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# Revision of the Palearctic species of the genus *Ochthebius* LEACH XXVIII. *Ochthebius (Enicocerus) colveranus* FERRO, 1979: inter- and intrapopulational aedeagal variability (Coleoptera: Hydraenidae)

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## Abstract

The inter- and intrapopulational aedeagal variability of *Ochthebius (Enicocerus) colveranus* FERRO, 1979 (Coleoptera: Hydraenidae), distributed from Central Europe to the Caucasus Region, is described and discussed. The length of the aedeagus gradually decreases from north-west to south-east. In south-eastern populations, the ventral (convex) margin of the distal lobe is usually more angular and its dorsal (concave) margin is in some cases more strongly curved. However, these features are not entirely constant; they vary to some extent even within populations. Thus, populations from north-eastern Greece, Turkey, the Caucasus Region and the Crimea might at most be regarded as a distinct subspecies (*O. c. ineditus* FERRO, 1982, described from the Crimea), which should in any case be tested with DNA sequence analyses. Specimens from southern Greece (type locality of *O. phthius* FERRO, 1988) do not differ significantly from specimens from northeastern Italy (type locality of *O. colveranus*), and therefore the synonymy of *O. phthius* and *O. colveranus* is confirmed.

**Key words:** Coleoptera, Hydraenidae, *Ochthebius colveranus*, taxonomy, subspecies, synonymy, aedeagus, variability.

## Introduction

*Ochthebius (Enicocerus) colveranus* FERRO, 1979, described from Italy, is a widely distributed species, currently known from about 20 countries from north-eastern Italy, south-eastern Central Europe, and south-eastern Europe to Turkey and the Caucasus Region (see JÄCH 1992, 2004 [note that DE should read GE]). Remarkably this species has not yet been recorded from southern Russia (e.g. Krasnodar), where it definitely should occur.

*Ochthebius ineditus* FERRO, 1982, described from the Crimean Peninsula, and *O. phthius* FERRO, 1988, described from southern Greece, were synonymized with *O. colveranus* by JÄCH (1992).

In his revision of the subgenus *Enicocerus* STEPHENS, 1829, JÄCH (1992) observed some aedeagal variability in *Ochthebius colveranus*: “in most of the European specimens main piece straight, slightly shorter, stouter and more evenly curved in some others (eastern Turkey, Ukraine), but I could not observe a constant distinguishing feature to separate different subspecies, as there is also intrapopulational variability”.

Based on additional material, which became available after 1992, we decided to take a more detailed look at the intra- and interpopulational variability of this species in order to clarify the status of its two synonyms.

## Material & Methods

All distal lobes were examined in the same view, i.e. in lateral view showing maximum outlines. Because of the often subtle nature of the aedeagal variability, no attempts have been made to quantify the features described above. This information is presented qualitatively, in terms of "trends" of variation throughout the range of the species.

The material examined is deposited in the Naturhistorisches Museum Wien, Vienna, Austria.

### MATERIAL EXAMINED:

I T A L Y: 1 ♂ (paratype of *O. colveranus*), Còlvera streamlet nr. Poffabro, Pordenone district, Friuli – Venézia Giùlia, 15.VII.1977, leg. G. Ferro (= type locality of *O. colveranus*).

