



A new record of *Carex aequialta* Kük. (Cyperaceae) in Korea

Seong-Jin Ji, Jong-Cheol Yang, Byoung-Un Oh¹ and You-Mi Lee*

Division of Forest Biodiversity and Herbarium, Korea National Arboretum, Pocheon 487-821, Korea

¹Department of Biology, Chungbuk National University, Cheongju 361-763, Korea

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한국 미기록 식물: 물꼬리사초(사초과)

지성진 · 양종철 · 오병운 · 이유미*

국립수목원 산림생물조사과, ¹충북대학교 생물학과

ABSTRACT: An unrecorded species, *Carex aequialta* Kük. (Cyperaceae), was found in Yecheon-gun, Gyeong-sangbuk-do and Jeju-si, Jeju-do. This species is distinguished from related taxa, *C. maximowiczii* Miq., *C. suifunensis* Kom., *C. phacota* Spreng., *C. dimorpholepis* Steud., *C. shimidzensis* Franch. and *C. tegulata* H. Lév. & Vaniot, by having suberect lateral spikes, awnless pistillate scales, short rhizomes and corymblike inflorescences. This taxon was named 'Mul-kko-ri-sa-cho' in Korean based on its external appearances and habitat. We provide its description, illustrations, photographs and the key of related taxa in Korea.

Keywords: *Carex aequialta*, sect. *Phacocystis*, *Carex*, Cyperaceae, new record

적 요: 사초과의 미기록종인 물꼬리사초(*Carex aequialta* Kük.)가 경상북도 예천군과 제주도 제주시에서 발견되었다. 이 종은 아직까지는 측소수, 망(까락)이 없는 자인편, 짧은 지하경, 산방형으로 배열하는 화서를 가져 근연종인 왕비늘사초(*C. maximowiczii* Miq.), 가는비늘사초(*C. suifunensis* Kom.), 비늘사초(*C. phacota* Spreng.), 이삭사초(*C. dimorpholepis* Steud.), 산꼬리사초(*C. shimidzensis* Franch.) 및 구슬사초(*C. tegulata* H. Lév. & Vaniot)와 구분된다. 국명은 외부형태와 생육지를 고려하여 '물꼬리사초'로 신칭하였고, 이에 대한 기재, 도해, 사진 및 근연분류군과의 검색표를 제시하였다.

주요어: 물꼬리사초, 왕비늘사초절, 사초속, 사초과, 미기록

Carex L., with about 2,000 species, is the largest genus in family Cyperaceae Juss. and is cosmopolitan in distribution (Reznicek, 1990; Goetghebeur, 1998; Egorova, 1999; Dai et al., 2010). It is characterized by all unisexual flowers and completely closed perigynia (Goetghebeur, 1998; Egorova, 1999; Dai et al., 2010). The genus is morphologically divided into four subgenera [*Carex* (=Eucarex), *Psyllophora* (=Primocarex), *Vignea*, *Vigneastra* (=Indocarex)] following Kükenthal (1909).

Section *Phacocystis* Dumort. (=sect. *Acutae* Fries) belongs

to subgenus *Carex* and is distinguished from other sections of the subgenus by having two stigmas and biconvex achenes (Kükenthal, 1909; Ohwi, 1936; Standley, 1985; Hoshino et al., 2011). This section consists of 70-140 species and is widespread in temperate and arctic zones of the northern hemisphere (Standley, 1985; Egorova, 1999).

In this study, *Carex aequialta* Kük. is reported as a newly recorded taxon in Korea. In addition, we provide its description, illustrations, photographs and a key of related taxa.

Description

Carex aequialta Kük., Pflanzenr. IV, 20(38): 354 (1909). (Figs. 1, 2)

*Author for correspondence: ymlee99@forest.go.kr

Type: Japan, Pref. Saitama, Toda, *Matsumura s.n.* (herbarium unclear).

Herbs, perennial, 42.7-59.9 cm tall, with short rhizomes. **Culms** trigonous, 25.9-50.3 cm long, scabrous on upper part of angles. **Leaves** basal and cauline; remnants of old leaves fibrous or not; basal ones brown, scalelike, not disintegrated; distal cauline ones subequaling culm, sheaths 9.4-21.6 cm long, blades 17.7-39.8 cm long, 2.8-4.5 mm wide; ligule scalelike. **Bracts** 3-4, sheathless, proximal blades longer than inflorescence, 6.2-33.1 cm long, 1.7-3.8 mm wide. **Inflorescences** corymblike, with 2-4 spikes, 5.6-27.7 cm long. **Terminal spike** staminate, 1.6-4.5 cm long, 1.9-3.1 mm wide, with peduncle 0.1-0.8 cm long; scales green, white at margin, narrowly obovate, 3.5-4.5 mm long, 1.0-1.3 mm wide, awnless. **Lateral spikes** 2-3, pistillate and rarely androgynous; proximal ones 1.5-4.8 cm long, 5.2-6.5 mm wide, with peduncles 0.5-2.2 cm long; prophylls 1.5-2.5 mm long; scales green, white at margin, elliptically ovate, 2.6-3.5 mm long, 1.0-1.3 mm wide, awnless. **Perigynia** obovate, 2.9-3.5 mm long, 2.0-2.6 mm wide, smooth, adaxial veinless, abaxial 3-6 veined, beak 0.1-0.2 mm long, mouth truncate. **Achenes** suborbicular, 2.0-2.5 mm long, 1.7-2.0 mm wide, erect at apex.

