

## ODONATA OF THE WESTERN RHODOPES, WITH SPECIAL REFERENCE TO THE WETLANDS NORTH OF THE TOWN OF SMOLYAN, SOUTH BULGARIA

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**Abstract** – A revised list is presented of 52 spp from 90 localities in Bulgaria and Greece. *Lestes barbarus*, *L. macrostigma*, *Erythromma najas*, *Cordulegaster bidentata*, *Sympetrum flavoolum* and *S. vulgatum* are new for the region. Taxonomic notes are provided on *Calopteryx splendens* and on the status of the *Somatochlora metallica*-*S. merionalis* complex.

### Introduction

The mountain system of the Rhodopes straddles the border between Bulgaria and Greece. It stretches about 230 km from West to East and up to 100 km from North to South. These are relatively low mountains, with an average altitude of 785 m and represent a huge labyrinth of ridges of different lengths and directions, deep river valleys, vast denudation surfaces and kettles. The eastern boundary is marked by the Maritsa river, whilst to the West the rivers Dreshtenets and Yadenitsa separate the Rhodopes from Rila, and the Mesta river from Pirin mountains. The Upper Thracian and Aegean plains outline the northern and southern borders, respectively.

The massif is divided into the Western and

the Eastern Rhodopes. The two parts are totally different in terms of their appearance. In the West, limestone rocks (karst) are pitted with caves and gashed by deep gorges. This area is embraced by deep, almost uniform forests of Norway Spruce (*Picea abies*), while in the lower parts small fragments of deciduous forests remain (*Quercus cerris*, *Q. frainetto*, *Fagus sylvatica*). The eastern section of the massif was formed by volcano activities, resulting in bare igneous rocky hills, in some parts weathered by wind and rain into characteristic rock mushroom and pinnacles. Deciduous forests (mainly *Quercus pubescens*) are scattered within the area. In general terms, the Western Rhodopes experience a transitional continental climate, while the Eastern Rhodopes are strongly influenced by the mediterranean climate. Most of the water in the mountains is accumulated deep within the rocks and natural surface wetlands are rare. Many small man-made lakes are fed by spring waters and by the tributaries of the larger rivers, viz. the Arda, Vacha, Chepinska, Chepelarska, Varbitsa, Krumovitsa and the Byala.

The hitherto published odonatological infor-

mation is largely incidental, based on occasional visits. While MARINOV (2004) dealt with the Eastern Rhodopes, in the present paper attention is given to the western part, with special reference to landslide lakes above the town of Smolyan ("Smolyanski ezera"). Unfortunately, the information for the similar sites above the village of Trigrad is very fragmentary. The Smolyan lakes were sampled by BESHOVSKI (1964, 1968), SCHEFFLER (1973) and RUSSEV & YANEVA (1975). Since these authors used different names for the wetlands visited, the identification of the localities was difficult. Here, their records are summarised, new and previously unpublished data for the Bulgarian and Greek Western Rhodopes are reviewed, and the local topographic names are adopted.

#### Localities (Fig. 1)

##### B u l g a r i a

- (1) Floods by the roadside near the village of Pobit kamak (41°48'N, 23°51'E): 23-VII-2004, Marinov, Lazarov leg.
- (2) Dospatska river S from the village of Medeni polyani (41°51'N, 23°58'E): 23-VII-2004, Marinov, Lazarov leg.
- (3) Small peat bog near the village of Medeni polyani (41°51'N, 23°58'E): 23-VIII-2004, Simov leg.
- (4) Swamp in the village of Yundola by the junction to Belovo (42°03'N, 23°51'E): (a) August 1939, National Museum of Natural History, Sofia; (b) July Kodjabashev leg.; (c) 21-VII-1999, Kodjabashev leg.; (d) 02-VII-2003, BECHEV & STOJANOVA (2004); (e) 5-VI-2005, (f) 9-VII-2006, Marinov leg.
- (5) "Lokvata" area above the village of Yundola on the touristic path to the "Kladova" hut (42°03'N, 23°53'E): 09-VII-2006, Marinov leg.
- (6) Yadenitsa river downstream from the village of Yundola (42°04'N, 23°52'E): (a) 14-VIII-1959, Buresch leg., van Pelt det.; (b) July Kodjabashev leg.; (c) 5-VII-2003, BECHEV & STOJANOVA (2004); (d) 9-VII-2006, Marinov leg.
- (7) Artificial lake S from the village of Draginovo (42°01'N, 23°59'E): 6-VI-2005, Marinov leg.
- (8) "Chibutsite" Protected Area NW from the town of Sarnitsa; surrounding floods and tributaries to the Dospat River (41°44'N, 24°00'E): (a) 13-VII-2004, Kodjabashev leg.; (b) 23-VII-2004, Marinov, Lazarov leg.; (c) 23-VIII-2004, Simov leg.
- (9) "Meandrite na reka Ribna" Protected Area S from the town of Velingrad: the river and its floods (41°56'N, 23°56'E): (a) 23-VII-2004, Marinov, Lazarov leg.; (b) 23-VIII-2004, Simov leg.
- (10) Artificial lake and river by the "Kara tepe" hunting base S from the town of Velingrad (41°56'N, 23°56'E): 23-VII-2004, Marinov, Lazarov leg.
- (11) A tributary of Trigradska river about 3 km S from the village of Trigrad (41°35'N, 24°23'E): (a) 17-VII-2003, Marinov, Diltchev, McGeeney, Smallshire leg.; (b) 2-VII-2005, Marinov, Beshkov, McGeeney leg.; (c) 24-VII-2005, Marinov, Beshkov, Powell leg.; (d) 4-VI-2006, (e) 19-VI-2006, Marinov leg.; (f) 21-VII-2006, Marinov, Beshkov, Powell leg.
- (12) Small stream about 10 km E from the village of Satovcha and W from the junction to the village of Osina (41°38'N, 24°03'E): 23-VI-2004; Marinov, Beshkov leg.
- (13) Dospatska River and small stream near the town of Dospat (41°39'N, 24°10'E): (a) 20-V-1962, BESHOVSKI (1964); (b) BESHOVSKI (1968).
- (14) Town of Dospat, floods of the river (41°39'N, 24°10'E): (a) 20-V-1962, BESHOVSKI (1964); (b) BESHOVSKI (1968).
- (15) Sarnena river crossing the road between the towns of Dospat and Devin about 2 km W from the junction to the village of Zmeitsa (41°39'N, 24°13'E): (a) 31-VII-1997, Marinov, Beshkov, Diltchev leg.; (b) 24-VII-1999, Marinov, Grebe leg.; (c) 23-VI-2004, Marinov, Beshkov leg.; (d) 8-VII-2004, Marinov, Beshkov, Smallshire leg.; (e) 23-VII-2004, Marinov, Lazarov leg.; (f) 3-VII-2005, Marinov, Beshkov, McGeeney leg.; (g) 25-VII-2005, (h) 21-VII-2006, Marinov, Beshkov, Powell leg.
- (16) Small stream near the road Borino-Dospat about 2 km W from the village of Borino

