



第十六卷

# 四川植物志

四川出版集团  
四川人民出版社

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《四川植物志》编辑委员会

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四川民族出版社

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# 《四川植物志》编辑委员会

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# 前 言

四川省位于青藏高原东缘长江上游地区和我国的西南内陆腹地,介于北纬 $26^{\circ}03' - 34^{\circ}19'$ 和东经 $97^{\circ}21' - 108^{\circ}31'$ 之间,幅员面积48.5万平方公里。辽阔的地域、复杂多样的地貌类型、明显的气候分异孕育了丰富的植物多样性,主要表现为植物种类繁多,区系成分复杂,植物演化途径多样。全省地形大致可分为盆地和高原两大部分。东部为著名的四川盆地,这里河网纵横,丘陵起伏,在海拔200—700米之间,为四川主要农业区。盆地周围群山环绕,北部有秦岭、大巴山为屏障,减弱了北来寒流的侵袭;太平洋、印度洋暖流沿长江和横断山脉水系进入盆地,形成盆地温暖湿润的环境。盆地东部地层,由于自第三纪以来,未经剧烈变动,因而保存了世界上其它地区早已绝种的一些古老植物和一些单种属或少种属古老、孤立的类型。四川西部为高原和高山峡谷地形,这里海拔3500米以上,峡谷纵列,雪山重叠,最高的贡嘎山,主峰海拔高达7500多米;海拔4000—5000米以上的高峰也较多。在这一地区有南北纵行的横断山系,这是我省地理特色之一;这一山系给植物区系的组成带来深刻影响,也是四川的主要林区之一。高原西北部有大面积沼泽、草地分布,为青藏高原的重要组成部分,是四川的主要牧区。四川复杂的地理条件和生态环境,孕育了繁多的植物类型,是我国植物资源最丰富的地区之一,约有高等植物一万余种,仅次于云南,居全国第二位,许多类群资源蕴藏量极为丰富,特别是川产珍稀植物为世界瞩目。但由于种种原因,对四川植物种类、分类缺乏系统整理,资源家底不清,远远不能满足对植物资源的保护和利用的需要。因此,编写《四川植物志》实显重要。

四川省特殊的地理位置和多样的地貌及气候为植物的生长提供了有利的条件。丰富的植物种类,是四川省的宝贵财富,清理好四川省丰富的植物种类,是对全国物种多样性的一个贡献,将为研究植物的系统演化、植物区系、植被、生态系统等提供科学依据。在经济建设和环境保护中,《四川植物志》是基础的科学资料。编写《四川植物志》的目的就是通过对四川省植物资源进行科学而系统的清理,使其能为四川省的经济建设和科学发展提供不可缺少的基础资料。《四川植物志》作为科学资料,具有十分重要的和不可替代的科学价值。生物多样性的的重要性已为世界所重视,而要认识和研究生物多样性,必须首先知道物种多样性,《四川植物志》的编写,就是对四川省物种多样性的研究和记载,其科学意义是不言而喻的。《四川植物志》对开展利用植物资源具有极其重要的科学指导作用,在社会主义经济体制下,地处中国内陆的四川省,必须充分发挥自然资源优势,特别要重

视植物资源丰富的优势,以加速本省经济的发展。四川植物种类多,类型齐全,还保存了一些被称为“活化石”的类群,如芒苞草(*Acanthochlamys bracteata*)、水杉(*Metasequoia glyptostroboides*)、银杉(*Cathaya argyrophylla*)等都是世界著名的珍贵植物。被子植物的起源与植物地理学上的一些重大理论问题的解决,都可能有赖于四川及邻近地区的研究。研究四川植物在理论上具有独特的意义。