A U S T R I A: SALZBURG: 1 ♂, Lengfelden, leg. H. Frieb; OBERÖSTERREICH: 1 ♀, Steyr, leg. J. Petz; 1 ♂, Grünburg, leg. M. Bernhauer; 1 ♂, "Steiermark"; NIEDERÖSTERREICH: 1 ♂, Lunz, leg. Schmidl"; 2 ♀♀, Saffenbach, 1.VIII.1979, leg. M.A. Jäch; 1 ♀, Erlauf River nr. Neubruck, 2.VIII.1979, leg. M.A. Jäch; 1 ♂, 4 ♀♀, Jeßnitz River nr. St. Anton, 5.VIII.1980, leg. M.A. Jäch; 2 ♂♂, 2 ♀♀, Melk River, 1 km S Mannersdorf, 230 m, 15.VI.2001, leg. M.A. Jäch; 2 ♂♂, 1 ♀, Melk River nr. Koppendorf, 15.VIII.1980, leg. M.A. Jäch; 1 ♀, 2 ♀♀, Tulln River nr. Nest, 250 m, 15°53'18"E 48°10'02"N, 12.IV.2001, leg. A. Komarek; 1 ♀, Tullnerbach, leg. A. Winkler; 5 ♂♂, 1 ♀, Tullnerbach, ex. coll. Grundmann; 1 ♂, 5 ♀♀, Mauerbach nr. Wien; 1 ♂, Wienerwald, 18.V.1928; 1 ♀, surroundings of Wien; 1 ♀, Wienerwald; 1 ♂, Weidlingbach nr. Klosterneuburg, Pius Parch Promenade, 18.III.1996, leg. F. Dietrich; 1 ♀, Schwechat River, 14.VI.1980, leg. M.A. Jäch; 4 ♀♀, Schwechat River nr. Mayerling, 14.V.1983, leg. H. Hebauer; 2 ♂♂, Schwechat River, ca. 1.5 km SW Sattelbach, ca. 6 km NW Baden, 280 m, 48°01'27.0"N 16°09'29.9"E, leg. M.A. Jäch; 1 ♂, Baden bei Wien; 17 exs., Schneeberg, leg. A. Winkler; STEIERMARK: 1 ♂, "B 6", without additional data (ex. coll. Grundmann).

S L O V E N I A: 2 ♂♂, 2 ♀♀, Branica [= Branik], St. Daniel [= Stanjel], VIII.1919, leg. E. Pretner; 1 ♀, Soča Valley nr. Plave, V.1925, leg. E. Pretner; 1 ♂, "Carniola" [= Kranj], "Wochein" [= Bohinj]; 1 ♂, "Radmannsdorf" [= Radovljica]; 1 ♀, Škofja Loka, 22.VIII.1922, leg. E. Pretner.

C R O A T I A: 3 ♂♂, 2 ♀♀, Istra, Boljun, VI.1913, leg. E. Pretner.

B O S N I A and H E R Z E G O V I N A: 4 ♂♂, 11 ♀♀, Sarajevo, leg. V. Apfelbeck; 1 ♀, Krupa Valley; 1 ♂, Čatrnja, Grmeč planina, 23.VII.1968, leg. E. Pretner; 1 ♀, Žanjecia nr. Gacko, 1.XI.1961, leg. E. Pretner.

S E R B I A: 10 ♂♂, Zamna River, Plavna, 3.VI.1960, leg. E. Pretner; 1 ♂, Sebečevska River, Sebečevo, 27.VI.1970, leg. E. Pretner; 1 ♀, Toplica River, 60 km W Niš, 19.VII.1988, leg. M.A. Jäch.

M O N T E N E G R O: 2 ♂♂, 2 ♀♀, Šavnik, Komarnica, 1.VII.1958, leg. E. Pretner.

S L O V A K I A: 1 ♂, Lietava, Lúčka, 25.VII.1930, leg. L. Korbel.

R O M A N I A: 1 ♂, 1 ♀, Caraşova, 14.VI.1986, leg. J. Kodada.

B U L G A R I A: 1 ♂, Tîrnovo, leg. F. Netolitzky.

M A C E D O N I A: 21 exs., NW Gevgelija, 12.VIII.1988, leg. M.A. Jäch.

A L B A N I A: 3 ♀♀, Mirdita, Zebia.

G R E E C E: 7 ♂♂, 12 ♀♀, 21 km E Ioannina, 1430 m, 39.67210N 21.11450E, 24.IX.1999, leg. M. Hess & U. Heckes; 1 ♂, NE Ioannina, 3 km NNE Grevenniti, ca. 950 m, 39°49.7'N 21°00.8'E, 29.IV.2000, leg. A. Komarek; 1 ♂ (paratype of *O. phthius*), Fthiotida, Lamia, 29.X.1979, leg. G. Ferro (= type locality of *O. phthius*); 2 ♂♂, 1 ♀, Vermio Mts., NW Thessaloniki, Olympos, 9.VI.1929, leg. L. Weirather; 1 ♂, Chalkidiki, N Pigradiakia, 23.VI.1988, leg. M.A. Jäch; 2 exs., Peloponnese, 40 km S Akrata, 800 m, 24.IX.1994, leg. M. & E. Jäch; 27 exs., Peloponnese, 2.5 km S Diakofto, ca. 30 m, 20.IX.1994, leg. M. & E. Jäch.