- (41°39'N, 24°13'E): (a) 25-VII-2005, (b) 21-VII-2006, Marinov, Beshkov, Powell leg.
- (17) Pools within the "Chaira" area above the village of Trigrad (41°38'N, 24°26'E): (a) 24-V-1994, Marinov leg., (b) 1-VIII-1997, Marinov, Beshkov, Diltchev leg.; (c) 25-VII-1999, Marinov, Grebe leg.; (d) 17-VII-2003, Marinov, Diltchev, McGeeney, Smallshire leg.
- (18) "Siniyat vir" pool within "Chaira" area above the village of Trigrad (41°38'N, 24°26'E): (a) 24-VI-1969, (b) 28-V-1971, (c) 20-VII-1971, RUSSEV & YANEVA (1975).
- (19) Vacha river by the road between the villages of Teshel and Grohotno near the junction to the Yagodina cave (41°41'N, 24°22'E): 25-V-1994, Marinov leg.
- (20) Floods of Vacha river by the road between the villages of Teshel and Grohotno (41°41'N, 24°21'E): 8-VII-2004, Marinov, Beshkov, Smallshire leg.
- (21) Near the "Devil's throat" cave N from the village of Trigrad (41°41'N, 24°22'E): 7-VII-2004; Marinov, Beshkov, Smallshire leg.
- (22) "Golyam Beglik" Reservoir (41°48'N, 24°10'E): (a) BELCHEVA (1959); (b) 21-IX-1954, BESHOVSKI (1964); (c) BESHOVSKI (1968).
- (23) Town of Batak, floods of the river (41°56'N, 24°13'E): (a) 2-X-1957, BESHOVSKI (1964); (b) BESHOVSKI (1968); (c) MARINOV (1999); (d) MARINOV (2001).
- (24) Between the village of Rakitovo and the town of Batak (41°59'N, 24°05'E): 22-V-1915, Iltchev leg.
- (25) "Izgoryaloto gryune" Reserve S from the town of Krichim, mountain path and stream inside the reserve (42°01'N, 24°26'E): (a) 1-VII-2004, Simov leg.; (b) 24-VII-2004, Marinov, Lazarov leg.
- (26) "Kiryanov gyl" (41°35'N, 24°41'E): (a) 29-VI-1990, Marinov leg.; (b) 26-V-1994, Marinov leg.
- (27) "Milushev gyl" (41°35'N, 24°41'E): (a) 12-V-1963, BESHOVSKI (1964); (b) BESHOVSKI (1968); (c) 25-VI-1969, (d) 30-V-1971, (e) 17-VII-1971, RUSSEV & YANEVA (1975); (f) 26-V-1994, Marinov leg.; (g) 8-VII-2006, Marinov leg.
- (28) "Mezinski gyl" (41°35'N, 24°40'E): (a) 19-V-1962, (b) 12-V-1963, BESHOVSKI (1964); (c) BESHOVSKI (1968); (d) 26-VI-1969, SCHEFFLER (1973); (e) 5-IX-1956, (f) 18-VII-1971, RUSSEV & YANEVA (1975); (g) 8-VII-2006, Marinov leg.
- (29) "Salaja" (41°36'N, 24°40'E): (a) 26-VI-1969, SCHEFFLER (1973); (b) 30-V-1971, (c) 17-VII-1971, RUSSEV & YANEVA (1975); (d) 26-V-1994, Marinov leg.; (e) 8-VII-2006, Marinov leg.
- (30) "Golyam Osmanov gyl" (41°36'N, 24°39'E): (a) 29-VI-1990, (b) 30-VI-1990, Marinov leg.; (c) 26-V-1994, Marinov leg.; (d) 2-VIII-1997, Marinov, Beshkov, Diltchev leg.
- (31) Floods S from "Golyam Osmanov gyl" (41°36'N, 24°39'E): 29-VI-1990, Marinov leg.
- (32) "Malak Osmanov gyl", pool W from "Golyam Osmanov gyl" (41°36'N,

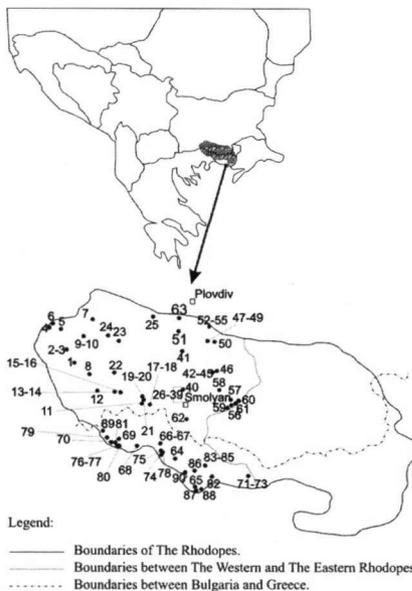


Fig. 1. The Rhodopes: the topographic position of Odonata localities.