《四川植物志》包括苔藓植物、蕨类植物、裸子植物和被子植物。苔藓植物以布罗氏(V. F. Brotherus, 1924—1925)的系统为基础,参考近年国内外有关系统编排;蕨类植物基本采用秦仁昌(1978)的系统;裸子植物采用郑万钧(1961)的系统;被子植物采用恩格勒(Engler)植物科志第Ⅱ版(1964)的分类系统,分科编号,但各科不一定按顺序出版。《四川植物志》对所记载科、属、种的形态特征、地理分布、生态环境、科学意义和用途等均作了系统而详细的描述。为了方便读者使用本书识别植物,书中列出了分属和分种检索表,所记载的植物,每卷约有百分之六十的种类附有图版。《四川植物志》是按《四川植物志》编写规格进行编写,在编写过程中,全面检索国内外文献,反映最新研究成果,图文并茂,产地到市县,并且记载了生境和海拔等资料数据,便于读者实地考察;对重要的经济种类列出了具体用途,有利于开发利用。书中使用了国内通用的中名,同时尽量列出地方土名,有助于澄清长期存在的名称混乱。书中按照《国际植物命名法规》的要求对类群进行了分类学处理,使其成果能够进行国际交流。

《四川植物志》为传世专著,为确保编写质量,在研究方法上,特别注意文献的考证、标本鉴定和种群的划分等问题。《四川植物志》自1981年出版以来,历时20余年,在国内外均有较好的影响和评价,但任务还很艰巨,尚需省内外植物学科技工作者共同努力,始能完成《四川植物志》这一巨著。重庆市于1997年设立直辖市,原四川省政区发生较大变化,重庆市及所辖市、区、县已不属四川省。但为了保持《四川植物志》项目的连续性、统一性和完整性,《四川植物志》仍按原四川省所辖政区范围编写(介于北纬 $26^{\circ}01' - 34^{\circ}21'$ 和东经 $97^{\circ}26' - 110^{\circ}12'$ 之间)。《四川植物志》在编写过程中承有关院校、科研单位的专家、科技工作者给予指导、帮助,对此表示十分感谢。由于水平有限,本志不免有缺点、错误,希读者批评指正。

《四川植物志》编辑委员会

2005年4月

## PREFACE

Sichuan Province (26°03'—34°19' N and 97°21'—108°31') in Southwestern China locates in Eastern Tibet Plateau and the upper reaches of Yangtze River, and covers an area of more than 485,000 square kilometers. The far-flung terrain, complex and diverse landforms, clear climatic differentiation gestate endue the region with abundant plant diversity, showing the characteristics of various plant species, miscellaneous flora, and diverse evolvments. The whole landform in Sichuan can be divided into two sections, i. e., basin and tableland. The former locates in the eastern Sichuan, and the latter distributes around the Basin. Sichuan Basin characterized by reticular river and rolling hill (a. s. l. 200 m—700 m) is the main agricultural region and plays important roles in economic and social development in Sichuan. The basin surrounded by many mountains, such as Mountains Qingling and Daba in Northern Sichuan, and Mountain Hengduan in Western Sichuan. As barriers, Mountains Qingling and Daba defend the invasion of cold snap from the north, and in turn lead to warm winter in the region. Meanwhile, the warm current coming from Pacific and Indian Oceans enter the basin along with Yangtze Rive and water system of Mountain Hengduan, and result in the humid and warm climate in Sichuan Basin. In particular, the antiquity and isolated plant (or type) of single (or few) genus and species that have already become extinct in other regions of the world are conserved in this area because the stratum in the east of Sichuan basin does not undergo acute alteration since tertiary. Western Sichuan is characterized by distributing plateau, alpine, valley, jokul and cliff widely. The average altitude of this section is above 3500 metres, and many peaks range from 4000 to 5000 metres. For example, the peak of Mt. Gongga, the highest mountain in the region is 7500 metres. Western Subalpine forest, the second largest forest region in China, is the main body of Mountain Hengduan which is one of the 25 hotspots in biodiversity conservation in the world. The unique and complex physiognomy in Mt. Hengduan provides diverse habitats for plant biodiversity. As an important component in Tibet Plateau, Northwestern plateau consisting of large area of wetland and grassland is the main pasture in Sichuan. As described above, the complex geographic condition and ecological environment breed abundant plant species diversity, which makes Sichuan become one of the second largest



provinces in plant resources except for Yunnan Province, and attract the global eyes. However, there is a lack of enough information on systematical investigations and classifications on plant resources due to various reasons, which is difficult to make needs of plant resource protection and utilization. It is very important to compile the Sichuan Flora, therefore.

