**BUXACEAE**

**Buxaceae**

Min Tianlu (闵天禄 Ming Tien-lu)

Shrubs, small trees, rarely subshrubs or perennial herbs, evergreen, monocious or rarely dioecious. Leaves simple, alternate or opposite, estipulate, margin entire or dentate, venation pinnate or tripinnate. Inflorescences axillary or terminal, racemose or densely spicate, bracteate. Flowers small, regular, unisexual. Male flowers: tepals 4–6 or rarely absent; stamens 4, 6–8, or numerous; central pistillode present or lacking. Female flowers: tepals 5 or 6 or several; carpels 2 or 3; ovary superior, 2- or 3-locular; styles 2 or 3, free, persistent; stigma broadly recurved; interstially nectaries present or lacking; ovules 2 or more per locule, pendent, anatropous, bitégmic, crassinucellar; micropyly formed by internal integument or by both integuments. Fruit a loculicidal dry capsule or a fleshy berry. Seeds black, shining; endosperm fleshy; cotyledons thin or plump.

Four or five genera and ca. 70 species: Africa, America, Asia, Europe; three genera and 28 species (21 endemic) in China.

Based on recent molecular data, the South American genus *Styloceras* Kunth ex A. Jussieu is included within the Buxaceae, and the African *Notobuxus* Oliver is included within *Buxus*.


1a. Leaves opposite, margin entire, venation pinnate; female flower solitary, apical on inflorescence; fruit a loculicidal capsule .............................................................................................................................. 1. *Buxus*

1b. Leaves alternate, usually tripinnate; female flower in basal part of inflorescence; fruit a berry, ± fleshy.

2a. Leaf margin entire; persistent style very short in fruit state, ca. 2 mm .............................................................................. 2. *Sarcococca*

2b. Leaf margin apically dentate; persistent style prismatic, elongated in fruit state, 8–15 mm ...................................................................... 3. *Pachyandra*

1. **BUXUS Linnaeus, Sp. Pl. 2: 983. 1753.**

**黄杨属 huang yang shu**

Shrubs or small trees, 0.15–6 m tall, evergreen, monoecious. Young branches tetragonous. Leaves opposite, shortly petiolate, leathery or thinly leathery, often shining, margin entire, venation pinnate. Inflorescences axillary or terminal, racemose, spicate, or converted into capitulate cluster, bracteate; female flower solitary, apical; male flowers several, basal. Flowers small, unisexual. Male flowers: tepals 4; stamens 4; central pistillode present. Female flowers: tepals 5 or 6; carpels 3; ovary 3-locular; styles 3, free; stigma often recurved; interstially nectaries or nectariferous tissue present; ovules 2 per locule, pendent, anatropous, bitégmic, crassinucellar; micropyly formed by internal integument, rudimentary aril. Fruit a dry capsule, globose or ovoid, usually glabrous, loculicidal, splitting into 3 valves; styles persistent. Seeds 2 per locule, oblong; testa black, shining; endosperm fleshy; cotyledons oblong.

About 100 species: Africa, America, Asia, Europe; 17 species (15 endemic) in China.

The following taxa have been described or recorded from Taiwan but are not treated here because we were unable to examine any material:

*Buxus liukiuensis* (Makino) Makino (Bot. Mag. (Tokyo) 16: 179. 1902; *B. sempervirens* Linnaeus var. *liukiuensis* Makino, Bot. Mag. (Tokyo) 9: 279. 1895; *B. microphylla* Siebold & Zuccarini var. *liukiuensis* (Makino) S. S. Ying). This taxon was described from Taiwan by Yang and Lu (Fl. Taiwan, ed. 2, 3: 666–668. 1993), who erroneously treated it as endemic (the type is from Ishigaki-jima, Ryukyu Islands, Japan) and included in its synonymy *B. liukiuensis* var. *longipedicellata* Hatusima (J. Dept. Agric. Kyushu Imp. Univ. 6: 293. 1942), which was described from “Syusyu Nanto” (Shuishe, Nantou), Taiwan.

*Buxus microphylla* Siebold & Zuccarini var. *tarokoensis* S. Y. Lu & Yuen P. Yang (Fl. Taiwan, ed. 2, 3: 668. 1993). This taxon was described from an elevation of 1800 m in the Taroko gorge, Hualian, Taiwan.

1a. Female flowers: style 2–3 × longer than ovary.

2a. Inflorescences 1–1.5 cm; bracts many, densely imbricate ................................................................. 1. *B. henryi*

2b. Inflorescences shorter than 1 cm; bracts sparsely arranged.

3a. Lateral veins parallel, obscure ........................................................................................................ 2. *B. pubiramea*

3b. Lateral veins parallel, visible on both surfaces in dried state.

4a. Leaves broadly ovate or elliptic, base usually rounded .................................................................. 3. *B. latistyla*

4b. Leaves elliptic-lanceolate, narrowly lanceolate, or oblanceolate.

5a. Some leaves elliptic-lanceolate, 8.5–12 × 3–3.8 cm ...................................................................... 4. *B. hainanensis*

5b. Most leaves lanceolate or oblanceolate, less than 7 cm, ca. 2 cm in diam.

6a. Leaves oblong-lanceolate or narrowly lanceolate, 3–7 × ca. 1.2 cm; style narrow and elongate at apex, recurved; branchlets sparsely pubescent or glabrescent ............................................ 5. *B. myrica*

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2 Institut für Biologie, AG Spezielle Botanik und Arboretum, Humboldt-Universität zu Berlin, Späthstraße 80/81, D-12437 Berlin, Germany.
6b. Leaves oblanceolate or narrowly obovate, 2–3.5 × 0.7–1 cm; style shorter and wider at apex, erect; branchlets pubescent .............................................. 6. B. austroyunnanensis
1b. Female flowers: style shorter than, equaling, or slightly longer than ovary.

7a. Sterile pistil not exceeding 1/2 of tepal in length (B. linearifolia sterile pistil up to 2/3 of tepal in length).
   8a. Leaves larger, oblong-lanceolate or elliptic-lanceolate, rarely lanceolate, (4–)6–8 cm ...................... 7. B. megistophylla
   8b. Leaves small and narrow.