- 24°39'E): (a) 26-V-1994, Marinov leg.; (b) 8-VII-2006, Marinov leg.
- (33) Pool N from "Malak Osmanov gyol" (41°36'N, 24°39'E): 21-VII-2006, Marinov leg.
- (34) "Lagera" (41°36'N, 24°39'E): (a) 18-VII-1971, RUSSEV & YANEVA (1975); (b) 29-VI-1990, Marinov leg.; (c) 30-VI-1990, Marinov leg.; (d) 26-V-1994, Marinov leg.; (e) 8-VII-2006, Marinov leg.
- (35) "Gastalaka" (41°37'N, 24°40'E): (a) 29-VI-1990, Marinov leg.; (b) 26-V-1994, Marinov leg.; (c) 1-VII-2005, Marinov, Beshkov, McGeeney leg.; (d) 8-VII-2006, Marinov leg.
- (36) "Trevistoto ezero" (41°37'N, 24°40'E): (a) 5-IX-1956, (b) 18-V-1962, (c) 12-V-1963, BESHOVSKI (1964); (d) BESHOVSKI (1968); (e) 25-VI-1969, SCHEFFLER (1973); (f) 18-VII-1971, RUSSEV & YANEVA (1975); (g) 29-VI-1990, (h) 30-VI-1990, (i) 26-V-1994, Marinov leg.; (j) 14-VIII-1994, Dimitrov leg.; (k) 02-VIII-1997, Marinov, Beshkov, Diltchev leg.; (l) MARINOV (2001); (m) 10-VIII-2002, Marinov leg.; (n) 16-VII-2003, Marinov, Diltchev, McGeeney, Smallshire leg., (o) 7-VII-2004; Marinov, Beshkov, Smallshire leg.; (p) 1-VII-2005, Marinov, Beshkov, McGeeney leg.; (q) 24-VII-2005, Marinov, Beshkov, Powell leg.; (r) 8-VII-2006, Marinov leg.; (s) 20-VII-2006, Marinov, Beshkov, Powell leg.
- (37) "Bistroto ezero" (41°37'N, 24°40'E): (a) 26-V-1994, Marinov leg.; (b) 8-VII-2006, Marinov leg.
- (38) "Matnoto ezero" (41°37'N, 24°40'E): (a) 5-IX-1956, (b) 18-V-1962, (c) 19-V-1962, (d) 12-V-1963, BESHOVSKI (1964), (e) BESHOVSKI (1968), (g) 27-VI-1969, SCHEFFLER (1973); (h) 27-VI-1969, RUSSEV & YANEVA (1975); (i) 29-VI-1990, Marinov leg.; (j) MARINOV (1999); (k) MARINOV (2001); (l) 8-VII-2006, Marinov leg.
- (39) Swamps within the "Smolyanski ezera" area (41°37'N, 24°40'E): (a) 5-X-1956, (b) 18-V-1962, BESHOVSKI (1964); (c) BESHOVSKI (1968).
- (40) Peat bog by the guest house of Electricity company, Pamporovo ski resort (41°37'N, 24°42'E): (a) 24-VII-2005, Marinov, Beshkov, Powell leg.; (b) 3-VI-2006, Marinov leg.; (c) 20/21-VII-2006, Davenport leg.
- (41) Village of Hvoina (41°52'N, 24°41'E): June-August, NEDELKOV (1923).
- (42) Artificial lakes by the "Momchil yunak" hut (41°41'N, 24°48'E): (a) 22-V-1994, Marinov leg.; (b) 7-VII-2006, Marinov leg.
- (43) Pool by the touristic path between "Momchil yunak" hut" and "Haidushki polyani" area about 620 m from "Momchil yunak" hut (41°41'N, 24°48'E): 07-VII-2006, Marinov leg.
- (44) Pool by the touristic path between "Momchil yunak" hut" and "Haidushki polyani" area about 930 m from "Momchil yunak" hut (41°41'N, 24°48'E): 07-VII-2006, Marinov leg.
- (45) Floods near the road between the villages Laki and Momchilovtsi on the junction to the "Momchil yunak" hut (41°41'N, 24°47'E): 07-VII-2006, Marinov leg.
- (46) Artificial lake within the "Haidushki polyani" area (41°41'N, 24°49'E): (a) 22-V-1994, Marinov leg.; (b) 7-VII-2006, Marinov leg.
- (47) Village of Bachkovo (41°56'N, 24°51'E): (a) June-August, NEDELKOV (1923); (b) 22-VIII-1938, URBANSKI (1947).
- (48) Chaya River near the Bachkovo Monastery (41°56'N, 24°51'E): (a) 6-VI-1999, Marinov leg.; (b) 3-VI-2006, Marinov leg.
- (49) Above Bachkovo Monastery (41°56'N, 24°51'E): NEDELKOV (1923).
- (50) "Chervenata stena" Reserve (41°55'N, 24°55'E): July, Kodjabashev leg.
- (51) Village of Dedovo (41°59'N, 24°39'E): 20-VII-1982, Botscharov leg., van Pelt det.
- (52) Town of Assenovgrad (42°01'N, 24°52'E): (a) NEDELKOV (1909); (b) NEDELKOV (1923); (c) 22-VIII-1938, (d) 25-VIII-1938, (e) 26-VIII-1938, URBANSKI (1947); (f) 25-V-1986, Natural History Museum, Plovdiv.
- (53) Assenov's fortress near the town of Assenovgrad (42°00'N, 24°52'E): 21-II-1993, Kolev leg.
- (54) Spring and stream crossing the road to the

