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LATISSIMUS

NEWSLETTER OF THE BALFOUR-BROWNE CLUB

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Cover photograph*: Eupotemus tuberculatus* Bilton & Bird, 2023, taken in the North West Province of South Africa in February 2023, and published as new 194 days later. See page 20. Do you remember a time when it was suggested that insect biodiversity was so huge as that it was impossible to get them all described? Does that still hold true?

Photograph: David Bilton

ADDRESSES Contacts for articles and reviewed works are given at the end of this issue of ***Latissimus***. The address for other correspondence is: Garth Foster, 3 Eglinton Terrace, Ayr KA7 1JJ, Scotland, UK – latissimus@btinternet.com

A PADDLING POOL, AN AQUARIUM, AND THREE BIPPOS

Anders Nilsson

Let there be beetles in my paddling pool

It all started on 20 May 2023 when I filled up an inflatable 1.3 m diameter paddling pool with a light blue bottom out on our lawn (Fig. 1). The pool served only as a substitute for the coastal rock pools I had planned to study living diving beetles in this summer. I did find it handy to make my studies in a close-by pool and expected the beetles to arrive by themselves. I did note from the start that lots of terrestrial insects were attracted to the water surface and did save quite a few bumblebees from drowning. I also added a few floating devices for them to climb. However, dead insects would also serve as a food source for the diving beetles I expected to show up. Seems I was a bit late for the water beetle spring migration, however, and the arrivals were few.

After only one day an *Helophorus flavipes* Fab. was the first beetle to be seen in the pool, and on 14 June a couple of *Hydroporus nigrita* (Fab.) were seen swimming. By now I had added a clump of *Sphagnum* moss to serve as a shelter for the beetles, and observed some algal growth on the bottom and in the water. Moreover, larvae of chironomids and culicids could be seen together with some fly larvae preferring the surface. On 14 July a single *Agabus bipustulatus* (L.) specimen was observed and named Bippo. Later in summer, birch seeds and other debris more or less covered the bottom, and it seemed like the clean paddling pool had started to develop into a normal beetle pool full of muck.

Local trash fauna

It was not until early September my urge to study living dytiscid beetles resulted in some real action. I then placed an aquarium on a table close to the pool and started to make observations on my friend Bippo. But before reporting on these observations, I will tell you about the water beetles that were collected from the paddling pool, when emptying it on 8 September. My friend Bippo turned out to be The Three Bippos, two females and one male. Obviously at least one of the females had laid some eggs as *bipustulatus* larvae were abundant. Twelve second and four first instar larvae were identified. The only other diving beetles were ten *Hydroporus nigrita* and three *H. incognitus* Sharp. Three other families were represented by one species each: *Limnebius truncatellus* (Thunberg) 10, *Helophorus flavipes* 4, and *Anacaena limbata* (Fab.) 3 specimens. Also two *Sigara* females were found.

Arrivals and visitors

As the insects were free to colonise, and also to leave, the faunal build-up is not to be viewed as a pure accumulation of specimens. In fact, some seemingly more transient visitors had been observed during the summer: one *Hydrobius subrotundus* Stephens on 7 July, and one *Helophorus brevipalpis* Bedel on 19 July. Moreover, an *Agabus congener* (Thunberg) specimen from a close-by water-filled bucket was transferred to the pool some day in July. At one occasion *Hydroporus* larvae were observed at the pool bottom, most likely belonging to *nigrita*, and I'm not sure if they managed to leave the pool for pupation or just disappeared. Anyway, it seems clear that all species found in the pool belong to a migrant fauna often encountered in ditches along forest roads and similar disturbed habitats. Most of them have also been observed landing on cars and other shiny objects, especially in late spring or early summer. Even if the species composition was trivial, it would still be of some interest to compare it with similar observations from other parts of Europe.

Pool storage and aquarium observations

Before emptying the paddling pool, it served as a home for the three Bippos, providing specimens for some activity studies carried out in an outdoor aquarium 3-7 September. Weather was sunny or partly cloudy during the period. The aquarium was 45 cm long, 22 cm wide and 25 cm high (Fig. 2). The bottom was covered by washed gravel and in one end a plastic construction originally used for holding felt tip colouring pens was filled and covered with *Sphagnum* moss, serving as shelter for the beetle under study. The construction was 18 cm long, 11 cm wide and 10 cm high. Water level was kept level with the top of the construction.

Figure 1 Paddling pool used, photographed on 11 August 2023. Some *Sphagnum* moss on the right and birch seeds make up much of the bottom debris

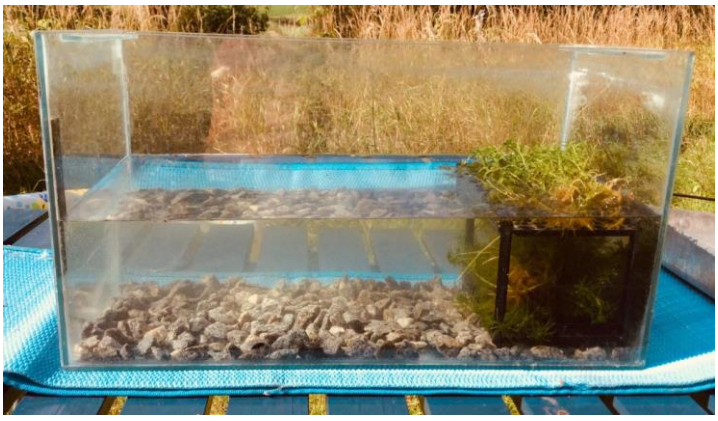

Figure 2 The aquarium I used for the Bippo watching. Moss shelter in plastic construction to the right. The thermometer was placed in the left corner

Observation set-up

Water temperature was measured at the start of each five minute observation period. Each set of four observations was carried out within an hour, and taking place in morning (7-9), midday (11-14) or evening (18.45-20.30). Altogether three 4 x 5-minute repeat sets of observations were made for each time of day. Before each observation set one Bippo was netted in the pool and transferred to the aquarium for half an hour to get acclimatised before recording started. Beetle activity was recorded using a stop watch and a dictaphone. Each movement of the beetle between the moss shelter and the exposed area of the aquarium was timed to the nearest second. Also visits to the water surface for gas exchange were recorded. The beetle was returned to the pool when each set of observations was completed.

No early birds

Water temperature ranged 3-10 °C in mornings, 10-22 at noon, and 11-18 in evenings (Fig. 3). Median values were lowest in the mornings and highest at noon. Beetle activity estimated as the number of movements between the exposed and sheltered parts of the aquarium during five minute periods was highest at noon and lowest in the mornings (Fig. 4). During the morning observations the beetle stayed in the shelter in eight out of twelve repeat sets of observations, whereas this happened in only five of the evening observations and in none of those made at midday. Activity estimated as time spent in the exposed part show a similar pattern (Fig. 5). The somewhat higher median value observed in evening than in noon observations is largely due to the fact that the evenings had one more value higher than 130

seconds than the noon observations. It is notable that in the evenings all zero values occurred in the first half of the hour of observations, suggesting an activity increase with the fading light. No surface visit was observed in the mornings, and the maximum numbers of visits was three and four in the evenings and noon observations, respectively (Fig. 6). Just ask for a file if you want to see the raw data.

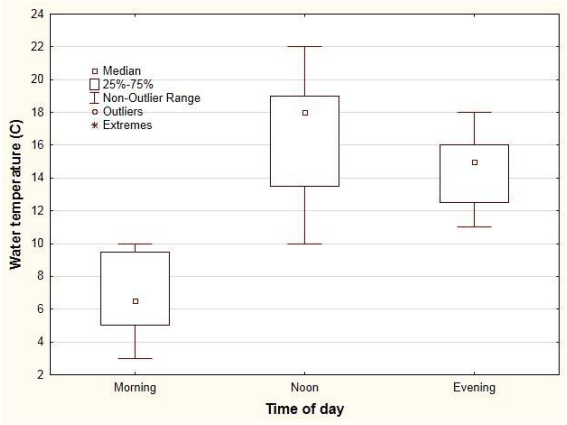

Figure 3 Box plot of water temperature as measured at the bottom at the start of each 5-minute repeat. Each day period is represented by 12 values

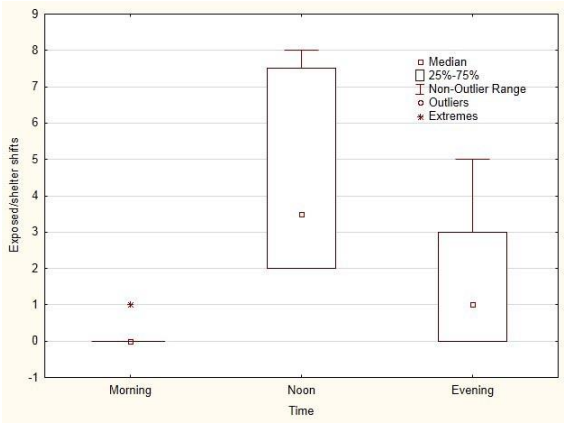

Figure 4 Box plot of number of movements between the exposed and sheltered parts of the aquarium in five minute periods. Each day period is represented by 12 values

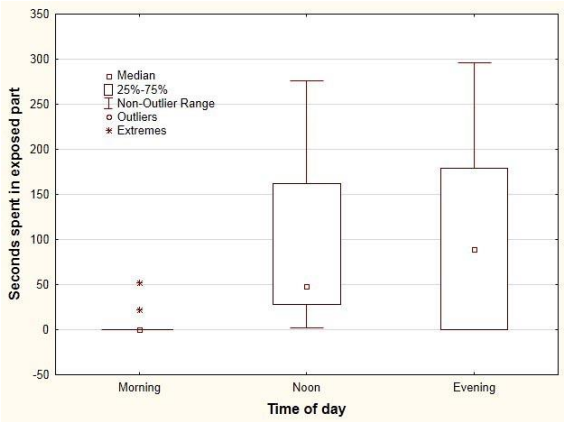

Figure 5 Box plot of time spent in the exposed part of the aquarium during five minutes. Time given as number of seconds, out of a total of 300. Each day period is represented by 12 values

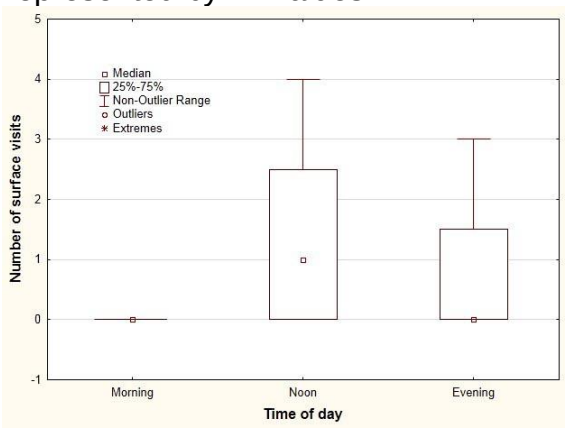

Figure 6 Box plot of number of surface visits including gas exchange during five minutes in the aquarium. Each day period is represented by 12 values

Let's work together

In my opinion, too few studies have been made on living diving beetles, and addressing individual variation in behaviour. With this limited study, my first aim is to provide inspiration to others to start studying water beetles alive as complementary to the normal netting-killing-mapping practice. The living beetle is the miracle that we should try to get to know better, and accepting that they are not all the same just because they belong to the same species. I had hoped to study only one Bippo, but as things turned out it was a gang of three, and even including both sexes. Another flaw is that I was unable to study night activity. A clear sky and moonlight maybe would have worked? Starting earlier in the season instead of waiting for dark September nights is of course an option. Separating effects of temperature variation

from those of innate circadian rhythms seems to demand a more controlled lab approach, but I really do like the outdoor semi-natural settings. And activity is of course only one of several aspects that can be studied. Some studies on living beetles have instead addressed mating or predatory behavior.

The geographical spread of the Balfour-Browne Club members is a potential benefit if we all started to do the same kind of studies in our backyards. Meeting at one place to list all of the species found during our collective effort is of course rewarding, but we could also for example run a paddling pool at home in order to compare the trash fauna over wide areas. Or establish an effective protocol for studying individual behaviour in the same species over a large part of its area of distribution. Finding ways to study the beetles alive in cheap but standardised ways without too large working efforts is aimed at, but still producing interesting results when all individual efforts are combined by some group of coordinators.

