Maianthemum harae (Asparagaceae), a new species from Taiwan

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Maianthemum harae Tseng & Chao, a new species of Asparagaceae from Taiwan, is described and illustrated. This species resembles M. formosanum in the shape and size of flower, but is easily distinguished from the latter by its tuberous rhizome, 9–12 leaves, lanceolate leaves and longer styles.

Maianthemum (Asparagaceae) comprises about 35 species and is distributed in eastern Asia, northern America, central America and northern Europe (Chen et al. 2000, Utech 2002). Nineteen of the species occur in China (Chen et al. 2003).

In the past decades, Maianthemum and Smilacina were considered distinct genera. They were separated by the floral morphology, the flowers being trimerous in Smilacina and bimerous in Maianthemum. LaFrankie (1986) transferred all species of Smilacina into Maianthemum based on anatomical and morphological features. The karyotype analysis by Meng et al. (2005) and the molecular biological study by Meng et al. (2008) also supported the lumping of these two genera.

So far only one species of Maianthemum was recognized in Taiwan, namely M. japonicum (Ying 2000, Boufford et al. 2003). According to Chao and Tseng (2010), that species was not distributed in Taiwan, and the name was a misinterpretation of M. formosanum. Recently, we have collected and studied abundant material of Taiwanese Maianthemum from the field and herbaria. We also reviewed the literature from the adjacent regions (Ohwi 1934, 1953, Hara 1987, Kim 1998, Chen et al. 2003) and local publications (Hayata 1908, 1917, 1920, Kawakami 1910, Sasaki 1928, Masumune 1930, 1936, 1954, Ohwi 1934, Yamamoto 1938, Liu & Ying 1978, Wang et al. 1978, Wang 1997, Ying 2000, Yang et al. 2001). After a thorough systematic study of Maianthemum in Taiwan we were able to find a new species which is described here.

Maianthemum harae Tseng & Chao, sp. nova (Figs. 1 and 2)

Maianthemum harae, a new species from Taiwan

Chialohu lake, 2200 m a.s.l., C. W. Chen 1541 (TAIF). Hualien County, Hsiulin Township, Tarokotaizan, 12 June 1933, S. Sasaki s.n. (TAI).

ETYMOLOGY. The species epithet “harae” commemorates Dr. Hiroshi Hara (1911–1986) for his contributions to plant taxonomy of the Far East. Dr. Hara was a great Japanese botanist who devoted his life to studying the Liliaceae of eastern Asia, and left an unfinished paper of eastern Asian Smilacina (Hara 1987).

Perennial herbs. Rhizome tuberous, 7–10 mm in diam., with many fibrous roots, root hairs present. Stems suberect to arching, 30–75 cm long, pubescent at upper part, covered with scale leaves at basal nodes. Leaves deciduous, simple, estipulate, chartaceous, alternate, lanceolate, 15–25 cm long, 5–10 cm wide, apex acute, base attenuate to obtuse, margin undulate, pubescent at abaxial surface and margin; petiole short, 3–5 mm long. Inflorescences terminal, paniculate, pubescent, 6–10 cm long, 5–8 cm wide, bracts absent. Flowers bisexual, flattened, fragrant, perianth with 6 segments, arranged into inconspicuous 2 whorls of 3, white, segments ca. 5 mm long, 2 mm wide, 1-veined, slightly recurved, apex attenuate to acute; stamens 6, filaments ca. 2 mm long,
anthers oblong, ca. 0.5 mm long; ovary superior, depressed globose, ca. 1.5 mm long, 2 mm in diam., glabrous, style 2–2.5 mm long, glabrous, stigma 3-lobed, pubescent. Fruits subglobose, 8–10 mm in diam., red at maturity.

*Maianthemum harae* is very similar to *M. formosanum*, but it is distinguished by having a tuberous rhizome, lanceolate and larger leaves and a 2 mm long style. *Maianthemum harae* also resembles *M. japonicum*, but it is distinguishable by having a tuberous rhizome, 9–12 leaves, and a 3-lobed stigma (Table 1).

There is also a conspicuous difference in the epidermis structure between *M. formosanum* and *M. harae*. Following the terminology of epidermis morphology by Dilcher (1974), the anticlinal cell walls of the two species are undulate, but the undulations are different. The undulations within the anticlinal wall in *M. formosanum* are V-type, with a sharper angle, but in *M. harae* they are U-type, with a smoother angle within the anticlinal wall (Fig. 2).

*Maianthemum harae* was found in the central mountain range at middle altitudes, grow-

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**Table 1. Comparison of *Maianthemum harae*, *M. formosanum* and *M. japonicum***

<table>
<thead>
<tr>
<th></th>
<th><em>M. harae</em></th>
<th><em>M. formosanum</em></th>
<th><em>M. japonicum</em></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rhizome</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shape</td>
<td>tubular</td>
<td>moniliform</td>
<td>terete</td>
</tr>
<tr>
<td>Diameter (mm)</td>
<td>7–10</td>
<td>4–6</td>
<td>7–10</td>
</tr>
<tr>
<td>Stems (cm)</td>
<td>30–75</td>
<td>5–30</td>
<td>30–60</td>
</tr>
<tr>
<td><strong>Leaves</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number</td>
<td>9–12</td>
<td>3–6</td>
<td>4–9</td>
</tr>
<tr>
<td>Length (cm)</td>
<td>15–25</td>
<td>5–10</td>
<td>6–15</td>
</tr>
<tr>
<td>Width (cm)</td>
<td>5–10</td>
<td>1–5</td>
<td>3–7</td>
</tr>
<tr>
<td>Venation</td>
<td>5–7</td>
<td>3–5</td>
<td>5–7</td>
</tr>
<tr>
<td>Shape</td>
<td>lanceolate</td>
<td>oblong</td>
<td>unknow</td>
</tr>
<tr>
<td>Anticlinal wall</td>
<td>undulate, V-type</td>
<td>undulate, U-type</td>
<td>ovate-oblong</td>
</tr>
<tr>
<td><strong>Inflorescences</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Trichomes</td>
<td>panicle</td>
<td>raceme to panicle</td>
<td>panicle</td>
</tr>
<tr>
<td><strong>Flowers</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Tepals (mm)</td>
<td>5 × 2</td>
<td>3 × 1.5</td>
<td>3 × 1.5</td>
</tr>
<tr>
<td>Styles length (mm)</td>
<td>2</td>
<td>0.5</td>
<td>0.5–1</td>
</tr>
<tr>
<td>Stigmas</td>
<td>3-lobed</td>
<td>3-lobed</td>
<td>subentire</td>
</tr>
<tr>
<td>Pedicel length (mm)</td>
<td>5</td>
<td>2</td>
<td>2–6</td>
</tr>
</tbody>
</table>
ing in the coniferous and broad-leaf forest with high humidity, often associated with Ainsliaea latifolia subsp. henryi (Asteraceae), Yushania niitakayamensis (Poaceae) and Ophiorrhiza japonica (Rubiaceae). Compared with M. formosanum which grows at altitudes 3000–3600 m a.s.l., M. harae grows at lower altitudes (1500–2800 m a.s.l.) with relatively high humidity. Both species are endemic to Taiwan (Fig. 3).

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