9a. Leaves ovoid, elliptic, or obovate, 3–6 × 1.5–2.5 cm; branchlets pubescent.
   10a. Leaves velutinous on both surfaces or glabrescent, lateral veins obscure; style and ovary equal in length; capsule glabrous ................................................................. 8. B. mollicula
   10b. Leaves glabrous, lateral veins visible adaxially; style ± shorter than ovary; capsule velutinous ................................................................. 9. B. hebecarpa

9b. Leaves spatulate, lanceolate, spatulate to linear, or obovate, elliptic, or obovate, less than 3(–4) cm and ca. 1 cm in diam.; branchlets pubescent or glabrous.
   11a. Leaves elliptic or oblong, lateral veins obscure adaxially, rugulose in dried state ...................... 10. B. rugulosa
   11b. Leaves more varied in shape, lateral veins visible adaxially, not rugulose in dried state.

12a. Branchlets densely pubescent; leaves narrowly obovate, oblong, or elliptic-oblong, 1–2 × 0.4–0.8 cm ...................................................... 11. B. stenophylla
12b. Branchlets glabrous or pubescent; leaves narrowly oblong, narrowly oblanceolate, spatulate, or linear.

13a. Ovary hirtellous; male flowers sessile; leaf blade lateral veins and midrib in 45° angles ................................................................. 12. B. cephalantha
13b. Ovary glabrous; male flowers pedicellate; leaf blade lateral veins and midrib in 30°–35° angles.

14a. Leaves spatulate or narrowly oblong, 2–3.5(–4) × 0.5–0.8(–0.9) cm; sterile pistil ca. 1/2 of sepal in length ....................... 13. B. harlandii
14b. Leaves linear, rarely linear-lanceolate, 1.5–2.5 × 0.3–0.5 cm; sterile pistil ca. 2/3 of sepal in length ......................... 14. B. linearifolia

7b. Sterile pistil equaling or exceeding sepal in length (rarely pistil ca. 2/3 of sepals in length, but then leaf not linear).
   15a. Leaves spatulate or obovate, 2–4 × 0.8–1.8 cm, midrib and lateral veins distinctly prominent ........................ 15. B. bodinieri
15b. Leaves many and varied in shape, lateral veins obscure or visible adaxially.

16a. Leaves oblanceolate or narrowly obovate, 1–1.6 × 0.4–0.6 cm, lateral veins obscure and not rugulose on either surface; male flowers shortly pedicellate ................................. 16. B. ichangensis
16b. Leaves broadly elliptic or oblong-elliptic, 1.5–3.5 × 0.8–2 cm, lateral veins visible or not and rugulose adaxially; male flowers sessile ........................................... 17. B. sinica


大花黄杨 da hua huang yang

Shrubs, ca. 3 m tall; branchlets terete; young branches tetragonous, glabrous; internodes 1.5–3 cm. Petiole 1–2 mm; leaf blade lanceolate, oblong-lanceolate, or ovate-oblong, 4–7 × 1.5–2.5(–3.5) cm, thinly coriaceous, base cuneate or acute, margin slightly reflexed, apex obtuse or slightly acute; midrib prominent on both surfaces, lateral veins obscure on both surfaces or visible on upper surface. Inflorescences axillary, 1–1.5 cm, 0.7–1 cm in diam., flowers dense, basal bracts ovate, 3–4 mm, grayish brown, apical bracts ovate-oblong, ca. 6 mm. Male flowers ca. 8; pedicels 2–4 mm, glabrous; tepals oblong or oblong-oblong, 4.5–5 mm, scarious, glabrous; stamens ca. 11 mm; sterile pistil with slender terete gynophore, apex slightly inflated, 1–1.5 mm. Female flowers: outer tepals oblong, ca. 6 mm; inner tepals ca. 3 mm, scarious, glabrous, persistent; ovary 2–2.5 mm; style narrow and long, complanate, 6–8 mm, recurved at apex, persistent. Capsule subglobose, ca. 6 mm; carpodopodium ca. 3 mm. Fl. Apr, fr. Jul.

- Forests; 1300–2000 m. Guizhou, W Hubei, Sichuan.


毛枝黄杨 mao zhi huang yang

Shrubs, ca. 3 m tall; branchlets terete; young branches tetragonous, 1–2 mm in diam., densely pubescent. Petiole flat, 1–5 mm; leaf blade oblong-lanceolate, rarely oblong-obovate, 5–7 × 1.5–2(–2.5) cm, thickly coriaceous, base cuneate, margin cartilaginous, slightly revolute, apex attenuate, rounded, or obtuse, or with retuse tip; adaxial midrib elevated, lateral veins sparse, at intervals of 1.5–2.5 mm, obscure on both surfaces. Inflorescences axillary or terminal. Flowers not seen. Capsule oblong, ca. 9 mm; persistent style ca. 7 mm; stigma decurrent to ca. 1/4 of style; persistent tepals ca. 1.5 mm; carpodopodium 5–8 mm, pubescent; persistent bracts many, ovate, acuminate, ca. 1 mm. Fr. Jun–Jul.

- Forests on slopes; ca. 700 m. Hainan (Baoting).


