

UDC 595.7

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txlam.iebr@gmail.com**DICYRTOCERCYON GANGLBAUER, 1904 (COLEOPTERA: HYDROPHILIDAE)
IN BELARUS AND ITS TAXONOMIC STATUS**

Morphological diagnosis, distribution and environmental preferences of genus *Dicyrtocercyon* Ganglbauer, 1904 are presented. The subgenus *Dicyrtocercyon* was described from Czechia. It is distributed in the Holarctic region. As a result of the study, the taxonomic status of subgenus *Dicyrtocercyon* is raised to the level of a genus. *Dicyrtocercyon* **stat. nov.** is a *Cercyon*-form genus from subfamily Sphaeridiinae, tribe Megasternini. This is indicated by the significant similarity of morphological signs, primarily with real *Cercyon* (*C. marinus* Thomson, 1853, *C. quisquilius* (Linnaeus, 1761), *C. nigriceps* (Marsham, 1802) etc.). The characteristic diagnostic morphological feature is that pronotum and elytra are separately convex in lateral view. Currently, the genus includes only one species *Dicyrtocercyon ustulatus* (Preyssler, 1790) **comb. nov.** It is most similar in coloration, size and body shape to species from the *C. marinus* group (*C. marinus* Thomson, 1853 and *C. bifenestratus* Küster, 1851) in the Belarusian fauna. This species has black maxillary palpi and mesoventral plate wider (ca. 2.5—3.2× as long as wide in *C. marinus* and 1.9—2.0 in *C. bifenestratus*). Mesoventral plate is narrower in *D. ustulatus* (ca. 4.0—4.2× as long as wide). The best distinguishing features are that lateral view of pronotum does not form a continuous curve with elytra and elytra epipleura is narrow slightly wedge-shaped, slightly bent downwards at anterior half of the elytron. Species *C. marinus* group have flat epipleura and lateral view of pronotum forming a continuous curve with elytra.

D. ustulatus is a detritobiont and inhabits various water bodies, as well as waterfowl nests, beaver and muskrat lodges.

Key words: Insecta; Coleoptera; Hydrophilidae; Sphaeridiinae; Megasternini; morphology; natural classification.

Fig. 17. Table 1. Ref.: 12 titles.

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txlam.iebr@gmail.com**DICYRTOCERCYON GANGLBAUER, 1904 (COLEOPTERA: HYDROPHILIDAE)
В БЕЛАРУСИ И ЕГО ТАКСОНОМИЧЕСКИЙ СТАТУС**

В статье представлен морфологический диагноз, распространение и экологические предпочтения рода *Dicyrtocercyon* Ganglbauer, 1904. Подрод *Dicyrtocercyon* был описан из Чехии. Он распространен в Голарктике. В результате исследований таксономический статус подрода *Dicyrtocercyon* повышен до уровня рода. *Dicyrtocercyon* **stat. nov.** является церционоподобным родом из подсемейства Sphaeridiinae трибы Megasternini. На это указывает значительное сходство морфологических признаков прежде всего с настоящими *Cercyon* (*C. marinus* Thomson, 1853, *C. quisquilius* (Linnaeus, 1761), *C. nigriceps* (Marsham, 1802) и др.). Характерным

диагностическим морфологическим признаком является то, что переднеспинка и надкрылья выпуклы отдельно при виде сбоку. В настоящее время род включает только один вид — *Dicyrtoceryon ustulatus* (Preysslner, 1790) **comb. nov.** По окраске, размерам и форме тела *D. ustulatus* наиболее близок к видам из группы *C. marinus* (*C. marinus* Thomson, 1853 и *C. bifenestratus* Küster, 1851) белорусской фауны. У этих видов чёрные максиллярные щупики и более широкий отросток среднегруди (примерно в 2,5—3,2 раза длина больше ширины у *C. marinus* и в 1,9—2,0 раза длина больше ширины у *C. bifenestratus*). Отросток среднегруди у *D. ustulatus* уже (примерно в 4,0—4,2 раза длина больше ширины). Лучшие отличительные признаки: вид сбоку переднеспинки, не образующей непрерывной дуги с надкрыльями, и узкие, слегка клиновидные эпиплевры надкрылий. У видов группы *C. marinus* эпиплевры плоские, а переднеспинка образует с надкрыльями единую дугу при виде сбоку.