The special geographic position, multiple physiognomy and climate are favorable to plant growth and reproduction. These abundant plant species is valuable wealth of Sichuan. It is very important for the species investigation in China to systematically investigate and list plant catalog in Sichuan, which is helpful to provide science basis for deeply studying the plant system evolvement, plant community, vegetation and ecological system. In the process of economy construction and environment protection, Sichuan Flora is the basic scientific information. To compile Sichuan Flora is to provide indispensable and basic information for the economy construction and scientific development of Sichuan Province by systematically and scientifically categorize the plant resources. Sichuan Flora possesses important and irreplaceable significance as the scientific data. In the world, the significance of biodiversity has been concerned. In order to understand and study the biodiversity, the first thing of all is to know biodiversity. The compiling of Sichuan Flora namely is studying of species diversity in Sichuan Province. Its scientific significance is gone without saying. It possesses very important scientific guidance effect for exploitation and utilization of plant resources. At the socialistic economy system, because province of Sichuan located in the inland of China, in order to accelerate its economy development, it must adequately take advantage of predominance of nature resource, especially must attach importance to the predominance of plant resources. The kinds of plant are very abundant, the types of plant are very complete in Sichuan. There are some plant species such as *Acanthochlamys bracteata*, *Metasequoia glyptostroboides*, *Cathaya argyrophylla* silver fir and *Vilmorix dovetree*, these plant are honoured by living fossil, and are famously rare and precious plant in the world. The account for some important theoretic issue such as the origin of angiosperm and some questions associated with plant geography all depend upon the research of province of Sichuan and its adjacent region. It has particular significance in theory to study the plant in province of Sichuan.

Sichuan Flora consists of moss, fern, gymnosperm and angiosperm. The arrangement of moss is based on the Brotherus's system (1924 - 1925) and refers to recently related systems in domestic and foreign country. The arrangement of fern is based on the Ching Renschang's system (1978). The arrangement of gymnosperm is based on the Cheng Wanchun's system (1961). The arrangement of angiosperm is based on the Engler's syllabus der pflanzenfamilien II

(1964). The sequences are according to numbers family, but the publication is not always according to the sequence. The morphologic characters, geography distribution, ecological environment, science significance, ecological utilization etc of the family, genus and species recorded in this flora are systematically and detailedly described. In the interest of the convenience for readers to use this Flora to identify plant, the key of genus and species are listed in book and many plate are attached, the plate account for percent 60 of the whole book. Sichuan Flora is compiled according to the specification draw by compilation committee. Picture and language both are luxuriant. The producing area is itemized to county. Furthermore, the growing environment of plant and altitude are recorded in this flora. This is very convenient for reader to make on - the - spot investigation. The concrete useness of plants that have important economical value are listed in this book. This is in favor of exploitation and utilization. The universal Chinese names of plants are used in this book, at the same time; the nicknames are listed by all means. This is helpful to clarify the long - standing denomination confusion. The classification of plant in this book is strictly according to the request of international code of botanical nomenclature. This is be propitious to international communion.

Sichuan Flora is a monograph that will be handed to many following generation. In order to ensure the compile quality, we especially pay much attention to the matter such as textual research of literature, identification of plant specimens and the classification of species etc. It has been lasted above 20 years since Sichuan Flora was published at 1981. The work of the compilation of Sichuan Flora is very hardly. Now, the Sichuan Flora is published to sixteenth volumes, but the task of future are yet very arduous. This needs the collective efforts of botanist inside and outside province to finish this magnum opus. Chongqing was set up as municipality directly under the central government at 1997. The governmental region of former province of Sichuan happen many changes. Chongqing, under its jurisdiction is already not parts of province of Sichuan. However, the region still is regarded as that of former Sichuan Province in order to retain the continuity, oneness and integrality of Sichuan Flora (26°01'—34°21' N and 97°26'—110°12'). In the process of compiling this flora, we have received many advice and help of colleagues from associated universities and institutes. We are deeply grateful to them. Because our knowledge level is limited, there are many unavoidable defect and mistake in this flora. We hope that readers point out these mistakes so that they can be corrected.

