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兰科火烧兰属分布于北美西部和喜马拉雅-中亚的一对替代种

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A pair of vicarious species of *Epipactis* (Orchidaceae) from western North America and Himalaya-central Asia

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Abstract A pair of vicarious species disjunctly distributed in western North America and Himalaya-central Asia, *Epipactis gigantea* Dougl. ex Hook. and *E. royleana* Lindl., are illustrated and discussed taxonomically and phytogeographically. A distribution map is provided and the morphological differences between them are tabled.

Key words *Epipactis gigantea*, *E. royleana*, vicarious species.

摘要 对间断地分布于北美西部和喜马拉雅-中亚的一对替代种——北美火烧兰 *Epipactis gigantea* 和卵叶火烧兰 *E. royleana* 进行了分类学与植物地理学方面的讨论。提供了一幅形态图、一份地理分布图以及它们之间形态区别的表。

关键词 北美火烧兰;卵叶火烧兰;替代种

火烧兰属 *Epipactis* Zinn.是兰科中少数几个喜湿的植物群之一,主要分布于北温带,约有20种。其中大多数种类分布于亚洲与欧洲,只有少数种类见于北非与北美。北美有两个种:*E. gigantea* Dougl. ex Hook. 与 *E. helleborine* (L.) Crantz。前者产于北美西部,后者系引入栽培尔后逸为野生的广布种。

1892年,Hemsley报告在中国四川发现北美植物 *E. gigantea* Dougl. ex Hook.,并指出属于北美与亚洲的间断分布,引起了广泛的关注。他同时还提到另外两种兰科植物在北美与亚洲的间断分布:*Cypripedium spectabile* Salisb.(= *Cyp. reginae* Walt.)与 *Cyp. arietinum* R. Br.。这些见解虽然得到 Franchet(1894)与 Rolfe(1903)等的认同,但经过后人的研究,已经证实后者是两对近缘替代种:北美的 *Cyp. reginae* Walt.与东亚的 *Cyp. flavum* Hunt & Summerh.,以及北美的 *Cyp. arietinum* R. Br.与东亚的 *Cyp. plectrochilum* Franch.(Chen, 1983a)。当然,这一变动并不影响它们在植物地理学上的意义。

然而,对于 *Epipactis gigantea* 是否也产于亚洲的看法就很不一致,至今仍存在着争论。*E. gigantea* 发表于1839年。在那以后仅一年北美又发现另一个新种 *E. armericana* Lindl.,但后来证实两者为同一种。有趣的是 Lindley 在1839年曾根据喜马拉雅地区的植物提出了一个裸名:*Epipactis royleana*,并在1840年予以正式发表。也就是说,他在1840年

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同时发表了北美洲的 *E. americana* (= *E. gigantea*)与喜马拉雅地区的 *E. royleana* 两个极其相近的种。但到了1857年,他在研究印度兰科植物的论文中才指出,*E. royleana* 十分接近于北美的 *E. americana* (= *E. gigantea*),区别点仅仅在于苞片较宽、短以及花较短。其后, Hooker (1890) 也持同样的观点,并认为两者可能属于同一种。在这以后,归并论逐渐为人们所接受,特别是 Hemsley (1892) 报道中国四川也有 *E. gigantea* 之后。Hooker (1899)、Rolfe (1903)、Duthie (1906)、Finet (1910)、Banerji 和 Pradhan (1984)、Deva 和 Naithani (1986)、Pangtey 等(1991)、Rose 等(1999)等学者都认为亚洲植物与北美洲植物并无区别,应归并入 *E. gigantea* 名下。只有较少的学者主张分开,亦即亚洲植物应当使用 *E. royleana* 之名,如 Schlechter (1919)、Nevski (1935)、Hara 等(1978)以及近期的 Robbins 和 Wood (1993)和 Cribb 等(1995)。