D. ustulatus — детритобионт, обитает в различных водных объектах, а также в гнёздах водоплавающих птиц, хатках бобров и ондатр.

Ключевые слова: Insecta; Coleoptera; Hydrophilidae; Sphaeridiinae; Megasternini; морфология; естественная классификация.

Рис. 17. Табл. 1. Библиогр.: 12 назв.

Introduction. Modern *Cercyon* is a polyphyletic genus, which needs serious taxonomic revision [1—3]. Based on the results of DNA analysis and morphological characteristics, some subgenera and species groups require upgrading to genus status (for example, *Cercyon dux* group, *C. littoralis* group, *C. tristis* group etc.). Thus, the subgenus *Himalcercyon* Hebauer, 2002 status was raised to genus [4].

The subgenus *Dicyrtoceryon* was described by Ganglbauer in 1904 with only one species [5]. *C. ustulatus* (Preysslner, 1790) was described from Czechia. It is distributed in the Palaearctic and Nearctic regions [6]. One more species *Cercyon* (*Dicyrtoceryon*) *diversipunctus* Hebauer, 2002 was described from India (Uttaranchal) and Nepal [7].

The subgenus is clearly distinguished from other *Cercyon* subgenera by the separately convex pronotum and elytra that do not form a continuous curve in lateral view. *Dicyrtoceryon* requires an upgrade in taxonomic status, which is confirmed by the results of DNA analysis. The closeness of subgenus *Dicyrtoceryon* and the genus *Deltostethus* Sharp, 1882 was first noted by Short, and Fikáček [1]. Its position within the tribe Megasternini corresponds to clade VI [2; 3]. While the real *Cercyon* (*C. (Cercyon) haemorrhoidalis* (Fabricius, 1775) *C. (C.) marinus* Thomson, 1853, *C. (C.) nigriceps* (Marsham, 1802), *C. (C.) quisquilius* (Linnaeus, 1761)), *C. (Paracycreon) laminatus* Sharp, 1873 etc.) belongs to clade VII [2]. At present, there is an objective need to reconsider the status of some taxa, including the subgenus *Dicyrtoceryon*.

Material and methods. The material for the article presents results of the research carried out on the territory of Belarus in the period from 1993 to 2024. The examined specimens are deposited in the following collections:

CDL D. S. Lundyshch collection, Baranavichy, Belarus;

CSR S. K. Ryndevich collection, Baranavichy, Belarus;

KUMN — V. N. Karazin Kharkiv National University Museum of Natural History, Kharkiv, Ukraine;

ZISP Zoological Institute, Russian Academy of Sciences, St Petersburg, Russia;

Brackets [...] are used for the comments attached by the authors.

The morphological characters were adopted according to Z. Mai et al [3]. Based on this publication, a table of morphological characteristics of species was made. All 44 characters are numbered and given in the same order as indicated in the cited article. In addition, sign 45 (lateral line between the pronotum and the elytra not forms notch (0), forms clear notch (1)) has been added in the data matrix for the morphological analysis of species.

The material was examined with the use of a Nikon SMZ-745T stereomicroscope.

The figures were prepared with the help of Photoshop CS5 program.

Results and discussion. The results of comparison of morphological characteristics and DNA analysis allow us to raise the status of *Dicyrtoceryon* to the genus level.