Received September 2023

SEXUAL CONFLICT IN DIVING BEETLES

In 1950 Bernhard Rensch postulated that size differences between the sexes increase with body size in taxa where males are the larger sex, but decrease with body size when females are larger. The theory goes that "coercive copulation strategies" should be more likely in species showing sexual dimorphism in size. Based on data for sixty species of Dytiscidae drawn from the literature the authors find that the sexes of diving beetles are isometric in relation to body size, i.e. Rensch's rule isn't working. This they associate with the males' ability to get improved grip either by adhesive setae or by suction pads. The Dytiscinae, with the pads, have a pronounced bias to larger females, whereas other diving beetles without pads show no bias. Having large suckers means males can control females without having to be larger. The correspondent is Rhaimer Guillermo-Ferreira.

POLIDO M, LOPEZ V M, DA SILVA G G, DEL LAMA M A & GUILLERMO-FERREIRA R 2023. A diving beetle's dilemma: the impact of sexual conflict on Rensch's rule. *Biological Journal of the Linnean Society* **XX** 1-6

MEDITERRANEAN KEYS

📖 MILLÁN A, GARCÍA-MESEGUER A J, PICAZO F, ABELLÁN P & SÁNCHEZ-FERNÁNDEZ D 2024 (*sic*). Order Coleoptera. Chapter 13, pp. 397-435 in A Maasri & J H Thorp (eds) *Identification and Ecology of Freshwater Arthropods in the Mediterranean Basin*. Amsterdam: Elsevier.

The first edition of this work is dated as published on 27 October 2023 on the Elsevier website, there accompanied by "Autumn books sale" offers that may be no longer available by the time this item is read. The authors' PDF is dated 2024 and you are encouraged to contact Andrés directly to ensure that you get a copy in which some items have been corrected. And you would be mad not to! It provides comprehensive coverage for the 14 families of beetles originally specified by Manfred Jäch as "true water beetles", taken down to genera, plus a key to larvae including the Psephenidae and Scirtidae. So here we have a key ranging from *Synchortus, Rhantaticus* and *Tassilodytes* to *Brownephilus*, as well as covering almost all the European genera. There are many new line drawings to illustrate the keys, plus a few habitat and habitus photographs, as here of *Nebrioporus ceresyi* (Aubé).

PLATAMBUS AND *COPELATUS* IMMATURE STAGES

Details are provided of the life-cycle of *Platambus ussuriensis* based on laboratory observations of material collected in Japan. Eggs, as seen here in two photographs courtesy of the author, were laid on a submerged dead leaf. Larvae are illustrated. It is noted that the second and third stage larvae have an occipital suture as in *P. koreanus* (Nilsson), whereas lack of this suture is claimed as a characteristic of Agabine larvae. Presence of the suture may be a trait of the *P. optatus* group. The larvae lack the Mask of Zorro to be seen in many other *Platambus*. The larval stage last 21 days, with development in the pupal chamber taking 23 days. Development of the *Copelatus* was 15-23 days for the larva with two individuals reared to adult and spending 39 and 42 days in the pupal chamber. The *Copelatus* larvae were observed eating chironomid larvae and tubificids whole from the day of hatching, as in other studies on *Copelatus* including the three-authored publication here. The latter compares the larval periods of five species, and shows that that of *kammuriensis* is the shortest, probably associated with its life in rainwater pools. New adults of *C. kammuriensis* could survive up to 54 days in the pupal chamber, a starvation capability useful for species subject to erratic frequency of rainfall.

WATANABE K 2022. Biological notes on immature stages of *Platambus ussuriensis* (Nilsson, 1997) and *Copelatus nakamurai* Guéorguiev, 1970 (Coleoptera: Dytiscidae). *The Coleopterists Bulletin* **76** 233-236.

WATANABE K, HAYASHI M & NAGASHIMA S 2023. Life history of *Copelatus kammuriensis* Tamu & Tsukamoto, 1955 (Coleoptera: Dytiscidae: Copelatinae) and biological implications. *Aquatic Insects* doi.10.1080/01650424.2023.2253250 pp. 13.

PALAEARCTIC *PLATEUMARIS*

The second paper concerns original descriptions. Those of *P. akiensis* Tominaga & Katsura, *P. constricticollis* Jacoby and *P. shirahatai* Kimoto were originally in English. The rest, *P amurensis* Weise, *P. bracata* (Scopoli), *P. consimilis* (Schrank), *P. roscida* Weise, *P. rustica* (Kunze), *P. sericea* (L.) and *P. weisei* (Duvivier), were described in Latin, French or German. Translations of descriptions into English are given, but not necessarily explanations of the names themselves. The correct spelling of *bracata* is as in Scopoli's original description, rather than in Weise's use of the name *braccata* in his redescription of *bracata*. But the big omission in both papers is *discolor* (Panzer), treated as a synonym of *sericea*. Elisabeth Geiser (in litt. to ed.) notes that *sericea* has an enormous distribution area and is genetically very heterogeneous, and she expects that a comprehensive genetic and micro-morphological study will reveal cryptic species, but, as she states in the first paper, "*P. discolor* may not be one of them." *P. caucasica* Zaitzev is treated as a new synonym of *sericea*: subsequent discussion between Elisabeth Geiser and Sasha Prokin raised the possibility that *P. caucasica* could be a subspecies of *sericea*.

GEISER E 2023. Revision of the Palaearctic species of the genus *Plateumaris* C.G. Thomson, 1859 (Coleoptera, Chrysomelidae, Donaciinae). *ZooKeys* **1177** 167-233.

GEISER E & GEISER R 2023. Original descriptions of Palaearctic species of the genus *Plateumaris* C.G. Thomson, 1859 (Coleoptera, Chrysomelidae, Donaciinae) and their translations. *ZooKeys* **1177** 235-258.

KOLEOPTEROLOGISCHE RUNDSCHAU 92 AND 93

Manfred Jäch has pointed out that it was only the *delivery* process that was delayed for *Kol. Rundschau* **92**. The printed version was available at the date as published. Here we have a good mix of water beetle papers in No **93**.

NEW CHINESE *HELOPHORUS*

The new species was found in a salt lake area of Qinghai by Czech entomologists in 2005. *H. sinovillosus* closely resembles *villosus* Duftschmid, found in the valleys of the Danube and Rhine.

ANGUS R B 2023. *Helophorus sinovillosus* sp. n., an unexpected discovery in Qinghai Province, China (Coleoptera: Helophoridae). *KR* **93** 199–203.

HETEROCERIDAE IN NEW CALEDONIA

A key is provided with *H. debilipes* Blackburn and *H. mastersii* MacLeay added to the fauna of New Caledonia.

JÄCH M A & SKALICKY S 2023. New records of Heteroceridae from New Caledonia (Coleoptera: Heteroceridae). *KR* **93** 321-326.

HYDRAENA KAHLENI

This endemic Italian species was described in *KR* **87**. More fieldwork has established that the species is confined to a small area of the Province of Treviso, and that some specimens were previously identified as either *H. larissae* Jäch & Díaz or *H. tarvisina* (Ferro).

KAHLEN M & JÄCH M A 2023. Zur Verbreitung von *Hydraena kahleni* Jäch M A & Díaz, 2017 samt kritischer Beurteilung von Literaturangaben verwandter *Hydraena*-Arten (Coleoptera: Hydraenidae). *KR* **93** 47-52.

AZOREAN *HELOPHORUS*

The new species is described from a male taken in a lake on São Miguel in 1978 by António Bivar de Sousa. Its aedeagus puts it somewhere between *H. rinki* Angus and *H. asturiensis* Kuwert. Furnas Lake must be one of the volcanic crater lakes but an article by Joshua Howgego in the *New Scientist* of 6 August 2022 suggests that Ludovic Ferrière may have decided that some São Miguel lakes are the result of meteorite impacts.

SHATROVSKIY A G & ANGUS R B 2023. *Helophorus bivari* sp.n. from the Azores (Coleoptera: Helophoridae). *KR* **93** 205-209.

BRAZILIAN HETEROCERIDAE

Heterocerus danielssoni Skalický, *H. steineri* Skalický, 2006 and *Tropicus alcicornis* Mascagni are recorded from the Mato Grosso. *T. borysi* Skalický, *T. tuberculatus* Pacheco and other species are also recorded.

SKALICKY S 2023. Faunistic records of Heteroceridae from the Brazilian state of Mato Grosso (Coleoptera: Heteroceridae). *KR* **93** 211–214.

LIMNEBIUS ASPERATUS REDISCOVERED

Knisch described this species as Italian on the basis of a male and a female in the collection of F.A.C. Müller. It was not covered as part of Pirisinu's 1981 key to Italian Palpicornia but Manfred Jäch designated a lectotype and illustrated the aedeagus in his 1993 treatment of *Limnebius*. This species has now been found in the River Rabbi, in Emilia-Romagna, and 40 km to the south-east in seepages near to the Presalino Waterfall. The rich beetle fauna of the areas is discussed.

TOLEDO M A & JÄCH M A 2023. *Limnebius asperatus* Knisch, 1922 – rediscovered almost a century after its original description (Coleoptera: Hydraenidae). *KR* **93** 37–45.

SAMOAN FAUNA

Fifteen species are identified with certainty on the Samoan Archipelago, plus *Hydaticus rhantatoides* Régimbart requiring confirmation and hydrophilids in *Crephelochares* and *Enochrus* needing more work. *Dineutus australis* (Fab.), *Hydrovatus fasciatus* Sharp, *Laccophilus seminiger* Fauvel, *Neohydrocoptus subfasciatus* (Sharp), are newly recorded.

WEWALKA G, SCHMAEDICK M A, TOLEDO M A, KOMAREK A, BALKE M & JÄCH M A 2023. A faunistic account of aquatic Coleoptera from the Samoan Archipelago (Pacific Ocean) (Coleoptera: Gyrinidae, Dytiscidae, Noteridae, Hydrophilidae excl. Sphaeridiinae). *KR* **93** 13–36.

NEW CALEDONIA UPDATE

The basis of this paper is a survey done in 2016-2018. Various combinations of the paper's authors are authorities for ten new species in the genera *Exocelina. Limbodessus* and *Necterosoma. Copelatus portior* Guignot, *Eretes australis* (Erichson) and *Hydroglyphus signatus* (Sharp) are newly recorded. *Laccophilus seminiger* Fauvel, previously thought likely to be extinct in New Caledonia, was rediscovered after 59 years and found to be locally common. These and other additions produce a checklist of 78 dytiscid and three noterid species.

WEWALKA G, JÄCH M A & MANUEL M 2023. An update on the diving beetles and burrowing water beetles of New Caledonia, with description of ten new species (Coleoptera: Dytiscidae, Noteridae). *KR* **93** 245-320.

ROCKPOOL *OCHTHEBIUS* AND OCEAN CURRENTS

This paper again concerns the distribution of *Ochthebius lejolisii* Mulsant & Rey and *O. quadricollis* Mulsant on the western Mediterranean coast, but it takes it to a new level. Ocean currents give a better prediction of the amount of genetic isolation and linkage in subpopulations than distance between sites alone. This indicates that rockpool species are subject to the same dispersal rules as fully marine organisms.

VILLASTRIGO A, ORENES-SALAZAR V, GARCIA-MESÉGUER A J, MIRÓN-GATÓN J M, MOURRE B, MILLÁN A & VELASCO J 2023. Oceanic currents maintain the genetic structure of non-marine coastal taxa in the western Mediterranean Sea. *npj Biodiversity* **2 25** pp. 9.

LITTLE BITTERN DIET

These data were acquired during a study of the feeding of nestling little bitterns around Lublin in eastern Poland. The 1,356 prey items, collected as regurgitated material from 78 broods, are dominated by fish and amphibians, but include thirteen water beetles identifiable to genus with the following species names - *Haliplus flavicollis* Sturm, *Rhantus latitans* Sharp, *Graphoderus cinereus* (L.), *Dytiscus circumcinctus* Ahrens, *D. dimidiatus* Bergsträsser, *D. marginalis* L., *Cybister lateralimarginalis* (De Geer), *Hydrobius fuscipes* (L.), *Hydrochara caraboides* (L.), *Cercyon marinus* Thomson, and *Tanysphyrus lemnae* (Paykull).

