

УДК 582.682+581.95(517.3)

## New regional records and conspectus of the genus *Corydalis* DC. (Papaveraceae) in Mongolia

## Новые региональные находки и конспект рода *Corydalis* DC. (Papaveraceae) в Монголии

Munkh-Erdene T.<sup>1</sup>, Gundegmaa V.<sup>2</sup>

Мунх-Эрдэнэ Т.<sup>1</sup>, Гундэгмаа В.<sup>2</sup>

<sup>1</sup>Department of Botany, Institute of General and Experimental Biology, Mongolian Academy of Sciences, Ulaanbaatar, Mongolia.  
E-mail: munkh-erdene@botany.mas.ac.mn, tmunkhu@gmail.com

<sup>1</sup>Отделение Ботаники, Институт общей и экспериментальной биологии, Монгольская Академия Наук, Монголия

<sup>2</sup>Department of Biology, School of Mathematics and Natural Sciences, Mongolian National University of Education  
E-mail: chalkhorum@gmail.com

<sup>2</sup>Отделение Биологии, Институт Математики и Естественных Наук, Монгольский Национальный Университет

**Summary.** This is a revision of the taxonomic composition of the Mongolian genus *Corydalis* DC. At present, there are 10 species and 2 subspecies of the genus in the flora of Mongolia. New species (*Corydalis sayanensis* Peschkova) is written in the flora of Mongolia, again one species was added (*C. schanginii* (Pall.) B. Fedtsch.). Here the species composition of the genus *Corydalis* DC. of the vascular flora of Mongolia is presented according with changes in new conspectus (Urgamal et al., 2014). We added 4 species on phytogeographical records of new regions included in the vascular flora of Mongolia.

**Реферат.** В статье представлен пересмотр таксономического состава рода *Corydalis* DC. из Монголии. В настоящее время во флоре Монголии насчитывается 10 видов и 2 подвида рода. Новые виды (*Corydalis sayanensis* Peschkova) отмечены в флоре Монголии с добавлением одного вида (*C. schanginii* (Pall.) B. Fedtsch.). Здесь представлен видовой состав рода *Corydalis* DC. сосудистой флоры Монголии в соответствии с изменениями в новом конспекте (Urgamal et al., 2014). Мы добавили 4 вида к фитогеографическим записям новых регионов, включенных в сосудистую флору Монголии.

### Introduction

The genus *Corydalis* DC. (Papaveraceae Jussieu, 1789) is little known taxonomically in Mongolia. Grubov (1982) first registered 5 species, later Ulzikhutag (1984) added 3 species, Gubanov's conspectus (1996) included 7 species, 4 subspecies and at the last Urgamal et al. (2014) registered 10 species of the genus in the flora of Mongolia (Table 1). Currently, our paper includes 10 *Corydalis* species and 2 subspecies. In 2013 we added new collections of *Corydalis sayanensis* Peschkova. The taxonomy of the genus *Corydalis* in Mongolia is revised here.

Table 1

History of the genus *Corydalis* species number in the flora of the Mongolia

Sources and references	Species and subspecies number
Grubov V. I. (1982)	5
Ulzikhutag N. (1984)	8
Gubanov I. A. (1996)	11
Urgamal et al. (2014)	10
At present (in this paper)	12

## Material and Methods

The *Corydalis* specimens from the Herbarium of the Institute of general and experimental Biology (UBA), Mongolian Academy of Science, the Herbarium of the National University of Mongolia (UBU), The Herbarium of the Central Botanical Garden of Siberia (NS, NSK), Russian Academy of Science as well as additional data, were used for the study. In a totaly, over 600 sheets of specimens collected by numerous scientists during a period from between 1896 to 2014 years were studied. The nomenclature and taxonomy follow works of Lidén Magnus (2008).

