

## 球隔麻属——荨麻科一新属,兼论荨麻科的柱头

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**摘要** 本文描述了分布于中国西藏东南部的荨麻科的一新亚族——球隔麻亚族,一新属——球隔麻属及其模式种球隔麻。它被认为是荨麻族较原始的一个类群。其环状柱头及球形药隔在荨麻科中至今还是首次发现。本文还论述了荨麻科植物的柱头特征、类型及其分类学意义,并探讨了它们的演化趋势。

**关键词** 荨麻科;荨麻族;球隔麻亚族;球隔麻属;球隔麻;环状柱头;球形药隔;荨麻科柱头

作者在鉴定中国科学院登山科学考察队,在西藏东南部的南迦巴瓦山采得的异常丰富的荨麻科植物标本时,发现采自墨脱境内的一号标本性状奇特,为常绿小乔木,雌花似藤麻族 (Trib. Procridaeae) 而具荨麻族 (Trib. Boehmeriaceae) 植物的习性,但可惜没有发现雄株标本。今年春天,作者又见到二号采自该地区的同种植物标本,其中一号还是雄花标本,经过进一步研究确认这类植物的花与藤麻族并不相同,而更类似荨麻族,但从已知的荨麻族中找不到它的适宜位置。因此,作者认定将其置于荨麻族下建立一个新亚族及一新属较为自然。

考虑到这个新属植物奇特的环状柱头在荨麻科中还是首次发现,作者认为对荨麻科的柱头有必要在本文中同时进行论述。

**球隔麻亚族 (荨麻族) 新亚族**

**Sphaerotylineae** C. J. Chen, subtrib. nov.

雌花被片 5,仅基部合生,与子房离生,在果时近膜质;柱头环形,宿存。

模式属:球隔麻属

1 属,分布同属。

作者(1980)曾提出荨麻族的雌花演化向着合生、减退和特化方向发展<sup>[1]</sup>。该族的其它亚族的雌花被片常 1—2,高度合生成管状,在口部具齿或裂齿。水丝麻亚族 (Subtrib. Maoutinae) 的雌花被极度退化,甚至不存在。而本新亚族的雌花被片 5,几乎离生,仅在基部合生,表现出该性状在荨麻族中的原始性。荨麻亚族 (Subtrib. Boehmerinae)<sup>[1]</sup> 与肉被麻亚族 (Subtrib. Sarconchlamydiae)<sup>[1,2]</sup> 的雌花被与子房分生,部分荨麻亚族的雌花被附着于子房,到紫麻亚族 (Subtrib. Oreocnidinae)<sup>[2]</sup> 与水丝麻亚族 (Subtrib. Maoutinae)<sup>[1,2]</sup> 的雌花被则常贴生于子房。荨麻族 (除荨麻亚族外) 的雌花被在果时均多少肉质化。然而,球隔麻亚族的雌花被与子房分生,在果时仍近膜质,在荨麻族中,同样表现出较为原始的性质。由于上述理由,作者把新建立的亚族排列在各亚族之首,其顺序是球隔麻亚族——荨麻亚族——肉被麻亚族——紫麻亚族——水丝麻亚族。

在工作中得到王文采教授的帮助并阅读全文,张泰利同志绘图,李渤生及程树志同志提供生态学资料,在此谨致谢忱。

**球隔麻属 新属****Sphaerotylos** C. J. Chen, gen. nov.

灌木或小乔木。叶互生, 基出 3 脉, 钟乳体点状; 托叶叶柄内生, 2 裂。花序雌雄异株, 聚伞圆锥状, 成对腋生, 团伞花序密集排成穗状。雄花: 花被片 5, 双盖覆瓦状排列; 雄蕊 5, 花丝在上部内折, 药隔膨大成球形。雌花: 花被片 5, 近膜质, 在基部合生, 果时增大, 与果离生; 子房直立, 柱头环状, 其上着生短的乳头状毛。瘦果宽卵球状或倒卵球状, 偏斜。

模式种: 球隔麻

只 1 种, 仅见于我国西藏东南部墨脱低山半常绿季风雨林地带。

本属的习性、花序、雄花被覆瓦状排列、雌花被与子房离生等性状, 与产印度东北部及印度尼西亚的苏门答腊的肉被麻属 (*Sarcochlamys* Gaudich.)<sup>[1], [5]</sup> 相似。主要区别在于本属的柱头环形, 雌花被片 5, 在基部合生, 在果时近膜质, 药隔膨大成球形。而肉被麻属柱头画面笔头状, 雌花被片 4, 合生成管状, 果时肉质, 一面膨胀成坛状, 药隔不膨大。

这一少见的常绿木本植物类群, 显然属于印度-马来西亚区系热带成分。在南迦巴瓦南坡墨脱地区还可见到毛叶锥头麻 (*Poikilospermum lanceolatum* (Trec.) Merr.), 圆齿火麻树 (*Dendrocnide sinuata* (Bl.) Chew) 等一些印度-马来西亚区系热带成分荨麻科植物。球隔麻属在这一地区的发现, 它不仅说明了这一地区暖湿气候成了一些古老生物 (如树蕨、罗汉松、穗花杉等) 的良好“庇护所”<sup>[3]</sup>, 而且对研究这一地区的地史与植物区系提供了资料。

