

## *Lysimachia quelpaertensis* (Primulaceae), a new species from Jeju Island, South Korea

Kyoung-Hwan Tae\*, Jae-Hwa Tho<sup>1</sup>, Seunghyun Hwang, Yong Dae Park, Eun-Jae Yang  
and Jaeseung Lee

JEMAYU Co., Ltd. 2915 Yusuam-ri, Aewol-eup, Jeju-si, Jeju-do 695-916, Korea

<sup>1</sup>Ecosystem Assessment Division, Ecology Research Dept. National Institute of Environmental Research, Incheon 404-708, Korea

(Received 22 April 2010 : Accepted 28 May 2010)

### 앵초과 참좁쌀풀속 1신종, 탐라까치수염

태경환\* · 도재화<sup>1</sup> · 황승현 · 박용대 · 양은재 · 이재승

(주)제마유 부설연구소, <sup>1</sup>국립환경과학원 생태연구부 생태평가과

**ABSTRACT:** Herein we describe a new species, *Lysimachia quelpaertensis* in Primulaceae from Jeju Island, South Korea. *Lysimachia quelpaertensis* differs from *L. barystachys*, *L. fortunei*, *L. clethroides* and *L. acroadenia* by having verticillate and linear-lanceolate leaves, 5 or 6 petals and 5- or 6-lobed calyx. Among the *Lysimachia* species, only *Lysimachia quelpaertensis* has verticillate leaves and white flowers.

**Keywords:** *Lysimachia quelpaertensis*, Primulaceae, verticillate, new species

**적 요:** 제주도에서 발견한 앵초과 참좁쌀풀속에 속하는 신종 탐라까치수염(*Lysimachia quelpaertensis* K.-H. Tae & J.S. Lee)을 기재 및 도해하였다. 탐라까치수염은 근연종인 까치수염, 진퍼리카치수염, 큰까치수염 및 섬까치수염과는 잎이 윤생하고, 형태가 선형 또는 피침형이며, 화피와 꽃받침이 5장 또는 6장으로 구성된 차이점을 보인다. 탐라까치수염은 참좁쌀풀속 식물종 중에서 잎이 윤생하면서 동시에 백색꽃을 갖는 유일한 종이다.

**주요어:** 탐라까치수염, 앵초과, 윤생, 신종

The genus *Lysimachia* includes about 190 species of perennial and annual plants, and is one of the largest genera in the Primulaceae (Cronquist, 1981; Takhtajan, 1997). Although the distribution of the genus is centered in southwest China, it extends throughout the temperate and subtropical regions of the northern hemisphere, and into southeastern Asia, with outlying members in South America and Africa.

The first comprehensive taxonomic treatment of *Lysimachia*, by Klatt (1866), included 9 sections and 45 species. Significantly, Handel-Mazzetti (1928) gave taxonomic emphasis to structure of androecium and that author's taxonomic treatment of 147 Chinese taxa included 5 subgenera, 19 sections and 12 subsections. However, Chen and Hu (1979) modified and rearranged these into 6 subgenera: *Idiophyton*, *Lysimachia*, *Palladia*, *Heterostylanda*,

*Naumburgia* and *Sandwicensia*.

Nakai (1911) reported 6 species and 1 variety of Korean *Lysimachia* and later (1952) arranged them in 7 species and 1 form: *L. barystachys*, *L. clethroides*, *L. coreana*, *L. davurica*, *L. davurica* f. *angustifolia*, *L. japonica*, *L. leucantha* and *L. pentapetala*. Korean *Lysimachia* were also reported by Mori (1921: 9 species), Kitagawa (1939: 5 species and 1 form), Chung (1957: 8 species) and Lee (1979: 9 species and 1 variety). Taxonomic studies on the genus have concentrated on morphological studies (Chung, 1960; Chung, 1965; Pak, 1974; Kim et al., 2007), cytological study (Ko et al., 1986) and palynological study (Kim et al., 1993).

While studying the genus in Korea, we found a population of *Lysimachia* that does not belong to any taxon hitherto described. The plants grow along the Donnaeko Valley of Mt. Halla on Jeju

\*Author for correspondence: 2001tae@hanmail.net

Island. The population of *L. quelpaertensis* in the type locality is distributed over an area of ca. 50 m<sup>2</sup> and consists of about 80 individuals. We herein describe and illustrate this new species of *Lysimachia* from Korea.

