

## 似动蜉属(*Cinygmina*)两新种 和属的特征(蜉蝣目:扁蚴蜉科)

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动蜉属(*Cinygma*)分布在全北区和东洋区,北美、苏联和日本均有报道,微动蜉属(*Cinygmula*)仅全北区、北美、苏联曾有记载,惟似动蜉属(*Cinygmina*)仅于1937年英国人D. E. Kimmins在印度阿萨姆(Assam)的卡西山(Khasi Hills)采得的标本定为新属新种—阿萨姆似动蜉(*Cinygmina assamensis*)外,直到现在未见有其他种类报道过。作者于1980年7月在江苏宜兴山区及其邻近安徽大洞和浙江雁荡山等地采到斜纹似动蜉(*Cinygmina obliquistriata*)新种♂成虫147头、♀成虫136头和红斑似动蜉(*Cinygmina rubromaculata*)新种♂成虫218头、♀成虫162头,该两新种均为宜兴山区的优势种。模式标本均保存在南京师范学院生物系,兹将两新种成虫的形态特征记述如下:

### 新 种 描 述

#### 斜纹似动蜉 *Cinygmina obliquistriata* 新种(图版1)

**雄成虫**(酒精保存):体长6—10.8毫米,淡黄色。复眼卵圆形,紫黑色,两眼在背面顶端相接触;单眼三个,中单眼小于侧单眼,基部均围以紫环。触角短,刚毛状(图1)。前胸宽大于长,后缘凹陷较深,近后缘背面有“一”字形的褐色斑。中胸发达,背面和侧面分别各有一对褐色长斑和褐色点斑。前翅长7—10.8毫米,无色、透明,翅脉相属扁蜉型,Sc区和R<sub>1</sub>区不透明,翅基部有一个三角形紫褐色斑点,翅痣区有十一根不分叉的Sc横脉和八根R<sub>1</sub>横脉。足黄色,前足略比体长,基节外侧有一条褐色长斑,腿节略短于胫节,跗节为胫节的 $1\frac{1}{2}$ — $1\frac{2}{3}$ 倍,基跗节为第二跗节的 $\frac{7}{10}$ — $\frac{8}{10}$ ,第二跗节长于第三跗节,少数等于第三跗节,各跗节之比为7:10:8:5:3,排列顺序为2,3,1,4,5(图2、3)。中、后足基节的两侧各有一对褐色斑点。前、后足腿节外侧边缘各有3—4条断续的条斑,后足腿节长于胫节,跗节为胫节之半,跗节之比与该属模式种阿萨姆似动蜉相仿,亦为10:9:7:5:12,排列顺序为5,1,2,3,4(图4、5)。三对足的爪均不相似。

腹部细长,第2—8腹节的两侧各有一条赭色斜纹,有些个体在每节后缘有赭色横斑与斜纹相连(图6)。尾须二条,长20—32毫米,约为体长的三倍多,周围有细毛,相间各节围以赭色环纹。

外生殖器淡黄色,尾铗四节,第二节最长,第三节长于端节,第三、四两节之和约为第二节的 $\frac{1}{2}$ 。阳茎叶左右分开,内叶较高并转向背面,两叶间有一个“U”字形缺刻,阳茎基部有一对顶端略尖的几丁质薄板(图7)。