阔柱黄杨 ku zhu huang yang

Shrubs, 1–4 m tall; branchlets terete, ribbed and grooved; young branches tetragonous or subterete, glabrous or sparsely...
pubescent. Leaves inserted in different plants or sometimes in
same plant, dimorphic in size; large leaves: petiole flat, 1–3 mm;
leaf blade ovate or oblong-lanceolate, rarely rhomboid-ovate or
lanceolate, 5–7 × 2–3.5 cm, coriaceous or chartaceous, adaxially
puberulent along midrib, base rounded or obtuse, rarely acute,
margin revolute, apex acuminate or acute, obtuse or with
mucronulate tip; midrib elevated on both surfaces, lateral veins
many, between them dense veinlets visible or obscure; small
leaves: broadly ovate or elliptic, 2–4 × 1.5–2 cm, base
rounded, apex acute, pubescent; lateral veins and veinlets more obscure
on both surfaces. Inflorescences axillary and terminal, 8–10 mm,
5–6 mm in diam.; bracts ovate, apiculate, 2–2.5 mm, abaxially
puberulent. Male flowers: pedicels ca. 1 mm; outer tepals ovate,
ca. 2.5 mm, acute, abaxially puberulent; inner tepals longer and
wider, glabrous; stamens 4–5 mm; anthers and superior half of
filaments puberulent; sterile pistil discoid-tetragonal, ca. 1 cm
in diam. Female flowers: pistil 4–5 mm; ovary 1.2–1.5 mm; style
compressed and broad, 2.5–3.5 mm, apex attenuate, base ca. 1.6
mm in diam.; stigma oblone, decurrent to middle part of style.
Capsule globose, up to 8.5 mm when mature, smooth; persistent
style ca. 4 mm; persistent tepals triangular-ovate, ca. 2 mm;
carpopodium 5–7 mm; bracts persistent. Fl. Mar–Apr, fr. May–
Jul.

Forests on slopes, beside mountain streams. NW Guangxi, SE
Yunnan (Funing) [Laos, N Vietnam].

海南黄杨 hai nan huang yang
Shrubs, 1–2 m tall; branchlets terete, ribbed; young
branches subterete, ca. 1 mm in diam., longitudinally channeled
laterally, sparsely puberulent in channels; internode 2–6 cm.
Petiole ca. 1 mm; leaf blade elliptic-oblong or oblong-lanceolate,
leaves on old lower branches small, 5.5–7 × 1.8–2.3 cm, on
young upper branches large, 8.5–12 × 3–3.8 cm, thinly coriaceous
or chartaceous, both surfaces glabrous, shining, base cuneate,
margin revolute, apex acuminate, obtuse, or with mucronulate
midrib; midrib elevated on both surfaces, lateral veins 18–20 pairs, 2–4 mm between veins, veinlets dense. Flowers not seen.
Capsule axillary or terminal, young fruit globose; persistent
style ca. 5 mm; persistent tepals 2–2.5 mm; carpocodium ca.
4 mm; persistent bracts lanceolate, subglabrous. Fr. Sep–Dec.
- Streams in forests, damp areas. S Hainan (Sanya).

11: 549. 1913.
杨梅黄杨 yang mei huang yang
Shrubs, 1–3 m tall; branchlets terete; young branches
slender, tetragonal, inner sides puberulent. Petiole 1–3 mm,
puberulent; leaf blade oblong-lanceolate or narrowly lanceolate,
3–7 × (0.8–)1–2 cm or 2–3.5(–4) × 0.5–0.7 cm, thinly leathery or
leathery, adaxially puberulent along midrib, base cuneate, margin
revolute, apex acute, acuminate, or obtuse, with retuse or
mucronulate tip; midrib elevated on both surfaces, lateral veins
and veinlets visible on both surfaces or adaxially more distinct.
Inflorescences axillary, ca. 5 mm initially, peduncle very short or
elongate, after male flower deciduous, rachis becoming clavate,
pubescent; bracts ovate, ca. 2 mm, acute, pubescent. Male flow-
ers ca. 10; pedicels 1–1.5 mm, pubescent; tepals ovate, 2–2.5
mm, glabrous; sterile pistil tetragonous, less than 1 mm high.
Female flowers: tepals ovate or ovate-elliptic, ca. 3 mm, margin
scariosus; ovary ca. 1.5 mm; style 2.5–3 mm or 3.5–4 mm, re-
curved or cirrate; stigma narrowly oblong-lanceolate, decurrent
to middle-lower part of style. Capsule globose, 8–10 mm or
5–5.5 mm; persistent style ca. 3 mm or 4–5 mm; carpocodium
5–10 mm; bracts many, persistent.

Forests, forests on slopes, along mountain streams, riverbanks;
200–2000 m. NW Guangxi, S and SW Guizhou, Hainan, Hunan,
Si-chuan, E Yunnan [Vietnam].
1a. Leaf blade oblong-lanceolate or narrowly
lanceolate, 3–7 × 1–2 cm; style 3.5–4 mm;
capsule 8–10 mm ............................................ 5a. var. myrica
1b. Leaf blade narrowly lanceolate, 2–3.5(–4) ×
0.5–0.7 cm; style 2.5–3 mm; capsule
5–5.5 mm ............................................ 5b. var. angustifolia

5a. Buxus myrica var. myrica
杨梅黄杨 (原变种) yang mei huang yang (yuan bian zhong)
   Leaf blade oblong-lanceolate or narrowly lanceolate, 3–7 ×
1–2 cm. Female flowers: style 3.5–4 mm. Capsule 8–10 mm. Fl.
Forests on slopes, along mountain streams; 200–2000 m. NW
Guangxi, S Guizhou, Hainan, Hunan, Sichuan, E Yunnan [Vietnam].

5b. Buxus myrica var. angustifolia Gagnepain, Fl. Gén. Indo-
Chine 5: 662. 1927.
狭叶杨梅黄杨 xia ye yang mei huang yang
   Leaf blade narrowly lanceolate, 2–3.5(–4) × 0.5–0.7 cm.
Female flowers: style 2.5–3 mm. Capsule globose, small, 5–5.5
mm. Fl. Apr.
Forests, riverbanks. NW Guangxi, SW Guizhou [N Vietnam].