Taxonomy

Family Hydrophilidae
Subfamily Sphaeridiinae
Tribe Megasternini
Subtribe Megasternina

Genus *Dicyrtocercyon* Ganglbauer, 1904 **stat. nov.**

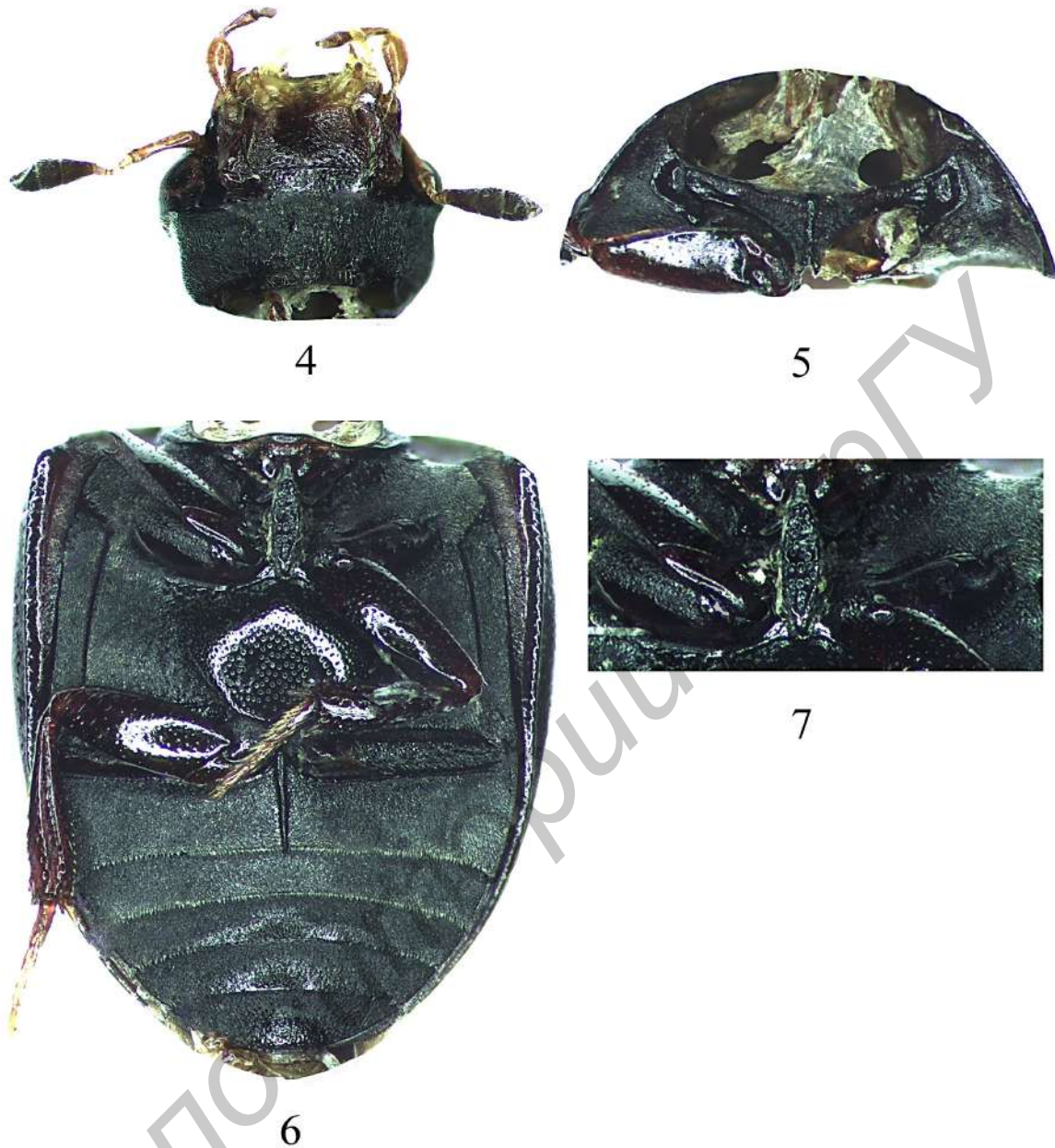
Type species: Sphaeridium ustulatum Preyssler, 1790.

Diagnosis. Body broadly oval, not parallel-sided at mid-length (Figures 1, 2). Dorsum without microsculpture. Lateral view of pronotum not forming a continuous curve with elytra, pronotum strongly bulging (Figure 3).



