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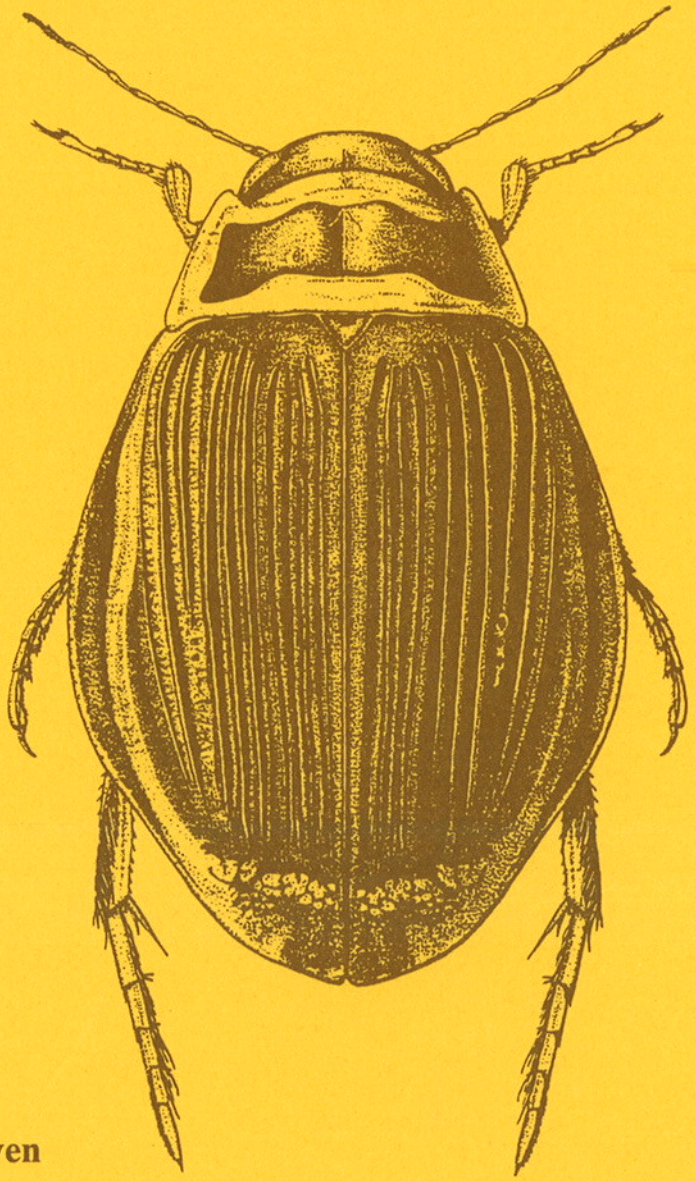
LATISSIMUS

NEWSLETTER OF THE BALFOUR-BROWNE CLUB



Number Eleven **April 1999**

BIODIVERSITY ACTION PLANS FOR BRITISH WATER BEETLES

Biodiversity Action Plans (BAPs) for many invertebrates, including the water beetles listed below, were launched on 8 March. The document is available as *UK Biodiversity Group Tranche 2 Action Plans* Volume IV - *Invertebrates* from the Biodiversity Action Plan Secretariat, DETR, Bristol. BAPs are of necessity anonymous but a fair amount of consultation has taken place. It will be interesting to see how Club members respond to them. BAPs are inevitably repetitive as the idea is that individual plans can be "drawn down" into a plan for conservation of a particular area; they therefore have to stand alone. Here are some of the abbreviations used for bodies required to take action:- CCW Countryside Commission for Wales; DANI Department of Agriculture, Northern Ireland; EA Environment Agency; EHS/DoE(NI) Environment & Heritage Service, Northern Ireland; EN English Nature; FE Forest Enterprise; JNCC Joint Nature Conservancy Council; IDB Internal Drainage Board; LA Local Authority; MAFF Ministry of Agriculture, Fisheries & Food; MoD Ministry of Defence; SEPA Scottish Environment Protection Agency; SNH Scottish Natural Heritage; SOAEFD Scottish Office, Agriculture, Environment & Fisheries Department; WOAD Welsh Office Agriculture Department.

The maps are based on 110,000 records held electronically and are intended to be complete. Solid symbols indicate 10 km square records from 1980 onwards, all other records being shown as open symbols. The maps are in DMAP, derived from RECORDER through a conversion program provided by Thurner Automation. Additional records should be referred to GNF.

Agabus brunneus Action Plan

1. Current status

1.1 *Agabus brunneus* is a beetle of shallow, sometimes intermittent, lowland streams, often occurring deep in the gravel. Last instar larvae have been noted in Britain in January and March, indicating that eggs are laid in the autumn, with the larvae overwintering. Early spring breeding of adults is, however, possible in the climatically favoured, southern coastal sites. Extensive tests using specimens from the Pyrenees have demonstrated that this species is unable to fly.

1.2 In the UK this species is confined to two areas, one in West Cornwall and one centred on the New Forest, but extending to South Wiltshire. Since 1970 *Agabus brunneus* has been recorded from 3 ten km squares in west Cornwall and in four squares in the New Forest and Dorset heath area. Most recent records are for the Charnon River in 1991 and Portreath in 1997 (West Cornwall), Linford Brook in 1997 and Widden Bottom in 1998 (the New Forest), and a stream near Wool (Dorset) in 1998. Thus it continues to occupy the two areas of its British distribution, but in both it is confined to a small number of sites. A recent survey of 26 streams in the New Forest revealed its presence in only one site. *Agabus brunneus* is centred on the Mediterranean, reaching northern Europe in southern England and Belgium. The type form, which occurs in Britain, has recently been recognised as part of a species complex, the other member (or members) coexisting with it in the Mediterranean area.

1.3 In Great Britain this species is classified as *Vulnerable*.

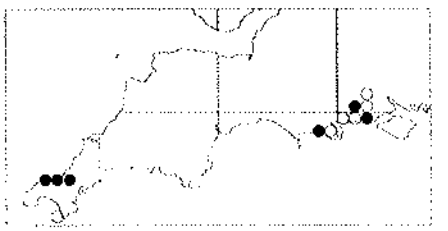
2. Current factors causing loss or decline

2.1 Water abstraction.

2.2 Damage to headwater drainage systems, particularly associated with tourist development and road improvement.

2.3 Agricultural improvement in occupied catchments, resulting in altered run-off and eutrophication.

2.4 Reduced grazing resulting in scrub encroachment and shading of streams.



3. Current action

3.1 A survey of the status of *Agabus brunneus*, commissioned by EN, has recently been completed.

3.2 An unpublished action plan has been written for EN.

3.3 Genetic studies are being undertaken by the University of Plymouth.

3.4 The New Forest is a candidate SAC.

4. Action plan objectives and targets

4.1 Maintain viable populations within each of the catchments currently occupied.

4.2 Ensure that viable populations are maintained at a minimum of five sites by 2010.

5. Proposed action with lead agencies

A survey of all known and extant historic sites has recently been undertaken, supported by EN and the Balfour-Browne Club. This survey should be followed up by monitoring of key sites in order to evaluate year-on-year variation in populations and in order to confirm the life-cycle strategy of this species in England.

ADDRESSES OF AUTHORS The addresses of authors of articles, and of the contacts for reviewed works, are given at the end of this issue of ***Latissimus***, together with a selection of e-mail numbers. The address for other correspondence is:- Professor G N Foster, 3 Eglinton Terrace, Ayr KA7 1JJ, Scotland, UK.

5.1 Policy and legislation

5.1.1 Where appropriate, include the requirements of the species when preparing or revising prescriptions for agri-environment schemes. (Action EN, MAFF)

5.1.2 Undertake a review of water abstraction policies within areas where the species occurs. (Action EA)

5.1.3 Address the requirements of this species in the LEAP process and in relevant WLMPs. (Action EA, IDBs, LAs, MAFF)

5.2 Site safeguard and management

5.2.1 Where possible, ensure that all occupied habitat is appropriately managed by 2008. (Action EA, EN, FE)

5.2.2 Ensure that the habitat requirements of *A. brunneus* are taken into account in any development policies, plans and proposals likely to affect headwater drainage systems. (Action EN, Heritage Department, Highways Agency, LAs)

5.2.3 Ensure that the species is included in site management documents for all relevant SSSIs. (Action EN)

5.2.4 Consider notifying as SSSIs sites holding key populations of the species where this is necessary to secure their long-term protection and appropriate management. (Action EN)

5.3 Species management and protection

5.3.1 Consider the need for reintroductions/ reinforcements to ensure the maintenance of five viable populations, with at least one in each of the catchments currently occupied. Undertake through translocations of native stock, if considered appropriate and feasible. (Action EN)

5.4 Advisory

5.4.1 Advise landowners and managers of the presence of this species and the importance of beneficial management for its conservation. (Action EN)

5.5 Future research and monitoring

5.5.1 Establish a regular monitoring programme at key sites. (Action EN)

5.5.2 Conduct targeted autecological research to inform habitat management. (Action EN)

5.5.3 If necessary, undertake genetic studies to inform a reintroduction programme. (Action EN)

5.5.4 Pass information gathered during survey and monitoring of this species to a central database for incorporation in national and international databases. (Action EN)

5.6 Communications and publicity

5.6.1 Promote opportunities for the appreciation of the species, and the conservation issues associated with its habitat. This should be achieved through articles within appropriate journals, as well as by a publicity leaflet. (Action EN)

5.6.2 Encourage research on the ecology and conservation of this species on an international level, and use the experience gained towards its conservation in the UK. (Action EN, JNCC)

5.7 Links with other action plans

5.7.1 Implementation of this action plan could benefit other species of lowland streams, including the freshwater crayfish *Austropotamobius pallipes*.

5.7.2 This plan should be considered in conjunction with that for lowland heathland.

Bidessus unistriatus Action Plan

1. Current status

1.1 *Bidessus unistriatus* is confined to lowland, stagnant water bodies and slow drains. Typical habitats include the extreme edge of sparsely vegetated pools of moderate depth, such as the fluctuating meres of the Brecks, and old drainage ditches full of reed litter. *B. unistriatus* has not been found in brackish water despite its occasional association with coastal areas. There is evidence of flight ability in south-west France.

1.2 This is a widespread species in Europe, being rare in the northern and southern extremes, and possibly found in Mongolia and China. In the UK, there are recent records for east and west Norfolk, from a Broadland drain, and from fluctuating meres. There is also an unconfirmed record for the Pevensey Levels, East Sussex. *B. unistriatus* has been recorded from 4 ten km squares in England since 1970. It appears to have become extinct at former sites in the New Forest, Studland, Camber and south Cambridgeshire. Post-glacial subfossil records for this species are widespread within England, but some may refer to another species of *Bidessus*, presumed to be extinct in Britain.

1.3 In Great Britain this species is currently classified as *Endangered*.

2. Current factors causing loss or decline

2.1 Water abstraction for agricultural and domestic use.

2.2 Agricultural improvement resulting in drainage and enrichment.

2.3 Cessation of traditional management techniques for reed fen in the Broads.

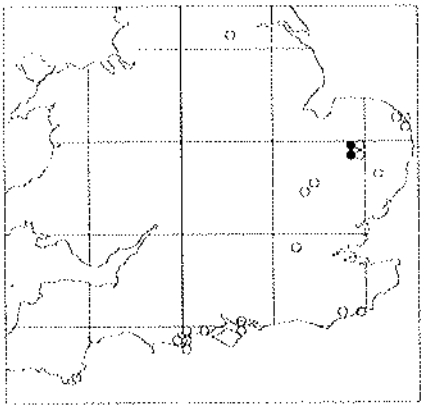
3. Current action

3.1 Surveys were undertaken in the Catfield area of Broadland by the Balfour-Browne Club in 1997/98.

3.2 The species is present on the MoD Stanford Training Area SSSI, which is within the Breckland candidate SAC.

4. Action plan objectives and targets

4.1 Maintain populations at all known sites.
4.2 Enhance populations at known sites by 2010.
4.3 Re-establish populations at one former site by 2010.



5. Proposed action with lead agencies

The objectives of this plan will be achieved by implementing beneficial habitat management at known sites, surveys to determine the status of the species, and by autecological research. Populations should be reintroduced to a former site with suitable habitat conditions.

5.1 Policy and legislation

5.1.1 Address the requirements of this species in the LEAP process and in relevant WLMPs. (Action EA, IDBs, LAs, MAFF)
5.1.2 Take account of the species' requirement in response to applications for water abstraction licenses. (Action EA)
5.1.3 Where appropriate, include the requirements of the species when preparing or revising prescriptions for agri-environment schemes. (Action EN, MAFF)

5.2 Site safeguard and management

5.2.1 Where possible, ensure that all occupied habitat is appropriately managed, including the maintenance of traditional reed-harvesting practices, by 2008. This may be through SSSI or agri-environment scheme management agreements. (Action Broads Authority, EN, MoD)
5.2.2 Ensure that the species is included in site management documents for all relevant SSSIs. (Action EN)
5.2.3 Consider notifying as SSSIs sites holding key populations of the species, where this is necessary to secure their long-term protection and appropriate management. (Action EN)

5.3 Species management and protection

5.3.1 Reintroduce a series of populations at a suitably managed former site by 2010. (Action EN)

5.4 Advisory

5.4.1 Advise landowners and managers of the presence of this species and the importance of beneficial management for its conservation. (Action EN, MAFF)
5.4.2 As far as possible, ensure that all relevant agri-environment project officers, and members of regional agri-environment consultation groups, are advised of locations of this species, its importance, and the management needed for its conservation. (Action EN, MAFF)

5.5 Future research and monitoring

5.5.1 Undertake further surveys to determine the status of the species. (Action EN)
5.5.2 Conduct targeted autecological research to inform habitat management. (Action EN)
5.5.3 Establish a regular monitoring programme for the species. (Action EN)
5.5.4 Consider undertaking genetic studies to inform the reintroduction programme. (Action EN)
5.5.5 Pass information gathered during survey and monitoring of this species to a central database for incorporation in national and international databases. (Action EN)
5.5.6 Encourage research on the ecology and conservation of this species on an international level, and use the experience gained towards its conservation in the UK. (Action EN, JNCC)

5.6 Communications and publicity

5.6.1 Promote opportunities for the appreciation of the species and the conservation issues associated with its habitat. This should be achieved through articles within appropriate journals, as well as by a publicity leaflet. (Action EN)

5.7 Links with other action plans

5.7.1 This action plan should be considered in conjunction with those for lowland heathland, reedbeds, fens and aquifer-fed naturally fluctuating water bodies.

