

# A Pharmacognostical Study on the Chinese Herbal Drug “Badushan”( *Sida szechuensis* )

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**Abstract** The morphological and histological features for the identification of the Chinese herbal drug “Badushan”( *Sida szechuensis* Matsuda) is illustrated in this paper.

**Key words** “Badushan”( *Sida szechuensis* ) Pharmacognostical identification

“Badushan” is a medicinal plant growing in the highland of southwestern China at altitudes between 1 000 to 2 000 m above sea level where it forms sparse patches in well-exposed slopes. It was botanically identified as *Sida szechuensis* Matsuda ( *Malvaceae* ) and has been claimed to be useful for ulcers, furuncle, dysentery and blood stasis through ethnopharmacological exploration. Our recent experiment showed that it contains polypodine A and polypodine B, and can inhibit platelet aggregation<sup>[1,2]</sup>. A perusal of the literatures revealed that no information was available concerning the pharmacognostical characters of the plant. This promoted us to carry out a detailed histological study of its vegetative organs, the results of which are reported in this paper.

## 1 MATERIALS AND METHODS

Fresh whole plants were uprooted from fields near the outskirts of Xichang city, Sichuan Province, during the month of August, 1990 when they were in full bloom.

The taxonomic authenticity of the plant was established by comparison with available literatures<sup>[3]</sup> and with an authentic herbarium specimens of Sichuan Institute of Chinese Materia Medica, Chongqing, China. Routine methods were employed for the anatomical studies on the stem, root and leaf of “Badushan”.

## 2 RESULTS AND DISCUSSIONS

### 2.1 Morphology

The plant, perennial, half-shrubby; root long stout, more or less curved; stem erect, branched or rarely simple, up to 1 m tall, sparsely covered with hair. Leaves simple and alternate 2~5 cm long and 0.5~2.5 cm broad, elliptic lanceolate to ovate oblong; margins crenulate, apex mucronate or obtuse, base cuneiform; stipules drill-shaped, shorter than petioles. Flowers single or clustered in terminal shoots or axils of leaves; pedicels 1 cm long; calyx campanulate, 1~3 mm long; corolla yellow, obovate, 4~6 mm long; corolla tubes more or less equal to the lobes; stamen column covered

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with long hard hair. Capsule nearly globose, 6 mm in diameter with terminal awn;carpel

8~9, covered with stellate hair. Flowering: July~Sept. Fruit: Sept~Nov (Fig. 1, A).