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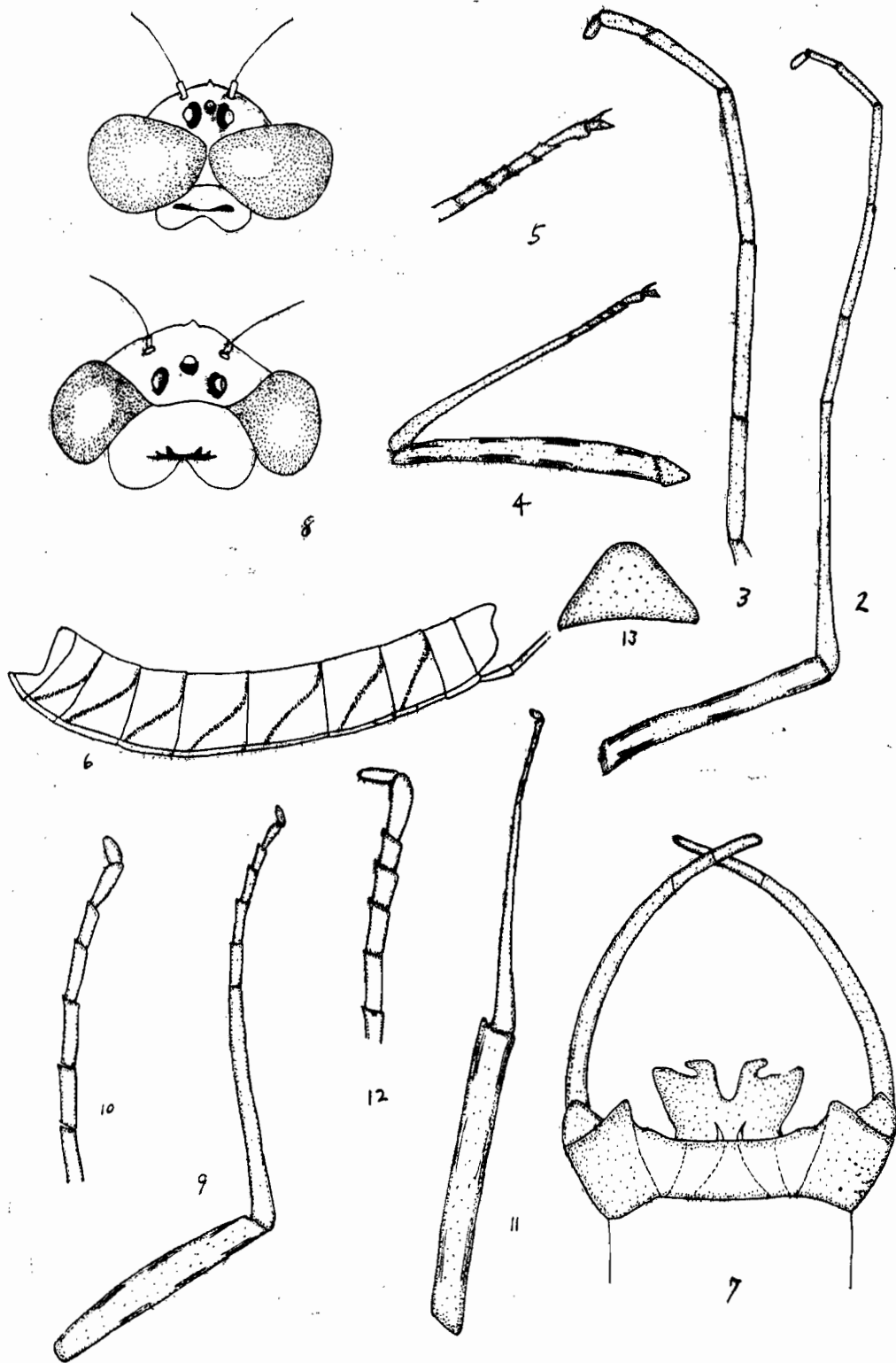


图 1—13 斜纹似动蜉 *Cinygmnia obliquistriata* 新种

1—7雄虫：1.头部背面观2.前足3.前足跗节放大4.后足5.后足跗节放大6.腹部侧面观7.外生殖器  
8—13雌虫：8.头部背面观 9.前足 10.前足跗节放大 11.后足 12.后足跗节放大 13.肛下板

**雌成虫**(酒精保存): 体黄色, 长6.5—10毫米, 复眼紫黑色, 心脏形, 心尖在背面相对但不接触, 两眼相隔的距离为一个侧单眼直径的两倍, 单眼和触角与雄虫同。前胸宽大于长, 后缘背面有一条分枝的褐斑(图8)。前翅7—11毫米, 足深黄色, 前足腿节略长于胫节, 胫节为跗节的 $1\frac{2}{3}$ , 跗节之比为16:18:13:8:15, 排列顺序为2, 1, 5, 3, 4(图9、10)。后足的腿节长于胫节, 胫节为跗节的三倍, 跗节之比为10:7:6:5:12, 排列顺序为5, 1, 2, 3, 4(图11,12)。爪均不相似。