Figures 1—3. — *Dicyrtocercyon ustulatus*, habitus: 1 — dorsal view; 2 — ventral view; 3 — lateral view. Scale bar — 0.5 mm

Рисунки 1—3. — *Dicyrtocercyon ustulatus*, габитус: 1 — вид сверху; 2 — вид снизу; 3 — вид сбоку. Длина масштабной линейки — 0,5 мм



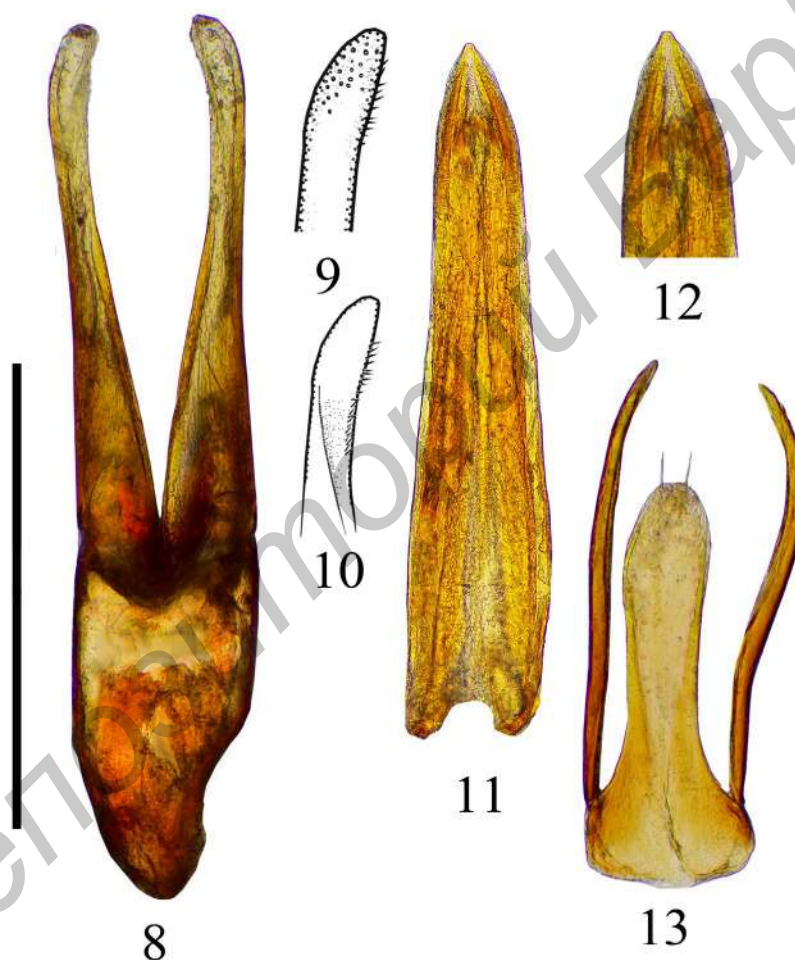
Figures 4—7. — *Dicyrtocercyon ustulatus*, morphological details: 4 — head, ventral view; 5 — prosternum, ventral view; 6 — meso-, meta-ventrite, abdomen, ventral view; 7 — mesoventral plate

Рисунки 4—7. — *Dicyrtocercyon ustulatus*, детали морфологии: 4 — голова, вид снизу; 5 — переднегрудь, вид снизу; 6 — средне-, заднегрудь, брюшко, вид снизу; 7 — отросток среднегруди

Shape of punctures on head and pronotum crescent-shaped. Posterior part of elytra weakly narrowing, lateral view strongly convex. Mentum subtrapezoidal, with anterior margin distinctly concave medially (Figure 4). Prosternum with sparse and fine pubescence on both sides of median carina mesally of the depressed lateral portions (Figure 5). Middle portion of prosternum gradually raised and tectiform medially, featuring a median carina, each side of median carina without transverse ridges. Prosternal process notched posteriorly. Lateral portion of prosternum without oblique ridge, antennal groove large with strongly convex outer margin (Figure 6). Anterior ridge of