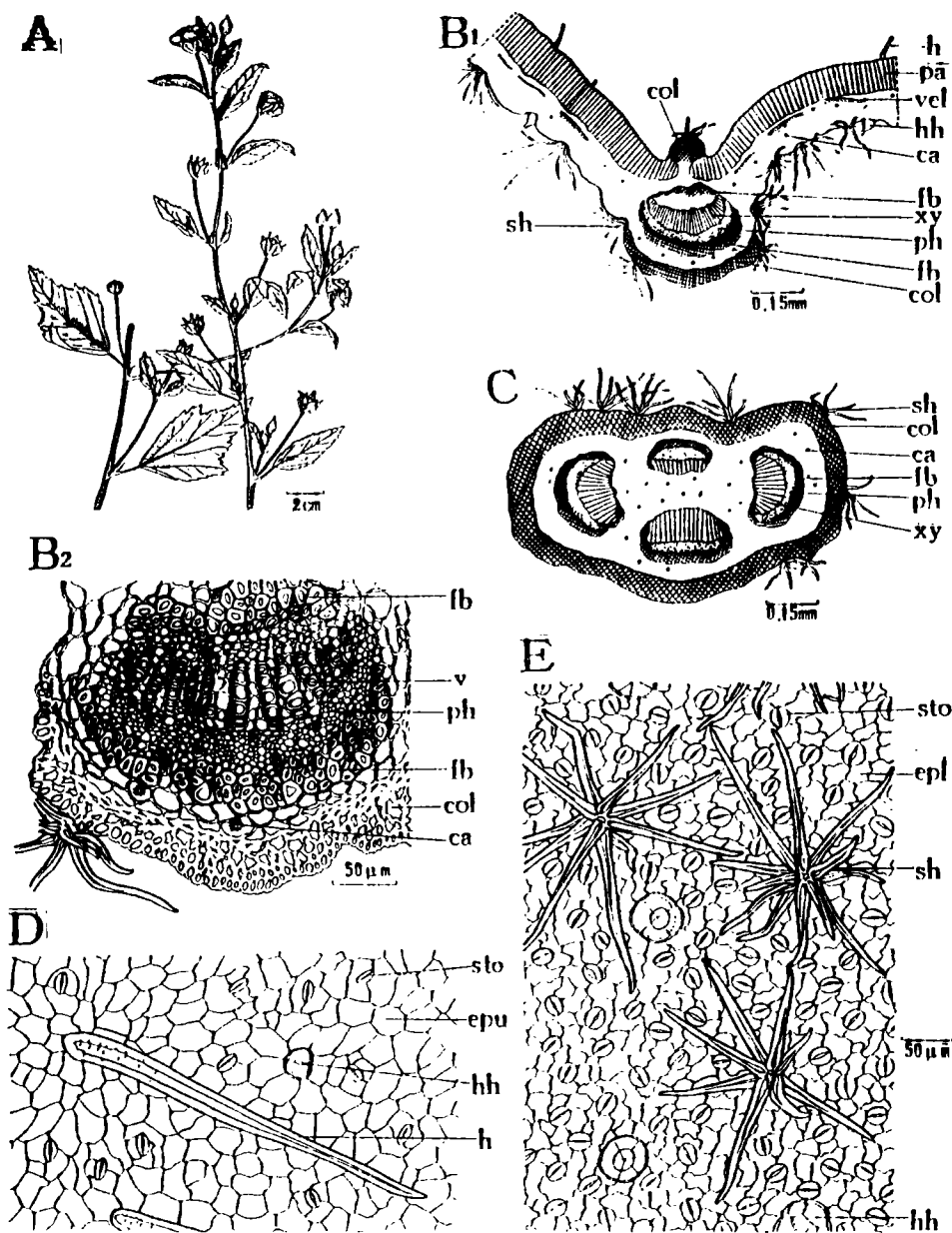


Fig. 1 Whole Plant and Leaf of *Sida szechuensis*

A: The whole plant above ground level

B<sub>1</sub>: Diagram of the transection of leaf through midrib

B<sub>2</sub>: Detailed drawing of the transection in midrib

C: Diagram of the transection of petiole

D, E: Lower and upper epidermis showing stomata and trichomes

h-hair col-collenchyma pa-palisade sh-stellate hair vel-veinlet sto-stomata hh-head hair epl-lower

epidermis ca-clusterd crystal epu-upper epidermis fb-fiber bundle v-vessel xy-xylem ph-phloem

## 2.2 Histology

### 2.2.1 Surface of Leaf

Upper epidermal cells are polygonal to subangular, slightly curve-walled from anticlinal view; stomatas are round to oblong and measure  $10\sim 13\text{ }\mu\text{m}$  in diameter. On the surface exhibits a lot of unicellular non-glandular hair which are straight or subtly sinuous and measure  $55\sim 430\text{ }\mu\text{m}$  long and  $20\sim 26\text{ }\mu\text{m}$  in diameter; also the glandular hair with  $1\sim 3$  celled head is observed and measures  $20\sim 25\text{ }\mu\text{m}$  in diameter. The upper epidermis of vein is mainly covered with stellate hair.

Lower epidermal cells are irregular sinuous-walled,  $7\sim 23\text{ }\mu\text{m}$  in diameter. Stomatas are obovate to oblong,  $15\sim 20\text{ }\mu\text{m}$  in diameter. Covering the lower epidermis are two kinds of hairs; the stellate hair is more abundant, comprising  $8\sim 20$  cells, up to  $225\text{ }\mu\text{m}$  in length and  $8\sim 14\text{ }\mu\text{m}$  in diameter; the glandular hair is spiral,  $35\sim 40\text{ }\mu\text{m}$  in diameter and with  $6\sim 8$ -celled base and one-celled apex (Fig. 1, B<sub>1</sub>, B<sub>2</sub>, C, D, E).

### 2.2.2 Leaf

Transverse section of leaf through midrib shows dorsiventral structure. Upper epidermis is a layer of more or less rectangular cells and covered with stellate nonglandular hair and spiral glandular hair in large quantities. Stomatas are ranunculaceous on both epidermises. Above the lower epidermis lie several layers of collenchymatous cells.

There are 4 vascular bundles of midrib which forms a fan-shaped structure, surrounded by a parenchymatous sheathing. Phloem is narrow and arched with fiber-bundled caps on its outsides; xylem vessels are nearly round,  $8\sim 18\text{ }\mu\text{m}$  in diameter and arranged radially,  $2\sim 5$  of which form a

row.

Some ray cells and the parenchymatous sheathing around the vascular bundles enclose clusters of calcium oxalate cystalls measuring  $5\sim 16\text{ }\mu\text{m}$  in diameter.

### 2.2.3 Stem

Transverse section of stem ( $3.5\text{ mm}$  in diam.) is almost circular and exhibits cork, cortex, phloem, xylem and pith.