### Taxonomic Treatment

*Lysimachia quelpaertensis* K.-H. Tae & J.S. Lee, sp. nov.

TYPE: KOREA, Jeju-do, Seogwipo-si, Sanghyo-dong, Donnaeko Valley, 450 m, 4 June 2009, K.-H. Tae & S.H. Hwang JMY 2009-00001 (Holotype: KB; isotype: KB, 1 sheet), Fig. 1.

Herba perennis usque ad 40–60 cm alta; radice repente; caule simplici; foliis ternis 4.9–6.0 cm longa subsessilibus vel infimis brevissime determinavi-lanceolatis acutis apiculatisve; racemo exserto multifloro elongato laxiusculo erecto vel acclivis albi corolla

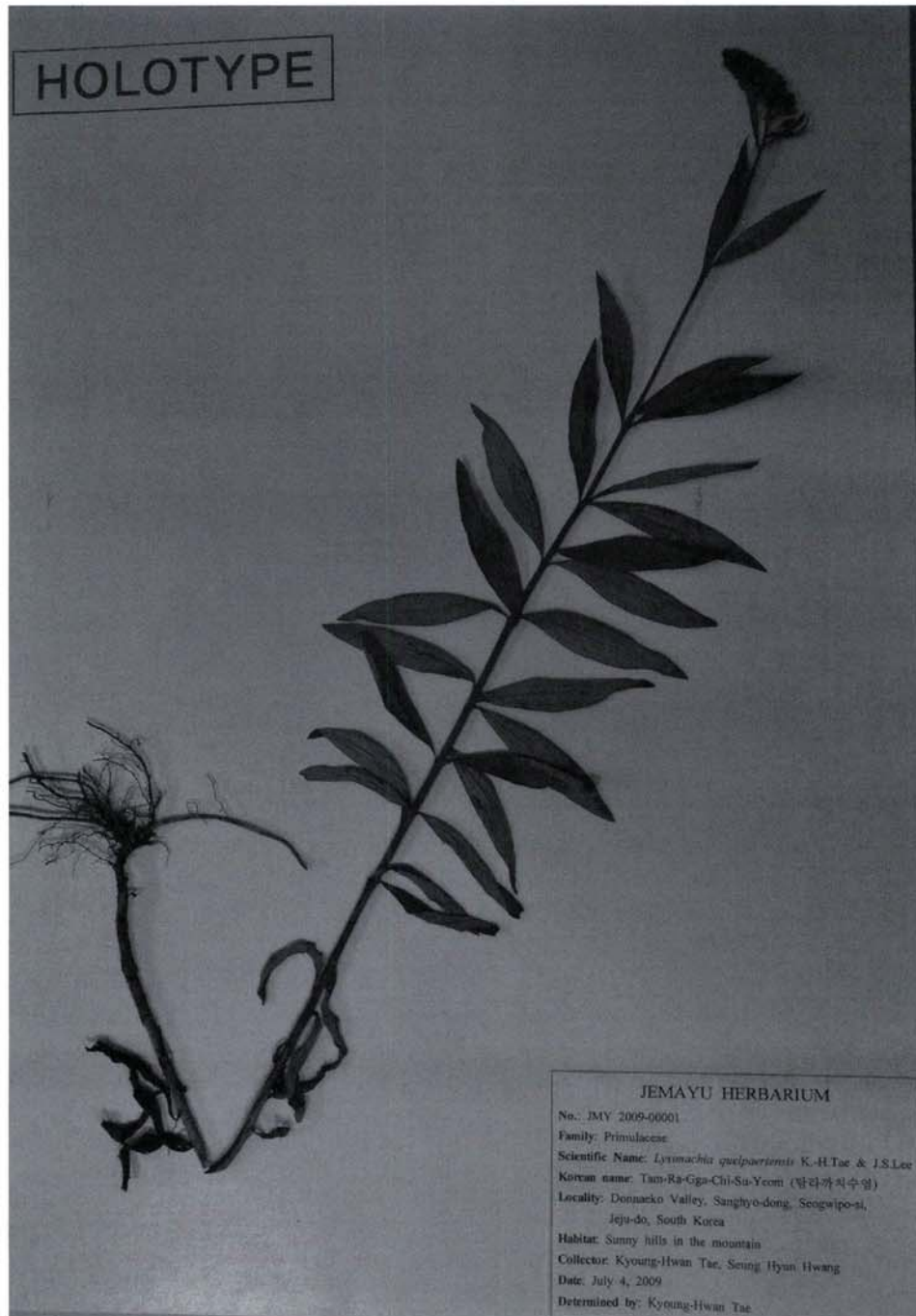


Fig. 1. Holotype of *Lysimachia quelpaertensis* K.-H. Tae & J. Lee (Primulaceae).

