Review of species of the genus *Cercyon* Leach, 1817 of Russia and adjacent regions. IV. The subgenera *Paracycreon* Orchymont, 1942 and *Dicyrtocercyon* Ganglbauer, 1904 (Coleoptera: Hydrophilidae)

S.K. Ryndevich


Morphological diagnoses, distribution and environmental preferences of species of the subgenera *Paracycreon* Orchymont, 1942 and *Dicyrtocercyon* Ganglbauer, 1904 from Russia and adjacent regions are presented. *Cercyon* (Paracycreon) *noctuabundus* Shatrovskiy is recorded from the Oriental Region for the first time.

S.K. Ryndevich, Baranovichi State University, Voykova ul. 21, Baranovichi 225404, Brest obl., Belarus. E-mail: ryndevichsk@mail.ru

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Introduction

The genus *Cercyon* Leach comprises 255 species, has the world-wide distribution, and is subdivided into 11 subgenera. This is the fourth contribution in the series of papers on the genus *Cercyon* of Russia and adjacent regions. My previous papers on the *Cercyon* of Russia and the adjacent regions (Ryndevich, 2004a, 2007b, 2007c) concern species of the *Clinocercyon* and *Conocercyon*, species of the *C. dux* group, *C. lateralis* group, *C. olibrus* group and *C. rotundulus* group, all of the subgenus *Cercyon*. The territory under the study includes a significant part of the Central and East Palaearctic within the former Soviet Union and the adjacent countries of Europe and Asia.

The subgenus *Paracycreon* Orchymont, 1942 includes 13 species from the Palaearctic (2 species), Afrotropical (5), Oriental (6), Australian (1) and Pacific (1) regions (Hansen, 1999; Hebauer, 2000, 2001, 2002). To my opinion, *Cercyon* (*Cercyon*) *tropisternus* Wu & Pu, 1995 and *C. (Cercyon) linearis* Wu & Pu, 1995 (Hansen, 1999) belong to the subgenus *Paracycreon*, because, according to the original descriptions (Jia et al., 1995), they have pre-episternal elevation sharply carinate longitudinally and structure of male genitalia (apices of parameres are bent outwards) typical of this subgenus. In addition, apices of parameres of *C. tropisternus* bear 3-4 short hairs like in species of *Paracycreon*. Unfortunately, the original descriptions are very short and the type material of these species is not available now.

Two species of *Paracycreon* are known from Russia. Sharp (1873) described *C. laminatus* from Japan. This species was introduced to the West and Central Palaearctic and Hawaii. Further research resulted in a description of a new species, *C. (P.) noctuabundus* from the Russian Far East (Shatrovskiy, 1992).

The subgenus *Dicyrtocercyon* Ganglbauer, 1904 includes only one species, *C. ustulatus* (Preyssler, 1790), described from Czechia and distributed in the Palaearctic and Nearctic regions.

Material and methods

The paper is based on the material from the Zoological Institute of the Russian Academy of Sciences, St. Petersburg, Russia (ZIN); the Natural History Museum, London, UK (BMNH); Zoological Museum of the Moscow State University, Moscow, Russia (ZMUM); and private collections of I.A. Solodovnikov (CIS), D.S. Lundyshev (CDL), A.O. Bienkowski (CAB), P.N. Sheshurak (CPS), A.G. Koval (CAK), and the author (CSR).

Material was examined using a Leica MZ 12.5 stereomicroscope and MBS-10 stereomicroscope.

The possibility of identification of *Cercyon* species by characters of the habitus, colour, male genitalia, structure of mesoventrite and metaventrite has been studied. The criteria according to which the species were united into groups were discussed earlier (Ryndevich, 2004a).

Subgenus *Paracycreon* Orchymont, 1942

Type species *Cercyon hova* Regimbart, 1903.

The characteristic features of the subgenus are as follows: body oval to broadly oval, dorsal...
convexity not interrupted between pronotum and elytra, pre-episternal elevation sharply carinate longitudinally (Fig. 3), contacting metasternum in a single point, epipleura of elytra flat, horizontal, metasternum not forming ridge and not delimiting small anterolateral portion of metaventrite.