FILIPIUK M, BUCZYŃSKI P & KLOSKOWSKI J 2023. Feeding ecology and reproductive success of the Little Bittern *Ixbrychus minutus* in differently managed pond habitats. *Journal of Ornithology* doi.org/10.1007/s10336-023-02119-y pp. 12 + supplementary information.

THE SACRED INDRAYANI

The Indrayani is a river in Pune, formerly known as Poona, in the west of India. Water quality is in decline because of human usage, in particular industrialisation, the "unplanned concentration of people in the suburban areas" and twice-yearly pilgrimages. It seems that the upper reaches such as illustrated here at Valvan, still support beetle life. Ninety-four individuals were assigned to 31 species, taken from 36 samplings of eight sites. Upper- and underside views are provided of all 31 species, including *Patrus punctulatus* (Régimbart), one of the two whirligigs, *Copelatus deccanensis* Sheth, Ghate & Hájek, one of 16 dytiscids, two *Canthydrus* representing the Noteridae, and *Hydrophilus olivaceus* (Fab.), the largest of 11 hydrophilids. The correspondent is Pallavi Takawane.

DEB R, TAKAWANE P & SUBRAMANIAN K A 2023. Sacred river of Pune: boon or bane for the diversity of aquatic beetles (Insecta: Coleoptera). *Journal of Threatened Taxa* **15** 24,043-24,053.

BEETLE EMERGENCE IN OLD BEAVER POND

This paper is mainly concerned with measuring the amount of transfer of biomass from the water to the surrounding land, estimated at just over 2 grams per square meter per year. The transfer is mainly through the emergence of mayflies, chironomids and other flies. Beetles were only 1.2% of the biomass from May to July. Only *Scirtes hemisphaericus* (L.) is identified to species, named genera being *Contacyphon, Galerucella*, *Donacia* and *Tanysphyrus*.

SILINA A E, GLADYSHEV M I, SUSHCHIK N N, KURINA E M, KOLMAKOVAB A A & SELEZNEV D G 2023. Emergence of amphibious Insects from an Old Beaver Pond in the Upper Khoper Valley under conditions of the Forest Steppe. *Contemporary Problems of Ecology* **16** 790-806.

SUBFOSSIL RECORDS IN A STUDY OF TREE SURVIVAL

It is shown that silver fir, *Abies alba* Miller, was the dominant tree in Bohemia from 4,300 years ago and for the following two millennia. This was probably because of a lack of disturbances such as fire and insect attack in a time of lower rainfall. *Hydroporus obscurus* Sturm was found through the whole peat core whereas *H. nigrita* (Fab.) was found only in the oldest part. *Plateumaris consimilis* (Schrank) was also common throughout whereas *P. sericea* (L.) was in the oldest peat and around 2,000-2,500 years ago.

SCHAFSTALL N & twelve others 2023. The absence of disturbances promoted Late Holocene expansion of silver fir (*Abies alba*) in the Bohemian Forest. *Palaeogeography, Palaeoclimatology, Palaeoecology* **635** (2024) 111950.

***HELOPHORUS* CHROMOSOMES**

The karyotypes of a further nine species given here bring the total known to 62, plus three hybrids. Parthenogenesis is still known only from *H. brevipalpis* Bedel and *H. orientalis* Motschulsky, in both cases in association with triploidy.

ANGUS R B 2023. An updated Atlas of *Helophorus* chromosomes. *Comparative Cytogenetics* **17** 295-326.

MYCETOPHILIC SPECIES OF HYDROPHILIDAE FROM BELARUS

Sergey K Ryndevich, Alexey V Zemoglyadchuk, Mikhail A Lukashenya

The terrestrial hydrophilid beetles are not typically mycetobiont. These beetles are rarely observed on fungi and myxomycetes and are mycetophilic species (Smetana, 1978, 1988; Nikitsky, 1996; Ryndevich, 1991; 2004, 2007; Ryndevich, Prokin, 2017; Ryndevich, Shatrovsky, 1995; Ryndevich et al., 2017, 2021; Tsinkevich & Lukashenya, 2017). They are saprobiont species and live mainly in the excrement of vertebrates and decaying plant remains. Currently 59 species of water scavenger beetles are noted in Belarus (Ryndevich 2005; Ryndevich *et al*. 2014). Nine species in the Belarusian fauna have been found on rotten mushrooms and are listed below.

Sphaeridiinae Latreille

***Cercyon haemorrhoidalis* (Fab.)** – Listed for Belovezhskaya Pushcha National park from rotting fruiting bodies of xylotrophic fungi (Tsinkevich & Lukashenya 2017).

***Cercyon impressus* (Sturm)** – Listed for Belovezhskaya Pushcha National park from rotting fruiting bodies of *Laetiporus sulphureus* (Bull.) Murrill (Tsinkevich & Lukashenya 2017).

***Cercyon lateralis* (Marsham)** – 2 km YuV Vitebska [SE Vitebsk], griby veshenki [oyster mushrooms *Pleurotus ostreatus* (Jacq.) Kumm.], 31.VII.1990, leg. Solodovnikov I.A. [in Russian], 1 specimen.

Listed for Belovezhskaya Pushcha National park from rotting fruiting bodies of *Laetiporus sulphureus* and *Piptoporus betulinus* (Bull.) Karsten (Tsinkevich & Lukashenya 2017).

***Cercyon melanocephalus* (L.)** – Listed for Belovezhskaya Pushcha National park from rotting fruiting bodies of *Laetiporus sulphureus* and *Piptoporus betulinus* (Tsinkevich & Lukashenya 2017).

***Cercyon quisquilius* (L.)** – Listed for Belovezhskaya Pushcha National park from rotting fruiting bodies of *Laetiporus sulphureus* (Tsinkevich & Lukashenya 2017).

***Cryptopleurum minutum* (Fab.)** – Listed for Belovezhskaya Pushcha National park from rotting fruiting bodies of *Laetiporus sulphureus* (Tsinkevich & Lukashenya 2017).

***Megasternum concinnum* (Marsham)** – [Brest reg., Belovezhskaya Pushcha National Park], kv. 264, kislichnaya dubrava [oxalis oak forest], 27.IV.2016, leg. O.V. Prishchepchik [in Russian], 1 specimen; Brest reg., Baranovichi distr., Stronga reserve, near v. Vershok, on rotten *Paxillus involutus* Batsch) Fr. 14.VIII.2023, leg. Ryndevich S.K., 1 specimen (Fig. 1). Minsk reg., Nesvizh district, 3 km E Gorodeya, forest, on rotten bolete (*Leccinum* sp.), 16.VIII.1994, leg. Ryndevich S.K., 1 specimen; 2 km N Gorodeya, afforestation along the railroad, on rotten *Pleurotus ostreatus*, 15.VIII.2001, leg. Ryndevich S.K., 1 specimen. Vitebskaya obl. [Vitebsk region], Rossonskiy r-n [Rossony district], Yukho--vichi, bliz reki Nishchi [near river Nischa], na gribakh [on mushrooms], 10.08.89, leg. Saluk S.V. [in Russian], 1 specimen. Vitebsk reg., Lepel district, Berezinsky reserve., near v. Kraytsy, on fungi, 2.VI.1994, leg. Ryndevich S.K., 1 specimen. Listed for Belovezhskaya Pushcha National park from rotting fruiting bodies of *Laetiporus*

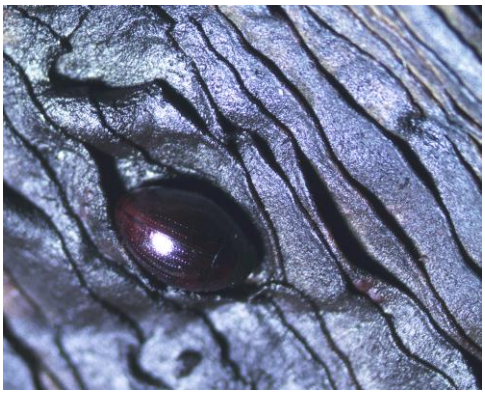

Figure 1 *Megasternum concinnum* on lower side of the mushroom body of *Paxillus involutus*

sulphureus (Tsinkevich & Lukashenya 2017; Ryndevich 2017) and for Vitebsk region from fungi (Ryndevich 1991).

***Sphaeridium bipustulatum* Fab.** – Minsk reg., Nesvizh district, 2 km NW Gorodeya, forest, on rotten myxomycetes in rotting poplar wood (*Populus* x *canadensis* Moench, 1785), 9.V.1985, leg. Ryndevich S.K., 3 specimens. Listed for Belovezhskaya Pushcha National park from rotting fruiting bodies of *Laetiporus sulphureus* (Tsinkevich & Lukashenya 2017).

***Sphaeridium scarabaeoides* (L.)** – Minsk reg., Nesvizh district, 2 km NW Gorodeya, forest, on rotten myxomycetes in rotting poplar wood (*Populus* x *canadensis*), 9.V.1985, leg. Ryndevich S.K., 1 specimen. Listed for Belovezhskaya Pushcha National park from rotting fruiting bodies of *Laetiporus sulphureus* (Tsinkevich & Lukashenya 2017).

Most species of water scavenger beetles (eight) have been found on rotting bodies of crab-of-the-woods *Laetiporus sulphureus*, also known as chicken-of-the-woods. Two species are recorded from the birch polypore *Piptoporus betulinus* and oyster mushroom *Pleurotus ostreatus*. Only one species of beetle is known from boletus (*Leccinum* sp.) and brown roll-rim *Paxillus involutus* (Batsch) Fries. All nine species of mycetophilic water scavenger beetles known from the territory of Belarus live on rotting fruiting bodies of xylotrophic fungi.Two species of *Sphaeridium* have been collected on myxogastrids (Myxogastria).

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NIKITSKY N B, OSIPOV I N, CHEMERIS M V, SEMENOV V B & GUSAKOV A A 1996: [The beetles of Prioksko-terrasny biosphere reserve – xylobiontes, mycetobiontes, and Scarabaeidae (with review of the Moscow region fauna of the groups)]. *Archives of Zoological Museum of Moscow State University* **36**: 1–197 [in Russian].

RYNDEVICH S K 1991 [New for fauna of Byelorussia water scavenger beetles (Coleoptera, Hydrophilidae)] In I.K. Lopatin & E.I. Khotko (eds) *Fauna i ekologiya zhestkokrylykh Byelorussia* 212-214. Minsk: Navuka I tekhnika [in Russian].

RYNDEVICH S K 2004. [*Fauna and ecology of water beetles of Belarus*]. Monograph in two parts. **I**. Minsk: Technoprint. 272 pp [in Russian].

RYNDEVICH S K 2005. A Checklist of Haliplidae, Noteridae, Dytiscidae, Gyrinidae, Hydraenidae, Helophoridae, Georissidae, Hydrochidae, Spercheidae, Hydrophilidae, Elmidae, Dryopidae & Limnichidae (Coleoptera) of Belarusian. In Konstantinov, Tishechkin, Penev (eds) Fauna. *Contributions to Systematics and Biology of Beetles. Papers Celebrating the 80th birthday of Igor Konstantinovich Lopatin*: 315–326. Sofia-Moscow: Pensoft Publishers.

RYNDEVICH S K 2007: Ecological classification on the basis of ecological preferences for the genus *Cercyon* Leach, 1817 (Coleoptera: Hydrophilidae) of the Palaearctic region. In: *Materials of the third All-Russian Symposium on Amphibiotic and aquatic Insects, Voronezh, 2007.* 281–284. Voronezh, Publishing and Printing Center of Voronezh State University.