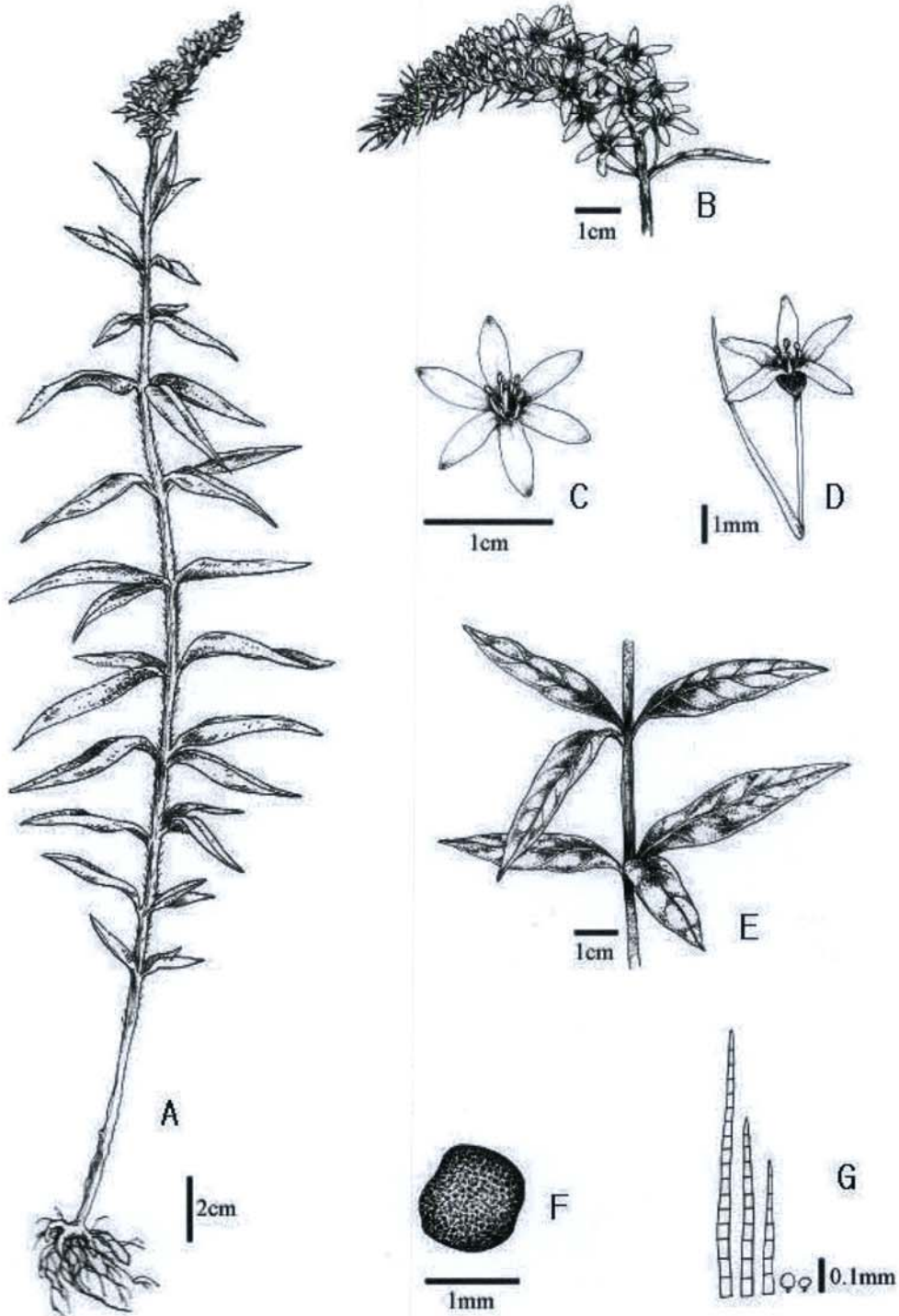


Fig. 2. *Lysimachia quelpaertensis* K.-H. Tae & J. Lee (Primulaceae) A. habit; B. inflorescence; C. corolla and stamens; D. flower and bract; E. leaves; F. seed; G. hair types.

5–6, 0.3–0.6 cm longa; calycis absidae 5–6, 0.2–0.3 cm longi; Fl. Jun.–Aug.

Perennial herb; Stem erect, 40–60 cm tall, non-branching, densely covered with multicellular hairs; Leaves verticillate, linear-

lanceolate, 4.9–6.0 cm long, 0.8–13.0 cm wide, sparsely covered with lanate multicellular hairs on both surfaces, entire; Racemes gooseneck or erect, 3.5–8.7 cm long, densely flowered, glandular and multicellular hair; Pedicel 0.5–0.7 cm long, usually slightly

**Table 1.** Diagnostic morphological characters of the new species and closely related taxa. The morphological characters of *L. quelpaertensis*, *L. barystachys*, *L. fortunei*, *L. clethroides* and *L. acroadenia* are based on Kim et al. (2007) and Lee (1979).

Characters		<i>L. quelpaertensis</i>	<i>L. barystachys</i>	<i>L. fortunei</i>	<i>L. clethroides</i>	<i>L. acroadenia</i>
Habitat		mountain	mountain or wetland	wetland	mountain	mountain or wetland
Leaf	shape	linear-lanceolate	elliptical, oblanceolate rhomboid	elliptical, oblanceolate rhomboid	elliptical-oblong, lanceolate-oblanceolate	broadly lanceolate-oblong
	hair of adaxial side	lanate multicellular	lanate multicellular	glabrous	lanate multicellular	glabrous
	arrangement	verticillate	alternate	alternate	alternate	alternate
	margin	entire	entire	entire	entire	entire
Stem	stipule	lanate	lanate	glabrous	lanate	
	hair	multicellular	multicellular	glabrous	multicellular	glandular