metaventrите at anterolateral corner very slightly bent posteriad. Mesoventral plate spindle-shaped and flat, with the posterior apex of mesoventral plate overlapping the anterior margin of metaventrите (Figure 7). Raised middle portion of metaventrите not protruding towards the mesoventral plate anteriorly and not forming a groove with the anterior ridge of metaventrите medially. Metaventrите without femoral lines. Epipleura of elytra narrow slightly wedge-shaped, slightly bent downwards at anterior half of the elytron, flat at posterior half. First abdominal ventrite with medial carina (Figure 6). Male genitalia of typical *Megasternina* form. Phallobase much shorter than parameres (Figure 8). Gonopore large triangular, slightly below the apex of median lobe (Figures 11, 12).

Differential diagnosis. Distinctive features of *Dicyrtocercyon* from other *Cercyon*-form species: dorsum without microsculpture, pronotum strongly bulging, lateral view of pronotum not forming a continuous curve with elytra. Depressed lateral portions of prosternum glabrous. Metaventrите without femoral lines. First segment of abdomen with medial carina.



Figures 8—13. — Male genitalia of *Dicyrtocercyon ustulatus*: 8 — phallobase (tegmen) with parameres; 9 — apex of paramere, dorsall view; 10 — apex of paramere, ventral view; 11 — medial lobe; 12 — apex of medial lobe; 13 — sternite 9. Scale bar for figures 8, 11—13 — 0.5 mm

Рисунки 8—13. — Гениталии самца *Dicyrtocercyon ustulatus*: 8 — фаллобаза (тегмен) с парамерами; 9 — вершина парамеры, вид сверху; 10 — вершина парамеры, вид снизу; 11 — срединная доля; 12 — вершина срединной доли; 13 — стернит 9. Масштабная линейка для рисунков 8, 11—13 — 0,5 мм

Dicyrtocercyon ustulatus (Preyssler, 1790) (Figures 1—17). **comb. nov.**

Scarabaeus haemorrhoidalis, Schrank, 1781.
Sphaeridium ustulatum Preysslér, 1790.
Hydrophilus haemorrhoidalis Fabricius, 1792.
Sphaeridium haemorrhoum Gyllenhal, 1808.
Cercyon xanthorhoeum Stephens, 1829.
Cercyon haemorrhoum var. *xanthorhoeum* Stephens, 1839.
Cercyon usiulatus (Preysslér, 1790).
Cercyon (*Dicyrocercyon*) *usiulatus* (Preysslér, 1790).

