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Taxonomic status of *Cercyon alpinus*, *C. exorabilis*, *C. strandi* and *C. tatricus* and notes on their biology (Coleoptera: Hydrophilidae: Sphaeridiinae)

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Abstract

Cercyon alpinus VOGT, 1969, *C. strandi* ROUBAL, 1938 and *C. tatricus* ENDRÖDY-YOUNGA, 1967 are revised and recognized as three distinct but likely closely related species. A new species group of *Cercyon* LEACH, 1817 is defined for these three species and characterized by differential characters. *Cercyon exorabilis* SHATROVSKIY, 1992 is considered as synonym of *C. tatricus*. A key to the species, their redescriptions and a discussion about the variability in comparison with the related species *C. melanocephalus* (LINNAEUS, 1758) and *C. haemorrhoidalis* (FABRICIUS, 1775) are given, as well as notes on bionomy and distribution. Relevant diagnostic characters are illustrated. *Cercyon tatricus* is recorded as new for Romania and the Ukraine, *C. alpinus* as new for Italy, Montenegro, Romania and the Ukraine, *C. strandi* as new for Turkey.

Key words: Taxonomy, synonymy, faunistics, Coleoptera, Hydrophiloidea, Hydrophilidae, Sphaeridiinae, *Cercyon*, Palearctic region.

Zusammenfassung

Cercyon alpinus VOGT, 1969, *C. strandi* ROUBAL, 1938 und *C. tatricus* ENDRÖDY-YOUNGA, 1967 werden revidiert und als drei eng verwandte aber deutlich getrennte Arten erkannt. Auf Basis von acht gemeinsamen Merkmalen werden diese drei Arten als neue Artengruppe innerhalb der Gattung *Cercyon* LEACH, 1817 zusammengefasst. *Cercyon exorabilis* SHATROVSKIY, 1992 wird mit *C. tatricus* synonymisiert. Ein Bestimmungschlüssel für alle drei Arten wird angefügt. Die Arten werden neu beschrieben and ihre Variabilität im Vergleich mit den verwandten Arten, *C. melanocephalus* (LINNAEUS, 1758) und *C. haemorrhoidalis* (FABRICIUS, 1775), diskutiert, zusammen mit Anmerkungen zur Bionomie und Verbreitung der Arten. Wichtige Merkmale werden illustriert. *Cercyon tatricus* wird erstmals für Rumänien und die Ukraine, *C. alpinus* erstmals für Italien, Montenegro, Rumänien und die Ukraine und *C. strandi* erstmals für die Türkei gemeldet.

Introduction

The montane species *Cercyon alpinus* was described in 1969 from the Alps by H. Vogt as closely related to the common European species *C. haemorrhoidalis* (FABRICIUS, 1775) and *C. melanocephalus* (LINNAEUS, 1758). Later, it was found also in Great Britain (OWEN & MENDEL 1990, OWEN 1994, BRATTON 1998). In 2000, I examined a small number of *Cercyon* from the Lower Tatra Mts. (Slovakia) containing specimens resembling VOGT's description of *C. alpinus*. However, in some details this material distinctly differed from his description. During a study of type material of some less-known

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Palearctic *Cercyon* species, I found three other species closely related to *C. alpinus*, all of them mentioned in the original descriptions only: *C. tatricus* ENDRÖDY-YOUNGA, 1967, *C. strandi* ROUBAL, 1938 and *C. exorabilis* SHATROVSKIY, 1992. The aim of this study is to clarify the taxonomic status of these species and sum up their distribution. For easier understanding, these species are compared with the widespread *C. haemorrhoidalis* and *C. melanocephalus*.

Material and methods

The label data of the type specimens are given in full, slash (/) indicates the change of lines, double slash (//) indicates different labels; label data of non-type specimens include locality name, date(s) and name(s) of the collector(s), and are converted to a standard format. When old names are used or the records need more precise explanation, comments are given in brackets.

Comparison of the species with *C. haemorrhoidalis* and *C. melanocephalus* is based on the examination of material of the latter two species stored in NMPC and MFOC (150 specimens of *C. haemorhoidalis* and 40 specimens of *C. melanocephalus* in total), precise label data of this material are not presented because it is not the goal of this paper.

Material was examined using an Olympus SD 30 stereomicroscope, figures were prepared using an ocular grid mounted on the MBS-10 stereomicroscope.

Generally, the morphological terminology follows HANSEN (1991), but it differs from HANSEN's and the general use by coleopterists and follows the general insect morphology in some aspects: "preepisternal elevation (of mesothorax)" is used for an elevated medioposterior part of the mesoventrite seen as a prolonged oval plate of the mesothorax viewed from ventral side; "mesoventrite" and "metaventrite" are used instead of "mesosternum" and "metasternum". See KOMAREK (2004) and FIKÁČEK & BOUKAL (2004) for details.

Acronyms:

HNHM	Hungarian Natural History Museum (Gy. Szél)
IRSN	Institute Royal des Sciences Naturelles de Belgique (A. Drumont, P. Limbourg)
JOEC	coll. J. A. Owen (Epsom, Surrey, UK)
MBDC	coll. M. Boukal (Pardubice, Czech Republic)
MFOC	coll. M. Fikáček (Praha, Czech Republic)
MMBC	Moravské zemské muzeum, Brno (V. Kubáň)
MMOC	coll. M. Mantič (Hlučín, Czech Republic)
NHMW	Naturhistorisches Museum Wien (M.A. Jäch, H. Schönmann, A. Komarek)
NMPC	Národní muzeum, Praha (J. Jelínek, J. Hájek)
SMFD	Forschunginstitut und Naturmuseum Senckenberg, Frankfurt am Main (D. Kovac)
SNMC	Slovenské národné múzeum, Bratislava (R. Csefalvay)
ZIRC	Zoological Institute, Russian Academy of Science, St. Petersburg (G.S. Medvedev)

Differential diagnosis

All five species treated within this paper belong to *Cercyon* s.str. (see VOGT 1972, HANSEN 1987, FIKÁČEK & BOUKAL 2004). *Cercyon alpinus*, *C. strandi* and *C. tatricus* seem to form a distinct monophyletic group within this subgenus. The monophyly of

this *C. alpinus*-group is supported by the following characters: maxillary palpi dark, elytral interstices without microsculpture, preepisternal elevation of mesothorax narrow with its posterior tip slightly overlapping anterior margin of metaventrite, preepisternal elevation carinate medially (Fig. 26), metaventrite with distinct femoral lines, and lateral portions of metaventrite without shallow pit-like punctures. In addition, the representatives of this species group also share a rather dark general coloration and similar biology, for details see Bionomical notes below.

In his revision of North American Sphaeridiinae, SMETANA (1978) defined the *C. haemorrhoidalis*-group on the basis of the same characters mentioned above for the *C. alpinus*-group, only with the exception of the presence of a carinate preepisternal elevation on the mesothorax. He included five species in this group: *C. haemorrhoidalis*, *C. melanocephalus*, *C. pygmaeus* (ILLIGER, 1801), *C. terminatus* (MARSHAM, 1802) and *C. impressus* (STURM, 1807). However, SMETANA's concept is relatively broad, allowing that *C. impressus* and *C. terminatus* do not match his concept precisely. For this reason the *C. haemorrhoidalis*-group seems not to be monophyletic, or at least the monophyly is not supported very well by the characters defined by SMETANA (1978).

There is no doubt about the considerable similarity of external characters of both species groups mentioned above. Moreover, the representatives of the above defined *C. alpinus*-group share all the characters on which the *C. haemorrhoidalis*-group is based, and differ from the latter group only by one character (carinate preepisternal elevation). In spite of that, I define here rather the distinct and clearly monophyletic *C. alpinus*-group and avoid its integration into the vaguely defined *C. haemorrhoidalis*-group. The precise relationships of the *C. alpinus*-group to the other species groups of *Cercyon* have to be clarified by a phylogenetic analysis and is not the aim of this contribution.

