

New subsections in *Corispermum* L. (*Chenopodiaceae*)

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ABSTRACT: In *Corispermum* L. (*Chenopodiaceae*) five new subsections are described and two new subsectional combinations are published. Brief taxonomic comments and notes on geographical distribution of taxa are given.

KEYWORDS: *Corispermum*, *Chenopodiaceae*, subsections, new taxa taxonomy

Introduction

Corispermum L. (*Chenopodiaceae*, *Corispermeae*) is a genus consisting of ca. 60 predominantly psammophytic species distributed mostly in the arid and temperate regions of Eurasia and North America. Being a comparatively large genus of the *Chenopodiaceae*, *Corispermum* definitely deserves a detailed infrageneric system. Unfortunately, taxonomists paid very little attention to infrageneric subdivisions of the genus. With the exception of three series described by KLOKOV (1960) for some European species, and two sections recently described by the present author (MOSYAKIN 1995b), no other infrageneric taxa have been proposed for this interesting genus.

The present article is a continuation of my previous publications devoted to the infrageneric taxonomy of *Corispermum* L. (MOSYAKIN 1995a, b). I believe that the new infrageneric entities validated below represent natural groups of species; they will be used in the forthcoming phytogeographical and geohistorical analysis of the genus. The proposed subsections contain mostly Eurasian species occurring in the former Soviet Union, and also North American taxa. At present, the proper placement of some insufficiently known Asian species still needs clarification. Because of that, in lists of species belonging to the subsections described below, I mentioned only those taxa which can be assigned to these subsections with a high degree of certainty. All new subsections described in the present article belong to *Corispermum* sect. *Corispermum*.

Corispermum* sect. *Corispermum

Type: *C. hyssopifolium* L. (lectotype of the genus).

Corispermum* subsect. *Corispermum

Synonym: *Corispermum* series *Hyssopifolia* KLOK., Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk SSSR 20: 114. 1960, nom. illegit.

Type: *C. hyssopifolium* L. (lectotype of the genus).

Fruits in most cases broadly elliptic or ovate in outline; abaxial side more or less strongly convex, adaxial side flat or nearly so. Wing narrow (ca. 0.1-0.2 mm wide) or absent. Perianth segment 1, well developed or rarely rudimentary. Leaves in most cases lanceolate or nearly so, rarely linear. Inflorescences dense or interrupted in lower part.

Species: *C. hyssopifolium* L. agg. (incl. *C. glabratum* KLOK. p.p., *C. hybridum* BESS. ex ANDRZ.), *C. orientale* LAM., *C. chinganicum* ILJIN, etc.

Distribution: eastern Europe, Central and eastern Asia.

***Corispermum* subsect. *Nitida* (KLOK.) MOSYAKIN, comb. nov.**

Basionym: *Corispermum* series *Nitida* KLOK., Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk SSSR 20: 105. 1960.

Type: *C. nitidum* KIT. ex SCHULT.

Similar to the preceding subsection but differs in having fruits more glabrous and shiny, never spotted; perianth segments 1-3; leaves from linear to filiform, often convolute; inflorescence at maturity narrow, interrupted almost up to the top. This subsection is very close to the subsection *Corispermum* s. str.

Species: *C. nitidum* KIT. ex SCHULT. agg. [including *C. microspermum* HOST = *C. nitidum* subsp. *microspermum* (HOST) MOSYAKIN = *C. nitidulum* KLOK., *C. calvum* KLOK., *C. ucrainicum* ILJIN emend. KLOK.], possibly also *C. heptapotamicum* ILJIN, but proper placement of the latter species is rather uncertain, because it shares some characters with representatives of the subsection *Lehmanniana*.

Distribution: Central and southeastern Europe, southwestern Asia; *Corispermum nitidum* also occasionally occur as an alien in North America (rarely) and western Europe.

***Corispermum* subsect. *Canescentia* (KLOK.) MOSYAKIN, comb. nov.**

Basionym: *Corispermum* series *Canescentia* KLOK., Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk SSSR 20: 91. 1960.

Type: *C. canescens* KIT. ex SCHULT.

Fruits ovate or obovate in outline, sometimes almost rounded; in most cases broadly winged. Wing emarginate (notched) at the apex near the style bases, the margins often

minutely denticulate. Perianth completely absent, or in some flowers represented by a small dissected rudimentary scale. Style base often curved inwards.

Species: *C. canescens* KIT. ex SCHULT., *C. marschallii* STEV. agg. (including *C. borysthenicum* ANDRZ., *C. stenopterum* KLOKOV, p.p., *C. volgicum* KLOKOV).

Distribution: southeastern Europe, western Asia.

***Corispermum* subsect. *Crassifolia* MOSYAKIN, subsect. nov.**

Type: *C. crassifolium* TURCZ.

Fructus ovales, obovati vel rotundato-ovales, alati, apice rotundati. Perianthium absens vel rarissime abortivum.

