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TAXONOMIC ANALYSIS OF THE *Cirsium* Mill. GENUS IN FLORA OF AZERBAIJAN

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ТАКСОНОМИЧЕСКИЙ АНАЛИЗ РОДА *Cirsium* Mill. ВО ФЛОРЕ АЗЕРБАЙДЖАНА

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Abstract. The main goal was a systematic analysis of the *Cirsium* Mill. genus (Asteraceae) in flora of Azerbaijan. Floristic-systematic, comparatively morphological, ecological and other methods were used. In addition, materials stored in the Herbarium Fund of the Botanical Institute of Ministry of Science and Education, Republic of Azerbaijan were studied related to this genus. As a result of the research, it was established that 31 species of the genus *Cirsium* Mill. are widespread in the flora of Azerbaijan.

Аннотация. Проведен систематический анализ рода *Cirsium* Mill. (Asteraceae) во флоре Азербайджана. Использовались флористически-систематические, сравнительно-морфологические, экологические и другие методы. Кроме того, были изучены относящиеся к этому роду материалы, хранящиеся в Гербарном фонде Ботанического института Министерства науки и образования Азербайджанской Республики. В результате проведенных исследований установлено, что во флоре Азербайджана распространен 31 вид рода *Cirsium* Mill.

Keywords: *Cirsium*, systematic analysis, flora.

Ключевые слова: бодяк, систематический анализ, флора.

Asteraceae represented by about 1,300 genera (20,000 species) in worldwide. In flora of Azerbaijan this family represented by 125 genera belonging to 584 species. Representatives of the family, in terms of life forms, are herbs, subshrubs, shrubs, sometimes trees. In temperate climates, members of this family are primarily perennial herbs and shrubs.

Cirsium Mill., numbering 250-300 perennial, biennial or annual species in Eurasia and North America. This genus are members of the *Cardueae* tribe, one of the largest tribes in Asteraceae. The name of *Cirsium* comes from the Greek “khirsos” (swollen vein) which given for the medicinal use of plants of this genus.

The first study of this genus was carried out in out in Prodrum Sytematis Naturalis by Candolle (1838). In Flora of Orientalis the species (74) of this genus was divided into 4 sections by E. Boisser (1875). In addition, 32 species (*C. elodes* M. Bieb., *C. incanum* (S. G. Gmel.) Fisch., *C. szovitsii* (K. Koch) Boiss., *Cirsium tomentosum* C. A. Mey., *C. cosmellii* (Ad) Petr., *C. lappaceum* (M. Bieb.) Fisch.), *C. anatolicum* (Petr.) Petr. ex Grossh., *C. congestum* Fisch. & C. A. Mey. ex DC., *C. bracteosum* DC., *C. ciliatum* (Murray) Moench, *C. echinus* (M. Bieb.) Hand.-Mazz., *C.*

hygrophilum Boiss., *C. macrobotrys* (K. Koch) Boiss., *C. osseticum* (Adams) Petr., *C. schelkownikowii* Petr., *C. strigosum* (M. Bieb.) Fisch., 1812, *C. subinerme* Fisch. & C. A. Mey., *C. vulgare* (Savi) Ten., *C. aduncum* Fisch. & C. A. Mey. ex DC., *C. arvense* var. *horridum* Wimm. & Grab.) were given by A. L. Charadze (1961) in Flora of Azerbaijan and 31 species were given by A. M. Asgarov (2016) Flora of Azerbaijan (Table).