Because the species of the *C. alpinus*-group are often misidentified as *C. haemorrhoidalis* or *C. melanocephalus*, I included these two latter species in the identification key and discuss their differential diagnoses in the systematic part. All five species treated within this paper can be thus separated from the other species of the subgenus *Cercyon* s.str. on the basis of the following characters: (1) surface of elytra without microsculpture between punctural series; (2) metaventrite with distinct femoral lines; (3) preepisternal elevation of mesothorax narrow, its posterior margin contacting metaventrite or feebly overlapped anterior margin of metaventrite; (4) maxillary palpi dark; (5) lateral portions of metaventrite without shallow pit-like punctures (× *C. impressus*); (6) total body length larger (ca. 2.3 - 3.2 mm; × *C. pygmaeus* and *C. terminatus*).

Distinguishing *C. impressus* from the five species treated here can be somewhat problematic on the basis of character 5 given above, although this species is very easily distinguished from the others by its general habitus. That is why I attach a short differential diagnosis of this species along with its comparison with the five species included in the key (for more information see VOGT 1972, SMETANA 1978, HANSEN 1987):

Cercyon impressus: 3.0 - 3.6 mm (the treated species are on average smaller, 2.3 - 3.2 mm); very convex (the treated species are more flat in lateral view); elytra strongly narrowed posteriorly (the treated species are less narrowed posteriorly); preepisternal elevation of mesothorax narrow and flat, without longitudinal keel, pronotum at its posterior margin with small pit-like depres-

sion just in front of scutellar shield (if in the treated species there is a shallow pit-like depression on the pronotum, then the preepisternal elevation of the mesothorax with longitudinal keel distinct at least on its posterior half).

Key to *Cercyon alpinus*, *C. strandi*, *C. tatricus*, *C. haemorrhoidalis* and *C. melanocephalus*

1a Preepisternal elevation of mesothorax, at least in its posterior part, with distinct median longitudinal carina (Fig. 26). Epipleura dark. Elytra dark with paler humeral spot and paler elytral apex, or whole elytra pale, only with sharply limited basal black wedge-shaped spot (Figs. 22 - 24) 2

1b Preepisternal elevation of mesothorax flat or only slightly convex, without median longitudinal carina. Epipleura dark or pale (rufo-testaceous). Elytra either pale (red or rufo-testaceous) with basal dark wedge-shaped or T-shaped, more or less sharply limited spot; or the whole elytra pale, or elytra dark, with distinct paler spot on apex and near scutellar shield (Figs. 25, 27 - 29) 4

2a Median lobe of aedeagus broad, only feebly narrowing apicad, abruptly narrowed apically (Fig. 6). Elytron dark, with paler apex and usually also with small paler spot in humeral area (Fig. 24). Punctation of elytral base relatively coarse and dense. Elytral series 10 very distinct, consisting of large closely standing punctures (separated by ca. their diameter) usually larger than punctures in other elytral series (Fig. 11)) ..... ***tatricus***

2b Median lobe of aedeagus narrow, distinctly narrowing apicad, not abruptly narrowed on its apex (Figs. 3, 9). Elytron either dark with paler small humeral spot and pale elytral apex, or pale with sharply or vaguely limited basal black wedge-shaped spot (Figs. 22, 23 and as Fig. 24). Punctation of elytral base sparse. Elytral series 10 somewhat reduced, composed of rather distant punctures of the same size as punctures in other elytral series (intervals larger than diameter of punctures); punctures of the elytral series 10 either distinct or blending in interval punctation and thus indistinct basally 3

3a Median lobe with very long almost parallel-sided apex, corona situated ca. in apical 0.25 of median lobe (Fig. 3). Elytron dark, with paler small humeral spot (sometimes indistinct) and pale elytral apex (as Fig. 24). Punctures on the base of elytral series 3 usually sparsely situated, separated by 2 - 3× diameter of one puncture. Series 10 strongly reduced basad, usually blending in the interval punctation and thus indistinct basally (Fig. 13) ..... ***strandi***

3b Median lobe of aedeagus with shorter, not nearly parallel-sided apex, corona situated c. in apical 0.17 - 0.20 of median lobe (Fig. 9). Elytron either dark, but with distinct, sometimes very vaguely defined basal black wedge-shaped spot contrasting with the paler elytral disc, or dark and becoming paler towards elytral apex, or pale (red to rufo-testaceous) with sharply limited basal black wedge-shaped spot (Figs. 22, 23). Punctures on the base of elytral series 3 usually very densely situated, separated by diameter of one puncture or more closely aggregated. Punctures of series 10 not gradually reduced towards elytral base; punctures in this series sparser than in the other elytral series and distinct even on elytral base. (Fig. 12) ..... ***alpinus***

4a Elytra either completely pale, rufo-testaceous, or pale with dark basal T-shaped spot (sometimes elytra darker, then pale colouration usually visible at least basally near scutellar shield) (Figs. 27 - 29). Epipleura usually pale, sometimes darkened distally. Punctation of elytral base coarse and dense. Elytral series 10 indistinct, reaching basal 0.25 of elytral length only. Aedeagus as in Figs. 14 - 16 ..... ***haemorrhoidalis***

4b Elytra pale, with sharply limited basal black wedge-shaped spot not extending posteriorly as narrow sutural strip, and with additional baso-lateral black spots (Fig. 25). Epipleura dark, slightly paler apically. Punctation of elytral base sparse. Elytral series 10 distinct, reaching basal 0.15 of elytral length. Aedeagus as in Figs. 17 - 19 ..... ***melanocephalus***

Cercyon alpinus VOGT, 1969

Cercyon alpinus VOGT 1969: 180

TYPE LOCALITY: Austria, Tirol Prov., Platzachalm, 1050 m a.s.l.

TYPE MATERIAL EXAMINED: **Paratype** ♂ (SMFD): "Neuhaus bei Schliersee [= Germany, Bavaria, 27.7 km SW Rosenheim] / 26. IV. 1953 / Wellschmied // Cercyon melanoceph. L. / M. Hüther det 1955 // alpinus // PARATYPUS".

ADDITIONAL MATERIAL EXAMINED (20 specimens): **Austria:** Lower Austria, Langau, Saurüsselboden, in deer dung, 15.v.1988, F. Ressl lgt., 1 female (NHMW). **Germany:** Bavaria, Bavarian Alps Mts., Winklmoos region, 5.viii.1989, Hirgstetter lgt, 1 male (MFOC); Bavaria, Bavarian Alps Mts., Sylvenstein, 22.x.1989, Witzgall lgt., 1 specimen (MFOC). **Great Britain:** Scotland, Braemar, 1.vi.1994, J.A. Owen lgt., 2 males (JOEC); same locality, 7.v.1990, J.A.Owen lgt. 1 male (JOEC); same locality, 30.vi.1994, J.A. Owen lgt., 2 males (JOEC); Scotland, Glen Lui [= gorge of Lui river], 7.v.1995, J.A. Owen lgt., 5 males (JOEC, MFOC); Linn of Dee [= gorge of Dee river], 22.viii.1990, deer dung, J.A. Owen lgt., 2 males (JOEC, MFOC); Scotland, Abernethy Forest [= ? nr. Abernethy, 5 km SSW of Grantown on Spey], 1994, J. Owen lgt., 1 male (JOEC). **Italy:** "Mte. Pagano" [= Teramo prov., Montepagano near Roseto degli Abruzzi village (E. GENTILI, pers. comm.)], without collecting date, Paganetti lgt., 1 male (IRSN). **Montenegro:** Han Garancic [= most probably Karačići, 14.5 km NE Pjevlja, N Montenegro], 19.-20.vii.1938, J. Fodor lgt., 1 female (HNHM). **Romania:** Huneodara distr., Retezat National Parc, Gura Zlata–Rade Su, 1300-1800m, 25.-27.vii.1999, L. Klíma lgt., 1 male (MBDC). **Ukraine:** Bliznica [= Bliznica Mt.], without collecting date, Fleischer lgt., 1 male (NMPC).

DIFFERENTIAL DIAGNOSIS: Pale specimens of *C. alpinus* are quite similar to *C. melanocephalus* by general coloration; dark specimens of *C. alpinus* are similar to *C. tatricus* and *C. strandi*.

Differential characters of *C. alpinus* to the latter species are summarized in Tab. 1, for comparison with *C. melanocephalus* see also differential diagnosis of this species.

