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Records of *Ranunculus longicaulis* and *R. pseudohirculus* (Ranunculaceae) from Nepal

Andrey S. Erst[(1*)] and Alexander P. Sukhorukov[(2,3)]

1. Central Siberian Botanical Garden, Zolotodolinskaya st. 101, Novosibirsk 630090, Russia.
2. Department of Higher Plants, Biological Faculty, Moscow Lomonosov State University, Vorobyovy Gory, 119991, Moscow, Russia.
3. Email: suchor@mail.ru
** Corresponding author. Email: erst_andrew@yahoo.com*

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ABSTRACT: The records of *Ranunculus longicaulis* and *R. pseudohirculus* are cited from Nepal. Both species were earlier identified as *R. pulchellus*. The key for delimitation as well as taxonomic notes of these three species are provided. Some populations from Central Asia and Himalayas differ in pubescence details and morphometry.

KEY WORD: Nepal, *Ranunculus*, taxonomy.

INTRODUCTION

The genus *Ranunculus* L. comprises approximately 550 species distributed in all continents excluding the Antarctic (Wang and Gilbert, 2001). Twenty-five representatives have been reported from the territory of Nepal (Press et al., 2000). One of them, *R. tricuspis* Maxim., clearly belongs to the genus *Halerpestes* Greene (*H. tricuspis* (Maxim.) Hand.-Mazz.). Alpine *Ranunculus* species require special interest as one of the groups with rich diversity in Central Asia, Tibet and Himalayas, namely *R. pulchellus* aggregates, which are diversely concepted in the floristical accounts or systematic treatments (Hooker and Thomson, 1855; Ovchinnikov, 1937; Hara and Williams, 1979; Liou, 1980; Grierson 1984; Kadota, 1991, 1995a, 1995b; Rau, 1993; Liu, 1994; Tamura, 1997; Borodina-Grabovskaja, 2001; Paun et al., 2005; Yonekura 2008; Yang and Huang 2008). Taxonomically, the *R. pulchellus* group is usually considered *Ranunculus* sect. *Auricomus* (Spach) Schur ser. *Pulchelli* W.T. Wang (Wang, 1995) or *Ranunculus* sect. *Ranunculus* subsect. *Pulchelli* (W.T. Wang) Luferov (Luferov, 2006). It includes *R. densiciliatus* W.T. Wang, *R. humillimus* W.T. Wang, *R. krasnovii* Ovcz., *R. longicaulis* C.A. Mey., *R. pseudohirculus* Schrenk, *R. pulchellus* C.A. Mey., *R. yechengensis* W.T. Wang, and the recently described *R. tuvinicus* A. Erst (Erst, 2007), and is distinguished by those characters of a perennial life history, leaves shaped elliptical or lanceolate with margin entire, dentate or, only in the upper part, lobate and peduncles mostly covered with reddish hairs (Ovchinnikov, 1937). The achenes possess a small semi-translucent edge (Erst, 2008, see Fig. 1). According to molecular results (Emadzade, 2010; Emadzade et al., 2010), *R. pulchellus* aggregate is part of the Asiatic alpine *Ranunculus* clade. Despite the limited number of samples included in this analysis, the species rank of some taxa, e.g., *R. longicaulis* or *R. pseudohirculus*, is well supported. *R. membranaceus* Royle and *R. heyingensis* W.T. Wang differ from members of the *R. pulchellus* group by life history, dense pubescence and heterophylly, as well as by achenes having a different structure.

From the territory of Nepal, only *R. pulchellus* has been reported (Press et al., 2000; Yonekura, 2008). The aim of the present paper is to discover the diversity of *R. pulchellus* aggregate in Nepal, with some taxonomical and morphological comments.

MATERIAL AND METHODS

Field investigations were carried out in Central and West Nepal during the years 2008 to 2010. Material from the collections in BM, H, K, LE, MHA and MW (acronyms are given at http://sweetgum.nybg.org/ih/) was examined. For morphological comments, additional specimens of all three species were revised in NS, NSK and ALTB. The images of achenes were obtained with the stereoscopic microscope "Discovery V4" and treated with AxioVision software.