腹部较雄虫粗壮, 黄色, 两侧赭色斜纹较浅, 尾须两条, 长16—18毫米, 约为体长的两倍余, 肛下板呈舌状(图13)。

**模式标本:** 正模♂配模♀, 宜兴县茗苳公社长岗大队, 80.VII.25, 副模40♂♂, 38♀♀, 太华公社, 80.VII.21—24; 52♂♂, 37♀♀, 1♂(亚), 6♀♀(亚), 茗苳公社, 80.VII.25—27; 38♂♂, 29♀♀, 2♂♂(亚), 湖汶公社, 80.VII.29—31; 12♂♂, 31♀♀, 1♂(亚), 1♀(亚) 浙江雁荡山, 80.VII.25—26; 4♂♂ 安徽大洞, 80.VII.

### 红斑似动蜉 *Cinygmia rubromaculata* 新种 (图版2)

**雄成虫**(酒精保存): 体黄色, 长7—9毫米。复眼大, 卵圆形, 紫黑色或灰色, 两眼在背面顶端相接触; 单眼三个, 中单眼小, 基部均围以紫色环斑。触角短, 刚毛状。前胸宽大于长, 后缘中央凹陷较深, 中胸发达, 无斑点。前翅长7.5—9.5毫米, 无色、透明, 闪光, 翅脉相属扁蜉型, 在翅基部R脉上有一条短的紫黑斑, 翅痣区不透明, 该区Sc横脉有十根, R<sub>1</sub>横脉有八根。前足黄色, 足与身体、腿节与胫节均等长, 跗节为胫节的 $1\frac{2}{5}$ 倍, 基跗节为第二跗节的 $\frac{6.6}{10} - \frac{8}{10}$ , 第二跗节长于第三跗节, 跗节各节之比为6.6:10:8:5:3.3, 排列顺序为2, 3, 1, 4, 5, (图14,15)。后足的腿节长于胫节, 为胫节的 $1\frac{1}{2}$ 倍, 跗节短于胫节之半, 跗节各节之比为9:7:5:4:12, 排列顺序为5, 1, 2, 3, 4(图16,17)。三对足的爪均不相似。

腹部细长, 第2—8腹节的两侧各有一块红斑(图18)。尾须二条, 长21—26毫米, 约为体长的三倍多, 周围有细毛但无色环。

外生殖器黄色, 尾铗四节, 第二节最长, 第三节长于端节, 三、四两节之和约为第二节的 $\frac{1}{3}$ , 基节的顶端向内突出。阳茎叶左右分开, 每叶又分两小叶, 内小叶大于外小叶, 后者的一部分常被生殖下板所遮盖, 两叶间的U形缺刻在腹面不明显, 但在背面可见, 其中还有一小叶; 叶上无刺, 阳茎叶基部有一对相距较远的几丁质薄板(图19)。

**雌成虫**(酒精保存): 体黄色, 长6—9毫米, 复眼心脏形, 紫黑色或灰色, 心尖在背面相对但不接触, 两眼相隔的距离为侧单眼直径的两倍。前翅长7—10毫米, 不透明的翅痣区有十三根Sc横脉和十根R<sub>1</sub>横脉。前足腿节长于胫节, 胫节为跗节的 $1\frac{2}{5}$ 倍, 跗节各节之比为9:9:7:5:9, 排列顺序为2=1=5:3:4(图20,21)。后足的腿节长于胫节, 胫节为跗节的2.6倍, 跗节各节之比为10:8:6:5:12, 排列顺序为5, 1, 2, 3, 4(图22,23)。爪均一钝一尖。

