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"Acciones Integradas": Excursion to Andalucía (Spain: Málaga, Cádiz), October 1998

(Coleoptera: Hydroscaphidae, Haliplidae, Gyrinidae, Dytiscidae,
Hydrochidae, Hydraenidae, Dryopidae, Elmidae)

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Abstract

Eight families of aquatic coleoptera (Hydroscaphidae, Haliplidae, Gyrinidae, Dytiscidae, Hydraenidae, Hydrochidae, Dryopidae, Elmidae) were sampled from 18 field stations in the provinces of Málaga and Cádiz (Andalucía, southern Spain) during a joint excursion in October 1998. Several new species were collected, two of which, *Ochthebius diazi* JÄCH (Hydraenidae) and *Hydrochus tarigi* RIBERA et al. (Hydrochidae) are described in separate articles in the present volume. Nine species of Hydraenidae are here recorded for the first time from Cádiz and eight species of Hydraenidae are recorded for the first time from Málaga. Some of the streams examined were found to harbour an enormous abundance of Hydraenidae: a total of 397 specimens representing six species of *Hydraena* KUGELANN were sampled within 15 seconds from a square of 20 x 20 cm.

Key words: Coleoptera, Hydroscaphidae, Haliplidae, Gyrinidae, Dytiscidae, Hydrochidae, Hydraenidae, Dryopidae, Elmidae, faunistics, Spain, Andalucía, Málaga, Cádiz.

Introduction

"Acciones Integradas Hispano-Austriacas" is a bilateral programme established by the "Spanish Ministerio de Educación y Ciencia" and the Austrian "Bundesministerium für Wissenschaft, Forschung und Kunst". Its aims are the intensification of cooperation between Spanish and Austrian scientists.

In the course of an "Acciones Integradas" project on the "Biodiversity and Systematics of Hydraenidae" the authors carried out a joint excursion to Andalucía (Spain: Cádiz and Málaga) in October 1998. A total of 18 field stations was investigated during this excursion and the knowledge of several water beetle families (especially Hydraenidae) of southern Spain was greatly improved resulting in the discovery of several new species of water beetles and numerous new provincial records.

Altogether, eight families of water beetles were sampled in the course of the "Acciones Integradas" excursion: Hydroscaphidae, Haliplidae, Gyrinidae, Dytiscidae, Hydraenidae, Hydrochidae, Dryopidae, Elmidae. Special emphasis was placed on Hydraenidae, Hydrochidae and Elmidae.

Faunistic data on the Hydraenidae of Andalucía known so far were summarized by SAINZ-CANTERO & al. (1997); additional information is available from GALLARDO & al. (1997). A very detailed synopsis of the distribution of the Elmidae of the Iberian Peninsula (including dot maps with province boundaries) was published by RICO (1997). Knowledge of the Iberian Hydrochidae is, however, still very scanty; a taxonomic revision is in preparation by A. Gayoso.

Description of sampling stations

Between October 19th and 23rd 18 field stations were sampled by J.A. Díaz, A. Gayoso, E. Jäch and M.A. Jäch.

The specimens collected are deposited in the Natural History Museum (Vienna), coll. Díaz (Lugo) and coll. Gayoso (Santiago de Compostela).

Sampling stations 1 - 5 and 18 are situated in the province of Málaga, the remaining sampling stations (6 - 17) are in Cádiz.

Stn. 1) Río Real, ca. 4 m wide, shaded, crystalline substratum, ca. 50 m a.s.l., ca. 7 km NNE Marbella, Sierra de las Nieves, S Ojén; 36°32'30"N/4°50'42"W, MGRS (Military Grid Reference System): 30SUF3483445679, UTM: 30S/334834/4045679; Fig. 1.

Stn. 2) Río Guadaiza, stream, ca. 2 - 3 m wide, in ca. 40 m wide gravelly river bed, few m a.s.l., near San Pedro de Alcántara, ca. 8 km SW Marbella; 36°29'15"N/4°58'27"W, 30SUF2313639910, 30S/323136/4039910; Fig. 2.

Stn. 3) Small stream (spring), ca. 450 m a.s.l., crystalline substratum, not shaded, at Los Almajeles, road San Pedro de Alcántara - Ronda, ca. 12 km NW San Pedro de Alcántara; coordinates not recorded.

Stn. 4) Río Genal, ca. 5 - 10 m wide, flowing through oak forest, ca. 450 m a.s.l., N Pujerra, ca. 20 road km SE Ronda; 36°37'15"N/5°09'10"W, 30SUF0746255059, 30S/307462/4055059.