Flower	branch	non branch	non branch or compound branch	non branch or simple branch	non branch or compound branch	non branch or simple branch
	hair of inflorescens	glandular & multicellular	multicellular	glandular	glandular and multicellular	glandular
	hair of bract	lanate	lanate	glandular	lanate	
	shape of inflorescens	gooseneck, erect	gooseneck, erect(rare)	erect	gooseneck, erect(rare)	erect
	hair of pedicel	glandular & multicellular	glandular & multicellular	glandular	glandular & multicellular	
	petal shape	lanceolate-oblong	ovate, elliptical	ovate	ovate, oblong	
	petal color	white	white	white	white	reddish white
	number of petals	5 or 6	5	5	5	5
number of calyx lobes	5 or 6	5	5	5	5	
flowering time	June-Aug.	June-Aug.	June-Aug.	June-Aug.	June-Aug.	June-Aug.

shorter than bracts, glandular and multicellular hair; Calyx 0.2–0.3 cm long, 5- or 6-lobed; Bract 0.4–0.8 cm long; Corolla white, 5 or 6, lanceolate-oblong, 0.3–0.6 cm long; Seeds black, 0.10–0.13 cm long. Fl. Jun–Aug.

Korean name: 탐라까치수염(Tam-ra-ga-chi-su-yeom)  
 Distribution: Korea (Mt. Halla, Jeju-do Province), endemic  
 Specimens examined: Warm-Temperate Forest Research Center, No. 10009274 Hyodoncheon Hyodon-dong, Seoqwoo-si, Jeju-do, Korea, Jae-Hwa Tho, Chang-min Kang, Seok-Jin Oh, Nov. 05, 2007, Col. No.:25238

The new species (Fig. 1) appears to be closely related to *Lysimachia barystachys* and *L. clethroides*. The characteristic features and differences among related species are summarized in Table 1. The new species differs from four other species in the leaf arrangement, leaf shape, number of petal and number of calyx lobes.