**Editorial Board of the Flora Sichuanica**

April 2005

## 第十六卷

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Tomus 16  
**ANGIOSPERMAE**

Redactor Song Zi - Pu and Qin Zi - Sheng

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## 13. 桑科 MORACEAE

乔木或灌木,稀为草本;通常有乳液。单叶互生,稀对生,全缘或具锯齿,有时分裂或为复叶,叶脉掌状或羽状;托叶2枚,通常早落。花小,单性,雌雄同株或异株,无花瓣,花序穗状、柔荑状、聚伞状或头状等;花序轴有时为肉质,增厚或封闭而为隐头花序,或开张为头状或圆柱状或盘状;雄花花被片2—4或更多,雄蕊与花被片同数而对生,花丝在芽内内折或直立,退化雄蕊有或无,雄花花被片4,稀更多或更少,宿存,子房上位、半下位或稀下位,每室有倒生胚珠1枚,花柱2裂或不裂,线形或画笔状,漏斗形。果为瘦果或核果,围以肉质变厚的花被片,或藏于花被片内形成聚花果,或隐藏于壶形花序托内形成聚花果(简称榕果),或陷入发达的花序轴内,形成大型的聚合果。胚悬垂,子叶折叠。

约53个属,1400余种,分布热带、亚热带地区,少数种属分布至温带。我国约产12属,153种和亚种,59个变种及变型。四川有8属,41种,17变种,2个亚种,1个变型。

### 分 属 检 索 表

1. 乔木、灌木或草本;雄蕊花丝在芽时内折;雌雄花序为聚伞、柔荑花序或雄花为圆锥、柔荑花序或雌花穗状或头状花序。
  2. 草本;雌雄花为聚伞花序或雄花为圆锥花序。
    3. 茎缠绕;叶对生;雌花2朵,生于覆瓦状排列的苞片内;果穗膨大成球果状 ..... 3. 葎草属 *Humulus* Linn.
    3. 茎直立;叶互生,稀对生;雌花单生于苞片内;果穗不膨大成球果状。
      4. 掌状复叶,小叶3—9;花雌雄异株,稀同株;雄花聚生为圆锥花序 ..... 1. 大麻属 *Cannabis* Linn.
      4. 单叶;雌雄同序,雌花和雄花混生,排成腋生的复聚伞花序 ..... 2. 水蛇麻属 *Fatoua* Caud.
  2. 乔木、灌木,稀为藤状灌木;雌雄花为柔荑花序或雌花为头状花序。
    5. 雌雄花序均为柔荑花序,聚花果圆柱形 ..... 4. 桑属 *Morus* Linn.
    5. 雄花序柔荑状,雌花序头状;聚花果球形,子房具柄 ..... 5. 构属 *Broussonetia* L' Herx. et Vent.
  1. 乔木、灌木;雄蕊花丝在芽时直立;雌雄花序为头状花序或雌雄花生于花序轴内壁为隐头花序。

6. 花为隐头花序,雌花、雄花和瘦果均生于封闭的花序轴的内壁;雄蕊1—3或更多 ..... 8. 榕属 *Ficus* Linn.
6. 雌雄花序均为头状花序或圆锥花序。
7. 雌雄花序均为头状;植物体具枝刺 ..... 7. 柘属 *Cudrania* Tree.
7. 雌雄花序头状或圆柱状;无刺 ..... 6. 波罗蜜属 *Artocarpus* J. R. et G. Forst.

## 1. 大麻属 *Cannabis* Linn.

一年生草本,茎皮富含强韧纤维。掌状复叶互生。花雌雄异株,稀同株;雄花排成圆锥花序,花被片5,覆瓦状排列,雄蕊5枚,在芽内直立;雌花聚生于叶腋内,组成短小头状或穗状花序,花被片1,不显著,与子房紧贴,花柱2。瘦果微扁,包于宿存的苞片内。

本属仅1种,产于中亚。四川有引种栽培。

1. 大麻(中国高等植物图鉴) 火麻(四川)、线麻(四川) 图版1:1—2

*Cannabis sativa* Linn., Sp. Pl. 1:1027. 1753; 中国植物志 23(1):223. 图57. 1998; 中国高等植物图鉴 1:503. 图1005,1972; 云南植物志 1:159. 1977.