腹部较雄虫粗壮, 色深黄, 两侧的红斑较浅, 尾须较短, 约18毫米, 肛下板呈舌状, 两侧稍凹陷(图24)。

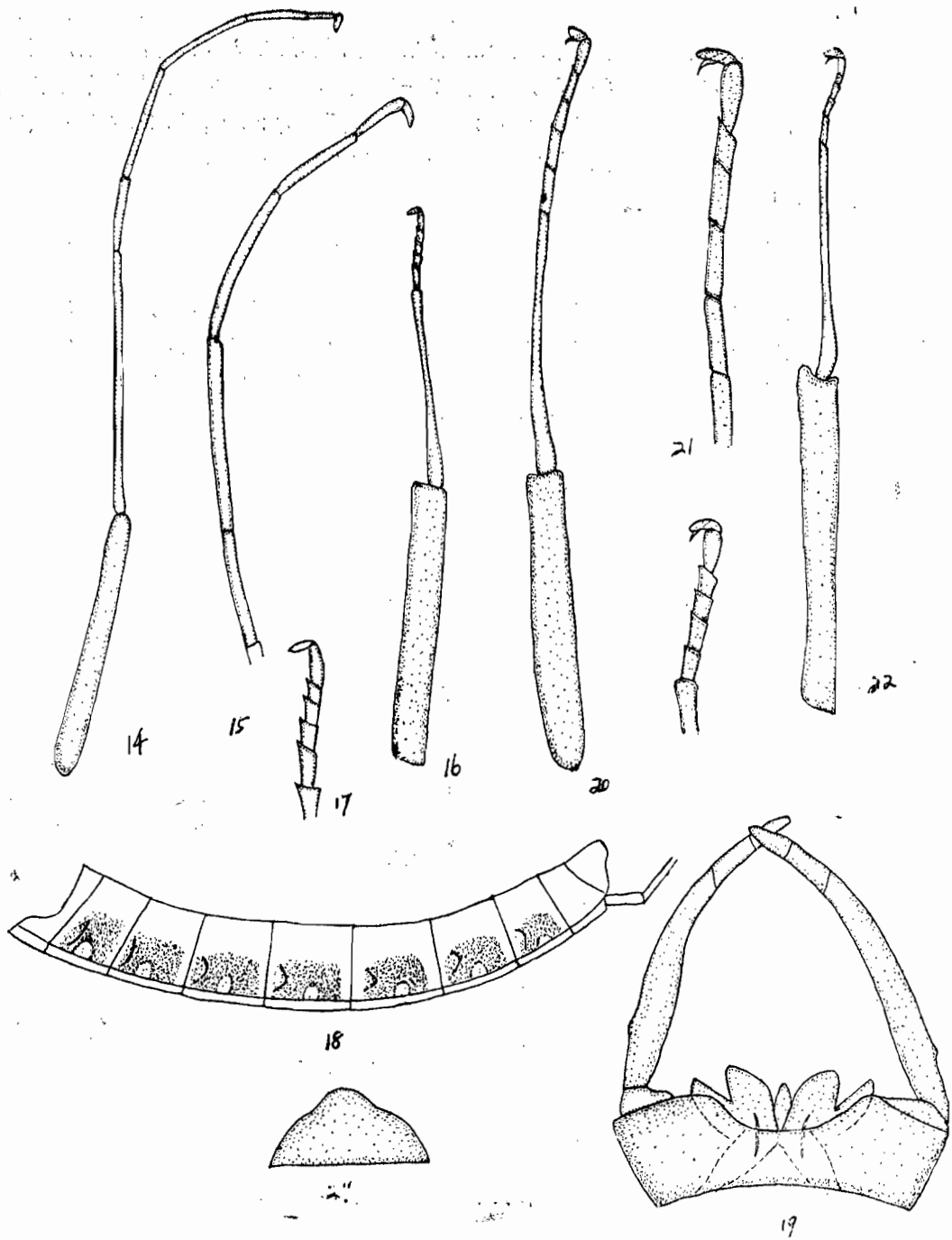


图14—24 红斑似动蜉 *Cinygmmina rubromaculata* 新种

14—19雄虫：14.前足 15.前足跗节放大 16.后足 17.后足跗节放大 18.腹部侧面观  
19.外生殖器

20—24雌虫：20.前足 21.前足跗节放大 22.后足 23.后足跗节放大 24.肛下板

**模式标本:** 正模♂配模♀, 张渚80.VI.20; 副模, 50♂♂, 46♀♀, 8♂♂(亚), 73♀♀(亚), 张渚80.VI.20; 161♂♂, 98♀♀, 30♀♀(亚), 茗苓80.VI.25—27; 6♂♂, 17♀♀, 湖汶, 80.VI.28—31。