Donacia aquatica Action Plan

1. Current status

1.1 *Donacia aquatica* usually occurs in small numbers on aquatic vegetation dominated by sedges, such as *Carex acutiformis*, at the margins of open water (lakes and fens). Adults are active during May and June. The larvae are aquatic, feeding below the surface on the submerged parts of emergent vegetation.
1.2 This was formerly a widespread but local species with pre-1970 records from much of southern and eastern England as far north as Northumberland and Cumberland. In Scotland there are old records from Dumfries-shire, east Inverness and Nairn, and Argyll mainland, and there is a single old record from Merionethshire in Wales. Post-1970 records show a considerable decline, with records restricted to West Sussex, Westmorland and north Lancashire, Roxburghshire and east Inverness and Nairn. It was also collected in County Fermanagh, Northern Ireland in 1992. This species is widespread in Europe.
1.3 In Great Britain this species is now classified as *Rare*.

2. Current factors causing loss or decline

2.1 Water abstraction.
2.2 Disturbance to marginal vegetation.
2.3 Infilling of lakes and ponds.
2.4 Eutrophication.

3. Current action

3.1 This species occurs on several SSSIs. The Northern Ireland site is an ASSI which is included within the Upper Lough Erne proposed SAC.
3.2 One site is a Sussex Wildlife Trust Reserve, and another (Insh Marshes) is an RSPB reserve.

4. Action plan objectives and targets

4.1 Maintain populations at all known sites.
4.2 Ensure the maintenance of a minimum of six viable populations across the historic range by 2010.

5. Proposed action with lead agencies

A survey of extant colonies and historic sites should be undertaken for this species. This will establish its current status and provide information to allow implementation of the other measures. Priorities include appropriate management of all extant sites, but this must be based on a better understanding of the beetle's ecological requirements. Each colony needs to be protected from water pollution, damaging agricultural practices and excessive water abstraction.

5.1 Policy and legislation

5.1.1 Take account of the species' requirements in response to applications for water abstraction licences. (Action EA, EHS, SEPA)
5.1.2 Where appropriate, include the requirements of the species when preparing or revising prescriptions for agri-environment schemes. (Action DANI, EHS, EN, MAFF, SNH, SOAEFD)
5.1.3 Address the requirements of this species through the LEAP process and in relevant WLMPs. (Action EA, IDBs, LAs, MAFF)

5.2 Site safeguard and management

5.2.1 Where possible, ensure that all occupied habitat is appropriately managed, including the maintenance of water quality and water levels, by 2008. This may be through SSSI/ASSI or agri-environment scheme management agreements. (Action DANI, DoE(NI), EA, EHS, EN, MAFF, SEPA, SNH, SOAEFD)
5.2.2 Ensure that the habitat requirements of *Donacia aquatica* are taken into account in any development policies, plans and proposals, particularly in respect to the infilling of ponds and lakes in which it occurs. (Action EN, EHS, LAs, SNH)
5.2.3 Ensure that the species is included in site management documents for all relevant ASSIs and SSSIs. (Action EN, EHS, SNH)
5.2.4 Consider notifying as SSSI/ASSIs sites supporting viable populations, where this is necessary to secure their long-term protection and appropriate management. (Action EHS, EN, SNH)

5.3 Species management and protection

5.3.1 Consider reintroducing *Donacia aquatica* to a series of sites within the former range, if necessary to maintain six viable populations. (Action CCW, EHS, EN, SNH)

5.4 Advisory

5.4.1 Advise landowners and managers of the presence of the species and the importance of beneficial management for its conservation. (Action EA, EHS, EN, SNH)
5.4.2 As far as possible, ensure that all relevant agri-environment project officers, members of regional agri-environment consultation groups, relevant drainage engineers and waterways managers are advised of locations for this species, its importance, and management needed for its conservation. (Action DANI, EA, EHS, EN, IDBs, MAFF, SEPA, SNH, SOAEFD)

5.5 Future research and monitoring

5.5.1 Undertake surveys to determine the status of this species. (Action CCW, EHS, EN, SNH)
5.5.2 Conduct targeted autecological research to inform habitat management. (Action EHS, EN, SNH)
5.5.3 Establish a regular monitoring programme for the species and its habitat. (Action EHS, EN, SNH)
5.5.4 Pass information gathered during survey and monitoring of this species to a central database for incorporation in national and international databases. (Action CCW, EHS, EN, SNH)

5.6 Communications and publicity

5.6.1 Promote opportunities for the appreciation of the species and the conservation issues associated with its habitat. This should be achieved through articles within appropriate journals, as well as by a publicity leaflet. (Action EHS, EN, SNH)

5.7 Links with other action plans

5.7.1 This action plan should be considered in conjunction with those for eutrophic standing waters, fens, and mesotrophic lakes.

Donacia bicolora Action Plan

1. Current status

1.1 *Donacia bicolora* is associated with branched bur-reed growing along the margins of rivers, and sometimes ponds, lakes and canals; proximity to flowing water seems to be preferred. The biology has not been studied in the UK. The adults probably feed on the foliage of the host plant, or possibly on the pollen of other aquatic plants, such as yellow flag (*Iris pseudacora*). The larvae are aquatic and feed at the roots/rhizomes of the host plant. Adults occur from mid April until August, with most records in June. The larvae probably have a one or two year developmental period.

1.2 This species has declined dramatically since 1970, before which it was widespread throughout southern England, with scattered records north to Northumberland, and in Wales and Ireland. In Britain this species is now restricted to three sites: in Dorset, Surrey and south Hampshire. In Northern Ireland it has been recorded from six sites in County Fermanagh since 1988 and was also collected at Kiltubbrid Lough, County Armagh in 1997. Although rare, it may be quite plentiful in favoured localities. The reasons for the decline of this species are unknown, but possible causes are listed below. Its congener *D. simplex*, which also occurs on branched bur-reed, has not declined. *Donacia bicolora* is widespread in northern, central and southern Europe, the Mediterranean region, Middle East and Siberia.

1.3 In Great Britain this species is now classified as *Vulnerable*.

2. Current factors causing loss or decline

2.1 Water abstraction.

2.2 Disturbance of marginal vegetation.

2.3 Infilling of lakes and ponds.

2.4 Eutrophication.

3. Current action

3.1 Three of the Northern Ireland sites are ASSIs, two of which are within the Upper Lough Erne candidate SAC. At least two of the three recent records for England fall within SSSIs.

4. Action plan objectives and targets

4.1 Maintain populations at all known sites.

4.2 Ensure the establishment and maintenance of six viable populations across the historic range by 2010.

5. Proposed action with lead agencies

A survey of extant colonies and historic sites should be undertaken for this species. This will establish its current status and provide information to allow targeting of the other measures recommended. Priorities will include appropriate management of all extant sites, based on a better understanding of the beetles' ecological requirements, and protection for each colony from water pollution, damaging agricultural practices and excessive water abstraction activities.

5.1 Policy and legislation

5.1.1 Take account of the species' requirements in response to applications for water abstraction licences. (Action EA, EHS)

5.1.2 Where appropriate, include the requirements of the species when preparing or revising prescriptions for agri-environment schemes. (Action DANI, EHS, EN, MAFF)

5.1.3 Address the requirements of this species in the LEAP process and in relevant WLMPs. (Action EA, IDBs, LAs, MAFF)

5.2 Site safeguard and management

5.2.1 Ensure that all occupied habitat is appropriately managed, including the maintenance of water quality and water levels, by 2008. This may be through SSSI/ASSI or agri-environment scheme management agreements. (Action DANI, EA, EHS, EN, MAFF)

.2.2 Ensure that the habitat requirements of *Donacia bicolor* are taken into account in any development policies, plans and proposals, particularly those involving the infilling of ponds and lakes in which it occurs. (Action EHS, EN, LAs)

5.2.3 Ensure that the species is included in site management documents for all relevant SSSIs/ASSIs. (Action EHS, EN)

5.2.4 Consider notifying as SSSIs/ASSIs sites holding key populations of the species, where this is necessary to secure their long-term protection and appropriate management. (Action EHS, EN)

5.3 Species management and protection

5.3.1 Consider reintroducing *Donacia bicolora* to a series of sites within the former range, if necessary to maintain six viable populations. (Action CCW, EHS, EN)

5.4 Advisory

5.4.1 Advise land owners and managers of the presence of the species and the importance of beneficial management for its conservation. (Action EHS, EN)

5.4.2 As far as possible, ensure that all relevant agri-environment project officers, members of regional agri-environment consultation groups, relevant drainage engineers and waterways managers are advised of

locations for this species, its importance, and the management needed for its conservation. (Action DANI, EA, EHS, EN, IDBs, MAFF)

5.5 Future research and monitoring

5.5.1 Undertake surveys to determine the status of this species. (Action CCW, EHS, EN)

5.5.2 Conduct targeted autecological research to inform habitat management. (Action EHS, EN)

5.5.3 Establish a regular monitoring programme for the species. (Action EHS, EN)

5.5.4 Pass information gathered during survey and monitoring of this species to a central database for incorporation in national and international databases. (Action CCW, EHS, EN)

5.6 Communications and publicity

5.6.1 Promote opportunities for the appreciation of the species and the conservation issues associated with its habitat. This should be achieved through articles within appropriate journals, as well as by a publicity leaflet. (Action EHS, EN)

5.7 Links with other action plans

5.7.1 This action plan should be considered in conjunction with those for coastal and floodplain grazing marsh, chalk rivers, fens, eutrophic standing waters, and mesotrophic lakes.

Graphoderus zonatus Action Plan

1. Current status

1.1 *Graphoderus zonatus* is known to occur naturally in Britain only in Woolmer Forest, north Hampshire. Within the Woolmer Forest area, adults occur in a wide range of pools, most of which are relatively recent in origin and which vary considerably in vegetation, pH, depth and degree of permanence. These include a deep, permanently flooded pond, with its bottom covered by *Sphagnum,* created by peat cutting in 1895; pools resulting from military activities; and pools dug as breeding sites for natterjack toads. Several of the pools receive inflow and are less acidic, and one has been limed. These pools have in common the absence of fish. Teneral adults of the beetle have been found in four of these ponds, indicating successful breeding. Woolmer Pond was excavated in 1986 and 1993 to recreate its mere structure. In the following years larvae were present in the pond from April to July, with third instars into August. Newly emerged adults occurred at the end of June, having pupated at the bases of rush tussocks. Adults may overwinter out of the water. In captivity young larvae fed on Cladocera, and older larvae fed on water boatmen and *Notonecta* nymphs; they showed a preference for open water.

1.2 In Europe the spangled diving beetle has two subspecies. The nominate form extends from south and central Europe to Mongolia, whilst *G. z. verrucifer* is boreo-alpine, extending from Scandinavia to northern Siberia and Italy. In mainland Europe the beetle occurs in the exposed edges of wave-washed sandy lakes, amongst submerged vegetation with some peat substratum, usually in moorland. The British form is probably the nominate form; this is consistent with the confinement of the *G. zonatus* to southern England, despite the abundance of apparently suitable habitats in Scotland.

1.3 In Great Britain the *G. zonatus* is currently classified as *Endangered.* It is given special protection under Schedule 5 of the Wildlife and Countryside Act 1981.

2. Current factors causing loss or decline

2.1 Desiccation of ponds, caused by low winter rainfall and, possibly, water abstraction.

2.2 Pollution by increased run-off from neighbouring roads, and leakage of effluent from a nearby pig farm.

2.3 Hydrological succession, leading to the loss of open water and eventually scrub encroachment.

2.4 Increases in pH, allowing colonisation by fish.

3. Current action

3.1 All of the occupied ponds at Woolmer are within an SSSI.

3.2 The species has been the subject of an English Nature Species Recovery Programme since 1993.

3.3 Woolmer Pond has been excavated by the MoD in 1986 and 1993.

3.4 Surveys have been undertaken of the water beetle fauna of Woolmer Forest and neighbouring areas.

3.5 Annual monitoring has been undertaken since 1993.

3.6 The identity and some aspects of the ecology of the previously undescribed larvae have been elucidated.

3.7 Material from Woolmer has been introduced into neighbouring sites, the survey of which had previously demonstrated the absence of this species. The translocations appear to have been unsuccessful.

4. Action plan objectives and targets

4.1 Ensure that at least four sub-populations are maintained within the Woolmer Forest area by 2010.

5. Proposed action with lead agencies

The priorities under this action plan are to refine knowledge of the ecology *G. zonatus*, to maintain constantly high water levels in occupied ponds [Members from countries where *G. zonatus* is more common may wish to comment on this point. Ed], and to maintain the number of self-sustaining populations.