At present, the subgenus Paracycreon includes the following species: Cercyon (P.) alternatus Balfour-Browne, 1948; C. (P.) coprinus Balfour-Browne, 1958; C. (P.) decemstriatus Orchymont, 1937; C. (P.) hova Regimbart, 1903; C. (P.) laminatus Sharp, 1873; C. (P.) mosqueryi Orchymont, 1942; C. (P.) morosus Knisch, 1925; C. (P.) subsolanus Balfour-Browne, 1939; C. (P.) vicinaloides Orchymont, 1925; C. (P.) maculosus Hebauer, 2002; C. (P.) pilosellus Hebauer, 2000; C. (P.) linifer Hebauer, 2001; C. (P.) tropisternus Wu & Pu, 1995; and C. (P.) linearis Wu & Pu, 1995.


and 1 August 1998, leg. A.O.Bienkowski (CAB); Altai: 1 spec, Semusnkiy Mt. R., at Tshegra, 19-24 August 2003, leg. V.D. Ivanov (CAK); the Far East: Primorskiy Terr.: 1 spec, Luk yano, 1 September 1992 (CSR); 1 spec, Vladivostok, dung, leg. Telishev (ZMUM); 1 spec, Vladivostok, 10 July 1909 (ZIN); Kuril Islands: 1 spec, Kunashir, near Mendelejevo, at light, 27 June 1985, leg. S.V. Saluk (CSR). Kazakhstan. 2 specs, Dzhungarskiy Alatau, Musdybulak River area, 20 August 1994 and 24 August 1994 (CSR).


Description. Body elongate oval (index length/width 1.7-1.9), widest in middle of elytra (Fig. 2). Dorsal side slightly convex, shiny, without microsculpture. Total dorsal sidecolour regularly yellowish brown. Head black. Pronotum in some specimens with brown central part and yellowish sides. Antennae and maxillary palpi yellow. Club of antennae brownish. Scutellum concolorous with rest of body. Humeral tubercles yellowish brown or brown. Coloration of elytra varied (Figs 4-14). Elytra in some specimens with yellow edge, brown central part, and dark suture. Ventral side dark brown or black. Metasternal pentagon, pre-episternal elevation, and apex of abdominal segments from yellowish brown to reddish brown. Legs yellow, yellowish brown, or reddish brown. Clypeus linear. Punctation of head and pronotum clear and dense. Pronotum widest near middle, without transverse series of punctures along posterior margin. Sides of pronotum strongly rounded. Posterior angles of pronotum not rounded. Base of pronotum with border. Scutellum small. Intervals of elytra flat, slightly convex apically, with shallow regular punctation finer than that on head and pronotum and in striae. Third interval of elytra wider than 2nd, 4th as wide as 2nd. Humeral tubercles very weak. Proventrite roof-shaped raised and finely carinate medially. Epipleura flat, horizontal. Metasternum not forming ridge and not delimiting any small anterolateral portion. Pre-episternal elevation sharply carinate longitudinally, contacting metasternum in a single point (Fig. 3). Metasternum without femoral lines. Metasternal pentagon flat, shiny, with very dense shallow punctuation and two ill-defined small depressions in posterior part. First ventrite of abdomen with median carina, as long as 2nd and 3rd ventrites combined. Male genitalia shown in Figs 15-19. Apices of parameres bent outwards, each with 2 pairs of hairs (Fig. 15). Median lobe rimmed with close-set short hairs, hairs becoming sparse to middle of median lobe (Fig. 16). Apex of genital segment with sparse hairs (Figs 17-19). Sclerotization of genital segment of some specimens incomplete (Figs 18, 19). Length 3-4 mm.