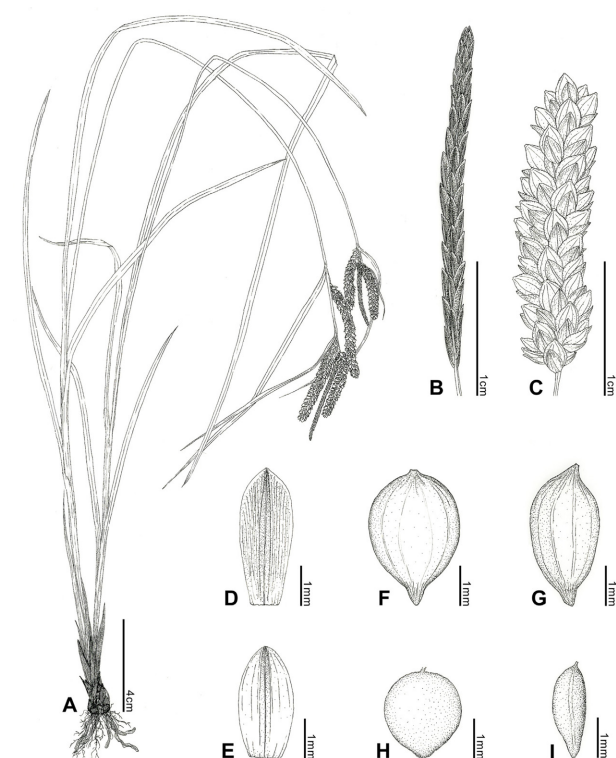


Fig. 1. Illustrations of *Carex aequalta* Kük. A. Habit; B. Terminal spike; C. Lateral spike; D. Staminate scale; E. Pistillate scale; F. Abaxial view of perigynium; G. Side view of perigynium; H. Abaxial view of achene; I. Side view of achene.

Korean name: Mul-kko-ri-sa-cho (물꼬리사초).

Distribution: China, Japan and Korea.

Korea: Gyeongsangbuk-do and Jeju-do.

Voucher specimens: Naksang-ri, Pungyang-myeon, Yecheon-gun, Gyeongsangbuk-do, 15 May 2011, *H. S. Kim* WR-20110515-042 (KH) / Yongsu-ri, Hangyeong-myeon, Jeju-si, Jeju-do, 30 Apr. 2011, *Y. H. Cho & J. H. Kim* WR-20110430-001 (KH); 30 Apr. 2011, *S. J. Ji et al.* 0001-0007 (KH); 30 Apr. 2011, *S. H. Park* 110140 (KH).

Note: *C. aequalta* Kük. is similar to *C. maximowiczii* Miq., *C. suifunensis* Kom., *C. phacota* Spreng., *C. dimorpholepis* Steud., *C. shimidzensis* Franch. and *C. tegulata* H. Lév. & Vaniot. But, the former is distinguished from the latter by having suberect lateral spikes, awnless pistillate scales, short rhizomes and corymblike inflorescences. This species grows at waterside and is found with *C. metallica* H. Lév., *C. dimorpholepis* Steud., *C. laticeps* C. B. Clarke, *Eleocharis attenuata* f. *laeviseta* (Nakai) Hara, *Polypogon fugax* Nees ex Steud. and *Scirpus planiculmis* F. Schmidt. *C. aequalta* Kük. was named 'Mul-kko-ri-sa-cho' in Korean based on its external appearances and habitat. The taxon has been restrictively recorded from Anhui and Jiangsu regions of China, and Honshu and North Kyushu regions of Japan (Dai et al., 2010;



Fig. 2. Photographs of *Carex aequalta* Kük. A. Habit; B. Underground structure; C. Ligule; D. Prophyll; E. Lateral spike; F. Staminate scale; G. Pistillate scale; H. Perigynium; I. Achene.

Hoshino et al., 2011) and is known as ‘Critically Endangered (CR)’ species in Japan (Biodiversity Center of Japan, 2014).

A key to *Carex aequalta* Kük. and its closely related taxa in Korea.

1. Lateral spikes pendent; pistillate scales awned
2. Inflorescence racemelike; pistillate scales excluding awn 2.9-5.4 mm long
3. Perigynia 3.6-5.3 mm long; achenes erect at apex
..... *C. maximowiczii* 왕비늘사초
3. Perigynia 2.9-3.4 mm long; achenes recurved at apex
..... *C. suifunensis* 가늌비늘사초
2. Inflorescence sub-corymblike; pistillate scales excluding awn 1.4-2.6 mm long
4. Peduncle of terminal spike 0.3-2.1 cm long; pistillate scales obovate; perigynia papillate
5. Terminal spike staminate; staminate scales awnless
..... *C. phacota* 비늘사초
5. Terminal spike gynecandrous; staminate scales awned
..... *C. dimorpholepis* 이삭사초
4. Peduncle of terminal spike absent; pistillate scales elliptically ovate; perigynia smooth
..... *C. shimidzensis* 산꼬리사초
1. Lateral spikes suberect; pistillate scales awnless
6. Plants with long rhizomes; inflorescences racemelike
..... *C. tegulata* 구슬사초
6. Plants with short rhizomes; inflorescences corymblike
..... *C. aequalta* 물꼬리사초

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