- Assenov's fortress near the town of Assenovgrad (42°00'N, 24°52'E): 6-VI-1999, Marinov leg.
- (55) Chaya River below the Assenov's fortress (42°00'N, 24°52'E): 6-VI-1999, Marinov leg.
- (56) Arda River by the wooden bridge near the road between the towns of Madan and Ardino to the junction to the village of Banite (41°35'N, 25°02'E): 5-VI-1999; Marinov leg.
- (57) River passing through the village of Banite (41°36'N, 25°00'E): 21-V-1994, Marinov leg.
- (58) Meadow near the village of Davidkovo (41°39'N, 24°58'E): 12-VIII-2004, Jennebach, Motz leg.
- (59) Arda River and pools along riverside by the ridge around 10 km E from the crossroad between the towns of Smolyan and Madan (41°32'N, 25°00'E): (a) 21-VI-2004; Marinov, Beshkov leg.; (b) 6-VII-2004; Marinov, Beshkov, Smallshire leg.; (c) 1-VII-2005, Marinov, Beshkov, McGeeney leg.
- (60) Tributary of Arda River crossing the road between the towns of Ardino and Smolyan near the junction to the village of Jaltusha (41°33'N, 25°04'E): 21-VI-2004; Marinov, Beshkov leg.
- (61) Floods by the roadside between the towns of Ardino and Smolyan near the junction to the village of Sedlartsi (41°33'N, 25°03'E): 6-VII-2004, Marinov, Beshkov, Smallshire leg.
- (62) Small pool by the Arda River near the village of Smolyan (41°30'N, 24°45'E): 1-IX-1957, RUSSEV (1964).
- (63) S from the village of Markovo (42°04'N, 24°42'E): BECHEV & STOJANOVA (2004).
- Greece**
- (64) Stream to the Néstos on the outskirts of Neochóri, right of Paranésti (41°14'N, 24°38'E): GREBE et al. (2005).
- (65) Néstos, bank of the river near the bridge 1 km ENE from Parádisos (41°07'N, 24°46'E): GREBE et al. (2005).
- (66) 5 km W of Dipótama (Arkoudórema river) (41°20'N, 24°30'E): LOPAU (2005).
- (67) 8 km W of Dipótama (41°20'N, 24°30'E): LOPAU (2005).
- (68) 9 km N of Thermiá (41°20'N, 24°20'E): LOPAU (2005).
- (69) 6 km N of Kalíkarpó (41°20'N, 24°10'E): LOPAU (2005).
- (70) 7 km NNW of Sidirónero (41°20'N, 24°10'E): LOPAU (2005).
- (71) River Komsátos 1 km SW of Tális (41°10'N, 25°10'E): LOPAU (2000).
- (72) Small stream to the river Komsátos 1 km SW of Tális (41°10'N, 25°10'E): LOPAU (2000).
- (73) Spring and stream 2 km S of Tális (41°10'N, 25°10'E): LOPAU (2000).
- (74) Pools in a brookvalley 4 km N of Paranésti (41°10'N, 24°30'E): LOPAU (1999).
- (75) Stream 14 km N of Paranésti (41°20'N, 24°30'E): LOPAU (1999).
- (76) Stream 3 km W of Sidirónero (41°10'N, 24°10'E): LOPAU (1999).
- (77) Stream 3 km W of Sidirónero (41°10'N, 24°10'E): LOPAU (1996).
- (78) River 6 km N of Paranésti (41°20'N, 24°30'E): LOPAU (1996).
- (79) Upper course of the Néstos near Potami (41°23'N, 24°06'E): LOPAU (1996).
- (80) Small stream to the Néstos River 3 km W of Sidirónero (41°10'N, 24°10'E): LOPAU (1996).
- (81) Small stream to the Néstos River SE of Pappádes (41°22'N, 24°10'E): LOPAU (1996).
- (82) River 5 km N of Xánthi (41°10'N, 24°53'E): LOPAU (1996).
- (83) River 5 km SW of Smínthi (41°10'N, 24°50'E): LOPAU (1996).
- (84) Spring by the road 5 km SW of Smínthi (41°10'N, 24°50'E): LOPAU (1996).
- (85) River 2 km NE of Smínthi (41°10'N, 24°50'E): LOPAU (1996).
- (86) Stream near Géerakas at the road Xánthi-Stavrouúpoli (41°10'N, 24°45'E): LOPAU (1996).
- (87) Meanders of Néstos River in the gorge near Galáni (41°06'N, 24°46'E): SCHNA-PAUFF et al. (1996).
- (88) View-point on the mountain Gamilla; no water (41°06'N, 24°48'E): SCHNA-PAUFF et al. (1996).

- (89) Small stream to the Néstos River with gravelbed near Paranésti (41°27'N, 24°04'E): SCHNAPAUFF et al. (1996).  
 (90) Gravel pit at the Néstos River near Stavroupoli (41°10'N, 24°45'E): SCHNAPAUFF et al. (1996).

#### List of species

Numbers in bold correspond to the locality numbers and letters to the dates given above. Other abbreviations used are: l: larvae; – exuv.: exuviae.