Stn. 5) Stream, partly dried out, hardly flowing, with residual pools, ca. 2 - 3 m wide, partly shaded by oak forest, ca. 500 m a.s.l., Ronda-Algodonales road, ca. 12 km NW Ronda; 36°46'31"N/5°13'39"W, 30SUF0119772326, 30S/301197/4072326.

Stn. 6) Río Bocaleones, ca. 5 m wide, partly shaded, ca. 300 m a.s.l., ca. 2 km WNW Zahara de la Sierra; 36°50'46"N/5°24'25"W, 30STF8537280588, 30S/285372/4080588.

Stn. 6a) Same river, few km upstream of stn. 6), WSW of Zahara de la Sierra, water more clear, stream densely shaded, water temperature remarkably variable, at exit of Garganta Verde [= Green Throat]; 36°49'56"N/5°24'18"W, 30STF8550079044, 30S/285500/4079044; Fig. 3.

Stn. 7) Spring, springfed pools, [source of río Guadalete], ca. 900 m a.s.l., unshaded, ca. 3 km W Grazalema, 34 km W Ronda; 36°45'46"N/5°22'46"W, 30STF8760371271, 30S/287603/4071271.

Stn. 8) Arroyo del Descansadero, stream, ca. 1 m wide, partly densely shaded by *Nerium oleander*, 550 m a.s.l., ca. 7 km E El Bosque, 1 km S Benamahoma, on El Bosque-Grazalema road; 36°45'29"N/5°27'41"W, 30STF8025370936, 30S/280253/4070936.

Stn. 9) Small stream, 0.5 m wide, hardly flowing, ca. 600 m a.s.l., sandstone, densely shaded by *Quercus suber*, ca. 14 km SW Ubrique; 36°36'44"N/5°29'46"W, 30STF7674854846, 30S/276748/4054846.

Stn. 10) Stream [source of arroyo del Caballo], ca. 2 m wide, cascades and pools, shaded by *Alnus*, ca. 300 m a.s.l., ca. 14 km NE Alcalá de los Gazules; 36°32'47"N/5°38'04"W, 30STF6415447871, 30S/264154/4047871; Fig. 4.

Stn. 11) Río Barbate, large pools, hardly flowing, unshaded, bed ca. 10 m wide, ca. 100 m a.s.l., ca. 6 km NE Alcalá de los Gazules; 36°29'53"N/5°41'29"W, 30STF5891542629, 30S/258915/4042629; Fig. 6.

Stn. 12) Río de las Cañas, almost dried out, hardly flowing, residual pools, bed ca. 20 m wide, ca. 100 m a.s.l., 21 km NW Los Barrios; 36°17'57"N/5°35'31"W, 30STF6723420344, 30S/267234/4020344; Fig. 5.

Stn. 13) Small stream [tributary of arroyo del Tiradero], ca. 1 m wide, slowly flowing, partly shaded by trees (oak) and bushes, ca. 100 m a.s.l., ca. 13 km W Los Barrios; 36°10'47"N/5°34'33"W, 30STF6832707037, 30S/268327/4007037; Fig. 7.

Stn. 14) Arroyo del Tiradero [type locality of *Hydraena allomorpha*], 5 - 10 m wide, with cascades, big boulders, shaded by *Alnus*, ca. 100 m a.s.l., ca. 15 km W Los Barrios; 36°09'34"N/5°34'37"W, 30STF6818004802, 30S/268180/4004802; Fig. 9.

Stn. 15) Estuary of río de la Jara, brackish, 5 - 10 m wide, W Tarifa; 36°04'44"N/5°41'24"W, 30STE5773796138, 30S/257737/3996138; Fig. 8.

Stn. 16) Río Guadalmejí, ca. 3 m wide, densely shaded by *Alnus*, rocks and gravel, ca. 250 m a.s.l., in gorge under bridge at El Bujeo, ca. 10 km SW Algeciras; 36°04'16"N/5°31'45"W, 30STE7220694864, 30S/272206/3994864; Fig. 11.

Stn. 17) Río Hozgarganta [tributary of río Guadiaro], potamal, very slowly flowing, very little gravel along shores, ca. 3 - 10 m wide, shores with eucalypt trees, ca. 50 m a.s.l., ca. 7 km SSE Jimena de la Frontera; 36°23'04"N/5°25'50"W, 30STF8197829419, 30S/281978/4029419.