Distribution. Palaearctic Region: Armenia, Austria, Belarus, Belgium, Denmark, Estonia, Finland, France, Georgia, Germany, Hungary, Israel, Italy, Japan, Kazakhstan, Lithuania, Moldova, the Netherlands, Poland, Russia (European part including the Northern Caucasus, West Siberia, and the Far East), Spain, Sweden, Switzerland, UK, Ukraine (including the Crimea and the Carpathians). Oriental Region: Taiwan. Pacific Region: Hawaii.

Environmental preferences. The species occurs in the dung of crow, horse and other mammals. Individuals of C. laminatus were collected in the nests of mute swan (Cygnus olor Gmelin).
Cercyon laminatus uses nests as a source of excrements and decaying plants for food and place for larvae and for pupation. It occurs also in decaying organic matter (e.g., debris near water) and comes frequently to light.

_Cercyon_ (Paracycreon) _noctuabundus_ Shatrovskiy, 1992


Paratypes. 12 specs, same locality and collector (all ZIN); 4 specs, south-western Khabarovsk Terr., Amur River, Bashurovo, 31 June – 2 August 1980, leg. V. Belov, UF-light (ZMUM).


Description. Body elongate-oval (index length/width 1.7), widest at middle of elytra (Fig. 1). Dorsal side slightly convex, shiny, without microsculpture. Total dorsal side colour from regularly yellow to brownish yellow. Head black, with yellow spots near eyes. Antennae and maxillary palpi yellow. Apex of antennal club brownish. Scutellum concolorous with rest of dorsal surface, with brown margins. Elytra yellow or brownish yellow, some specimens with brownish central spot. Ventral side brownish yellow or brownish. Proventricle yellow. Legs yellow to brownish yellow. Clypeus linear. Punctuation of head and pronotum clear and dense. Pronotum widest near middle, without transverse series of punctures along posterior margin. Sides of pronotum strongly convex. Posterior angles of pronotum not rounded. Base of pronotum with border. Scutellum small. Intervals of elytra flat, slightly convex apically, with shallow regular punctuation finer than that on head, pronotum, and in striae. Third interval of elytra as wide as 2nd, 4th a bit narrower than 2nd and 3rd. Humeral tubercles very weak. Proventricle roof-shaped raised and finely carinate medially. Epipleura flat, horizontal. Metasternum not forming ridge and not delimiting any small anterolateral portion. Pre-episternal elevation sharply carinate longitudinally, contacting metasternum in a single point, dark anteriorly. Metasternum without femoral lines. Metasternal pentagon flat, shiny, with very dense shallow punctuation and 2 ill-defined small depressions in posterior part. First ventrite of abdomen with median carina, 1.6 times as long as 2nd ventrite. Male genitalia shown in Figs 20-23. Apices of parameres bent outwards, bearing 2 pairs of short hairs (Fig. 20). Median lobe narrowing at apex (Fig. 21), rimmed with thick short hairs in its apical part, hairs shifting from edge to medial surface of median lobe closer to midlength of latter. Median lobe in the China specimen less abruptly narrowing toward apex (Fig. 22). Apex of genital segment with thin hairs (Fig. 23). Sclerotization of genital segment at edge very weak. Length 2.1-2.9 mm.

Comparison. The species is very similar to _C. (P.) subsolanus_ Balfour-Browne distributed in the Oriental Region: Bhutan, India, Indonesia (Sumatra, Sunda), Malaysia (peninsular part), Nepal, Philippines, Singapore, Sri Lanka, Taiwan, Thailand, and Vietnam. I have examined type material of _C. (P.) subsolanus_ from BMNH: Holotype: _σ_ Type, 931Q, Singapore, C.J. Saunders, B.M. 1929-369, _Cercyon subsolanus_ Balfour-Browne det. Paratypes: _σ_ Paratype, 931Q, _♀_ Allotype, Singapore, 22.IX.-19.XII.1915, Dr. M. Cameron, Brit. Mus., 1932-121.

