Linzer biol. Beitr.	37/1	425-434	25.7.2005

A contribution to the knowledge of the water beetle fauna of Uzbekistan (Coleoptera: Hydradephaga, Hydrophiloidea, Staphylinoidea and Dryopoidea)

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A b s t r a c t : A total of 36 species of water beetles were collected in the urban area of Tashkent, the flood zone of the river Syr Darya near Yangi Chinoz Qorgoni, and some streams and irrigation channels in the mountains of NE Uzbekistan in July and August 2004. They belong to the following families (species numbers in parentheses): Haliplidae (3), Noteridae (1), Gyrinidae (2), Dytiscidae (18), Hydrophilidae (8), Hydraenidae (3) and Elmidae (1). Seven species, most of them known from the neighbouring countries, are recorded for the first time from Uzbekistan: *Ametor redesculptus* SEMENOV, 1900, *Haliplus sibiricus* MOTSCHULSKY, 1860, *Ilybius cinctus* SHARP, 1878, *Limnebius atomus* (DUFTSCHMID, 1805), *Laccobius simulatrix* D'ORCHYMONT, 1932, *Laccobius syriacus* GUILLEBEAU, 1896 and *Ochthebius afghanicus* JÄCH, 1991. Most of the collected species are widespread in the Palaearctic region, only five of these are restricted to mountain ranges in Central Asia and NW China. For some remarkable species ecological and additional distributional notes are given.

K e y w o r d s : Aquatic Coleoptera, Uzbekistan, first records, faunistics, ecology.

Introduction

The countries in Central Asia have a rich and diverse fauna. Russian and Uzbek zoologists include the area, together with Iran, in the Irano-Turanian zoogeographical subregion (AZIMOV et al. 1993, KHAMRAEV 2003).

Many Central Asian water beetles, especially from the lower parts of Uzbekistan, can be identified with the help of the main important European identification keys (e.g. ZAITZEV 1953, DROST et al. 1992, HEBAUER & KLAUSNITZER 1998, NILSSON & HOLMEN 1995, ANGUS 1992). Additional new contributions to the Noteridae (TOLEDO 2004), Dytiscidae (e.g. HENDRICH 1993, WEWALKA 1992, TOLEDO 1998, FERY & BRANCUCCI 1997, FERY & HOSSEINIE 1998, FERY 2003a, 2003b), Haliplidae (e.g. VAN VONDEL 1991, 1992), Hydrophilidae (e.g. SCHÖDL 1991, 1993, SCHÖDL & Ji 1995, HEBAUER 1991), Helophoridae (e.g. ANGUS 1984, 1985, 1992 & 1995) and Hydraenidae (e.g. JÄCH 1991, 1993) have made it possible to identify many of the Central Asian endemic species as well.

Despite the fact that the taxonomy and systematics of most groups are well-known there are, however, very few references to the ecology and faunistics of water beetles of the region (e.g. BALKE & HENDRICH 1988, HEBAUER 1991, ŠTASTNÝ 1993).

Adults and larvae of water beetles were collected during six field trips on a four-week stay in north-eastern Uzbekistan in July and August 2004. The area has not been well investigated for water beetles before. As a consequence the results of this fieldwork provided a number of remarkable regional records.

Material and Methods

Specimens mentioned in this work are deposited in several collections which are abbreviated in the text as follows:

CDB ..... Collection Dr. David Boukal, Budejovice, Czech Republic
CGC ..... Collection Gilbert L. Challet, California, United States; property of The Bohart Museum (University of California at Davis, United States)
CHF ..... Collection Dr. Hans Fery, Berlin, Germany, property of NMW
CLH ..... Collection Dr. Lars Hendrich, Berlin, Germany, property of NMW
CIR ..... Collection Dr. Ignacio Ribera, Madrid, Spain
NMW ..... Naturhistorisches Museum Wien, Vienna, Austria
NHML ..... The Natural History Museum, London, England
OLML ..... Oberösterreichische Landesmuseen Linz, Austria

The Study Area

The Central Asian republic Uzbekistan, with the capital Tashkent, is a landlocked country that covers an area of about 447,400 sq km. Mountains dominate the landscape in the east and northeast. Several branches of the western Tien Shan and Pamirs-Alai mountain ranges cross into Uzbekistan from neighbouring Kyrgyzstan and Tajikistan, with some peaks reaching above 4000 m (13,000 ft). To the west of the mountains, Uzbekistan is generally low in elevation. More than two-thirds of Uzbekistan's territory is covered by desert and steppe. Uzbekistan generally lies between the two largest rivers of Central Asia, the Amu Darya and Syr Darya. These two roughly parallel rivers both have their headwaters in the mountains east of Uzbekistan and follow north-westerly courses toward the Aral Sea, a saltwater lake straddling the border between Uzbekistan and Kazakhstan. Since the early 1960s the Aral Sea has shrunk to less than half its former size, and dry land has separated the remaining water into two main lakes (AZIMOV et al. 1993).