RYNDEVICH S K 2017: [Family Hydrophilidae] In *Catalogue of Insects of the National park "Belovezhskaya Pushcha"* 76-79. Minsk: Belarusskiy dom pechati [in Russian].
RYNDEVICH S K, FOSTER G N, BILTON D T, AQUILINA R, TURNER C R, SHAVERDO H & PROKIN A A 2014. Additions to Belarusian fauna of water beetles *Latissimus* **33** 32–42.
RYNDEVICH S K, JIA F & FIKÁČEK M 2017. A review of the Asian species of the *Cercyon unipunctatus* group (Coleoptera: Hydrophilidae: Sphaeridiinae). *Acta Entomologica Musei Nationalis Pragae* **57** 535–576.
RYNDEVICH S K & PROKIN A A 2017 Two new species of *Cercyon* (*Clinocercyon*) from Russian Far East (Coleoptera: Hydrophilidae) *Zootaxa*. **4300** 125–134.
RYNDEVICH S K, PROKIN A A, MAKAROV K V & SUNDUKOV YU N 2021. The beetles of the families Helophoridae, Georissidae, Hydrophilidae, Hydraenidae and Elmidae (Insecta: Coleoptera) of Kunashir Island and the Lesser Kuriles. *Journal of Asia-Pacific Biodiversity* **14** 461–491.
RYNDEVICH S K & SHATROVSKY A G 1995 Water scavenger beetles (Coleoptera, Hydrophilidae) of fauna of Belarus. *Trudy zoologicheskogo muzeya BGU* **1** 77-90 [in Russian].
SMETANA A 1978. Revision of the subfamily Sphaeridiinae of America north of Mexico (Coleoptera: Hydrophilidae). *Memoirs of Entomological Society of Canada* **105** 1–292.
SMETANA A 1988. Review of the family Hydrophilidae of Canada and Alaska (Coleoptera). *Memoirs of the Entomological Society of Canada* **142** 1–316.
TSINKEVICH V A & LUKASHENYA M A 2017. [Xylophilous beetles (Coleoptera) of National Park "Belovezhskaya Pushcha"]. Minsk: Riftur print. 240 pp [in Russian].

Received September 2023

NEW SICILIAN ROCKPOOL *OCHTHEBIUS*

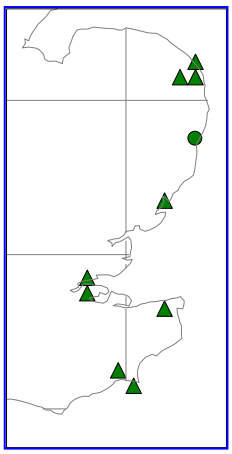
O. senczuki joins *O. biltoni* Jäch & Delgado as Sicilian endemic *Ochthebius* (*Cobalius*) species, and it seems that some *Ochthebius* near *adriaticus* Reitter could be yet another one (see Sabatteli *et al*. 2021, noted in ***Latissimus* 50** 35). The 18 known species of *Cobalius* are listed and discussed.

SABATELLI S, BARTOCCI S, D'AMICI C & AUDISIO P 2023. A new species of *Ochthebius* (*Cobalius*) (Coleoptera: Hydraenidae: Ochthebiinae) inhabiting marine rockpools in NW Sicily. *European Zoological Journal* **90** 790-799.
SABATELLI S, RUSPANTINI P, CARDOLI P & AUDISIO P 2021. Underestimated diversity: cryptic species and phylogenetic relationships in the subgenus *Cobalius* (Coleoptera: Hydraenidae) from marine rockpools. *Molecular Phylogenetic and Evolution* **163** doi.org/10.1016/j.mpev.2021.107243 pp 14.

KENTISH FINDS IN LINED PONDS

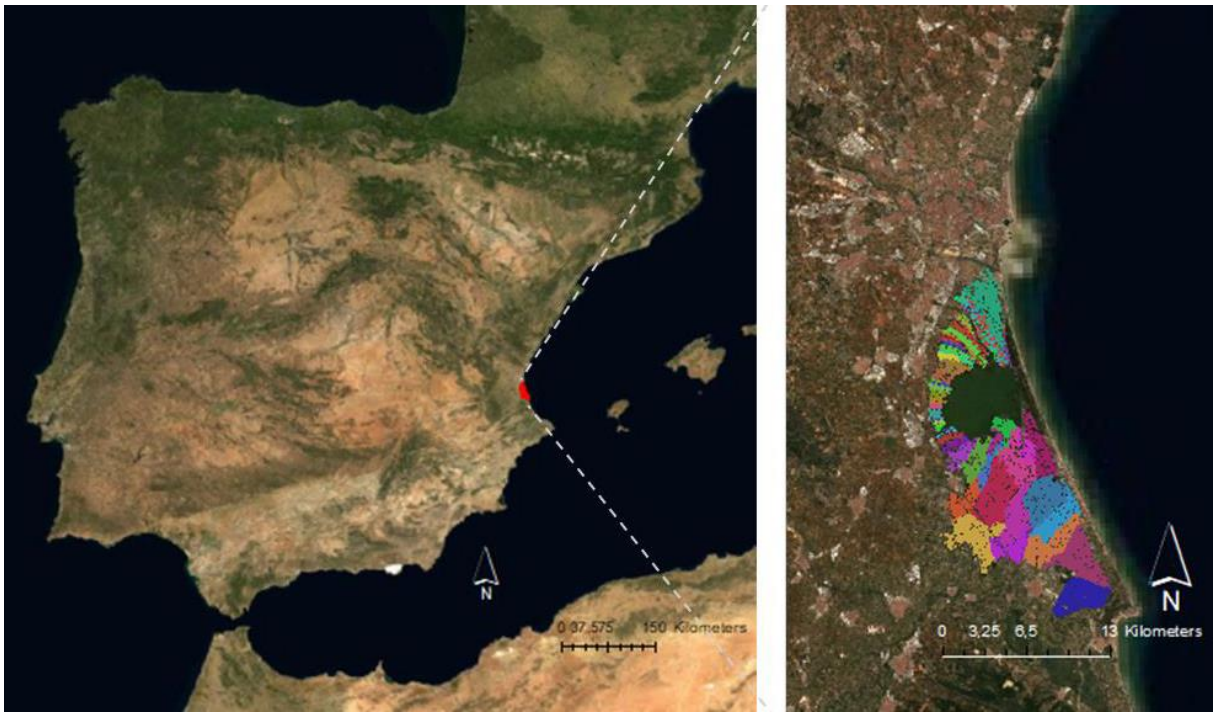
Hydrovatus cuspidatus remains a rare species in England, confined (mapped here) to the east coast of East Anglia, Kent and Sussex. Other species reported include *Graptodytes bilineatus* (Sturm) and *Pelenomus canaliculatus* (Fåhraeus). It is noted a layer of substrate over the pond lining is important to provide pupation sites.

DENTON J 2023. *Hydrovatus cuspidatus* (Kunze) (Coleoptera: Dytiscidae) in West Kent, with notes on other uncommon water beetle species occupying artificially lined ponds. *British Journal of Entomology and Natural History* **36** 213.



ALBUFERA DE ADRA

The maps here are downloaded from a *bioRxiv* preprint in turn downloaded from www.ign.es. They show the Albufera de Adra which the authors note as a Ramsar site important for about 250 species of migrating bird. We know it, mainly in the past, as an important site for water beetles such as *Methles cribratellus* (Fairmaire), *Canthydrus siculus* (Ragusa) [formerly *diophthalmus* (Reiche & Saulcy)] and *Cybister vulneratus* Klug. Various clever things are done to predict the effects of applying pesticides, in particular acetamiprid, to the paddy fields (brightly coloured on the map on the right) surrounding the lake. Without too much computing we might predict that the outcome will not be good. Contact details are unknown.



MENTZEL S, MARTÍNEZ-MEGÍAS C, GRUNG M, RICO A, TOLLEFSEN K E, VAN DEN BRINK P J & MOE S J 2022. Using a Bayesian network model to predict effects of pesticides on aquatic community endpoints in a rice field – A southern European case study *bioRxiv* preprint doi.org.10.1101/2022.10.19.512688

PREDICTING WATER BEETLE DIVERSITY IN A CHINESE POND

Thirty-nine species of water beetle - the whirligig *Patrus productus* (Régimbart), three Noteridae, 16 Dytiscidae and 19 Hydrophilidae - were recorded in a 30-year-old artificial pond. The overall number of species and the numbers of specimens of each species were compared with predictions based on a neural network, initially 70% or more accurate, but raised to 88% accurate for the numbers of individuals by a VAEGAN, the meaning of which you see in the title. Eight ecological features were used in the predictions - water temperature, salinity, pH, water depth, amount of vegetation, proportion of submerged plants, water area and water level. The correspondent is Xiaomei Yang. Presumably the next step is some combination of eDNA and machine-learning.

HU M, JIANG S, JIA F, YANG X& Li Z 2023. Improved prediction of aquatic beetle diversity in a stagnant pool by a One-Dimensional Convolutional Neural Network using Variational Autoencoder Generative Adversarial Network-Generated Data. *Applied Sciences* **13** pp. 21.

CYBISTER LATERALIMARGINALIS INCREASING?

Gert van Ee has drawn attention to a Dutch television showing of Vroege Vogels (Early Birds) on 1 September 2023 about Gils van Dijk's experiences with *Dytiscus latissimus* L., which goes back to his trapping it in a pond behind his parents' house in 2005. The video clip from the program is (or was) at
https://www.bnnvara.nl/vroegevogels/artikelen/brede-geelgerande-waterroofkever-een-zeldzaamheid

It shows/ed the two presenters boating out to collect a trap, eventually displaying its catch. This included a groggy female *latissimus* but Gert has drawn attention to the abundant *Cybister lateralimarginalis* (De Geer) caught in the same trap. He raises the question about the extent to which *lateralimarginalis* is on the increase in Europe, and why. See also Nilsson (2021) and Prokin & Cherevichko (2017).

In England is it not about time that someone improved on the one larva and one adult caught in the 21st and 20th centuries respectively?

ANON 2022. *Cybister* and *Megadytes* in England. ***Latissimus* 53** 18.

DIJK G van 2006. De brede geelgerande waterroofkever *Dytiscus latissimus* na 38 jaar weer in Nederland opgedoken (Coleoptera: Dytiscidae). *Nederlandse faunistische Mededelingen* **24** 1-6.

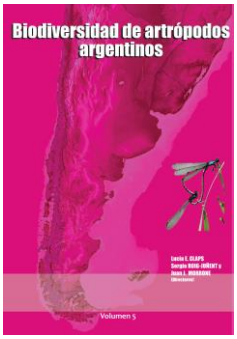
NILSSON A N 2021. The Devil's Advocate in the search for the invasive water beetle. ***Latissimus* 50** 2-8.

PROKIN A & CHEREVICHKO A 2017. Naturalisation of *Cybister lateralimarginalis* in the north of European Russia confirmed by the finding of larva. ***Latissimus* 40** 18-19.

PATAGONIAN PONDS

A wonderfully misleading title! Ninety-three ponds were sampled from about 38 to 54 degrees South over the length of Patagonia. Analysis of data based on modelling and various indices suggests that ponds at the temperature extremes have the most unique beetle assemblages. Another extreme would be based on sites with low dissolved oxygen levels, linked to those species with larvae that have gills, such as some *Haliplus* and *Berosus*. Another potential relationship is based on the likelihood of desiccation of sites and flight capability. The multiple-faceted approach of the title concerned giving each pond a conservation value, eleven sites with the highest conservation priority being in north-west Patagonia, two others being in the Santa Cruz and Tierra del Fuego provinces on the southern extremity of South America.

MARTÍNEZ-ROMÁN N, EPELE L B, MANZO L M, GRECH M G & ARCHANGELSKY M 2023. Beetle mania: understanding pond aquatic beetles diversity patterns through a multiple-facet approach. *Heliyon* **9** e19666 10 pp.



ARGENTINIAN DYTISCIDAE

📖 MICHAT M C, ARCHANGELSKY M & BENETTI C J 2023. Dytiscidae. pp. 137-158 in L.E. Claps, S. Roig-Juñent & J.J. Morrone (eds) *Biodiversidad de Artrópodos Argentinos* **5**. Universidad Nacional de Tucumán: Editorial INSUE.

One hundred and twenty-six species of Dytiscidae are covered in Spanish. A key to the 32 genera is accompanied by habitus photographs of each of them, and distribution maps of the provinces in which they occur.

***HYDRAENA PYGMAEA* COMPLEX**

The reddish *H. reflexa* Rey is reinstated as a species distinct from *H. pygmaea* Waterhouse. It is found in Corsica and Sardinia in mountain streams, claims for its occurrence on the mainland being based on the true *pygmaea*. Genetic analysis indicates that the two species diverged 5.5 million years ago when the Corsico-Sardinian block became separated from the mainland at the end of the Messinian. David Bilton, the photographer here of *reflexa*, asserts that this will not be the last paper from Ignacio Ribera!

BILTON D T, RIBERA I & VILLASTRIGO A 2023. The colonisation of the Tyrrhenian Islands by *Hydraena* water beetles, with *Hydraena reflexa* Rey, 1884 reinstated as a valid species endemic to Corsica and Sardinia (Coleoptera, Hydraenidae). *Organisms Diversity & Evolution* doi.org/10.1007/s13127-023-00620-z pp. 20.