Stn. 18) Large carstic spring, arroyo de la Cueva del Gato, effluent from Cueva del Gato [= Cat's Cave], ca. 700 m a.s.l., río Guadiaro Valley, near Benaoján, ca. 10 km SW Ronda; 36°43'23"N/5°13'57"W, 30SUF0059966558, 30S/300599/4066558; Fig. 10.

Results

Gyrinidae, although represented in huge swarms in many of the sampling stations, were not thoroughly sampled.

At least one new species of Hydraenidae, *Ochthebius diazi*, was discovered during our excursion. It is described in a separate article herein (see JÄCH 1999: 90).

Seven species of *Hydrochus* were collected during the excursion: three of these can be readily identified, one species, *H. tariqi*, is new to science (described in this volume, see RIBERA & al. 1999: 99), and three species cannot be identified without a thorough revision of the Iberian *Hydrochus*. The three unidentified species are not included in the following lists.

List of species sampled

Species	Stations
HYDROSCAPHIDAE	
<i>Hydroscapha granulum</i> MOTSCHULSKY	
	2, 12
HALIPLIDAE	
<i>Haliplus lineatocollis</i> (MARSHAM)	1, 4, 5, 6, 7, 8
<i>Peltodytes rotundatus</i> (AUBÉ)	14
DYTISCIDAE	
<i>Agabus biguttatus</i> (OLIVIER)	8, 10
<i>A. bipustulatus</i> (L.)	5, 9, 13
<i>A. brunneus</i> (F.)	5, 9, 12, 13, 14
<i>A. didymus</i> (OLIVIER)	5, 10, 13, 14
<i>A. heydeni</i> WEHNCKE	9

<i>A. hozgargantae</i> BURMEISTER	9
<i>Bidessus coxalis</i> SHARP	11
<i>B. minutissimus</i> (GERMAR)	1, 2, 4, 6, 11
<i>Deronectes fairmairei</i> (LEPRIEUR)	6
<i>D. hispanicus</i> (ROSENHAUER)	1, 3, 5, 6, 10, 13, 16
<i>D. moestus inconspectus</i> (LEPRIEUR)	5, 10
<i>Graptodytes aequalis</i> (ZIMMERMANN)	12, 17
<i>G. flavipes</i> (OLIVIER)	11
<i>G. ignotus</i> (MULSANT & REY)	1, 3, 4, 5, 6, 7, 10, 12, 13, 14, 17
<i>G. varius</i> (AUBÉ)	5, 6, 6a, 8, 10, 13, 14, 16, 17
<i>Hydroglyphus pusillus</i> (F.)	12
<i>Hydroporus basinotatus</i> REICHE	4, 6, 6a, 8, 10, 13, 14, 16
<i>H. discretus</i> FAIRMAIRE & BRISOUT	6, 6a, 8, 9, 10, 13, 16
<i>H. lucasi</i> REICHE	5, 10, 13, 16
<i>H. obsoletus</i> AUBÉ	6a, 7, 9, 10, 16
<i>H. tessellatus</i> DRAPIEZ	6a, 10
<i>Laccophilus hyalinus</i> (DE GEER)	1, 6, 16
<i>L. minutus</i> (L.)	13
<i>Meladema coriacea</i> CASTELNAU [= LAPORTE]	5
<i>Nebrioporus clarkii</i> (WOLLASTON)	1, 4, 6
<i>Rhantus suturalis</i> (MACLEAY)	12
<i>Stictonectes epipleuricus</i> (SEIDLITZ)	5, 16
<i>S. lepidus</i> (OLIVIER)	13
<i>S. optatus</i> (SEIDLITZ)	3, 5, 6a, 7, 8, 10, 13, 16
<i>Stictotarsus duodecimpustulatus</i> (F.)	5
<i>Yola bicarinata</i> (L.)	5
GYRINIDAE	
<i>Aulonogyrus striatus</i> FABRICIUS	1
<i>Gyrinus dejeani</i> BRULLÉ	1, 5, 8, 10, 13, 16
<i>G. urinator</i> ILLIGER	1
<i>Oretochilus villosus</i> MÜLLER	4, 8
HYDRAENIDAE	
<i>Aulacochthebius exaratus</i> MULSANT	5, 11, 15, 17
<i>Hydraena alcantarana</i> IENISTEA	1, 3
<i>Hydraena allomorpha</i> LAGAR & FRESNEDA	8, 10, 13, 14, 16, 18
<i>Hydraena andalusa</i> LAGAR & FRESNEDA	5, 6, 8, 10, 13, 14, 16
<i>Hydraena bisulcata</i> REY	1, 4, 5, 6, 6a, 7, 8, 10, 11, 12, 13, 14, 16, 17, 18
<i>Hydraena bolivari</i> d'ORCHYMONT	6a, 8
<i>Hydraena capta</i> d'ORCHYMONT	1, 4, 5, 6, 6a, 7, 8, 9, 10, 13, 14, 16, 18
<i>Hydraena claryi</i> JÄCH	4, 5, 6, 6a, 8, 18
<i>Hydraena cordata</i> SCHAUFUSS	5, 6, 6a, 8, 10, 11, 13, 14, 16, 17
<i>Hydraena exasperata</i> d'ORCHYMONT	4, 13, 14, 16