Table

<i>Herbarium Fund of the Institute of Botany of the Ministry of Science and Education, Republic of Azerbaijan</i>	<i>Flora of Azerbaijan V. 8, 1961</i>	<i>Synopsis flora of the Caucasus V. 3(2), 2012</i>	<i>A. M. Asgarov Flora of Azerbaijan 2016</i>
<i>C. aduncum</i> Fisch. & C. A. Mey. ex DC.	+	+	+
<i>C. alatum</i> (S. G. Gmel.) Bobrov (= <i>C. elodes</i> M. Bieb.)	<i>C. elodes</i>	–	–
<i>C. arvense</i> (L.) Scop. (= <i>C. incanum</i> (S. G. Gmel.) Fisch.)	<i>C. incanum</i>	+	+
<i>C. arvense</i> (L.) Scop. (= <i>C. arvense</i> var. <i>mite</i> Wimm. & Grab.)	–	–	–
<i>C. arvense</i> (L.) Scop. (= <i>C. arvense</i> var. <i>horridum</i> Wimm. & Grab.)	+	–	–
<i>C. bracteosum</i> DC.	+	+	+
<i>C. canum</i> (L.) All.	–	+	–
<i>C. ciliatum</i> (Murray) Moench	+	+	+
<i>C. ciliatum</i> (Murray) Moench (= <i>C. szovitsii</i> (K. Koch) Boiss.)	<i>C. szovitsii</i>	<i>C. szovitsii</i>	<i>C. szovitsii</i>
<i>C. echinus</i> (M. Bieb.) Hand.-Mazz.	+	+	+
<i>C. isophyllum</i> (Petr.) Grossh. (= <i>C. horridum</i> (Adams) Petr. var. <i>hypopolia</i> Trautv.)		–	–
<i>C. isophyllum</i> (Petr.) Grossh. (= <i>Cirsium tomentosum</i> C. A. Mey.)	<i>C. tomentosum</i>	<i>C. tomentosum</i>	<i>C. tomentosum</i>
<i>C. hygrophilum</i> Boiss.	+	+	+
<i>C. kosmelii</i> (Adams) Fisch. ex Hohen. (= <i>C. kosmelii</i> (Ad) Petr.)	<i>C. kosmelii</i>	<i>C. kosmelii</i>	<i>C. kosmelii</i>
<i>C. leucocephalum</i> subsp. <i>penicillatum</i> (K. Koch) Greuter (= <i>C. lappaceum</i> (M. Bieb.) Fisch.)	<i>C. lappaceum</i>	<i>C. lappaceum</i>	<i>C. lappaceum</i>
<i>C. leucocephalum</i> (Willd.) Spreng. (= <i>C. anatolicum</i> (Petr.) Petr. ex Grossh.)	<i>C. anatolicum</i>	<i>C. anatolicum</i>	<i>C. anatolicum</i>
<i>C. macrobotrys</i> (K. Koch) Boiss.	+	+	+
<i>C. obvallatum</i> (M. Bieb.) Fisch.		+	+
<i>C. osseticum</i> (Adams) Petr.	+	+	+
<i>C. schelkownikowii</i> Petr.	+	+	+
<i>C. sorocephalum</i> Fisch. & C. A. Mey. (= <i>C. congestum</i> Fisch. & C. A. Mey. ex DC.)	<i>C. congestum</i>	+	+
<i>C. strigosum</i> (M. Bieb.) Fisch., 1812	+	+	+
<i>C. subinerme</i> Fisch. & C. A. Mey.	+	+	+
<i>C. vulgare</i> (Savi) Ten.	+	+	+

In flora of Azerbaijan the genus of *Cirsium* is commonly known as the ‘gangal’. These species grow in different regions of the country and contain several geographical populations with great morphological and genetic variability. *Cirsium* (gangal) are one of the most taxonomically challenging groups of Asteraceae family in Azerbaijan. These taxonomic difficulties have been

hypothesized to be the result of limited morphological differentiation, incipient speciation among taxa. Classification of the genus *Cirsium* Mill. according to the angiosperm phylogenetic groups (APG IV):

Regnum Plantae
Division Tracheophyta
Class Magnoliopsida
Ordo Asterales
Superordo Asteranae
Familia Asteraceae
Tribe Cardueae
Genus *Cirsium* Mill.

Cirsium Mill. Stems are erect, tall, branched. The leaves are glabrous or pubescent, usually covered with small spines or bristles on top. Flowers hermaphrodite, bisexual or unisexual, red, purple, pink, sometimes yellowish or almost white. The corolla is tubular-funnel-shaped, straight, deeply five-incised or dissected into five narrow segments. Stamens with pubescent filaments. Achenes obovoid-oblong, smooth, glabrous. Pappus plumose, usually deciduous bristles. Blooms in July-September. In the different botanical-geographical regions of Azerbaijan (mainly Guba, Shabran, Nakhchivan), this genus can be found from lowland to high-mountain zones, open forests, wet, damp places, river valleys and meadows.