_Cercyon (P.) subsolanus_ differs in the structure of the metasternal pentagon and the male genitalia, and in larger size (length 2.6-3.2 mm). The elytra lack brownish central spot. The third interval of the elytra is a bit wider than the 2nd one, twice as wide as the 4th interval. _Cercyon (P.) subsolanus_
has a slightly convex metasternal pentagon with some short hairs in the center and in the posterior part. The median lobe is gradually narrowing towards the apex (Fig. 25), bearing several short, very thin sparse hairs anteriorly; hairs at the edge are absent. Each paramere with two pairs of short hairs at the apex (Fig. 24). The two hairs at the apex are very closely located and look like one thick hair. The hairs of the second pair are located rather far from each other.

**Distribution.** Palaearctic Region: Russia (Far East). Oriental Region: China (Guizhou Province) (new record).

**Environmental preferences.** The species occurs in the cow dung and frequently comes to light.

Subgenus *Dicytocrayon* Ganglbauer, 1904

Type species *Sphaeridium ustulatum* Preyssler, 1790.

The characteristic features of this subgenus are as follows: body broadly oval, pronotum and elytra each separately convex in lateral view (Fig. 27), not forming continuous curve; epipleura of elytra narrow, slightly wedge-shaped, slightly bent downwards; pre-episternal elevation forming elongate subparallel-sided tablet and contacting metaventrite in a single point; metasternum forming no ridge and not delimiting small anterolateral portion of metasternum.

At present the subgenus contains only one species.
**Material examined.**

**Belarus.** 1 spec, Vitebsk Prov., Mioty Distr.: near Zacherev'e, 15 July 1993 (CSR); 1 spec, Lake Ob- sterno near Zacherev'e, lake drifts, 27 July 1995, leg. S. Ryndevich (CSR); Minsk Distr., near Raubichi, bank of river, 27 May 1985 (CSR); 1 spec, Mogilevskaya gub[erniya], [now Vitebsk Prov.], Lisino, 21 June 1967, leg. Birla (ZIN); Brest Prov.: 8 specs, near Malorita, pond, 22 June 1997 (CSR); 1 spec, same data, canal (CSR); Baranovichi Distr.: 6 specs, near Kolpenita, hut of muskrat No. 3, 22 May 2007, leg. D.S. Lundyshnev (CDL); 4 specs, near Domashievichy, hut of muskrat, 17 August 2007, leg. D.S. Lundyshnev & S.K. Ryndevich (CSR, CDL).

**Russia.** 1 spec, Petropol [= St. Petersburg] (ZIN); 1 spec, Petersburg gub[erniya], Verkhotur'e (ZIN); 1 spec, SPb, Moskovskoe shosse, 10 May 1862, leg. A. Morawits (ZIN); Ligovo near St. Petersburg, 9 May 1862, leg. A. Morawits (ZIN); 1 spec, Serezhino, Yamburg- ski uyezd, 24 August 1895, leg. Bianchi (ZIN); 1 spec, Sablino, 6 May 1923, leg. A. Ivanov (ZIN); Tver Prov.: 1 spec, Bologoye, 9 July 1905 (ZIN); Moscow Prov.: 3 specs, Ramenskiy Distr., railway station Otdykh, mud, 16 July 1999, leg. Nikitskiy & Petrov (ZMUM); 3 specs, Nikola Gora, 7 August 1946, leg. S. Nikulin (ZMUM); 1 spec, Salykovo (ZIN); 2 specs, Klin Distr., Boblovko, 5 and 6 May 1906, leg. D. Smirnov (ZIN); Bryansk Experiment Forestry, 10 April 1908, leg. A. Morawits (ZIN); 5 specs, Kaluga (ZIN); 1 spec, Yaroslavl' (ZIN); 13 specs, Yaroslavl' (ZIN); 1 spec, Yaroslavl', Yaroslavl' uyezd, 4 May 1898, 7-8 p.m., coll. A. Yakovlev (ZIN); 1 spec, Vorozhby (ZIN); 2 specs, Vyatka River, 15-25 May 1900, coll. A. Yakovlev (ZIN); 1 spec, Lazorevka, 29 April-5 May 1901, coll. A. Yakovlev (ZIN); 1 spec, Samlety (ZIN); 1 spec, Saratov, leg. Richter (ZIN); 4 specs, Bogorodsk, 2 and 9 May 1891, 7 June 1891 (ZIN); 6 specs, Northern Caucasus, Kuban region, E. Koenig, coll. G. Sievers (ZIN).