## Results

The taxonomy of *Corydalis* in Mongolia is revised here. Currently 10 species and 2 subspecies are listed for Mongolia. In the conspectus of Gubanov (1996), two species (*C. schanginii* (Pall.) B. Fedtsch., *C. sajanensis* Peschkova) have been added. It's revealed that 10 species and 2 subspecies occur in the flora of Mongolia at present. This is the revision of the phytogeographical regions composition of the Mongolia which was based on the Herbarium (UBA). The distribution data was carried in phytogeographical regionalization (Grubov, 1982) of the Mongolia (Table 2). According to our research work there have been identified new regional records for 4 species of the *Corydalis* in Mongolia. In totally, the following general of *Corydalis* DC. are knowing to occur in Mongolia. As result since of Urgamal et al. (2014) new species have been added (Table 3).

### CONSPECTUS OF THE GENUS *CORYDALIS* DC. 1805 OF MONGOLIA

Fl. Franz., ed. 3, 4: 637. 1805

Symbols: # - new combination,

+ - new species added,

6+ - new region records.

***Corydalis adunca* Maxim.** 1879, Bull. Acad. Imp. Sci. Saint-Petersburg, Sér. 3, 24: 29. [6+ (Munkh-Erdene 2016), 7, 13, 15].

***C. capnoides* (L.) Pers.** 1806, Syn. Pl. 2: 270. *C. capnoides* subsp. *tenella* Kamelin, 1986, Bull. Mosk. Obshch. Inp. Prir., Otd. Biol. 91 (6): 91. [2+ (Doronkin et al. 2015), 6+(Munkh-Erdene, Urgamal 2014), 7, 9+ (Munkh-Erdene 2011), 14].

***C. grubovii* Mikhailova** 1981, Novosti Syst. Vyssh. Rast. 18: 197. [6+ (Munkh-Erdene, 2016), 7, 14+ (1345, UBA)]. – Endemic. Described from Mongolian Altai phytogeographical region (LE).

**#*C. impatiens* (Pall.) Fisch.** 1821, in DC., Reg. Veg. Syst. Nat. 2: 124; *Fumaria impatiens* Pall. 1776. *Corydalis sibirica* var. *impatiens* (Pall.) Regel, 1861, Bull. Soc. Imp. Nat. Moscou 34(1): 143. *C. sibirica* subsp. *impatens* (Pall.) Gubanov, 1996, Konsp. Fl. Vneshn. Mong. 52. *C. impatiens* (Pall.) Fisch. 1821; Urgamal et Munkh-Erdene, 2014, Consp. Vasc. Pl. Mongolia: 79. [1+, 2+, 3+ (Munkh-Erdene 2011), 7]. – Discribed from Mongolian Altai phytogeographical region (MW).

***C. inconspicua* Bunge** 1842, Fl. Ross. 1: 104. *C. tenella* Kar. et Kir. 1842, Bull. Soc. Imp. Nat. Moscou 15(1): 143. *C. capnoides* subsp. *tenella* Kamelin, 1986, Bull. Mosk. Obshch. Inp. Prir., Otd. Biol. 91 (6): 91. [1, 2, 6+ (Gundegmaa, 2014), 7].

***C. pauciflora* (Steph.) Pers.** 1806, Syn. Pl. 2: 269. *Fumaria pauciflora* Stephan ex Willd. 1800, Sp. Pl. 3: 861. [1, 2, 6, 7+ (710, UBA), 13].

**+*C. sajanensis* Peschkova** 1990, Bot. Zhurn. (Moscow & Leningrad) 75: 85. [1+, 6+ (Gundegmaa, 2014)]. – Described from South Siberia (LE). Isotypus (NS).

**+*C. schanginii* (Pall.) B. Fedtsch.** 1904, Trudy Imp. S.-Peterburgsk. Bot. Sada. 23(2): 372. – *Fumaria schanginii* Pall. 1779, Acta Acad. Sci. Imp. Petrop. 6: 267. [7, 14].

***C. sibirica* (L.fil.) Pers.** 1806, Syn. Pl. 2: 270. *Fumaria sibirica* L. f. 1781, Suppl. Pl. 314. [1, 2, 3, 4, 7+, 8+ (Munkh-Erdene, 2011), 9, 10, 13].

***C. stricta* Steph ex Fisch.** 1821, in DC., Reg. Veg. Syst. Nat. 2: 123. [6, 7, 13+ (0412, UBA)].

**#*C. stricta* subsp. *holosepala* Mikhailova** 1981, Novost. Syst. Vyssh. Rast. 18:193. [7]. Endemic. Described from Mongolian Altai phytogeographical (LE).