## 属 的 特 征

似动蜉属 Genus *Cinygmina* Kimmins、动蜉属 Genus *Cinygma* Eaton 和微动蜉属 Genus *Cinygmula* McDunnough 在形态上非常相似。它们的主要区别在于似动蜉属的雄虫两复眼在背面顶端相接触而其他两个属的雄虫两复眼均不接触。动蜉属前翅的翅痣区有一条细脉把该区分割成上小下大的两层小室, 但其他两个属的翅痣区均为单层且横脉不形成网状。微动蜉属雄虫的尾铗末两节之和与第二节等长而其他两个属的尾铗末两节之和均短于第二节。似动蜉属的阳茎叶中间有一广阔的U形缺刻, 叶上无刺, 生殖刺极度退化而代之以几丁质薄板而其他两个属的阳茎叶并不形成U形缺刻且生殖刺较明显。

Kimmins 描述似动蜉属的特征比较简单, 作者根据该属三个已知种的形态特点对该属拟作如下的补充: 体中型, 复眼大, 卵圆形, 两眼在背面顶端相接触。♂前足等于或大于体长, ♀前足比体短。♂前足的腿节等于或短于胫节, 跗节为胫节的  $1\frac{1}{5}$ — $1\frac{2}{5}$  倍, 前足基跗节为第二跗节的  $\frac{6}{10}$ — $\frac{8}{10}$ , 通常为  $\frac{7}{10}$  左右, 跗节各节的排列顺序为 2, 3, 1, 4, 5。♂后足腿节长于胫节, 跗节为胫节之半或不到一半, 基跗节略长于第二节, 第五节仅稍长于基跗节, 跗节各节的排列顺序为 5, 1, 2, 3, 4。三对足的爪均不相似。前翅的脉相属扁蜉型, 翅痣区无分叉横脉。尾铗四节, 末两节的长度约为第二节的  $\frac{1}{3}$ ; 阳茎分叶, 叶间通常有一U字形缺刻, 生殖刺极度退化, 仅留有一对小的几丁质薄板, 分布在东洋区和古北区。

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## ABSTRACT

### TWO NEW SPECIES AND DIAGNOSTIC CHARACTERS OF GENUS CINYGMINA (EPHEMEROPTERA: ECDYONEURIDAE)

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This paper describes two new species of mayflies of genus *Cinygmina* from Jiangsu, Zhejiang and Anhui provinces. The type specimens are all deposited in the Department of Biology, Nanjing Teachers College.

*Cinygmina obliquistriata*, sp. nov. (fig. 1-13)

**Male imago**(In alc.); Length of body 6-10.8mm. General color light yellow. Compound eyes moderately large, ovoid, purplish black, being contiguous apically. posterior margin of prothorax deeply emarginate with a transverse ochreous marking dorsally. Fore wing 7-10.8mm long, almost colorless and hyaline, except Sc & R<sub>1</sub> areas opaque, typical Heptagenine venation. Fore leg longer than body, fore femur shorter than tibia, anterior tarsus  $1\frac{1}{5}$  -  $1\frac{2}{5}$  times as long as tibia, fore basal tarsal joint  $\frac{7}{10}$  -  $\frac{8}{10}$  as long as the 2nd tarsal joint, being longer than or equal to the third joint. Relative lengths of anterior tarsal joints = 7:10:8:5:3, of posterior tarsus = 10:9:7:5:12, with tarsal joints rank 2, 3, 1, 4, 5 and 5, 1, 2, 3, 4 respectively. All claws dissimilar. Abdomen yellowish, with an ochreous oblique strip marking on each side of 2-8 segments. Genitalia with forceps 4 segmented, 2nd the longest, 3rd and 4th combined about  $\frac{1}{3}$  of 2nd. penial lobes with its inner lobules projecting dorsally, with a wide U-shaped excision between them, and with a pair of small thin chitinous plates at the base.