REDESCRIPTION: Body moderately convex. Length: 2.7 - 3.2 mm; width: 1.5 - 1.65 mm. Coloration: Head and pronotum black, head with minute paler spots anteriorly of eyes, pronotum with paler narrow stripes on lateral and posterior margins. Elytra with vaguely limited wedge-shaped black basal spot, reaching from about 0.5 of elytral length on sutural interval to base of elytral series 5. Between elytral intervals 5 and 6 with distinct paler spot basally, this spot confluent with paler posterior part of elytra in some specimens, but usually distinctly even if vaguely limited from darker surrounding; laterally to this paler spot with black elytral base (Fig. 22). In some specimens with sharply limited basal wedge-shaped dark spot medially and smaller basal spots laterally, and with red or rufo-testaceous elytral disc (Fig. 23). Epipleura dark, sometimes with narrow paler stripe on its mesal margin.Ventral side black, legs rufo-testaceous, with femur darker than tibia and tarsus. Maxillary palpi and antennae moderately dark, rufo-testacous, antennal club slightly darker than basal antennomeres.

Head sparsely punctate, punctures distinctly impressed, separated by 2 - 4× their diameter, punctation equal on the whole surface, interstices shining, without microsculpture. Anterior margin of clypeus shallowly concave, distinctly rimmed.

Tab. 1: Differential characters of *Cercyon alpinus*, *C. strandi*, *C. tatricus*, *C. haemorrhoidalis* and *C. melanocephalus*.

	C. alpinus	*C. strandi*	*C. tatricus*	*C. haemorrhoidalis*	*C. melanocephalus*
Interval puncation on elytra	Finer and sparser	Finer and sparser	Coarser and denser	Coarser and denser	Finer and sparser
Coloration of elytral disc	Rufo-testaceous to dark	Dark	Dark	Rufo- testaceous to dark	Rufo-testaceous
Dark basal spot on elytra	Triangular: present and sharply to vaguely limited, or missing	Missing	Missing	T-shaped	Triangular: sharply limited
Paler area near scutellum	Missing	Missing	Missing	Present or (very rarely) missing	Missing
Epipleura coloration	Dark	Dark	Dark	Pale	Dark
Longitudinal ridge on preepisternal elevation of mesothorax	Present at least in posterior part	Present at least in posterior part	Present at least in posterior part	Absent	Absent
Appearance of elytral series 10	Punctures finer and more distant than in adjacent series, distinguishable from interval punctation even basally	Punctures finer and more distant than in adjacent series, gradually reduced and not distinguishable from interval punctation basally	Punctures as large or slighly coarser than in adjacent series, distinguishable from interval punctation basally	Punctures small, reduced, series reaching basal 0.25 of elytral lenghth only, missing in humeral area	Punctures as large as and more distant than in adjacent series, distinguishable from interval punctation basally
Shape of elytral apex	Rectangularly rounded	Rectangularly rounded or obtusely extended	Rectangularly rounded	Obtusely extended	Rectangularly rouded
Shape of median lobe	Very narrow (narrower than distance of corona from apex), awl-shaped, continuously narrowed from apical 0.25, forming long acute top	Very narrow, continuously narrowed apicad, apically with very long almost parallel-sided top	Wide, abruptly narrowed into a short and thin tip apically	Narrow, almost parallel-sided throughout, continuously narrowed from apical 0.12 to apex	Narrow (not narrower than distance of corona from apex), slightly broadened in basal 0.2-0.25, continuously narrowed from apical 0.33 to apex
Distance of corona to apex of median lobe	0.17 - 0..20	0.25	0.15	0.15	0.18
Apex of parameres	Slightly widened on outer margin	Slightly widened on outer margin	Distrinctly widened on outer margin	Slightly widened on outer margin	Distrinctly widened on outer margin

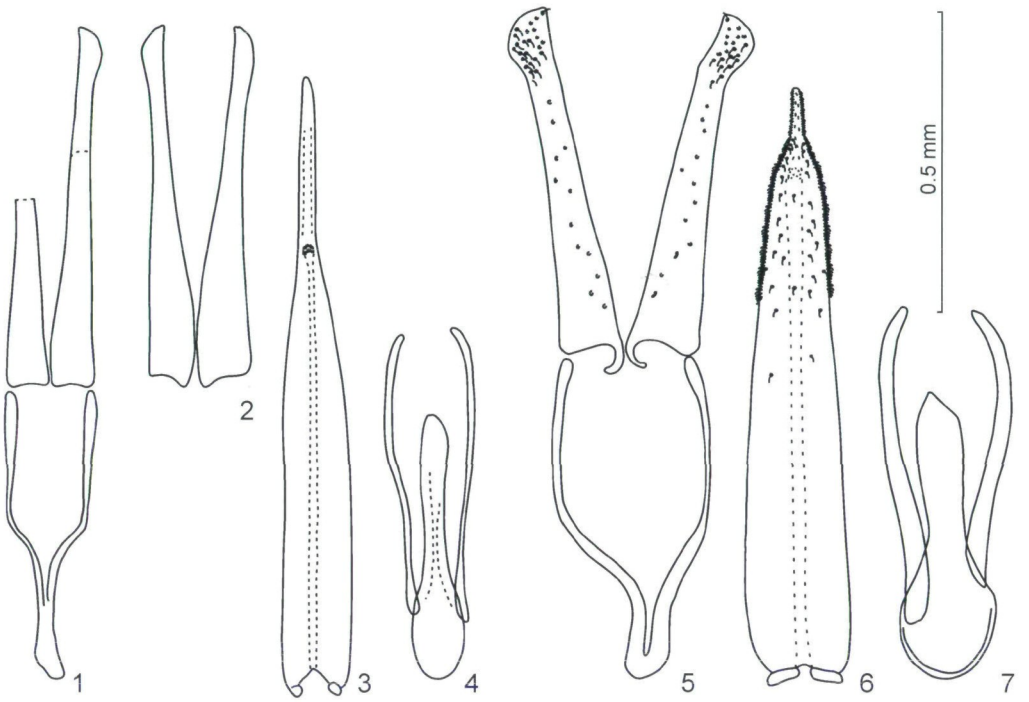


Fig. 1 - 7: Male genitalia. 1 - 4: *Cercyon strandi* (1: tegmen of lectotype, 2: parameres of paralectotype, 3: median lobe, 4: sternite 9); 5 - 7: *Cercyon tatricus* (5: tegmen, 6: median lobe, 7: sternite 9).

Prothorax: Pronotum transverse, arcuately narrowed anteriad, punctation similar as on head, interstices shining, without microsculpture. Distinct rim on lateral margins, not reaching postero-lateral corners. Frontally to scutellar shield with shallow but distinct impression (similar as in *C. impressus*) in some specimens. Prosternum longitudinaly carinate, with distinct notch posteriorly, antennal grooves distinct, well developed.
Mesothorax: Scutellum triangular, longer than wide, without microsculpture, punctation finer than on pronotum. Elytron with 10 punctural series (including sutural series). Series 1 - 6 arising almost at elytral base, series 7 - 9 arising slightly more distally. All series not impressed basally, becoming impressed apicad. Punctures of elytral series separated by distance of their diameter, or closely aggregated (at least on base of series 3). Series 10 reduced in length, reaching from 0.5 of elytral length to humeral area, punctures of this series smaller and more sparsely distributed than in other series, but distinctly separable from interval punctation even in basal part of this series. All intervals flat throughout. Interval punctation indistinctly denser than on pronotum, with punctures as large as on pronotum, separated by 3 - 4× diameter of one puncture, becoming smaller and more sparsely distributed laterad and apicad. Interstices shining, without microsculpture. Elytral apex rectangularly rounded (as in Fig. 20). Preepisternal elevation narrow (4× longer than wide), prolonged, from 0.5 of its length continuously narrowed apicad and posteriad; posterior apex blunty pointed, slightly overlapping anterior margin of metaventrite; with distinct longitudinal carina medially, reaching usually

almost to anterior apex, sometimes shorter, but always distinct in posterior part of elevation. Punctation on elevation consisting of large, densely situated, elongate setiferous punctures, interstices without microsculpture.
Metathorax: Metaventrite with elevated median pentagonal area, punctation distinctly impressed, but not very dense, with smaller and densely situated punctures on anterior and posterior margins in some individuals. Interstices shining, without microsculpture. Lateral portions of metaventrite without shallow pit-like punctures, with pubescent microreticulation. Femoral lines present, rather distinct and long. Anterolateral ridges absent.
Legs: Pro- and metafemora rather densely punctate, interstices with distinct microsculpture consisting of longitudinal irregular lines.
Male genitalia (Figs. 8 - 10): Aedeagus with relatively narrow phallobase bearing long manubrium; parameres slightly longer than phallobase, not distinctly widened on lateral margin apically. Median lobe very narrow, awl-shaped, continuously narrowed from apical 0.25 to apex, forming long acute tip. Corona situated in apical 0.17 - 0.20. Sternite 9 tongue-like.