5.1 Policy and legislation

5.1.1 Undertake a review of water abstraction policies within the area where the species occurs. (Action EA)

5.1.2 Address the requirements of this species in the LEAP process and in relevant WLMPs. (Action EA, IDBs, LAs, MAFF)

5.2 Site safeguard and management

5.2.1 Ensure that the species is included in site management documents for the Woolmer SSSI. (Action EN)

5.2.2 Ensure that the habitat requirements of this species are taken into account in any development policies, plans and proposals that might affect the Woolmer area. (Action EA, EN, LAs)

5.2.3 Where possible, ensure that all occupied habitat is appropriately managed, including prevention of pollution, by 2008. (Action EN, MoD)

5.2.4 If practicable, excavate four new pools in the Woolmer area. (Action EN, MoD)

5.3 Species management and protection

5.3.1 If necessary, introduce the spangled diving beetle to newly-created pools to ensure that four sub-populations are maintained in the area. (Action EN)

5.4 Advisory

5.4.1 Advise all landowners, land managers and planning authorities associated with the Woolmer Forest catchment of appropriate management, including the risks associated with contaminated run-off. (Action EA, EN)

5.5 Future research and monitoring

5.5.1 Continue annual monitoring of adults and larvae. (Action EN)

5.5.2 Conduct targeted autecological research to inform habitat management, in particular the overwintering preferences and feeding habits of the adults. (Action EN)

5.5.3 Pass information gathered during survey and monitoring of this species to a central database for incorporation in national and international databases. (Action EN)

5.6 Communications and publicity

5.6.1 Promote opportunities for the appreciation of the species and the conservation issues associated with its habitat. This should be achieved through articles within appropriate journals, as well as by a publicity leaflet. (Action EN)

5.7 Links with other action plans

5.7.1 Implementation of this plan could benefit other species of shallow heathland pools, including natterjack toad *Bufo calamita*.

5.7.2 This plan should be considered in conjunction with that for lowland heathland.

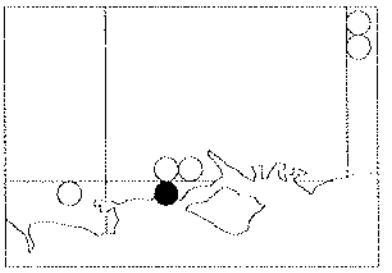
Helophorus laticollis Action Plan

1. Current status

1.1 *Helophorus laticollis* is found in shallow, exposed, grassy pools on heathland. Unlike other British species of the genus which place their egg cocoons in mud beside water, *H. laticollis* places its cocoons among vegetation in the water.

1.2 Although originally found on heathland in Dorset, south Hampshire and Surrey, *Helophorus laticollis* has been recorded only from the New Forest since the 1960s. This species is centred on northern Europe, from Scandinavia south-west to the Netherlands and east to Moscow, with other outlying populations in the central French mountains, southern Germany and Iceland.

1.3 In Great Britain this species is now classified as *Vulnerable*.



2. Current factors causing loss or decline

2.1 Water abstraction.

2.2 Damage to headwater drainage systems, in particular associated with tourist development and road improvement.

2.3 Reduction in grazing, resulting in scrub encroachment.

3. Current action

3.1 Recent records are from within the New Forest SSSI/candidate SAC.

4. Action plan objectives and targets

4.1 Maintain populations at all known sites.

4.2 Ensure populations at known sites have long-term viability.

4.3 Restore populations to two suitable sites within the historic range by 2010.

5. Proposed action with lead agencies

The priority for action is to ensure the continuation of suitable grazing practice in the New Forest so that the habitat is maintained. Reintroductions to sites within the former range must be undertaken. In addition, surveys are required to establish the distribution of the beetle.

5.1 Policy and legislation

5.1.1 Take account of the species' requirements in response to water abstraction licences. (Action EA)

5.1.2 Address the requirements of this species in the LEAP process and in relevant WLMPs. (Action EA, IDBs, LAs, MAFF)

5.2 **Site safeguard and management**

5.2.1 Where possible, ensure that all occupied habitat is appropriately managed by 2008. (Action EN, FE)

5.2.2 Ensure that the species is included in site management documents for all relevant SSSIs. (Action EN)

5.2.3 Ensure that the habitat requirements of *Helophorus laticollis* are taken into account in any relevant development policies, plans and proposals. (Action EN, LAs)

5.2.4 Consider notifying as SSSIs sites holding key populations of the species, where this is necessary to secure their long-term protection and appropriate management. (Action EN)

5.3 **Species management and protection**

5.3.1 Reintroduce this species to two heathland sites, one in Surrey and one in north Hampshire, to establish two new viable populations. (Action EN)

5.4 **Advisory**

5.4.1 Advise landowners and managers of the presence of this species and the importance of beneficial management for its conservation. (Action EA, EN)

5.5 **Future research and monitoring**

5.5.1 Undertake surveys of New Forest and Dorset heathland to identify the extent of the present distribution of this species. (Action EN)

5.5.2 Conduct targeted autecological research to inform habitat management. (Action EN)

5.5.3 Establish a regular monitoring programme for the species. (Action EN)

5.5.4 Pass information gathered during survey and monitoring of this species to a central database for incorporation in national and international databases. (Action EN)

5.6 **Communications and publicity**

5.6.1 Promote opportunities for the appreciation of the species and the conservation issues associated with heathland pools. This should be achieved through articles within appropriate journals, as well as by a publicity leaflet. (Action EN)

5.7 **Links with other action plans**

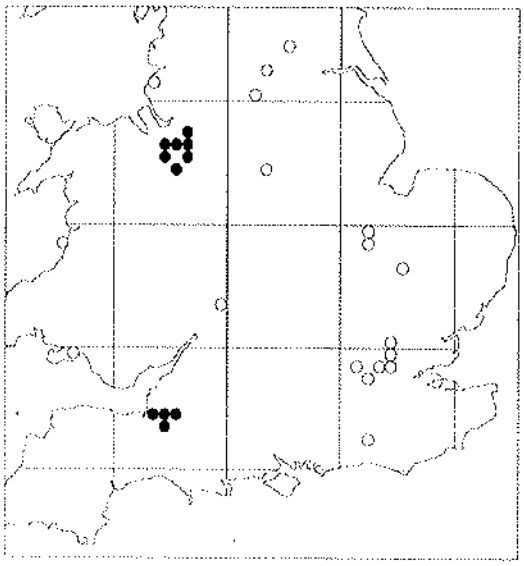
5.7.1 Implementation of this action plan could benefit other species associated with wet heathland, including the water beetle *Agabus brunneus*.

5.7.2 This plan should be considered in conjunction with that for lowland heathland.

Lesser silver water beetle (*Hydrochara caraboides*) Action Plan

1. Current status

1.1 The lesser silver water beetle is found in exposed, richly vegetated ditches and ponds. In the Somerset Moors, this species is confined to peat areas and is frequent only on the turbary peats of Tadham and Westhay Moors. The species benefits from piecemeal, periodic ditch cleaning and high water levels that reduce peat wastage on the Somerset Moors. The Cheshire sites include some relatively undisturbed ponds. The egg cocoon's construction necessitates the use of floating debris and, therefore, large floating plants, such as frogbit and flote-grass, are thought to be beneficial. However, access to ponds and ditches by grazing animals may be required in order to maintain an open structure. Eggs are laid in spring or early summer, and larvae occur, often floating just below the surface, from May to July. The larvae are predators of water snails. Adults emerge during the summer and overwinter, though it is not clear whether this occurs in the water or on the bank. Adults are occasionally found attracted to light or to glass, and fly readily at dusk if kept in captivity.



1.2 In Britain this species is known from 11 ten km squares since 1970. It was much more widely distributed in the 19th century, being particularly well recorded from the Hammersmith Marshes, the Cambridgeshire Fens and Askham Bog. Until recently it was thought to have become confined to ditches on the deeper turbary peats of the Somerset Moors, but the discovery in 1990 of an adult in a pond on the Cheshire Plain has been followed by the discovery of more colonies, some with egg cocoons and larvae. By 1997, it had been recorded from 7 ten km squares here.

1.3 In Great Britain this species is classified as *Endangered*. It is given full protection under Schedule 5 of the Wildlife and Countryside Act 1981.

2. Current factors causing loss or decline

2.1 Inappropriate ditch management.

2.2 Conversion of grazing marsh to arable land, resulting in steeper ditch profiles and overgrowth of ditches in the absence of grazing.
2.3 Infilling of ponds.
2.4 Agricultural improvement.
2.5 Loss of ponds to urban development.

3. Current action

3.1 Ponds on the Cheshire Plain have been the subject of the Pond Life Survey since 1995.
3.2 Through EN's Species Recovery Programme, additional survey has been undertaken and some ponds have been managed to improve them for this species.
3.3 Surveys for this species were undertaken in 1993 and 1994 on the Somerset Moors.
3.4 The species is present in the Somerset Levels and Moors SPA.

4. Action plan objectives and targets

4.1 Maintain viable populations within the Somerset Moors and the Cheshire Plain.

5. Proposed action with lead agencies

The priorities for the lesser silver water beetle are to implement appropriate habitat management at existing sites, and to undertake research to elucidate relevant aspects of the species' ecology. In addition, further surveys should be carried out to establish the distribution of the beetle.

5.1 Policy and legislation

5.1.1 Where appropriate, include the requirements of the species when preparing or revising prescriptions for agri-environment schemes. (Action EN, MAFF)
5.1.2 Take account of this species' requirements in response to applications for water abstraction licences. (Action EA)
5.1.3 Address the requirements of this species in the LEAP process and in relevant WLMPs. (Action EA, IDBs, LAs, MAFF)

5.2 Site safeguard and management

5.2.1 Where possible, ensure that all occupied habitat is appropriately managed, including periodic ditch cleaning on the Somerset Moors, by 2008. This may be through SSSI or agri-environment scheme management agreements. (Action EA, EN, IDBs, MAFF)
5.2.2 Ensure that the habitat requirements of *Hydrochara caraboides* are taken into account in any relevant development policies, plans and proposals. (Action EN, LAs)
5.2.3 Ensure that the species is included in site management documents for all relevant SSSIs. (Action EN)
5.2.4 Consider notifying as SSSIs sites holding key populations of the species, where this is necessary to secure their long-term protection and appropriate management. (Action EN)

5.3 Species management and protection

5.3.1 None proposed.

5.4 Advisory

5.4.1 Advise landowners and managers of the presence of this species and the importance of beneficial management for its conservation. (Action EA, EN, MAFF)
5.4.2 As far as possible, ensure that all relevant agri-environment project officers, and members of regional agri-environment consultation groups, are advised of locations of this species, its importance, and the management needed for its conservation. (Action EN, MAFF)

5.5 Future research and monitoring

5.5.1 Undertake further surveys to determine the status of this species. (Action EN)
5.5.2 Establish a regular monitoring programme for this species. (Action EN)
5.5.3 Conduct targeted autecological research to inform habitat management. (Action EN)
5.5.4 Pass information gathered during survey and monitoring of this species to a central database for incorporation in national and international databases. (Action EN)

5.6 Communications and publicity

5.6.1 Promote opportunities for the appreciation of the species and the conservation issues associated with its habitat. This should be achieved through articles within appropriate journals, as well as by a publicity leaflet. (Action EN)

5.7 Links with other action plans

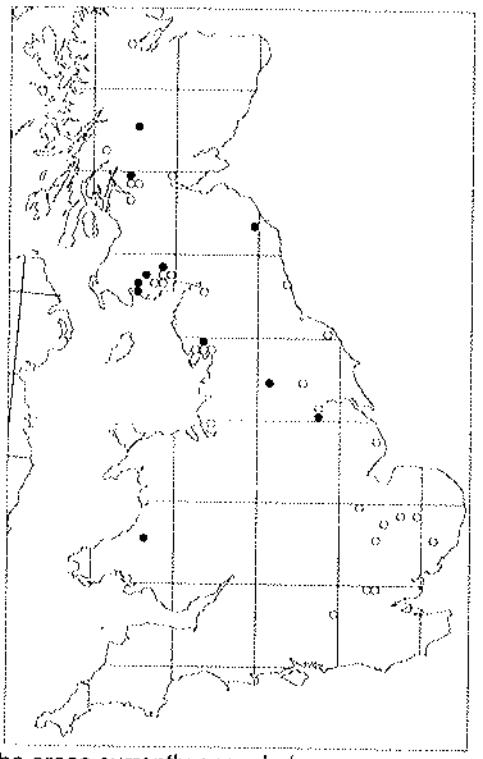
5.7.1 Implementation of this action plan could benefit other species of grazing marsh, including the shining ramshorn snail *Segmentina nitida*.
5.7.2 This plan should be considered in conjunction with that for coastal and floodplain grazing marsh.

Hydroporus rufifrons Action Plan

1. Current status

1.1 *Hydroporus rufifrons* occurs in extremely shallow, temporary pools in unimproved pasture, often in old oxbow systems. Its elusiveness is probably, in part, the result of the brief period of adult activity in the autumn and spring. Flight tests have proved negative.

1.2 *Hydroporus rufifrons* is generally regarded as a rare species, scattered through north and central Europe from France to western Siberia. In the UK, recent published records are for Cardiganshire, north Lincolnshire, mid-west Yorkshire, Westmorland, south Northumberland, Dumfriesshire, and Stirlingshire. An earlier record for Raasay is considered unlikely. It has been recorded at seven sites in the 1980s and three in the 1990s. This species has apparently become extinct in many former habitats on the east side of England from Boldon Flats, County Durham, to west Norfolk, where it was formerly found near to the fluctuating meres of Wretham Heath. The species has also been lost from some northern sites, for example Thurstonfield Lough, but appears to have a stronghold in Galloway and in the southern part of the Lake District.



1.3 In Great Britain this species is classified as *Vulnerable*.

2. Current factors causing loss or decline

2.1 Loss of unimproved pasture.

2.2 Damage to lakeside marginal pool complexes.

2.3 Inundation through impoundment for reservoirs.

3. Current action

3.1 This species occurs on several SSSIs, NNRs and other nature reserves.

4. Action plan objectives and targets

4.1 Ensure that viable populations are maintained within each of the areas currently occupied.

4.2 Reintroduce two populations of this species in East Anglia, and one population in South Wales, by 2010, if not refound in these former parts of its range.

5. Proposed action with lead agencies

The actions in this plan focus on maintaining or establishing appropriate management on sites where *Hydroporus rufifrons* is present. This requires research to supplement existing knowledge of the beetle and its habitat. This beetle is flightless and unlikely to recolonise sites, so a reintroduction programme is needed to recover former sites.