U K R A I N E: 12 ♂♂, 38 ♀♀, Crimea, leg. E. Moczarski; 3 ♂♂, Crimea, 4 km SE Sokolinoe, Kokkozka River, 21.–23.V.2005, leg. R. Ruta.

T U R K E Y: ISTANBUL: 2 ♂♂, 4 ♀♀, Ömerli, 18.V.1987, leg. M.A. Jäch; BURSA: 4 ♂♂, 4 ♀♀, Uludağ, 31.VII.1988, leg. M.A. Jäch; 2 ♀♀, Bursa – Orhaneli, 1.VIII.1988, leg. M.A. Jäch; 1 ♂, Mezit, 39°56'115"N 29°43'017"E, 450 m, 13.VIII.2005, leg. N. Ertorun; BALIKESIR: 3 ♂♂, 13 ♀♀, Balikesir – Susurluk, 2.VIII.1988, leg. M.A. Jäch; ÇANAKKALE: 1 ♂, 4 ♀♀, S Türkmenli, 5.VIII.1988, leg. M.A. Jäch; 1 ♂, W Kalkim, 3.VIII.1988, leg. M.A. Jäch; IZMIR: 5 ♂♂, 1 ♀, N Bergama, 4.VIII.1988, leg. M.A. Jäch; GÜMÜŞHANE: 4 ♂♂, 4 ♀♀, Vaukdagi Pass, 1.VI.1989, leg. M.A. Jäch; KONYA: 1 ♂, 2 ♀♀, Karahasan, Hadim, 4.VIII.1990, leg. S. Schödl; BITLIS: 2 ♀♀, Mutki, 11.VI.1987, leg. M.A. Jäch; VAN: 2 ♂♂, 5 ♀♀, Van – Başkale, Güzeldere Pass, 2600 m, 5.VI.1987, leg. M.A. Jäch; ARTVIN: 4 ♂♂, 3 ♀♀, Artvin – Borçka 4.VI.1989, leg. M.A. Jäch; 2 ♂♂, 4 ♀♀, Çam Pass, 6.VI.1989, leg. M.A. Jäch; 1 ♂, Ardesen, 3.VI.1989, leg. S. Schödl; KARS: 3 ♂♂, 7 ♀♀, Sarıkamış, 8.VI.1989, leg. M.A. Jäch; 1 ♂, Kağızman, 8.VI.1989, leg. S. Schödl.

A R M E N I A: 1 ♀, Geghard River nr. Geghard, E Yerevan, 1600 m, 40°08.39'N 44°49.12'E, 5.V.2001, leg. H. Shaverdo; 1 ♂, Amberd River, above Byurakan, Mt. Aragats south slope, 1580 m, 40°21.60'N 44°15.06'E, 10.V.2001, leg. H. Shaverdo.

G E O R G I A (or RUSSIA): 1 ♀, Kasbek, leg. F. Kolenati.