VARIABILITY: *C. alpinus* is very variable regarding the coloration of the elytra and the length of the longitudinal carina on the preepisteral elevation of the mesothorax, as described in the key and in the redescription (Figs. 22, 23). In contrast to OWEN (1994), the median longitudial carina on the preepisternal elevation of the mesothorax is always present, though restricted to the posterior part in some individuals. The elytral punctation varies to a certain extent: in some specimens the interval punctation of the elytra can be slightly looser than described; the punctures of the elytral series 10 can be slightly reduced basad and thus rather indistinct. In all latter mentioned cases the individuals resemble *C. strandi* and can be distinguished from it by the male genitalia. The punctation on the metaventrite is rather variable but usually not as coarse as in *C. tatricus*. The male genitalia do not vary morphologically in all specimens examined.

DISTRIBUTION (Fig. 30, circles): Great Britain, Italy, Germany, Austria, Ukraine, Romania, Montenegro. The records from western Europe were summarized by HOFMANN & FLECHTNER (2003). They summarized older published records (VOGT 1969, GEISER 1984, OWEN & MENDEL 1990, OWEN 1994) and their own data from the Fichtelgebirge (Germany, Bavaria). GEISER (2001) adds some additional records from Austria and Germany (Bavaria). Records from all these contributions are included in the distributional map of this species. The species is recorded as new for Italy, the Ukraine, Romania and Montenegro.
In general, *C. alpinus* seems to be distributed in montane and submontane areas throughout Europe.

Cercyon tatricus ENDRÖDY-YOUNGA, 1967

Cercyon tatricus ENDRÖDY-YOUNGA 1967: 63
Cercyon tatricus ENDRÖDY-YOUNGA: ENDRÖDY-YOUNGA 1968: 74, ENDRÖDY-YOUNGA 1969: 222 (subsequently published descriptions of the same species)
Cercyon exorabilis SHATROVSKIY 1992: 362: Syn: HANSEN (2004)

TYPE LOCALITY: Slovakia, High Tatra Mts., "Felkai Völgy" [= ?Velká Studená dolina valley], 1450 - 1600m.

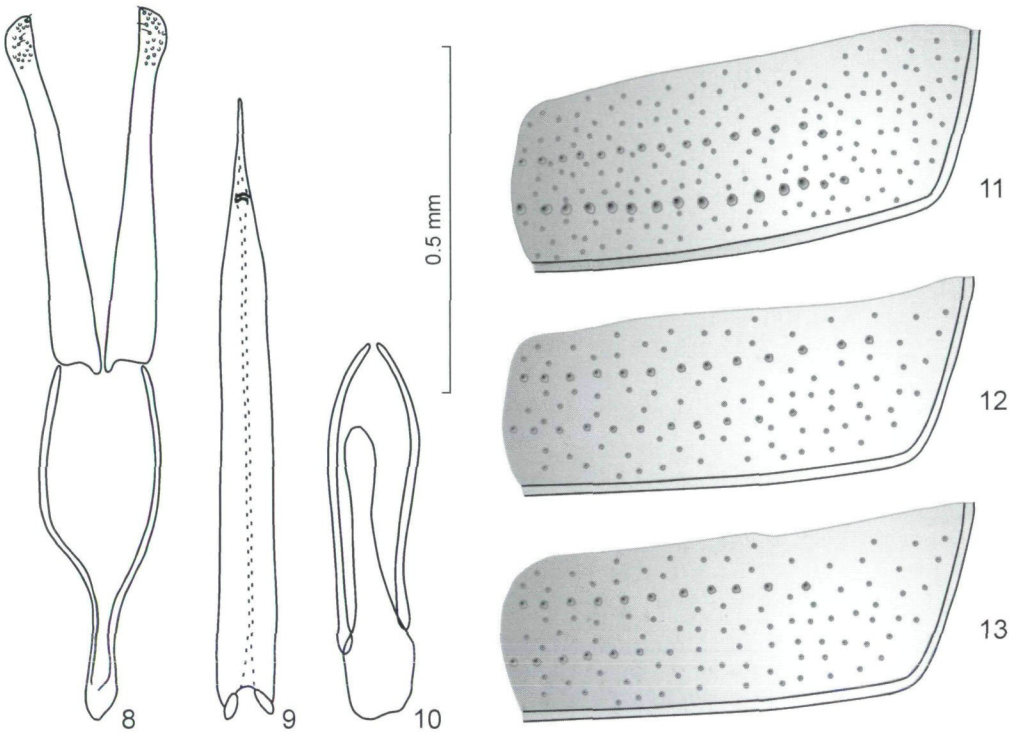


Fig. 8 - 13: 8 - 10: male genitalia of *Cercyon alpinus* (8: tegmen, 9: median lobe, 10: sternite 9). 11 - 13: punctation of the humeral part of elytra. 11: *Cercyon tatricus*; 12: *Cercyon alpinus*; 13: *Cercyon strandi*.

TYPE MATERIAL EXAMINED: *Cercyon tatricus*: **Holotype** ♂ (HNHM): "Slov. M. Tátra [= High Tatra Mts.] / Endrödy – Younga // Felkai Völgy [= ? Velká Studená dolina valley, NW Starý Smokovec] / 1450 - 1600 m // ex sterc. equi / 11.VII. 1962 // HOLOTYPUS 1965 / Cercyon tatricus [handwritten] / Dr. Endrödy – Younga [red-hemmed label]". **Paratypes:** label data as in holotype, 5 specimens (HNHM), 1 male (BMNH); label data as in holotype, but the range of altitudes is "1250 - 1500m", 3 specimens (HNHM). In one of the descriptions (ENDRÖDY-YOUNGA 1969) it is mentioned that the description was based on "3 ♂, 4 ♀ and 7 additional specimens". The holotype is mentioned as collected in the altitudes "1250 - 1500" (not in "1450 - 1600m" as is given under the holotype), together with allotype and six paratypes. In the HNHM I have found only a male with given altitudes "1250 - 1500m" not labeled as type, and no specimen labeled as allotype. Because four type specimens are missing in collection of the HNHM, I consider the latter specimen to be a part of type series (paratype).

Cercyon exorabilis: **Holotype** ♂ (ZIRC): "промысел Озерпах [= harbor Ozerpakh] / лиман Амура [= delta of Amur river] / Чернабуи [= Cernabun lgt.] 13. VI. [1]915 [printed, only date hand-written] // Holotypus ♂ / Cercyon / exorabilis / Shatrovskiy [red label, name and author hand-written] // Zoological Institute / Academy of Sciences / St. Petersburg [yellow label, printed]. **Paratype:** "Амур. обл.. [= Amur Territory] / р. Кумусуи [= Kumusun River, ca 30 km NE of Tokur, E part of Amur Territory] / 30 VII 1979 Кабаков [= Kabakov lgt.] // Paratypus / Cercyon / exorabilis / Shatrovskiy // Zoological Institute / Russian Academy of Sciences / St. Petersburg", female (ZIRC).

ADDITIONAL MATERIAL EXAMINED (15 specimens): **Romania:** Huneodara distr., Retezat National Parc., Gura Zlata-Rade Su, 1300-1800 m, 25.-27.vii.1999, Klíma lgt., 1 male (MBDC). **Slovakia:** Bělké Tatry [= probably Belianské Tatry Mts.], 24.ix.1955, J. Dezort lgt., 1 male, 1 female (MMBC); High Tatra

National Parc, Podbánské, 23.vii.1989, R. Fornůsek lgt., 1 male (MBDC); Lower Tatra Mts., Demänovská Dolina, Krakova Hoľa Mt., 1750m, 25.vii.2001, area with *Pinus mugo*, excrements of *Ursus arctos*, without collector data, 2 males, 4 females (MFOC, JOEC); Muráňská planina Mts., Muráň – Kľak Mt., meadow, in horse excrements, 26.vii.2003, Mantič lgt., 1 female (MBDC); Muráňská planina Mts., Muráň, Hrdzavá dolina valley, excrements of *Cervus*, beech-fir forest, 14.v.2004, lgt. M. Mantič, 1 male (MMOC). **? Slovakia:** "Csernaklera", 1875, lgt. Pável, 1 female (HNHM). **Ukraine:** Ivano-Frankivsk reg., road to Petros Mt., 7.viii.1981, lgt. Shatrovskiy, 1 female (ZIRC); Ivano-Frankivsk reg., road Goverla Mt. – Petros Mt., 7.viii.1981, lgt. Shatrovskiy, 1 female (ZIRC).