<i>Hydraena gaditana</i> LAGAR & FRESNEDA	4, 6, 7, 8
<i>Hydraena hernandoi</i> FRESNEDA & LAGAR	1, 4, 5, 6, 8, 9, 10, 11, 13, 14, 16, 17, 18
<i>Hydraena servilia</i> d'ORCHYMONT	1, 6, 14, 16, 18
<i>Limnebius bacchus</i> BALFOUR-BROWNE	1, 14, 16
<i>Limnebius cordobanus</i> d'ORCHYMONT	1, 5, 6, 12, 14
<i>Limnebius evanescens</i> KIESENWETTER	2, 11, 17, 18
<i>Limnebius fretalis</i> PEYERIMHOFF	5, 6, 6a, 8, 9, 10, 13, 14, 16, 18
<i>Limnebius gerhardtii</i> HEYDEN	1
<i>Limnebius hispanicus</i> d'ORCHYMONT	5
<i>Limnebius ignarus</i> BALFOUR-BROWNE	1, 8
<i>Limnebius maurus</i> BALFOUR-BROWNE	5, 6, 6a, 7, 8, 11, 12, 13, 14, 17, 18
<i>Ochthebius aeneus</i> STEPHENS	17
<i>Ochthebius bonnairei</i> GUILLEBEAU	5, 6, 6a
<i>Ochthebius diazi</i> JÄCH	14
<i>Ochthebius difficilis</i> MULSANT	2, 11
<i>Ochthebius dilatatus</i> STEPHENS	5, 6, 6a, 7, 8, 10, 11, 12, 13, 14, 17
<i>Ochthebius exsculptus</i> GERMAR	4
<i>Ochthebius mediterraneus</i> IENISTEA	2
<i>Ochthebius merinidicus</i> FERRO	6
<i>Ochthebius poweri</i> RYE	5, 14
<i>Ochthebius quadrifoveolatus</i> WOLLASTON	2, 4, 6
<i>Ochthebius semisericeus</i> SAINTE-CLAIRES DEVILLE complex sp. 1	3
<i>Ochthebius semisericeus</i> complex sp. 2	6
<i>Ochthebius viridis</i> PEYRON complex (sp. 2 sensu JÄCH 1992)	6, 11, 12, 15

HYDROCHIDAE

<i>Hydrochus angustatus</i> GERMAR	5
<i>H. grandicollis</i> KIESENWETTER	14, 18
<i>H. nooreinus</i> BERGE HENEGOUWEN & SAINZ-CANTERO	5
<i>H. tariqi</i> RIBERA, HERNANDO & AGUILERA	13, 16

ELMIDAE

<i>Elmis maugetii</i> LATREILLE	1, 4
<i>Elmis rioloides</i> (KUWERT)	6, 6a, 8, 13, 14, 16
<i>Limnius intermedius</i> FAIRMAIRE	4
<i>Limnius opacus</i> MÜLLER	1, 4, 6, 6a, 8, 10, 13, 14, 16
<i>Limnius volckmari</i> (PANZER)	6
<i>Normandia nitens</i> (MÜLLER)	6, 8
<i>Oulimnius major</i> (REY)	14, 18
<i>Oulimnius rivularis</i> (ROSENHAUER)	7, 11, 12
<i>Oulimnius troglodytes</i> (GYLLENHÅL)	1, 4, 10, 13
<i>Riolus illiesi</i> STEFFAN	6, 8
<i>Stenelmis canaliculata</i> (GYLLENHÅL)	1, 10, 16