Imp. Univ. 6: 286. 1942 [“austro-yunnanensis”].
滇南黄杨 dian nan huang yang
Shrubs small, prostrate or erect, 0.5–2.5 m tall; branchlets
terete; young branches tetragonal, ca. 1 mm in diam., pubescent.
Petiole very short; leaf blade oblong-lanceolate or narrowly
oblanceolate, 2.5–7 × 0.7–1 cm, thinly leathery, adaxially pu-
erulent or subglabrous along midrib, base cuneate, margin
revolute, apex obtuse, with mucronulate or retuse tip; midrib
elevated on both surfaces, lateral veins and veinlets dense and
visible on both surfaces. Inflorescences axillary; rachis clavate
and elongate post male flower anthesis, pilose; bracts ovate,
persistent, 1.5–2 mm, acute, margin scariosus, abaxially pilose.
Male flowers ca. 8; pedicels ca. 1 mm; tepals broadly ovate,
2–2.5 mm, glabrous, persistent; sterile pistil ca. 1 mm, inflated at
apex. Female flowers: tepals ovate, 2–2.5 mm, glabrous, per-
sistent; ovary ca. 1.5 mm; style compressed and wide, 2.5–3
mm, attenuate upward, slightly recurved or erect; stigma nar-
rowly obcordate, decurrent to middle part of style. Capsule glo-
bose, 6–8 mm in diam.; persistent style ca. 3 mm; carpocodium

大叶黄杨 da ye huang yang

Shrubs or small trees, 0.6–2 m tall; young branches tetragonous or subterete, ribbed and grooved, glabrous. Petiole 2–3 mm, puberulent; leaf blade ovate, elliptic, or oblong-lanceolate, 4–8 × 1.5–3 cm, rarely lanceolate, up to 9 cm, or rhomboid-ovate, up to 4 cm wide, leathery or thinly leathery, shining above, puberulent along midrib, base cuneate, margin revolute, apex acuminate, obtuse, or with apiculate tip; midrib elevated on both surfaces, lateral veins many, visible on both surfaces. Inflorescences axillary; rachis 5–7 mm, pubescent or glabrous; bracts broadly ovate, acute, margins scariosus, abaxially puberulent near base. Male flowers 8–10; pedicels ca. 0.8 mm; outer tepals broadly ovate, ca. 2 mm; inner tepals orbicular, 2–2.5 mm, glabrous; stamens ca. 6 mm; sterile pistil ca. 1 mm. Female flowers: tepals ovate-elliptic, ca. 3 mm, glabrous; ovary 2–2.5 mm; style ca. 2.5 mm, erect, slightly recurved at apex; stigma obcordate, deciduous to 1/3 of style. Capsule subglobose, 6–7 mm; persistent style ca. 5 mm. Fl. Mar–Apr, fr. Jun–Jul.


软毛黄杨 ruan mao huang yang

Shrubs, ca. 3 m tall; young branches subtetragonous, ca. 2 mm in diam., pubescent or glabrous. Petiole 1–2 mm, pubescent; leaf blade ovate, oblong, or elliptic, rarely oblong-lanceolate, 3–5 × 1.2–1.8(–2) cm, leathery, densely velutinous on both surfaces, base broadly cuneate or cuneate, margin slightly revolute, apex rounded or obtuse, with retuse or mucronate tip; midrib elevated on both surfaces, lateral veins obscure. Inflorescences axillary, shortly terete, ca. 1 cm; rachis ± elongate, 3–4 mm, densely velutinous; bracts ovate-triangular, ca. 1.5 mm, acute, abaxially pilose. Male flowers 6–8, sessile; tepals orbicular, ca. 2 mm, abaxially convex, plicate, adaxially concave, glabrous; sterile pistil very short. Female flowers: tepals ovate-triangular, 3.5–4 mm; ovary and style equal in length; stigma linear-cordate, deciduous to base of style. Capsule ovoid-globose, ca. 1 cm, shining; persistent style ca. 3 mm, erect, apex recurved.

8b. Buxus mollicula var. glabra

软毛黄杨(原变种) ruan mao huang yang (yuan bian zhong)

Buxus wallichiana Baillon var. velutina Franchet.


8a. Buxus mollicula var. mollicula

变光软毛黄杨 bian guang ruan mao huang yang

Young branches glabrous. Leaf blade glabrous or only puberulent along basal part of midrib adaxially.


毛果黄杨 mao guo huang yang

Shrubs, ca. 3 m tall; branchlets terete; young branches tetragonous, densely pubescent; internode 1.5–2.5 cm. Petiole 2–3 mm, puberulent; leaf blade ovate, elliptic, or oblong-ovate, rarely lanceolate, 3–6(–7) × 1.5–2(–2.5) cm, thickly leathery, puberulent along midrib above, base cuneate, margin revolute, apex acute or acuminate; midrib very elevated above, level below, lateral veins adaxially visible, abaxially obscure. Inflorescences axillary, capitulate; rachis ca. 4 mm, sparsely pilose; bracts sparsely pilose, basal bracts small, ovate, dense, bracts below male flowers broadly ovate, ca. 2 mm. Male flowers 1–6; pedicels 0.5–0.8 mm, sparsely pilose; outer tepals broadly ovate; inner tepals orbicular, 2–2.5 mm; stamens ca. 4.2 mm; sterile pistil with terete short gynophore, apex inflated, 1–1.2 mm. Female flowers: outer tepals slightly narrow, inner tepals broadly ovate, 2–2.5 mm; ovary ca. 2.2 mm, densely agglutinated tomentulose; style thick, ca. 1.2 mm; stigma obcordate, deciduous to base of style. Capsule globose, 7–9 mm, agglutinated tomentulose; persistent style ca. 2 mm. Fl. Mar, fr. Jun.


皱叶黄杨 zhou ye huang yang

Shrubs, 1–2 m tall; branchlets subterete; young branches tetragonous, 1–2 mm in diam., pubescent on 4 sides, or 2 opposite sides glabrous. Petiole 2–3 mm, densely puberulent; leaf blade leathery, elliptic, obovate-elliptic, rhomboid-oblong, oblong, or narrowly oblong, 0.8–2.5 × 0.5–1.2 cm, adaxially shining, puberulent along midrib, slightly pinnate-rugulose in dried state, base broadly cuneate or cuneate, margin revolute, apex obtuse, rounded, or retuse; abaxial midrib and lateral veins obscure. Inflorescences axillary and terminal, capitulate; rachis 3–4 mm, puberulent; bracts ovate, 2.5–3 mm, puberulent. Male flowers 8–10; pedicels 0.5–1 mm; outer tepals ovate; inner tepals suborbicular, 2–3 mm, glabrous, reddish brown or light yellow in dried state; sterile pistil ca. 1 mm, apex inflated. Female flowers: tepals broadly ovate, 2.5–3 mm, abaxially pubescent; ovary ca. 3
mm; style thick, ca. 1.5 mm; stigma obcordate, decurrent to middle part of style. Capsule ovoid-globose, 8–10 mm, glabrous; persistent style 2–3 mm.