- *Calopteryx splendens* (Harr.)  
LOPAU & WENDLER (1995); **15d**, g; **50** (3♂); **56**; **59a**, b; **60**; **65**; **71**; **72**; **74**; **79**; **80**; **81**; **82**; **87**; **89**.
- *Calopteryx virgo* (L.)  
LOPAU & WENDLER (1995); **2** (1♂); **6b**, c; **9a**; **11a**; **13a** (8l.); **15a**, b, c, d, e, g, h; **16b**; **20**; **25b**; **59a**, c; **64**; **66**; **68**; **70**; **72**; **74**; **75**; **76**; **77**; **80**; **81**; **82**; **86**; **89**.
- *Epallage fatime* (Charp.)  
LOPAU & WENDLER (1995); **89**.
- *Lestes barbarus* (Fabr.)  
**4f**; **11c**; **15g**; **17b**, c, d.
- *Lestes dryas* Kirby  
**4c** (8♂, 4♀); **8b**, c (1♂); **9a** (1 exuv.); **10**; **15a**, b, d, f, g, h; **17c**, d; **35c**; **36k**, m, p; **38e**; **40a**; **46b**; **61**.
- *Lestes macrostigma* (Eversm.)  
**36s**.
- *Lestes sponsa* (Hans.)  
**17c**, **36k** (1♀), m, n, q; **52b** (June-August).
- *Sympecma fusca* (Vander L.)  
**47b** (1♂); **52a** (July-August); **53** (1♂); **90**.
- *Platycnemis pennipes* (Pall.)  
LOPAU & WENDLER (1995); **11a**; **17b**, c; **15b**, g, h; **23a** (1l.); **25b**; **26a** (1♂), b; **27f**, g; **29d**, e; **34e**; **42b**; **50** (1♀); **55**; **56**; **57**; **59b**, c; **61**; **66**; **71**; **73**; **74**; **78**; **79**; **86**; **87**; **89**.
- *Pyrrhosoma nymphula* (Sulz.)  
LOPAU & WENDLER (1995); **5**; **8b**; **10**; **11b**; **15a**, b, c, d, g, h; **17c**; **18b**; **19**; **27a** (1♂), b; **28a** (2l.), b (1l.); **g**; **29a**, e; **31** (1♂, 1♀); **35b**, c, d; **36c**, e, p, q; **37a** (2♂, 4♀); **38b**, c, i; **40a**; **46b**; **59b**; **70**; **73**.
- *Erythromma najas* (Hans.)  
**17c**, d.
- *Erythromma viridulum* (Charp.)  
**90**.
- *Coenagrion hastulatum* (Charp.)  
**4d**; **14b**; **27b**; **28a** (5♂, 4♀; 37l.), b (10l.); **30c**, **32a**; **35b** (1♂, 1♀), c, d; **36b**, c (7l.), e, h (2♂, 1♀), i (13♂, 1♀), k, n, o, p, q, r, s; **37b**; **38c** (25l.), g, l; **40a**.
- *Coenagrion puella* (L.)  
**4e**, f; **5**; **7**; **8b**; **10**; **14b**; **15a**, b, c, d, e, f, g, h; **17a** (3♂, 2♀), b, c, d; **19**; **27g**; **28c**, d; **29a**, e; **30c**, d; **33**; **32a,b**; **34e**; **35b**, d; **36a** (6l.), e, i (3♂), k, n, q; **42**; **46b**; **59c**; **73**.
- *Coenagrion pulchellum* (Vander L.)  
**14b**; **23b**; **27a** (8l.); **28a**; **36b**, d.
- *Coenagrion scitulum* (Ramb.)  
**90**.
- *Coenagrion* sp.  
**29b**, c; **34a**; **36f**.
- *Enallagma cyathigerum* (Charp.)  
**15a**, b, c, d, g, h; **17a** (1♀), b, c; **27g**; **28d**; **29a**, e; **30d**; **34b**, e; **36i**, (1♂), n, **40a**; **42b**; **46b**.
- *Ischnura elegans* (Vander L.)  
**15a**, b, c, g, h; **17a** (2♂, 1♀), b, d; **27a** (1♂), c; **28a** (1♂), d, e; **29a**, e; **30d**; **34b**, d; **36b** (1l.), d, i (1♂); **37b**; **42a** (3♂, 2♀); **46a** (4♂♂), b; **71**; **90**.
- *Ischnura pumilio* (Charp.)  
**4f**; **5**; **11a**; **14b**; **15c**, d; **17a** (3♂, 2♀); **19** (3♂, 1♀); **20**; **27c**, d; **28a** (4♂, 1♀; 2l.), d, e; **30**; **32b**; **34d**, e; **35d**; **36b** (1♂, 4l.), d, e, i (2♂, 1♀), o; **39c**; **42a** (1♂), b; **46b**; **52a** (July-August).
- *Ischnura* sp.  
**27d**, e; **28f**; **36f**; **38h**.
- *Aeshna affinis* Vander L.  
LOPAU & WENDLER (1995); **15g**.
- *Aeshna cyanea* (Müll.)  
LOPAU & WENDLER (1995); **3** (1l.); **8b**; **10**; **15a**, d, e, g, h; **17b**, c, d; **18a**, b; **27g**; **28c**; **35c**; **36d**, j (1♂), k, m, n, o, q, s; **38b**, c (24l.), d (4l.); **40a**; **44**; **77**.
- *Aeshna juncea* (L.)  
**17c**; **36j** (1♂), n, p, q, s; **52a** (August), b (July).
- *Aeshna mixta* Latr.  
**21**; **41**; **49** (June-August); **52b** (June-August); **78**; **87**; **88**.
- *Aeshna* sp.  
**17b**, c; **38h**.
- *Anax imperator* Leach  
**14b**; **15a**, b; **17b**, c; **27a** (3l.), f; **30b**, c; **36a**