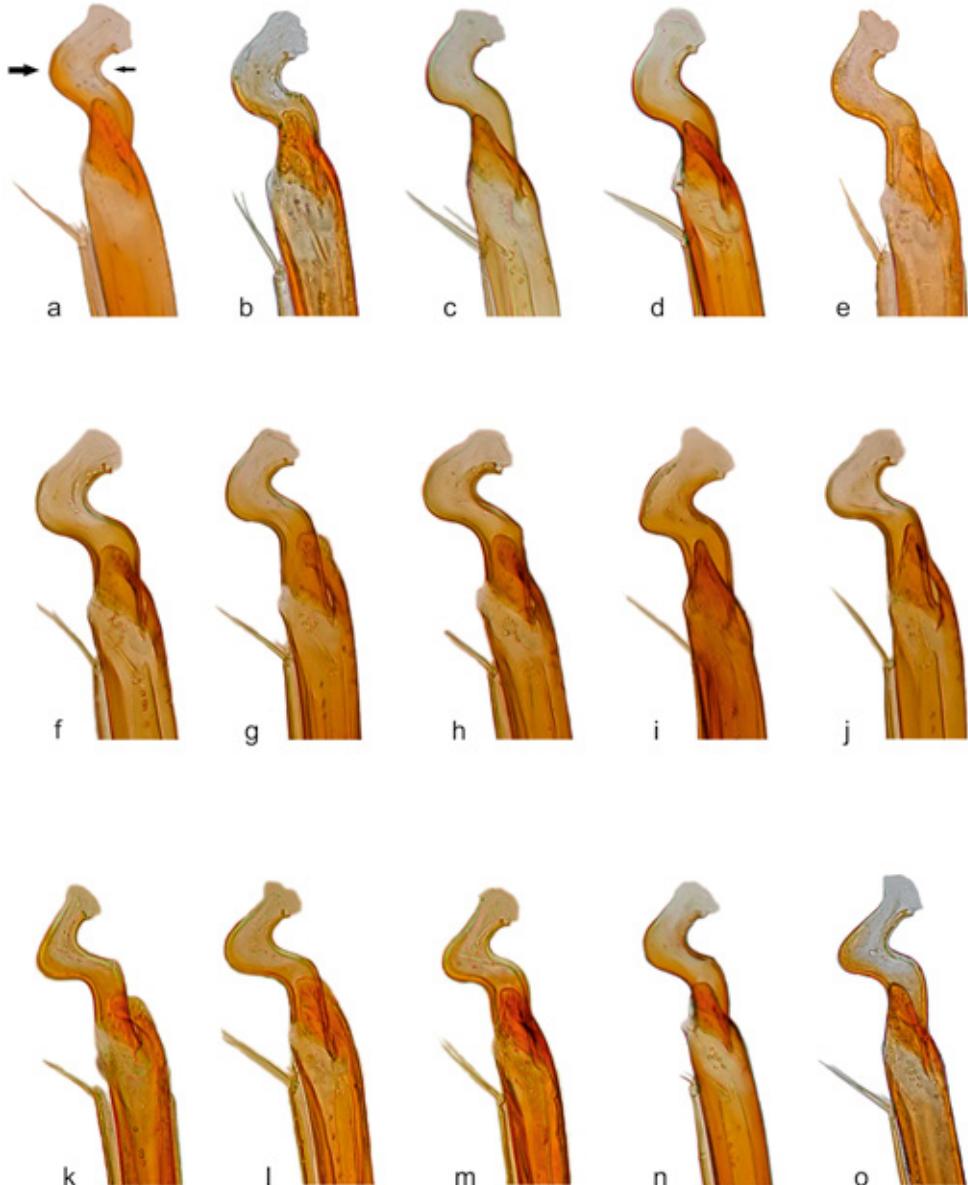


Fig. 1: Aedeagal distal lobe of *O. colveranus* from: a) Weidlingbach (Austria); b) Poffabro (N Italy) – paratype of *O. colveranus*; c) Lietava (Slovakia); d) Carașova (Romania); e) Sarajevo (Bosnia and Herzegovina); f) Ioannina (W Greece); g–h) Peloponnese (S Greece); i) Thessaloniki (NE Greece); j) Chalkidiki, Pirgadikia (NE Greece); k) Istanbul (W Turkey); l) Bursa (W Turkey); m) Artvin (E Turkey); n) Kars (E Turkey); o) Crimea (Ukraine). Thick arrow: ventral (external or convex) margin of distal lobe; thin arrow: dorsal (internal or concave) margin of distal lobe.