WATER BEETLE WOMAN Anders Nilsson

Our President, that "insect man from another world", writes.....

Guess water beetles are rarer in comic books than in ponds. But those who seek shall find. Most of you will remember *DC Comics* hero No **1** Superman and his so-called girlfriend Lois Lane. She appeared also in her own comic books and in No **69** from October 1966 there is a really weird story with a lot of bugs in it called “Beware of the Bug-Belle”. Turns out that Lana Lang, Lois’s main competitor for the heart of Superman, once helped “an insect man from another world” and as gift received a “bio-ring” which enabled her temporarily to change into any kind of bug. The ring’s power has a restriction though, not permitting the same change again within 24 hours. Some years later Lana’s costume and biogenetic ring are borrowed by Lois Lane, who decides to become the new insect queen when Superman is out of the city. Now, when chasing some crooks that escape in a motor boat, Lois decides to transform into “water beetle woman”. Only her head is human, whereas the rest is a perfect diving beetle, carrying the ring on one of the front claws. Swimming faster than the boat runs she succeeds in turning it upside down. Taking the shape of a silkworm, she then spins a cocoon for each culprit and hands them over to the police.

Received November 2023


SUDDENLY...
CUT THE FUNNY STUFF, LADY, OR I'LL PERFORATE THIS WATCHMAN!
OKAY... YOU WIN... FOR NOW!
MOMENTS LATER...
REMEMBER... IF WE SEE YOU FOLLOWING US, WE BUMP OFF THIS GUY!
YOU WON'T SEE ME!
BUT WHEN THE BOAT HAS LEFT...
THEY WON'T SEE ME... BECAUSE I'LL BE UNDER-WATER... TRAILING THEM AS A WATER BEETLE WOMAN!
WITHIN MINUTES, THE SWIFT-SWIMMING INSECT QUEEN CATCHES UP WITH THE SMALL CRAFT...
NOW I HAVE TO STOP THESE RATS! IF I HIT THE BOAT JUST RIGHT...
AND SO...
YIPES! WE'RE CAPSIZING!
AND ME WEARING MY GOOD SUIT!
I THOUGHT WE HAD THIS JOB PLANNED SO PERFECT...BLUB!
7

A SUBSTANTIAL FEELING OF IMMORTALITY

Our president has also drawn attention to a comment by Carl Lindroth in his preface to the 1960 *Catalogus Coleopterorum Fennoscandiae et Daniae*.

> "*it gave the incentive to intensified and detailed faunistic investigations by an increasing number of collectors who gained a substantial feeling of immortality in filling out empty columns of the catalogue with new records of their own*."

The "*it*" is Walter Hellén's 1939 catalogue, which in turn might be referred to John Sahlberg's catalogue series, starting with the Carnivora in 1875. Slightly earlier David Sharp had prepared a similar type of region-by-region catalogue for Scotland, his very broad categories being replaced by Frank Balfour-Browne's commitment to the vice-county system in Ireland and Britain.

Anyone who has added to an existing catalogue may wish to polish their halo at this point.

HELLÉN W (ed.) 1939. *Catalogus Coleopterorum Daniae et Fennoscandiae*. Helsingforsiae, Societas Fauna et Flora Fennica **129.**

LINDROTH C (ed.) 1960. *Catalogus Coleopterorum Fennoscandiae et Daniae.* Lund: Entomologiska Sällskapet.

SAHLBERG J R 1875. Enumeratio Coleopterorum carnivororum Fenniae. Systematisk förteckning öfver de inom Finlands natural-historiska område hittills funna Coleoptera carnivora jemte uppgift om arternas utbredning och beskrifningar af nya och mindre kända species. *Notiser ur Sällskapets pro Fauna et Flora Fennica Förhandlingar* (N.S.) **14** 41-200.

SHARP D (ed.) 1873, 1874. The Coleoptera of Scotland. *Scottish Naturalist* **2** 89-96, 137-142.

NEW *ELMIS* SPECIES STATUSES

E. syriaca zoufali is upgraded to a distinct species (illustrated courtesy of Manfred Jäch) ranging from Romania and the Balkan Peninsula to some Aegean islands and western Anatolia. "The Anatolian Diagonal", based on the East Anatolian Fault, clearly separates *E. syriaca syriaca* as a distinct species from the Caucasus south to eastern Turkey, Iran, probably also Afghanistan, and the Levant. Inside the Anatolian Fault area Manfred Jäch found *E. bosnica* (Zaitzev), *E. maugetii* Latreille, *E. rioloides* (Kuwert) and *E. robusta* Jäch, but no trace of either *syriaca* or *zoufali*. The type locality of *E. zoufali* is Višegrad in Bosnia and Herzegovina but there remain problems with the type material seen by Berthélemy in the Reitter collection in Budapest. *E. quadricollis* was originally described by Reitter from Tashkent, Uzbekistan, and material genetically analysed here probably belongs to that species, but one specimen from Xinjiang turns out to be an as yet unnamed species. Thirteen named species of *Elmis* are now known.

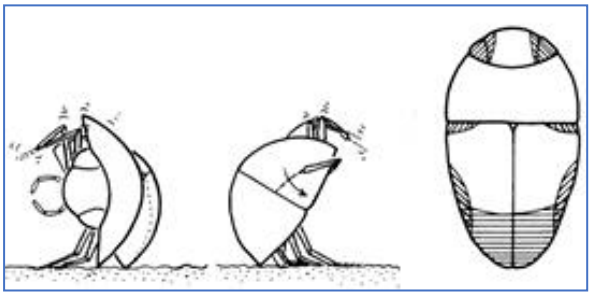
JÄCH M A, BROJER M, STANKOVIČ V M, BOŠNJAK M, LUZ D, DORCHIN N, HERSHKOVITZ Y, NOVAKOVIČ B, ŽIVIČ I, DORFER W & MAĐARIČ B B 2023. *Elmis syriaca* (Kuwert, 1890) and *E. zoufali* (Reitter, 1910) (Coleoptera: Elmidae) confirmed as distinct species based on molecular data, morphology and geographical distribution. *Diversity* **15** 994.

ELMIDAE IN BRAZIL

Until now four species of Elmidae have been recorded in the state of Tocantins - *Potamophilops bragaorum* Fernandes & Hamada, *Stenhelmoides strictifrons* Grouvelle, *Portelmis gurneyi* Spangler, and *Portelmis krolowi* Polizei & Fernandes. The present work, which appears to be chapter 1 of a dissertation, is an inventory of the thirteen genera, 33 species and one subspecies that are now known from Tocantins based on those found in the district of Taquaruçu. One of the beetles, illustrated, is *Neoelmis maculata* Hinton. I wonder what these South American enthusiasts would have made of Howard Hinton.

GUEDES J, FERNANDES A, KROLOW T K & SHIMABUKURO P 2023. Inventário das espécies de Elmidae do distrito de Taquaruçu, Palmas, Tocantins, Brasil. Dissertação, Universidade Federal de Tocantins, pp 97.

NORTH AMERICAN HYDRAENIDS



Twenty-six new species and new distribution information on seventy species are always good but those nuggets of observations on biology tend to attract the crowd. Phil Perkins reiterates his studies of the exocrine secretory delivery system as it relates to the behaviour and morphology of hydraenid life in water. Here, for example, we have the way in which *Limnebius piceus* Horn, out of the water, balances on edge so that the right legs, the ones above the body, can be used to spread secretions from the hypomeral exocrine glands to increase the effectiveness of the respiratory bubble. Feeding specialisations are recognised as needing much more work. Both adults and larvae have large molar grinding surfaces on the mandibles to process the microscopic fauna and flora grazed on wet surfaces. Maxillae are generally provided with brushes but Ochthebiini also have laciniae with strong teeth. Phil notes that his magnum opus, the Western Hemisphere Hydraenidae paper from 1980, is freely available on the Biodiversity Heritage Library.

PERKINS P D 2023. New Neotropical and Nearctic species of water beetles in the genera *Hydraena* Kugelann and *Ochthebius* Leach, a key to North American genera and subgenera of the family, new distribution records, and a synopsis of ecology, behavior and morphology related to aquatic life (Coleoptera: Hydraenidae). *Zootaxa* **5367** 1-86.

SWISS HYDROPHILOIDEA

One hundred and six species of hydrophiloid beetles are recognised as Swiss, with sixteen species excluded and seven species newly recorded:- *Helophorus montenegrinus* Kuwert, *Paracymus scutellaris* (Rosenhauer), *Cercyon alpinus* Vogt, *C. castaneipennis* Vorst, *C. tatricus* Endrödy-Younga, *Megasternum immaculatum* (Stephens), and *Pachysternum capense* (Mulsant).

COSANDEY V, CHITTARO Y & SANCHEZ A 2023. Annotated checklist of the Hydrophiloidea of Switzerland (Coleoptera). *Alpine Entomology* **7** 167-184.

LIOPTERUS HAEMORRHOIDALIS IS AFGHAN

Troops stationed in Afghanistan in 2012 and 2013 set up light traps and got thousands of insects, the beetles from which are now in the museum in Karlsruhe. One female *Liopterus* was taken at Kunduz airport in 2013. Edgar Fichtner originally reported *haemorrhoidalis* as capable of flight. Other diving beetles caught include *Colymbetes semenovi* (Jakovlev), *Hydaticus ponticus* Sharp and *Laccophilus poecilus* (Klug), plus some species well known to fly.

FICHTNER E 1972. Flugvermögen und Lichtfang von Wasserkäfern (Nachtrag). *Entomologische Nachrichten* **16** 47-50.

HENDRICH L & BALKE M 2023. First record of the diving beetle *Liopterus haemorrhoidalis* (Fabricius, 1787) for Afghanistan, with notes on other species from Kunduz and Mazar-e-Sharif (Coleoptera, Dytiscidae). *Spixiana* **46** 26.

COPELATINE LARVAE

The larvae of *Liopterus haemorrhoidalis* (Fab.), *Exocelina australiae* (Clark), *E. ferruginea* (Sharp) and ten species of *Copelatus* are described. Analysis of larval characters reinforces the single origin of Copelatinae. They stand out from other Dytiscidae on the basis of several characters including the short middle legs. Their legs and urogomphi go along with a creeping way of life. The mouthparts are also distinctive, in particular the toothed and non-grooved mandibles. The authors call for a study of the larva of *L. atriceps* (Sharp) to see if it shares some of the possibly discordant features of *haemorrhoidalis*.

ALARIE Y, MICHAT M C, WATANABE K, SHAVERDO H, WANG L-J & WATTS C H S 2022. An outlook on larval morphology of Copelatinae diving beetles with phylogenetic considerations (Coleoptera: Adephaga, Dytiscidae). *Zootaxa* **5175** 151-205.

HYGROFLORIC LIFE STYLE

Given the chance, Jack Balfour-Browne would often enthuse about bromeliadicolous dytiscids, and in 1938 he was the first to describe two species of *Copelatus* in that habitat. He stated "it appears not improbable that further species of the Copelatini will be found to Bromeliadicolous, whether of terrestrial or epiphytic Bromeliads, since the oval depressed form of the body of this tribe of Dytiscidae is perfectly adapted to the habitat formed by the accumulation of water in the leaf-bases of this type of plant." Here it is noted that living in the main tanks is the exception - as long ago as 1912 Hugh Scott recorded most specimens from the thin layer of water between the leaf axils, which the authors here consider to provide a more stable habitat than the central tanks, which often get filled up with debris. The term hygrofloric is coined for this life in wet leaf axils. Three new species are described here, one from Brazil, one from Peru and *C. florae* ranging 2,600 km, from Colombia, Costa Rica, Ecuador and Panama, including its larva, illustrated here courtesy of the authors. But which one of the ten authors thought up hygrofloric?