RESULTS

Three species from *R. pulchellus* group (*R. pulchellus* s. str., *R. pseudohirculus* and *R. longicaulis*) are to be included in the flora of Nepal. The characteristics to distinguish these species are given in the key.

Key to the delimitation of *R. pulchellus* group in Nepal

1a. Stems elongated, 20 to 35 cm tall, branched from the middle; all leaves entire, narrowly spatulate; flowers 0.7 to 1 cm in diameter, petals elliptical or oblong, equal to sepals or slightly longer, sometimes underdeveloped. ……..…….. 1. *R. longicaulis*

1b. Stems up to 20 cm tall; leaves elliptical, oblong-elliptical or broadly spatulate; flower at least 1 cm in diameter; petals obovate or almost round with petals/sepals ratio not less than 1.5:1 …….…. 2

2a. Leaves flat, rosette leaves dentate or lobate in their upper part, cauline leaves pinnatifide. Flowers 1 to 1.7 cm in diameter; petals obovate ……..……. 2. *R. pulchellus*

2b. Leaves spoon-shaped (not flat), their margin entire or with 1 to 2 small teeth. Flower 1.4 to 2.5 cm in diameter; petals broadly obovate or almost round ……..…….. 3. *R. pseudohirculus*

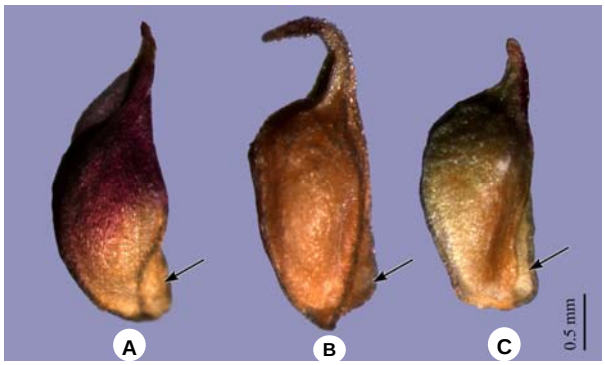

Fig. 1. Achenes of the species. A: *Ranunculus pseudohirculus*. B: *R. pulchellus*. C: *R. longicaulis* – cursor: semi-translucent edge at the basal achene's part.

TAXONOMIC TREATMENTS

1. ***Ranunculus longicaulis*** C.A. Mey. in Ledebour, Fl. Alt. 2: 308. 1830.

R. pulchellus C.A. Mey. var. *longicaulis* Trautv., Bull. Soc. Nat. Mosc. 33: 68. 1860.
R. nephelogenes Edgew. var. *longicaulis* (Trautv.) W.T. Wang, Bull. Bot. Res. Harbin 7(2): 110. 1987.
R. pulchellus auct. non C.A. Mey.

Described from [Russian] Altai. Lectotypus (Luferov and Borodina-Grabovskaya, in prep.): "In locis humidis ad fl. Tscharysch (Ledebour), in locis paludosis ad fontes fl. Jelo, *Al. Bunge 830*", (LE!). See Fig. 2.

Ecology and elevation: Moist meadows, swamps, brooks, gravelly substrates in the river beds at the altitudes 3,000 to 4,500 m.

Specimens seen from Nepal: *West part*: (Humla prov.), near Simikot, 12,000 ft, 31.V.1952, *O. Polunin, W.R. Sykes & L.H.J. Williams 4238* (BM); *Central part*: (Mustang prov.), Muktinath, in moist meadow, 12,500 ft, 8.VI.1954, *A. Stainton, W.R. Sykes & L.H.J. Williams 5639* (BM); Mustang, Namdo, in marshy field, 13,500 ft, 6.VIII.1954, *A. Stainton, W.R. Sykes & L.H.J. Williams 2243* (BM).