**球隔麻 新种 图 1****Sphaerotylos medogensis** C. J. Chen, sp. nov.

常绿灌木或小乔木, 高 2—6 米。叶薄革质, 披针形或狭披针形, 长 12—29 厘米, 宽 4.5—9 厘米, 先端渐尖或长渐尖, 基部宽楔形, 边缘有细锯齿, 上面近无毛, 下面在脉网内被一层灰色毡毛, 基出脉 3 条, 侧出的 2 条稍弧曲, 伸达尖端, 中脉上部 1/4 处每侧有二级脉 3—4 条, 向外的二级脉缺或每侧有 1 条, 粗大, 自侧出的基生脉下部约五分之一处伸出达叶片中部边缘, 三级脉多数, 横出, 结成网, 外向的三级脉多数, 在近边缘网结; 叶柄长 2—6 厘米; 托叶三角状卵形, 长 8—10 毫米。花序长 7—9 厘米, 团伞花序无梗, 由多数花聚合成头状或块状花簇, 密生于花枝上, 径 2—3 毫米。雄花径约 0.7 毫米, 花药长圆形, 长约 0.2 毫米, 药隔宽约 0.2 毫米。雌花细小, 花被片长圆状倒卵形, 在果时增大, 长 0.3—0.4 毫米, 先端微钝。瘦果小, 压扁, 偏斜, 长约 0.5 毫米, 光滑。花期 4—5 月, 果期 6—7 月。

西藏: 墨脱, 希让至德阳拉途中, 海拔 900 米, 山谷雨林, 1983 年 5 月 30 日, 倪志诚 282 (模式, PE; XZ<sup>1)</sup>); 同县, 地东至希让, 海拔 850 米, 林缘与柁木林下, 1983 年 4 月 6 日, 李渤生与程树志 03920 (PE); 同县, 背崩至江新途中, 海拔 850 米, 丛林水边, 1983 年 6 月 3 日, 李渤生与程树志 04999 (PE)。

这种稀有植物仅见于北纬 29°3′—29°13′ 东经 94°40′—95°20′ 的西藏墨脱地区, 常生于海拔 850—900 米河滩较开旷次生湿润林内, 这里年平均气温 16—18℃, 最冷月平均

1) XZ——西藏西藏自治区生物高原研究所标本室。

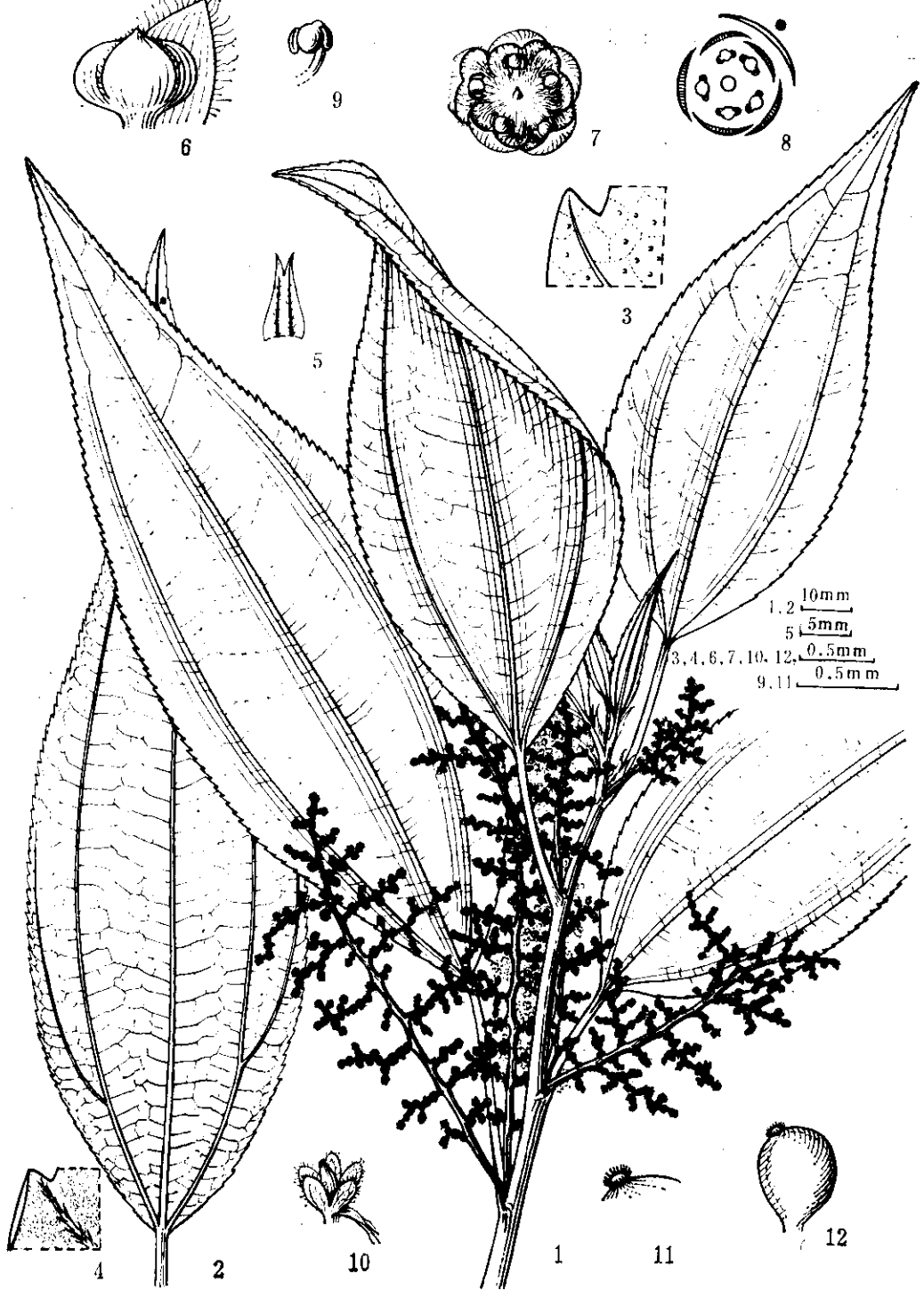


图1 球隔麻 1.花枝; 2.叶背面观; 3.叶一小块(上面观)示点状钟乳体; 4.叶一小块(背面观)示毛被; 5.托叶; 6.雄花; 7.展开的雄花; 8.雄花花图式; 9.雄蕊; 10.雌花; 11.柱头; 12.瘦果。(除2根据李渤生及程树志 04999号,其余均据倪志诚 282号标本绘制)(张泰利绘)