The indigenous vegetation is equally diverse. Drought-resistant grasses and low shrubs cover the steppes, except in areas that have been cleared for crop cultivation. Ancient walnut-tree forests are located in the lower mountains, whereas spruce, larch, and juniper thrive in the higher elevations. Elm and poplar trees grow along river banks, along with dense stands of brush called tugai.

Uzbekistan has a harsh continental climate. Four distinct seasons create great fluctuations in temperature over the course of a year. Average daily temperatures in January range from -6° to 2° C (21° to 36° F) and in July from 26° to 32° C (79° to 90° F), although temperatures can be much more extreme. There are also wide ranges of temperature between day and night. Precipitation is scant, and the long, hot summers are

marked by drought, although the only truly arid region in Uzbekistan is the Qyzylqum desert. The wettest months are March and April. Snow is common from December through February, although snow cover often melts within a couple of days (KHAMRAEV 2003).

All specimens treated in this paper were obtained from the Province of Tashkent which is situated in the north-eastern part of the country between the western slopes of the Tien Shan mountain range and the river Syr Darya.

Localities Sampled

Locality 1a: Tashkent Province, Charvak area, Yakka-tut village near Burchmulla, 1200m, 26.7.-3.8.2004, 41°38′N 70°03′E, small, slow flowing irrigation channel in the village of Yakka-tut, sandy and muddy bottom, with green algae and *Chara* sp..

Locality 1b: As 1a, but small, fast flowing irrigation channel in the middle of Yakka-tut, sandy and stony bottom, with few floating green algae, *Chara* sp. and dense emerged vegetation (Fig. 1).

Locality 2a: Tashkent Province, Charvak area, Burchmulla, Kok-su river, 1300m, 26.7.-3.8.2004, 41°38′N 70°03′E, fast flowing mountain river without any vegetation. Beetles in small protected embayment near the shore and/or under stones (Fig. 3).

Locality 2b: Tashkent Province, Charvak area, Burchmulla, Kok-su river, 1300m, 26.7.-3.8.2004, 41°38′N 70°03′E, slow flowing mountain spring. Beetles under stones and among floating mosses.

Locality 3: Tashkent Province, Tashkent, "Aquapark", 18.7.2004, artificial swimming pool.

Locality 4: Tashkent Province, Tashkent "Botanickeskiy sad" [Botanical Garden], 6.8.2004, slow flowing and shaded irrigation channels without any vegetation and small eutrophic artificial ponds rich in aquatic vegetation, green algae, mats of floating grasses and *Typha*.

Locality 5a: Border of Tashkent/Syr Darya Province, 50 km WSW Tashkent, near Chinaz (Yangi Chinoz Qorgoni), 9.8.2004, 40°55′N 68°39′E, flood zone of Sirdarya river, shallow, exposed oxbow pond (about 1500 m²), few floating grasses and few macrophytes, sandy bottom with a thin layer of organic debris.

Locality 5b: As 5a, but 40°57′N 68°43′E, shallow (up to 1 m), exposed, slow flowing stream (2.5 m width), very rich in aquatic vegetation (*Ceratophyllum*, floating *Potamogeton natans*, *Lemna*) and mats of floating grasses, sandy bottom with a thin layer of organic debris (Fig. 2).

Locality 5c: As 5a, but 40°55′N 68°44′E, eutrophic, perennial, deep, exposed oxbow lake with dense stands of *Typha angustifolia, Butomus umbellatus* and *Phragmites australis*. Probably used as fish pond. Beetles in half-shaded, shallow water among mats of floating grasses.

All specimens collected by Lars and Emma Hendrich.

Results

A total of 36 species of water beetles (Table 1) were collected in the urban area of Tashkent, the flood zone of the river Syr Darya near Yangi Chinoz Qorgoni, and some streams and irrigation channels in the mountains of NE Uzbekistan in July and August 2004.

Table 1: Aquatic Coleoptera collected in NE Uzbekistan in 2004. Species names in **bold** represent first records of the respective species for the country.