HÁJEK J, ALARIE Y, BENETTI C J, HAMADA N, SPRINGER M, HENDRICH L, VILLASTRIGO A, OSPINA TORRES R, BASANTES M S & BALKE M 2023. Underestimated diversity and range size of diving beetles in tank bromeliads - Coleoptera of 'hygrofloric' lifestyle (Dytiscidae). *Zoological Journal of the Linnean Society*. https://doi.org/10.1093/zoolinnean/zlad093

FYNBOS FAUNA

The Garden Route National Park has most of the remaining natural forest of the Cape. Sixty-one water beetle species were found in the Park, mostly in freshwater streams and isolated forest ponds. This diverse fauna includes many species endemic to the fynbos-dominated area of the Cape, but few are forest specialists. The Groot River illustrated here supports twelve taxa including four species endemic to South Africa - *Aulonogyrus formosus knysnanus* Brinck, *Copelatus kaffer* Balfour-Browne, *C. capensis* Balfour-Browne, and *Hyphydrus soni* Biström.

BIRD M S, BILTON D T, MLAMBO M C & PERISSINOTTO R 2023. Water beetles (Coleoptera) associated with Afrotemperate Forest patches in the Garden Route National Park, South Africa. *ZooKeys* **1182** 237-258.

***SPHAGNUM FARMING* AND BEETLES**

One way of mitigating the effects of peat-stripping is to re-establish *Sphagnum*, perhaps with the possibility of harvesting the resultant growth as an alternative to the natural product. This has been going on for at least ten years in Germany. In this study of degraded bogs close to the border with the Netherlands 926 beetle individuals in 89 species were found by hand-searching quadrats. Species represented by more than thirty individuals were *Hydroporus scalesianus* Stephens, *Chaetarthria seminulum* (Herbst), *Contacyphon hilaris* (Nyholm), *C. variabilis* (Thunberg), a *Euasthetus* species, *Myllaena intermedia* Erichson and *Scopaeus laevigatus* (Gyllenhal). Another six dytiscid and nine hydrophilid species were found. As might be expected, a dense *Sphagnum* cover was important for establishing the beetle fauna, with vascular plants helping initial development of habitat structure on bare peat. But further overgrowth with vascular plants shaded *Sphagnum* growth and reduced the diversity of peat-dependent beetles.

ZOCH L, BUDIG S & REICH M 2023. *Sphagnum* cultivation sites as habitat for beetles (Coleoptera) and the effect of vegetation structure on species occurrence and abundance. *Journal of Insect Conservation* doi.org/10.1007/s10841-023-00524-5 pp. 14.

DONACIA IN THE UPPER JORDAN

Lake Hula in the Upper Jordan Valley was drained in the 1950s, but some restoration was attempted in the 1960s and the lake and swamps are now both a World Heritage site and a RAMSAR site. *Donacia bicolora* Zschach was recorded in 1977, but genetic analysis indicates that the species is really *D. simplex* Fab., another species that feeds on *Sparganium erectum* L., an endangered species in Israel. Despite the analysis which includes, for example, a highly citable Minimum Spanning Haplotype Network for 15 named taxa, there are still reservations about the actual species concerned. The photograph by Zohar Yanai shows David Furth on the hunt for *Donacia*.

FURTH D G, MONTAGNA M & MAGOGA G 2023. Rediscovery of a lost semi-aquatic leaf beetle in the Hula Valley, Israel (Coleoptera, Chrysomelidae, Donaciinae). *ZooKeys* **1177** 57-74.

EPIMETOPID NEW IN SOUTH AFRICA

Two specimens of this new species were found in the edge of a stream in the Mountain Sanctuary Park, Magliesberg in February 2023. These are the first epimetopids confirmed south of the Congo Basin and Tanzania, the closest known species being *E. carinaticollis* (Basilewsky) from Congo and Burundi. Our front cover's photograph is of *tuberculatus*.

BILTON D T & BIRD M S 2023. *Eupotemus tuberculatus* sp. nov., the first hooded shore beetle confirmed from southern Africa (Coleoptera. Epimetopidae). *Zootaxa* **5339** 196-200.

HELOPHORUS OUT OF AFRICA

Prior to this publication only two species were known from Africa - *H. aethiops* J. Balfour-Browne from South Africa and *H. aethiopicus* Régimbart from Ethiopia with the subspecies *cooperi* d'Orchymont. These are redescribed here with *cooperi* raised to specific status. Three new species are described *H. nyandaruaensis* from mountainous areas of the East African Rift, *H. simiensis* from Ethiopia and *H. brumopluvialis* from and named for the winter rainfall areas of the west of South Africa. Two colonisation events are proposed, one based on species with 9-segmented antennae in the east and the other based on the three species with 8-segmented antennae in the south.

BILTON D T 2023. Out of the Palaearctic: the *Helophorus* water beetles of the Afrotropical Region (Coleoptera: Helophoridae). *Acta Entomologica Musei Nationalis Pragae* **63** 249-264.

REDUCING CATTLE ACCESS INCREASES ELMIDS

Fencing off headwater streams to prevent cattle access is often proposed as a way to reduce sediment movement. Here some studies indicate improvement in macroinvertebrate populations downstream of long-term fencing, with *Elmis aenea* (Müller) and *Limnius volckmari* (Panzer) being specified as beneficiaries.

O'SULLIVAN M, HUALLACHÁIN D Ó, ANTUNES P O, JENNINGS E, LINNANE S, WYNNE C & KELLY-QUIN M 2023. Mitigation of impacts of cattle access on stream ecosystems: efficacy of fencing. *River Research & Applications* doi: 10.1002/rra.4218 pp. 15.

ANACAENA BIPUSTULATA IN CZECH REPUBLIC

This has been found at three old industrial sites, on ash, on kaolin and on lignite spoil. Michal Straka OKed use of the photograph, by Vojtěch Kolář and J. Lipárová.

KOLÁŘ V, BOUKAL D S, SYCHRA J & STRAKA M 2023. [New faunistic records of *Anacaena bipustulata* (Marsham, 1802) at post-industrial sites and its current distribution in the Czech Republic] *Sborník Oblastního muzea Mostě, řada přírodovědná* **41** 99-105 [in Czech with English abstract]

BAGOUS IN NORFOLK

It seems that up to 2023 only five specimens of a terrestrial member of *Bagous*, *diglyptus*, were known in Britain. Its discovery feeding on meadow saxifrage in grassland has prompted this review of the records of the aquatic *Bagous* in Norfolk, the northern part of East Anglia. The following are known only as old records - *B. argillaceus* Gyllenhal, *B. binodulus* (Herbst), *B. frit* (Herbst), and *B. tempestivus* (Herbst). The following have more recent records - *B. collignensis* (Herbst) in 2022, *B. glabrirostris* (Herbst) in 1998, *B. limosus* (Gyllenhal) in 2017, *B. lutosus* (Gyllenhal) in 2018, *B. lutulentus* (Gyllenhal) in 2014, *B. lutulosus* (Gyllenhal) in 2017, *B. puncticollis* (Herbst) in 1998, *B. tubulus* Caldara & O'Brien in 1999, and *Hydronomus alismatis* (Marsham) in 2010. A 1906 record of *B. longitarsis* Thomson needs confirmation. *B. petro* (Herbst) has been incorrectly recorded from Norfolk. When asked if this could be the forerunner of a review of UK Bagoinae the authors separately said "no"!

LANE S A & COLLIER M J 2023. *Bagous diglyptus* Boheman (Curculionidae) rediscovered in Britain and a summary of Norfolk Bagoinae records. *The Coleopterist* **32** 71-77.

PERUVIAN COASTAL WETLANDS

Six coastal lagoons of the Pantanos de Villa, Lima, were surveyed finding 1,475 beetle individuals. Water chemistry could be used to explain the differences in distribution of Hydrophilidae and *Gymnochthebius peruvianus* (J. Balfour-Browne). as opposed to other Hydraenidae and to Dytiscidae, the distribution of which might be more related to the size and depth of the lagoons than to their plant diversity. *Desmopachria challeti* Miller and *Hydraena quechua* Perkins are newly recorded for Peru. Twelve water beetle species are illustrated as a nice bonus to the multivariate approach. The unidentified *Rhantus* looks alarmingly like the Supertramp!

CÓRDOVA-TELLO C A & HUAMANTINCO-ARAUJO A A 2023. Efecto de las variables fisicoquímicas en la comunidad de coléopteros acuáticos en un humedal costero, Lima, Perú. *Acta Biológica Colombiana* **28** 204-219.

SLOVAK RECORDS

The newly recorded (well, five years ago) species is *Helochares punctatus* Sharp. Fifty species were recorded overall, other rare species being *Dryops similaris* Bollow, *Limnius intermedius* Fairmaire and *Hydraena excisa* Kiesenwetter.

SÁINZ-CANTERO C E, TIERNO de FIGUEROA J M, OBOÑA J, HRIVNIAK Ľ & MANKO P 2018. Aquatic beetles (Insecta: Coleoptera) of selected Natura 2000 protected sites in eastern Slovakia - a new record for Slovakia and new distribution records. *Acta Musei Silesiae*, Opava, *ser. Scientiae Naturales* **67** 97-108.

This sounds like a very good pond indeed by any standards. The Greifensoll's checklist runs to 204 beetle species, 82 species being aquatic, 10 terrestrial and, separated out by Tobias Mainda, 21 Steninae. Noteworthy are *Agabus labiatus* (Brahm), *Rhantus bistriatus* (Bergsträsser), *Graptodytes bilineatus* (Sturm), *Hydroporus fuscipennis* Schaum, and *Dryops griseus* (Erichson). *Telmatophilus sparganii* (Ahrens) is new for Mecklenburg-Western Pomerania. The history of the site is uncertain but a map dating to 1692-1709 shows a damp depression where the pond is now. Full collecting details are given with photographs of the site, a wintry one here, and of important species.

WENDLANDT L & MAINDA T 2023. Die Käferfauna (Coleoptera) des Greifensolls bei Greifswald in Vorpommern. *Archiv Natur- und Landeskunde Mecklenburg-Vorpommern* **59** 29-48.

DIVING BEETLES FACE THE URBAN HARD JUNGLE

This paper follows the extent to which flight-related features of *Acilius canaliculatus* (Nicolai), *Hydaticus seminiger* (De Geer) and *Ilybius ater* (De Geer) change in relation to the extent of hard surfaces in their surroundings in Helsinki, and to the presence of fish. The *Ilybius* has a larger wing area (1.1 cm²) than the *Acilius* (0.9 cm²) and the *Hydaticus* (0.76-0.77 cm²), and this extra flight capability may preadapt it to the urban landscape, explaining why it appears to be unaffected by the amount of hard surfaces. The other species also varied in response, but at differing levels of impermeability.

LIAO W & LIN H 2023. Urbanisation drives inter- and intraspecific variation in flight-related morphological traits of aquatic insects at different landscape scales. *Insect Conservation and Diversity* doi: 10.1111/icad.12703 pp. 17.

SOLWAY UPDATE

In 1946 Professor Frank Balfour-Browne published an update of the water beetles of "the Solway district". That area is now administratively Dumfries & Galloway Council, covering the three vice-counties, Wigtownshire, Kirkcudbrightshire and Dumfriesshire, and the area of Scotland most likely to be colonised by species moving north under the influence of climate change, so it is important to make sure that new arrivals really are new. To do that the current paper digs further back in history than Balfour-Browne's, and the results are inevitably tinged with some doubts. The following species are thought to have occurred in Scotland despite published rejections: *Hydroporus figuratus* (Gyllenhal), *Helophorus alternans* Gené, *H. dorsalis* (Marsham), *Berosus signaticollis* (Charpentier) and *Enochrus bicolor* (Fab.). The following are not reliably recorded as Scottish: *Ilybius quadriguttatus* (Lacordaire), *Hydroporus neglectus* Schaum, *Scarodytes halensis* (Fab.), *Hydrochus elongatus* (Schaller), *Berosus spinosus* (Steven), *Cercyon granarius* Erichson, *Limnebius papposus* Mulsant, *Donacia marginata* Hoppe, *D. sparganii* Ahrens, and *Bagous frit* (Herbst). For the Solway area alone, *Gyrinus paykulli* Ochs, *Elodes pseudominutus* Klausnitzer and *Dryops nitidulus* (Heer) are considered not to have been recorded reliably, but the following do have old records - *Haliplus obliquus* (Fab.), *Laccophilus hyalinus* (De Geer), *Hydrochus angustatus* Germar, *Berosus luridus* (L.), *Helochares lividus* (Forster), *Cercyon obsoletus* (Gyllenhal) and *Bagous collignensis* (Herbst). The most entertaining mistake concerns a specimen of *D. nitidulus* in David Sharp's collection labelled as from "Thornhill" on 25 July 1910, but never mentioned by Sharp in his publications. It was assumed that as Sharp had lived near to Thornhill, Dumfriesshire, this specimen also came from there. But Sharp left the area in 1883! The "Thornhill" of the label must be the one in Hampshire, England, near to Brockenhurst where Sharp took up residence in 1910, and in an area of England with other records of *nitidulus*. A newly created slip is the implication that William Lennon inspired Balfour-Browne according to Robert Angus's obituary, whereas Balfour-Browne noted in his autobiography (page 6) that acquaintance with Lennon was coupled with his originally concentrating on water beetles, Lennon having been inspired earlier by David Sharp.