DRYOPIDAE

<i>Dryops algiricus</i> (LUCAS)	7
<i>Dryops gracilis</i> (KARSCH)	1, 5, 6, 7, 8, 11, 12, 13, 14, 16
<i>Dryops luridus</i> (ERICHSON)	4
<i>Dryops sulcipennis</i> (COSTA)	1, 4, 7, 18
<i>Pomatinus substriatus</i> (MÜLLER)	13, 14

List of stations and species sampled

Stn. 1: Haliplidae: *Haliplus lineatocollis*; Dytiscidae: *Bidessus minutissimus*, *Deronectes hispanicus*, *Graptodytes ignotus*, *Laccophilus hyalinus*, *Nebrioporus clarkii*; Gyrinidae: *Aulonogyrus striatus*, *Gyrinus dejeani*, *G. urinator*; Hydraenidae: *Hydraena alcantarana*, *H. bisulcata*, *H. capta*, *H. hernandoi*, *H. servilia*, *Limnebius bacchus*, *L. cordobanus*, *L. gerhardtii*, *L. ignarus*; Dryopidae: *D. gracilis*, *D. sulcipennis*; Elmidae: *Elmis maugetii*, *Limnius opacus*, *Stenelmis canaliculata*, *Oulimnius troglodytes*.

Stn. 2: Hydroscaphidae: *Hydroscapha granulum*; Dytiscidae: *Bidessus minutissimus*; Hydraenidae: *Limnebius evanescens*, *Ochthebius difficilis*, *O. mediterraneus*, *O. quadrifoveolatus*; Dryopidae: *Dryops* sp. ♀.

Stn. 3: Dytiscidae: *Deronectes hispanicus*, *Graptodytes ignotus*, *Stictonectes optatus*; Hydraenidae: *Hydraena alcantarana*, *Ochthebius semisericeus* complex sp. 1; Dryopidae: *Dryops* sp. ♀.

Stn. 4: Haliplidae: *Haliplus lineatocollis*; Dytiscidae: *Bidessus minutissimus*, *Graptodytes ignotus*, *Hydroporus basinotatus*, *Nebrioporus clarkii*; Gyrinidae: *Oretochilus villosus*; Hydraenidae: *Hydraena bisulcata*, *H. capta*, *H. claryi*, *H. exasperata*, *H. gaditana*, *H. hernandoi*, *Ochthebius excultus*, *O. quadrifoveolatus*; Dryopidae: *Dryops luridus*, *D. sulcipennis*; Elmidae: *Elmis maugetii*, *Limnius opacus*, *L. intermedius*, *Oulimnius troglodytes*.

Stn. 5: Haliplidae: *Haliplus lineatocollis*; Dytiscidae: *Agabus brunneus*, *A. bipustulatus*, *A. didymus*, *Deronectes hispanicus*, *D. moestus inconspectus*, *Graptodytes ignotus*, *G. varius*, *Hydroporus lucasi*, *Meladema coriacea*, *Stictonectes epipleuricus*, *S. optatus*, *Stictotarsus duodecimpustulatus*, *Yola bicarinata*; Gyrinidae: *Gyrinus dejeani*; Hydraenidae: *Aulacochthebius exaratus*, *Hydraena andalusa*, *H. bisulcata*, *H. capta*, *H. claryi*, *H. cordata*, *H. hernandoi*, *Limnebius cordobanus*, *L. fretalis*, *L. hispanicus*, *L. maurus*, *Ochthebius bonnairei*, *O. dilatatus*, *O. poweri*; Hydrochidae: *Hydrochus angustatus*, *H. nooreinus*; Dryopidae: *Dryops gracilis*.

Stn. 6: Haliplidae: *Haliplus lineatocollis*; Dytiscidae: *Bidessus minutissimus*, *Deronectes fairmairei*, *D. hispanicus*, *Graptodytes ignotus*, *G. varius*, *Hydroporus basinotatus*, *H. discretus*, *Laccophilus hyalinus*, *Nebrioporus clarkii*; Hydraenidae: *Hydraena andalusa*, *H. bisulcata*, *H. capta*, *H. claryi*, *H. cordata*, *H. gaditana*, *H. hernandoi*, *H. servilia*, *Limnebius cordobanus*, *L. fretalis*, *L. maurus*, *Ochthebius bonnairei*, *O. dilatatus*, *O. merinidicus*, *O. quadrifoveolatus*, *O. semisericeus* complex sp. 2, *O. viridis* complex; Dryopidae: *Dryops gracilis*; Elmidae: *Elmis riolooides*, *Limnius opacus*, *L. volckmari*, *Normandia nitens*, *Riolus illiesi*.