Fig. 1 *Sphaerotylos medogensis* C. J. Chen 1. habit; 2. leaf; 3. detail of leaf showing the punctiform cystoliths on the upper surface; 4. detail of leaf showing the indumentum on the lower surface; 5. stipule; 6. staminate flower in bud; 7. staminate flower in opened state; 8. diagram of staminate flower; 9. stamen; 10. pistillate flower; 11. stigma; 12. achene. (all from Z. C. Li 282, except 2 from P. S. Li & S. Z. Cheng 04999) (Drawn by Miss T. L. Zhang)

气温约 10°C, 几乎无雪霜日, 年降水量 2,500—3,000 毫米, 属于低山热带北缘湿润气候带<sup>[4]</sup>, 常半生的乔木有尼泊尔桤木 (*Alnus nepalensis* D. Don), 尼泊尔野桐 (*Mallotus nepalensis* Muell-Arg.) 和中平树 (*Macaranga denticulata* (Bl.) Muell-Arg.)<sup>[5]</sup>。

本种植物花丝明显缩短, 药隔膨大成球状(见图 1:9), 在荨麻科还是罕见的。球状药隔可能会增强花丝的外弹力, 这显然与适应风媒传粉有关。

本种部分叶的叶脉也很奇特, 在侧出的基生脉下部五分之一处向外各边伸出一条较粗的脉(见图 1:2), 在这两条脉汇合处及其以下部位有 2 条维管束, 而其上只有 1 条维管束, 叶柄有五条维管束; 而本种植物正常侧出的基生脉下部则只有 1 条维管束, 叶柄有 3 条维管束。因此, 可以认为部分叶中出现的这一对粗脉很可能是最外的一对基生脉。从而, 推想这种植物是从具有五出脉和较宽的叶的一种近缘植物演化而来。在进化过程中, 它的叶变狭长, 最外一对基生脉逐步退化, 在下部与中间一对基生脉合生, 多数叶已退化成三出基脉, 稀可见到五出脉的残迹。

## 荨麻科的柱头

### (一) 荨麻科与荨麻目其它科的柱头特征比较

榆科及广义的桑科 (Engler, 1889) (除新分出的锥头麻科 *Cecropiaceae*<sup>[6]</sup>外) 花柱 2, 柱头常丝形, 柱头毛常着生于柱头的内侧。可是荨麻科及锥头麻科的花柱单一或缺如; 锥头麻科的柱头仅有舌状、画笔头状或盾状, 而荨麻科的柱头则远较荨麻目其它科的复杂, 形状多样(见图 2), 常作为分属的重要依据。

### (二) 柱头类型

1. 头状(图 2:1—4) 柱头头状, 常无花柱, 短的乳突状毛呈放射状着生。

荨麻族: 花点草属、荨麻属(部分)、*Gyrotaenia*、*Urera* 和 *Obetia* (部分)。

藤麻族: *Sarcopilea*。

苧麻族: *Astrothalamus*、*Touchardia* (部分)、微柱麻属(多数)、锥头麻属(部分)和水丝麻属(部分)。

2. 画笔头状(图 2: 5—8。)与头状柱头不同之处在于具长的乳头状毛, 多向上伸展, 形如画笔头的笔毛。

荨麻族: *Parsana* 荨麻属(部分), *Hesperocnide*

藤麻族: 冷水花属(包括 *Achudemia*, *Smithiella*)<sup>[2]</sup>、赤车属、楼梯草属、藤麻属、*Peteloiella*、*Neopilea* 和假楼梯草属(包括 *Meniscogyne*)<sup>[2]</sup>。