5.1 Policy and legislation

5.1.1 Where appropriate, include the requirements of the species when preparing or revising prescriptions for agri-environment schemes. (Action CCW, EN, MAFF, SNH, SOAEFD, WOAD)

5.1.2 Address the requirements of this species in the LEAP process and in relevant WLMPs. (Action EA, IDBs, LAs, MAFF)

5.2 Site safeguard and management

5.2.1 Where possible, ensure that all occupied habitat is appropriately managed by 2010, for example through SSSI or agri-environment scheme management agreements. (Action CCW, EN, MAFF, SNH, SOAEFD, WOAD)

5.2.2 Ensure that the species is included in site management documents for all relevant SSSIs. (Action CCW, EN, SNH)

5.2.3 Consider notifying as SSSIs sites holding key populations, where this is necessary to secure their long-term protection and appropriate management. (Action CCW, EN, SNH)

5.3 Species management and protection

5.3.1 Consider reintroducing the beetle to a series of sites within the former range to establish three new viable populations, two in East Anglia and one in South Wales. (Action CCW, EN)

5.4 Advisory

5.4.1 Advise landowners and managers of the presence of the species and the importance of beneficial management for its conservation. (Action CCW, EN, MAFF, SNH, SOAEFD, WOAD)

5.4.2 As far as possible, ensure that all relevant agri-environment project officers, and members of regional agri-environment consultation groups, are advised of locations of this species, its importance, and the management needed for its conservation. (Action CCW, EN, MAFF, SNH, SOAEFD, WOAD)

5.5 Future research and monitoring

5.5.1 Undertake surveys to determine the status of the species. (Action CCW, EN, SNH)

5.5.2 Conduct targeted autecological research to inform habitat management. (Action CCW, EN, SNH)

5.5.3 Pass information gathered during survey and monitoring of this species to a central database for incorporation in national and international databases. (Action CCW, EN, SNH)

5.5.4 Encourage studies of the genetics of the beetle to inform any reintroduction programme. (Action CCW, EN, SNH)

5.5.5 Encourage research on the ecology and conservation of this species on an international level, and use the experience to inform habitat management in the UK. (Action CCW, EN, JNCC, SNH)

5.6 Communications and publicity

5.6.1 Promote opportunities for the appreciation of this species and the conservation issues associated with its habitat. This should be achieved through articles within appropriate journals, as well as by a publicity leaflet. (Action CCW, EN, SNH)

5.7 Links with other action plans

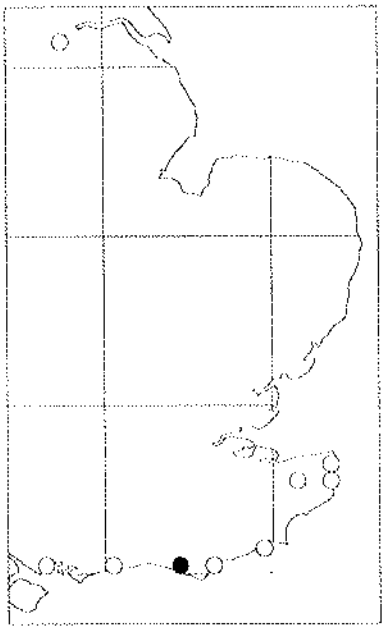
5.7.1 This plan should be considered in conjunction with those for fens, and coastal and floodplain grazing marsh.

Laccophilus poecilus Action Plan

1. Current status

1.1 *Laccophilus poecilus* occupies lowland fen and grazing marsh, near the coast but not in brackish water. Typically, it is associated with richly vegetated margins of ditches and lakes, often with dense ivy-leaved duckweed and aquatic liverwort, but also in dense wet litter in beds of reeds and sedges. There is evidence of flight ability from south-west France.

1.2 There are recent published records for East Sussex and older records for south Hampshire, West Sussex, east Kent and south-west Yorkshire. The species was not found during recent survey work on Thorne Waste, from where it was last reported in 1954. The most recent record for Kent is based on a specimen taken at Canterbury in 1958. *L. poecilus* appears to have become extinct everywhere in its British range except the Lewes Levels, where it was rediscovered in July 1996. It used to be common in parts of the Pevensey Levels, from where it has been lost after water quality deteriorated. *L. poecilus* is a widely distributed Palearctic species, probably commonest around the Mediterranean; it ranges north to southern Norway and Sweden, extending to Asia Minor, Syria, Egypt and the Caspian.



1.3 In Great Britain this species is currently classified as *Vulnerable*.

2. Current factors causing loss or decline

2.1 Water abstraction.

2.2 Declining water quality.

2.3 Conversion of grazing marsh to arable land.

2.4 Inappropriate ditch management.

3. Current action

3.1 A survey, funded by EN, has recently been undertaken of the area of the Lewes Levels formerly occupied by *L. poecilus*.

3.2 The only proven extant site is on the Lewes Brooks SSSI.

4. Action plan objectives and targets

4.1 Maintain a viable population on the Lewes Levels.

4.2 Ensure the establishment and maintenance of viable populations in each of the Pevensey Levels and Deal Marshes by 2010, if not refound in these former parts of its range.

5. Proposed action with lead agencies

The actions in this plan focus on maintaining or establishing appropriate management on sites where *L. poecilus* is present. This requires research to supplement existing knowledge of the beetle and its habitat. A reintroduction programme may be needed to recover former sites.

5.1 Policy and legislation

5.1.1 Where appropriate, include the requirements of the species when preparing or revising prescriptions for agri-environment schemes. (Action EN, MAFF)

5.1.2 Take account of the species' requirement in response to applications for water abstraction licences. (Action EA)

5.1.3 Address the requirements of this species in the LEAP process and in relevant WLMPs. (Action EA, IDBs, LAs, MAFF)

5.2 Site safeguard and management

5.2.1 Where possible, ensure that occupied habitat is appropriately managed, including rotational management of ditch systems, by 2008. This may be achieved through SSSI or agri-environment scheme management agreements. (Action EA, EN, IDBs, MAFF)

5.2.2 Ensure that the species is included in site management documents for the Lewes Brooks SSSI. (Action EN)
5.2.3 Consider notifying as SSSIs any newly-discovered sites holding viable populations of the species. (Action EN)

5.3 Species management and protection

5.3.1 If surveys show that no populations exist outside the Lewes Levels, reintroduce populations of this species to a series of sites within the former range by 2010. (Action EN)

5.4 Advisory

5.4.1 Advise landowners and managers of the presence of this species and the importance of beneficial management for its conservation. (Action EA, EN)

5.5 Future research and monitoring

5.5.1 Undertake surveys to determine the status of this species. (Action EN)
5.5.2 Conduct targeted autecological research to inform habitat management. (Action EN)
5.5.3 Establish a regular monitoring programme at Lewes Levels and any newly-discovered sites. (Action EN)
5.5.4 Pass information gathered during survey and monitoring of this species to a central database for incorporation in national and international databases. (Action EN)

5.6 Communication and publicity

5.6.1 Promote opportunities for the appreciation of the species and the conservation issues associated with its habitat. This should be achieved through articles within appropriate journals, as well as by a publicity leaflet. (Action EN)

5.7 Links with other action plans

5.7.1 Implementation of this action plan could benefit other species of grazing marsh, including the aquatic molluscs *Segmentina nitida* and *Anisus vorticulus*.
5.7.2 This plan should be considered in conjunction with those for fens, and coastal and floodplain grazing marsh.

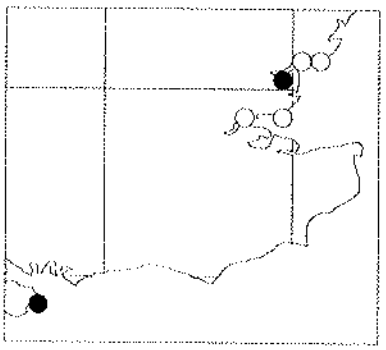
Paracymus aeneus Action Plan

1. Current status

1.1 *Paracymus aeneus* lives in saline pools above the high-water mark, usually in association with vegetation at the edge of ponds.
1.2 There are recent published records for the Isle of Wight, and the species has recently been rediscovered in south Essex. *P. aeneus* is confined to 2 ten km grid squares in England, having only ever been known from a total of six. It is common along the Mediterranean coasts and at saline localities inland as far as central Germany and the Caspian. In northern Europe it reaches southern Norway, Denmark and the southern tip of Sweden.
1.3 In Great Britain this species is currently classified as *Vulnerable*. It is given full protection under Schedule 5 of the Wildlife and Countryside Act 1981.

2. Current factors causing loss or decline

2.1 Loss of habitat by coastal development, particularly rubbish infill.
2.2 Construction of sea defences.



3. Current action

3.1 This species was rediscovered as a result of survey work, supported by EN, in Essex in 1991. The status of *P. aeneus* in the Isle of Wight was assessed in 1995 through survey work commissioned by EN.
3.2 Both sites are within SSSIs, one of which was extended to include the beetle's locality, which are contained within the Solent and Isle of Wight Lagoons candidate SAC and the Essex Estuaries candidate SAC.

4. Action plan objectives and targets

4.1 Ensure that viable populations are maintained within saltmarsh systems currently occupied in the Isle of Wight and Essex.

5. Proposed action with lead agencies

The objectives of this plan will be achieved by protecting existing populations from damaging activities, and by creating additional habitat through the creation of shallow ponds around the high-water mark. Additional survey work needs to be undertaken to determine the status of this species, and research should be conducted into the ecological requirements of this species. Reintroductions will only be considered if either of the two known populations become extinct.

5.1 Policy and legislation

5.1.1 Address the requirements of this species in the LEAP process and in relevant Shoreline Management Plans. (Action EA, LAs, MAFF)

5.2 Site safeguard and management

5.2.1 Where possible, ensure that all habitat is appropriately managed by 2008, for example through site management agreements. (Action EN)

5.2.2 Ensure that the habitat requirements of *Paracymus aeneus* are taken into account in any relevant development policies, plans and proposals, particularly relating to coastal defence and protection. (Action EA, EN, LAs, MAFF)

5.2.3 Where possible, increase the available habitat at known sites and adjacent areas. (Action EA, EN)

5.2.4 Ensure that this species is included in site management documents for the two relevant SSSIs. (Action EN)

5.3 Species management and protection

5.3.1 In the event of population failure at the Isle of Wight or Essex sites, prepare a contingency plan for reintroductions. (Action EN)

5.4 Advisory

5.4.1 Advise landowners and managers of the presence of this species and the importance of beneficial management for its conservation. (Action EN)

5.5 Future research and monitoring

5.5.1 Undertake further surveys to determine the status of this species. (Action EN)

5.5.2 Conduct targeted autecological research to inform habitat management. (Action EN)

5.5.3 Establish a regular monitoring programme for the species. (Action EN)

5.5.4 Pass information gathered during survey and monitoring of this species to a central database for incorporation in national and international databases. (Action EN)

5.5.5 Encourage research on the ecology and conservation of this species on an international level, and use the experience gained towards its conservation in the UK. (Action EN, JNCC)

5.6 Communications and publicity

5.6.1 Promote opportunities for the appreciation of the species and the conservation issues associated with its habitat. This should be achieved through articles within appropriate journals, as well as by a publicity leaflet. (Action EN)

5.7 Links with other action plans

5.7.1 This action plan should be considered in conjunction with those for coastal saltmarsh, and saline lagoons.

Hydroporus cantabricus Species Statement

1. Current status

1.1 *Hydroporus cantabricus* occurs in shallow pools on peat on exposed heathland in southern England. It is found in ruts created by vehicles and in small pools associated with artillery practice. Abroad *H. cantabricus* occurs in wooded bogs and base-rich fens. *H. cantabricus* has been found as teneral adults in pitfall traps in June, indicating that it breeds in spring in temporary pools. Its life cycle is otherwise unknown.

1.2 This species is known in Britain from only three 10 km squares on the Isle of Purbeck and in neighbouring heathland south of the River Frome, Dorset. The last record was from Studland Heath NNR in 1993. There are also recent published records for Jersey. *H. cantabricus* is a Palaearctic 'Atlantic' species, known from western France, Belgium, northern Spain and Portugal. Eastern European records almost certainly refer to *H. hebaueri*.

1.3 In Great Britain this species is currently classified as *Rare*.

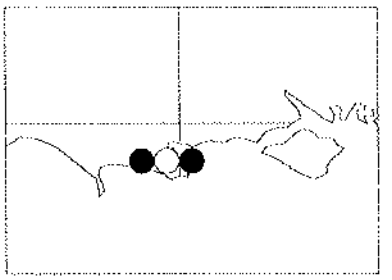
2. Current factors causing loss or decline

2.1 Loss of heathland habitats through agricultural improvement, afforestation and urban encroachment.

2.2 Climate change resulting in loss of temporary pools on lowland heaths.

3. Current action

3.1 This species occurs on the Studland Heath NNR and has been recorded from some other lowland heath SSSIs.



4. Objective for the species

4.1 Maintain existing populations of *H. cantabricus*.

5. Proposed action

5.1 Monitoring only. The requirements of the species should be taken into account in the delivery of the action plan for lowland heathland.

Acknowledgements

Will Simonson, Biodiversity Officer for English Nature, provided electronic copies of the final versions of the BAPs. It would be impossible to acknowledge the efforts of all those who contributed records to the data-base from which these plans were derived. It is possibly desirable to maintain the anonymity of those who wrote the plans! I hope that Club members in the UK will use these plans at every opportunity to gain support from the agencies and non-government organisations that drove the UK BAP through. **GNF**

SOME IDEAS ABOUT RECENT REPORTS OF WATER BEETLES LANDING ON CAR ROOFS

by Gilles Carron and Tibor Becze-Deak

Water beetles landing on car roofs were recently reported by Jäch (1997), Nilsson (1997) and van Vondel (1998) in ***Latissimus* 9** and **10**. Although some hypotheses are exposed to explain why beetles are attracted by car roofs, a clear explanation was lacking. As a generalist entomologist (GC) and a biophysicist (TB-D) together we would like to discuss some ideas which are mainly based on recent publications.

