

# *Calypogeia japonica* Stephani, a Newly Recorded Liverwort in Taiwan

Kuei-Yu Yao<sup>1</sup> and Jia-Dong Yang<sup>1,2</sup>

<sup>1</sup>Endemic Species Research Institute; <sup>2</sup>Corresponding author E-mail: jdyang@tesri.gov.tw

**ABSTRACT** We report *Calypogeia japonica* Stephani as a newly recorded liverwort species in Taiwan. It is distinguishable from other congeners by having eye ball-like oil bodies in its leaf cells, abundant gemmae in yellowish-green color at apices of shoots, and U-shaped inserted under leaves with long decurrent bases. The occurrence recorded here for Taiwan, Erziping Trail, Yangmingshan National Park (25° 11' 7.6" N, 121° 31' 28.6"E), is the southernmost locality for this species. This paper also provides a brief description of the species' characters with illustrations and information on its habitat and distribution.

**Key words:** *Calypogeia japonica*, liverwort, new record, Taiwan

## 臺灣新紀錄蘚類—日本護蒴蘚

姚奎宇<sup>1</sup>，楊嘉棟<sup>1,2</sup>

<sup>1</sup>行政院農業委員會特有生物研究保育中心；<sup>2</sup>通訊作者 E-mail: jdyang@tesri.gov.tw

**[摘要]** 本文報導臺灣新紀錄蘚類—日本護蒴蘚(新擬)。本種可藉由其眼球狀的葉細胞油體、莖頂常具黃綠色芽胞及具下沿之 U 形插生的腹葉等特徵，與臺灣其它同屬物種區別。日本護蒴蘚在台灣的分布地點陽明山國家公園二子坪步道(北緯 25° 11' 7.6"、東經 121° 31' 28.6")為本種之最南分布地點。文中並附有本種之形態描述、圖片及棲地與分布等資料。

**關鍵字：**日本護蒴蘚、蘚類、新紀錄、臺灣

### Introduction

Seven species of liverworts belonging to the genus *Calypogeia* have been reported from Taiwan (Yang and Lin 2009, Yang 2011). In our recent plant inventory survey of Yangmingshan National Park, we collected some specimens of *Calypogeia japonica* Stephani from Erziping Trail. It turns out to be a new record to the liverwort flora of Taiwan. This paper briefly describes its characters with illustrations and

provides information on its habitat and distribution. The voucher specimens are deposited at the Herbarium of Endemic Species Research Institute (TAIE).

### Taxonomic Treatment

***Calypogeia japonica*** Stephani, Spec. Hepat. 6:448 (1924).

*Calypogeia tsukushiensis* Amakawa, J. Jpn. Bot. 33:338 (1958).

*Description:*

Plants up to 25 mm long, with leaves 2.0–2.3 mm wide, fresh specimen whitish green to yellowish green in color, dried specimen yellowish brown. Stems irregularly branched, 0.25–0.31 mm in diameter; cells almost undifferentiated, with thin-wall and small trigones. Rhizoids fasciculate at base of underleaves. Leaves imbricate, incubous, ovate to triangular-ovate, 0.9–1.3 mm long, 0.9–1.2 mm wide; margin entire; apex acute to obtuse, sometimes with very shallow bifid. Leaf cells thin-walled, trigones minute, intermediate thickening absent; marginal cells rectangular, 44–50 × 26–41 μm; median cells polygonal, 30–51 × 28–41 μm; basal cells similar to median ones in shape but larger, 54–82 × 29–38 μm. Cuticle smooth. Oil bodies usually 2–3 per cell for leaf lobe, compound type with a pupil (eye-ball like), ovate to elliptical, 12–15 × 5–6 μm. Underleaves widely ovate, 0.36–0.57 mm long, 0.51–0.65 mm wide, bilobed to 1/3–1/2 in length, with long decurrent bases, insertion U-shaped. Gemmae abundant on tips of shoots, 1–2 celled, yellowish green. Sporophyte not seen.

*Habitat and Distribution:*

According to literature (Amakawa 1958, Furuki and Ota 2001, Choi *et al.* 2011) and our field observation, *C. japonica* grows on wet and shaded rock surface with thin layer of soil or humus.

It is found at Erziping Trail, Yangmingshan National Park of Taiwan (elevation 850 m), Japan (Honshu to Kyushu, elevations 210–1,100 m) and Korea (Jeonbuk, elevation 250 m).

*Specimens examined :*

New Taipei City: Sanzhi District, Erziping Trail, Yangmingshan National Park, on wet and

shaded rock surface with thin layer of soil, elevation 850 m, 25° 11' 7.6" N, 121° 31' 28.6"E, Nov. 3, 2009, *J. -D. Yang 6259* (TAIE); Dec. 21, 2015, *J. -D. Yang 8649, 8651, 8652, 8653* (TAIE).