一年生直立草本,有特异气味。茎高1—3米,有纵沟,灰绿色,密生柔毛。掌状复叶,叶互生或下部对生;小叶3—9片,披针形或线状披针形,长7—15厘米,先端渐尖,基部渐狭,边缘具粗锯齿,表面深绿色,具糙毛,背面淡绿色,具长糙毛;叶柄长4—13厘米,被糙毛。雄花黄绿色,花被片长卵形,长约4毫米;花丝极短,花药纵裂;雌花序短,生于叶腋,球形或穗形,雌花绿色。瘦果扁球形,直径约4毫米。花期5—6月;果期10月。

原产印度锡金邦、不丹和中亚细亚,现各国均有野生或栽培。我国各地也有栽培或野生。四川常见。

有2亚种;subsp. *sativa* 生产纤维和油,具较高而细长、稀疏分枝的茎和长而中空的节间,如印度锡金邦、不丹和我国通常栽培的大麻(火麻);subsp. *indica* (Lamarck) Small et Cronquist,生产树脂,特别是在幼叶和花序中。其植株矮小,多分枝而具短而实心的节间。后者是生产大麻烟的植物,大多数国家作为违禁品,禁止栽培。

## 2. 水蛇麻属 *Fatoua* Gaud.

草本。单叶互生,边缘具锯齿;托叶早落。花单性同株,雌雄性花混生,组成腋生头状、聚伞花序,具小苞片;雄花花被片4深裂,镊合状排列;雄蕊4枚,花丝在芽时内折,退化雌蕊很小,圆锥状;雌花花被片4—6裂,裂片镊合状排列,子房歪斜,花柱稍侧生,柱头

2 裂,丝状,胚珠倒生。核果小,斜球形,微偏,为宿存花被包围,果皮稍壳质。种皮膜质,无胚乳,胚内弯,子叶宽,相等,胚根长,向上内弯。

2 种,分布于亚洲东部、东南部至澳大利亚。我国产于东南部、南部和中部。四川产 1 种。

1. 水蛇麻(中国高等植物图鉴) 图版 1:3—7

*Fatoua villosa* (Thunb.) Nakai in Bot. Mag. Tokyo 41:516. 1927; 中国植物志 23 (1):3. 图 1. 1998; 中国高等植物图鉴 1:477. 图 954. 1972; 云南植物志 6:562. 图 157. 1995; 海南植物志 2:372. 图 478. 1965.

一年生草本,高可达 60 厘米。茎直立,纤细,少分枝或不分枝,幼时绿色,后变紫黑色,被微柔毛。叶膜质,卵形至卵状披针形,长 1.5—7.5 厘米,宽 1—4 厘米,先端渐尖,基部近截形,稍下延至叶柄,边缘有钝齿,两面疏生短刺毛;三出脉,侧脉 3—5 对;叶柄长 5—10 毫米;托叶早落。花单性,雌雄同株,雌花和雄花混生成复聚伞花序,花序单生或成对生于叶腋,直径约 6 毫米;花序梗长约 4 毫米;雄花花被片 4 裂,裂片舟状三角形,雄蕊 4,花丝内弯,与花被裂片对生,退化雌蕊极小,圆锥形;雌花近无梗,花被片 4,宽舟状,宿存,外面被毛,子房近扁球形,花柱侧生,向上延伸成丝状,柱头浅二裂,被毛,宿存。瘦果小,略扁,具三棱,红褐色,外面有小瘤状突起。小核果具种子 1 粒。花期 6—11 月。

据《云南植物志》记载:该种产于四川盆地,未见标本。分布于河北、山东、河南、江苏、浙江、湖北、安徽、江西、福建、台湾、广东、广西、贵州和云南。朝鲜、日本、越南、马来西亚、菲律宾、印度尼西亚(爪哇)、巴布亚新几内亚、澳大利亚等国也有。

### 3. 葎草属 *Humulus* Linn.

一年生或多年生蔓生草本。茎缠绕,具倒生小钩刺。叶对生,有柄,掌状 3—7 裂或不裂。花雌雄异株;雄花集成圆锥花序,花被 5 裂,雄蕊 5 枚;雌花常 2 朵生于宿存的苞片内,苞片覆瓦状排列,形成一穗状花序,雌花具 1 小苞片,花被片 1,膜质,全缘,紧包子房,柱头 2,线形。果实为扁平瘦果,与宿存的苞片共同组成球果。