DIFFERENTIAL DIAGNOSIS: Differential characters to all these species are summarized in Tab. 1. General coloration of *C. tatricus* is similar to *C. strandi* and to dark specimens of *C. alpinus* only.

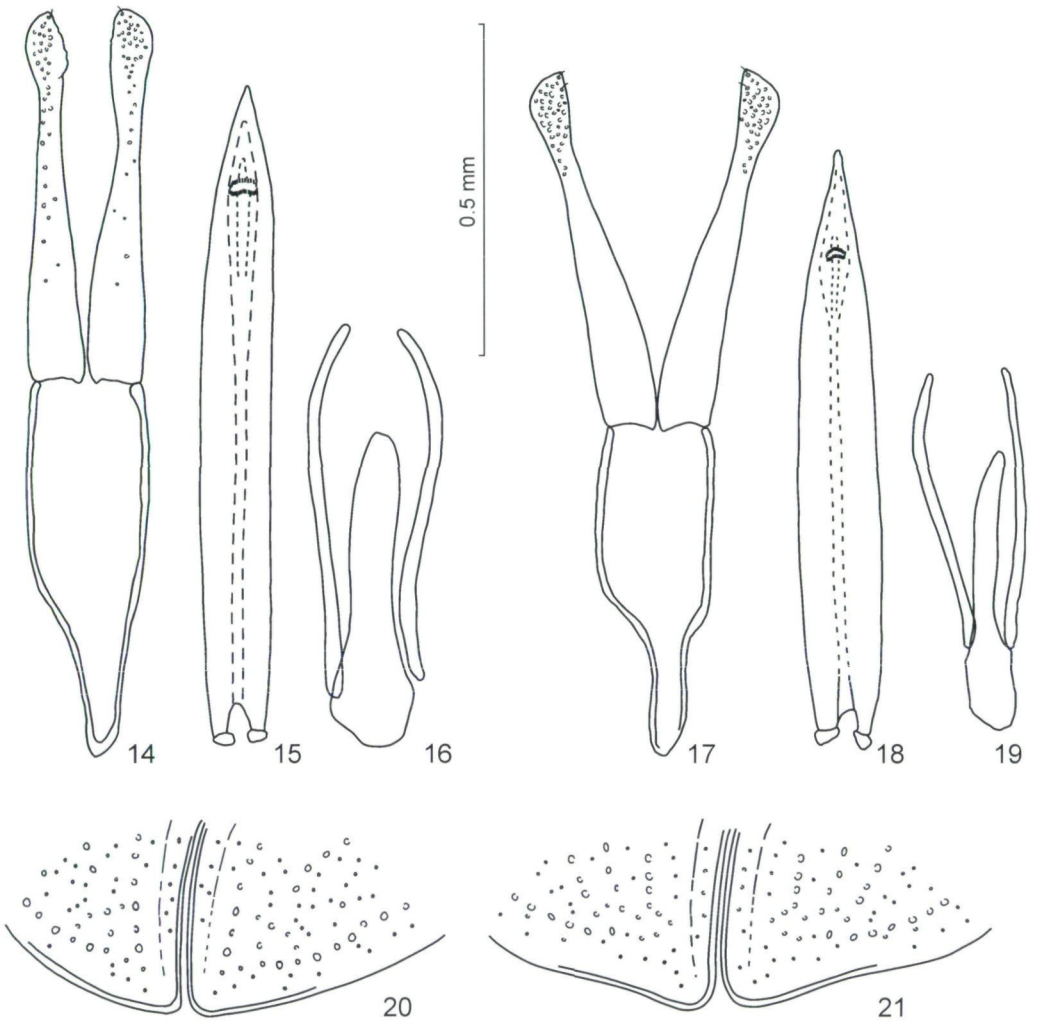
REDESCRIPTION: Body moderately convex. Length: 2.6 - 3.0 mm; width: 1.35 - 1.5 mm.

Coloration: Head and pronotum black, head with minute paler spots anteriorly of eyes, pronotum with paler narrow stripes on lateral and posterior margins. Elytra dark, black, becoming paler apicad (Fig. 24); with paler, very vaguely limited rufo-testaceous spot apically, reaching apical 0.25 of elytral length. On the base of elytral series 6 with small paler spot. Epipleura dark, sometimes with very narrow paler stripe on mesal margin. Ventral surface dark, black to piceous black. Meso- and metafemora usually black, with paler apex. Tibia and tarsus paler, rufo-testaceous. Maxillary palpi and basal antennomeres dark, brown to piceous black, antennal club slightly paler, rufo-testaceous.

Head distinctly and not very densely punctate, punctation equally distributed on the whole surface. Interstices shining, without microsculpture. Clypeus shallowly concave on anterior margin, distinctly rimmed.

Prothorax: Pronotum transverse, arcuately narrowed anteriad, punctation similar as on head. Interstices shining, without microsculpture. Distinct rim on lateral margins not reaching postero-lateral corners of pronotum. Frontally to scutellar shield with shallow but distinct impression (similar to *C. impressus*) in some specimens. Prosternum longitudinally carinate, with distinct notch posteriorly. Antennal grooves distinct, well developed.

Mesothorax: Scutellar shield longer than wide, with rather distinct and dense punctation, without microsculpture. Elytron with 10 punctural series (including sutural one); serial punctures distinctly larger than interval punctation, densely situated, separated by distance of their diameter. Series 1 to 5 arising almost at elytral base, series 6 and 10 arising slightly more apically, series 7 to 9 arising more apically than series 6. All series not impressed basally, becoming shallowly impressed apicad. Series 10 shortened but very distinct, reaching to 0.5 of elytral length apically, with punctures usually slightly larger than in remaining series, not becoming distinctly smaller basad, separated by same distance as in other elytral series or slightly closely aggregated (Fig. 11). Intervals flat through entire length of elytra, punctation of elytral base more distinct and denser than on pronotum, becoming less distinct and sparser laterad and apicad. Elytral apex rectangularly rounded. Preepisternal elevation narrow and elongate in shape (4× longer than wide), continuously narrowed to sharply rounded tips posteriad and anteriad, with posterior tip slightly overlapping anterior margin of metaventrite; medially with longitudinal carina at least in posterior half. Punctation of elevation moderately coarse and dense, with setiferous punctures slightly elongate in shape. Interstices without microsculpture.



Figs. 14 - 21: 14 - 16: male genitalia of *Cercyon haemorrhoidalis* (14: tegmen, 15: median lobe, 16: sternite 9); 17 - 19: male genitalia of *C. melanocephalus* (17: tegmen, 18: median lobe, 19: sternite 9). 20 - 21: elytral apex. 20: *C. haemorrhoidalis*; 21: *C. strandi*.

Metathorax: Metaventrite with elevated median pentagonal area; its punctation rather strong and dense, medially with punctures, usually distinctly larger than on preepisternal elevation of mesothorax, becoming smaller but slightly more densely distributed apicad and posteriad. Interstices without microsculpture. Lateral parts of metaventrite without pit-like punctures, with microreticulate pubescent surface reaching anteromedian part of metaventrite in some individuals. Femoral lines present, very distinct posteriorly, usually becoming rather indistinct anteriad. Anterolateral ridges absent.
Legs: Meso- and metafemora with rather distinct and dense punctation, interstices with very distinct microsculpture consisting of longitudinal irregular lines.