- Mixed forests and forest margins on limestone, thickets on mountain slopes and on limestone; 1900–4000 m. SW and W Sichuan, E and SE Xizang, NW Yunnan.

1a. Leaf blade villous on both surfaces; petiole villous ................................. 10c. var. rupicola

1b. Leaf blade adaxially puberulent only along midrib; petiole pubescent.

2a. Shrubs, 1–2 m tall; young branches pubescent; leaf blade rhomboid-oblong, oblong, or narrowly oblong, 1.5–2.5(–3.5) × 0.6–1.2 cm; ovary longer than style. Capsule ovoid, to 6 mm in diam., gray and puberulent initially, later glabrous and shining; persistent style ca. 2 mm. Fl. Feb–Mar, fr. Jun–Jul.

- Forests, riversides. SE Fujian (Anxi), C and NW Guangdong, Guizhou.


头花黄杨 tou hua huang yang

Shrubs, ca. 1.5 m tall; branchlets terete; young branches tetragonous, 0.7–1 mm in diam., densely pubescent. Petiole ca. 1 mm; leaf blade narrowly obovate, oblong, or elliptic-oblong, 1–2 × 0.4–0.8 cm, puberulent along midrib in basal part, abaxially light green, adaxially deep green, base cuneate, apex obtuse or truncate, with retuse tip; petiole pubescent; leaf blade elliptic, obovate-elliptic, or oblong, 8–11(–14) × 5–8 mm ........................... 10b. var. prostrata

10a. Buxus rugulosa var. rugulosa

皱叶黄杨 zhou ye huang yang (yuansh bi zhong)

_Buxus microphylla_ Siebold & Zuccarini var. _platyphylla_ (Schneider) Handel-Mazzetti.

Shrubs, prostrate, multibranched, 0.3–1.2 m tall; young branches densely pannose-tomentulose; leaf blade elliptic, obovate-elliptic, or oblong, 8–11(–14) × 5–8 mm, adaxially puberulent along midrib. Fl. Mar–May, fr. Jun–Sep.

- Mixed forests on limestone; 2300–3400 m. SW Sichuan, E Xizang, NW Yunnan.

11. Buxus stenophylla

狭叶黄杨 xia ye huang yang

_Buxus ichangensis_ var. _fukienensis_ Hatusima.

Shrubs, ca. 1.5 m tall; branchlets terete; young branches tetragonous, 0.7–1 mm in diam., densely pubescent. Petiole ca. 1 mm; leaf blade narrowly obovate, oblong, or elliptic-oblong, 1–2 × 0.4–0.8 cm, puberulent along midrib in basal part, abaxially light green, adaxially deep green, base cuneate, apex obtuse or truncate, with retuse tip; petiole pubescent; leaf blade elliptic, obovate-elliptic, or oblong, 8–11(–14) × 5–8 mm, subglabrous; sterile pistil ca. 1 mm, apex inflated. Female flowers: tepals ovate-triangular, ca. 2.5 mm; pistil ca. 4 mm; ovary and style equal in length; style slightly recurved; stigma obcordate and decurrent to basal part of style. Capsule globose, ca. 6 mm in diam., gray and puberulent initially, later glabrous and shining; persistent style ca. 2 mm. Fl. Feb–Mar, fr. Jun–Jul.

- Forests, riversides. SE Fujian (Anxi), C and NW Guangdong, Guizhou.

1b. Young branches glabrous; leaf blade narrowly oblong or oblanceolate.
12b. Buxus cephalantha var. shantouensis

Shrubs small, 0.5–1 m tall; branchlets subtetragonal; young branches subtetragonal, slender, ca. 1 mm in diam., sparsely pubescent; internode 1–2 cm. Petiole not obvious; leaf blade spatulate, rarely narrowly oblong, 20–35 (–40) × 5–8 (–9) mm, thinly leathery, adaxially shiny, puberulent along basal part of midrib, base cuneate, apex acute, rounded to obtuse, or with retuse tip; midrib elevated on both surfaces, lateral veins and veinlets dense and visible adaxially, obscure abaxially. Inflorescences axillary and terminal, capitate, dense; rachis ca. 1.4–1.8 mm, subequal to tepals in length. Female flowers: ovary and style equal in length, glabrous; style erect, 1.4–1.8 mm, subequal to tepals in length. Capsule ovoid, ca. 1.5 mm, slightly compressed; stigma obcordate, deciduous to 1/3–1/2 of style. Capsule ovoid, ca. 5 mm; persistent style erect, 3–4 mm. Fl. Feb, fr. May–Aug.


Shrubs, 3–4 m tall; branchlets terete; young branches tetragonous, pubescent or glabrescent. Petiole 1–2 mm; leaf blade usually spatulate, also narrowly ovate or obovate, widest in apical part, 20–40 × 8–18 mm, thinly leathery, adaxially green and shining, puberulent on basal half of midrib, abaxially glaucescent, base narrowly cuneate, apex rounded or obtuse, with retuse tip; midrib elevated, lateral veins visible on both surfaces or only adaxially. Inflorescence axillary, capitulate, 5–6 mm, flowers dense; rachis ca. 2.5 mm; bracts ovate, glabrous abaxially or pubescent. Male flowers ca. 10; pedicels only ca. 0.4 mm; tepals ovate-orbicular, ca. 2.5 mm; stamens ca. 6 mm; sterile pistil with slender gynophore, apex inflated, ca. 2.5 mm, equal to tepals in length or slightly longer. Female flowers: outer tepals ca. 2 mm; inner tepals ca. 2.5 mm; ovary ca. 2 mm, glabrous; style 1.5 mm, slightly compressed; stigma obcordate, deciduous to 1/3–1/2 of style. Capsule ovoid, ca. 5 mm; persistent style erect, 3–4 mm. Fl. Feb, fr. May–Aug.


