

## 紫荆属种子表皮纹饰的扫描电镜观察

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**摘要** 报道了七种紫荆属植物的种子表皮的扫描电镜观察结果。根据种皮性状可将紫荆属植物分为两群: 第一群仅包含黄山紫荆一种; 第二群包含其余的全部种类。

**关键词** 紫荆属; 种子表皮纹饰; 扫描电镜观察

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## SCANNING ELECTRON MICROSCOPIC STUDY OF SEED COAT PATTERNS IN *CERCIS* L. (LEGUMINOSAE)

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**Abstract** Seed coat patterns of seven species of *Cercis* were studied by using scanning electron microscope. Two groups of species were recognized by spermodermic characters. The first group includes a single species, *C. chingii*. The second group includes all other species studied.

**Key words** *Cercis*; Seed coat pattern; SEM

### 1 Introduction

Wunderlin et al<sup>[1]</sup> in a reorganization of the tribe Cercideae recognized 5 genera, viz., *Adenolobus* (Harvey) Torr. & Hillc., *Cercis* L., *Griffonea* Baillon, *Brenierea* Humbert, and *Bauhinia* L. Subtribe Cercidinae consists of *Cercis* L. and an African genus of two species, *Adenolobus*.

*Cercis* L., is a genus of 8 species disjunctly distributed in the temperate part of China, North America and the Mediterranean Area, while all other genera have tropical distribution. The genus is easily distinguishable by its pseudo-papilionoid flowers in the subfamily Caesalpinioideae.

Of the 8 recognized species, 5 species are to be found in China, which include the widely cultivated garden plant *C. chinensis* Bunge, and 4 lesser known species, *C. glabra* Pamp., *C. racemosa* Oliv., *C. chuniana* Metc. and *C. chingii* Chun. Two species, viz., *C.*

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*canadensis* L. and *C. occidentalis* L. are distributed in North America. In the Mediterranean from Pakistan, Afghanistan in the east to France, Greece and Turkey in the west, only one species, *C. siliquastrum* L., is recognized.

In *Cercis*, *C. chuniana* and *C. chingii* are readily distinguishable from all other species in the genus respectively by having asymmetrical rhomboid-ovoid leaves and branched racemose inflorescence, or by having unwinged, more or less woody pods. All other species are distinguished only by quantitative characters.

The significance of seed coat characters from an evolutionary perspective has long been acknowledged<sup>[2,3]</sup>. Seed micromorphological characters have been used successfully to solve taxonomic problems in diverse groups of angiosperms<sup>[4,5]</sup>.

Although there are usually only 8 species recognized in the whole genus, *Cercis* species are notorious for being difficult to be delimited. Seed coat patterns are studied in 7 species of the genus in an attempt to find useful characters in diagnosing species on the one hand, and in elucidating phylogenetic relationships among the species on the other.

## 2 Material and methods

Seeds of *Cercis* were collected either from cultivated plants or in their natural habitat. Only *C. siliquastrum* seeds were taken from herbarium specimen. Whole mature seeds were glued and mounted on stubs, then coated with a thin layer of gold.

Observations were made under a Joel Scanning Electron Microscope.

Terminology followed that of Harris & Harris<sup>[6]</sup>.

## 3 Results and discussion

Mature seeds of *Cercis* are ovate and compressed, and 6–8×4–6×2–3 mm in size (Table 1).

Two groups of species can be distinguished by seed morphology. Seed of *C. chingii* is different from all other species in the genus by having perforate spermoderm pattern.

Cancellate spermoderm patterns are found in all other species. Species in the genus except *C. chingii* can be further distinguished by the difference in detailed seed coat patterns. *C. chinensis*

Table 1 Seed characters of *Cercis* species

Species	Origin or voucher	Seed size (mm)	Seed coat pattern
<i>Cercis chingii</i>	Nanjing Bot. Garden	7–8×3.5–4×1.9–2.1	Perforation
<i>C. chinensis</i>	Changsha, Hunan	4.5–5×3.5–3.7×2.8–3.1	Cancellation, elongated
<i>C. glabra</i>	D. X. Zhang 329	4.7–5.6×3.8–6.4×1.8–2.1	Cancellation, elongated
<i>C. chuniana</i>	Lianxian, Guangdong	5–6×3.8–4.2×2.5–3	Cancellation
<i>C. occidentalis</i>	J. P. Tracy 9176 & Bartholomew et Anderson 4228	6–7×3.5–5.1×1.6–2.1	Cancellation
<i>C. canadensis</i>	Hudson Seedsman; Iowa Univ.	4.8–6×3.5–5×1.5–2.2	Cancellation
<i>C. siliquastrum</i>	Larsen 36145	no data	Cancellation

and *C. glabra* are very similar and distinguishable from other species in having more or less elongated cancellate pattern, while *C. chuniana*, *C. siliquastrum*, *C. canadensis* and *C. occidentalis* have more regular cancellate seed coat pattern.

As the distinctness of pod morphology, the distinctness of seed morphology including seed coat pattern of *C. chingii* is very impressive. But whether this distinctness warrants a formal taxonomic recognition deserves further study.

On the other hand, the similarity between *C. chinensis* and *C. glabra* in seed morphology can also be easily explained, as these two species are very similar morphologically.

As most vegetative and reproductive characters are only quantitatively different in different species, so are most seed coat characters in the genus *Cercis*.

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#### Explanation of plate

1. *Cercis chingii*; 2. *C. chinensis*; 3. *C. chuniana*; 4. *C. siliquastrum*; 5. *C. canadensis*; 6. *C. occidentalis*.

Scale bar=10  $\mu\text{m}$  for all figures.