Remarks: Some specimens from Russia (Altai and Tuva Republics) and Kazakhstan are distinguished by glabrous or sparsely pubescent sepals and smaller diameter of the corolla.

General distribution: Asiatic Russia (Mountain South Siberia), Central Asia (Eastern Kazakhstan, Mongolia, Kyrgyzstan, Uzbekistan, Tajikistan and China) and Himalayas (India, Pakistan and Bhutan).

2. ***Ranunculus pulchellus*** C.A. Mey. in Ledebour, Fl. Alt. 2: 333. 1830.

R. longicaulis C.A. Mey. subsp. *pulchellus* (C.A. Mey.) Gubanov, Fl. Vost. Khangaya: 130. 1983.
R. longicaulis C.A. Mey. var. *pulchellus* (C.A. Mey.) Gubanov, Fl. Khangaya: 110. 1989.

Described from Siberia. Lectotypus (Luferov and Borodina-Grabovskaya, in prep.): "In [locis] humidis subsalsis ad [fl.] Tschuja (Bunge)" (LE!). See Fig. 3.

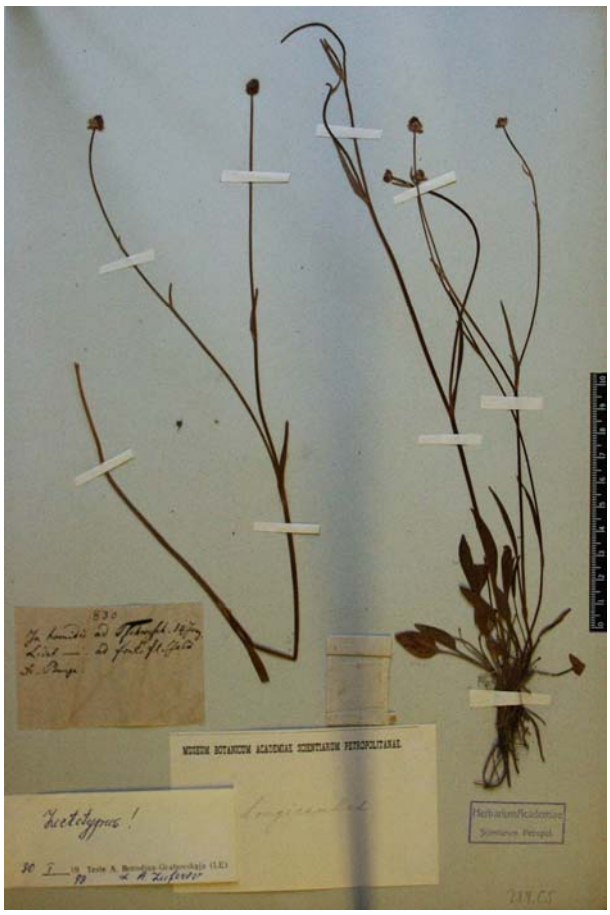

Fig. 2. Lectotype specimen of *Ranunculus longicaulis* C. A. Mey.

Ecology and elevation: Moist meadows, river beds, forest belts and lower part of the alpine belt, at altitudes 2,700 to 4,000.

Fig. 3. Lectotype specimen of *Ranunculus pulchellus* C. A. Mey.

Specimens seen from Nepal: *Central part*: Langsisa Kharka, 14,200 ft, swampy pool, 15.VI.1949, *O. Polunin 415* (BM); Langtang valley, 13,000 ft, flooded grassland, 26.VI.1965, *A.D. Schilling & al. 440* (K). The plants of these specimens possess uncharacteristically long leaf lobes. *Eastern part*: Lumbasumba Himal, 14,500 ft, on banks near a stream, 30.X.1971, leg. *Beer 10657* (BM); Kambachen, 27º44' N, 87º59' E, alt. 4,100 m, boggy ground in standing water, 12.IX.1989, S. *Crawford & al. 609* (K).