必须指出,Hemsley (1892)、Rolfe (1903)和 Finet (1910) 等人所谓的 *E. gigantea* 是指中国湖北、四川、云南一带的植物。他们所依据的保存于欧洲各大标本室的标本经笔者剖视研究,实际上均应为 *E. mairei* Schltr.。后者与 *E. gigantea* 以及 *E. royleana* 均有较明显的差别。这在笔者新近发表的文章中已予以澄清(陈心启,罗毅波,2002)。这里只着重讨论 *E. gigantea* 与 *E. royleana* 之间的异同以及是否应予归并的问题。

此两种植物在体态与花的外观上确实是十分相似的,在标本压干的情况下极难予以分辨。这也是长期存在争论的根本原因。但近来 Robbins 和 Wood (1993)与 Cribb 等(1995)的研究取得了一些进展。他们利用栽培的活植物进行比较,提出一些新区别点。笔者最近在欧洲各标本馆剖视了为数众多的标本,也有一些收获(图1)。兹将北美与喜马拉雅地区植物之间的区别点列于表1。

表1 北美火烧兰与卵叶火烧兰之间的区别
Table 1 The differences of *Epipactis gigantea* Dougl. ex Hook. and *E. royleana* Lindl.

	北美火烧兰 *Epipactis gigantea*	卵叶火烧兰 *Epipactis royleana*	文献 References
侧萼片 Lateral sepals	基部较窄,边缘稍内弯 the bases narrower and the margins slightly incurved	基部略宽,边缘不内弯 the bases broader and the margins not incurved	Robbins & Wood (1993)
花瓣 Petals	略狭,网脉较少 slightly narrower, less reticulate-veined	略宽,网脉较多 slightly broader, more reticulate-veined	Robbins & Wood (1993)
上唇 Epichile	稍长 slightly longer	稍短 slightly shorter	Robbins & Wood (1993)
下唇 Hypochile	中央有较多的胼胝状突起,突起通常近直立,其色泽不同于唇盘组织 with a lot of warty projections usually suberect and different in colour from the disc	中央不具或只有较少的突起,突起稍凸出,其色泽与唇盘组织相似 without or with some projections slightly convex and similar in colour to the disc	陈心启,罗毅波 (Chen & Luo) (2002)
花色 Floral colour	不具深的、似李的紫色 without a rich plum purple	有深的、似李的紫色 having a rich plum purple	Cribb et al. (1995)