Material examined: Belarus, Vitebsk reg., Miory distr., near v. Zacherev'e, 15.07.1993, 1 specimen, (CSR); Vitebsk reg., Miory distr., near v. Zacherev'e, lake Obsterno, lake drifts, 27.07.1995, leg. Ryndevich S., 1 specimen, (CSR); Belarus, Vitebsk reg., Lepel, distr., Berezinsky res., vill. Domzheritsy, pond, 13.V.2024, leg. Ryndevich S. K., 1 specimen, (CSR); Minsk distr., near Raubichi, bank of river, 27.05.1985, 1 specimen, (CSR); Beshenkovichskiy r-n [Beshankovichy district], g. p. [urban settlement] Ula, kray nizinnogo bolota [edge of the fen], 14.07.1985, leg. Maksimenkov [in Russian], 1 specimen, (KUMN); Luskopol', Mogilevskaya obl., [former Senno uyezd, now Vitebsk reg., Vitebsk distr.] 21.VI.[19]07, [leg.] Birulya, [in Russian], 1 specimen, (ZISP); Minsk reg. [near Minsk] Dubrovka [vill. Dubrova], Rakovskoe shosse [roadway, probably incorrect data, person. com by O.R. Alexandrowicz], okr. vdkhr. [near Dubrovskoe reservoir], 29.05.1977, leg. O. Alexandrowicz [in Russian], 2 specimens, (KUMN); Priluki [Minsk distr.], 20.04.1977, leg. O. Alexandrowicz [in Russian], 1 specimen, (KUMN); [Minsk reg.] Krupskiy r-n [Krupki distr.], Yazby, 19.05.1988, leg. O. Alexandrowicz [in Russian], 1 specimen, (KUMN); Grodno reg. Zelvyanskiy r-n [Grodno reg., Zelva distr.], okr. Zelvy [Zelva], na ber. vdkhr. [on the shore of the reservoir], 16.06.1990, leg. O. Alexandrowicz [in Russian], 1 specimen, (KUMN); Belarus, Svisloch region, [Grodno reg., Svisloch distr.], Suchya [Sukhaya] Dolina, Svisloch river, 12.06.1996, O. Alexandrowicz lg., 1 specimen, (CSR); Brest reg. Stolinskiy r-n [Stolin distr.], Banovskaya m. s.[?], 14.07.1985, leg. Maksimenkov [in Russian], 1 specimen, (KUMN); Baranovichskiy r-n [Baranovichy distr.], d. [vill.] Molchad, 15.06.—15.07.1984, [in Russian], 1 specimen, (KUMN); Brest reg., near Malorita, pond, 22.06.1997, leg. Ryndevich S. K., 8 specimens, (CSR); same data but, canal, 1 specimen, (CSR); Brest reg., Baranovichy distr., near v. Kolpenitza, hut of muskrat no. 3, 22.05.2007, leg. Lundyshev D. S., 6 specimens, (CDL); same data but former peat mining sites, in the coot's nest, 16.05.2007, 1 specimen, (CDL); same data but 22.05.2007, 3 specimens, (CDL); same data but in the nest of a black-headed gull, 1.06.2008, 1 specimen, (CDL); Brest reg., near Baranovichy, reservoir "Baranovichskoe", in the nest of the red-headed pochard, 6.06.2007, 1 specimen, (CDL); Brest reg., Baranovichy distr., near v. Domashevichy, hut of muskrat, 17.08.2007, leg. Lundyshev D. S. & Ryndevich S. K., 4 specimens, (CSR, CDL); Brest reg., Baranovichy distr., near vill. Stolovichy, beaver lodge no. 1, 4.06.2007, leg. Lundyshev D. S., Machulski A. Yu., 1 specimen (juvenile), (CSR); Brest reg., Lyakhovichy distr., near vill. Darevo, Shchara river, 6.05.2001, leg. Ryndevich S., 3 specimens, (CSR); Brestskaya obl., Pruzhanskiy r-n, oz. Papernya, v gnezde lebedya-shipuna [Brest reg., Pruzhany distr., lake Papernya, in the nest of a mute swan,] 18.5.2004 [in Russian], 2 specimens, (CDL); Belarus, Brest reg., Pinsk, distr., N vill. Snin, river Yaselda, 16.VI.2024, leg. Ryndevich S. K., 1 specimen (CSR).

Description. Length 2.7—3.3 mm. Body broadly oval (index length/width 1.5—1.6), widest in middle of elytra (Figures 1, 2). Dorsal side moderately convex, strongly shiny, without microsculpture. Total dorsal side colour regularly black. Head and pronotum black, Antennae and maxillary palpi brownish-yellow or yellow. Club of antennae brownish. Scutellum black. Color of elytra black with reddish or brownish yellow apical spot with dark elytral suture (Figures 1, 3).



Figures 14—17. — Habitats of *Dicyrtocercyon ustulatus*: **14** — Pond in village Domzheritsy (Vitebsk reg., Berezinsky reserve); **15** — river Yaselda north of the village Snin, (Brest reg., Pinsk distr.); **16** — the inside of a beaver's lodge near village Stolovichy (Brest reg., Baranavichy distr.); **17** — muskrat lodge near village Domashevichy (Brest reg., Baranavichy distr.)