SPECIES	DISTRIBUTION	Locality 1a	Locality 1b	Locality 2a	Locality 2b	Locality 3	Locality 4	Locality 5a	Locality 5b	Locality 5c
Haliplidae										
Haliplus ruficollis (DE GEER, 1774)	Palaearctic									2
***Haliplus sibiricus* MOTSCHULSKY, 1860**	Palaearctic	85	80							
Peltodytes caesus (DUFTSCHMID, 1805)	Palaearctic								2	
Noteridae										
Noterus clavicornis (DE GEER, 1774)	Palaearctic						27	3	3	3
Dytiscidae										
Agabus amoenus amoenus SOLSKY, 1874	Central Asia, China								3	4
Agabus basalis (GEBLER, 1830)	Central Asia, China	2	1							
Agabus bipustulatus (LINNAEUS, 1767)	Palaearctic	24	8							
Colymbetes fuscus (LINNAEUS, 1758)	Palaearctic						1			3
Cybister tripunctatus lateralis (FABRICIUS, 1798)	East Pal., Or.							1		
Deronectes abnormicollis SEMENOV, 1900	Mts. of Central Asia	13	36							
Deronectes vestitus (GEBLER, 1849)	Mts. of Central Asia	1								
Eretes sticticus (LINNAEUS, 1767)	Pal. and Afrotrop.					1				
Herophydrus musicus (KLUG, 1834)	Palaearctic						1	12	2	
Hydroglyphus geminus (FABRICIUS, 1792)	Palaearctic	2						1	17	
Hydroglyphus signatellus (KLUG, 1834)	Palaearctic							4	14	2
Hydroporus goldschmidti GSCHWENDTNER, 1923	Mts. Central Asia, China	3								
***Ilybius cinctus* SHARP, 1878**	Central Asia, China							1	61	
Laccophilus h. hyalinus (DEGEER, 1774)	Palaearctic								1	1
Laccophilus minutus (LINNAEUS, 1758)	Pal. and Or.						3	8	35	10
Laccophilus poecilus KLUG, 1834	Palaearctic								4	
Nebrioporus airumlus (KOLENATI, 1845)	Central Asia	40	132					1		
Rhantus suturalis (MACLEAY, 1825)	Pal., Or. Austr.						1			
Gyrinidae										
Aulonogyrus concinnus (KLUG, 1834)	Palaearctic						22			
Gyrinus distinctus AUBE, 1836	Palaearctic	94	97	30	2		27		1	
Hydrophilidae										
***Ametor redesculptus* SEMENOV, 1900**	Mts. Central Asia, China				1					
Berosus spinosus (STEVEN, 1808)	Palaearctic							1		
Enochrus ater (KUWERT, 1888)	Palaearctic							2	2	
Enochrus melanocephalus (OLIVIER, 1792)	Palaearctic							2	2	
Hydrobius fuscipes (LINNAEUS, 1758)	Palaearctic	1								
Hydrophilus piceus (LINNAEUS, 1758)	Palaearctic						2		1	
Laccobius exilis GENTILI, 1974	Pal. and Or.							5		
***Laccobius simulatrix* D'ORCHYMONT, 1932**	Palaearctic	2	3						1	
***Laccobius syriacus* GUILLEBEAU, 1896**	Palaearctic	4								
Hydraenidae										
***Limnebius* cf. *atomus* (DUFTSCHMID, 1805)**	Palaearctic								1	
Ochthebius spec. 1 (near ragusae)	?	1								
***Ochthebius afghanicus* JÄCH, 1991**	Mts. of Central Asia			4						
Elmidae										
Grouvellinus rioloides (REITTER, 1887)	Central Asia				15					
Specimens: 984		272	357	34	18	1	84	41	150	25
Species: 36		13	7	2	3	1	8	12	16	7

Seven species, most of them known from at least one of the neighbouring countries Afghanistan, Kazakhstan, Tajikistan, Turkmenistan or Kyrgyzstan, are recorded for the first time from Uzbekistan: *Ametor redesculptus* SEMENOV 1900, *Haliplus sibiricus* MOTSCHULSKY 1860, *Ilybius cinctus* SHARP 1878, *Limnebius atomus* (DUFTSCHMID 1805), *Laccobius simulatrix* D'ORCHYMONT 1932, *Laccobius syriacus* GUILLEBEAU 1896 and *Ochthebius afghanicus* JÄCH 1991.