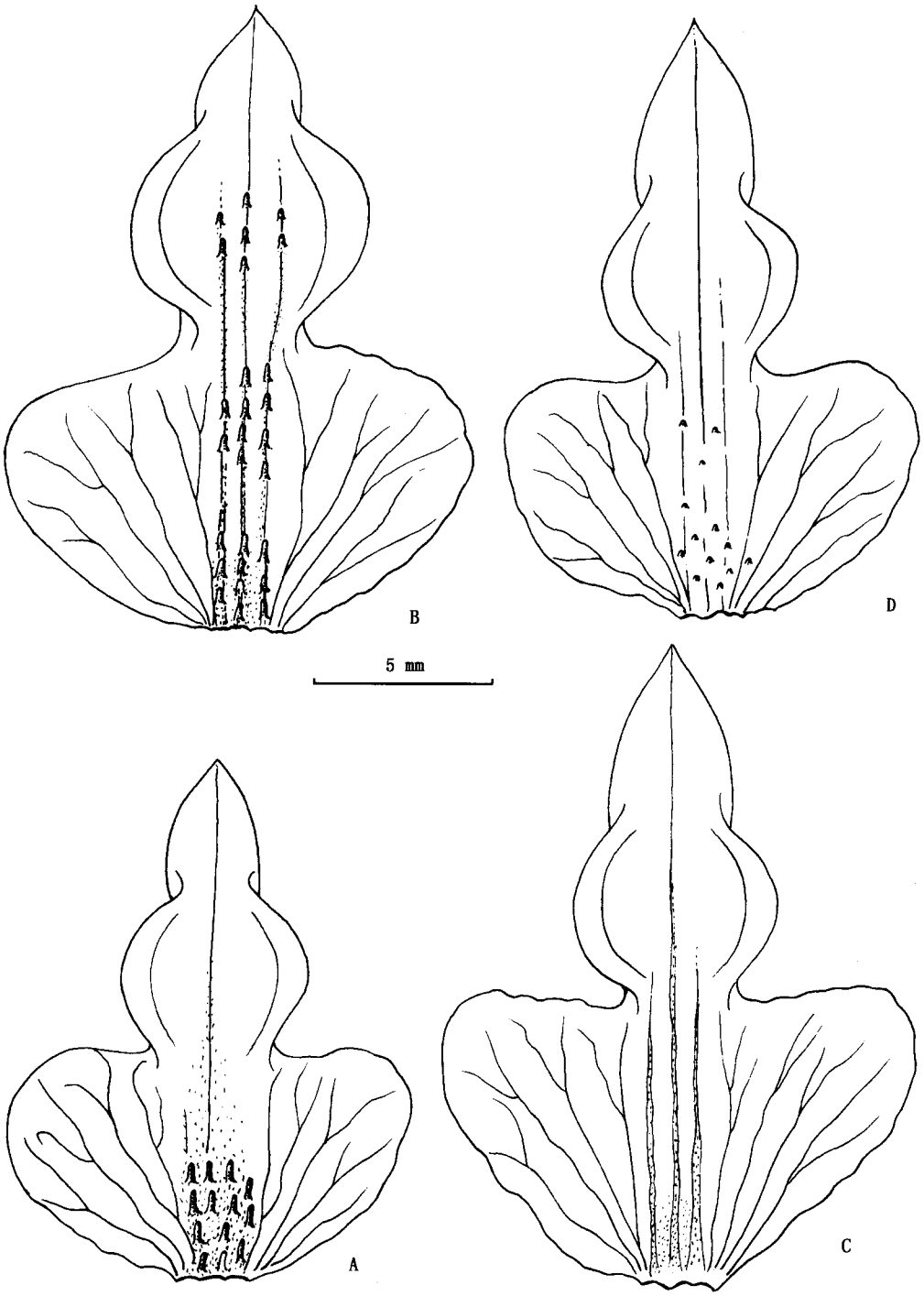

图 1　**A**, **B**, 北美火烧兰。A, 唇瓣,根据 L. A. McGill Lam 2340 (K), Arizona 标本; B, 唇瓣,根据 A. H. Wolley-Dod 349 (K), California 标本。**C**, **D**, 卵叶火烧兰。C, 唇瓣,根据 J. S. Gamble 343 (K), NW Himalaya 标本; D, 唇瓣,根据 G. Wilson & Phillips 372 (K), Nepal 标本。

Fig. 1.　**A**, **B**, *Epipactis gigantea* Dougl. ex Hook. A, lip, after L. A. McGill Lam 2340 (K), Arizona; B, lip, after A. H. Wolley-Dod 349 (K), California. **C**, **D**, *E. royleana* Lindl. C, lip, after J. S. Gamble 343 (K), NW Himalaya; D, lip, after G. Wilson & Phillips 372 (K), Nepal.

这些特征虽然有一定的变化和交叉,不易掌握,必须综合考虑,但作为分种依据却是充分的。何况 *E. gigantea* 与 *E. royleana* 之间较长期的、远距离的地理隔离也是一个重要因素。在兰科中,目前可以找到多对北美与亚洲的近缘种的间断分布(Chen,1983b),但只有一对属于北美西部与喜马拉雅 - 中亚的间断分布。这是令人感兴趣的。这两个种的特点是:体态与花的形态均十分相似,大多生于溪流旁湿润岩石边、水边湿地、沼泽边缘与草甸湿润处。花期也都在 5 - 8 月间,以 6 - 7 月为盛花期。它们无疑是一对亲缘关系极其密切的姐妹种。对其作进一步的历史植物地理学和生物学研究是很有价值的。这里仅对其间断分布作一简要介绍,以供将来深入研究。

地理分布 图 2

北美火烧兰 *Epipactis gigantea* Dougl. ex Hook.

加拿大 Canada: S. British Columbia; 美国 U. S. A: Washington, Oregan, W Montana, Idaho, Wyoming, SW South Dakota, Nevada, Utah, W Colorado, California, Arizona, New Mexico, SW Oklahoma, W Texas; 墨西哥 Mexico: N Baja California, Hidalgo. Alt. 550 - 2200 m.