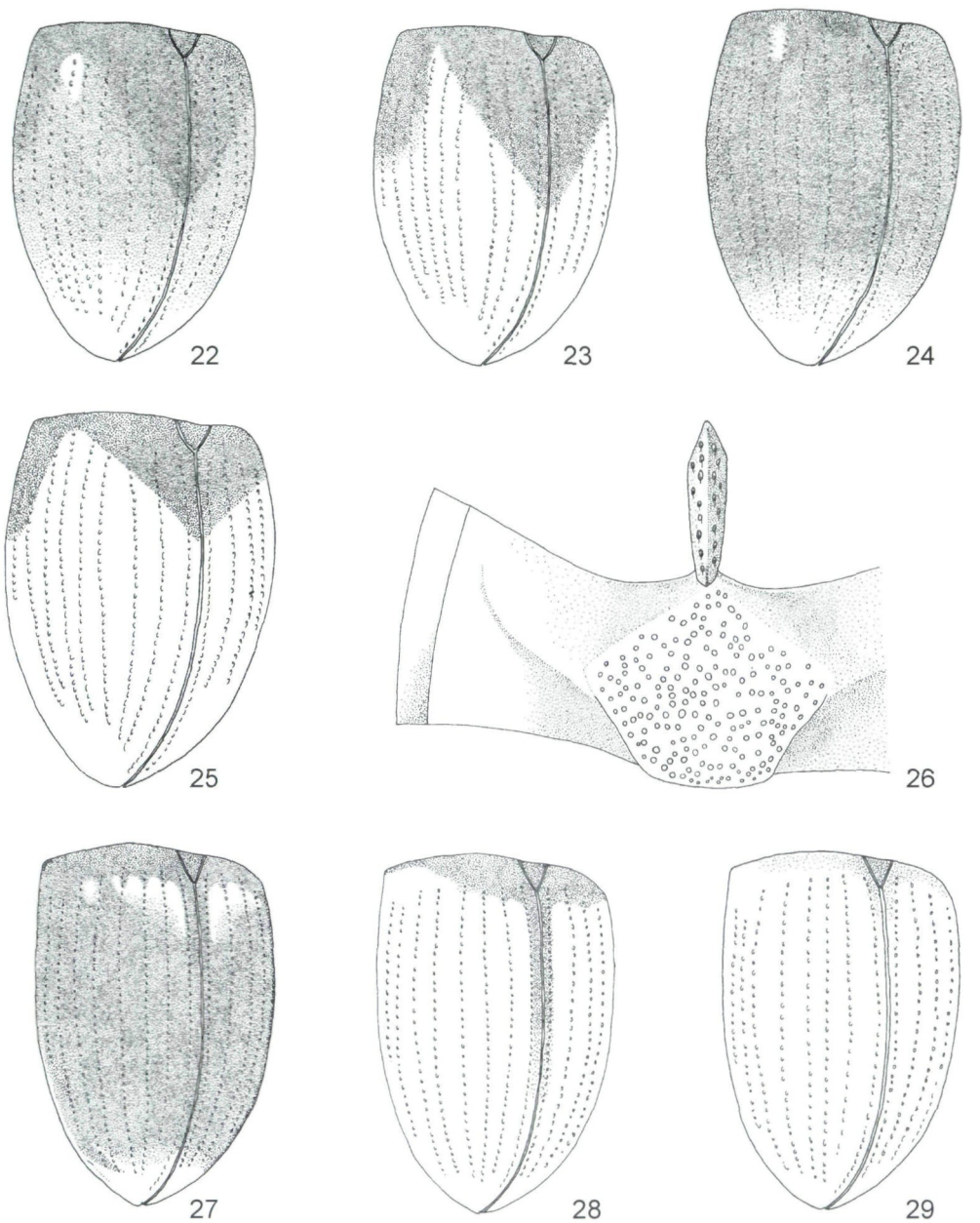
Male genitalia (Figs. 5 - 7): Aedeagus with short and wide phallobase, about of the same length or slightly shorter than parameres, manubrium relatively short and wide. Parameres widened on their lateral margin apically. Median lobe wide, abruptly narrowed into short and thin tip apically, bearing long hairs on each side; corona situated in apical 0.15 of median lobe. Sternite 9 tongue-like.

VARIABILITY: The coloration is quite constant, but the apical pale spot on the elytra can vary in shape and size, extending more basad on the last elytral interval, reaching up to 0.5 of elytral length in some specimens. In specimens with a large apical spot on the elytra, the elytral color becomes gradually paler from base to apex (this kind of coloration is present also in both type specimens of *C. exorabilis* examined). The humeral pale spot can be nearly or completely missing in some specimens. The density of the interval and serial elytral punctation is slightly variable - in some specimens (including the holotype of *C. exorabilis*) the interval punctures are nearly as large as those forming elytral series. The elytral series 10 is always distinct in the humeral area, but its punctures can be slightly smaller and not so distinctly pronounced basally in some specimens. The carina on the preepisternal elevation of the mesothorax varies a bit in length, but is always distinct in the posterior part of the elevation. The punctation of the metaventrite is rather variable, but generally much coarser and denser than in the other species mentioned. The male genitalia are constant in their morphology in all specimens examined.

DISCUSSION: SHATROVSKIY (1992) mentioned only a very short description of *C. exorabilis* without any differential characters distinguishing this species from *C. tatricus*. However, as there are a few specimens of *C. tatricus* identified correctly by Shatrovskiy in the collection of ZIRC, this species was probably known to him at the time of the description of *C. exorabilis*. Thus, Shatrovskiy seemed to describe *C. exorabilis* probably on the basis of these features: (1) slight difference of elytral punctation and coloration of the Eastern Palearctic specimens (see Variability for details); and/or (2) isolation of the distributional areas of *C. exorabilis* and *C. tatricus*.

As it is discussed above, the external morphological characters, including the elytral punctation and coloration of *C. tatricus* are variable to a certain extent. Examined specimens of *C. exorabilis* differ slightly from most individuals of *C. tatricus* by these very characters, but fall into the variability observed for the European individuals of this species. The male genitalia of *C. exorabilis* and *C. tatricus* are completely identical. The isolation of the populations of *C. tatricus* and *C. exorabilis* also cannot be a reason for regarding *C. tatricus* and *C. exorabilis* as two distinct species. Therefore *C. exorabilis* is a junior subjective synonym of *C. tatricus*, representing geographically detached populations of this species. To clarify the distribution of *C. tatricus*, more material from the Eastern Palearctic is needed.

NOTE: *C. exorabilis* was mentioned as a synonym of *C. tatricus* already by HANSEN (2004) in the Catalogue of Palearctic Beetles. As the Hydrophiloidea part of this Catalogue was finished after the death of M. Hansen in 2000, his manuscript was used but sent to some Hydrophiloidea specialists including me for adding missing data and needed corrections. Because at that time the preparation of this paper was nearly finished, I added also the above mentioned synonym to the Catalogue. However, by confusion, this new synonym was not mentioned in the new nomenclatoric acts chapter and



Figs. 22 - 29: 22 - 25, 27 - 29: elytral coloration. 26: preepisternal elevation and metaventrite of *Cercyon alpinus*. 22 - 23: *C. alpinus*; 24: *C. tatricus*; 25: *C. melanocephalus*; 27 - 29: *C. haemorrhoidalis*.

was not marked as a "syn.nov.". Despite of that, the synonymization is valid, and has to be cited as made by HANSEN (2004). Here I alert this nomenclatoric act and add all the explanatory information to allow its right interpretation by the subsequent authors.

DISTRIBUTION (Figs. 30, 31, triangles): So far known from two widely separated areas - from the Carpathian Mountains in Europe (Slovakia, the Ukraine, Romania) and from the Russian Far East (Amur Territory, Kabarovsk Territory, Primorsk Territory, Kamchatka). Here recorded as new to the Ukraine, Romania and under the name *C. tatricus* for Russia.

Cercyon strandi ROUBAL, 1938

Cercyon Strandi ROUBAL 1938: 56 - 57
Cercyon alpinus: MARDZHANYAN (1997), not auct.

