Aphyllorchis rotundatipetala (Orchidaceae), a new species from Taiwan

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Aphyllorchis rotundatipetala C.S. Leou, S.K. Yu & C.T. Lee, a new species of Orchidaceae discovered in Taiwan, is described and illustrated. It is related to A. montana and A. simplex. The distinguishing characters of A. rotundatipetala are peloric and yellow flowers, obtuse apex of petals and lip, pinnate veins at the lip’s top, and entire apex of the rostellum.

The genus Aphyllorchis comprises about 30 species distributed in the tropics and the Himalayas, extending as far north as Japan and south to Australia (Chen & Gale 2009). Species of the genus are holomycotrophic, leafless terrestrial herbs with a short erect rhizome, an erect stem and a terminal inflorescence of a few to many resupinate flowers (Averyanov 2011, Barretto et al. 2011). The flowers are often with a long pedicellate ovary and two granular-farinaceous polinia (Tang & Wang 1951, Chen 1978, Fan et al. 2011). The sepals and petals are similar and free. The flowers of all species of Aphyllorchis are often overlooked during field surveys. In 2012, an undescribed species of this genus was discovered at two sites in Taiwan. One site is located in northern Taiwan and was discovered by Sheng-Kun Yu, Chun-Chu Hsu, and Shih-Hsiung Lin. The other site is located in central Taiwan and discovered by Chi-Te Lee.

Aphyllorchis rotundatipetala C.S. Leou, S.K. Yu & C.T. Lee, sp. nova (Figs. 1 and 2).

Holotype: Taiwan. New Taipei City, Sanxia district, 24°52’35”N, 121°22’27”E, 400 m a.s.l., 30 August 2012 C. T. Lee 033 (TAI).

Etymology: The epithet rotundatipetala refers to the apex of petals which are rotundate or obtuse.
Achlorophyllous erect herbs 30–56 cm tall, stem yellowish brown or grey purple, scattered with purple stripes or dots, glabrous, 6 or 7 noded, internodes much shorter at proximal end, each node with a scale 10–23 mm long, scales on distal end oblong-lanceolate, sheathed toward proximal end. Inflorescence loosely racemose, 13–19-flowered; floral bracts reflexed, oblong-lanceolate, 10–16 mm long, 2.5–4 mm wide, purple-striped, 3-nerved. Flowers resupinate, yellow, erect or ascending when young, more or less perpendicular to rachis during blooming, hardly opened or rarely spreading; pedicel and ovary straight, 16–26 mm long, 2–2.5 mm thick, glabrous when viewed with naked eye but bearing sparse or dense glandular hairs when observed under high magnification; sepals similar, yellow, oblong-cymbiform, apex obtuse, 9.5–12 mm long, 3.5–4 mm wide, (10–12 × 4–5.5 mm when flattened), purple-dotted abaxially, lateral ones narrower; petals yellow, oblong, 9.5–11.5 mm long, 2–3 mm wide, (9.5–11.5 × 3.5–4 mm when flattened), thinner, straight or slightly falcate at apex, base subtruncate, apex rotundate or obtuse, margin entire and recurved backward at middle, entire or minutely denticate or rarely praemorse at apex, 3-nerved at base, pinnate-veined above, keeled abaxially along midrib; lip yellow, undivided, similar to petals. Column erect, subterete 10 mm long, arched, yellow, apex slightly dilated, bearing 2 yellow staminodes on dorsal side, slightly protruding or bearing 1 or 2 linear appendages on ventral side, appendages 0.5–1.5 mm long; stigma subterminal; rostellum ovate-ligulate, appressed to stigma, apex entire and bent upward; anther ellipsoid, orange-yellow, 2 mm long, 1.5 mm wide, 2-celled; pollinia 2, each 2-partite, soft, lunar, yellow.
Scanning electron microscope (SEM) observations of *Aphyllorchis rotundatipetala* revealed that it bears dense glandular hairs on the ovary surface and has adjoining single-pollen grains. The pollen shape is variable. The grains have simple apertures and large pores. The exine of pollen grains is reticulate. The pollen grains of *A. rotundatipetala* are similar to those of *A. borneensis* (Ackerman & Williams 1980).

*Aphyllorchis rotundatipetala* grows in the humus in a broad-leaved forest, and it has been found in two localities. In northern Taiwan (Sanxia District) approximately ten plants were found at about 400 m a.s.l. In central Taiwan (Heping District), a small population of three plants were found at about 700 m a.s.l.

Before the present report, *A. montana* was the only species of *Aphyllorchis* recorded in Taiwan (Su 2000). *Aphyllorchis montana* is widely distributed at altitudes ranging from 350 m to 1500 m in the mountains of Taiwan (Su 2000). Both species grow at similar altitudes, but in different habitats. Although *A. rotundatipetala* resembles *A. montana*, the former can be recognized by its peloric flowers.

*Aphyllorchis rotundatipetala* is similar also to *A. simplex*, which also has an unmodified lip. According to the records, *A. simplex* is distributed only in Kwangtung (China) (Chen & Gale 2009). Although *A. rotundatipetala* is morphologically close to *A. montana* and *A. simplex* (Lang 1999, Chen & Gale 2009, Averyanov 2011), it is clearly different from them (see Appendix).

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**References**


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**Appendix.** Morphological differences among *Aphyllorchis rotundatipetala*, *A. montana* and *A. simplex*. Data of *A. simplex* is based on the descriptions in Tang and Wang (1951), Chen (1978), and Chen and Gale (2009).

<table>
<thead>
<tr>
<th>Characters</th>
<th><em>A. rotundatipetala</em></th>
<th><em>A. montana</em></th>
<th><em>A. simplex</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>Flower</td>
<td>peloric</td>
<td>prominent lip</td>
<td>peloric</td>
</tr>
<tr>
<td>Flower color</td>
<td>yellow</td>
<td>yellow</td>
<td>white</td>
</tr>
<tr>
<td>Shape of petal apex</td>
<td>obtuse</td>
<td>obtuse</td>
<td>acute</td>
</tr>
<tr>
<td>Shape of lip</td>
<td>similar to petals, obtuse at apex</td>
<td>3-lobed, acute and crisped at apex</td>
<td>similar to petals, acute at apex</td>
</tr>
<tr>
<td>Color of staminode</td>
<td>yellow</td>
<td>n/a</td>
<td>silver</td>
</tr>
<tr>
<td>Shape of rostellum</td>
<td>ovate-ligulate, entire apex</td>
<td>tongue-like, entire apex</td>
<td>ovate, emarginate apex</td>
</tr>
</tbody>
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