卵叶火烧兰 *Epipactis royleana* Lindl.

乌兹别克斯坦 Uzbekistan: Samarhand; 阿富汗 Afghanistan: Nuristan, Kabul; 克什米尔 Kashmir: Gandabal, Gilgit, Sind Valley, Pir Panjal, Nail Gurez, Baltistan, Waziristan; 巴基斯坦 Pakistan: Chitral, Kangan Hazara, Phagal, Baghrot Valley, Chenab; 印度 India: Himachal, Tehri-Garhwal, Bashahr, Budhi, Ganga Valley, Kunawar, Chamba, Pithoragarh-Palang; 尼泊尔 Nepal; 锡金 Sikkim; 不丹 Bhutan; 中国 China: SE Xizang (位于林芝 Nyingchi 与墨脱 Mêdog 之间的雅鲁藏布江拐弯处). Alt. 1400 - 4000 m.

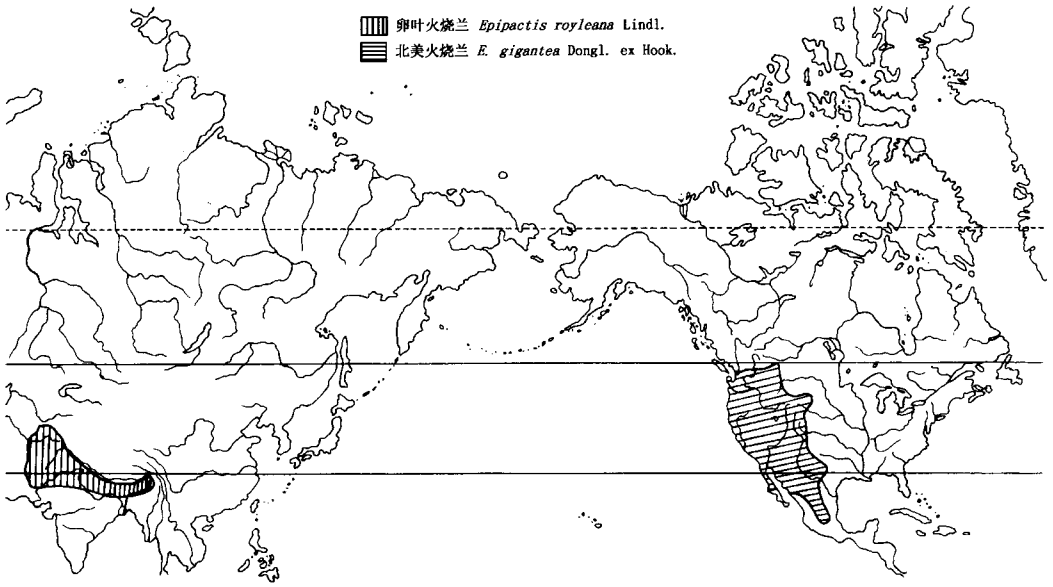

图 2 卵叶火烧兰(喜马拉雅 - 中亚)和北美火烧兰(北美洲西部)的分布图

Fig. 2. Distribution of the species-pair *Epipactis royleana* Lindl. (Himalaya - central Asia) and *E. gigantea* Dongl. ex Hook. (Western North America).

Epipactis gigantea Dougl. ex Hook. is an orchid species of wide distribution in western North America, and its Asian counterpart *E. royleana* Lindl. occurs in central Asia and Himalaya. They are very similar to each other both in habit and floral structure. Some botanists considered them conspecific, while others recognized them as two separate species. There are three orchid species, *Epipactis gigantea*, *Cypripedium spectabile* Salisb. (= *Cyp. reginae* Walt.) and *Cyp. arietinum* R. Br. which were reported to be disjunctly distributed in North America and China. The latter two, however, have proved to be two pairs of vicarious species: North American *Cyp. reginae* vs Asian *Cyp. flavum* Hunt & Summerh., and North American *Cyp. arietinum* vs Asian *Cyp. plectrochilum* Franch. (Chen, 1983a). But there has been an argument about *Epipactis gigantea* and *E. royleana* until recently. As a result of our recent examination and study (Chen & Luo, 2002), we agree with Robbins & Wood (1993) and Cribb et al. (1995) in treating them as two separate species. The differences between them are discussed, illustrated and tabled, and a distribution map is provided. This is the only example of disjunct distribution in western North America and Himalaya – central Asia in the Orchidaceae, and is of phytogeographic interest. Although there are some more pairs of orchid species disjunctly distributed in North America and Asia, they are all of eastern North American and eastern Asian distribution type.