Colymbetes fuscus (LINNAEUS, 1758), *Herophydrus musicus* (KLUG 1834), *Laccophilus hyalinus hyalinus* (DE GEER 1774), *Laccophilus minutus* (LINNAEUS 1758) and *Noterus clavicornis* (DE GEER 1774), not mentioned for Uzbekistan in the catalogue of Palaearctic Noteridae and Dytiscidae (NILSSON 2004), were previously recorded from Margelan [= Marghilon, 40°30'N 71°44'' E (SCHÜTZE & KLEINFELD 1997)] in Eastern Uzbekistan by HEYDEN (1880-1881). Furthermore, two photos together with locality information ["Uzbekistan, Tashkent, in drying aryk, 4-VII-1968, leg. E. Berlov"] of *Cybister tripunctatus lateralis* (FABRICIUS 1798) are published under: http://www.zin.ru/Animalia/Coleoptera/eng/dyt_1403.htm.

Remarkable Species

The following species are rarely collected or represent new records, and almost nothing is known about their habitat preferences.

Agabus amoenus amoenus SOLSKY 1874

Material examined: 3 ex., loc. 5 b; 4 ex., loc. 5c (CLH).

Distribution: Georgia, Southern Russia, Ukraine, Kazakhstan and Uzbekistan (NILSSON 2004).

Habitat: All specimens were collected among mats of floating grasses, in exposed, shallow and muddy water, at the edge of a slow flowing eutrophic stream (Fig. 2) and a fish pond.

Ametor redesculptus SEMENOV 1900

Material examined: 1 male, loc. 2b (CLH).

Distribution: Described from the Zeravshan Mountains in northern Tajikistan. Another record for this country was later published by HEBAUER (1991). The species is distributed in the mountains from Central Asia over Nepal, India (Sikkim) to China (SCHÖDL & JI 1995). First record for Uzbekistan.

Habitat: Rheophilic. The single specimen was collected under stones and gravel, in a protected embayment, at the edge of a slow flowing mountain stream.

Deronectes vestitus GEBLER 1849

Material examined: 1 female, loc. 1a (CLH).

Distribution: A rarely collected species, only 13 specimens were known from southwestern Siberia, Kazakhstan, Uzbekistan and Tajikistan (FERY 2003a).

Habitat: The single specimen was collected among numerous *D. abnormicollis*

SEMENOV, 1900 under mats of floating grasses, in a shaded part of a slow flowing irrigation channel (Fig. 1).

***Hydroporus goldschmidti* GSCHWENDTNER 1923**

Material examined: 1 male, 2 females, loc. 1a (CLH, CIR).

Distribution: A rarely collected species recorded from Uzbekistan, Kyrgyzstan and Western China (WEWALKA 1992, NILSSON 2004).

Habitat: GSCHWENDTNER (1923) stated that the type specimens have been collected at the Ton river near the Issuk-Kul (Kyrgyzstan) and at the banks of the Baghratsh-Kul (China) but he did not mention if the species prefers standing or running water. The only three specimens from Yakka-tut were collected among green algae and floating grasses, in the coldest part of a slow flowing irrigation channel. Probably only a refuge for the remaining adults of the first generation in summer. As many *Hydroporus* of the *planus*-group in the Near and Middle East *H. goldschmidti* is probably an early spring breeder (see WEWALKA 1992).

Remarks: Both females are reticulated similar to the male specimen and are shiny but the elytra are reticulated not only on the apex but finely also on the posterior half.

***Ilybius cinctus* SHARP 1878**

Material examined: 1 ex., loc. 5a; 61 ex., loc. 5b (CLH, NHML, OLML).

Distribution: Widespread in Central Asia, Western and Northern China (NILSSON 2004). First record for Uzbekistan.

Habitat: All but one of the specimens were collected among floating grass mats and dense stands of *Ceratophyllum* and *Myriophyllum*, in shallow (10 – 30 cm) and muddy water, at the edge of an exposed, slow flowing eutrophic stream (Fig. 2). The habitat is similar to that of the related European *Ilybius fuliginosus* (FABRICIUS, 1792).

***Limnebius* cf. *atomus* (DUFTSCHMID 1805)**

Material examined: 1 male, loc. 5b (NMW).

Distribution. Widespread in central and eastern Europe, Turkey and Siberia (JÄCH 1993). First record for Uzbekistan. Probably the single specimen belongs to an undescribed species but more material is needed (Jäch pers. com.).

Habitat. In very shallow water (1 cm depths), among rotten grasses at the edge of an eutrophic, exposed and slow flowing stream.

***Ochthebius afghanicus* JÄCH 1991**

Material examined: 4 ex., loc. 2a (NMW).

Distribution. Only known from the type locality in Afghanistan, Salang Valley, Ejan (JÄCH 1991). First record for Uzbekistan.

Habitat. Rheophilic. All four specimens were found in very shallow water (2 cm depths), under stones, at the margin of a fast flowing mountain river (Fig. 3).