Cork is made up of  $3\sim 5$  layers of compact subrectangular cells, residual epidermis is found occasionally. Cortex consists of  $5\sim 6$  layers of periclinally elongated parenchymatous cells; inner cortex has a hardly broken ring of tangentially elongated cells. Phloem is present in distinct ring and comprises  $4\sim 5$  layers of fibrous bundles which contain  $6\sim 30$  fibers measuring  $3\sim 16\text{ }\mu\text{m}$  in diameter; cambium is clearly seen. Xylem vessels are sparse,  $10\sim 15\text{ }\mu\text{m}$  in diameter, single or  $2\sim 4$  radially arranged and with bordered or simple pits. Rays are noteworthy; xylem and phloem are traversed by uniseriate or bifarious medullary rays, the cells of which are radially elongated and sparsely pitted in xylem region while tangentially elongated in phloem region where clusters of crystalline calcium oxalate are found.

### 2.2.4 Root

The anatomical characters of the root is similar to that of the stem. The outer part of the root is composed of  $5\sim 8$  layers of flate cells containing calcium oxalate cystalls. Phloem fiber bundles are abundant and arranged outwards in  $5\sim 7$  layers; each bundle consists of  $5\sim 50$  fibers measuring  $5\sim 18\text{ }\mu\text{m}$  in diameter. Xylem is well-developed and occupies  $4/5$  of the area of transverse section (Fig. 2).

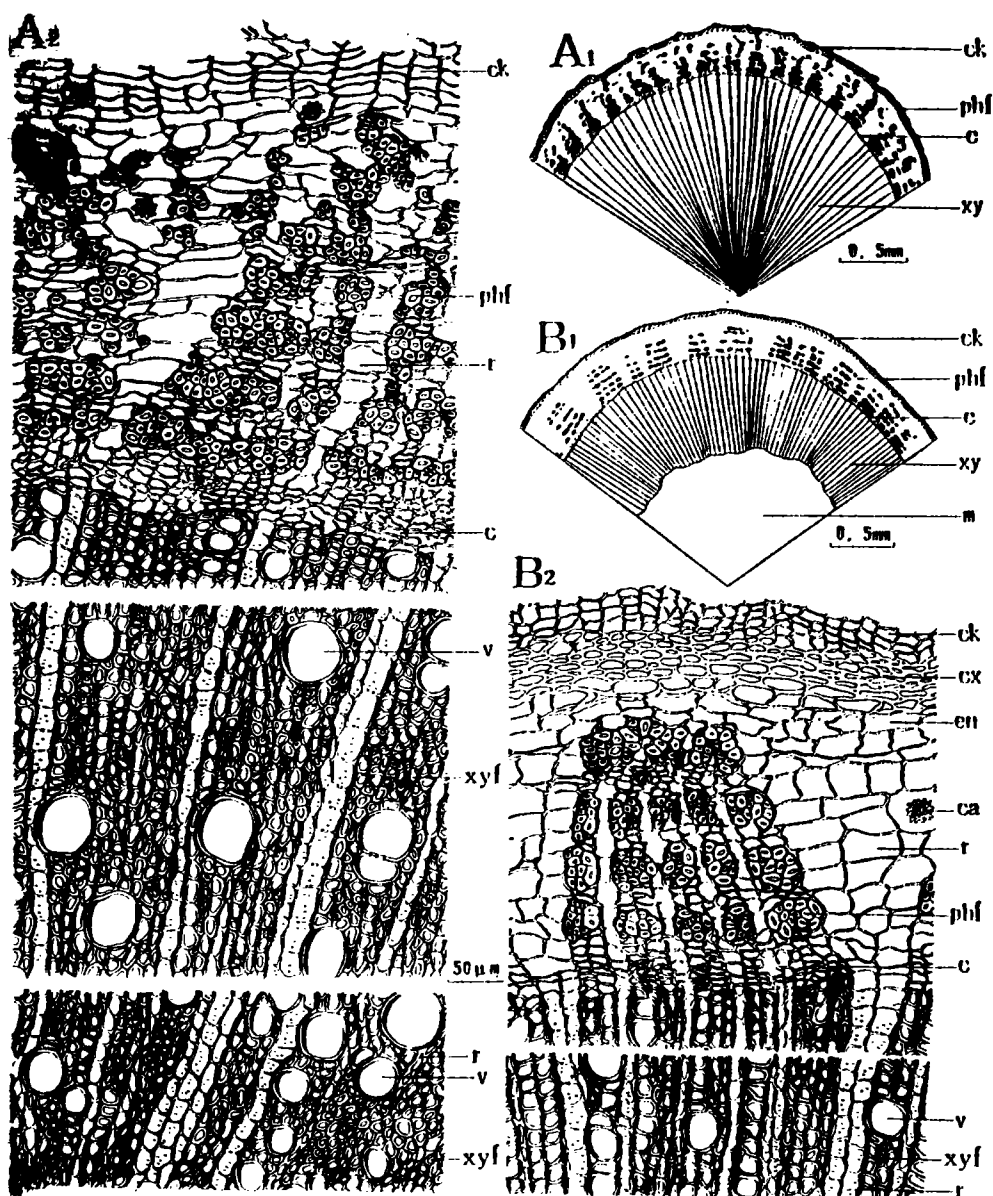


Fig. 2 Transections of Stem and Root of *Sida szechuensis*

A<sub>1</sub>, A<sub>2</sub>: Diagram and detailed drawing of the transection of root