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参 考 文 献

Banerji M L, Pradhan P. 1984. The Orchids of Nepal Himalaya. Vaduz: A. R. Cantner Verlag. 1 – 534.

Chen S-C. 1983a. Two pairs of vicarious species of *Cypripedium* (Orchidaceae) from eastern Asia and eastern North America. Brittonia 35: 159 – 163.

Chen S-C. 1983b. A comparison of orchid floras of temperate North America and eastern Asia. Annals of the Missouri Botanical Garden 70: 713 – 723.

Chen S-C (陈心启), Luo Y-B (罗毅波). 2002. Additional notes on some species of *Epipactis* (Orchidaceae). Acta Phytotaxonomica Sinica (植物分类学报) 40: 141 – 146.

Cribb P, Hall T, Prendergast G. 1995. The genus *Epipactis* in cultivation. Orchid Review 103 (1201): 9 – 13.

Deva S, Naithani H B. 1986. Orchid Flora of North West Himalaya. New Dehli: Media Associates. 1 – 459.

Duthie J F. 1906. The orchids of the north-western Himalaya. Annals of the Royal Botanic Gardens Calcutta 9 (2): 1 – 211.

Finet A. 1910. Orchidées du Su-tchuen. Notulae Systematicae Paris 1: 260 – 261.

Franchet A. 1894. Les *Cypripedium* de l'Asie centrale et de l'Asie orientale. Journal de Botanique (Morot) 8: 225 – 233, 249 – 256, 265 – 271.

Hara H, Steam W T, Williams L H J. 1978. An Enumeration of the Flowering Plants of Nepal. London: Trustees British Museum. 1: 1 – 154.

Hemsley W B. 1892. Observations on a botanical collection made by Mr. A. E. Pratt in western China, with descriptions of some Chinese plants from various collections. Botanical Journal of the Linnean Society 29: 298 – 321.

Hooker J D. 1890. Flora of British India. London: L. Reere & Co. 6: 1 – 792.

Hooker J D. 1899. *Epipactis gigantea*. Curtis's Botanical Magazine 125: t. 7690.

Lindley J. 1840. Genera and Species of Orchidaceous Plants. London: Ridgways. 461.

Lindley J. 1857. Contributions to the orchidology of India. Botanical Journal of the Linnean Society 1: 170 – 190.

Nevski S A. 1935. Orchidaceae. In: Komarov ed. Flora of the URSS. Leningrad: Academjiae Scientiarum URSS. 4: 589 – 754.

Pangtey Y P S, Samant S S, Rawat G S. 1991. Orchids of Kumaun Himalaya. Dehra Dun: Gajendra Singh Galhot at Shiva Offset Press. 1 – 193.

Robbins S, Wood J J. 1993. *Epipactis royleana*. Kew Magazine 10: 18 – 22.

Rolfe R A. 1903. Orchidaceae. In: Forbes F B, Hemsley W B eds. Enumeration of all the plants known from China proper, Formosa, Hainan, The Corea, The Luchu Archipelago and the Island of Hongkong. Botanical Journal of the Linnean Society 36: 1 – 67.

Rose T K, Bhattacharjee S K, Basak P D U C. 1999. Orchids of India. Calcutta: Naya Prokash. 1 – 487.

Schlechter R. 1919. Orchideologiae Sino-Japoniae prodromus. Repertorium specierum novarum regni vegetabilis, Beihefte 4: 1 – 319.