**#*C. stricta* subsp. *spathosepala* Mikhailova** 1981, Novost. Syst. Vyssh. Rast. 18:194. [7]. – Subendemic. Described from Mongolian Altai phytogeographical region (LE).

Table 2

The number of phytogeographical regions of the Mongolia for *Corydalis* species (by Grubov, 1982)

Species name	Number of phytogeographical regions
1. <i>Corydalis adunca</i>	6+ (Munkh-Erdene, 2016), 7, 13, 15
2. <i>C. capnoides</i>	2+ (Doronkin, 2015), 6+ (Munkh-Erdene, 2016), 7, 9+ (Munkh-Erdene 2011), 14
3. <i>C. grubovii</i>	6+ (Munkh-Erdene, 2016), 7, 14+ (this paper)
4. <i>C. inconspicua</i>	1, 2, 6+ (this paper), 7
5. <i>C. pauciflora</i>	1, 2, 6, 7+ (this paper), 13
6. <i>C. sibirica</i>	1, 2, 3, 4, 7+, 8+ (Munkh-Erdene, 2011) 9, 10, 13
#7. <i>C. impatiens</i>	1+, 2+, 3+ (Munkh-Erdene, 2011), 7
8. <i>C. stricta</i>	6, 7, 13+ (this paper)
9. <i>C. stricta</i> subsp. <i>holosepala</i>	7
10. <i>C. stricta</i> subsp. <i>spathosepala</i>	7
+11. <i>C. sajanensis</i>	1+ (Munkh-Erdene, Urgamal 2013), 6# (Gundegmaa, 2016)
+12. <i>C. schanginii</i>	7+ 14+ (Munkh-Erdene, Urgamal 2013)

(+) new species and new added to phytogeographical region numbers of the flora

(#) again registered in to paper (Gubanov, 1996)

Table 3

New regional records of *Corydalis* species in phytogeographical regions of Mongolia

№	Species number	Location	Index	Collector
1	<i>Corydalis adunca</i>	Province – Bayan-Ulgii, somon- Ulaankhus	UBA/B013	Munkh-Erdene T.
2	<i>C. capnoides</i>	Province – Dornod, somon – Sumber, River of Khalkh gol	UBA/285	Gubanov A., Kamelin A., Dariimaa Sh., Ganbold G.
3	<i>C. capnoides</i>	Province – Bayan-Ulgii, River of Sangiin gol	UBA/1516	Gubanov A., Kamelin A., Dariimaa Sh., Ganbold G.
4	+ <i>C. grubovii</i>	Province – Bayan-Ulgii, somon – Tsagaannuur	UBA/910	Dariimaa Sh., Ganbold E.
5	<i>C. grubovii</i>	Province – Khobdo, somon – Uyench River of Kharganat gol	UBA/1345	Grubov V.I., Muldashev Sh., Dariimaa Sh.
6	+ <i>C. inconspicua</i>	Province – Uvs, somon – Sagil	2014070503	Gundegmaa V.
7	<i>C. impatiens</i>	Province – Khovsgol, somon – Ulaan-uul, Mountain of Khordil Saridag uul	UBA/391	Gubanov A., Kamelin A., Dariimaa Sh., Ganbold G.
8	<i>C. impatiens</i>	Province – Selenge, somon – Zelter, river of Zeltriin gol	UBA/282	Dariimaa Sh., Norov D.
9	<i>C. impatiens</i>	Province – Zavkhan, somon – Otgon, Mountain of Otgontenger uul	UBA/5352	Munkh-Erdene T.
10	<i>C. impatiens</i>	Province – Tuv, Somon, river of Baruun Burkhiin gol	UBA/28	Zoyo D.
11	<i>C. impatiens</i>	Province – Arkhangai, somon –Tuvshruulekh, Mountain of Khaikhan uul	UBA/49	Grubov V.I., Ulzikhutag N.
12	+ <i>C. pauciflora</i>	Province – Bayan-Ulgii, lake of Dayan nuur	UBA/710	Grubov V.I., Ulzikhutag N.
13	+ <i>C. sajanensis</i>	Province – Khovsgol, somon -Tsagaannuur, lake of Tsagaan nuur	UBA/654	Grubov V.I., Ulzikhutag N.

