

Rohdea lihengiana (Ruscaceae s. lato), a new species from Yunnan, China

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Rohdea lihengiana Q. Qiao & C.Q. Zhang (Ruscaceae s. lato), a new species from Yunnan, China, is described and illustrated. It is similar to *R. fimbriata* in the irregularly dentate or fimbriate margin of the bracts and lobes, but differs from it by having sessile leaves, a shorter style, only one fertile bract per flower, and two inflorescences annually.

Key words: karyotype, new species, *Rohdea*, taxonomy

The genus *Rohdea* was first described by Roth (1821) to accommodate only *R. japonica*. Previous studies have recognized only that species in the genus (Liang 1978, Liang & Tamura 2000). Yamashita and Tamura (2004) reduced the generic name *Campylandra* to *Rohdea* based on evidence from molecular analyses, because *Rohdea* was described prior to *Campylandra*. Currently there are about 18 species in *Rohdea*, distributed in SE Asia (Tanaka 2003).

In order to examine the relationships between the species, we undertook a molecular phylogenetic study of the taxa. During the course of this work, a morphologically distinct and apparently undescribed species was identified. It was collected from the Luquan county in Yunnan province. We have observed the characters of the plants for two years and found only minor variation. Examination of type specimens and comparison with published species descriptions and some related specimens deposited in KUN

showed that a new species was at hand. We also present analyses of somatic chromosomes at metaphase of the new species.

Material and methods

The examined plants were collected from Luquan county in Yunnan province. Observations of macroscopic features, such as leaf length was recorded from fresh material in the field. Vouchers will be deposited in the herbarium of the Kunming Institute of Botany (KUN).

Cells of root tips obtained from the plants were used for chromosome counts and karyotype analyses. Root tips were pretreated in 2 mM hydroxyquinoline at room temperature for four or five hours, and then fixed in Carnoy's liquid fixative (3 ethanol: 1 glacial acetic acid) at 4 °C for 18 hours. After maceration in 1 N hydrochloric acid at 60 °C for 10 minutes, the material

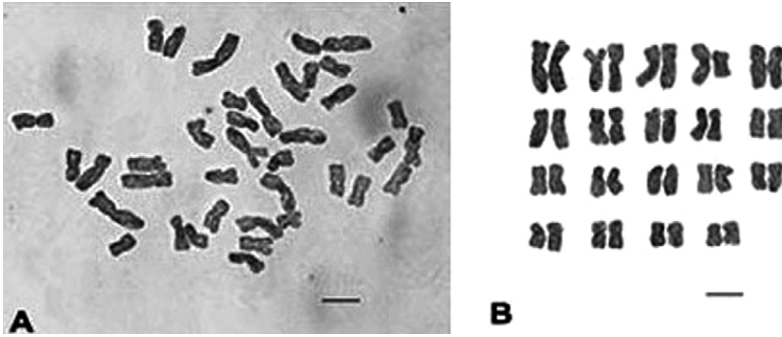


Fig. 1. Photomicrographs of somatic metaphase chromosomes in *Rohdea lihengiana* (from holotype). — A: Metaphase plate. — B: Karyograms. Bar = 10 μ m.

was stained with carbol fuchsin and squashed for observation in 45% acetic acid. Five individuals were investigated for the species. Chromosome measurements were obtained from the photographs of the best five mitotic metaphase plates. Terminology for position of centromeres on chromosomes follows Levan *et al.* (1964), and that for karyotypes follows the classification of Stebbins (1971).

Results

The karyotype morphology of *R. lihengiana* resembles the other species in the genus and has the formula $2n = 38 = 30m + 8sm$. The ratio of the longest to the shortest chromosomes is 2.33:1, and the karyotype symmetry is 2B. The chromosomes of the fourth pair differ significantly in their length, but they both have median centromeres (m type). (Fig. 1 and Table 1).

Rohdea lihengiana Q. Qiao & C. Q. Zhang, *sp. nova* (Fig. 2)

Haec species affinis R. fimbriatae, sed foliis sessilibus, subcoriacteis, bracteis ovato-lanceolatis, margine erosae, in quoque flore una, style brevissimo, 0.5 mm longis differt.

TYPE: China, Yunnan Province, Luquan county, Wumeng village, 25°56'N, 102°45'E, alt. 2250 m, 15.V.2007 Q. Qiao 06051 (holotype KUN).

ETYMOLOGY: The species is named in honour of our revered teacher, eminent botanist and pioneer researcher on *Rohdea*, Professor Li Heng of the Kunming Institute of Botany, Chinese Academy of Science.

Herbs perennial, rhizome yellow-brown or green, terete, slightly curved, 1–3 cm thick. Stem short. Leaves 3–6(8), basal, petiole indistinct, leaf blade lorate-lanceolate, 30–70 \times 4–7 cm, apex acuminate, papery or subleathery. Spike 5–6 \times 2–3 cm, densely many-flowered, sometimes with several sterile apical bracts, peduncle 10 cm, fertile bracts 1 per flower, pale green, 7–8 \times 3–4 mm, ovate-lanceolate, membranous, margin white, irregularly dentate. Perianth subcampanulate, tube 3–4 \times 3–4 mm. Lobes 6, spreading, yellow or green, 3–4 \times 3–4 mm, broadly ovate, fleshy, margin white, membranous, irregularly dentate or fimbriate. Stamens 6, anthers positioned as high as stigma, dorsifixed, pale-yellow, 1–1.5 mm long, alternating with 6 tubercles, filaments with incurved free part 2–3 mm. Pistil 1, 3–4 mm long, style 0.5–1 mm or inconspicuous, ovary ovoid-globose, 3 mm in diam, 3-loculed, ovules 2 per locule. Stigma 3-lobed. Berries ovoid to globose.