Shrubs, 15–30 (–100) cm tall; branchlets terete; young branches dense, tetragonal, very slender, ca. 0.5 mm in diam., densely or sparsely pubescent. Petiole ca. 1 mm; leaf blade oblanceolate or narrowly obovate, 10–16 × 4–6 mm, thinly leathery, glabrous on both surfaces, adaxially shining, base cuneate, apex rounded, with mucronate tip; midrib elevated on both surfaces or only adaxially. Inflorescences axillary or terminal, capitulate; rachis pubescent; bracts obovate, 1–2 mm, acute. Male flowers 8–12; pedicels ca. 0.4 mm; tepals ovate, 1.8–2 mm, bracts and tepals reddish brown interrupted striate; stamens 4–5 mm; sterile pistil slender, with terete gynophore, apex inflated, 1.4–1.8 mm, subequal to tepals in length. Female flowers: tepals obovate-oblong, ca. 2.5 mm; ovary longer than style, glabrous. Capsule ellipsoid or oblong, ca. 5 mm, shining, longitudinally grooved; persistent style ca. 2 mm, slender; stigma decurrent to middle part of style. Fl. Mar, fr. Jul.

黄杨 huang yang

Shrubs or small trees; branchlets terete, longitudinally ribbed, grayish white; young branches tetragonal, pubescent; internode (3–)5–20 mm. Petiole 1–2 mm; leaf blade varied in shape and size, broadly elliptic, broadly obovate, orbicular, obovate, obovate-oblong, or elliptic-lanceolate to lanceolate, (5–)7–35 × (3.5–)5–20 mm, leathery, thickly leathery, or thinly leathery, shining adaxially, glabrous on both surfaces or puberulent along basal half of midrib, base rounded to cuneate, apex rounded, obtuse with retuse tip or acuminate with acute tip; midrib elevated adaxially, lateral veins obscure and rugulose adaxially. Inflorescences axillary, capitulate; rachis 3–4 mm, pubescent; bracts broadly ovate, 2.5–3 mm, glabrous; stamens ca. 4 mm; sterile pistil with clavate gynophore, apex slightly inflated, ca. 2 mm, sterile pistil and tepals length ca. 2:3 or equal to 3:2. Female flowers: tepals ca. 3 mm; ovary slightly longer than style, glabrous; style thick and compressed; stigma obovate, decurrent along midrib abaxially.

- Forests in mountain valleys and on slopes, thickets, streamsides, stony areas; 600–2600 m. Anhui, Chongqing, Fujian, Guangdong, Guangxi, Guizhou, Hunan, Jiangxi, Shaanxi, Shandong, Sichuan, Taiwan, Zhejiang.
- Shrubs or small trees, 1–6 m tall; internode 5–20 mm. Leaf blade broadly elliptic, broadly obovate, obovate-oblong, 1.5–3.5 × 0.8–2 cm, lucid and puberulent along basal half of midrib adaxially, densely white papillate along midrib abaxially, apex rounded or obtuse, with retuse tip; midrib elevated and lateral veins visible adaxially. Sterile pistil and tepals length 2:3. Capsule globose, 6–8(–10) mm. Fl. Mar, fr. May–Jun.
- Forests in mountain valleys, streamsides; 1200–2600 m. Anhui, Gansu, Guangdong, Guangxi, Guizhou, Hubei, Jiangsu, Jiangxi, Shaanxi, Shandong, Sichuan, Zhejiang.

**17a. Buxus sinica** var. **sinica**

黄杨(原变种) huang yang (yuan bian zhong)


- Forests in mountain valleys, streamsides; 1200–2600 m. Anhui, Gansu, Guangdong, Guangxi, Guizhou, Hubei, Jiangsu, Jiangxi, Shaanxi, Shandong, Sichuan, Zhejiang.


尖叶黄杨 jian ye huang yang


- Thickets, stony areas along streamsides; 600–2000 m. Anhui, Chongqing, Fujian, Guangdong, Guangxi, Hubei, Hunan, Jiangxi, Sichuan, Zhejiang.


中间黄杨 zhong jian huang yang


- Forests in mountain valleys, streamsides; 1200–2600 m. Anhui, Chongqing, Fujian, Guangdong, Guangxi, Hubei, Hunan, Jiangxi, Sichuan, Zhejiang.


小叶黄杨 xiao ye huang yang

Shrubs, evergreen, monoecious; branches erect. Leaves alternate, shortly petiolate, leathery, margin entire, venation pinnate or palmately triplinerved. Inflorescences axillary or terminal, capitulate or racemose, bracteate; male flowers several, inserted laterally in apical part; female flowers several, inserted basally; sometimes male or female flowers solitary in inflorescence. Flowers small, white or rose. Male flowers mostly with 2 bracteoles; tepals 4, divided into inner and outer series; stamens 4, opposite to tepals; filaments exserted, slightly compressed; sterile pistil 1, oblong, 4-ribbed, apex depressed. Female flowers pedicellate; bracteoles several, imbricate; tepals 4–6, decussate or 3 segments verticillate; interstylar nectaries or nectariferous tissue lacking; ovary 2- or 3-loccular; styles 2 exserted, slightly compressed; sterile pistil 1, oblong, 4-ribbed, apex depressed. Female flowers several, inserted basally; sometimes male or female flowers solitary in inflorescence. Flowers small, white or rose.

About 20 species: Asia, one species in Central and North America (Guatemala, Mexico); nine species (five endemic) in China.

1a. Young branches distinctly pubescent.

2. Inflorescence racemose or shortly racemose.

3a. Plants with fibrous roots; leaves ovate, ovate-lanceolate, or lanceolate, basal lateral veins a pair to triplinerved; capsule scarlet or black-brown .......................................................... 6. S. ruscifolia

3b. Plants with rhizome; leaves lanceolate or oblanceolate, lateral veins pinnate; capsule black or blue-black .......................................................... 7. S. hookeriana

2b. Inflorescence subcapitate or globose, ca. 1 cm.

4a. Leaf blade oblong-lanceolate or oblanceolate, 6–9 × 2–3 cm; inflorescence subcapitate, ca. 1 cm; male flower sessile ................................................................. 8. S. orientalis

4b. Leaf blade elliptic, (5.5–)7–8.5 × 2–2.9 cm; inflorescence globose, 1–1.5 cm; male flower shortly pedicellate ................................................................. 9. S. confertiflora

1b. Young branches glabrous or slightly puberulent only under microscope.