苧麻族: *Sarcochlamys*、*Touchardia*、微柱麻属(部分)、水麻属和四脉麻属。

墙草族: 墙草属(部分)。

3. 盾状(图 2: 9—10) 柱头盘状, 着生于粗短的花柱上, 周围边上着生长乳头状毛。

苧麻族: 紫麻属、*Gibbsia*。

4. 环状(图 2: 11—12。)与盾状柱头近似, 不同在于无花柱, 柱头呈一环, 其上着生短的乳突毛。

苧麻族: 球隔麻属。

5. 矩圆形(图 2: 13。)具短的花柱, 柱头呈微扁的矩圆形, 花后常歪斜, 周围着生稍

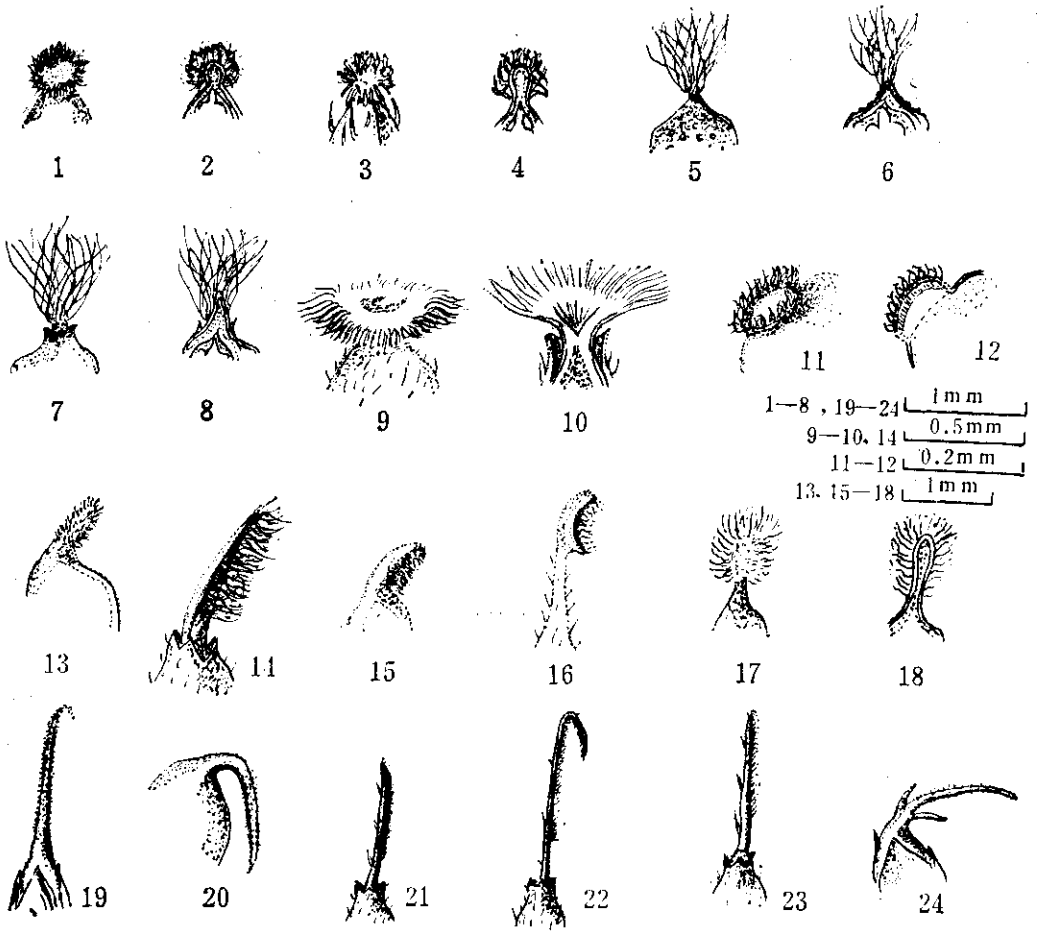


图 2 荨麻科柱头类型 1—4. 头状: 1—2. 齿叶荨麻(陈伟烈及陈家瑞 7579); 水丝麻(辛景三 908)。5—8. 画笔头状: 5—6. 假楼梯草(蔡希陶 59055); 7—8. 长叶水麻(汪发绩 23672)。9—10. 盾状: 紫麻(胡启明 2528)。11—12. 环状: 球隔麻(倪志诚 282)。13. 矩圆形: *Obetia ficifolia* Gaudich. (仿 Weddell<sup>[14]</sup>)。14—15. 舌状: 14. 舌柱麻(陈家瑞 205); 15. 福建红小麻(陈家瑞及李振宇 109)。16. 半月形: *Myriocarpa longipes* Liebm. (孙洪范 5757)。17—18. 匙形: *Touchardia latifolia* Gaudich. (仿 Weddell<sup>[14]</sup>)。19—20. 钻状: 海南火麻树(李朝贤 584)。21—24. 丝形: 21. 苧麻(刘林翰 15208); 22. 序叶苧麻(滇西北队 24465); 23. 红雾水葛(王启无 79364)。24. 三裂丝形: 红小麻(王启无 77747)。(除注明者外,其余均为作者绘)

Fig. 2 Types of stigmas of Urticaceae 1—4. Capititate stigma: 1—2. *Urtica lactevirens* Maxim. subsp. *dentata* (Hand.-Mazz. C. J. chen (W. L. Chen, C. J. Chen 7579); 3—4. *Maoutia puya* (Wall.) Wedd. (J. S. Xin 908). 5—8. Penicillate stigma: 5—6. *Lecanthus peduncularis* (Royle) Wedd. (H. T. Tsai 59055); 7—8. *Debregeasia longifolia* (Burm. f.) Wedd. (F. T. Wang 23672). 9—10. Peltate stigma: *Oreocnide frutescens* (Thunb.) Miq. (C. M. Hu 2528). 11—12. Circular stigma: *Sphaerotylos medogensis* C. J. Chen (Z. C. Li 282). 13. Oblong stigma: *Obetia ficifolia* Gaudich. (from Weddell<sup>[14]</sup>). 14—15. Lingulate stigma: 14. *Archiboehmeria atrata* (Gagnep.) C. J. Chen (C. J. Chen 205); 15. *Laportea fujianensis* C. J. Chen (C. J. Chen & Z. Y. Li 109). 16. Semilunar stigma: *Myriocarpa longipes* Liebm. (H. F. Sun 5757). 17—18. Spatulate stigma: *Touchardia latifolia* Gaudich. (from Weddell<sup>[14]</sup>). 19—20. Subulate stigma: *Dendrocnicide stimulanis* (L. f.) Chew (C. I. Lei 584). 21—23. Filiform stigma: 21. *Boehmeria nivea* (L.) Gaudich. (L. H. Liu 15208); 22. *B. clidemioides* Miq. var. *diffusa* (Wedd.) Hand.-Mazz. (N. W. Yunnan Exped. 24465); 23. *Fouzozlia sanguinea* (Bl.) Merr. (C. W. Wang 79364). 24. Trifid-filiform: *Laportea interrupta* (L.) Chew (C. W. Wang 77747). 2, 4, 6, 8, 10, 12 and 18. longitudinal sections of the stigmas. All based on the specimens conserved in PE. (Drawn by author, except those noted)

短的乳头状毛。

荨麻族: *Obetia* (部分)。

6. 舌状 (图 2: 14—15。) 常有花柱, 柱头呈舌形, 扁, 上狭下宽, 在一侧着生长的或短乳头状毛。

荨麻族: 艾麻属(部分)、火麻树属 (*Dendrocniide*)<sup>[8]</sup> (大部分)。

苧麻族: 舌柱麻属 (*Archiboehmeria*)<sup>[11]</sup>、锥头麻属(部分)。

7. 半新月形 (图 2: 16) 具长的花柱, 柱头呈半新月形, 内侧着生乳突状毛。

苧麻族: *Myriocarpa*。

8. 匙形 (图 2: 17—18。) 具短的花柱, 柱头上部较宽, 下部渐狭呈匙形, 长乳突状毛着生于柱头的一侧及边缘。

苧麻族: *Touchardia* (部分)。

9. 钻状 (图 2: 19—20。) 具花柱, 柱头线形, 基部较粗向上渐狭呈极细的尖端, 花后强烈下弯, 周围着生很细的乳头状突起。

荨麻族: 火树麻属(部分)、蝎子草属。

10. 丝形 (图 2: 21—23。) 具显著的花柱, 柱头短或长丝形, 常在一侧着生短的乳头状毛。

花后花柱无关节, 宿存:

荨麻族: 艾麻属 (包括 *Sceptrocniide* 和 *Fleurya*)<sup>[7]</sup> (部分)。

苧麻族: 苧麻属、隆冠麻属、*Neraudia* 和 *Phenax*。

墙草族: *Gesnouinia* 和 *Rousselia*。

单蕊族: *Australina*、*Forsskahlea* 和单蕊属。

花柱有关节, 花后脱落:

苧麻族: 雾水葛属、糯米团属、*Distemon*、落尾木属和 *Pseudopipturus*。

墙草族: 墙草属(部分)。

11. 三裂丝形 (图 2: 24。) 与上种不同的是柱头基部 3 裂, 中央裂最长, 侧生二裂较短, 周围着生细乳突。

荨麻族: 仅见于红小麻 (*Laportea interrupta* (L.) Chew) 和 *L. ovatifolia* (Schumach) Chew。

### (三) 荨麻科柱头某些性状的相关性

荨麻科是典型的风媒传粉植物, 乳突状的柱头毛起着接受花粉和使花粉萌发的重要作用。在进化过程中, 各类群通过自然选择使各类柱头都保持了柱头毛一定的总面积。从上节和图 2 中不难看出柱头毛长度和柱头长度以及柱头类型之间存在着一定的相关性: 丝形、钻状、多数舌状等长形柱头着生的柱头毛较短, 而画笔头状、盾状等短形柱头的柱头毛则明显变长; 在长形柱头中, 着生于柱头周围的柱头毛比仅在一侧的更短。

### (四) 关于柱头演化趋势问题

荨麻目植物的演化, 显然是以花器官简化和特化的方式进行的。即两性花 <sup>(减退)</sup> 单性花; 2 心皮 <sup>(减退)</sup> 单心皮; 花柱 2 <sup>(减退)</sup> 单一; 花粉大的 <sup>(缩小)</sup> 小的 (Erdtman,

1952);倒生胚珠——直生胚珠;雄蕊在芽时直立 (特化) 内折。这些性状演化趋势反映在荨麻目各类群的进化方向就是: 榆科——桑科——荨麻科。榆科和桑科的柱头常为丝形的,因此,荨麻目的柱头的演化推测是从长形的丝形柱头向着缩短的各类短形柱头发展的。然而,对于荨麻科各类群多式多样的柱头却很难看出一条明晰的演化路线来,这是因为: 1. 除藤麻族具单一的画笔头状柱头和单蕊族只具丝形柱头外,在多数族里包含有几乎同样的几种类型柱头。如画笔头状柱头除在进化很高的单蕊族不存在外在其余四个族中均有;而丝形柱头除藤麻族没有外在其余四个族中都能找到;甚至个别属也具有几种不同类型的柱头,如艾麻属具丝形、三裂丝形、舌状、卵状等柱头。以上事实不仅充分说明荨麻科的柱头比起荨麻目其它科的来可塑性最大,而且还说明某些类群的柱头显然是后来衍生的,这就增加了分析荨麻科柱头演化趋势的困难。2. 榆科与桑科的柱头虽多为丝形的,但现在却无充分理由证明荨麻科的柱头原始类型就是丝形的。按传统说法,虽然荨麻科可能起源于桑科,但与最近分出的锥头麻科具有更多的共同特征<sup>[6]</sup>,而后者则缺丝形柱头。即使如此,至今还没有人论述什么分类群是荨麻科较原始者。既然如此,就很难

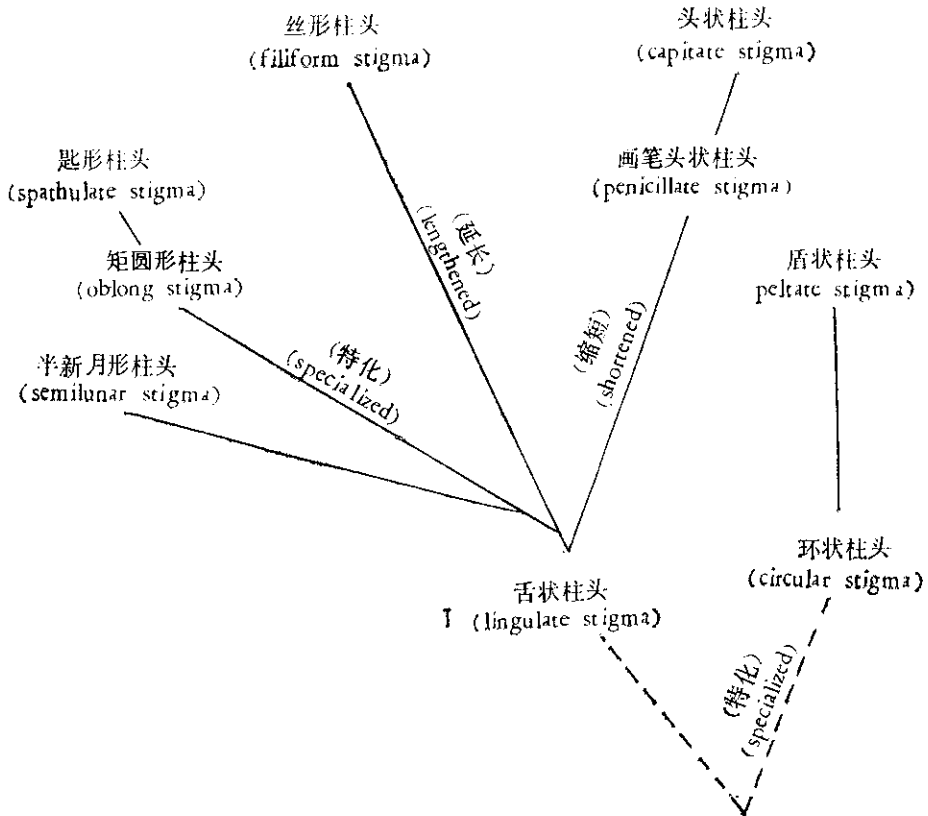


图 3 荨麻科柱头的演化趋势

Fig. 3 The evolutionary trend of the stigma in Urticaceae

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去阐明整个科的柱头的演化问题了。

尽管如此, 一些族内柱头演化趋势, 只要结合其它相关性状分析, 则较容易揭示出来。如在荨麻族中, 它的雌花被的演化很可能是向着合生、减退或特化方向发展<sup>[1]</sup>, 而它的柱头演化路线很可能如图 3 所示。

