Two new species of *Mahonia* (Berberidaceae) from Yunnan, China

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Two new species of *Mahonia* (Berberidaceae), *M. dulongensis* H. Li and *M.lushuiensis* T.S. Ying & H. Li, are described and illustrated from Yunnan, China. *Mahonia dulongensis* is morphologically similar to *M. taronensis*, but it differs in having 16–18 teeth on each leaflet margin side, adaxially with conspicuous lateral veins, and inflorescence of 11 fascicled racemes, 5–13 cm long, sometimes with branches. *Mahonia lushuiensis* is similar to *M. polyodonta*, but can be easily distinguished by its having 3–4 pairs of leaflets, adaxially with lateral veins flat or inconspicuous, and bracts of inflorescence ovate, 1 × 0.8 cm.

Key words: Berberidaceae, *Mahonia*, new species, taxonomy

Berberidaceae is a large family with 17 genera and about 650 species. It is widely distributed in the northern temperate zone and subtropical mountainous region. According to Ying (2001) 11 genera and 303 species occur in China.

*Mahonia* is one of the biggest genera in Berberidaceae. About 60 species are widely distributed in E and SE of Asia, also in western North America, Central America and western South America. There are 31 species in China (including 23 endemic species and one endemic subspecies), mainly in Sichuan, Yunnan, Guizhou and SE of Xizang provinces (Ying 2001). Fifteen species were recorded for Yunnan Province by Bao (1997).

During our fieldwork in Yunnan from 2004 to 2005, thousands of specimens were collected.

Two species of *Mahonia* were identified as new after investigating their morphological characteristics (Grierson 1984, Bao 1997, Ying 2001) and examining specimens in the herbaria in KUN and PE.

**Mahonia dulongensis** H. Li, sp. nova (Fig. 1)

Species nova *M. taronensi* affinis sed folio margine 16–18 spinoso-serratuero, racemis 11 fasciculatis aliquot ramosis, pedicellis bracteis aequilongis vel longioribus differt.

**Type:** China. Yunnan Province, Gongshan, Dulongjiang, 27°55^°^ 46.2^"^ N, 98°20^°^ 1.9^"^ E, on roadside, alt. 1620 m above sea level, 5.XI.2004 Gaoligongshan Biodiversity Survey 21834 (holotype KUN; isotypes CAS, E). — Paratypes:
China. Yunnan Province, Gongshan County, Dulongjiang town: Dulongjiang elementary school, in broad-leaved forest beside river, alt. 1320 m, 29.XII.1990 Dulongjiang Valley Exped. 1378 (KUN); Moqiewang village, in everygreen forest valley, alt. 1600 m, 10.I.1991 Dulongjiang Valley Exped. 1838 (KUN); Kongdang village, in everygreen broad-leaved forest, alt. 1480 m, 30.XII.1990 Dulongjiang Valley Exped. 1498 (KUN); Dizhengdang village, in everygreen forest, alt. 1800 m, 12.IV.1991 Dulongjiang Valley Exped. 5594 (KUN); Xuebalaka mountains, in broad-leaved forest, alt. 2000 m, 15.IV.1991 Dulongjiang Valley Exped. 5942 (KUN).