*Remarks:*

The oil bodies in leaf cells are fairly fixed character for the species and apparently have taxonomic value. However, they have not been commonly used because they are absent in dried herbarium materials (Furuki and Higuchi 1996, Stewart 1978). *Calypogeia japonica* is easily distinguishable from other congeners in Taiwan by having the eye-ball like oil bodies in its leaf cells, abundant gemmae in yellowish-green color at apices of shoots, and U-shapedly inserted underleaves with long decurrent bases. *Calypogeia japonica* is similar to *C. tosana* (Stephani) Stephani, a congeners species and very common in Yangmingshan National Park. *Calypogeia tosana* differs in its compound type oil bodies without pupil, and underleaves distinctly 4-lobed (Yang 2011).

According to Furuki & Ota (2001) and Choi *et al.* (2011), *Calypogeia japonica* has previously been known only from Japan and Korea. The occurrence recorded here for Taiwan, Erziping Trail, Yangmingshan National Park (25° 11' 7.6" N, 121° 31' 28.6"E), is the southernmost locality for this species.

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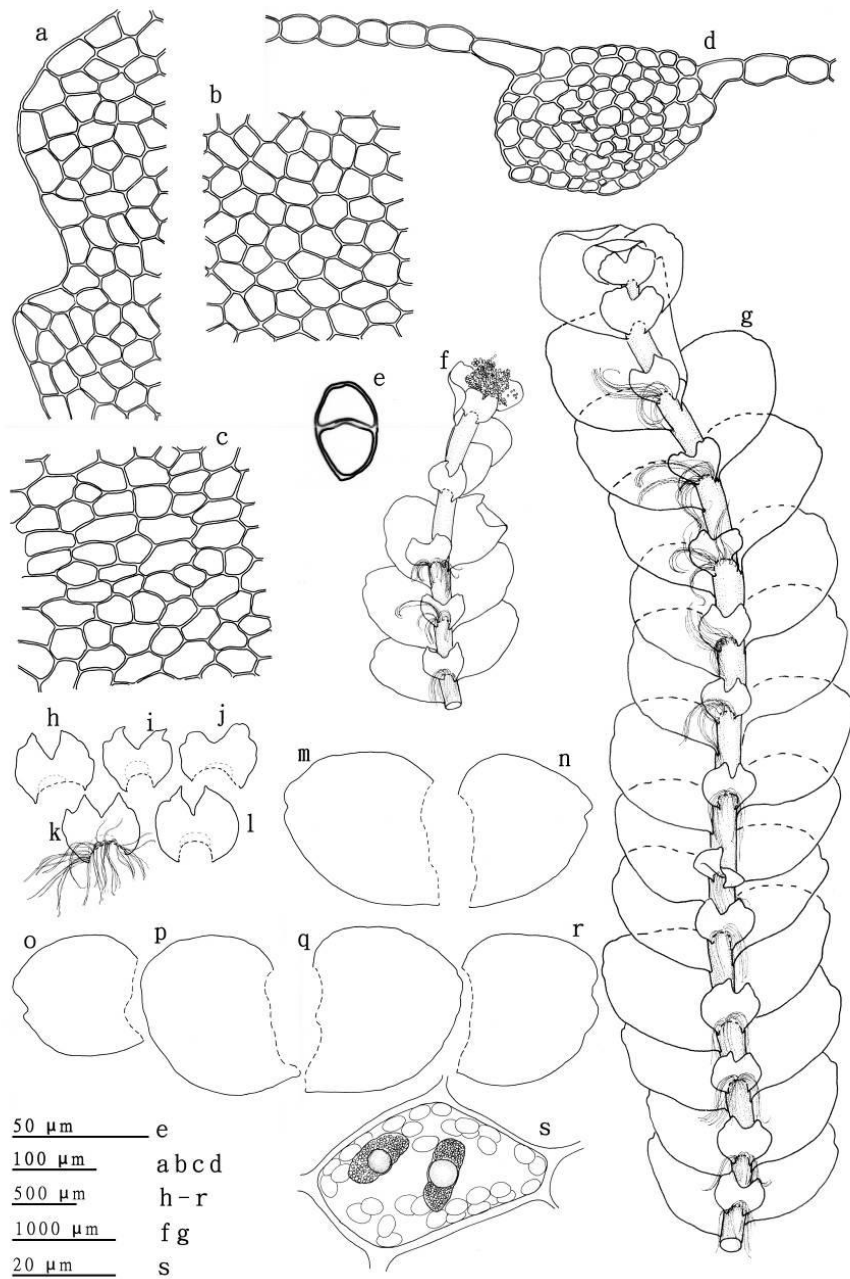
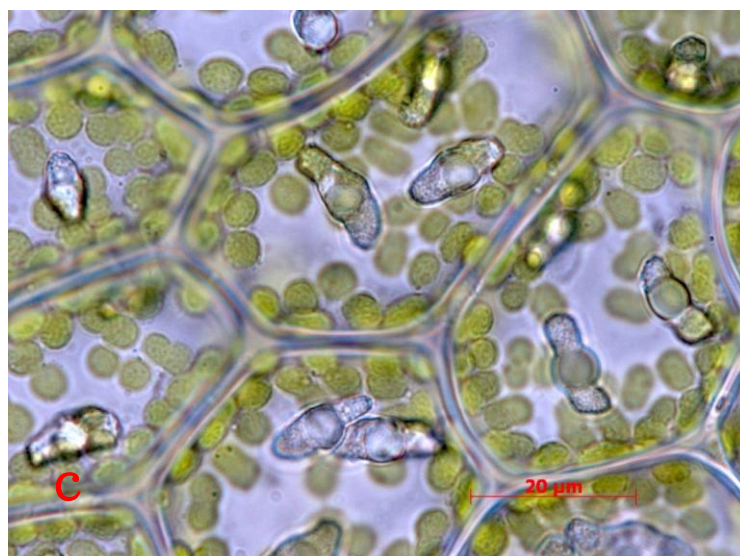
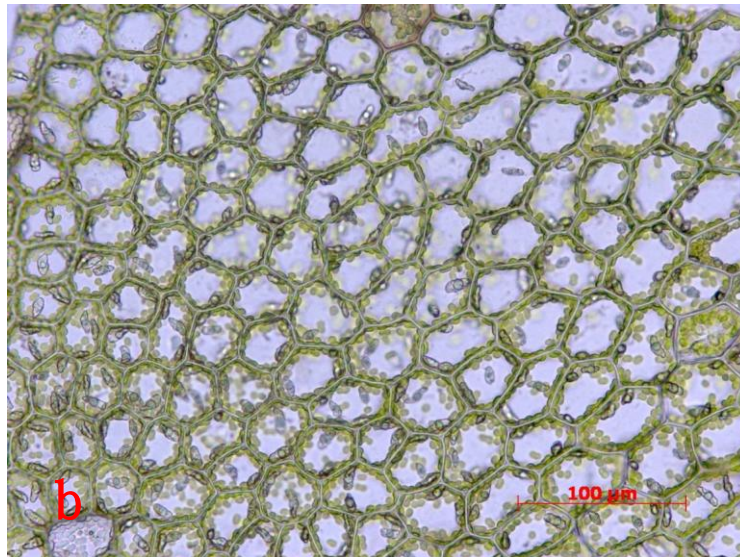