Рисунки 14—17. — Места обитания *Dicyrtocercyon ustulatus*: **14** — пруд в д. Домжерицы (Витебская обл., Березинский заповедник); **15** — р. Ясельда, севернее д. Снин (Брестская обл., Пинский р-н); **16** — внутренняя часть бобровой хатки возле д. Столовичи (Брестская обл., Барановичский р-н); **17** — хатка ондатры возле д. Домашевичи (Брестская обл., Барановичский р-н)

Ventral side dark brown or black. Legs reddish brown to black, tarsi reddish or yellowish brown (Figure 2). Punctuation of head and pronotum clear and dense. Shape of punctures on head and pronotum: crescent-shaped. Clypeus linear. Mentum distinctly concave medially with sparse and fine punctures, with fine transverse microsculpture (Figure 4). Pronotum widest near middle, without transverse series of punctures along posterior margin. Sides of pronotum moderately rounded. Posterior angles of pronotum not rounded. Base of pronotum without border. Middle portion of prosternum gradually raised and tectiform medially. Antennal groove large with strongly convex outer margin. Prosternal process notched posteriorly (Figure 5). Elytra with ten deep punctate striae. Intervals of elytra flat, slightly convex apically, with shallow regular punctuation, which is as on head and pronotum or a bit smaller than that on head and pronotum and in punctate striae. Third interval of elytra same width as well as second, the fourth narrower than second and third. Humeral tubercles very weak. Epipleura of elytra narrow slightly wedge-shaped, slightly bent downwards at anterior half of the elytron, flat at posterior half (Figure 2). Mesoventral plate narrow (ca. 4.0—4.2× as long as wide), almost parallel-sided. Metaventricle does not form ridge and does not delimit a small anterolateral portion of metaventricle. Metaventricle without femoral lines. Punctuation on the raised mesoventral plate and middle portion of metaventricle (metaventricle pentagon) with sparse and fine punctures. Middle portion of metaventricle flat, shiny, with two small deepening at posterior. Half the width of the raised middle portion of metaventricle not wider than the pubescent lateral portion at its widest point. Tarsi with elongated hairs (Figure 2). First segment of abdomen with medial carina, 2 times as long as second segment (Figure 6). Male genitalia as in Figures 8—13. Paramere apex rounded and curved inwards, inner side of parameres at apex with close-set very short tiny hairs (Figures 8, 9). Paramere about 2 times longer than phallobase. Median lobe of aedeagus widest basally, gradually narrowing towards apex (Figure 11). Apex of median lobe pointed (Figure 12). Gonopore large triangular, slightly below the apex of median lobe. Apex of sternite 9 with pair of tiny hairs (Figure 13).

Distribution. Holarctic: Palearctic: Austria, Belarus, Bosnia and Herzegovina, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Macedonia, Moldova, Netherlands, Norway, Poland, Portugal, Romania, Russia (European part, Western Siberia), Slovakia, Spain, Sweden, Switzerland, Turkey, Ukraine. **Nearctic:** Canada (Quebec), USA (New Hampshire, New Jersey, New York).

Environmental preferences. This species is freshwater detritobiont. It inhabits decomposing plant remnants near water (river and lake drifts), lives not very deep in the detritus (also occur in sand on the banks of water bodies) (Figures 14, 15). *D. ustulatus* was also found in the burrow of common vole. It used burrow as a refugium in winter. Specimens of *D. ustulatus* use muskrats' lodges as a source of decomposing plants for food and a place for larvae and for pupation. Immature specimens were collected in muskrats' lodge (Figure 17) [6; 8—11]. This species was recorded from beaver lodge (Figure 16) [9; 11]. *D. usiulatus* is often found in the nests of waterfowl, it has been found in the nests of mute swan (*Cygnus olor* (Gmelin, 1789)), red-headed pochard (*Aythya ferina* (Linnaeus, 1758)), goot (*Fulica atra* Linnaeus, 1758) and black-headed gull (*Chroicocephalus ridibundus* (Linnaeus, 1766)) [12]. The record of *D. ustulatus* being found in cow dung [10] are probably erroneous or this find is accidental.

Dicyrtocercyon is *Cercyon*-form genus from tribe Megasternini. This is indicated by the significant similarity of morphological signs, primarily with real *Cercyon* (*C. melanocephalus* (Linnaeus, 1758), *C. haemorrhoidalis* (Fabricius, 1775), *C. marinus* Thomson, 1853, *C. quisquilius* (Linnaeus, 1761), *C. nigriceps* (Marsham, 1802) and *C. laminatus*) Sharp, 1873 (Table 1).