**Etymology.** The specific epithet is derived from the name of the county where the specimens were collected.

Shrub, 1.5-m tall, evergreen. Leaves imparipinnate alternate, narrowly obovate, ca. 43.6 × 23 cm, abaxially green, adaxially dark olivaceous-green, with 8 pairs of leaflets, lowest pair smaller and ca. 1 cm above base of petiole, abaxially with conspicuously raised midvein and lateral veins, adaxially with conspicuous midvein, lateral veins also conspicuous; rachis stout, ca. 0.3 cm in diameter, internodes 3.5–4.5 cm; lowest pair of leaflets ovate or narrowly ovate, 2–3 × 1–1.5 cm, margin with 4–6 teeth per side; middle pair of leaflets ovate-lanceolate, 6–14 × 3–3.5 cm, base broadly cuneate or subrounded, margin with 9–18 teeth per side, apex caudate-acuminate; terminal leaflet obovate-
lanceolate, 14.5 × 3.5 cm, petiolule ca. 2 cm, base cuneate, apex caudate-acuminate, margin with 16–18 teeth per side. Inflorescence of 11 fascicled racemes, 5–13 cm long, 3 of 11 with branches; bracts of inflorescence ovate to ovate-oblong, 1–2.5 × 0.7–1 cm. Pedicel 0.4–0.8 cm long; floral bract lanceolate, 0.4–0.6 × 0.5–1 mm. Flowers yellow. Outer sepals ovate, ca. 2 × 1 mm; median sepals oblong-elliptic, ca. 3.5 × 1.5 mm; inner sepals oblong, ca. 4 × 2.5 mm. Petals oblong-obovate, ca. 3 × 1.5 mm, base with 2 distinct glands, apex entire. Stamens ca. 2 mm; anther connective not prolonged, truncate. Ovary ca. 2.5 mm; ovules 2. Flowering in November, fruit not seen.

*Mahonia dulongensis* is similar to *M. tarnaensis*, but it is not difficult to distinguish them from each other. *Mahonia dulongensis* is characterized by having 16–18 teeth on each leaflet margin side, adaxially with conspicuous lateral veins, and inflorescence consisting of 11 fascicled racemes, 5–13 cm long, sometimes with branches, pedicels longer than bracts or equal. *Mahonia tarnaensis* has 6–8 teeth per leaflet margin side, adaxially with inconspicuous lateral veins, and inflorescence consisting of 3–5 fascicled racemes, 5–8 cm long, without branches, and bracts longer than pedicels (see Table 1).

This species was also collected during the investigation of the Dulongjiang Region in October 1990 to June 1991. *Mahonia dulongensis* H. Li was first mentioned as a nomen nudum in The Flora of Dulongjiang Region (Li 1993). This species is currently known to be distributed only

### Table 1. Morphological differences among *Mahonia dulongensis*, *M. taraenas*, *M. lushuiensis* and *M. polyodonta*.

<table>
<thead>
<tr>
<th></th>
<th><em>M. dulongensis</em></th>
<th><em>M. taraenas</em></th>
<th><em>M. lushuiensis</em></th>
<th><em>M. polyodonta</em></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Leaflets</strong></td>
<td>8 pairs</td>
<td>5–10 pairs</td>
<td>3–4 pairs</td>
<td>4–8 pairs</td>
</tr>
<tr>
<td><strong>Leaflet margin</strong></td>
<td>16–18 teeth per side</td>
<td>6–8 teeth per side</td>
<td>9–12 teeth per side</td>
<td>10–16 teeth per side</td>
</tr>
<tr>
<td><strong>Distance between lowest pair of leaflets and petioles</strong></td>
<td>0.5 cm</td>
<td>1 cm</td>
<td>0.5 cm</td>
<td>0.5–2.5 cm (–4 cm)</td>
</tr>
<tr>
<td><strong>Adaxial lateral veins</strong></td>
<td>conspicuous</td>
<td>inconspicuous</td>
<td>inconspicuous</td>
<td>conspicuous</td>
</tr>
<tr>
<td><strong>Top leaflet</strong></td>
<td>obovate-lanceolate, margin with 16–18 teeth per side</td>
<td>lanceolate, margin with 5–11 teeth per side</td>
<td>ovate-lanceolate, margin with 9–12 teeth per side</td>
<td>ovate-oblong, margin with 8–12 teeth per side</td>
</tr>
<tr>
<td><strong>Racemes</strong></td>
<td>11 fascicled 5–13 cm long, sometimes has branches</td>
<td>3–5 fascicled 5–8 cm long, no branches</td>
<td>5 fascicled 4–5 cm long, no branches</td>
<td>3–5 fascicled 5–6 cm long, no branches</td>
</tr>
<tr>
<td><strong>Bracts of inflorescence</strong></td>
<td>1–2 × 0.7–1 cm bracts shorter than pedicels or equal</td>
<td>1–2 × 0.7–1 cm bracts longer than pedicels</td>
<td>ca. 0.8 cm bracts longer than pedicels</td>
<td>2 × ca. 1 cm bracts longer than pedicels</td>
</tr>
<tr>
<td><strong>Bracts/pedicels</strong></td>
<td>apex entire</td>
<td>apex acute</td>
<td>apex acutely emarginate, lobes rounded</td>
<td>apex acutely emarginate, lobes rounded</td>
</tr>
<tr>
<td><strong>Petals</strong></td>
<td>in evergreen broad-leaved forest, alt. 1320–2000 m</td>
<td>in forests or edge of forests, alt. 1500–3000 m</td>
<td>growing on granite, along roadside in sun, alt. 3125 m</td>
<td>in forest, scrubby slopes, bamboo thickets, roadsides, rocky areas, alt. 1300–3100 m</td>
</tr>
<tr>
<td><strong>Habitat</strong></td>
<td>Dulong River region in Gongshan County of Yunnan, China</td>
<td>SE Xizang, Dulong River region in Gongshan County of Yunnan, China</td>
<td>Lushui County in western Yunnan, China</td>
<td>Myanmar, Indian Assam, China: NE Guizhou, W Hubei, Sichuan, Xizang, Yunnan (Luquan, Suijiang, Tengchong, Yanshan)</td>
</tr>
</tbody>
</table>
in the Dulong River region in Gongshan County (Li 2000).