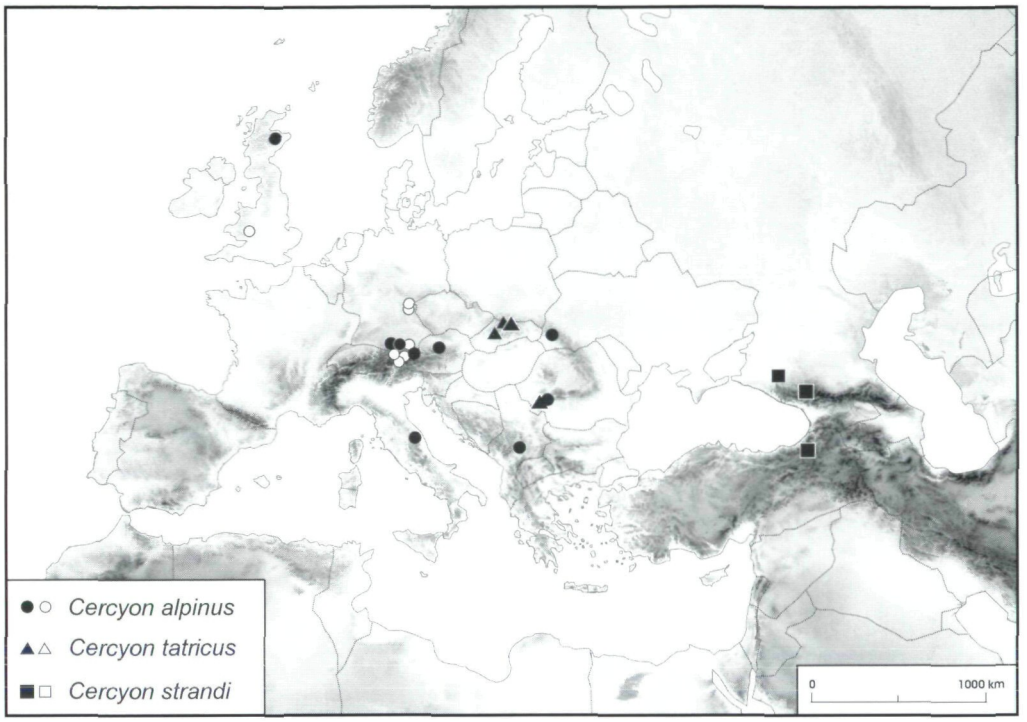
TYPE LOCALITY: Russia, Caucasus Mts., Krasnaya Polyana E of Sochi.

TYPE MATERIAL EXAMINED: **Lectotype** ♂ (SNMC): "Caucasus occ. / Красная Поляна [= Krasnaya Polyana] / Roubal VII. 1910 [printed label] // Strandi [pencil, handwritten] / Roubal det. 1... [one additional handwritten symbol is illegible] // type [pencil, in same handwritten as above] // [orange square label without any data] // dissected by A. Shatrovskiy 1983 / and contained into D.M.H.F. // Lectotypus ♂ / Cercyon strandi Roubal / design. Shatrovskiy 1983 [red label, partly handwritten]". **Paralectotype:** "Ca.b. Teberda [= Karachay-Cherkessia Territory, Caucasus Mts.] / VI. [1]912 Roubal [yellow, printed label]// Strandi m. [pencil, in handwritten] / Roubal det. // type [pencil, in handwritten] // [red square label without any data] // Paralectotypus / Cercyon strandi Roubal / design. Shatrovskiy 1983", female (SNMC).

ADDITIONAL MATERIAL EXAMINED (9 specimens): **Russia:** Karachay – Cherkessia Territory., Caucasus Mts. Teberda, vi.1912, Roubal lgt., 2 females (SNMC); "bl. g. Chehashchka [= near "Chehashchka" Mt.], Maik. otd. Kub. o. [= Kabardino-Balkaria]", 3.vi.1903, lgt. Filinchenko, 1 male (ZIRC). **Turkey:** Rize prov., Ayder, 2.vi.1989, S. Schödl lgt., 1 female (NHMW); Kaçkar Dağları Mts., Asağı Kavrun env., 2000 m, 7.vii.2003, H. Poláček lgt., 2 females (MFOC). **Without precise locality:** "Transcaucasia", without collecting date, lgt. Kolenati, 1 female (ZIRC); "Caucasus, Armen. Geb.", without collecting date, Leder & Reitter lgt., 1 male (HNHM); "Borzhom", 26.v.[19]11, F.A. Zaitzev lgt., 1 specimen (ZIRC) (specimen in a poor condition, identified and compared with type specimens by Shatrovskiy).

DIFFERENTIAL DIAGNOSIS: Coloration similar to *C. tatricus* and to dark specimens of *C. alpinus*. For differencial characters to both latter species see Tab. 1. The external characters are variable to some extent (see Variability for details), and examination of male genitalia is usually needed to distinguish these dark specimens from *C. strandi*.

REDESCRIPTION: Body moderately convex. Length: 2.50 - 3.20 mm; width: 1.40 - 1.65 mm.
Coloration: Head and pronotum black, head with minute paler spots in front of eyes, pronotum with paler narrow stripes on lateral and posterior margins. Elytra dark basally, black to piceous, becoming continuously paler apicad, usually with vaguely limited pale spot apically (as on Fig. 24); between bases of elytral series 5 and 6 with small pale spot. Epipleura dark. Ventral side black to piceous. Legs with dark brown femora, tibiae and tarsi rufo-testaceous. Maxillary palpi and antennae dark rufo-testaceous.
Head with moderately strong and rather dense punctation. Interstices shining, without microsculpture. Anterior margin of clypeus shallowly concave, distinctly rimmed.
Prothorax: Pronotum transverse, arcuately narrowed anteriad. Puncation similar as on head; distinct rim on lateral margins reaching or slightly overlapping postero-lateral corners. Interstices shining, without microsculpture. Prosternum with longitudinal median carina, posterior margin with small notch. Antennal grooves distinct, well developed.
Mesothorax: Scutellar shield longer than wide, with few punctures slightly smaller and



Figs. 30: Distribution of *Cercyon alpinus*, *C. strandi* and *C. tatricus* in Europe. Black symbols: revised material; white symbols: literature data.

more densely distributed than on pronotum, interstices without microsculpture. Elytron with 10 punctural series (including sutural one). Series 1 - 5 arising almost at elytral base, series 6 - 9 arising slightly more apically. Serial punctures slightly larger than interval punctation, separated by 2 - 3× diameter of one puncture basally. Series not impressed basally, becoming slightly impressed apicad. Series 10 shortened, reaching from 0.5 of elytral length almost to humeral area; punctures of series 10 more sparsely arranged than on other elytral series, becoming finer basad, not separable from interval punctation at humeral area (Fig. 13). Intervals flat throughout. Interval punctation only slightly denser than on pronotum, with punctures of same size as on pronotum, becoming smaller and sparserly distributed apicad and laterad. Elytral apex rectangulary rounded or (not in lectotype and paralectotype) slightly, obtusely extended (as on Fig. 21). Preepisternal elevation narrowly elongate (4× longer than wide), narrowed posteriad and anteriad to the sharply rounded tips; posterior tip slightly overlapping anterior margin of metaventrite; medially with longitudinal carina at least in posterior half. Surface of elevation with moderately strong punctation consisted of setiferous and slightly elongate punctures.

Metathorax: Metaventrite with elevated median pentagonal area, its punctation moderately strong but not very dense, usually becoming slightly weaker (but slightly denser in lectotype) anteriad. Interstices shining, without microsculpture. Lateral parts pubescently microreticulate, without pit-like punctures. Femoral lines distinct, rather

long, almost reaching anterolateral margin of metaventrite. Anterolateral ridges absent. Legs: Middle and posterior femora distinctly punctate, interstices with distinct microsculpture consisting of longitudinal irregular lines.
Male genitalia (Figs. 1 - 4): Aedeagus with basal piece and parameres similar to *C. alpinus* both in length and shape. Median lobe rather narrow, continuously but not very strongly narrowed apicad, apically with very long and almost parallel-sided top; corona standing in apical 0.25 of median lobe. Chaetotaxy of parameres and median lobe not examined (and missing on the figures).