- (11.), e; 42a; 46a; 52b (May-July); 88; 90.
- *Anax ephippiger* (Burm.)  
LOPAU & WENDLER (1995); 85.
  - *Anax parthenope* (Sél.)  
89.
  - *Brachytron pratense* (Müll.)  
14b, 36d.
  - *Caliaeschna microstigma* (Schneider)  
64; 70; 73; 76; 89.
  - *Gomphus vulgatissimus* (L.)  
LOPAU & WENDLER (1995); 62, 65; 75;  
87; 89.
  - *Ophiogomphus cecilia* (Fourcroy)  
65; 87; 88; 89.
  - *Onychogomphus forcipatus* (L.)  
LOPAU & WENDLER (1995); 15b; 25a  
(1 ♂), b; 50 (1 ♀); 56; 59b; 65; 66; 68; 79; 80;  
87; 89.
  - *Cordulegaster bidentata* Sél.  
6a (1 ♀); 8a; 51 (1 ♂); 54.
  - *Cordulegaster heros* Theischinger  
10; 15a (1 ♂), d, e; 16a, b; 63.
  - *Cordulegaster picta* Sél.  
LOPAU & WENDLER (1995); 60; 67; 68;  
69; 70; 75; 76; 77; 89.
  - *Cordulegaster* sp.  
77; 80.
  - *Cordulia aenea* (L.)  
10; 17b, c, d; 26b; 27f, g; 28c, d (1 ♀); 29d;  
30c; 32a; 35b, c; 36b (2l.), e, h (1 ♂), i (5 ♂),  
n, o, p, q, s; 38c (1 ♂), g (1 ♂).
  - *Somatochlora meridionalis* Nielsen  
5; 6c, d; 9b (1 ♂); 15d, g; 74.
  - *Somatochlora metallica* (Vander L.)  
23a (3l.), c, d; 36d, l; 38a (1l.), c (1l.), j; k.
  - *Libellula depressa* L.  
LOPAU & WENDLER (1995); 11a, d, e, f;  
14a (1l.), b; 15a, d, g; 17c; 23a (1l.), b; 28a, c,  
d; 29a, d; 30c; 35b; 36b (2l.), e; 39a (1l.); 43;  
52f (1 ♀); 59b, c; 66; 73; 74; 87; 89; 90.
  - *Libellula fulva* Müll.  
17c; 52b (April); 89.
  - *Libellula quadrimaculata* L.  
4b (2 ♂), e, f; 5; 8b; 10; 13b; 15a, d, e, g; 17b,  
c, d; 22a, b(1l.), c; 24; 27a (1 ♀; 1 exuv.), b, g;  
28c, d, g; 29d, e; 30a, c; 32a, b; 34b, e; 35a,  
b, c; 36b (6l.), c(3l.), d, e, g, h (2 ♂, 1 ♀), I  
(6 ♂), m, n, o, p, q, r, s; 38a (2l.), b, c (3l., 2 ♀),  
e, l; 39b (4l., 1 ♂, 2 ♀); 40a, b, c.
  - *Orthetrum albistylum* (Sél.)  
90.
  - *Orthetrum brunneum* (Fonsc.)  
LOPAU & WENDLER (1995); 49; 66; 68;  
83; 84; 86; 89.
  - *Orthetrum cancellatum* (L.)  
8b; 17c, d; 27g; 90.
  - *Orthetrum coerulescens* (Fabr.)  
LOPAU & WENDLER (1995); 89.
  - *Crocothemis erythraea* (Brullé)  
LOPAU & WENDLER (1995); 28d; 65; 78;  
90.
  - *Sympetrum depressiusculum* (Sél.)  
22c.
  - *Sympetrum flaveolum* (L.)  
1; 4a (1 ♂); 8b; 9a, b; 10; 12; 15d, f, g, h; 17b,  
c, d; 34c, e; 36k; 40a.
  - *Sympetrum fonscolombeii* (Sél.)  
LOPAU & WENDLER (1995); 11a; 15b;  
86.
  - *Sympetrum meridionale* (Sél.)  
LOPAU & WENDLER (1995); 52a (July-  
August), c (2 ♂), e (2 ♂, 1 ♀); 65.
  - *Sympetrum sanguineum* (Müll.)  
8b; 23b; 15a, d, g, h; 28d (1 ♂); 36p; 59b;  
87.
  - *Sympetrum striolatum* (Charp.)  
LOPAU & WENDLER (1995); 22c; 25b;  
36h (1l.); 52e (4 ♂, 4 ♀); 65; 69; 86.
  - *Sympetrum vulgatum* (L.)  
17b (1 ♂); 36m (1 ♂).
  - *Sympetrum* sp.  
27c; 34a.
- Census of species**  
A total of 52 species are reported here for the Western Rhodopes. New for the region are:
- *Lestes barbarus*: discovered in four localities, but single individuals only.
  - *Lestes macrostigma*: 1 ♂ was found at an altitude of 1545 m.a.s.l. The site is very atypical for the species: freshwater pool with acid water. The nearest breeding site lies outside of the mountain area, about 70-80 km due South.
  - *Erythromma najas*: at the moment it is found to be locally abundant in one wetland only.
  - *Cordulegaster bidentata*: it is given here from four localities, three of these from museum specimens. The fourth place seems to be important, since numerous ♂♂ were seen

there.

- *Sympetrum vulgatum*: only 2 ♂ are known from two localities. On both visits teneral were found. Only a few visits were made in the proper flying season, hence the paucity of recorded specimens.
- *Sympetrum flaveolum*: it is given from seven localities.

*Somatochlora flavomaculata* is removed from the Rhodopes list, but it was reported from the adjacent territories (POPOV, 1961; PETROV, 1973), while a recent record (BECHEV & STOJANOVA, 2004) is based on a misidentification of *S. meridionalis*.

The regional occurrence of *S. metallica* is doubtful. It is solely based on the unconfirmed records of larvae, made in the 1960s.

The discovery of *Lestes viridis*, *Coenagrion ornatum*, *Erythromma lindenii*, *Aeshna isosceles* and *Selysiothemis nigra* in the Western Rhodopes, whether breeding or as occasional migrants, is expected. In NE Greece they occur very close to the investigated area (cf. LOPAU & WENDLER, 1995). Similar is the case of *Gomphus flavipes*. Its larvae were recorded from the Maritsa river, some 10-15 km N from the Rhodopes (UZUNOV et al., 1981). In conclusion, it could be reasonably assumed that at least 58 species occur in the Western Rhodopes, i.e. the same number as known from the eastern part of the range (cf. MARINOV, 2004). The region is certainly to be considered a European dragonfly hot spot.

#### Taxonomic notes

*Calopteryx splendens* is a polytypical taxon, with at least 15 forms known from the European Mediterranean (RÜPPELL et al., 2005). An analysis for the W Mediterranean was provided by WEEKERS et al. (2001), but the situation in the Balkan Peninsula remains as yet unclear. *C. s. balcanica* Fudakowski is listed for Bulgaria by DUMONT (1977) and BESHOVSKI (1994). With reference to the southern Balkan, many authors refer to STOBBE (1990), who distinguished two morphological groups: *C. s. balcanica* in W and SW Greece, and *C. s. mingrelica* Sél. in E and NE Greece. The latter subspecies was identified from the Greek section of the Western Rhodopes (LOPAU, 2000);

the specimens from the Bulgarian side of the mountain ridge are also close to it.