**Mahonia lushuiensis** T.S. Ying & H. Li, *sp. nova* (Fig. 2)

*Species affinis M. polyodontae, sed foliolis 3–4 jugis, in sicco superne nervis planis, inconspicuis, bracteis fasciculatis ca. 1 × 0.8 cm differt.*


*Etyymology.* The specific epithet is derived from the name of the county where the specimens were collected.

Shrub 0.5 m tall, evergreen. Leaves imparipinnate alternate, narrowly obovate, ca. 16–18 × 7–8 cm, abaxially deep green, adaxially dark green, with 3–4 pairs of leaflets, lowest pair smaller and ca. 0.5 cm above base of petiole, abaxially with conspicuously raised midvein and lateral veins, adaxially with conspicuous mid-
vein, lateral veins flat or inconspicuous; rachis stout, ca. 2 mm in diameter, internodes ca. 4 cm; lowest pair of leaflets ovate, apex caudate-acuminate, 2.5 \( \times \) 1.5 cm, margin with 7–8 teeth per side; middle pair of leaflets elliptic or lanceolate, 7 \( \times \) 2.5 cm, base cuneate, oblique, margin with 11–12 teeth per side, apex caudate-acuminate; terminal leaflet ovate-lanceolate, 7 \( \times \) 2.5 cm, petiolule ca. 2 cm, base cuneate, apex caudate-acuminate, margin with 9–12 teeth per side. Inflorescence of 5 fascicled racemes, 4–5 cm long; bracts of inflorescence ovate, 1 \( \times \) 0.8 cm. Pedicel 0.4 cm long; floral bract broadly lanceolate, 0.6 \( \times \) 3 mm. Flowers yellow. Outer sepals ovate-lanceolate, ca. 6 \( \times \) 3 mm; median sepals oblong-elliptic, ca. 4.2 \( \times \) 2.5 mm; inner sepals oblong, ca. 5 \( \times \) 2.5 mm; petals oblong, ca. 4 \( \times \) 2 mm, base with 2 distinct glands, apex acutely emarginate, lobes rounded. Stamens ca. 3 mm; anther connective not prolonged, truncate. Ovary ca. 3 mm; ovules 2. Flowering in May, fruit not seen.

*Mahonia lushuiensis* is similar to *M. polyodonta*, but it is easily distinguished by having 3–4 pairs of leaflets, adaxial lateral veins flat or inconspicuous, and by the bracts of the inflorescence ovate, 1 \( \times \) 0.8 cm. *Mahonia polyodonta* has 4–8 pairs of leaflets, adaxial lateral veins conspicuous, and bracts of inflorescence ovate-lanceolate, 2 \( \times \) 1 cm (see Table 1).

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### References


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