Let us analyse the three reports mentioned above and find out their common characteristics. In Jäch's case, 159 and 222 water beetles belonging to 10 species and 3 families were collected on the bonnet, roof and boot of a red car in the late afternoon/early evening (16.00-18.30 h) of 10 and 11 August respectively. The weather was partly sunny, partly overcast. In Nilsson's case, hundreds of *Hydroporus* belonging to several species were collected on two red cars roofs from 1983 to 1997 with one species *(Hydroporus incognitus)* having the greatest numbers in May and June (381 individuals between 19.30 and 21.30 h on 9 June 1997). Highest numbers of beetles were seen in the evening. In van Vondel's case, many beetles (15 families of which five were aquatic) landed on a red car in the evenings (16.00-20.00 h) of 21 and 25 July; the weather was indicated as probably cloudy. Furthermore, Nilsson (1997) reported an interesting case of dytiscids landing on a white plastic tray.

Common features of these events were: a smooth metallic (car) or plastic surface; the attractive car roofs were red; aquatic beetles were more attracted than other beetles (although terrestrial species were also reported); most landings were observed in late afternoon/early evening. However, the weather was variable and thus so were the light characteristics (direct or diffuse because of clouds).

Horvath and his colleagues of the Biological Physics Department of the University Eötvös Roland in Budapest have studied the attractivity of polarised light on animals (Schwind & Horvath 1993; Horvath 1995; Horvath & Varju 1995; Horvath & Pomozi 1997). They have shown that aquatic insects are strongly attracted to surfaces reflecting horizontally polarised light. Water bugs and water beetles are known to detect their habitat by the horizontally polarised light reflected at the water surface (Schwind 1991, 1995). Some terrestrial insects may also be sensitive to polarised light and detect moist surfaces to feed or oviposit as these also reflect polarised light (Horvath *et al.* 1998a).

Dark, smooth and bright surfaces can reflect horizontally polarised light and so prove attractive to animals sensitive to polarised light such as aquatic insects (Horvath *et al.* 1998a). Some surfaces such as oil lakes, asphalt roads and black plastic sheeting used in agriculture are also very polarising, sometimes even more than the water's surface. They are thus sometimes even more attractive than water to aquatic insects (Horvath, Bernath & Molnar 1998b; Horvath *et al.* 1998a). This explains why mayflies (Ephemeroptera) sometimes oviposit on roads instead of in nearby rivers (Kriska, Horvath & Andrikovics 1998), why dragonflies lay eggs while in flight over roofs of automobiles, smooth cement floors or dark brown perspex (review in Wildermuth 1998) and why birds and insects land on Kuwaiti oil lakes (Horvath & Zeil 1996) and on a refined oil lake near Budapest (Horvath *et al.* 1998a). A behavioural field test made by Wildermuth (1998) showed that dragonflies were attracted by dark brown perspex but not by aluminium foil. This is because only the former reflects horizontally polarised light to a high degree. Aluminium is not an efficient polariser because it is usually covered by a thin film of oxide.

The phenomenon of water beetles landing on plastic or car roofs can be reasonably explained by the attractive physical properties (reflecting horizontally polarised light) of these surfaces. This also explains why water beetles are found on cars more than terrestrial ones. Nevertheless, if the collected species of terrestrial beetles are attracted by muddy surfaces, their presence on car roofs could be explained by the same phenomenon.

The percentage of reflected polarised light is higher if the incident light is oblique than if it is near-vertical. The degree of polarisation is equal to 0 or weak if the incident light is near the vertical ($\hat{i}$ = 0-40°), then grows abruptly and reaches its maximum (over 90%) at 53.1° (for water) and keeps high (>80%) as the angle comes nearer to 90° (i.e. when the incident ray is horizontal to the water surface). Thus one may expect that mornings and evenings, when sun rays are oblique, are more favourable to insects searching for polarised surfaces. Indeed the insects were mainly collected in late afternoon/ evening. Nevertheless this attraction is also noted at midday for dragonflies (in summer in Switzerland, Wildermuth 1998). Morning swarms have not been reported for water beetles. This could be explained by the humid conditions of the habitats preventing the insects from drying out and warming up sufficiently to fly away at the beginning of the day. On a sunny evening, strongly polarised rays are obliquely reflected and are best detected at great distance. This could be most useful to insects flying

high in distance flight, such as swarming water beetles. The same seems less important to insects usually flying just above the surface, such as patrolling dragonflies.

If evening polarised light is an important requirement for water beetles looking for other potential habitats, we might think that if the weather is sunny there could be a preferential direction chosen by the flying beetles, i.e. from east to west! This appears to be against the trend of dispersal. In fact, a multidirectional detection of polarised light is possible if there are even slight waves or irregularities (such as vegetation) at the water's surface.

As the reflected polarised light does not change much if the sun light is direct or obscured by clouds, weather seems to be not important. Indeed, water beetles land on cars whatever the weather. What changes is the light of the sky which, in cloudy weather, is not reflected on the water surface. In this case, a black sheet was noted as more attractive to an *Aeshna* (Odonata) than the water's surface (Wildermuth 1998). However, geometry can have an effect: in cloudy conditions the light is "multi-source" or diffuse, and the reflected rays are not unidirectional (as they are in bright sunny conditions). So the polarised rays are reflected multidimensionally and could be detected from many more aerial positions by the flying insects.

What is the influence of the red colour? Nilsson (1997) observed that his red car was much more attractive than differently coloured ones parked nearby. But Wildermuth (1998) observed in field experiments that red perspex proved largely unattractive to dragonflies and showed that the polarisation of the light was more important than the colour. As different insects may be sensitive to polarised light in different regions of the spectrum, more tests are needed (Wildermuth 1997). Perhaps *Hydroporus* and other water beetles are more sensitive to polarised light in the red range of the spectrum? The effect of the red colour itself on insects cannot yet be excluded.

Finally, why is *Hydroporus incognitus* collected more than other species? We suggest that the optical system of this species should be investigated and compared with those of other species. It would be worthwhile to study in collaboration with biophysicists the properties of its photoreceptors, which in some insects are also polarisation-sensitive (Horvath *et al.* 1998a).

Acknowledgement We thank Christian Monnerat (Neuchâtel) for his valuable references on Odonata, and Dr Judit Becze-Deak (Colombier) and Edward Mitchell (Neuchâtel) for their critical revision of the article and their help in translation.

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HORVATH, G. & POMOZI, I. 1997. How celestial polarization changes due to reflection from the deflector panels used in deflector loft and mirror experiments studying avian navigation. *Journal of Theoretical Biology* **184** 291-300.

HORVATH, G. & VARJU, D. 1995. Underwater refraction-polarization patterns of skylight perceived by aquatic animal through Snell's window of the water surface. *Vision Research* **35** 1651-1666.

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SCHWIND, R. 1995. Spectral regions in which aquatic insects see reflected polarized light. *Journal of Comparative Physiology* **177 A** 439.

SCHWIND, R & HORVATH, G. 1993. Reflection-polarization pattern at water surfaces and correction of a common representation of the polarization pattern of the sky. *Naturwissenschaften* **80** 82-83.

VONDEL, B.J. van 1996. Another case of water beetles landing on a red car roof. ***Latissimus* 10** 29.

WILDERMUTH, H. 1997. How dragonflies detect water. *Abstracts Paper XIV. International Symposium of Odonatology, Maribor* 40.

WILDERMUTH, H. 1998. Dragonflies recognize the water of rendezvous and oviposition sites by horizontally polarized light: a behavioural field test. *Naturwissenschaften* **85** 297-302.

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HYDRADEPHAGA PUBLICATION LIST AND LIST OF TAXA DESCRIBED BY THE LATE DR T G VAZIRANI

by Anders N Nilsson

Dr Tahil Gianchand Vazirani was born on 26th October 1926, at Sukker, Sind, in Pakistan. After studies at the University of Bombay, he was employed by the Zoological Survey of India in 1948. In the late 60's he worked for a shorter period in the Natural History Museum of Paris under a French Government Scholarship. In the mid 70's he became deputy director at the Survey and moved to the Desert Regional Station at Jodhpur. In 1979 he moved to London as Research Officer on Coleoptera in the Commonwealth Institute of Entomology, London. He worked in London until his death in 1982 or 1983.

According to the text on the dust-jacket of his 1984 Fauna of India volume, Vazirani published more than 100 scientific papers. So far, I have tracked down 54 of his papers dealing with Hydradephaga. Other papers concerned chrysomelids and weevils, as well as heteropteran bugs, centipedes, bat parasites, and even the feeding habits of lizards. He published most of his papers alone, and the only cooperative works I know of are one published with Günther Wewalka in 1985 and one with Mogens Holmen in 1990, both published posthumously. The only hydradephagan species that I have found named after him is *Hydaticus vaziranii* Wewalka 1979:126, from the Andaman Islands.

Dr Vazirani described many new species: three in the Gyrinidae, four in the Haliplidae, one in the Noteridae, one in the Amphizoidae (later transferred to the Dytiscidae), and 47 in the Dytiscidae. He also described one subspecies and several new subgenera in the Dytiscidae. It seems that his descriptions were often overlooked by European specialists working with Oriental taxa, even though most of the descriptions were listed in the *Zoological Record*, often with some delay. Some of his taxa have been included in revisions by European specialists, although they did not have access to type material. Most of the Vazirani types have been deposited in the collections of the Zoological Survey of India in Calcutta. According to the personal experience of Paolo Mazzoldi (in litt.), the study of Vazirani types is possible only after an initial period of correspondence with the Indian bureaucracy, followed by a stay in Calcutta for at least a week. Bringing your own microscope is a good idea. As the gyrinid types Paolo was looking for could not be found in Calcutta, they might well be in London.

The delay commonly found in the publication of Dr. Vazirani's papers provides a problem in dating his descriptions accurately. Without access to most of the journals in which he published, I have chiefly used the information found in the *Zoological Record* together with his own dates as given in the reference list of later papers or on reprints in his own handwriting. I would be very glad for comments on the publication years that I have listed, in case there are other more firmly based opinions held by the readers. Most appreciated would also be copies of the papers I am still missing, i.e. nos 1 and 6, plus those not listed at all of course.

List of publications dealing with Hydradephaga

The papers are here listed in chronological order. After most of the titles I have given information in relation to the *Zoological Record*: [ZR] listed in *Zoological Record* same year, [ZR 19xx] publication year as given in *Zoological Record*, and [(ZR 19xx)] delayed listing in *Zoological Record*.

1. Vazirani T.G. 1952 A new host record of the Hymenopterous parasite *Melcha ornatipennis* Cameron (Ichneumonidae). *Journal of the Zoological Society of India* **4** 101.
2. Vazirani T.G. 1953 On a collection of aquatic Coleoptera from the Mettur Dam, Salem District, Madras, with the description of a new species. *Records of the Indian Museum, Calcutta* **50** (1952) 423-428. ZR
3. Vazirani T.G. 1958 On a collection of Gyrinidae (Coleoptera) in the Zoological Survey of India, with the descriptions of two new species. *Records of the Indian Museum, Calcutta* **53** (1955) 13-17. ZR
4. Vazirani T.G. 1963 On the Indian species of the genus *Neptosternus* Sharp (Dytiscidae - Coleoptera) with the description of a new species. *Bulletin of Entomology, Loyola College Madras* **4** 14-17. (ZR 1965)
5. Vazirani T.G. 1964 On a new species of aquatic beetle of the genus *Amphizoa* LeConte,1853 (Insecta: Coleoptera: Amphizoidae) from Kashmir, India. *Proceedings of the Zoological Society of Calcutta* **17** 145-147. (ZR 1965)
6. Vazirani T.G. 1964 On the morphology and ecology of the larvae of *Cybister* spp. (Dytiscidae, Coleoptera). *Bulletin of Entomology, Loyola College Madras* **5** 31-48.