HABITAT ECOLOGY AND ENVIRONMENT: The specimens were growing on lateritic soil in conifer forest, the substrate pH is 6.2.

PHENOLOGY: Flowering March to May and October to December; berries are usually ripe in November and April. To our knowledge it is the only species in *Rohdea* that flowers twice each year.

Comparison of morphology between the species of *Rohdea* indicates that this species closely resembles *R. fimbriata* in having irregularly dentate or fimbriate margins of bracts and lobes. These features are unique and consistent and separate the two species from the congeners. The two species also differ clearly from each other in many characters (Table 2 and Fig. 2).

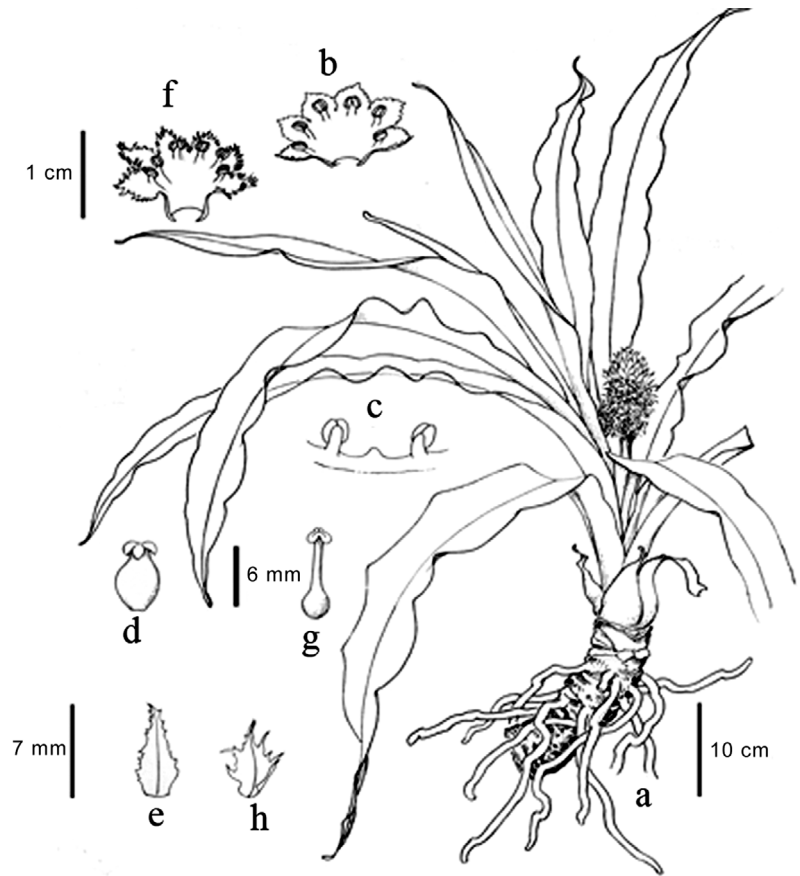


Fig. 2. Details of *Rohdea lihengiana* and *R. fimbriata* (from holotype, drawn by Mr. Yang Jiankun). — **a–e:** *R. lihengiana*. **a:** Plant. **b:** Perianth. **c:** Tubercle between two lobes. **d:** Pistil. **e:** Bract. — **f–h:** *R. fimbriata*. **f:** Perianth. **g:** Pistil. **h:** Bract.

Table 1. The parameters of chromosomes in *Rohdea lihengiana*.

Chromosome no.	Relative length	Arm ratio	Type
1	1.79 + 2.31 = 4.1	1.29	m
2	1.46 + 2.27 = 3.73	1.55	m
3	1.39 + 2.12 = 3.51	1.53	m
4	1.46 + 1.9 = 3.36	1.30	m
	0.88 + 1.17 = 2.05	1.33	m
5	1.17 + 2.05 = 3.22	1.75	sm
6	1.02 + 2.19 = 3.21	2.15	sm
7	1.17 + 1.68 = 2.85	1.44	m
8	0.73 + 1.9 = 2.63	2.60	sm
9	0.88 + 1.61 = 2.49	1.50	m
10	0.95 + 1.39 = 2.34	1.46	m
11	1.02 + 1.32 = 2.34	1.29	m
12	0.95 + 1.32 = 2.27	1.39	m
13	0.58 + 1.75 = 2.33	3.0	sm
14	1.02 + 1.17 = 2.19	1.15	m
15	1.02 + 1.17 = 2.19	1.15	m
16	1.02 + 1.39 = 2.41	1.36	m
17	0.88 + 1.17 = 2.05	1.33	m
18	0.73 + 1.17 = 1.9	1.60	m
19	0.73 + 1.02 = 1.75	1.40	m

ADDITIONAL SPECIMEN EXAMINED (paratype): China, Yunnan province, Luquan county, Wumeng village, alt. 2250 m, *Q. Qiao & C. Q. Zhang 20070515* (KUN).

Table 2. Main morphological characters that distinguish *Rohdea lihengiana* from *R. fimbriata*.

Characters	<i>R. fimbriata</i>	<i>R. lihengiana</i>
Leaf shape	elliptic-lanceolate	lorate-lanceolate
Leaf margins	crisped/entire	even/denticulate
Leaf texture	papery	leathery
No. of bracts	2	1
Margins of bracts	fimbriate	irregularly dentate
Margins of lobes	fimbriate	irregularly dentate
Style length	1–3.5 mm	0–0.5 mm
Appendage between anthers	present	absent
Breadth of ovary	2 mm	3 mm

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