Stn. 6a: Dytiscidae: *Graptodytes varius*, *Hydroporus basinotatus*, *H. discretus*, *H. obsoletus*, *H. tessellatus*, *Stictonectes optatus*; Hydraenidae: *Hydraena bisulcata*, *H. bolivari*, *H. capta*, *H. claryi*, *H. cordata*, *Limnebius fretalis*, *L. maurus*, *Ochthebius bonnairei*, *O. dilatatus*; Elmidae: *Elmis riolooides*, *Limnius opacus*.

Stn. 7: Haliplidae: *Haliplus lineatocollis*; Dytiscidae: *Graptodytes ignotus*, *Hydroporus obsoletus*, *Stictonectes optatus*; Hydraenidae: *Hydraena bisulcata*, *H. capta*, *H. gaditana*, *Limnebius maurus*, *Ochthebius dilatatus*; Dryopidae: *Dryops algiricus*, *D. gracilis*, *D. sulcipennis*; Elmidae: *Oulimnius rivularis*.

Stn. 8: Haliplidae: *Haliplus lineatocollis*; Dytiscidae: *Agabus biguttatus*, *Graptodytes varius*, *Hydroporus basinotatus*, *H. discretus*, *Stictonectes optatus*; Gyrinidae: *Gyrinus dejani*, *Orectochilus villosus*; Hydraenidae: *Hydraena allomorpha*, *H. andalusa*, *H. bisulcata*, *H. bolivari*, *H. capta*, *H. claryi*, *H. cordata*, *H. gaditana*, *H. hernandoi*, *Limnebius freatalis*, *L. ignarus*, *L. maurus*, *Ochthebius dilatatus*; Dryopidae: *Dryops gracilis*; Elmidae: *Elmis rioloides*, *Limnius opacus*, *Normandia nitens*, *Riolus illiesi*.

Stn. 9: Dytiscidae: *Agabus bipustulatus*, *A. brunneus*, *A. heydeni*, *A. hozgargantae*, *Hydroporus obsoletus*, *H. discretus*; Hydraenidae: *Hydraena capta*, *H. hernandoi*, *Limnebius freatalis*.

Stn. 10: Dytiscidae: *Agabus biguttatus*, *A. didymus*, *Deronectes hispanicus*, *D. moestus inconspectus*, *Graptodytes ignotus*, *G. varius*, *Hydroporus basinotatus*, *H. discretus*, *H. lucasi*, *H. obsoletus*, *H. tessellatus*, *Stictonectes optatus*; Gyrinidae: *Gyrinus dejani*; Hydraenidae: *Hydraena allomorpha*, *H. andalusa*, *H. bisulcata*, *H. capta*, *H. cordata*, *H. hernandoi*, *Limnebius freatalis*, *Ochthebius dilatatus*; Elmidae: *Elmis rioloides*, *Limnius opacus*, *Oulimnius troglodytes*, *Stenelmis canaliculata*.

Stn. 11: Dytiscidae: *Bidessus coxalis*, *B. minutissimus*, *Graptodytes flavipes*; Hydraenidae: *Hydraena bisulcata*, *H. cordata*, *H. hernandoi*, *Aulacochthebius exaratus*, *Limnebius evanescens*, *L. maurus*, *Ochthebius difficilis*, *O. dilatatus*, *O. viridis complex*; Dryopidae: *Dryops gracilis*; Elmidae: *Oulimnius rivularis*.

Stn. 12: Hydroscaphidae: *Hydroscapha granulum*; Dytiscidae: *Agabus brunneus*, *Graptodytes aequalis*, *G. ignotus*, *Hydroglyphus pusillus*, *Rhantus suturalis*; Hydraenidae: *Hydraena bisulcata*, *Limnebius cordobanus*, *L. maurus*, *Ochthebius dilatatus*, *O. viridis complex*; Dryopidae: *Dryops gracilis*; Elmidae: *Oulimnius rivularis*.