**Female imago**(In alc.); Length<sup>1</sup> of body 6.5-10mm. Compound eyes purplish black, heart-shaped, with its apices facing together but not contiguous, distance between two eyes separated by a space about twice the longest diameter of a lateral ocellus. Prothorax with a branched ochreous marking dorsally. Fore leg shorter than body, fore femur slightly longer than tibia, being  $1\frac{3}{8}$  times as long as tarsus. Relative lengths of anterior tarsal joints = 16:18:13:8:15, of posterior tarsus = 10:7:6:5:12, with tarsal joints rank 2, 1, 5, 3, 4 and 5, 1, 2, 3, 4 respectively. Abdomen rather broader, oblique markings lighter, subanal plate tongue-shaped.

**Distribution:** Yi Xing, Jiangsu Province; Yan Dang Shan, Zhejiang

province; Da Dong, Anhui Province.

**Holotype** ♂, **Allotype** ♀, Ming Ling, 25.VII.80.

**Paratype:** 52 ♂♂, 37 ♀♀, Ming Ling, Yi xing, 25-27. VII. 80; 40 ♂♂, 38 ♀♀ Ta Hua, Yi Xing, 21-24. VII. 80; 38 ♂♂, 29 ♀♀, Hu Fu, Yi Xing, 29-31. VII. 80; 12 ♂♂, 31 ♀♀, Yan Dang Shan, Zhejiang Province, 25-26. VII. 80; 4 ♂♂ Da Dong, Anhui, VII. 80.

**Cinygmia rubromaculata** sp. nov. (fig. 14-24)

**Male imago** (In alc.) Length of body 7-9 mm. Compound eyes moderately large, ovoid, purplish black or grey, being contiguous apically. Fore wing 7.5-9.5 mm, stigmatic area opaque, typical Heptagenine venation. Length of body and fore femur about as long as that of fore leg and fore tibia respectively, fore tarsus  $1\frac{2}{5}$  times as long as tibia, tarsal joint  $\frac{6.6}{10}$ — $\frac{8}{10}$  as long as 2nd tarsal joint, being longer than 3rd. Relative lengths of anterior tarsal joints = 6.6:10:8.5:3.3, of posterior tarsal joints = 9:7:5:4:12, with tarsal joints rank 2,3,1,4,5 and 5,1,2,3,4 respectively. All claws dissimilar. Abdomen slender with a piece of red marking on each side of 2-8 segments. Genitalia with forceps same as the preceding species. Penial lobes each divided into 2 small lobules, inner one larger than outer, being partly covered by subgenital plate. In addition, a small lobe situated in between 2 penial lobes, with a pair of widely separated chitinous plates at the base.

**Female imago** (In alc.): Length of body 6-9 mm. Compound eyes same as male, but not contiguous. Fore wing 7-10 mm. long, stigmatic area opaque. Fore leg shorter than body, fore femur longer than tibia, being  $1\frac{2}{5}$  times as long as tarsus. Relative lengths of fore tarsal joints = 9:9:7:5:9, of posterior tarsal joints = 10:8:6:5:12, with tarsal joints rank 2 = 1 = 5,3,4 and 5,1,2,3,4 respectively. Abdominal segments broader and red markings lighter than male, subanal plates tongue-shaped with lateral sides slightly emarginate.

**Distribution:** Yi Xing, Jiangsu Province.

**Holotype** ♂, **Allotype** ♀, Zhang Zhu, 20. VII. 80; **paratype** 50 ♂♂, 46 ♀♀, Zhang Zhu, 20. VII. 80; 161 ♂♂, 98 ♀♀, Ming Ling, Yi Xing, 25-27. VII. 80; 6 ♂♂, 17 ♀♀, Hu Fu, Yi Xing, 29-31. VII. 80.

**Generic Diagnosis:** The differences of 3 closely related genera Cinygma, Cinygmula and Cinygmia are discussed. The diagnostic characters of genus Cinygmia are redescribed in detail.