5a. Leaf blade wider, usually elliptic, elliptic-oblong, or elliptic-lanceolate, length:width ratio 2.5–3:1, venation distinctly triplinerved.

6a. Leaf blade 6–10(–12) × 2–3.5(–5) cm, triplinerved and distance from base 2–5 mm; tepals 3–4 mm in male flower; styles 2 or 3 ......................................................... 4. S. wallichii

6b. Leaf blade 8–16(–20) × 4–6 cm, triplinerved and distance from base 1.5–2 mm; tepals ca. 2 mm in male flower; styles 2 ......................................................... 5. S. vagans

5b. Leaf blade narrow and long, usually lanceolate or oblong-lanceolate, length:width ratio 4–5:1, venation indistinctly triplinurved or pinnate.

7a. Petiole 5–8 mm; styles 3; young branches glabrous ......................................................... 1. S. saligna

7b. Petiole 10–18 mm; styles 2; young branches glabrous or slightly puberulent under microscope.

8a. Young branches slightly puberulent under microscope; leaf blade thinly leathery, 1.5–2.5 cm wide, venation triplinerved; male flower with 2 bracteoles ......................................................... 2. S. longipetiolata

8b. Young branches glabrous; leaf blade papery, 2.5–3.7 cm wide, venation pinnate; male flower bracteoles absent ......................................................... 3. S. longifolia


BUXACEAE

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6. Sarcococca ruscifolia  

Shrubs, 1–4 m tall, densely ramified; young branches densely or slightly pubescent; main root and developed fibrous roots present. Petiole 3–6 mm; leaf blade usually ovate or elliptic-lanceolate, 3.5–5.5 × 1–2.5 cm, variable in shape and size, sometimes elliptic-ovate, lanceolate, or narrowly lanceolate, smaller 2–3 × 0.7–1.2 cm, narrower 4–7 × 0.7–1.4 cm, larger 6–7 × 2.5–3 cm, thinly leathery, lucid green adaxially, light green abaxially, base cuneate or rounded, apex acute or acuminate; midrib elevated adaxially, puberulent near base, basal lateral veins a pair to triplinerved. Inflorescences short racemes, 1–2 cm; rachis puberulent; bracts lanceolate or ovate-lanceolate. Flowers white, fragrant. Male flowers 2–7, inserted on major part of rachis; male flowers in basal part pedicellate, lanceolate. Flowers white, fragrant. Male flowers 2–7, inserted on major part of rachis; male flowers in basal part pedicellate, pedicels ca. 2 mm, bracteoles 2, ovate, 1–2 mm; male flowers in apical part subsessile, sometimes ebracteolate; tepals usually 4, rarely 3 or 5, ca. 3 mm, outer tepals ovate, acuminate, inner tepals broadly elliptic or broadly ovate, rounded, mucronate; stamens ca. 7 mm. Female flowers 2–5, inserted in basal part of rachis, flower and pedicel 6–8 mm; bracteoles several, imbricate, narrowly ovate; tepals 1.5–2 mm. Capsule globose, 7–8 mm in diam., scarlet or black-brown; persistent styles 2 or 3, ca. 2 mm. Fl. and fr. Oct–Feb.

7a. Sarcococca hookeriana var. hookeriana

Shrubs or small trees, up to 3 m tall; young branches longitudinally ribbed, pubescent. Petiole slender, 6–8 mm; leaf blade lanceolate, oblanceolate, elliptic-lanceolate, oblong-lanceolate, or narrowly lanceolate, rarely elliptic or elliptic-oblong, (3–)5–8(–11) × (0.7–)1.3–1.8 cm, deep green adaxially, puberulent along midrib, base attenuate, apex acuminate or acute; midrib impressed or plane adaxially, elevated abaxially, lateral veins pinnate, obscure on both surfaces. Inflorescences racemes, ca. 1 cm; rachis puberulent; bracts ovate or ovate-lanceolate, apex subulate-apiculate, puberulent abaxially. Male flowers 5–8, inserted in apical part of rachis, shortly pedicellate or sessile, ebracteolate or 2 bracteoles on basal flowers; tepals 4, inner tepals broadly elliptic or suborbicular, 3–3.5 mm, outer tepals shorter, puberulent abaxially. Female flowers 1 or 2, inserted on base of rachis, flower and pedicel 6–7 mm; bracteoles several, ovate, imbricate; tepals similar to bracteoles, ca. 2 mm. Fruit globose, capsule black or blue-black; persistent styles 2 or 3, ca. 2 mm, erect, apices recurved.

7b. Sarcococca hookeriana var. digyna

Shrubs, 0.6–3 m tall, with rhizome; young branches longitudinally ribbed, pubescent. Petiole 5–8 mm; leaf blade oblanceolate or oblong-oblanceolate, rarely elliptic or elliptic-oblong, 6–9 × 2–3 cm, thinly leathery, base cuneate or broadly cuneate, margin revolute, apex acuminate; midrib plane or slightly elevated adaxially, puberulent, elevated abaxially, basal lateral veins a pair to triplinerved, visible on both surfaces, other lateral veins slightly visible adaxially. Inflorescences subcapitate, ca. 1 cm; rachis puberulent; bracts ovate, 1–2.5 mm. Male flowers 3–5 or more, clustered in apical part of rachis, sessile; bracteoles 2, broadly ovate, 1–1.5 mm; tepals broadly ovate or suborbicular, to 3 mm; filaments ca. 5 mm; anthers ca. 1.5 mm. Female flowers 1–3 or more, in basal part of rachis, flower and pedicel 3–5 mm; bracteoles ovate, imbricate; tepals similar to apical bracteoles. Drupe ovoid or globose, ca. 7 mm in diam., black when mature; persistent styles 2, ca. 1.5 mm, erect, apices recurved; carpodipodium 3–5 mm. Fl. Mar or Sep, fr. May–Jun or Nov–Dec.
3. PACHYSANDRA A. Michaux, Fl. Bor.-Amer. 2: 177. 1803.