7. Vazirani T.G. 1965 Revision of the Oriental species of the genus *Platambus* Thomson (Insecta: Coleoptera: Dytiscidae), with descriptions of three new species. *Proceedings of the Zoological Society of Calcutta* **18** 25-34. ZR
8. Vazirani T.G. 1966 A review of the Indian Haliplidae (Insecta Coleoptera), with descriptions of two new species. *Proceedings of the Zoological Society of Calcutta* **19** 127-134
9. Vazirani T.G. 1968 Contribution to the study of aquatic beetles (Coleoptera). 1. On a collection of Dytiscidae from the Western Ghats with descriptions of two new species. *Oriental Insects* 1(1967) 99-112.
10. Vazirani T.G. 1969 Contribution to the study of aquatic beetles (Coleoptera). 2. A review of the subfamilies Noterinae, Laccophilinae, Dytiscinae and Hydroporinae (in part) from India. *Oriental Insects* **2** (1968) 221-341. ZR 1968
11. Vazirani T.G. 1969 Contribution to the study of aquatic beetles (Coleoptera). IV. A review of *Pleurodytes* Régimbart (Col. Dytiscidae). *Annales de la Société Entomologique de France* (N. S.) **5** 137-141.
12. Vazirani T.G. 1969 Contribution to the study of aquatic beetles (Coleoptera). V. Revision of Indian species of *Hyphoporus* Sharp (Dysticidae). *Bulletin du Muséum National d'Histoire Naturelle* (2) **41**(1) 203-225.
13. Vazirani T.G. 1969 Two new species and notes on other species of aquatic Coleoptera from Ceylon. *Spolia Zeylanica* **31** 399-403.
14. Vazirani T.G. 1970 Contributions to the study of aquatic beetles (Coleoptera). VI. A review of Hydroporinae: Dytiscidae in part, from India. *Oriental Insects* **4** 93-129.
15. Vazirani T.G. 1970 Contributions to the study of aquatic beetles (Coleoptera). 9. On a collection of Dytiscidae from South Andaman Islands. *Oriental Insects* **4** 177-184.
16. Vazirani T.G. 1970 Contributions to the study of aquatic beetles (Coleoptera). VII. A revision of Indian Colymbetinae (Dytiscidae). *Oriental Insects* **4** 303-362.
17. Vazirani T.G. 1970 Contributions to the study of aquatic beetles (Coleoptera). 10. On a collection of Dytiscidae from Goa. *Oriental Insects* **4** 441-446.
18. Vazirani T.G. 1970 Fauna of Rajasthan, India. Part 5. Aquatic beetles (Insecta: Coleoptera: Dytiscidae). *Records of the Zoological Survey of India* **62** 29-49.
19. Vazirani, T.G. 1970 On *Laccoporus nigritulus* (Gschwendtner) comb. nov. (Coleoptera: Dytiscidae). *Current Science* **39** (24) 563.
20. Vazirani T.G. 1971 Contributions to the study of aquatic beetles (Coleoptera). 8. A new subgenus of *Clypeodytes* Régimbart (Dytiscidae). *Journal of the Bombay Natural History Society* **68** 481-482.
21. Vazirani T.G. 1971 Description of the larva of the aquatic beetle, *Sandracottus dejeani* (Aubé). *Proceedings of the Zoological Society of Calcutta* **24** 25-28.
22. Vazirani T.G. 1972 On the reported occurrence of *Dytiscus marginalis* Linnaeus (Coleoptera: Dytiscidae) from India. *Bulletin of Entomology, Loyola College Madras* **12** (1971)(2)137.
23. Vazirani T.G. 1972 Contribution to the study of aquatic beetles. 13. A collection of Dytiscidae from Nilgiri Hills, South India, with the description of a new species. *Proceedings of the Zoological Society of Calcutta* **25** 117-122. ZR
24. Vazirani T.G. ?1972. Aquatic insects in relation to fisheries in India. *Cheetal, Journal of the W.L.P.S. of India*, **17** (2) 14-24.
25. Vazirani T.G. 1973 Contributions to the study of aquatic beetles (Coleoptera). 11. On a collection of Gyrinidae, Dytiscidae, and Hydrophilidae from Andaman Islands. *Records of the Zoological Survey of India* **67** (1972) 81-85.
26. Vazirani T.G. 1973 Contribution to the study of aquatic beetles. 12. On a collection of Dytiscidae from Gujarat with description of a new species. *Records of the Zoological Survey of India* **67** (1972) 287-302. ZR 1973
27. Vazirani T.G. 1973 Contribution to the study of aquatic beetles. -14. *Copelatus neelumae* sp. nov. (Dytiscidae) from India. *Journal of the Bombay Natural History Society* **70** (1972) 224-226. ZR 1973
28. Vazirani T.G. 1974 Two new species of Dytiscidae (Insecta: Coleoptera) from India. *Indian Museum Bulletin* **7** (1)(1972) 16-20. ZR 1974
29. Vazirani T.G. 1975 *Laccophilus wewalki* sp. nov. (Coleoptera: Dytiscidae) from India. *Oriental Insects* **8** (1974) 487-488.
30. Vazirani T.G. 1975 A new species of Haliplidae (Insecta: Coleoptera) from India. *Oriental Insects* **9** (3) 317-318.

31. Vazirani T.G. 1975 A new species of *Neptosternus* Sharp (Dytiscidae: Coleoptera) from India. *Geobios Jodhpur* **2** 160-161.
32. Vazirani T.G. 1975 Some new records of Dytiscidae (Coleoptera) from Tamil Nadu (India). *Newsletter of the Zoological Survey of India* **1** (2) 20-21.
33. Vazirani T.G. 1976 Some new records of Dytiscidaa (Coleoptera) from N.E. India. *Newsletter of the Zoological Survey of India* **2** (2) 61-63. (ZR 1977)
34. Vazirani T.G. 1976 Some new records of Dytiscidae (Coleoptera) from Uttar Pradesh, India. *Newsletter of the Zoological Survey of India* **2** (2) 65-67. (ZR 1977)
35. Vazirani T.G. 1976 Contribution to the study of aquatic beetles (Coleoptera). 15. Subgeneric classification of *Platynectes* Régimbart (Dytiscidae). *Records of the Zoological Survey of India* **71** 169-173.
36. Vazirani T.G. 1977 External morphology of *Cybister tripunctatus asiaticus* Sharp (Coleoptera: Dytiscidae). *Records of the Zoological Survey of India* **72** (1-4) 23-38. (ZR 1978)
37. Vazirani T.G. 1977 Contribution to the study of aquatic beetles (Coleoptera). 14. On the collection of Dytiscidae from Gujarat. Part 2. *Records of the Zoological Survey of India* **73** (1-4) 53-61. (ZR 1978)
38. Vazirani T.G. 1977 Notes on a collection of Dytiscidae (Coleoptera) from Maharashtra, with description of a new species. *Records of the Zoological Survey of India* **73** (1-4) 123-133. (ZR 1978)
39. Vazirani T.G. 1977 Some new records of Dytiscidae (Coleoptera) from South Gujarat. *Newsletter of the Zoological Survey of India* **3** (1)41-45. ZR
40. Vazirani T.G. 1977 Some new records of Indian Haliplidae (Coleoptera). *Newsletter of the Zoological Survey of India* **3** (4) 169. ZR
41. Vazirani T.G. 1977 Collection of Gyrinidae (Coleoptera) from Madhya Pradesh. *Newsletter of the Zoological Survey of India* **3** (5) 251-253. ZR
42. Vazirani T.G. 1977 Collection of Gyrinidae (Coleoptera) from Maharashtra. *Newsletter of the Zoological Survey of India* **3** (5) 279-280. ZR
43. Vazirani T.G. 1977 On the collection of Gyrinidae (Coleoptera) from N.E. India. *Newsletter of the Zoological Survey of India* **3** (5) 290-292. ZR
44. Vazirani T.G. 1977 Taxonomic status of *Cybister gracilis* Sharp (Coleoptera Dytiscidae). *Indian Journal of Entomology* **37** (1975) 214-215. ZR 1977
45. Vazirani T.G. 1977 Taxonomic status of *Cybister prolixus* Sharp (Coleoptera: Dystiscidae). *Indian Journal of Entomology* **37** (1975) 307-308. ZR 1977
46. Vazirani T.G. 1977 Dytiscidae collected at light in the Oriental Region. *Indian Museum Bulletin* **9** (1) (1974) 41-44.
47. Vazirani T.G. 1977 Catalogue of Oriental Dytiscidae. *Records of the Zoological Survey of India Miscellaneous Publication Occasional Paper* **6** (1977) 1-111. (ZR 1980)
48. Vazirani T.G. 1980 Dytiscidae: Coleoptera from Himachal Pradesh with description of a new species. *Bulletin of the Zoological Survey of India* **3** 27-30.
49. Vazirani T.G. 1981 Collection of Dytiscidae (Coleoptera) from Madhya Pradesh. Bulletin of the Zoological Survey of India **3** 257-265.
50. Vazirani T.G. 1984 *The Fauna of India. Coleoptera. Family Gyrinidae and family Haliplidae.* Zoological Survey of India, Calcutta, 140 pp. + 57 figs + 3 pls.
51. Wewalka G. & Vazirani T.G. 1985 Two new species of Dytiscidae (Coleoptera) from Sri Lanka. *Zeitschrift der Arbeitsgemeinschaft Österreichischer Entomologen* **36**(1984) 113-115.
52. Holmen M. & Vazirani T.G. 1990 Notes on the genera *Neptosternus* Sharp and *Copelatus* Erichson from Sri Lanka and India with the description of new species (Coleoptera: Dytiscidae). *Koleopterologische Rundschau* **60** 19-31.

Notes

[4] According to Vazirani 46:17, the species *Neptosternus biharensis* was first described by Vazirani in 1962 "Second All India Cong. Zool., Abst.:90". This reference is unknown to me.

[10] Although this paper was listed by *Zoological Record* for 1968, the information on the cover of the issue says that is was not printed until February 1969.

[28] *Zoological Record* 1979 cites a second description of the two species described in this paper as: Vazirani T.G. 1975: Two new species of *Copelatus* Erichson, (Insecta: Coleoptera: Dytiscidae) from India, 341-347. *In*: Tiwari K.K. & Srivastava C.B. (Eds). Dr B.S. Chauhan commemoration

volume 1975. *Zoological Society of India*, Vani Vihar, Orissa, India, i-viii + 1-439 pp. This work is unknown to me.

[52] The publication of this paper was seriously delayed by the death of Dr Vazirani. It was cited as being in press in *Entomologica Scandinavica* by Jäch (1984:240) and others. When finally published in 1990, the manuscript had been strongly modified by Holmen (in litt.).

Described taxa and their current status

The names of the Hydradephaga taxa described by Dr Vazirani have been arranged alphabetically under each category and family. The current status of the names are given when they have been dealt with by other specialists. The numbers with square brackets after the genus name of the original binomen refer to the publication list.

Species

Gyrinidae

himalayensis 1984:56 *(Orectochilus)* [50].
orissaensis 1958:13 *(Orectochilus)* [3].
ribeiroi 1958:14 *(Orectochilus)* [3].

Haliplidae

agarwali 1984:117 *(Haliplus)* [50].
kapuri 1975:317 *(Haliplus)* [30], revised by van Vondel 1993:301.
manipurensis 1966:132 *(Haliplus)* [8], confirmed by van Vondel 1993:303.
pruthii 1966:130 *(Haliplus)* [8], confirmed by van Vondel 1993:310.

Noteridae

pseudomorsbachi 1969:399 *(Canthydrus)* [13].

Dytiscidae

anitae 1969:221 *(Hyphoporus)* [12].
assamensis 1969:309 *(Hyphydrus)* [10], junior synonym of *Hyphydrus sumatrae* Régimbart 1880:211 *vide* Biström 1982:94.
assamensis 1970:316 *(Copelatus)* [16].
aurofasciatus 1972:118 *(Laccophilus)* [23], revised by Brancucci 1983:261.
balfourbrownei 1965:28 *(Platambus)* [7], revised by Brancucci 1988:200.
balli 1970:127 *(Potamonectes)* [14], transferred to *Nebrioporus (Nebrioporus)* Régimbart 1906:237 by Nilsson & Angus 1992:287.
bangalorensis 1970:311 *(Copelatus)* [16], confirmed by Rocchi 1986:33.
bertrandi 1969:218 *(Hyphoporus)* [12].
biharensis 1963:14 *(Neptosternus)* [4], confirmed by Holmen & Vazirani 1990:21.
birmanicus 1970:352 *(Rhantus)* [16], junior synonym of *Rhantus suturalis* (MacLeay 1825:135) *vide* Balke 1992:292.
biswasi 1965:32 *(Platambus)* [7], revised by Brancucci 1988:193.
ceylonicus 1969:402 *(Copelatus)* [13].
ceylonicus Holmen & Vazirani 1990:22 *(Neptosternus)* [52].
dehraduni 1969:211 *(Hyphoporus)* [12].
geetae 1969:221 *(Hyphoporus)* [12].
gibsoni 1974:19 *(Copelatus)* [28].
guignoti 1965:27 *(Platambus)* [7], junior synonym of *Platambus lindbergi* Guéorguiev 1963:218 *vide* Brancucci 1988:202.
guignoti 1970:346 *(Hydronebrius)* [16], junior synonym of *Hydronebrius kashmirensis* (Vazirani 1965:145) *vide* Kavanaugh & Roughley 1981:271.
gujaratensis 1973:297 *(Guignotus)* [26], transferred to *Hydroglyphus* Motschulsky 1853:5 by Biström 1988:13.
hemani 1968:106 *(Clypeodytes)* [9], confirmed by Biström 1988:30.
horai 1953:424 *(Neptosternus)* [2], confirmed by Holmen & Vazirani 1990:21.
horai 1969:329 *(Clypeodytes)* [10], transferred to *Leiodytes* Guignot 1936:20 by Biström 1988:27.
jaechi Wewalka & Vazirani 1985:114 *(Sandracottus)* [51].
josephi 1969:223 *(Hyphoporus)* [12].
karnatakus Holmen & Vazirani 1990:27 *(Copelatus)* [52].
kashmirensis 1964:145 *(Amphizoa)* [5], transferred to *Hydronebrius* Jakovlev 1897:37 by Kavanaugh & Roughley 1981:271.
kashmirensis 1970:118 *(Hydroporus)* [14], preocc. by Régimbart 1899:195 (now in *Nebrioporus*); transferred to *Hygrotus (Coelambus)* by Brancucci 1981:181; *Hygrotus vaziranii* nom. nov. given here.
kempi 1970:330 *(Agraphis)* [16], transferred to *Platambus (Agraphis)* by Brancucci 1988:214.
lambai 1977:127 *(Lacconectus)* [38], revised by Brancucci 1989:107.
mahleri Holmen & Vazirani 1990:28 *(Copelatus)* [52].

manii 1970:124 *(Potamonectes)* [14], transferred to *Nebrioporus (Nebrioporus)* Régimbart 1906:237 by Nilsson & Angus 1992:288; junior synonym of *Nebrioporus indicus* (Sharp 1882:431) *vide* Toledo 1998:86.
manipurensis 1969:277 *(Sandracottus)* [10].
minutus 1969:330 *(Clypeodytes)* [10], transferred to *Leiodytes* Guignot 1936:20 by Biström 1988:27.
mysorensis 1970:319 *(Copelatus)* [16], confirmed by Rocchi 1986:33.
neelumae 1973:224 *(Copelatus)* [27].
orissaensis 1969:328 *(Clypeodytes)* [10], transferred to *Leiodytes* Guignot 1936:20 by Biström 1988:27.
pradhani 1969:315 *(Guignotus)* [10], transferred to *Hydroglyphus* Motschulsky 1853:5 by Biström 1988:14.
punjabensis 1970:355 *(Rhantus)* [16], junior synonym of *Rhantus sikkimensis* Régimbart 1899:306 *vide* Balke 1992:289.
rajasthanicus 1975:160 *(Neptosternus)* [31], confirmed by Holmen & Vazirani 1990:21.
sabitae 1968:103 *(Microdytes)* [9], confirmed by Wewalka 1997:31.
satie 1980:28 *(Potamonectes)* [48], transferred to *Nebrioporus (Nebrioporus)* Régimbart 1906:237 by Nilsson & Angus 1992:288; junior synonym of *Nebrioporus melanogrammus* (Régimbart 1899:199) *vide* Toledo 1998:84.
sharpi 1969:264 *(Hydaticus)* [10], preoccupied by Peschet 1917:45; *Hydaticus orissaensis* nom. nov. given here.
sindensis 1969:247 *(Laccophilus)* [10], junior synonym of *Laccophilus indicus* Gschwendtner 1936:366 *vide* Brancucci 1983:322.
sinharajaicus Holmen & Vazirani 1990:21 *(Neptosternus)* [52].
spangleri 1974:19 *(Copelatus)* [28].
subaequalis 1969:217 *(Hyphoporus)* [12].
tabrobanicus Wewalka & Vazirani 1985:113 *(Copelatus)* [51].
wewalkai 1975:487 *(Laccophilus)* [29], junior synonym of *Laccophilus anticatus anticatus* Sharp 1890:341 *vide* Brancucci 1983:302. The name of this species was misspelled first as "*wewalki*" in the title and then as "*wewalka*" in the description; as it is clearly stated that it was named after "Dr. Wewalka" it has to be emended to *wewalkai*.
wewalkai Holmen & Vazirani 1990:28 *(Copelatus)* [52], nom. nov. for *Copelatus spangleri* Wewalka 1981:68, not Vazirani 1974:19.