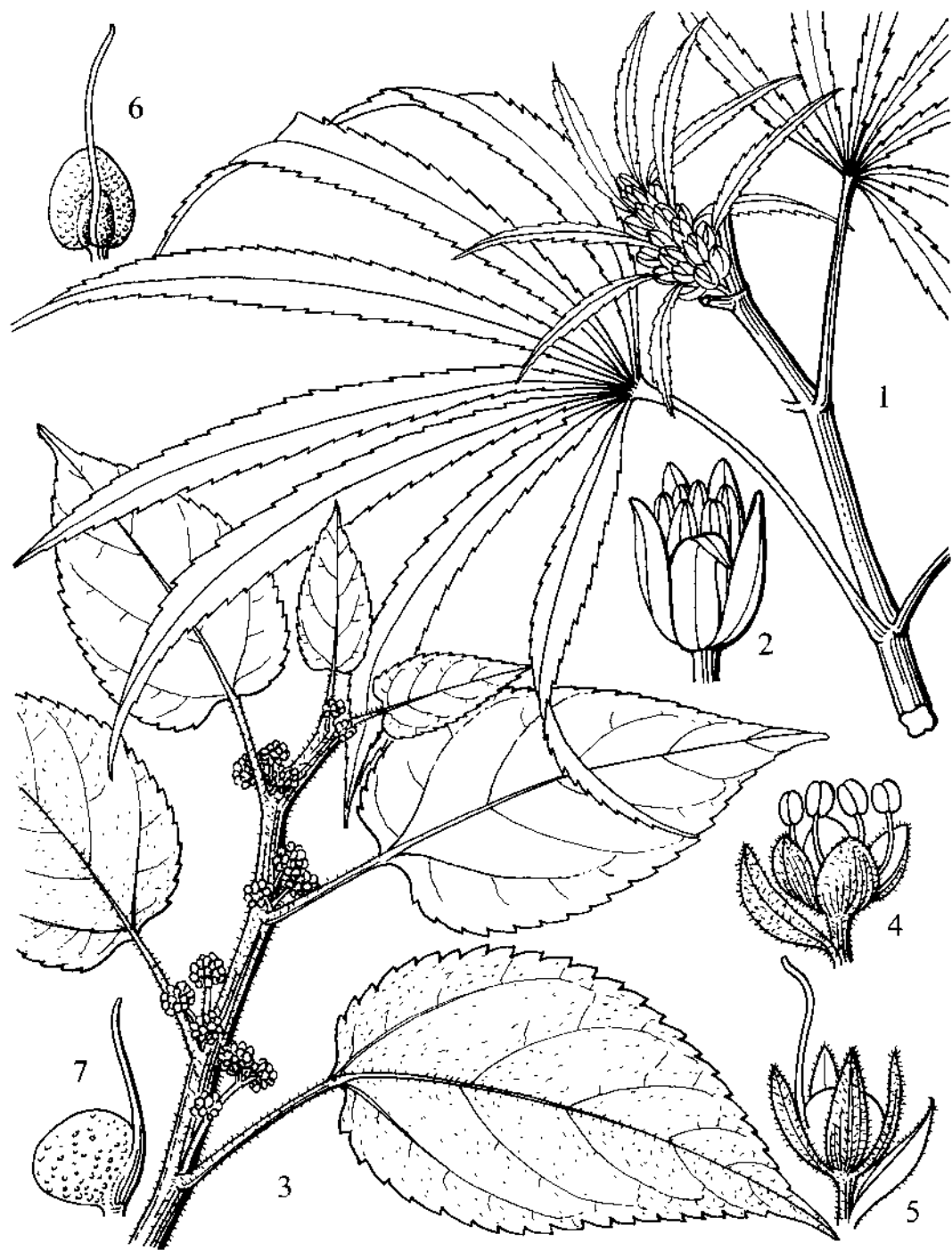
有 4 种,产于北半球温带。我国有 3 种。四川产 2 种。

### 分 种 检 索 表

1. 叶肾状五角形,掌状深裂为 5—7 裂,稀 3 裂;瘦果成熟时露出苞片外 ..... 1. 葎草 *H. scandens* (Lour.) Merr.



图版 1



1—2. 大麻 *Cannabis sativa* Linn. 1. 果枝, 2. 雄花。3—7. 水蛇麻 *Fatoua villosa* (Thunb.) Nakai. 3. 花枝, 4. 雄花, 5. 雌花, 6. 瘦果腹面, 7. 瘦果侧面。(江无琼绘)