Fruits ovate, broadly obovate or sometimes almost rotundate; winged. Wing comparatively broad [occasionally narrower than 0.2 mm in *C. gallicum* ILJIN and *C. uralense* (ILJIN) AELLEN], rotundate at the apex. Perianth completely absent or rudimentary. Style bases in fruits short and straight or curved outwards.

Species: *C. intermedium* SCHWEIGG.; *C. gallicum* ILJIN; *C. algidum* ILJIN; *C. crassifolium* TURCZ.; *C. uralense* (ILJIN) AELLEN (*C. squarrosum* auct. p. p., non L.); *C. maynense* IGNATOV; *C. pacificum* MOSYAKIN.

The western European relict species *C. gallicum* had for a long time been erroneously treated as *C. hyssopifolium* or *C. leptopterum* by almost all European botanists (see AELLEN 1961, 1964; JALAS & SUOMINEN 1980; AELLEN & AKEROYD 1993); in fact, this species is very closely related to the Baltic *C. intermedium*, and in the "lumper's" approach to the species concept, it may be treated as a subspecies of the latter. Of the species cited above, *C. algidum* shows evident morphological transition towards the subsection *Pallasiana*. The recently described species *C. maynense* IGNATOV (IGNATOV 1986) is still insufficiently known, but seems to be closely related to *C. crassifolium*. However, its proper placement (in subsection *Crassifolia* or *Pallasiana*) is not completely clear yet. The North American species *C. pacificum* MOSYAKIN (1995b), is restricted to the Pacific Northwest of the USA (states of Washington, Idaho and Oregon; probably also adjacent regions of British Columbia, Canada) and also related to the Siberian *C. crassifolium*. The subsection can be subdivided into two series (or even segregate subsections), one of them containing *C. intermedium* and *C. gallicum*, and another including *C. crassifolium*, *C. maynense* and *C. pacificum*.

The subsection *Crassifolia* is of Siberian origin. Its expansion in northern and western Europe (with subsequent evolution and differentiation of local geographic races) probably occurred during the interglacial and postglacial phases of the Pleistocene and Holocene. The Siberian *C. crassifolium* seems to be closely related to the hypothetical ancestor of the subsection. In spite of some general similarity between some species of the subsections *Canescentia* and *Crassifolia*, their history and development (at least in Europe) were independent (for more details see MOSYAKIN 1995b).

Distribution: western and northern Europe, northern Asia (Siberia, Russian Far East), northwestern North America.

***Corispermum* subsect. *Aralocaspica* MOSYAKIN, subsect. nov.**

Type: *C. aralocaspicum* ILJIN

Fructus rotundati vel rotundato-ovales; alati vel apteri (*C. caucasicum*); apice emarginati. Perianthium monophyllum vel rarius triphyllum. Spicae saepissime tenues, interruptae vel remotiflorae. Folia linearia vel lineari-filiformia.

Wing of fruits in most cases emarginate at apex (as in species of the subsection *Canescentia*). Perianth segments 1-3, well developed. Inflorescences thin, interrupted. Leaves from linear to filiform.

Species: *C. aralocaspicum* ILJIN, *C. caucasicum* (ILJIN) ILJIN, *C. filifolium* C. A. MEY. ex A. BECKER.

Within the *C. aralocaspicum* aggregate, the littoral Caspian race *C. caucasicum* shows evident morphological transition towards the subsection *Corispermum*. For more details about species of this subsection see ILJIN (1929, 1936)

Distribution: southeasternmost Europe, Caucasus, northern Iran, Central Asia (western part).

***Corispermum* subsect. *Lehmanniana* MOSYAKIN, subsect. nov.**

Type: *C. lehmannianum* BUNGE

Fructus obovati, rarius ovales; plerumque supra mediam latissimi, in fronte plano-convexi vel compressi, a tergo plani; alati. Perianthium monophyllum. Spicae saepissime tenues.

Similar to the subsection *Hyssopifolia*, but fruits almost always obovate in outline; dorsiventrally depressed (abaxial side depressed-convex or flat-convex); fruit surface in some cases indistinctly maculate, warty or covered with branched hairs.

Species: *C. lehmannianum* BUNGE, *C. laxiflorum* SCHRENK, *C. papillosum* (O. KUNTZE) ILJIN, and probably also insufficiently known taxa *C. ikramii* AELLEN (Pakistan, see AELLEN 1964b), *C. afghanicum* PODLECH (Afghanistan, see PODLECH, 1975), *C. ladakhianum* GREY-WILSON & WADHWA (Kashmir, India; see GREY-WILSON & WADHWA 1987).

Distribution: Central and western Asia, southeasternmost Europe.

***Corispermum* subsect. *Platyptera* MOSYAKIN, subsect. nov.**

Type: *C. platypterum* KITAG.