ANGUS R B 1967. Obituary. William Alexander Frank Balfour-Browne. *Entomologist's Monthly Magazine* **103** 286-288, 1 plate.

BALFOUR-BROWNE, F. 1962. *Water beetles and other things. Half a Century's work.* Dumfries: Blacklock Farries & Sons Ltd.

FOSTER G N 2023. A pre-millennial history of recording water beetles in Dumfries & Galloway, VCs 72-74. *Transactions of the Dumfriesshire and Galloway Natural History and Antiquarian Society* **96** 1-25.

MOROCCAN HOTSPOTS

Analysis predicts that the highest species richness of water beetles will be in the mountainous parts of the Rif, the Prerif, the Middle Atlas and the northern Central Plateau. Of these 22% are unprotected and 65 poorly protected. The analysis was based on 237 species, all listed, with five or more occurrence records.

BELHAJ A, SÁNCHEZ-FERNÁNDEZ D, EL HEMIANI B C & BENNAS N 2022. A general lack of complete inventories for aquatic beetles in Morocco. *Journal of Insect Conservation* **27** 75–85 (2023).

BELHAJ A, PALLARÉS S, BENNAS N, CHERGUI B & SÁNCHEZ-FERNÁNDEZ D 2023. Towards the identification of hotspots of freshwater biodiversity in North-Western Africa: a case study using species distribution models for water beetles in Morocco. *Global Ecology and Conservation* **43** e02441.

entoL!VE 14 SEPTEMBER 2023

Keiron Brown of the Biological Recording Company extracted a talk on British and Irish water beetles that some might find of interest if only because of some up-to-date distribution maps. You should be able to find it on YouTube or at https://biologicalrecording.co.uk/2023/09/14/water-beetles/

A few may have gone to sleep or left before the last slide. This was intended to demonstrate how little we know and was of a saltmarsh in the Clyde Estuary at low tide and within which water welled up containing several *Hydroporus obsoletus* Aubé, i.e. a freshwater spring beneath the sea. The beetle image is by the late Franz Hebauer.

DYTISCUS DIET

A problem with rearing the Critically Endangered *Dytiscus sharpi* Wehncke in captivity could be that it would need about 300 tadpoles to raise one adult. Experiments with diets of *Asellus hilgendorfii* Bovallius, goldfish and crickets showed that the larvae of this species may be generalist predators as rearing was successful on all three alternative food sources. Thanks to Kohei Watanabe for use of the image.

WATANABE K & SUMIKAWA T 2023. Larval prey options for the endangered species *Dytiscus sharpi* (Coleoptera: Dytiscidae: Dytiscinae) for sustainable ex-situ conservation. *Journal of Insect Conservation* doi.org/10.1007/s10841-023-00506-7 pp. 11.

BALTIC HABITATS

The author advises that the canoe shown here is useful for getting to islands but is not suitable for the open sea. The fauna of coastal waters at Nordmaling in the Gulf of Bothnia includes seven Gyrinidae, five Haliplidae, forty Dytiscidae, two *Helophorus*, two *Ochthebius*, twelve Hydrophilidae, nine Donaciinae and one weevil, *Phytobius leucogaster* (Marsham). The only obvious brackish water species are *Ochthebius marinus* (Paykull) and *Macroplea mutica* (Fab.). It is noted that five species of *Enochrus* each have their own preferred habitats in this area.

NILSSON A N 2023. Havssträndernas vattenskalbaggar i Nordmalings skärgård. *Skörvnöpparn* **15** 9-19.

RECORDING IN SWEDEN

Anders' main aim here is to discuss how the recent development of online province catalogues linked to coordinate-based databases will change the meaning of a 'new provincial record' when compared to the traditional manual system. He uses records of *Agabus setulosus* (Sahlberg), *Hydrocolus sahlbergi* Nilsson and *Laccophilus biguttatus* Kirby.

NILSSON A N 2023. Betydelsen av begreppet landskapsfynd före och efter Artportalens tillkomst. *Skörvnöpparn* **15** 20-24.

NILSSON A N 2023. Skalbaggskataloger och fyndhistorik – en pilotstudie av tre dykare *Skörvnöpparn* **15** 25-28.

DAVID ATTY 1930-2023

The death has recently been reported of David Brian Atty. His entry in Michael Darby's (2022) biography of coleopterists is the same or similar to one you might find online. He generated a huge number of records of British beetles, including about 700 of water beetles, mainly reflect his origin in Lancashire, his working life at GCHQ in Gloucestershire and his retirement to the Lake District in 1988. He self-published *Coleoptera of Gloucestershire* in 1983, listed below with those other publications covering water beetles. His collection was auctioned off to a private buyer before his death, but there remains some concern about his extensive reference material. Thanks go to Steve Hewitt for access to this photograph of David, to Steve Routledge who originally alerted me to David's loss, and to Keith Alexander for additional information.

ATTY D B 1983. *Coleoptera of Gloucestershire*. Cheltenham, D.B. Atty.
ATTY D B 2015. *A checklist of Cumbrian beetles*. Carlisle Natural History Society.
ATTY D B 2009. Some new and noteworthy Coleoptera from Cumbria. *The Coleopterist* **18** (1) 67-70.
ATTY D 2016. Beetles on 'Wainwrights' 1970-2015. *Lakeland Naturalist* **4** 17-20.

MATSU ISLANDS RECORDS

There are eight main islands in the Matsu Islands complex coming to within 9km of the south coast of mainland China. Only three species were known previous to a visit by Yu-Hsiang Ho and Hsin-Ju Cheng in May 2023 The three were *Cybister tripunctatus lateralis* (Fab.), *Eretes griseus* (Fab.) and what appears from photographs to be *Dineutus orientalis* (Modder). The newly recorded species are *Allodessus megacephalus* (Gschwendtner), *Platynectes dissimilis* (Sharp), *Dactylosternum* cf. *hydrophiloides* (MacLeay), an *Enochrus*, *Helochares neglectus* (Hope) and another *Helochares*, and *Sternolophus rufipes* (Fab.), seen here. Chi-Feng Lee and Kohei Watanabe provided photographs of the new finds.

LIU H-C, HO Y-H, CHENG H-J & ŠŤASTNÝ J 2023. Notes on Hydradephaga and Hydrophilidae (Insecta: Coleoptera) of the Matsu Islands, including a new record of *Platynectes dissimilis* (Sharp, 1873) from Taiwan. *Taiwanese Journal of Entomological Studies* **8** 70-75.

***CYBISTER* DIET**

Experiments here establish that the larvae of *Cybister sugillatus* effectively used odonate nymphs as prey, being unable to complete their development on frog tadpoles. This paper provides a useful set of citations on this subject.

FUKUOKA T, TAMURA R, YAMASAKI S & OHBA S-y 2023. Effects of different prey on larval growth in the diving beetle *Cybister sugillatus* Erichson, 1834. *Aquatic Insects* **44** 226-234.

POND RESTORATION STUDY IN CHINA

Some success is claimed in restoration of ponds to natural wetlands but this is based on traits rather than named species, so it is not possible to decide if water beetles were involved or benefitted. However, Table 1 provides an interesting list of traits - voltinism, development related to season, adult life span, adult ability to exit, ability to survive desiccation, female dispersal ability, flying strength, swimming ability, phoretic ability, body armour, shape in relation to flow resistance, respiration system, body size at maturity, thermal preference, habit (burrowing, climbing, skating, etc.) and the more usual trophic habitat categories. Haitao Wu is the correspondent.

LU K, JÄHNIG S C, WU H, XIE Z, CHEN X & HE F 2023. Trait-based approach of aquatic insects to track recovery of wetland ecosystems in Northeast China. *Ecological Indicators* **155** 111012.

***BUNITES* LARVAE**

The first instar larva was described in 2005. Second and third instar larvae, described here, were found in further visits to the site in Argentina. A basal suture on the urogomphus separates *Bunites* from other Colymbetinae. Morphological analysis supports the earlier finding that *Bunites* Spangler shared a common ancestry with *Meladema* Laporte, *Hoperius* Fall and *Neoscutopterus* Balfour-Browne, and is sister to *Meladema*.

MICHAT M C, ALARIE Y & BALKE M 2023. *Bunites distigma* (Brullé, 1837): discovery of the second- and third-instar larvae and phylogenetic relationships within the Colymbetinae (Coleoptera: Dytiscidae). *Zootaxa* **5353** 551-566.

MICHAT M C 2005. Larval morphology and phylogenetic relationships of *Bunites distigma* (Brullé) (Coleoptera: Dytiscidae: Colymbetinae: Colymbetini). *The Coleopterists Bulletin* **59** (4) 433-447.

HYDROPHILID LARVAE IN TAIWAN

Crephelochares do not construct an egg cocoon and the larvae are rather active, suggested that, unlike most hydrophilid larvae, they are not ambush predators. The larvae of *C. abnormalis* (Sharp) and *Peltochares atropiceus* (Régimbart) are described. It appears that what was described by Bertrand as a *Peltochares* larva from Madagascar actually belongs to *Tritonus* Mulsant. *Peltochares* are confirmed as carrying their egg cocoons like *Helochares*.

MINOSHIMA Y N, FIKÁČEK M & LIU H-C 2023. Larval morphology of *Crephelochares* and *Peltochares* (Coleoptera: Hydrophilidae). *Acta entomologica Musei nationalis Pragae* **63** 305-322.

SURVIVING IN THE SIERRA NEVADA LAKES

The thermal tolerances were compared for water beetles living in the high lakes of the Spanish Sierra Nevada - *Agabus nevadensis* Lindberg, *Hydroporus marginatus* (Duftschmid), *H. nevadensis* Sharp, *H. sabaudus sierranevadensis* Shaverdo, and *Boreonectes ibericus* (Dutton & Angus). Their upper thermal limits are about the same as for other beetles but differences were found in responses at lower temperatures, and most could survive submersion below ice. It seems that the most important threat from climate change lies in colonisation by lowland dytiscids rather than a physiological inability to survive higher temperatures.

CARBONELL J A, PALLARÉS S, VELASCO J, MILLÁN A, PICAZO F & ABELLÁN P 2023. Thermal biology of aquatic insects in alpine lakes: insights from diving beetles. *Freshwater Biology* doi 10.1111/fwb.14190 pp.13.

CYBISTER - POSSIBLE EFFECTS OF CLIMATE CHANGE

C. lateralis is classified as endangered in Japan but recently it seems that adults appear earlier in the year and the number of adults produced in late summer is increasing. This suggests that the adult beetles are now able to overwinter in Ishikawa, so being able to breed earlier, also, with the possibility of earlier migration from western Japan to the area.

WATANABE K, SUMIKAWA T, FUKUTOMI H, NISHIJIMA Y & HIRONAKA M 2023. Current status of the northern population of the diving beetle *Cybister tripunctatus lateralis* (Coleoptera, Dytiscidae) in Ishikawa Prefecture, Japan. *Elytra* **13** 195-202.

RHANTATICUS LARVAE

Larvae of *R. congestus* from Madagascar were used to place *Rhantaticus* firmly within the Aciliini, being of the skipjack form. Whilst they can be distinguished from other genera by size variations such as the narrower head capsule, it is not yet possible to "break the polytomy", i.e. to establish the relative relationships within the tribe.

ALARIE Y, MICHAT M C, BERGSTEN J & HÁJEK J 2023, Morphology of the larvae of *Rhantaticus congestus* (Klug, 1833) and phylogenetic comparison with other known Aciliini (Coleoptera: Dytiscidae, Dytiscinae). *Zootaxa* **5380** 247-264.

POTAMOPHILUS IN NORTH AFRICA

The comprehensive title explains everything except the location in the Rif Mountains in Morocco. Genbank accessions for France, Germany and Slovakia were used alongside COI sequences for *P. kelabitensis* Kodada, Boukal, Vďačný, Goffová & Ondrejková from Malaysia (reference below) and *Elmis maugetii* Latreille from Slovakia.