Table 1. — The data matrix used for the morphological analysis of species of “*Cercyon*”Таблица 1. — Матрица данных для морфологического анализа видов *Cercyon*

Species	Number and code of character
	111111111122222222223333333333444444 123456789012345678901234567890123456789012345
Subgenus <i>Cercyon</i>	
<i>Cercyon melanocephalus</i>	11000000020010001000000100000111022000000120
<i>Cercyon haemorrhoidalis</i>	11000000020010001000000100000111022000000120
<i>Cercyon marinus</i>	11000000010110001000000001001110010000110120
<i>Cercyon quisquilius</i>	1100000002001000000000000000001111221100111100
<i>Cercyon nigriceps</i>	1100000001001100000000000100001110021100?2?110
Subgenus <i>Paracycreon</i>	
<i>Cercyon laminatus</i>	110100000010110000111120000001111221001000100
<i>Dicyrtocercyon ustulatus</i>	010010010010100001000000000000010121200000010
<i>Cercyon dux</i> -group	
<i>Cercyon fimbriatus</i>	110100010100300001010001000000111013000001100
<i>Cercyon tristis</i> -group	
<i>Cercyon convexiusculus</i>	0010000001102100000000000012000111111100010010
<i>Cercyon tristis</i>	0010000001102100000000000012100110012000000010

Note — Species groups in need of taxonomic status upgrade are shown in red.

It significantly differs morphologically from species from groups (*Cercyon tristis*-group and *Cercyon dux*-group) which also require raising the taxonomic status to a separate genus in the future.

There are currently 25 species listed in the Belarusian fauna. The majority of them are clearly distinguishable from *Dicyrtocercyon ustulatus* [8]. It is most similar in coloration, size and body shape to two Holarctic species from the *C. marinus*-group (*C. marinus* Thomson, 1853 and *C. bifenestratus* Küster, 1851) in the Belarus fauna. But these both species have black maxillary palpi and a wider mesoventral plate (ca. 2.5—3.2× as long as wide in *C. marinus* and 1.9—2.0 in *C. bifenestratus*) [8]. Mesoventral plate is narrower in *D. ustulatus* (ca. 4.0—4.2× as long as wide). The best distinguishing features are that lateral view of pronotum does not form a continuous curve with elytra and elytra epipleura is narrow slightly wedge-shaped, slightly bent downwards at anterior half of the elytron. Species of *C. marinus*-group have flat epipleura and lateral view of pronotum forming a continuous curve with elytra.

The inclusion of *C. diversipunctus* in genus *Dicyrtocercyon* raises some doubts. The structure of the male genitalia and the shape and size of the punctation [7] are very different from *D. ustulatus*. Only a study of the type material will allow us to determine the genus affiliation of this species.

Conclusion. The research allowed to raise the taxonomic status of the subgenus *Dicyrtocercyon* to the level of a genus. Currently, the genus includes only one species *D. ustulatus*. The characteristic diagnostic morphological feature is that pronotum and elytra are separately convex in lateral view. *D. ustulatus* is a detritobiont and inhabits various water bodies, as well as waterfowl nests and beaver and muskrat lodges.

We are very grateful to O. R. Aleksandrowicz (Institute of Biology and Earth Sciences, Pomeranian Academy in Slupsk, Slupsk, Poland), B. A. Korotyaev (Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia), D. S. Lundyshev (Baranavichy State University, Baranavichy, Belarus), A. Yu. Machulski (Baranavichy, Belarus) for loan material and photo of beaver's lodge, A. V. Zemoglyadchuk (Baranavichy State University, Baranavichy, Belarus) for loan material and help in preparing the habitus photos.

This study was carried out with the financial support of the Belarusian Republican Foundation for Fundamental Research (project B24V-008) to S. K. Ryndevich and Vietnam Academy of Science and Technology (project QTBY01.02/24-25) to X. L. Truong.

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Received by the editorial staff 22.02.2026.