**Ukraine.** 1 spec, Chernigov Prov., Gub[erniya], [now Kiev Prov.], 15 June 1891 (ZIN); 6 specs, Northern Caucasus, Kuban region, E. Koenig, coll. G. Sievers (ZIN). **Europe.** 1 spec, Chernigov Prov., Nezhin, pond, 1977, leg. A. Yakovlev (ZIN); 1 spec, Vorozhby (ZIN); 1 spec, Donetska oblast, 1987, leg. A. Yakovlev (ZIN); 1 spec, Zaporozhye (ZIN); 1 spec, Crimea, 1990, leg. A. Yakovlev (ZIN).

**Description.** Body broadly oval (index length/width 1.5-1.6), widest in middle of elytra.
(Fig. 26). Dorsal side moderately convex, strongly shiny, without microsculpture. Total dorsal side colour regularly black. Head black. Antennae and maxillary palpi brownish yellow. Club of antennae brownish, Scutellum of same colour as rest of body. Elytra black with reddish or brownish yellow apical spot and dark suture. Underside dark brown or black. Some specimens with brown metasternal pentagon, pre-episternal elevation, and apices of abdominal ventrites. Legs reddish brown to black, tarsi reddish or yellowish brown. Clypeus linear. Punctuation of head and pronotum clear and dense. 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. Pronotum and elytra each separately convex in lateral view, not forming continuous curve (Fig. 27). Scutellum small, of same colour as rest of body. Elytra with 10 deep punctate striae. Intervals of elytra flat, slightly convex apically, with shallow regular punctuation, similar to, or somewhat finer than that on head and pronotum and in elytral striae. Third interval of elytra as wide as 2nd, 4th narrower than 2nd and 3rd. Hemeral tubercles very weak. Proventricle roof-shaped raised and finely carinate medially. Epipleura of elytra narrow, flat, slightly wedge-shaped, slightly bent downwards. Apex of genital segment with pair of thin hairs (Fig. 28-31). Inner side of parameres at twice as long as second ventrite. Male genitalia part. First ventrite of abdomen with median carina, punctation and two small depressions in posterior that on head and pronotum and in elytral striae. Carinate medially. Epipleura of elytra narrow, flat, slightly convex apically, with shallow regular punctuation, similar to, or somewhat finer than that on head and pronotum and in elytral striae. Carinate medially. Epipleura of elytra narrow, flat, slightly convex apically, with shallow regular punctuation, similar to, or somewhat finer than that on head and pronotum and in elytral striae.

Distribution. Palearctic Region: Austria, Belarus, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Latvia, Lithuania, Macedonia, Netherlands, Norway, Poland, Portugal, Romania, Russian Federation (European part, "Siberia"), Slovakia, Spain, Sweden, Switzerland, Turkey, UK, Ukraine (including the Crimea), “Yugoslavia”.

Record from Siberia by Zaitsev (1908) needs confirmation, because Siberian specimens of C. ustulatus are absent from Zaitsev’s (ZIN) and other collections. Nearctic Region: Canada (Quebec), USA (New Hampshire, New Jersey, New York).

Environmental preferences. Freshwater detrito-biont. Inhabits decaying plant debris near water (river and lake drifts), lives not very deep in the detritus (beetles also occur in sand on the banks of water bodies). Cercyon ustulatus was found hibernating in the burrow of common vole; it also uses muskrats’ lodges as a source of decaying plants for food and a place for larvae and for pupation: tenereal adults have been collected in muskrats’ lodge.

Smetana (1988) recorded this species from beaver lodge and from cow dung (Smetana, 1978).

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