Subspecies

Dytiscidae
pictus nalinie 1969:311 *(Hyphydrus)* [10], nom. nov. for *Hyphydrus pictus indicus* Gschwendtner 1936:367, not Sharp 1882:382; junior synonym of *Hyphydrus gschwendtneri* Guignot 1942:17 *vide* Biström 1982:93.

Subgenera

Dytiscidae
Carinonectes 1976:171 (of *Platynectes*) [35], nom. nov. for *Neoplatynectes* Guéorguiev 1972:34, not Vazirani 1970:343; junior synonym of *Platynectes* Régimbart 1879:454 *vide* Nilsson *et al.* 1989:292.
Gueorguievtes 1976:170 (of *Platynectes*) [35], confirmed by Nilsson *et al.* 1989:295.
Neoplatynectes 1970:343 (of *Platynectes*) [16], junior synonym of *Agabus* Leach 1817:69 *vide* Nilsson 1997:625.
Paraclypeus 1971:481 (of *Clypeodytes*) [20], status unclear *vide* Biström 1988:30.
Paralacconectus 1970:326 (of *Lacconectus*) [16], junior synonym of *Lacconectus* Motschulsky 1855:83 *vide* Brancucci 1986:90.
Paraplatynectes 1970:342 (of *Platynectes*) [16], junior synonym of *Platambus* Thomson 1859:14 *vide* Nilsson *et al.* 1989:304.

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CALIFORNIAN DYTISCIDAE

This list is for 127 species in 27 genera. Mountainous counties have 40 or more species while many central valley counties have 20 or less. Gilbert Challet draws members' attention to his new address.

CHALLET, G.L. & BRETT, R. 1998. Distribution of the Dytiscidae (Coleoptera) of California by County. *Coleopterists Bulletin* **52** (1) 43-54.

CHILEAN HYDRAENIDAE

By description of the new species, Ochtheosus franzi, the number of species in this strange terrestrial genus is doubled. If one includes the undescribed species depicted by B-B in 1975 then there are now five *Hydraenida* species, with the description of *H. franzi* and *H. sanctijacobi.*

BALFOUR-BROWNE, J. 1975 *Parhydraenida*, gen. n., and notes on *Hydraenida ocellata* Germain (Coleoptera: Staphylinoidea, Hydraenidae). *Revista Brasileira de Entomologia* **19** 39-45.

JÄCH, M.A. 1998. Description of two new species of *Hydraenida* Germain (Coleoptera: Hydraenidae). *Koleopterologische Rundschau* **68** 167-169.

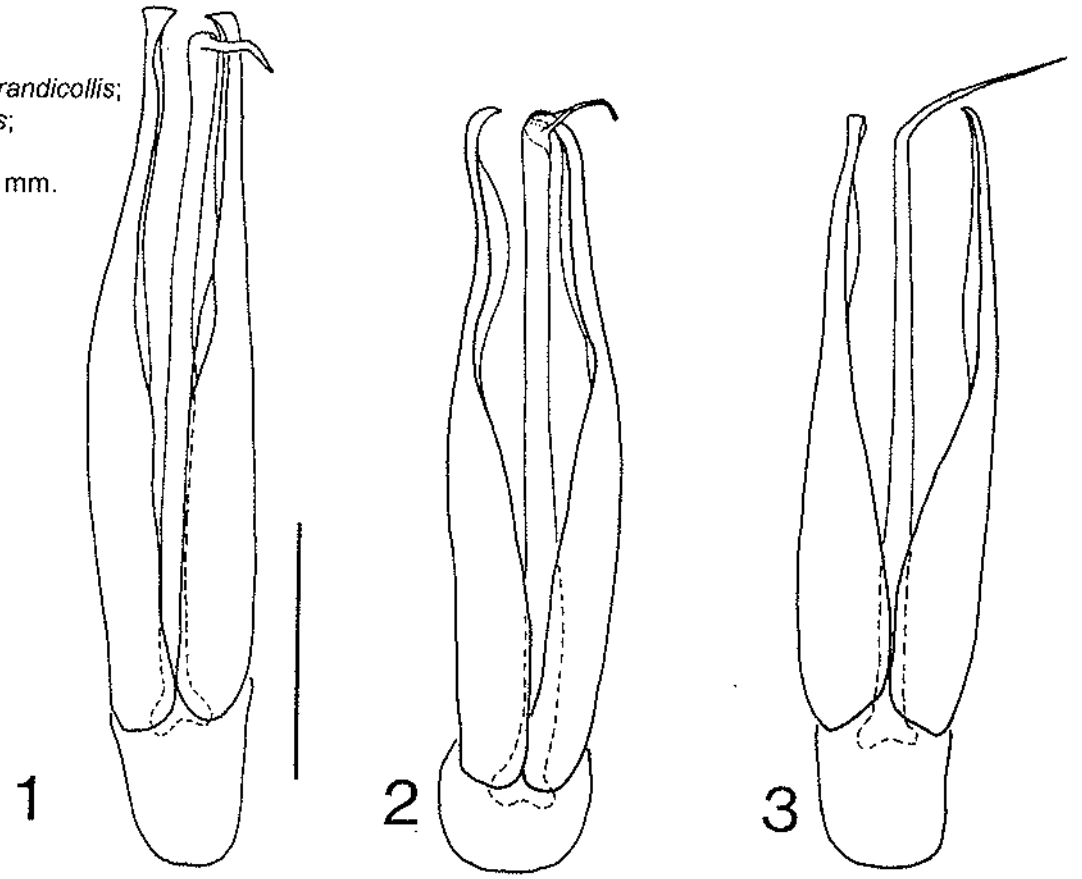
JÄCH, M.A. 1998. Synopsis of the genus *Ochtheosus* Perkins (Coleoptera: Hydraenidae). *Koleopterologische Rundschau* **68** 171-174.

NOTES ON THE STATUS OF *HYDROCHUS INTERRUPTUS* HEYDEN AND *H. MARTINAE* MAKHAN by Ignacio Ribera, Carles Hernando and Pedro Aguilera

The species of the genus *Hydrochus* can be readily characterised by their aedeagus, but their external morphology is most variable, in particular in size, colour, and degree of development of the punctures, elytral ridges and tubercles. It is not surprising that the taxonomy of the genus has proved a nightmare (although not always can the beetles be blamed). In western Europe the revisional work of Angus (1976) settled many long-lasting problems, but the status of several southern taxa remained obscure. At the Balfour-Browne Club meeting in Barcelona in 1994 Arno van Berge Henegouwen presented (via Garth Foster) the preliminary results of a revision of the western European species of the genus, including many interesting novelties, which raised the expectation of an almost definitive solution to most of the problems with Iberian and north African species of *Hydrochus*. Unfortunately, this revision has still not been published (although one of the species presented as new, "*Hydrochus fangbani*", is in the process of being independently described by Valladares *et al.* (in press), and the confusion around the species of *Hydrochus* has increased. Here we note some problems to be solved concerning the status of *H. interruptus* Heyden and the recently described *H. martinae* Makhan, with the hope, if not of solving anything finally, of at least confining the chaos.

Hydrochus interruptus was described from La Granja, in Sierra de Guadarrama (province of Segovia, central Spain) based on material collected by E. vom Bruck, of which one specimen was kept by Heyden (Heyden 1870). It was synonymised with *H. nitidicollis* Mulsant by Angus (1976), following the suggestions given by J. Balfour-Browne (in litt. 1972), who examined the only type from La Granja (apparently a female). The same specimen was studied by d'Orchymont (1929), who noted the existence of another specimen from El Escorial (also in Sierra de Guadarrama, province of Madrid, at ca. 30-40 km from La Granja) labelled as *H. interruptus* in the Kniz [Knisch] collection, which according to him seemed to have a different external morphology.

Figures 1-3
Aedeagi of
1 *Hydrochus grandicollis*;
2 *H. interruptus*;
3 *H. nitidicollis.*
Scale bar 0.25 mm.



We have not been able to study the type of *H. interruptus* from La Granja, which is not available in the Deutsches Entomologisches Institut (Eberswalde) (DEI), but we have studied the specimens (two) deposited in the Kniz collection (also in the DEI), with a hand-written identification label by Heyden, and some other material from El Escorial collected by Pérez-Arcas, deposited in the Museo Nacional de Ciencias Naturales (Madrid) (MNCN), and also labelled as *H. interruptus*. All of them correspond to the same species, which is different from *H. nitidicollis* (as compared with material deposited in the

the same species, which is different from *H. nitidicollis* (as compared with material deposited in the Natural History Museum in London, NHM, which agrees with the concept of the species fixed by Angus 1976). There are important and constant differences between these two species in the aedeagus (Figs 1 - 3), specially in the apex of the parameres, and the aspect in lateral view (much more curved in *H. interruptus* than in *H. nitidus* and *H. grandicollis*).

Hydrochus interruptus is also different from *Hydrochus grandicollis* Kiesenwetter in Heyden (1870), described on the basis of one specimen from Jaén (Andalucía) and two from Corsica. According to the description, specimens from both localities were identical except in that those from Corsica were somewhat larger, and with a more pronounced metallic hue. We have not been able to study the types of *H. grandicollis*, but there are no apparent confusions with the concept of this species, which is well characterised by its aedeagus (Fig. 3), and different from *H. interruptus* and *H. nitidicollis* (see also Castro & Delgado 1998 for differences between *H. nitidicollis* and *H. grandicollis*, although these authors do not recognise *H. interruptus*).

Hydrochus martinae was described by Makhan (1996) based on material collected in El Escorial by Pérez-Arcas. The holotype of *H. martinae* bears an identification label with the name *H. interruptus* Heyden, although this was not noted its description, in which the name *H. interruptus* is not even mentioned. The study of the type and some paratypes of *H. martinae*, deposited in the MNCN, demonstrated that it is the same as the species as *H. interruptus* from the DEI and the MNCN (and probably all belong to the same series of specimens, as the cards on which they are glued look very similar). There is still the faint possibility that the true *H. interruptus* is in fact *H. nitidicollis*, and what we consider here as *H. interruptus* should then be referred to *H. martinae*. This is because we have not examined the type unique of *H. interruptus*, which according to d'Orchymont (1929) had a different morphology to that of the specimens in the Kniz collection. We thus refrain from a formal synonymisation of *H. martinae* until the study of the type of *H. interruptus* becomes possible.

Type material of *Hydrochus martinae*: types: Holotype male (MNCN) "H. interrup \ tus Heyd. V. \ Escorial [hw]", "Col. Del Sr. \ Perez Arcas", red holotype label, "Hydrochus \ martinae \ det. D. Makhan \ 1996", "M.N.C.N. \ Madrid \ 12258 [hw]", "M.N.C.N. \ Madrid", "Hydrochus \ interruptus Heyd. \ I. Ribera det. 1998". Paratype: "Escorial ? \ Pérez Arcas [hw]", "Hydrochus \ martinae \ det. D. Makhan \ 1996", red paratype label with the ref no. 12258, "M.N.C.N. \ Madrid". Three additional specimens with the same data and Makhan identification label, and apparently designated as paratypes in the description, do not bear paratype labels.

Examined material of *Hydrochus interruptus* collected by Pérez-Arcas: SPAIN: Madrid: El Escorial, 14 examples, Pérez-Arcas coll. (MNCN); 2 examples Kraatz coll. (specimens determined by Kniz, with the same manuscript letter and type of cards as the Specimens deposited in Madrid) (DEI).

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VALLADARES, L. F., DÍAZ-PAZOS, J. A. & DELGADO, J. A. *Hydrochus ibericus* sp. n. from the Iberian Peninsula (Coleoptera: Hydrochidae). *Aquatic Insects* (in press).

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PALAEARCTIC *ENOCHRUS BICOLOR* COMPLEX

The *Enochrus bicolor* complex is recognised as having five Palaearctic species:

Enochrus bicolor (Fab.) - Portugal and North Africa to Finland, Mongolia and Japan;

E. falcarius Hebauer - western Mediterranean, from Sicily, Tunisia and Spain;

E. segmentinotatus (Kuwert) - Portugal and Gambia to Mongolia;

E. sinuatus d'Orchymont - Pakistan and Iran;

E. turanicus sp.n. - Turkmenistan and Iran.

E. bicolor and *E. segmentinotatus* can be distinguished by the aedeagophore, the inner face of the parameres of *segmentinotatus* being distinctly angulate. There is also an "*Anacaena limbata/ lutescens*" character, hydrofuge pubescence covering 4/5ths of the hind femora of male *bicolor* but three quarters in *segmentinotatus*. Coverage in females is greater.