Material and Methods

Plant materials were collected (2021-2022), during expeditions to the different regions of Azerbaijan. Also, the herbarium specimens stored in the Herbarium fond of the Institute of Botany, Ministry of Science and Education Republic of Azerbaijan were used in this study. Classic comparative morphological methods were used for identification of species [1-7].

Result and Discussion

When checking herbarium specimens in the Herbarium Fund of the Institute of Botany, Ministry of Science and Education Republic of Azerbaijan, it was established that there are 282 herbarium specimens of 20 species (*C. aduncum* Fisch. & C. A. Mey. ex DC., *C. alatum* (S. G. Gmel.) Bobrov (= *C. elodes* M. Bieb.), *C. arvense* (L.) Scop. (= *C. incanum* (S. G. Gmel.) Fisch.), *C. bracteosum* DC., *C. canum* (L.) All., *C. ciliatum* (Murray) Moench, *C. ciliatum* (Murray) Moench (= *C. szovitsii* (K. Koch) Boiss.), *C. echinus* (M. Bieb.) Hand.-Mazz., *C. isophyllum* (Petr.) Grossh. (= *C. horridum* (Adams) Petr. var. *hypopolia* Trautv.), *C. isophyllum* (Petr.) Grossh. (= *Cirsium tomentosum* C. A. Mey.), *C. hygrophilum* Boiss., *C. kosmelii* (Adams) Fisch. ex Hohen. (= *C. kosmelii* (Ad) Petr.), *C. leucocephalum* (Willd.) Spreng. (= *C. anatolicum* (Petr.) Petr. ex Grossh.), *C. macrobotrys* (K. Koch) Boiss., *C. macrocephalum* C. A. Mey., *C. obvallatum* (M. Bieb.) Fisch., *C. osseticum* (Adams) Petr., *C. schelkownikowii* Petr., *C. sorocephalum* Fisch. & C. A. Mey., *C. strigosum* (M. Bieb.) Fisch., 1812, *C. subinerme* Fisch. & C. A. Mey., *C. vulgare* (Savi) Ten., 1 subspecies — *C. leucocephalum* subsp. *penicillatum* (K. Koch) Greuter of this genus. Some of these species, which described in the 8th volume of the “Flora of Azerbaijan” are currently synonymized based on the results of modern research (www.worldfloraonline.org, www.ipni.org, www.emplantbase.org):

- C. alatum* (S. G. Gmel.) Bobrov (= *C. elodes* M. Bieb.);
C. arvense (L.) Scop. (= *C. incanum* (S. G. Gmel.) Fisch.);
C. arvense (L.) Scop. (= *C. arvense* var. *mite* Wimm. & Grab.);
C. ciliatum (Murray) Moench (= *C. szovitsii* (K. Koch) Boiss.);
C. isophyllum (Petr.) Grossh. (= *C. horridum* (Adams) Petr. var. *hypopolia* Trautv.);
C. isophyllum (Petr.) Grossh. (= *Cirsium tomentosum* C. A. Mey.);
C. kosmelii (Adams) Fisch. ex Hohen. (= *C. cosmellii* (Ad) Petr.);
C. leucocephalum subsp. *penicillatum* (K. Koch) Greuter (= *C. lappaceum* (M. Bieb.) Fisch.);
C. leucocephalum (Willd.) Spreng. (= *C. anatolicum* (Petr.) Petr. ex Grossh.);
C. sorocephalum Fisch. & C. A. Mey. (= *C. congestum* Fisch. & C. A. Mey. ex DC.).

Cirsium Mill. (gangal) is widely used in both folk and traditional medicine as a plant that improves liver function and cleanses it. In addition, *Cirsium* cleanses the body of harmful substances and toxins, removes excess fluid, accelerates the breakdown of fats, and reduces appetite. This plant is used as a remedy for heart disease, joint disease, atherosclerosis, hepatitis, cholelithiasis, cholecystitis, colitis, haemorrhoids, gastric ulcer, skin diseases (such as psoriasis, eczema, acne), gynecological diseases, otitis, rectal fissures. An infusion, oil, and healing powder are prepared from *Cirsium* Mill. which are used for various skin wounds, burns and rectal fissures.

In addition, thistles are sources of food for bumblebees, hawk moths, flies, beetles, butterflies, and even hummingbirds. Thistles also provide important nesting resources for cavity — nesting bees, and their seeds are sources of food for songbirds and small mammals.

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