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## SPHAEROTYLOS C. J. CHEN——A REMARKABLE NEW GENUS OF URTICACEAE FROM CHINA, WITH NOTES ON STIGMAS OF THE FAMILY

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**Summary** A new subtribe of the family *Urticaceae*, *Sphaerotylineae* C. J. Chen, a new genus, *Sphaerotylos* C. J. Chen and its type species *S. medogensis* C. J. Chen from south-eastern Xizang (Tibet) in China are described and illustrated. The subtribe is regarded as a primitive group in the tribe *Boehmerieae*. The ring-shaped stigma and the ball-like connective are the first discovery in the family *Urticaceae*. The types of the stigma of the family, their taxonomic significance and their evolution are also discussed in the present paper.

**Key words** *Urticaceae*; Trib. *Boehmerieae*; Subtrib. *Sphaerotylineae*; Gen. *Sphaerotylos*; *S. medogensis*; circular stigma; ball-like connective; *Urticaceous stigma*

In winter of 1983, when the author identified plentiful collections of *Urticaceae* from the Mt. Namjagbarwa at the end of the Eastern Himalayas collected by the Mountaineering and Scientific Expedition of Academia Sinica to the Mt. Namjagbarwa,



I found a specimen (Z. C. Ni 282) which, although highly distinct, was totally unknown to me. The first discovery of this plant aroused my great excitement and was preliminarily considered to be a new genus but this collection consists of pistillate material only. Two further numbers respectively with staminate and pistillate flowers collected from the different populations but the same area were subsequently examined in this spring. This plant is at first sight similar to Trib. Procridae in flower, but in fact closer to Trib. Boehmerieae in flower and habit. However, there is no suitable position either in the present subtribes or the genera for this remarkable taxon to be put into, so these plants should be described as a new genus, *Sphaerotylos*, which belongs to the newly established subtribe, Sphaerotylinae, in the tribe Boehmerieae.

In view of the unique circular stigma of the new genus which has been first discovered in the family Urticaceae, the author considers it necessary to give special discussions on the stigma of the family later in this paper.

Subtrib. **Sphaerotylinae** C. J. Chen, subtrib. nov. (Trib. Boehmerieae)

Tepala floris feminei 5, tantum basi connata, ab ovario separata, sub fructu submembranacea haud succulenta; stigma annulare, margine breviter papillosum, persistens.

Typus subtribus: *Sphaerotylos* C. J. Chen

Only one genus, distribution being the same to the genus.

The author (1980) proposed that Trib. Boehmerieae might have taken the road of floral fusion, reduction and specialization<sup>[1]</sup>. The pistillate perianth of this tribe except the present new subtribe is gamophyllous, saccate, with 4—2 lobes or dents at the mouth. In Subtrib. Maoutinae the pistillate perianth is strongly or completely reduced, whereas that of the new subtribe is conspicuous, 5-parted, connate only at the base. The pistillate perianth of Subtrib. Boehmerinae is dry or membranous; that of Subtrib. Sarcoclamydiae<sup>[2]</sup> always becomes fleshy, and that of both the subtribes is free or slightly adherent to ovary; in Subtrib. Oreocnidinae<sup>[3]</sup> and Subtrib. Maoutinae<sup>[4]</sup> the perianth becomes fleshy and succulent, and closely adnate to the fruit. However, in the present subtribe the perianth is submembranous and still free from the ovary. Therefore, the perianth of the pistillate flower in the subtribe Sphaerotylorinae stays obviously still at the primitive stage although the stigma of this subtribe has specialized into a ring-shaped one. From this reason, the present subtribe Sphaerotylinae should be placed the first before all others in the tribe Boehmerieae. Thus, the order of the subtribes in the tribe might be as follows: Sphaerotylinae — Boehmerinae — Sarcoclamydiae — Oreocnidinae — Maoutinae.

**Sphaerotylos** C. J. Chen, gen. nov.

(Trib. Boehmerieae, Subtrib. Sphaerotylinae)

Frutex vel arbuscula inermis. Folia alterna, serrata, trinervia, cystolithis punctiformibus inspersa; stipulae scariosae, fulvae, interpetiolares, bifidae, deciduae. Inflorescentiae dioicae, in foliorum axillis geminae, cymoso-paniculatae; glomeruli in spicis densissime dispositi. Flores masculi: tepala 5, basi connata, in aestivatione quineuncialia; stamina 5, filamentis superne inflexis, connectivis globosis, crassis; pistillodium parvum, conoideum, apiculatum, basi lana alba densissime obtectum. Flores feminei: tepala 5, leviter inaequalia, submembranacea, virentia, ab ovario separata, basi connata, post anthesin aucta; staminodium nullum; ovarium erectum, apice obliquum; stigma sessile, annulare, margine breviter papillosum, persistens. Achenia late ovoidea vel obovo-

idea, obliqua et compressa. Semina conformia; albumen nullum: cotyledones subrotundatae.

Typus generis: *Sphaerotylos medogensis* C. J. Chen .

One species, known only from Medog, southeastern Xizang (Tibet), China.