Remarks: Most specimens from Central Asia collected at least in the Altai Mountains (on the border of Russia, Kazakhstan and Mongolia) differ from Nepali plants by having glabrous peduncles.

General distribution: Asiatic Russia (South Siberia), Central Asia (Mongolia, China and Eastern Kazakhstan) and Himalayas (India, Pakistan and Bhutan).

3. ***Ranunculus pseudohirculus*** Schrenk in Fisch. & C.A. Mey., Enum. Pl. Nov. 1: 65. 1841.

R. pulchellus var. *pseudohirculus* (Schrenk) Trautv., Bull. Soc. Nat. Mosc. 33, 1: 68. 1860.
R. longicaulis C.A. Mey. var. *pseudohirculus* (Schrenk) Gubanov, Fl. Khangaya: 110. 1989.
R. pulchellus auct. non C.A. Mey.

Lectotypus (Luferov & Borodina-Grabovskaya, in prep.): [Eastern Kazakhstan] "In Alatau, 19.VII. 1840, *A. Schrenk 578*" (LE!). See Fig. 4.

Ecology and elevation: Alpine and subalpine meadows, river beds, at altitudes 4,200 to 5,700 m.

Specimens seen from Nepal: *Western part:* Mukden

Fig. 4. Lectotype specimen of *Ranunculus pseudohirculus* Schrenk.

Khola, among grass, 18,500 ft, 2.VI.1952, *O.Polunin, W.R. Sykes, L.H.J. Williams 1173* (BM); (Dolpa prov.) Khung Khola headwaters, 5,200 m, 16.VIII.1973, *Grey-Wilson & Phillips 645* (BM). *Central Nepal*: Bhangyan Khola, 13,500 ft, swamp, 17.VI.1953, *P.C. Gardner 747* (K); Mustang prov., Annapurna Conservation area, Trekking route Jomosom– Muktinath, 5 km west from Muktinath, Jharkot village, 3,600 m, 28º50' N 83º53' E, wet grassy meadow, 7.V.2010, *A. Sukhorukov 114* (MW). *Eastern part*: Thami, open marshy ground, 14,000 ft, 12.V.1954, s. leg. *58* (K).

Remarks: Some specimens from Russia (Altai and Tuva Republics) are distinguished by glabrous or sparsely pubescent sepals and larger diameter of corolla.

General distribution: Asiatic Russia (South Siberia), Central Asia (Eastern Kazakhstan, Uzbekistan, Tajikistan, Mongolia and China) and Himalayas (India, Pakistan and Bhutan).

CONCLUSION

The species rank of *R. longicaulis* and *R. pseudohirculus* is morphologically supported. They seem to be widely distributed, but their range in Himalayas and China must to be clarified. Also some specimens within one species have different morphological features.

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長莖毛茛(*Ranunculus longicaulis*)及 *R. pseudohirculus*(毛茛科, Ranunculaceae)在尼泊爾的紀錄

Andrey S. Erst[1*] and Alexander P. Sukhorukov[2]

1. Central Siberian Botanical Garden, Zolotodolinskaya st. 101, Novosibirsk 630090, Russia.
2. Department of Higher Plants, Biological Faculty, Moscow Lomonosov State University, Vorobyovy Gory, 119991, Moscow, Russia.
3. Email: suchor@mail.ru
* 通信作者。*Email: erst_andrew@yahoo.com*

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摘要：本文報導於尼泊爾之長莖毛茛（*Ranunculus longicaulis*）及 *R. pseudohirculus* 此二物種的紀錄；這二個種物因早期被鑑定為美麗毛茛（*R. pulchellus*）而忽略。本文提供鑑別此三物種的檢索表和分類資訊；並發現其部分分布於中亞及喜馬拉雅區域的族群，在其柔毛的細微構造上和形態上有所差異。

關鍵詞：尼泊爾、毛茛屬、分類學。