*Lysimachia quelpaertensis* has verticillate (whorled) leaves. Leaf shape was linear-lanceolate. Also, the new species can be distinguished from *L. barystachys*, *L. fortunei*, *L. clethroides* and *L. acroadenia* in having petal 5 or 6 and calyx 5 or 6 lobed.

The flower color of genus *Lysimachia* is considered important feature, being either yellow or white. The species of this genus with verticillate leaf arrangement had yellow flowers, as in *L. coreana*, *L. davurica*, *L. vulgaris* and *L. vulgaris* var. *davurica*.

However, *Lysimachia quelpaertensis* has verticillate leaf arrangement and white flowers.

**Key to five Korean *Lysimachia* species**

1. Leaves with lanate multicellular hairs, stems multicellular hairy or glandular hairy
2. Leaves alternate
3. Flowers white ..... *L. clethroides*, *L. barystachys*
3. Flowers reddish white ..... *L. acroadenia*
2. Leaves verticillate ..... *L. quelpaertensis*
1. Leaves glabrous, stems glabrous ..... *L. fortunei*

**Acknowledgments**

This research was supported by the Ministry of Environment of the Korean Government. The authors wish to thank Dr. Kim C.-S. of Warm-Temperate Forest Research Center, Jeju-do for help with some materials.

**Literature Cited**

Chen, F. H. and C. M. Hu 1979. Taxonomic and phylogeographic studies on Chinese species of *Lysimachia*. Acta Phytotax Sinica 17: 21-53.  
 Chung, T. H. 1957. Korean flora II. Shinzisa Seoul pp. 487-490 (in Korean).

- Chung, B. S. 1960. On the *Lysimachia coreana* Nakai. J. Plant Biol. 2: 35-36 (in Korean).
- Chung, T. H. 1965. Illustrated Encyclopedia of Fauna & Flora of Korea. Vol. 5 Tracheophyta. The Ministry of Education Seoul pp.923-927 (in Korean).
- Cronquist, A. 1981. An Integrated System of Classification of Flowering Plant. Columbia Univ. Press New York NY.
- Handel-Mazzetti, H. 1928. A revision of the Chinese species of *Lysimachia* with a new system of the whole genus. Notes RBG Edinb 16: 52-122.
- Kim, J. M., K. H. Tae and J. H. Kim. 2007. A taxonmomy study of *Lysimachia* sect. *Spicatae* (Primulaceae) based on morphological characters. Korean J. Pl. Taxon 1: 61-78 (in Korean).
- Kim, Y. R., K. H. Tae, J. G. Sim and S. C. Ko. 1993. A palyno-taxonomic study on the genus *Lysimachia* in Korea. Korean J. Pl. Taxon 23: 43-58 (in Korean).
- Kitagawa, M. 1939. Lineamenta flora Manshuricae. Inst Sci Res Manchoukuo 3 (Append.): 1-487.
- Klatt, F. W. 1866. Die Gattung *Lysimachia* L. Abh Naturw Ver Hamb 4, 4: 1-45.
- Ko, S. C., I. T. Im and Y. S. Kim. 1986. A cytotoxic study on the genus *Lysimachia* in Korea. Korea J. Pl. Taxon 3: 187-197 (in Korean).
- Lee, T. B. 1979. Illustrated flora of Korea. Hyangmoonsa Seoul, 606-608 (in Korean).
- Mori, T. 1921. An enumeration of plants hitherto known from Corea. Gov. Gen. Chos. Seoul pp. 282-283.
- Nakai, T. 1911. Flora Koreana II. J. Coll. Sci. Imp. Univ. Tokyo 31: 81-83 (in Korean).
- Nakai, T. 1952. A Synoptical Sketch of Korean Flora. Bull. Sci. Mus. Tokyo 31: 90 (in Korean).
- Pak, M. K. 1974. Keys to the Herbaceous Plants in Korea (Dicotyledoneae). Jungumsa Seoul pp. 331-332 (in Korean).
- Takhtajan, A. L. 1997. Diversity and Classification of Flowering Plants. Columbia Univ. Press New York.