In habit, inflorescence, quincuncial staminate perianth and pistillate perianth free from ovary the present genus is allied to *Sarcochlamys* Gaudich. <sup>(11,12,15)</sup> from Assam of India and Sumatra of Indonesia, but differs essentially from it by the ring-shaped stigma, the pistillate perianth 5-partite, submembranous in fruit and the ball-like connective. In *Sarcochlamys* the stigma penicillate, the pistillate perianth tubular, 4-dentate, soon succulent, and dilated at one side and thus jar-shaped in fruit, and the ordinary connective.

The evergreen woody group like *Sphaerotylos* is quite rare in Urticaceae. This genus is evidently a tropical element of the Indo-Malaysian flora. Some other tropical elements in Urticaceae, such as *Poikilospermum lanceolatum* (Trec.) Merr., *Dendrocnide sinuata* (Bl.) Chew also appear in the Medog region on the southern flank of the Mt. Namjagbarwa. The present primitive genus *Sphaerotylos* in Trib. Boehmerieae which has been discovered in this region, is doubtlessly of an importance for study of the geographical history and the flora of this region.

***Sphaerotylos medogensis*** C. J. Chen, sp. nov. Fig. 1

Frutex sempervirens et magnus vel arbuscula sempervirens, 2—6 m alta; cortex cinereo-brunneus, lenticellis ellipticis; ramuli brunnei, pube brevi adpressa vestiti. Folia tenuiter coriacea, lanceolata vel anguste lanceolata, 12—29 cm longa, 4.5—9 cm lata, apice acuminata vel anguste acuminata, basi late cuneata, interdum anguste cuneata, margine serrulata et leviter revoluta, supra atrovirentia, in sicco cinereo-denigrantia, subglabra, favosa, subtus cinereo-tomentosa ad nervos adpresse puberula, cystolithis minutis punctiformibus supra sparsis inconspicuisque, nervis basilaribus tribus, lateraliibus leviter arcuatis, usque ad apicem limbi excurrentibus, nervis secundariis a fere quarta parte superiore limbi utrinque 3—4, inconspicuis, exterioribus nullis vel in fere parte quinta inferiore nervorum lateraliuum utrinque 1, marginis c. medium attingentibus, nervis tertiis numerosis regularibus transversalibus, exterioribus prope marginem inter se anastomosantibus, nervis totis supra magis minusve impressis, subtus prominentibus; petioli 2—6 cm longi, adpresso-puberuli; stipulae triangulariovatae, c. 9 mm longae, ad tertiam partem bifidae, ad nervos puberulae. Inflorescentiae 7—9 cm longae, 3—5 cm latae; rhachides puberulae; glomeruli sessiles, subcapitati, 2—3 mm diam.; bractee scariosae, fulvae, c. 1 mm longae. Flores masculi sessiles vel brevi-pedicellares, sub fructu compresso-globosi, c. 0.7 mm diam.: tepala 5, leviter inaequalia, elliptica, concava, c. 0.5 mm longa, apice acutiuscula vel obtusa, extus et margine sparsim puberula: stamina 5, antheris oblongis c. 0.2 mm longis, connectivis c. 0.2 mm latis. Flores feminei subsessiles, minimi, c. 0.4 mm longi, tepalis saepe oblongo-obovatis, sub fructu auctis, usque ad 0.3—0.4 mm longis, apice obtusis, sparsim ciliatis, reticulatis. Achenia minuta, c. 0.5 mm longa, flavo-virentia, levia.

Xizang (Tibet): Xirang, on the road to Deyangla, Medog County, on the southern flank of the Eastern Himalayas, alt. 900 m, in the evergreen rainforest in valley, tree (♀) 5—6 m high May 30 1983, Z. C. Ni 282 (PE, holotype; XZ\*); Diadong to Xirang,

\* XZ—Herbarium, Xizang Plateau Institute of Biology, Lhasa, Xizang (Tibet).

the same county, alt. 850 m, at the edge of the forest and in the *Alnus* forests, shrub (♂) 2—3 m high, April 6 1983, P. S. Li and S. Z. Cheng 03920 (PE); Beibeng to Jiangxin, the same county, alt. 850 m, in rainforests by water margin, shrub (♀) 3 m high, June 3 1983, P. S. Li and S. Z. Cheng 04999 (PE).

This rare plant is found only from Medog region of the Great Bend Gorge along the Yarlung Zangbo River in south-eastern Xizang (approximately 29°13'—29°30'N, 94°40'—95°20'E). It often grows in open and damp secondary forests on flood lands from the altitude of 850—900 m, where belonging to the climatic zone of north tropical montane humid<sup>[4]</sup>. The companion trees are *Alnus nepalensis* D. Don, *Mallotus nepalensis* Muell-Arg., *Macaranga denticulata* (Bl.) Muell-Arg. etc.<sup>[5]</sup>.

The filaments in the taxon are shortened and the connectives are specialized by the elasticity of the filaments when the anthers open. It might be correlated with an adaptation to wind pollination.

The nervation of the some leaves of this species is also strange. A pair of thick veins arising from the lower part of the basilateral vein (see Fig. 1:2) has an appearance of secondary ones, but on the contrary, they might be originally basal veins, which have been fused with the basilateral ones because the two vascular bundles are observed below the fork, but only one either above the fork or in the lower part of the ordinary basilateral vein. Consequently, it is logical to assume that the pair of "secondary veins" might well be the remains of the external pair of the basal veins, and this taxon might have been derived from the race with a quinquenerved leaf.

## STIGMAS OF THE FAMILY URTICACEAE

**Characteristic Comparison of Stigmas of Urticaceae with Those of Other Urticales** In Ulmaceae and Moraceae (s.l.) (Engler 1889) except the new family, Cecropiaceae established by Berg (1978), the style is bifid and the stigma is usually filiform with stigmatose hairs on its inner face. In Cecropiaceae and Urticaceae the style is unbranched or absent, and the stigma of the former is lingulate, capitate-penicillate or peltate, whereas in Urticaceae the stigma is greatly diverse, being the most complicate in the order Urticales, and has an important significance in classification of genera.