Fig. 1. *Calypogeia japonica* Stephani: a, marginal cells of leaf lobes; b, median cells of leaf lobes; c, basal cells of leaf lobe; d, transverse section of stem; e, gemma; f, gemmae on top of branch, ventral view; g, ventral view of a portion of sterile plant; h-l, under leaves; m-r, leaves; s, oil bodies in the median cells of leaf lobe. (a-r drawn from *J. -D. Yang 6259*, s drawn from *J. -D. Yang 8649*)



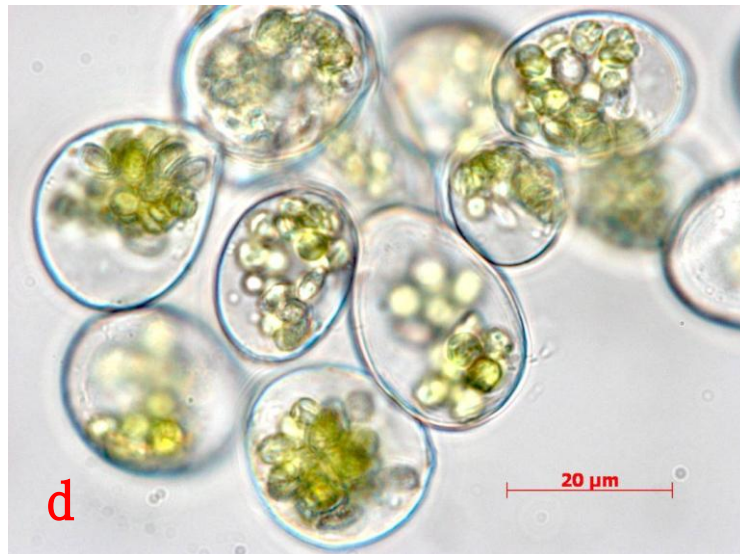


Fig. 2. *Calypogeia japonica* Stephani: a, habitat: on a rock-wall with thin layer of soil; b, cells of leaf lobe; c, eye-ball like oil bodies; d, gemmae. (a. from *J. -D. Yang* 8652, b-d. from *J. -D. Yang* 8649)

Council of Agriculture, Taiwan.

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