The *Somatochlora metallica* – *S. meridionalis* status is unclear. For Bulgaria MARINOV (1999, 2001) refers to them as separate species, since they have completely different habitat requirements and a distinct distribution throughout the country. *S. metallica* is restricted to the lakes of Rila, Pirin (?) and the Rhodopes, while *S. meridionalis* is mostly found along the SE Black Sea coast and it is widely distributed also elsewhere, e.g. in the Eastern Rhodopes (MARINOV, 2004), near the city of Sofia and even in North Bulgaria (town of Ugarchin). It may migrate high up into the mountains e.g. Sredna gora, ca 2 km S of the town of Koprivshtitsa (alt. ca 1050 m a.s.l.). The four recent sightings at loc. 5, 6, 9 and 15 (all streams, alt. 1245-1550 m) are of particular interest.

*S. metallica* and *S. meridionalis* are mainly separated by the colour of the pterostigma and the presence/absence of the thoracic yellow spot. The 2 specimens, collected at loc. 15 in 2004, have dark pterostigma (typical for *meridionalis*) and no yellow spot (typical for *metallica*), resembling therefore *S. metallica aboacanica* Belyshev, a taxon described from Siberia and confirmed for N Norway (BOUDOT et al., 2004). All individuals caught at this locality in 2005 had dark pterostigma and showed variation in the yellow spot: from lacking it completely to having it well developed as in the true *meridionalis*.

The same situation occurred in loc. 5. Six out of eight individuals caught in 2006 have dark pterostigma and a well developed yellow spot. One has dark pterostigma, but lacks any spots on the thorax (Figs 2a, b), while one has brownish pterostigma and a vestigial yellow spot (Figs 3a, b). No variation among the individuals was noticed at loc. 6, although it is situated only 2 km in a straight line from loc. 5. All six specimens from this site have typical morphological features of *meridionalis* (Figs 4a, b). An individual without any yellow spot and with dark pterostigma was found at loc. 9.

In all other situations where *S. meridionalis* was recorded in Bulgaria from lower altitudes, the specimens examined do not show any deviation from the typical features. Also no variation

was found among the individuals from higher altitudes around and above 2000 m (Rila mountain lakes), nor in those that were identified as *S. metallica*. They have dark pterostigma and lack the yellow thoracic spot.

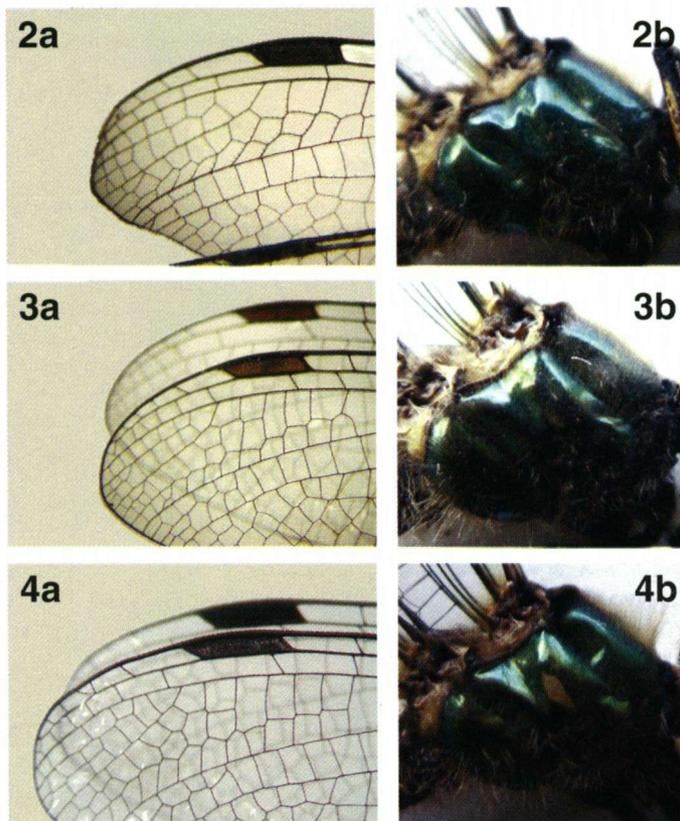
It seems apparent that the yellow thoracic spot does not help separating individuals of the two species from the altitudes of 1200-1500 m.a.s.l. in Bulgaria. In all probability there is a hybrid zone between the two within this range. A different approach will be needed for solving the problem of the status of the two taxa.

**Wetlands North from the town of Smolyan**

The wetlands known as “Smolyanski ezera” (Smolyan lakes) are situated in a stretch of up

to 10 km North from the town (Fig. 5). They are attractive places for recreation and scientific research as they are unique to the country in their origin. Most of the lakes lost their natural appearance around 1961/62. Dykes were built to raise the water levels and some (“Kiryanov gyol”) were cleared of the floating vegetation. Others were turned into fish farms or filled up with soil (“Blatoto”). The fish farms are out of use since the 1990s. The so-called “Mezinski gyol”, the subject of several odonatological investigations, is about to be lost too, as construction activities are planned nearby and it is being filled with soil.

The three northernmost lakes are the only ones that remain untouched. Apart from sev-



Figs 2-4. *Somatochlora* specimens from loc. 5: (2a) dark pterostigma in the forewings; (2b) lack of yellow spot on the thorax; – (3a) brown pterostigma in the forewings; (3b) vestigial yellow spot on the thorax; – (4a) dark pterostigma in the forewings; (4b) yellow spot on the thorax.

eral small lakes along the northern Black Sea coast these are the examples of landslide lakes in Bulgaria (IVANOV et al., 1964; GEORGIEV, 1991). MICHEV et al. (1995) included in this group the wetlands above the village of Trigrad. They were formed by landslides, activated by underground waters. In the same way some lower areas (up to 5 m deep) in the terrain (karst) were also filled up with water. They have a low pH, between 6.0 and 7.2 (IVANOV et al., 1964).