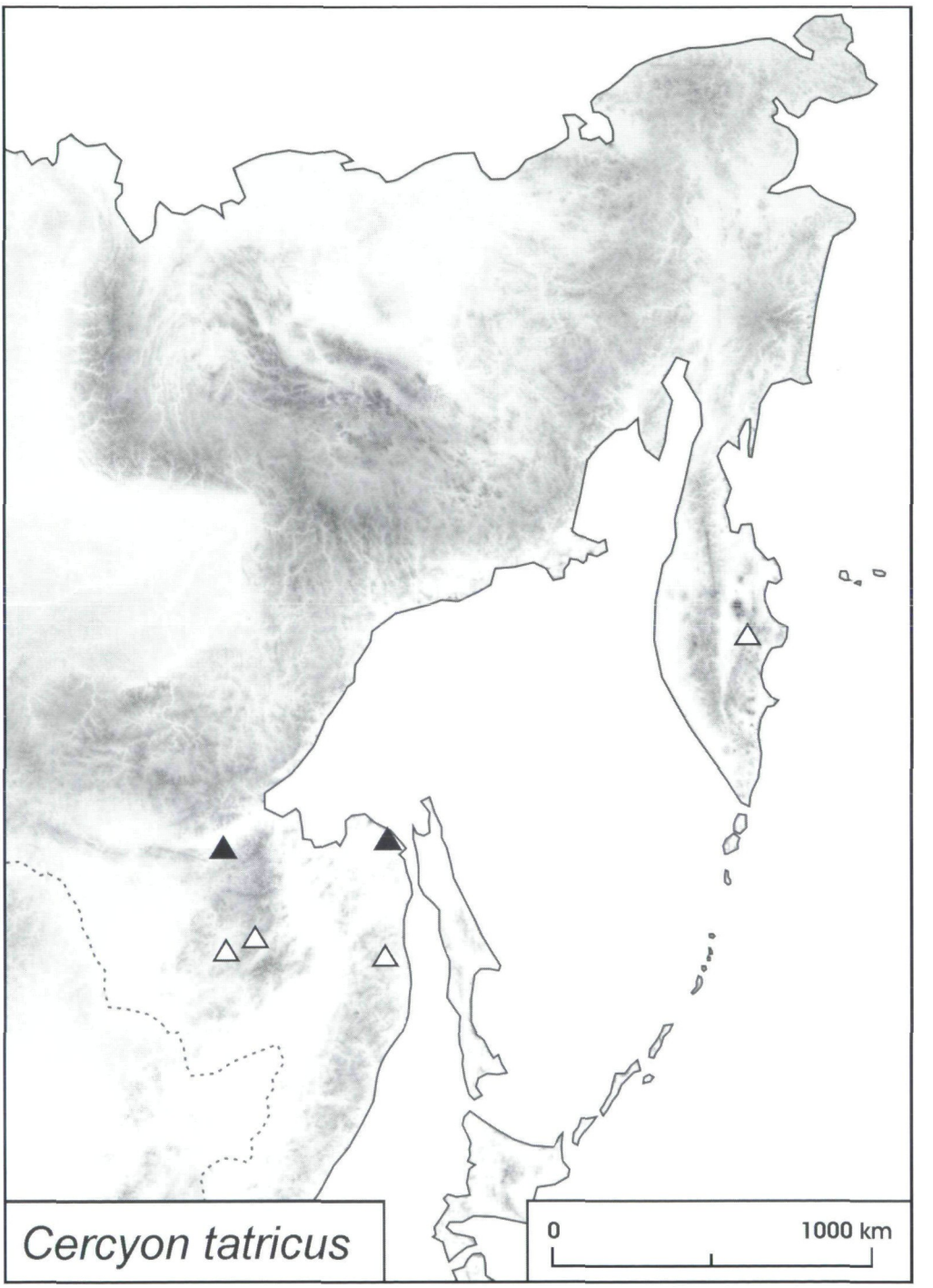
VARIABILITY: The coloration is quite uniform in all examined specimens. The elytral punctation varies usually in density and size of interval and serial punctures. Rarely, the elytral punctation can be quite similar to some *C. alpinus* with looser punctation.

DISTRIBUTION (Fig. 30, squares): This species is hitherto known only from the Caucasus Mts. and from the adjacent mountain regions in Turkey. The record of *C. alpinus* from Armenia mentioned by MARDZHANYAN (1997) and adopted also by HANSEN (1999) most probably concerns this species (*C. alpinus* seems to reach the Carpathian Mts. only in the eastern part and the confusion of *C. strandi* with *C. alpinus* is quite possible).

Cercyon haemorrhoidalis (FABRICIUS, 1775)

For description and synonymy see e.g. SMETANA (1978) and HANSEN (1987).

DIFFERENTIAL DIAGNOSIS: Very variable species, however usually easily distinguishable from all other species mentioned by pale coloration present at least on the elytral base near scutellar shield on the bases of elytral intervals 2-4 (Figs. 27 - 29, this pale spot is present also in most of the dark specimens and is best seen after wetting the beetle) and preepisternal elevation of mesothorax without longitudinal medial carina (in some specimens the surface of the preepisternal elevation can be slightly convex, but in this case never with acute edge). Generally, this species is very variable in elytral coloration, most individuals are pale, red to rufo-testaceous (however this pale coloration can be often more or less darkened), with distinct and relatively sharply limited T-shaped spot basally, which extends posteriorly to the sutural interval (Fig. 28). In some specimens the elytra are pale, nearly or completely without any black pattern (Fig. 29). Rarely, the elytra are completely dark with only a slightly paler spot in humeral area ("ab. *bifenestratellus*"), then distinguishable from all other mentioned species according to pale epipleura. The elytral punctation of *C. haemorrhoidalis* is most similar to *C. tatricus*. The elytral apex is slightly obtusely extended in most specimens (Fig. 21, similarly to some *C. strandi*). In comparison with the other mentioned species, *C. haemorrhoidalis* has also a comparatively longer and less convex body-shape. The phallobase is comparatively longer and narrower than in *C. melanocephalus* and *C. tatricus*, the parameres are as long as the phallobase. In contrast to *C. melanocephalus* and *C. tatricus,* the parameres are not distinctly widened on the lateral margin apically (Fig. 11), the median lobe is narrower than in *C. tatricus*, almost parallel-sided throughout the whole lobe, and continuously narrowed from the apical 0.12 to the apex. The corona is situated in the apical 0.15 of the median lobe. The rows of setae on the apex are rather indistinct and badly visible even in translucent light in the microscope (at 50× magnification).



Figs. 31: Distribution of *Cercyon tatricus* in the Far East. Black symbols: revised material; white symbols: literature data.

Cercyon melanocephalus (LINNAEUS, 1758)

For description and synonymy see e.g. SMETANA (1978) and HANSEN (1987).

DIFFERENTIAL DIAGNOSIS: In contrast to the other species mentioned (except *C. haemorrhoidalis*), the longitudinal median carina on the preepisternal elevation of the mesothorax is absent in this species. All specimens of *C. melanocephalus* examined have distinctly pale elytra (red to rufo-testaceous) with sharply limited basal black wedge-shaped spot and additional basolateral spots (Fig. 25). The epipleura are dark, only sometimes paler posteriorly. By both latter characters, *C. melanocephalus* is similar to pale specimens of *C. alpinus* and often confused with it. The elytral punctation is fine and sparser, and thus also most similar to *C. alpinus*. Except of the absence of the longitudinal carina mentioned above, *C. melanocephalus* can be distinguished from *C. alpinus* by the male genitalia. The median lobe is distinctly wider but relatively shorter than in *C. alpinus*, having the biggest width in its basal 0.2 - 0.25; from the apical 0.33 it is regularly narrowed to the apex. The corona is situated in the apical 0.18 of the median lobe; the maximum width of the median lobe is ca. the same as the distance of the corona from its apex (smaller in *C. alpinus*). There are two indistinct rows of setae apically. The parameres are distinctly widened on the lateral margins apically. The phallobase is comparatively short and wide, of the same length or slightly shorter than the parameres. For more detailed comparison of *C. melanocephalus* with the other species of the group see Tab. 1 and the identification key above.

Bionomical notes

According to the label data attached to some specimens, species discussed seem to have a similar biology. They were found in various mammal excrements (*Equus*, *Bos*, *Cervus elaphus*, *Capreolus capreolus*, *Ursus arctos*); all Scottish and most of the German and Austrian specimens of *C. alpinus*, as well as some Slovakian *C. tatricus* were found in deer dung. Most specimens were found at higher altitudes, usually above 1200 m a.s.l. However, according to HOFMANN & FLECHTNER (2003) some specimens of *C. alpinus* were found at elevations of about 800 m a.s.l. in Germany. Thus, this species seems not to have a typical arcto-alpine distribution and inhabits probably montane and submontane forest areas in central Europe. Label data also confirm these habitat preferences for the Slovakian *C. tatricus*, which were found e.g. in beech-fir forest or in the area with high bushes of *Pinus mugo*. Unfortunately, there are no precise data about collecting circumstances of *C. strandi*, however its distribution shows that its biology is probably similar to the other two species.

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