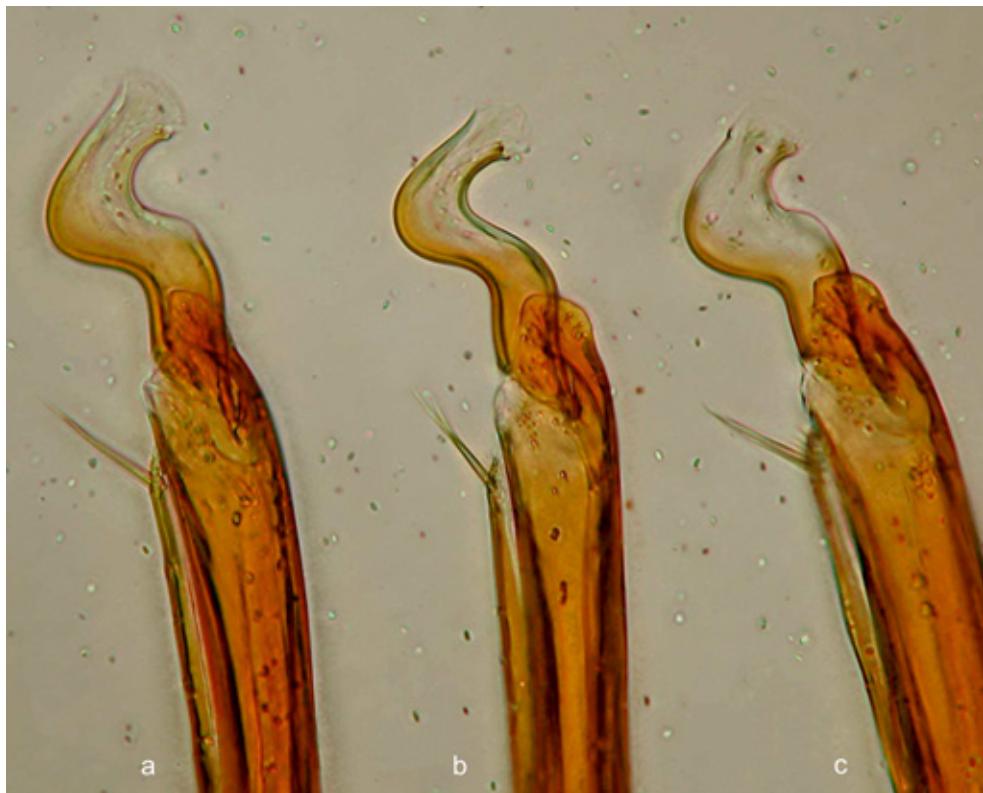


Fig. 2: Aedeagal variation in the distal lobe of *O. colveranus* from Sarıkamış (Kars, NE Turkey).

## Results

### Variation in aedeagal size:

The projected length (PL) sensu JÄCH (1998) is gradually decreasing from north-west to south-east:

Austria/Italy:  $0.459 \pm 0.008$  mm (n = 10)

Former Yugoslav republics:  $0.450 \pm 0.01$  (n = 6)

Greece:  $0.422 \pm 0.02$  (n = 6)

Turkey and Crimea:  $0.399 \pm 0.02$  (n = 12)

### Variation in the shape of the aedeagal distal lobe:

In specimens from the more western part of the distribution, the dorsal (concave or inner) margin of the distal lobe varies to some extent, not following any obvious geographical cline. For instance, it is more strongly curved in specimens from Austria, Italy and S Greece (Peloponnese) (see Fig. 1a–b, g–h) than in specimens from Romania, Bosnia and NW Greece (see Fig. 1d–f). In

specimens from the eastern part of the distribution (NE Greece to the Caucasus Region and the Crimea) the dorsal margin is usually less strongly curved, thus distal lobe more strongly gaping dorsally. However, intermediate conditions are quite frequent.

The ventral (convex or external) margin of the distal lobe is usually evenly rounded in populations from Central Europe to southern Greece (see Fig. 1a–h), while it is usually more angular in populations from NE Greece, Turkey, the Caucasus Region and the Crimea (see Fig. 1i–m, o). However, these differences are not entirely constant; see for instance Fig. 1n, showing the regularly convex distal lobe of a specimen from eastern Turkey.

Generally, the variability of the shape of the distal lobe is sometimes remarkably pronounced within populations (see Fig. 2).

### Discussion

Based on aedeagal morphology we were unable to discern different species or subspecies unambiguously. Populations from NE Greece, Turkey, the Caucasus Region and the Crimea might at most be regarded as a distinct subspecies (*O. c. ineditus* FERRO, 1982, described from the Crimea) based on the more angular ventral margin of the distal lobe. However, before regarding *O. ineditus* as a valid subspecies, comprehensive DNA sequence analyses should be carried out to test the genetic significance of this feature.

Specimens from S Greece (type locality of *O. phthisus* FERRO, 1988) do not differ significantly from specimens from NE Italy (type locality of *O. colveranus*), and therefore, based on aedeagal morphology, the synonymy of *O. phthisus* and *O. colveranus* is confirmed.

On the other hand, it cannot be excluded, that assessment of molecular data, especially from isolated populations along the margins of the distribution area (e.g. Peloponnese) might indeed reveal the existence of cryptic species with restricted distribution.

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The Hydraenidae, the remaining parts of the Scirtidae, faunistic/taxonomic updates on some of the other families, additional keys, a complete checklist of all New Caledonian water beetles as well as some contributions on larvae will be published in the “Water Beetles of New Caledonia (part 2)”.

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