Fructus obovati, plerumque supra lineam mediam latissimi, in fronte subplani vel subplano-convexi, a tergo plerumque plani vel leviter concavi, alati; ala plerumque (0.5-) 0.7-1.0(-1.5) mm lata, margine subintegra, erosa, vel irregulariter eroso-denticulata, apice stylorum basi longe adnata, plerumque emarginata; incisura inter basin stylorum margine alarum profundiore.

Fruits obovate in outline, usually broadest above the middle, almost flat or slightly convex at abaxial side, flat or slightly concave at adaxial side, winged. Wing usually ca. (0.5-)0.7-1.0(-1.5) broad; margins subentire, erose, or irregularly erose-denticulate; long-adenate to the style bases, usually emarginate at apex. Style bases long, in most cases divided to below the edge of the wing.

Species: *C. stenolepis* KITAG., *C. platypterum* KITAG., *C. macrocarpum* BUNGE ex MAXIM., *C. pallidum* MOSYAKIN.

Distribution: eastern Asia (southern Russian Far East, northeastern China), northwestern North America (*C. pallidum* known from the state of Washington, USA).

This subsection is closely related to the following one. A very peculiar disjunct distribution of representatives of this subsection is similar to that of the *C. crassifolium* - *C. pacificum* group (MOSYAKIN, 1995b).

***Corispermum* subsect. *Pallasiana* MOSYAKIN, subsect. nov.**

TYPE: *C. pallasii* STEVEN (including *C. leptopterum* (ASCHERS.) ILJIN, *C. membranaceum* ILJIN, *C. sibiricum* subsp. *baicalense* ILJIN, *C. bjelorusasicum* KLOK. et KRASNOVA)

Fructus plerumque obovales vel oblongo-obovati, supra lineam mediam latissimi; in fronte convexi, interdum maculati, papilloso vel stellato pilosi; apice rotundati vel basi stylorum apiculati. Perianthium monophyllum, rarissime triphyllum vel abortivum. Spicae saepissime oblongae, densae vel densiusculae, rarius laxiusculae, in parte inferiore interruptae.

This subsection shares some characters of the subsections *Corispermum* and *Lehmanniana*. It differs from the former subsection in having obovate or oblong-obovate fruits (with widest part above the medium line, not in the central portion of the fruit), often with maculate, minutely warty or pubescent surface. It may be distinguished from the latter subsection by its more convex fruits and in most cases rather dense, clavate (club-shaped) inflorescences.

Species: *C. pallasii* STEV. [= *C. leptopterum* (ASCHERS.) ILJIN; known from Europe, Siberia and North America] and some other Asian taxa (*C. sibiricum* ILJIN, *C. elongatum* BUNGE ex MAXIM., *C. candelabrum* ILJIN, *C. confertum* BUNGE ex MAXIM., *C. stauntonii* MOQ., *C. bardunovii* M. POPOV ex M. LOMONOSOVA and some others), and the majority of North American representatives of the genus [*C. americanum* (NUTT.) NUTT. (incl. *C. simplicissimum* LUNELL, *C. marginale* RYDB. s. str., *C. imbricatum* A. NELS.); *C. villosum* RYDB. (incl. *C. emarginatum* RYDB.), *C. welshii* MOSYAKIN; *C. hookeri* MOSYAKIN, *C. navicula* MOSYAKIN).

Distribution: Central, northern and eastern Asia (arid and temperate zones), North America; in Europe probably only adventive.

This subsection now has an almost Holarctic distribution, but it is evidently of Asian origin. Its representatives penetrated into North America in the Pleistocene through the Beringia Land Bridge. Fossil fruits of *Corispermum* are known from several localities within the area where modern American species occur (see BETANCOURT et al. 1984). In

many cases American specimens (especially with immature fruits) are almost indistinguishable from Asian representatives of the *C. pallasii* aggregate (for more details see MOSYAKIN 1995a, b).

The reconstructed expansion history of the European *C. pallasii* s. l. may be regarded as an additional evidence for its adventive (alien) occurrence in Europe (see KÖCK 1986; STRAZDIN'SH 1985).

Thus, at present the infrageneric taxa of *Corispermum* could be grouped as follows:

Genus *Corispermum* L.

Sect. *Patellisperma* MOSYAKIN

Sect. *Declinata* MOSYAKIN

Sect. *Corispermum*

Subsect. *Corispermum*

Subsect. *Nitida* (KLOK.) MOSYAKIN

Subsect. *Canescentia* (KLOK.) MOSYAKIN

Subsect. *Crassifolia* MOSYAKIN

Subsect. *Pallasiana* MOSYAKIN

Subsect. *Lehmanniana* MOSYAKIN

Subsect. *Aralocaspica* MOSYAKIN

Subsect. *Platyptera* MOSYAKIN

I believe, in addition to the infrageneric taxa listed above, that at least three more subsections can be segregated within the type section of the genus. However, delimitation of these still undescribed subsections remains a task for further studies.

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