KODADA J, BENNAS N, GOFFOVÁ K & ČIAMPOR F 2023. *Potamophilus acuminatus* (Fabricius, 1792): distribution update in North Africa confirmed by COI barcoding sequencing (Coleoptera, Elmidae). *Zootaxa* **5200** 565-575.

KODADA J, BOUKAL D S, VĎAČNÝ P, GOFFOVÁ K & ONDREJKOVÁ 2022. Elmidae of Sarawak: the genus *Potamophilus* Germar, 1811, with a description of *P. kelabitensis* sp. nov. (Insecta: Coleoptera). *European Journal of Taxonomy* **806** 1-18.

GENOME OF A CAVE DWELLER

The complete mitochondrial genome sequences were analysed for five specimens of an unnamed *Desmopachria*, found in a cave in Brazil. These were then compared with those for fifteen other diving beetle species, with representatives of Haliplidae, Gyrinidae and Carabidae as outgroups.

VASCONCELOS S, OLIVEIRA R R M, PIRES E S, PIETROBON T, PROUS X, ASENJO A & OLIVEIRA G 2021. Complete mitochondrial genome of a cave dwelling *Desmopachria* (Insecta: Coleoptera: Dytiscidae) from the Eastern Amazon. *Mitochondrial DNA Part B* **6** 415-417.

ERETES ON ELBA

E. griseus was found on Elba in September 2022 at Capoliveri by Duccio Tognini. The sporadic occurrence of this species is described from Italy in general and Tuscany in particular.

FORBICIONI L & ROCCHI S 2023. Interessante presenza di *Eretes griseus* (Fabricius, 1781) all'isola d'Elba (Toscana) e note sulla corologia in Italia (Coleoptera: Dytiscidae). *Onychium* **16** 51-56.

HYDROPHILUS ATERRIMUS IN BELARUS

This is the only species of *Hydrophilus* in Belarus, records of *H. piceus* L. being considered wrong. The two species are distinguished here and the occurrence of *H. aterrimus* is detailed along with what is known of its biology. Illustrated is a site in the River Serguch, Vitebsk.

RYNDEVICH S K 2023. [*Hydrophilus aterrimus* Eschscholtz, 1822 (Insecta: Coleoptera: Hydrophilidae) in Belarus]. *BarSU Herald, Biological Sciences (General biology)* **2** 69-79.

DONACIA FEEDING LIMITS

Monthly evening meetings of the Royal Entomological Society now take place online. A rare occurrence was mention of a water beetle in the October 2023 meeting by Martin Kaltenpoth which, according to Richard Harrington's review (*Antenna* **47** (4) 210), included reference to work on the bacteria symbiotic in *Donacia* Malpighian tubules. See ***Latissimus* 49** 35.

REIS F, KIRSCH R, PAUCHET Y, BAUER E, BILZ L C, FUKUMORI K, FUKATSU T, KÖLSCH G & KALTENPOTH M 2020. Bacterial symbionts support larval sap feeding and adult folivory in (semi-)aquatic reed beetles. *Nature Communications* doi.org/10.1038/s41467-020-16687-7. pp. 15.

CAPABILITY BROWN POOL IN HEREFORDSHIRE

Berrington Pool got a bad press in ***Latissimus* 55** (Anon 2023. Club meeting in Herefordshire, May 2023. pp. 2-6) but further effort by Will Watson and Giles King-Salter has produced a list of 36 water beetles among 103 aquatic invertebrate taxa. *Hydaticus seminiger* (De Geer) is singled out and illustrated.

WATSON W R C & KING-SALTER G 2023. *Berrington Hall Pool. Aquatic invertebrate and plant survey - 2023.* Report to the National Trust. 16 pp.

MIDDLE ATLAS CATALOGUE

Another welcome Moroccan resumé, this time centred on the Tasekka National Park. Coleoptera are four Gyrinidae, one Haliplidae (*Haliplus lineatocollis* (Marsham) of course!), 27 Dytiscidae including *Agabus alexandrae* Ribera, Hernando & Aguilera, four *Helophorus* including *H. rufipes* (Bosc) and *H. oxygonus* Bedel, ten Hydrophilidae, eleven Hydraenidae including *Hydraena allomorpha* Lagar & Fresneda, three Elmidae and three Dryopidae.

BELAHCEN K, CHERGUI B, EL HAISSOUFI M, L'MOHDI O, EL ALAMI M & BENNAS N 2023. New data on biodiversity and chorology of aquatic insects of Tazekka National Park (Middle Atlas, Morocco) I: Odonata, Coleoptera, and Hemiptera. *Transactions American Entomological Society* **149** 261-297.

WHERE THE LOWER CANYONS MEET

Two springs have yielded a fourth *Typhloelmis* in this genus known only from the Rio Grande/Rio Bravo watershed in Texas. *Typhloelmis* are blind with pale and a thin cuticle, and have yet to be linked clearly to any non-subterranean genus.

BARR C B, HUTCHINS B T, SCHWARTZ B F & WINTON R C 2023. *Typhloelmis spangleri* Barr, new species, description of a fourth stygobiontic elmid from Texas, USA, and a new record of *Typhloelmis finegan* Barr, 2015 (Coleoptera: Elmidae: Elminae). *The Coleopterists Bulletin* **77** 655-666.

NEW RECORDS FOR ITALY

This is a cornucopia of new records, best viewed directly by accessing the *Rivista* as a PDF on the museum website www.museoscienzebergamo.it/educazione/pubblicazioni/rivista-del-museo/.

Of the sixty species reported possibly the best is the second Italian record for *Ochthebius dalmatinus* Ganglbauer. The first recent records from Sardinia are given for *Hydroscapha granulum* (Motschulsky), *Chaetarthria similis* Wollaston, *Hemisphaera seriatopunctata* (Perris) and *Stenelmis canaliculata* (Gyllenhal). And many more!

TOLEDO M & ROCCHI S 2023. Reperti inediti di Coleoptera (Insecta) Dytiscidae, Hydroscaphidae, Scirtidae, Elmidae, Dryopidae, Psephenidae, Hydraenidae, Helophoridae, Georissidae e Hydrophilidae in Italia. *Rivista del Museo Civico di Scienze Naturali "Enrico Caffi", Bergamo* **36** 41-57.

NEW CHALLENGE, OLD BEHAVIOUR?

Adult *Dytiscus sinensis* Feng were used to assess the ecological side effects of three types of insecticide in a "hypothetical paddy field", a 3 cm-deep column of water. The more old-fashioned kind of insecticide, the pyrethroid lambda-cyhalothrin, killed beetles at field strength, but the newer types did not. Taking advantage of an exposed tile, more beetles climbed out of water treated with the anthranilic diamide chlorantraniliprole than of the "neonic" thiamethoxam. Is escaping from contaminated water an old dytiscid trick?

WANG L, LIU L & FENG S 2023. The water-exiting behavior and survival of predaceous diving beetles in responses to lambda-cyhalothrin, chlorantraniliprole, and thiamethoxam. *Aquatic Toxicology* DOI:10.1016/j.aquatox.2023.106812

SUPHIS

Suphis are distinctive among burrowing water beetles of the Noteridae in being strongly convex. The main purpose of the paper is to conserve the current view of the genus by providing a neotype of *S. fluviatilis* Guignot to displace the specimen thought to be the type but way off the description provided by Félix Guignot. The best way to explain why the description matches the putative type so poorly is that an unknown person must have been substituted the real type in Paris Museum with a specimen of *S. notaticollis* Zimmermann. *S. fluviatilis* is known from Paraguay, Brazil and Argentina, though some Argentinian specimens have proved to be *notaticollis*. Photograph prepared by Hans Fery courtesy of Juan Ignacio Urcola.

URCOLA J I, GUIMARÃES B A C, TORRES P L M, FERY H & MICHAT M C 2023. Redescription and neotype designation of *Suphis fluviatilis* Guignot, 1948 (Coleoptera: Dytiscoidea: Noteridae) and notes on other species of the genus. *Zootaxa* **5374** 137-147.

HOTSPOTS IN NORTH AFRICA

Mayfly genera are combined with water beetle genera to show centres of biodiversity in Morocco, Algeria and Tunisia to be mainly associated with mountainous areas near to the sea. About 80% of these areas have no conservation protection status.

SLIMANI N, WOOD P J, GUILBERT E, BOUMAIZA M & SÁNCHEZ-FERNÁNDEZ D 2022. Using biodiversity indicators to identify priority areas for freshwater conservation in the African "Mediterranean Basin" biodiversity hotspot. *Biological Conservation* **276** 109783 pp. 7.

BELARUS CHECKLIST

This appraisal of the beetles of Belarus is very welcome. It recognises as Belarusian Sphaeriusidae (1 species), Gyrinidae (10), Haliplidae (18), Noteridae (2), Dytiscidae (121), Helophoridae (18), Spercheidae (1), Hydrophilidae (60). Hydraenidae (22), Scirtidae (17), Elmidae (11), Dryopidae (7), Limnichidae (3), Heteroceridae (6), Donaciinae (2), and Bagoinae (16). Species that appear to be erroneously recorded or needing confirmation from Belarus include *Gyrinus caspius* Ménétries, *G. colymbus* Erichson, *G. distinctus* Aubé, *G. opacus* Sahlberg, *Haliplus apicalis* Thomson, *Agabus arcticus* (Paykull), *Hydroglyphus hamulatus* (Gyllenhal), *Hydrophilus piceus* L. (see also p. 29), *Anacaena globulus* (Paykull), *Helochares lividus* (Forster), *Cercyon unipustulatus* Nakane (should have been *C. unipunctatus* (L.)), *Hydraena nigrita* Germar, *Limnichus pygmaeus* (Sturm), *Macroplea mutica* (Fab.), *Bagous argillaceus* Gyllenhal, and *Notaris aethiops* (Fab.).

ALEKSANDROWICZ O, PISANENKO A, RYNDEVICH S & SALUK S 2023. *The check-list of Belarus Coleoptera*. Pomeranian University in Słupsk.

SURFACE FAUNA IN JAPAN

This is a review of all the insects using the water's surface, i.e. not just whirligigs, water crickets, measurers and striders. So the list runs to the water-lily aphid *Rhopalosiphum nymphaeae* (L.), which can be abundant on floating leaves, and *Lathromeroidea silvarum* Nowicki, a trichogrammatid parasite on water beetle eggs. The conservation issues facing such insects are discussed, for example, the invasion of exotic plants like *Azolla* and *Eichhornia*, and alien animals such as the nutria or coypu (*Myocastor coypus* (Molina), bullfrogs, and the greatest evil of all (in some people's opinion!), the common carp, *Cyprinus carpio* L. An interesting approach, perhaps to be copied in other parts of the world.

HAYASHI M 2023. Insect diversity of lentic water surface in Japan. *Japanese Journal of Systematic Entomology* **29** 199-210.

NORTHERN SPANISH RIVERS

Ninety-two macroinvertebrate samples from northern Spanish rivers produced 123 species identified by DNA. Of these about twenty were water beetles, the only one named to species being *Pomatinus substriatus* (Müller). One would expect many more species with this amount of recording effort, so barcode samples continue to disappoint.

FUEYO Á, SÁNCHEZ O, COYA R, CARLEOS C, ESCUDERO A, CORDÓN J, FERNÁNDEZ S, GRANERO-CASTRO J & BORRELL J 2024. The influence of database enrichment using local macroinvertebrate genetic references for metabarcoding based biodiversity studies in river monitoring. *Ecological Indicators* **158** 111454 pp. 11. [online 22 December 2023]

***CRASSULA* NOT AS BAD AS THOUGHT?**

New Zealand Pygmyweed, *Crassula helmsii* (Kirk) Cockayne is generally regarded as a threat to biodiversity, but field work in the UK, Belgium and Netherlands indicates that invaded sites support more macroinvertebrate species than uninvaded ones. For beetles this is also true for abundance. Wow.

TASKER S J L, FOGGO A, SCHEERS K, van der LOOP J, GIORDANO A & BILTON D T 2024. Nuanced impacts of the invasive aquatic plant *Crassula helmsii* on Northwest European freshwater macroinvertebrate assemblages. *Science of the Total Environment* **913** 169667 pp 13. [online 23 December 2023]

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