End of table 3

14	+ <i>C. sajanensis</i>	Province – Uvs, Somon- Bukh Murun, Mountain of Siilkhem nuruu	201406302	Gundegmaa V.
15	<i>C. schanginii</i>	Province – Khobdo, Uyench, river of Uyench gol	UBA/0243	Grubov V.I., Ulzikhutag N.
16	+ <i>Corydalis stricta</i>	Province – Bayankhongor, somon – Bogdo, Mountain of Ikh Bogdo uul	UBA/0412	Munkh-Erdene T.

Note: (+) new regional records added to phytogeographical region numbers of the flora of Mongolia

### REFERENCES

- Doronkin V., Shaulo D., Han I., Vlasova N., Ivleva V., Enkhtuya L., Munkh-Erdene T., Ochgerel N., Munkhjargal B. New records for the flora of Selenge Province (Mongolia) // Skvortsovia, 2015. – Vol. 2, No. 1. – P. 8–27.
- Grubov V. I. Key of the vascular plants of Mongolia. – Leningrad: Nauka, 1982. – 503 pp.
- Gubanov I. A. Conspectus of the flora of Outer Mongolia. – Moscow: Valang Press, 1996. – 109 pp.
- Gundegmaa V., Urgamal M. New records in the Khovd and Mongolian Altai phytogeographical regions to the flora of Mongolia. // Сохранение разнообразия растительного мира: Тувы и сопредельных регионов Центральной Азии: история, современность, перспективы. (06–07 June 2016). – Kyzyl, 2016. – P. 76–78.
- Jamsran Ts., Ulzikhutag N., Sanchir Ch. Key of the vascular plants of Ulaanbaatar. – Ulaanbaatar Press, 1972. – 93 p.
- Lidén M. Flora of China. FOC. Vol. 7. – Beijing, 2008. – 345 pp.
- Mikhailova M. Generis *Corydalis* Vent. (Fumariaceae) species nova e republica populari Mongolia // Novit. Syst. Pl. Vasc., 1981. – Vol. 18. – P. 197–199.
- Mikhailova M. Subsection Strictae (Fedde) Fedde generis *Corydalis* Vent. (Fumariaceae) revisio critica // Novit. Syst. Pl. Vasc., 1981. – Vol. 18. – P. 191–196.
- Munkh-Erdene T., Urgamal M. Systematic investigation of the genus *Corydalis* in the Flora of Mongolia // Proceedings of Institute of General and Experimental Biology, 2016. – Vol. 32. – P. 107–113. (in Mongolian).
- Munkh-Erdene T., Urgamal M. The genus of *Corydalis* DC & LAM (Papaveraceae) in the flora of Mongolia // Khurel togoot-2013 (Biology-agriculture department): Proceedings of Scientific and Practical Conference (15–16 October 2013). – Ulaanbaatar, 2013. – P. 105–106.
- Munkh-Erdene T. Genus of *Corydalis* DC. & Lam. in Mongolia. // Proceedings of Institute of Botany (Ulaanbaatar), 2011. – Vol. 23. – S. 105–106 (in Mongolian).
- Shaulo D.N., Sonnikova A.E. New species of the genus *Papaver* L. (Papaveraceae) from West Sayan // Turczaninowia, 2005. – Vol. 6, iss. 4. – P. 5–6.
- Shu-Jin Z., Yum-Qun Z. Classification and Distribution of the Genus *Corydalis* Vent. in Nei Mongol // Acta Scien. Nat. Uni. (Intramongolica), 1987. – Vol. 18, No. 1. – P. 171–178.
- Ulzikhutag N. Dictionary of Latin-Mongolian-Russian names of vascular plants in People's Republic of Mongolia, Scientific Proceeding of the State Terminology Commission (No. 129–133). – Ulaanbaatar Press, 1984. – 445 pp.
- Urgamal M., Oyuntsetseg B., Nyambayar D., Dulamsuren Ch. Conspectus of the vascular plants of Mongolia. – Ulaanbaatar: Admon Press, 2014. – 282 pp.