Stn. 13: Dytiscidae: *Agabus bipustulatus*, *A. brunneus*, *A. didymus*, *Deronectes hispanicus*, *Graptodytes ignotus*, *G. varius*, *Hydroporus basinotatus*, *H. discretus*, *H. lucasi*, *Laccophilus minutus*, *Stictonectes lepidus*, *S. optatus*; Gyrinidae: *Gyrinus dejani*; Hydraenidae: *Hydraena allomorpha*, *H. andalusa*, *H. bisulcata*, *H. capta*, *H. cordata*, *H. exasperata*, *H. hernandoi*, *Limnebius freatalis*, *L. maurus*, *Ochthebius dilatatus*; Hydrochidae: *Hydrochus tariqi*; Dryopidae: *Dryops gracilis*, *Pomatinus substriatus*; Elmidae: *Elmis rioloides*, *Limnius opacus*, *Oulimnius troglodytes*.

Stn. 14: Haliplidae: *Peltodytes rotundatus*; Dytiscidae: *Agabus brunneus*, *A. didymus*, *Graptodytes ignotus*, *G. varius*, *Hydroporus basinotatus*; Hydraenidae: *Hydraena allomorpha*, *H. andalusa*, *H. bisulcata*, *H. capta*, *H. cordata*, *H. exasperata*, *H. hernandoi*, *H. servilia*, *Limnebius bacchus*, *L. cordobanus*, *L. freatalis*, *L. maurus*, *Ochthebius diazi*, *O. dilatatus*, *O. poweri*; Hydrochidae: *Hydrochus grandicollis*; Dryopidae: *Dryops gracilis*, *Pomatinus substriatus*; Elmidae: *Elmis rioloides*, *Limnius opacus*, *Oulimnius major*.

Stn. 15: Hydraenidae: *Aulacochthebius exaratus*, *Ochthebius viridis complex*.

Stn. 16: Dytiscidae: *Deronectes hispanicus*, *Graptodytes varius*, *Hydroporus basinotatus*, *H. discretus*, *H. lucasi*, *H. obsoletus*, *Laccophilus hyalinus*, *Stictonectes epipleuricus*, *S. optatus*; Hydraenidae: *Hydraena allomorpha*, *H. andalusa*, *H. bisulcata*, *H. capta*, *H. cordata*, *H. exasperata*, *H. hernandoi*, *H. servilia*, *Limnebius bacchus*, *L. freatalis*; Hydrochidae: *Hydrochus tariqi*; Dryopidae: *Dryops gracilis*; Elmidae: *Elmis rioloides*, *Limnius opacus*, *Stenelmis canaliculata*.

Stn. 17: Dytiscidae: *Graptodytes aequalis*, *G. ignotus*, *G. varius*; Hydraenidae: *Aulacochthebius exaratus*, *Hydraena bisulcata*, *H. cordata*, *H. hernandoi*, *Limnebius evanescens*, *L. maurus*, *Ochthebius aeneus*, *O. dilatatus*; Dryopidae: *Dryops sp. ♀*.

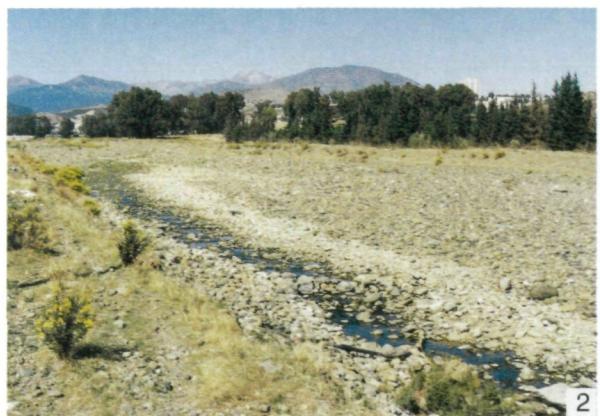
Stn. 18: Hydraenidae: *Hydraena allomorpha*, *H. bisulcata*, *H. capta*, *H. claryi*, *H. hernandoi*, *H. servilia*, *Limnebius evanescens*, *L. freatalis*, *L. maurus*; Hydrochidae: *Hydrochus grandicollis*; Dryopidae: *Dryops sulcipennis*; Elmidae: *Oulimnius major*.



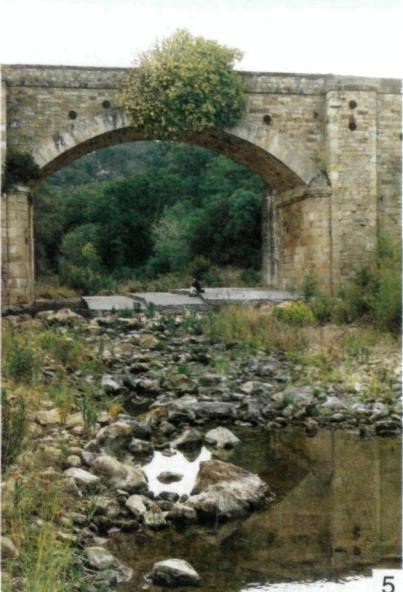
1



4



2



5



3

Figs. 1 - 5: Sampling stations, 1) stn. 1, Alberto "Chico" Gayoso, 2) stn. 2, 3) stn. 6a, Juan Angel Díaz, 4) stn. 10, 5) stn. 12. All photographs by M.A. Jäch.