### Types of Stigmas of Urticaceae (Fig. 2)

**1. Capitate** (Fig. 2: 1—4.) Style often absent; stigma suddenly thickened into a knob-like body on the top of ovary, with a large number of short papillose hairs radiant from the knob.

Trib. Urereae: *Nanocnide*, *Urtica* (partly), *Gyrotaenia*, *Urera* and *Obetia* (partly).

Trib. Procridae: *Sarcopilea*.

Trib. Boehmerieae: *Astrothalamus*, *Touchardia* (partly), *Chamabainia* (mostly), *Poikilospermum* (partly) and *Maoutia* (partly).

**2. Penicillate** (Fig. 2: 5—8.) Stigma similar to the capitate type, but different from it by the papillose hairs much longer and erect. It looks like a painting brush.

Trib. Urereae: *Parsana*, *Urtica* (partly) and *Hesperocnide*.

Trib. Procridae: All members of this tribe except *Sarcopilea*. *Pilea* (including *Achudemia*, *Smithiella*)<sup>[6]</sup>, *Pellionia*, *Elatostema*, *Procris*, *Petelotiella*, *Neopilea* and *Le-*

*canthus* (including *Meniscogyne*)<sup>(2)</sup>.

3. **Peltate** (Fig. 2: 9—10) Stigma discoid, fixed to a thick and short stalked style by the centre, with long ciliate-papillose hairs on the margin.

Trib. Boehmerieae: *Oreocnide*<sup>(2)</sup> and *Gibbsia*.

4. **Circular** (Fig. 2: 11—12.) Stigma ring-shaped, fixed on the top of ovary with short papillose hairs.

Trib. Boehmerieae: *Sphaerotylos*.

5. **Oblong** (Fig. 2: 13.) Stigma flattened-oblong on a short style, with papillose hairs on both sides.

Trib. Urereae: *Obetia* (partly).

Trib. Boehmerieae: *Touchardia* (partly).

6. **Lingulate** (Fig. 2: 14—15.) Stigma tongue-shaped, plano-convex, wider in the lower part, obtuse at apex, with short papillose hairs on one side, fixed on a style.

Trib. Urereae: *Laportea* (including *Fleurya*)<sup>(7)</sup> and *Dendrocnode* (mostly)<sup>(3)</sup>.

Trib. Boehmerieae: *Archiboehmeria*<sup>(1)</sup> and *Poikilospermum* (partly).

7. **Semilunar** (Fig. 2: 16.) Stigma crescent-shaped with short papillose hairs on the inner side, fixed on a conspicuous style. Trib. Boehmerieae: *Myriocarpa*.

8. **Spatulate** (Fig. 2: 17—18.) Stigma spatula-shaped, the broad upper part attenuate gradually downwards into a flattened stalk with long papillose hairs on one side and on the margin.

Trib. Boehmerieae: *Touchardia* (partly).

9. **Subulate** (Fig. 2: 19—20.) Stigma awl-shaped, tapering from broad base to a very fine point, with very minute papillae around it, often greatly reflexed in fruit, fixed on a style.

Trib. Urereae: *Dendrocnode* (partly) and *Girardinia*.

10. **Filiform** (Fig. 2: 21—23.) Stigma short or long, filiform, with often short papillose hairs on one side, on a conspicuous style.

Style not jointed, persistent:

Trib. Urereae: *Laportea* (including *Sceptrocnode* and *Fleurya*)<sup>(7)</sup> (partly).

Trib. Boehmerieae: *Boehmeria*, *Cypholophus*, *Neraudia* and *Phenax*.

Trib. Parietarieae: *Gesnouvina* and *Rousselia*.

Trib. Forsskahleeae: *Australina*, *Forsskahlea* and *Droguetia*.

Style jointed, soon deciduous:

Trib. Boehmerieae: *Pouzolzia*, *Gonostegia*, *Distemon*, *Pipturus* and *Pseudopipturus*.

Trib. Parietarieae: *Parietaria* (partly).

11. **Trifid-filiform** (Fig. 2: 24.) Stigma similar to the filiform one, but differing from it in being trifid from base, with the middle lobe being the longest one.

Trib. Urereae: only found in *Laportea interrupta* (L.) Chew and *L. ovatifolia* (Schumach.) Chew.

**Correlations of Some Stigmatic Characters of Urticaceae** Urticaceae is typically wind-pollinated plant. The stigmatic papillose hairs perform important functions in reception of pollen grains and their germination. Although the stigmatic hairs of the family vary in length and their arrangement, the total area of the stigmatic tissue appears to be roughly equal to each flower in the different taxa as a result of natural selection. The correlations of some stigmatic characters seem to be as follows: The length

of stigmatic hairs is inversely proportional to that of the stigma, viz. the narrow and long stigmas (e.g. filiform, subulate, most lingulate stigmas) possess relatively shorter stigmatic papillose hairs than the wider and shorter stigmas (e.g. capitate-penicillate, peltate stigmas) do; in the narrow and long stigmas the stigmatic papillose hairs all around the stigmatic body are obviously much shorter than those on one side (e.g. subulate stigma).

**Evolutionary Trend of Stigma of Urticaceae** It is difficult to solve this problem. The main reasons are the following two points: Firstly, what taxon is primitive in Urticaceae is still a question. Although Urticaceae, in traditional idea, may be derived from Moraceae, nobody has revealed what taxon of Moraceae is allied to Urticaceae. Secondly, most of tribes in Urticaceae have almost similar stigmas. This fact shows clearly that the stigma of Urticaceae has much greater differentiation than that of the other Urticales, and the stigmas in some taxa are obviously derived. Thus, this adds to the difficulties to analyse the evolutionary line of stigma of Urticaceae.

In spite of this, the evolutionary trend of stigma in some tribes seems to be easily realized if analysing the question in combination with the evolution of the other correlated characters. For example, in Trib. Boehmerieae the evolutionary line of their stigmas is shown in the figure 3.