Zoogeographical Notes

The water beetle fauna of lentic habitats in the lowlands of NE Uzbekistan is dominated by widespread Palaearctic faunal elements, e.g. *Noterus clavicornis*, *Colymbetes fuscus*, *Herophydrus musicus*, *Hydroglyphus geminus* (FABRICIUS 1792), *Nebrioporus airumlus* (KOLENATI 1845), all three *Laccophilus* species, *Berosus spinosus* (STEVEN 1808) or *Hydrobius fuscipes* (LINNAEUS 1758). Two species are widespread in the Palaearctic, Afrotropical (*Eretes sticticus* (LINNAEUS 1776)) and/or Oriental (*Cybister tripunctatus lateralis* (Fig. 4), *Laccobius exilis* GENTILI 1974) and Australasian realms (*Rhantus suturalis* (MACLEAY 1825)).

Eight of the recorded species are distributed from Central Asia (*Deronectes abnormicollis*, *D. vestitus*, *Ochthebius afghanicus*) to China (*Agabus amoenus amoenus*, *Ametor redesculptus*, *Grouvellinus rioloides* (REITTER 1887), *Hydroporus goldschmidti*, *Ilybius cinctus*). With the exception of *A. amoenus amoenus* and *I. cinctus*, all of them are restricted to permanent, artificial and non artificial, mainly lotic habitats at higher altitudes.

The greatest diversity at higher altitudes was encountered in artificial irrigation channels, where *D. abnormicollis*, *H. sibiricus* and *N. airumlus* are the dominant water beetles at this time of the year. In the lowlands the well vegetated slow flowing inflows of the Syr Darya housed a diverse water beetle fauna. It seems that in the dry summer period, when the study took place and many ponds, shallow lakes and small irrigation ditches started to dry out, these lotic habitats become a refuge for the adults of many lentic species (e.g. *Herophydrus musicus*, *Hydroglyphus pusillus*, *H. signatellus* and *Hydrophilus piceus*).

Acknowledgements

The author thanks Dr. Manfred Jäch (Vienna, Austria) and Dr. Franz Hebauer (Plattling, Germany) for identifying the Hydraenidae, Elmidae and some Hydrophilidae. Dr. Hans Fery (Berlin, Germany) and Bernhard J. van Vondel (Hendrik-Ido-Ambacht, The Netherlands) provided important old literature and Dr. David Bilton (Plymouth, England) is thanked for correcting the manuscript. Finally, both authors warmly thanks the family of the junior author for their generous assistance and hosting during the stay in Uzbekistan.

Zusammenfassung

In der vorliegenden Arbeit wird über eine Ausbeute von 36 aquatisch lebenden Käferarten, die sich auf die Familien (Artenzahlen in Klammern) der Noteridae (1), Halplidae (3), Dytiscidae (18), Gyrinidae (2), Hydrophilidae (8), Hydraenidae (3) und Elmidae (1) verteilen, berichtet. Alle Tiere wurden im Juli und August 2004 in Nordost-Usbekistan, in Taschkent, dem Gebiet des Syr Darya bei Yangi Chinoz Qorgoni und in den Ausläufern des Tien Shan Gebirges gesammelt. Sieben Arten werden zum ersten Mal für Usbekistan gemeldet: *Ametor redesculptus*, *Haliplus sibiricus*, *Ilybius cinctus*, *Limnebius atomus*, *Laccobius simulatrix*, *Laccobius syriacus* und *Ochthebius afghanicus*. Die meisten der nachgewiesenen Arten sind in der Paläarktis weit verbreitet, nur fünf Taxa sind auf die Gebirge Zentralasiens und Nordwest-Chinas beschränkt. Für einige bemerkenswerte Arten werden zusätzliche Angaben zur Lebensweise und Verbreitung gemacht.

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Fig. 1: Loc. 1b, fast flowing irrigation channel in the village Yakka-tut near Burchmullla, 1200 m. Habitat of *Haliplus sibiricus*, *Deronectes abnormicollis*, *Nebrioporus airumlus* and their larvae. **Fig. 2**: Loc. 5b, slow flowing inflow of the Syr Darya near Yangi Chinoz Qorgoni. Habitat of numerous water beetles such as *Cybister tripunctatus lateralis*, *Hydroglyphus signatellus*, *Ilybius cinctus* and *Agabus amoenus amoenus*. **Fig. 3**: Loc. 2a, Koksu-river near Burchmulla, 1300 m, the habitat of *Ochthebius afghanicus*. **Fig. 4**: *Cybister tripunctatus lateralis* (FABRICIUS 1798) [total length: 30 mm], widespread in the Oriental realm and one of the largest dytiscids in Uzbekistan. All photos by L. Hendrich.