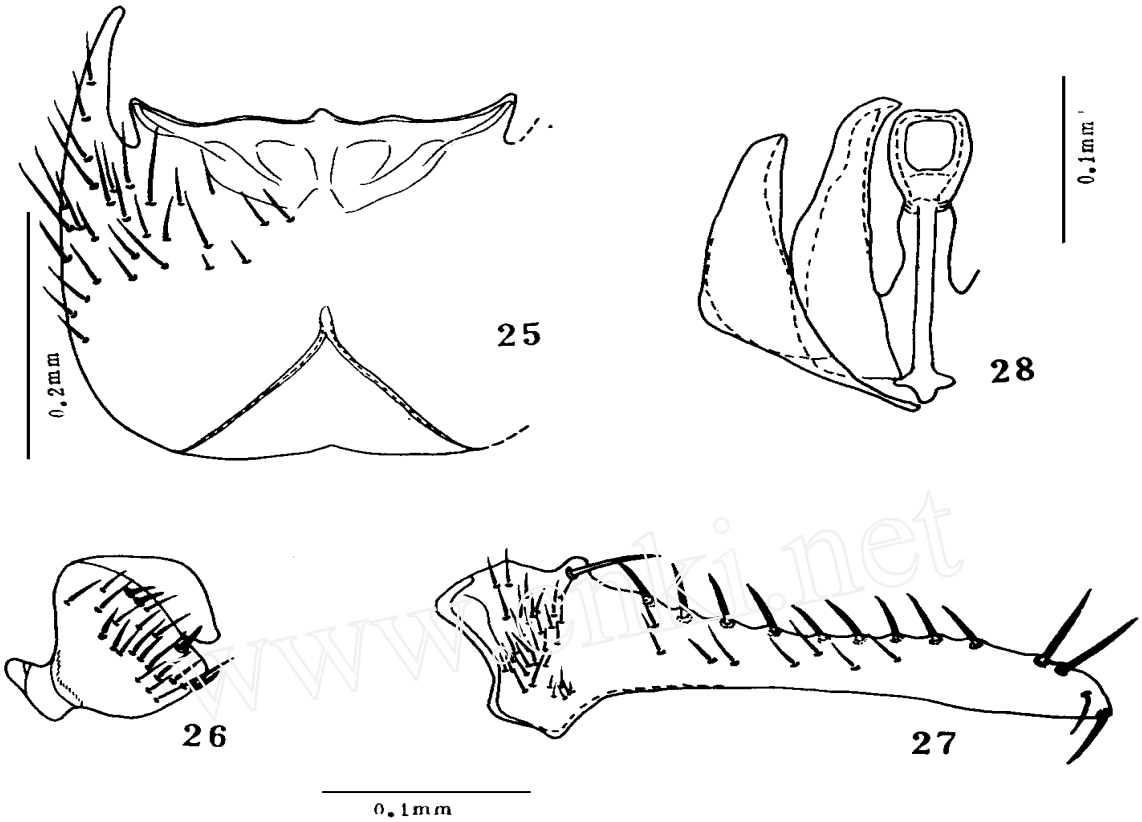
Proepisternum with 4 setae. Mesepimeron with 5 setae. Middle tibia with 4*a*, 5 strong *d* (1 weaker basal to them), 2 strong preapical *p* with 3 short basal to them. (Hind tibia lacking). Wing length 3.8mm. The male genitalia are shown in Figs. 25~28.

Holotype♂, Jinxiu (720m), Guangxi, 11-VI-1982, Yang Chikun.

Remarks: This species is well characterized especially by the structure of basistyle and intromittent organ.

9. *Mycetophila perpauca* Lastovka, new to China (Figs. 29~32)

Mycetophila perpauca Lastovka, 1972, p. 288. Type locality: Japan, Hollaido.



Figs. 25- 28 *Mycetophila meridionalisa*, sp. nov.

25. gonocoxopodites, ventral view; 26. basistyle, ventral view; 27. dististyle, dorsolateral view; 28. intromittent organ, dorsal view.