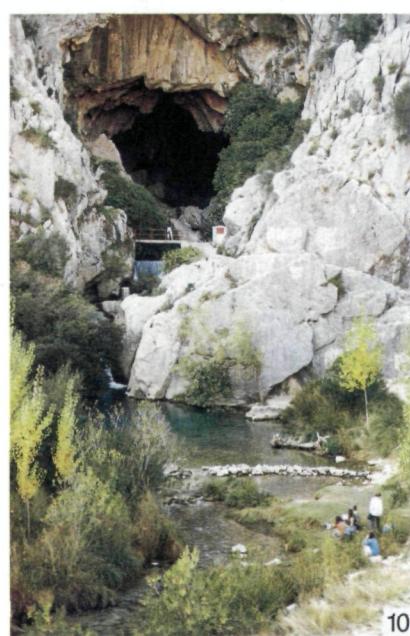
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7



10



8

Figs. 6 - 10: Sampling stations, 6) stn. 11, 7) stn. 13, type locality of *Hydrochus tariqi*, 8) stn. 15, 9) stn. 14, type locality of *Ochthebius diazi*, 10) stn. 18. All photographs by M.A. Jäch.



Fig. 11: Sampling station 16; pale patch at center of photograph indicates quantitative sampling area; arrow indicates sampling net with which quantitative sample was taken; a small swarm of Gyrinidae is visible near upper right corner of photograph. Photograph by M.A. Jäch.

New provincial records for Hydraenidae and Elmidae

Cádiz: *Hydraena servilia*, *Limnebius bacchus*, *L. cordobanus*, *L. evanescens*, *Ochthebius aeneus*, *O. difficilis*, *O. merinidicus*, *O. poweri*, *O. quadrifoveolatus*, *O. viridis* complex (sp. 2); *Normandia nitens*, *Oulimnius major*.

Málaga: *Aulacochthebius exaratus*, *Hydraena allomorpha*, *H. gaditana*, *H. servilia*, *Ochthebius exsculptus*, *O. mediterraneus*, *O. poweri*, *O. viridis* complex (sp. 2); *Oulimnius major*.

Discussion

Hydraena servilia was hitherto considered a very rare species. It had not been collected in Cádiz or Málaga before. However, we found it to be quite common in these two provinces. The reason for its previous "scarcity" is probably the fact that *H. servilia* prefers clean water and certain kinds of microhabitats which are often neglected by entomologists: submerged rootlets along river margins and moss on partly submerged stones in moderately swift current.

As for the list of Andalusian Hydraenidae published by SAINZ-CANTERO et al. (1997) the following species should be removed: *Hydraena africana* KUWERT (see JÄCH et al. 1998), *Limnebius nitidus* (MARSHAM) (probably confused with *L. gerhardti* and *L. maurus* by former authors), and *Ochthebius pedicularius* KUWERT (probably confused with *O. mediterraneus* by

former authors). *Hydraena unca* VALLADARES was recorded from Málaga (paratypes); since this record has never been confirmed we have examined these questionable paratypes, deposited in the Natural History Museum, London; they are in fact *H. cordata*.

Hydraenidae (especially *Hydraena*) were found in great numbers in some of the stations sampled. Particularly rich was stn. 16, where the first author carried out a semi-quantitative sample with remarkable results: A square of ca. 20 x 20 cm of benthic gravel was selected; the gravel was stirred by hand for about 15 seconds, and the drift resulting from the disturbance was collected with a hand net (see Fig. 11); the sample yielded a total of 397 (!) adults of *Hydraena* spp.: *Hydraena allomorpha* (128), *H. andalusa* (62), *H. bisulcata* (123), *H. capta* (61), *H. cordata* (22), *H. exasperata* (1); besides *Hydraena*, only few other water beetles were collected in the course of this semiquantitative sample: *Limnius opacus* (10 adults, 5 larvae), *Elmis rioloides* (6 adults, 1 larva), *Hydroporus basinotatus* (2 adults).

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