板凳果属 ban deng guo shu

Subshrubs, creeping or decumbent, or perennial herbs. Leaves alternate, petiolate, thinly leathery or papery, margin dentate in apical half, rarely entire, lateral veins 2 or 3 pairs, lower triplinerved. Inflorescences terminal or axillary spikes, bracteate, androgynous; male flowers inserted in middle to apical part, female flowers in basal part, rarely both solitary in inflorescence. Flowers small, white or rose. Male flowers: tepals 4, divided into outer and inner series; stamens 4, opposite to tepals; filaments exserted, slightly compressed and broad; sterile pistil 1–4–6, ovary with 2 or 3 locules; styles 2 or 3, long; white or rose. Male flowers: tepals 4, divided into outer and inner series; stamens 4, opposite to tepals; filaments exserted, slightly compressed and broad; sterile pistil 1–4–6, ovary with 2 or 3 locules; styles 2 or 3, long. Fruit a drupe.

Three species: one in SE America, two in E Asia; two species (one endemic) in China.

1a. Inflorescence terminal, 2–4 cm; leaf blade rhombic-obovate, base cuneate, glabrous abaxially; styles 2

1b. Inflorescence axillary, 1–2 cm; leaf blade ovate-oblong, base rounded, truncate, or subcordate, pubescent or villous abaxially; styles 3 ...............................................................................................................................................  2.


顶尖板凳果 ding hua ban deng guo

Subshrubs; stem slightly thick, puberulent, lower part rhizomatous, ca. 30 cm, prostrate, curved, or obliquely ascending, with densely fibrous adventitious roots, upper part erect, ca. 30 cm tall, leafy. Leaves at intervals of 2–4 cm on stem or 4–6 leaves close to each other; petiole 1–3 cm; leaf blade rhombic-obovate, 2.5–5–(9) × 1.5–3–(6) cm, leathery, puberulent along midrib adaxially, base attenuate into petiole, margin dentate toward apex. Inflorescences terminal, 2–4 cm, erect, rachis and bracts glabrous. Flowers white. Male flowers more than 15, inserted on almost all rachis, sessile; bracts and tepals broadly ovate, bracts small, tepals 2.5–3.5 mm; filaments ca. 7 mm; sterile pistil ca. 0.6 mm. Female flowers 1 or 2, inserted basally on rachis or sometimes solitary apically in 1 or 2 leaf axils, flower and pedicel ca. 4 mm; bracts and tepals ovate, imbricate; styles exserted after pollinated, apex convolute. Fruit ovoid, 5–6 mm; persistent style thick and reflexed, 5–10 mm. Fl. and fr. Apr.–May.

Shady and damp land in forests; 1000–2600 m. Gansu, Hubei, Shaanxi, Sichuan, Zhejiang [Japan].


板凳果 ban deng guo

Subshrubs; stem lower part creeping, with fibrous adventitious roots, upper part erect, 30–50 cm tall, mostly leafy, lower 1/2 with small, sparse, usually deciduous scale leaves; branches pubescent. Petiole 2–4 cm, pubescent, or 5–7 cm, villous; leaf blade ovate, elliptic-ovate, broadly ovate, oblong-oblong, or oblong, 5–8 × 3–5 cm or 6–16 × 4–10 cm, papery, glabrous adaxially, tiny papillate and densely pubescent or pubescent and densely villous along midrib and lateral veins or scattered villous abaxially, base shallowly cordate, truncate, or rounded, rarely cuneate, margin dentate at middle-upper part or subentire, apex acute or acuminate. Inflorescences axillary, 1–2 cm or 2.5–5 cm, erect or pendulous. Flowers white, rose, or red. Male flowers (5–)10–20, inserted almost over all of rachis, sessile; bracts ovate; tepals elliptic or oblong, 2–2.5–(3) mm; anthers elliptic, curved after pollinated; sterile pistil shortly terete, ca. 0.5 mm, apex inflated. Female flowers (1–)3–6, inserted basally on rachis, flower and pedicel ca. 4 mm; tepals imbricate, ovate-lanceolate or oblong-lanceolate, 2–3 mm, glabrous; style exserted after pollinated, apex convolute. Fruit globose, ca. 1 mm in diam., yellow or purplish red when mature; persistent styles 1–1.5 mm.

Shady and damp land in forests; 1000–2600 m. C and NW Fujian, NW Guangdong, S Jiangxi, S Shaanxi, W Sichuan, Taiwan, C, SE, and W Yunnan.

- Forests, thickets; 600–2500 m. C and NW Fujian, NW Guangdong, S Jiangxi, S Shaanxi, W Sichuan, Taiwan, C, SE, and W Yunnan.

- Three species: one in SE America, two in E Asia; two species (one endemic) in China.
5–10; female flowers 1–3; fruit yellow or red when mature

1b. Leaf blade pubescent and densely villous along midrib and lateral veins abaxially or scattered villous abaxially; petiole 5–7 cm; inflorescence 2.5–5 cm, flowers red; male flowers 10–20; female flowers 3–6; fruit purplish red when mature

2a. Pachysandra axillaris var. axillaris

板凳果(原变种) ban deng guo (yuan bian zhong)

Pachysandra axillaris var. glaberrima (Handel-Mazzetti) C. Y. Wu; P. axillaris var. tricarpa Hayata; P. stylosa Dunn var. glaberrima Handel-Mazzetti; P. tricarpa (Hayata) S. S. Ying.


多毛板凳果 duo mao ban deng guo


Petiole 5–7 cm; leaf blade ovate, broadly ovate, or ovate-oblong to suborbicular, 6–16 × 4–10 cm, pubescent and densely villous along midrib and lateral veins abaxially or scattered villous abaxially, base rounded or acute, rarely cuneate, margin entire or sparsely crenate, undulate-serrate, or shallowly serrate at middle-upper part. Inflorescences 2.5–5 cm, pendulous. Flowers red. Male flowers 10–20. Female flowers 3–6. Fruit purplish red when mature.

- Forests; 600–2100 m. C and NW Fujian, NW Guangdong, S Jiangxi, S Shaanxi, SE Yunnan.