Male: Head dark brown. Antennae brown on basal segments, the flagellum brownish. Palpi brown, with the third segment broadest. Mesoscutum brown. Scutellum brownish. Pleura mainly brown. Legs including coxae brownish yellow. Abdomen brown, genitalia yellow. Wing clear yellowish, with central spot; cross vein *r-m* about tiwce as long as stalk of median fork. Long basal cross vein *tb* with 14 setulae below.

Proepisternum with 3 long setae. Mesepimeron with 4 setae. Middle tibia with 3*a*, 5 strong *d* (1 weaker basal to them), 1 strong preapical *p* with 2 short basal to them. Hind tibia with 6*a*, 5 strong *d* (1 weaker basal to them), 7*p* on apical two-thirds. Wing length 3. 8mm. The male genitalia are shown in Figs. 29～32.

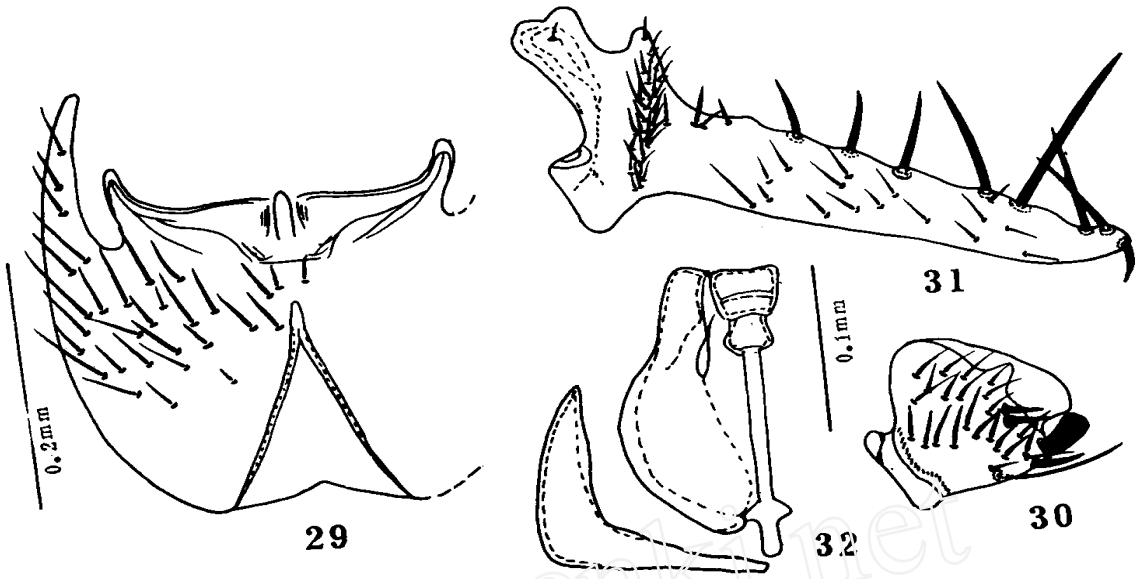
Female: Coloration as in male. Wing length 3. 8mm. Long basal cross vein *tb* with 16 setulae below.

Material examined: 1♂, 1♀, Wudangshan, Hubei, 29- V- 1984, Yang Chikun.

Distribution: China (Hubei), Japan.

Remarks: The Chinese specimens are a little larger in size, the numbers of setulae on middle and hind tibia are also different from the holotype.

10. *Mycetophila strobli* Lastovka, (Figs. 33～36)



Figs. 29- 32　*Mycetophila perpauca* Lastovka

29. gonocoxopodites, ventral view; 30. basistyle, ventral view; 31. dististyle, dorsolateral view; 32. intromittent organ, dorsal view.

Mycetophila strobli Lastovka, 1972, p. 281. Type locality: Austria, Styria.

For a list of its synonymy, see Lastovka (1972).