A brief description of the “Smolyanski ezera” wetlands is provided below. They are arranged according to their altitude, local names and the names used earlier by other researchers.

- “Kiryanov gyol” – Situated close to the “Ribkata” restaurant, Smolyan, 1115 m.a.s.l. No Odonata sampled previously.
- “Milushev gyol” – About 600 m E from the main Smolyan-Stoikite road, 1150 m.a.s.l. Given under the same name by previous authors.
- “Mezinski gyol” – By the roadside between the town of Smolyan and the village of Stoikite, 1176 m.a.s.l. It was drained out about 1984 and is now filled up with soil. It is given under the same name by BESHOVSKI (1964, 1968) and most probably identic to “Fundort Nr. 1: S-Bulgarien, Rhodopen. Ca. 2 km N Smoljan, unmittelbar an der Straße nach Plovdiv, 1200 m NN.” of SCHEFFLER (1973).
- “Salaja” – By the roadside between the town of Smolyan and the village of Stoikite near the restaurant “Ezerata”, 1318 m.a.s.l. Previously given as “Fundort Nr. 2: S-Bulgarien, Rhodopen. Ca. 3 km N Smoljan, dicht am Restaurant “Ezerata”, 1200 m NN.” (SCHEFFLER, 1973) and as “Salasha” (RUSSEV & YANEVA, 1975).
- “Golyam Osmanov gyol”, “Malak Osmanov gyol” and pool N from “Malak Osmanov gyol”; by the roadside between the town of Smolyan and the village of Stoikite near the junction to the “Smolyanski ezera” hut, 1375-1393 m.a.s.l. No Odonata sampled previously.
- “Lagera” – Situated after the junction to the “Smolyanski ezera” hut about 700 m SW from it, 1476 m.a.s.l. Previously reported as “Lagot” (RUSSEV & YANEVA, 1975).
- “Gastalaka” – About 300 m N from the “Smolyanski ezera” hut, 1529 m.a.s.l. Its name was invented by the author, since a local name doesn't exist. No Odonata sampled previously.
- “Trevistoto ezero” – About 300 m NE from the “Smolyanski ezera” hut, 1545 m.a.s.l. The most famous wetland of the group. *Sphagnum* covers much of the water surface

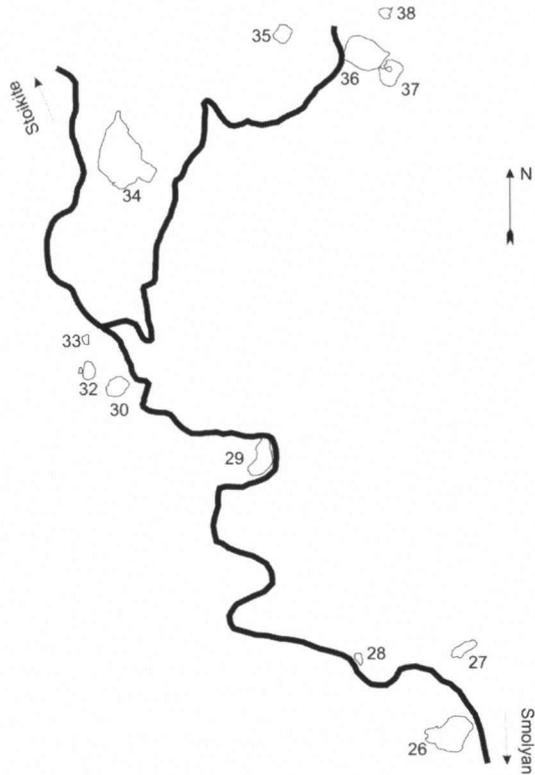


Fig. 5. Map of the wetlands above the town of Smolyan. Numbers correspond with the localities given in the text.

and it is as dense as to enable walking over it. Floating vegetation (*Potamogeton natans*) covers rest of the water surface and gives its local name, which means "The grassy lake". Previously referred to as: "II. Smolyansko (Dolno) ezero" (BESHOVSKI, 1964, 1968); "Fundort Nr. 3: S-Bulgarien, Rhodopen. 10 km N Smoljan, 500 m E der Hütte "V. Kolarov". "Smolen-Seen", 1550 m NN." (SCHEFFLER, 1973); and "Blatistoto ezero" (RUSSEV & YANEVA, 1975).

- "Bistroto ezero" - Immediately by the "Trevistoto ezero", 1545 m.a.s.l. No Odonata sampled previously.
- "Matnoto ezero" - Some 200 NNE from "Trevistoto ezero", 1583 m.a.s.l. Previously listed as: "I. Smolyansko (Gorno) ezero" (BESHOVSKI, 1964, 1968); "Fundort Nr. 4: 500 m E Fundort Nr. 3, 1600 m NN." (SCHEFFLER, 1973); and "Samodivsko (Matno) ezero" (RUSSEV & YANEVA, 1975).
- One of the previously sampled localities cannot be referred to any of the known sites within the region. It was given as "Ormanovsko ezero" (RUSSEV & YANEVA, 1975). *Ischnura pumilio* and *Ischnura* sp. were recorded from there.

Surprisingly, this group of wetlands is exposed to extreme human pressure and it is not legally protected. The ponds support a unique odonate assemblage for the country. Most typical species are *Lestes sponsa*, *Pyrrhosoma nymphula*, *Coenagrion hastulatum*, *Aeshna juncea*, *Cordulia aenea*, *Libellula quadrimaculata* and *Sympetrum vulgatum*. For *C. hastulatum* the four uppermost lakes represent the southernmost point of its global distribution. Most importantly they are the only confirmed breeding sites for the species in Bulgaria.

*Brachytron pratense* was not seen in the area for almost 40 years. This could be due to the circumstance that most surveys have taken place in summer, while this species is on the wing in spring. Obviously, the inadequate adult season coverage is one of the main shortcomings of the hitherto conducted surveys. Although the Rhodopes are among the odonatologically best explored regions in Bulgaria, for an effective species conservation more information on

their local ecology and biology will have to be gathered.

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