B<sub>1</sub>, B<sub>2</sub>: Diagram and detailed drawing of the transection of stem

ca-clustered crystal v-vessel xy-xylem c-cambium r-ray phf-phloem fiber cx-cortex xyf-xylem fiber

ck-cork en-endodermis m-medulla

## 2.2.5 Petiole

Transverse section of petiole shows more or less rectangular in structure. Epidermis is a layer of round to rectangular cells and covered with stellate hair as well as cuticle. Under the epidermis is 3~5 layers of collenchyma. Vascular cylinder forms

4 symmetrically arranged bundles exterior to each is a cap-shaped tissue consisting of tens of fibers. Most of the parenchymatous cells are packed with cluster of crystalline calcium oxalate.

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**摘要** 拔毒散为彝族草药,来源于锦葵科植物拔毒散 *Sida szechuensis* Matsuda,具有清热解毒、去腐生肌等功能。研究表明,拔毒散含有促蛻皮甾酮 A 和 B(polypodine A and B)等成分,能有效抑制血小板聚集。该文报道了拔毒散的形态性状及组织特征,为其鉴定和利用提供了参考依据。

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## 葛根的紫外光谱法鉴定

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**摘要** 通过对我国产 9 种葛根的紫外光谱法进行鉴定,总结出不同品种间区别。

**关键词** 葛根 紫外光谱 检索表

葛根为常用中药,始载于《神农本草经》。我国药典规定入药的有野葛和粉葛 2 种,具解肌退热、生津、透疹、升阳止泻等功效<sup>[1]</sup>。但葛根的种类较多,我国葛属植物约有 9 种 2 变种<sup>[2]</sup>,各种葛所含成分存在差异,需要提供较好的鉴别方法,现将采集到的 9 种葛采用紫外光谱法进行鉴别研究,结果重现性良好。

### 1 材料及来源

样品来源见表 1。

### 2 仪器及参数

仪器:日本岛津 UV-265FW 分光光度计。

参数:原阶紫外光谱,波长范围 400~200 nm,狭缝:2 nm,扫描速度:快速,量程范围:0~4 ABS,波长标尺放大:20 nm/cm。

一阶导数紫外光谱:波长范围 400~200 nm,狭缝:2 nm,Δλ 2 nm,扫描速度:快速,量程范围:±1.5ABS,波长标尺放大:20 nm/cm。

表 1 9 种葛的来源

药材	学名	产地	采收期
野葛	<i>Pueraria lobata</i>	安徽金寨	1994-08
野葛	<i>P. lobata</i>	贵州岑巩	1994-10
野葛	<i>P. lobata</i>	天津蓟县	1994-10
野葛	<i>P. lobata</i>	辽宁旅顺	1994-09
野葛	<i>P. lobata</i>	陕西西安	1994-10
野葛	<i>P. lobata</i>	江西南昌	1994-08
野葛	<i>P. lobata</i>	山东泰安	1994-10
野葛	<i>P. lobata</i>	河北井陉	1994-10
野葛	<i>P. lobata</i>	浙江临安	1995-05
野葛	<i>P. lobata</i>	四川峨嵋	1994-11
密花葛	<i>P. alopecuroides</i>	云南景洪	1995-03
粉葛	<i>P. thomsonii</i>	云南大理	1994-11
粉葛	<i>P. thomsonii</i>	云南丽江	1994-11
粉葛	<i>P. thomsonii</i>	云南景洪	1995-03
食用葛	<i>P. edulis</i>	云南巍山	1994-11
食用葛	<i>P. edulis</i>	云南丽江	1994-11
三裂叶葛	<i>P. phaseoloides</i>	广东广州	1995-11
越南葛	<i>P. montana</i>	广东博罗	1995-11
峨嵋葛	<i>P. omeiensis</i>	四川峨嵋	1994-11
苦葛	<i>P. peduncularis</i>	云南巍山	1994-11
苦葛	<i>P. peduncularis</i>	四川峨嵋	1994-10
黄毛葛	<i>P. calycina</i>	云南永胜	1994-11

### 3 方法与结果

方法:称取葛根干燥粉末(60 目)0.5 g,

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曾 明 男,本科毕业于江西中医学院药学系中药专业,毕业后任教于解放军福州医学高等专科学校,讲师。硕士毕业于第二军医大学药学院,现正攻读药学博士学位,研究方向为中药质量评价和活性成分研究。在核心期刊上发表第一作者学术论文十余篇,参编著作一部。

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