Male: Head darker brown. Antennae brownish yellow. Palpi brownish, with the third segment broadest. Mesoscutum brown. Scutellum yellow brownish. Pleura mainly brown. Legs including coxae yellow. Abdomen brown, genitalia yellow. Wing clear yellowish, with central spot; cross vein *r-m* little longer than stalk median fork. Long basal cross vein *tb* with 10 setulae below.

Proepisternum with 3 long setae. Mesepimeron with 4 setae. Middle tibia with 4*a*, 4 strong *d* with 2 short basal to them, 2 strong preapical *p* with 2 short basal to them. Hind tibia with 6*a*, 5 strong *d* (1 weaker basal to them), 10*p* on apical two-thirds. Wing length 4. 1mm. The male genitalia are shown in Figs. 33～36.

Material examined: 1♂, Yuehualin (1700m), Changbaishan, Jilin, 24- VIII- 1985, Yang Chikun.

Distribution: China (Jilin), Austria, Czechia, Slovakia, Sweden.

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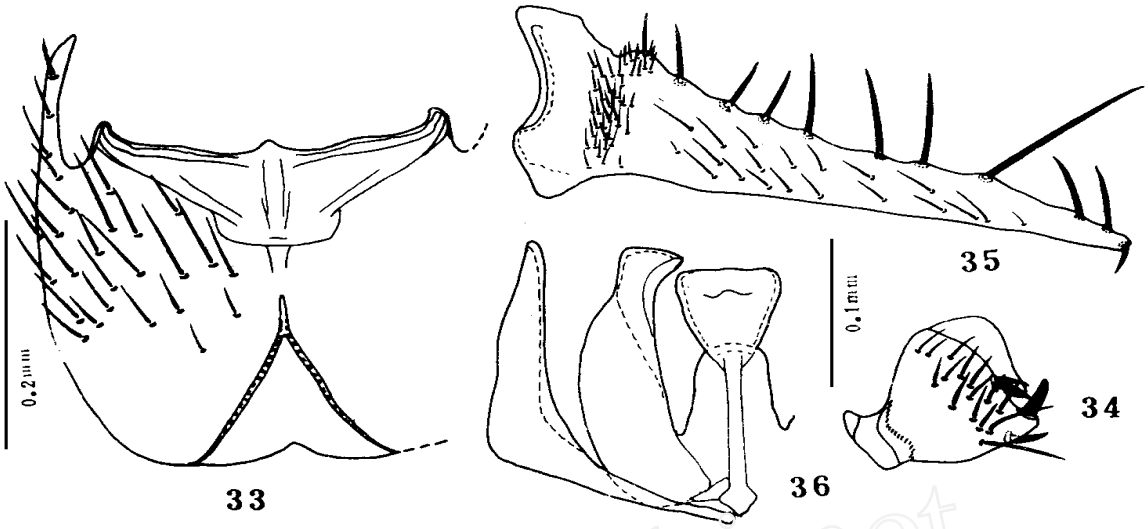

Figs. 33-36. *Mycetophila strobli*, Lastovka

33. gonocoxopodites, ventral view; 34. basistyle, ventral view; 35. dististyle, dorsolateral view; 36. intromittent organ, dorsal view.

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中国罗夫菌蚊物种群(Mycetophila ruficollis group)研究

(双翅目: 菌蚊科)

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罗夫菌蚊物种群(*Mycetophila ruficollis*-group)全世界已知30余种,其中全北区有12种,东洋区种类未作系统研究。中国记载过2种。本研究对中国的罗夫菌蚊物种群作了系统研究整理,发现了6新种(角突菌蚊*M. cetophila angularisa*、弯尾菌蚊*M. curvicaudata*、粗壮菌蚊*M. fortisa*、深色菌蚊*M. furvusa*、查氏菌蚊*M. chandleri*、南方菌蚊*M. meridionalisa*)和2中国新记录种,并编制了中国已知种类的检索表。至此我国该物种群共有10种。新种模式标本分别保存在浙江林学院和中国农业大学昆虫标本馆。

关键词　双翅目　菌蚊科　罗夫菌蚊物种群　新种　中国

中图分类号　Q969.444.2