SCHÖDL, S. 1998. Taxonomic revision of *Enochrus* (Coleoptera: Hydrophilidae). I. The *E. bicolor* species complex. *Entomological Problems* **29** (2) 111-127.

Czech Republic meeting, 1998
traditional B~BC activity of
checking out other people's nets [top left]
ritual slaying of organiser [bottom left]
Australians and Dutch
at work and play [bottom mid left]
an unexplained halt at Dubový rybník
[top right]
Jizera River on the Polish border,
a site for *Derenectes platynotus* [mid right]
the famous devastated forest of Na čihadle in the
Jizerské mountains [bottom right]
Helen Shaverdo, Hans Fery and winner of
biggest net competition [small]
Photographs: Jiří Hájek and Jochen Mölle

WATER BEETLES IN A MANUFACTURED LANDSCAPE

by D A Lott

Last year I was asked to carry out a survey of aquatic invertebrates at Sence Valley Forest Park in North-west Leicestershire, England. This 62 ha site is a former open-cast coal mine which has been landscaped within the last two years and planted with trees to become part of the new National Forest. Five lakes have been included in the landscape scheme as well as numerous smaller features including a moderately flowing 2m wide stream which runs over a predominantly clay substratum and connects with two of the lakes.

Most, if not all, water beetles can be assumed to have colonised the various water bodies less than two years previously. Such a situation provides an opportunity to investigate environmental variables independently of any within-site historical factors which may affect species distribution.

Water beetles at 14 sites were sampled with a standard aluminium-frame water net on 21 and 23 September 1998. The sites comprised five lakes ranging in surface area from 1,500 to 35,000 m², a small pond, a vegetation-choked ditch, four temporary *Typha* pools at nodes in the ditch system and three sampling points on flowing water.

The 46 species found are listed in Table 1. Pond 1, which contained *Myriophyllum,* supported the largest number of species including five nationally scarce species, a high number for Leicestershire. Only six species were found in lake 2, the site in the earliest stage of vegetational succession, but this site would score higher on any rarity index (see e.g. Eyre & Rushton 1989) because a high proportion of the species are nationally or locally scarce. Over one third of species with a national conservation status which occur in Leicestershire are associated with recently created or disturbed sites (Lott 1995). *Hygrotus nigrolineatus* and *Rhantus suturellus* are both species which have recently spread into Leicestershire as a consequence of gravel extraction and other activities which leave large, water-filled holes in the ground.

The accompanying biplot (Figure 1) of species and environmental variables was produced by Canonical Correspondence Analysis (CCA) (ter Braak 1987-92) of the fourteen species lists and the environmental variables listed below:

1. water flowing or static (nominal variable);
2. log area;
3. water temporary or permanent (nominal variable),
4. log proportion of water surface covered by emergent or floating vegetation.

Figure 1. Biplot based on 14 species lists and four environmental variables

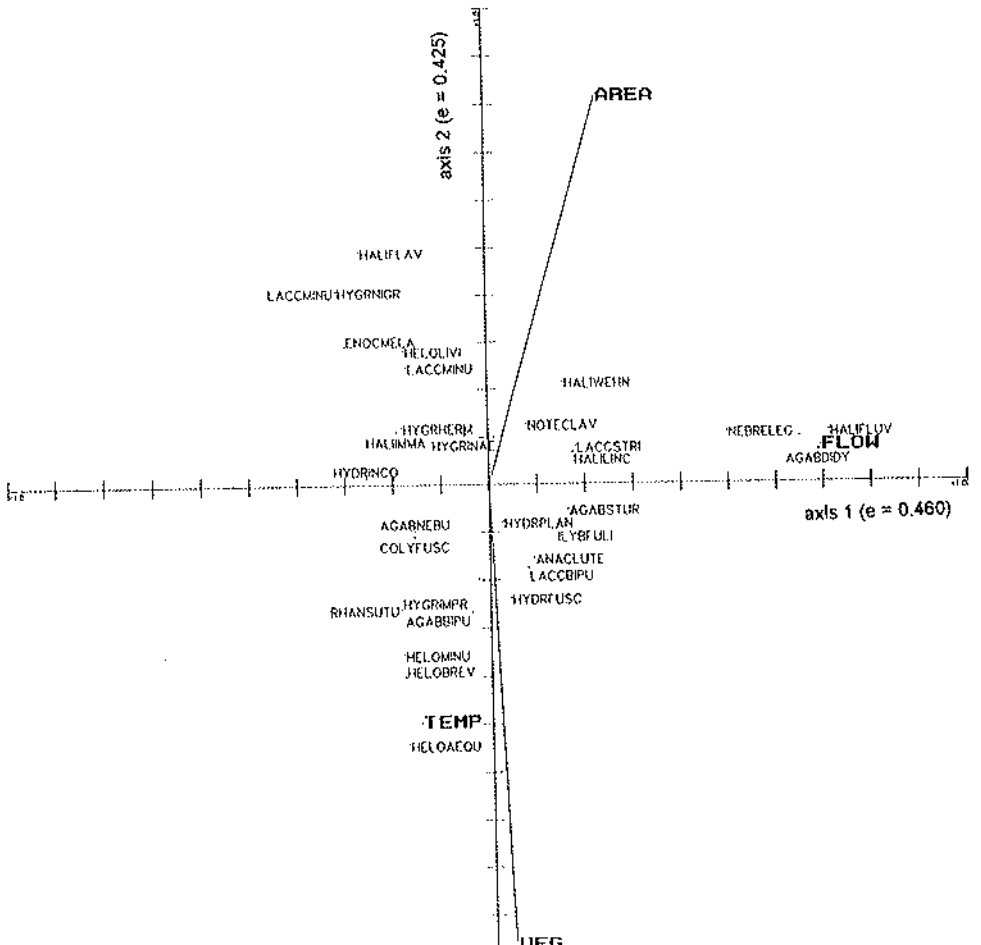

TABLE 1

		stream			lakes					pond	ditch	*Typha* pools				
Species	national status	1	2	3	1	2	3	4	5	1	1	1	2	3	4	Total sites
Haliplus flavicollis					X	X			X							3
Haliplus fluviatilis			X	X												2
Haliplus immaculatus					X	X	X	X	X					X	X	7
Haliplus laminatus	Nb			X												1
Haliplus lineatocollis		X	X	X			X		X	X			X			7
Haliplus lineolatus									X							1
Haliplus obliquus							X									1
Haliplus wehnckei			X	X		X	X			X						5
Hygrobia hermanni					X		X		X			X				4
Noterus clavicornis		X			X		X			X						4
Laccophilus minutus					X		X	X	X	X						5
Hyphydrus ovatus					X											1
Hydroglyphus pusillus	Nb									X						1
Hygrotus impressopunctatus										X			X			2
Hygrotus inaequalis		X			X		X	X	X	X					X	7
Hygrotus nigrolineatus	Na					X			X	X						3
Hygrotus versicolor									X							1
Hydroporus incognitus									X	X			X			3
Hydroporus planus		X	X		X				X	X		X	X		X	8
Hydroporus tessellatus													X			1
Nebrioporus elegans		X	X	X				X								4
Platambus maculatus				X												1
Agabus bipustulatus		X					X			X	X	X	X	X	X	8
Agabus didymus		X		X												2
Agabus nebulosus					X			X	X	X	X	X	X		X	8
Agabus paludosus			X													1
Agabus sturmii		X								X	X					3
Ilybius ater								X								1
Ilybius fuliginosus		X		X			X	X					X		X	6
Rhantus suturalis	Nb									X				X		2
Colymbetes fuscus								X		X				X		3
Gyrinus substriatus		X														1
Helophorus aequalis												X	X	X	X	4
Helophorus brevipalpis										X			X	X	X	4
Helophorus grandis													X			1
Helophorus minutus										X			X	X		3
Hydrobius fuscipes				X						X			X		X	4
Anacaena lutescens			X							X	X		X			4
Laccobius bipunctatus		X								X	X		X			4
Laccobius minutus						X			X	X						3
Laccobius striatulus		X	X	X	X				X	X			X			7
Helochares lividus	Nb				X	X		X		X						4
Enochrus melanocephalus	Nb								X	X						2
Ochthebius dilatatus															X	1
Hydraena riparia											X					1
Elmis aenea				X												1
total spp.		12	8	11	11	6	10	9	15	24	6	5	16	7	10	46

The beetle assemblages exhibit a strong response to two environmental gradients. Flow was the environmental factor with the greatest effect on species composition. Area, vegetation cover and the temporary nature of the water were all important along axis 2, the second most important axis, but there was very little separation of these factors on axes 3 and 4. It is difficult to speculate on which of these factors is the most important, because they are all closely connected. The size of a water body and, in particular, its depth may determine not only whether it is temporary or permanent but also the

amount of disturbance by wave action and flooding which regulates the rate of vegetational succession.

Species which live in temporary ponds need strategies for surviving a lack of open water. The manoeuvrability of species and their ability to swim fast to escape predators are all species traits which have different survival values according to the density of vegetation cover. Site area may appear to have no mechanistic link with species assemblage composition. However, the area of an open water body can have an indirect but marked effect on water beetle assemblage species composition because of the way it influences water permanence and vegetation cover.

Acknowledgement
I am grateful to the National Forest Company for funding this work.

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TER BRAAK, C.J.F. 1987-1992 *CANOCO - a FORTRAN program for Canonical Community Ordination.* Microcomputer Power, Ithaca, New York.

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AGABUS NEBULOSUS FORSTER NEW TO THE CYPRUS HYDRADEPHAGA LIST

by Gilles Carron

Checking the Hydradephaga list of Cyprus recently established by Miller, Bilton & Fery (1997), I noticed that the *Agabus nebulosus* I had collected in 1998 on this island were new to its fauna. The specimens were collected at an altitude of 1920 m on the top of Mount Olympus (Troodos Mountains) on May 4th in a small temporary pool (about 1.5 m2 in surface), in a hole on the muddy road that runs from the parking to the ski-lift's top.

Acknowledgement I want to thank David Bilton (Plymouth) who kindly checked my beetles and exchanged valuable information on the island's fauna.

Reference

MILLER, K., BILTON, D. & FERY, H. 1997. The water beetles of Cyprus. Part 1. Hydradephaga. ***Latissimus*** **9** 25-29.

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NEW SUBTERRANEAN DYTISCID GENUS, *GLAREADESSUS*

A Rouch pump was used to extract groundwater in Oman by Professor Jan Stock, resulting not in oil but in a *Hydroglyphus*-like new genus. It differs from *Hydroglyphus* in body shape, being flat and narrow, and by its two-segmented paramere. The sutural lines of *Glareadessus* separates it from *Uvarus* and *Microdessus.* Although *G. stocki* was first detected by pumping in 1996, specimens of another new species, *G. franzi*, were caught at light in 1974 in Iran, and were "discovered" in Vienna Museum

WEWALKA, G & BISTRÖM, O. 1998. *Glareadessus* gen. n. with description of two new species from the Persian Gulf Region (Coleoptera: Dytiscidae). *Koleopterologische Rundschau* **68** 59-63.

LIFE CYCLE AND CHROMOSOMES UPGRADE AN *HELOPHORUS*

H. kervillei, from Corfu, is considered to be a species distinct from *H. pallidipennis* on the basis of the chromosome complement of the female, and the fact that it has two instars as against the three typical of *Helophorus*. *H. pallidipennis* was also once thought to have only two instars, but further breeding work with material from Israel now indicates that three instars are involved.

ANGUS, R.B. 1998. *Helophorus pallidipennis* Mulsant & Wachanru and *H. kervillei* d'Orchymont as good species (Coleoptera: Helophoridae). *Koleopterologische Rundschau* **68** 189-196.

PITFALL TRAPPED WATER BEETLES IN SCOTLAND

A pitfall study of river sediments in Scotland has generated a few interesting records for water beetles, mainly small dytiscids and hydraenids. *Helophorus arvernicus* Mulsant proved particularly vulnerable to trapping. Some records for 100 km grid square NT should be referred to NY.

EYRE, M.D., LUFF, M.L., & LOTT, D.A. 1998. Rare and notable beetle species records from Scotland from survey work with pitfall traps, 1992-1996. *The Coleopterist* **7** (3) 81-90.

WATER BEETLES OF CHINA

JÄCH, M.A. & JI, L. (eds) 1998. *Water Beetles of China.* Volume **2**. Available from: Dr H. Schönmann, Naturhistorisches Museum, Burgring 7, A-1014 Wien, Austria. (fax ++ 43 (1) 523 5254); members of the Wiener Coleopterologenverien for 500 Austrian Schillings (US$45) or non-members 1000 Schillings ($90).

Dr Manfred Jäch and Professor Lanzhu Ji are to be congratulated for making more progress so quickly. This second volume covers the whole gamut of water beetle families from China and neighbouring countries. Seventy one species (below) are described as new, plus one new genus and a large number of other taxonomic changes. The book contains a bonus in the form of an annotated checklist of the wetland beetles of the world, covering 43 families. The 44th, an as yet undescribed adephagan family discovered by Paul Spangler, remains elusive. Manfred proposes some standardised common names for families. Some will take some getting used to but have charm (e.g. Lepiceridae are False Minute Mudloving Beetles). The study of *Ochthebius* underlines the problem associated with the erection of *Enicocerus* as a separate genus; there was no trace of the postocular secretion sulcus in Chinese *Enicocerus* used by Perkins on the basis of two *Enicocerus* species from elsewhere.

Even if one never travels to China, the plethora of paintings of beetles and colour photographs of collecting sites makes this book an object of sustained interest.

Ametor elongatus Ji & Schödl
Amphizoa smetanai Roughley, Xie & Yu
Cephalobyrrhus bertiae Pütz
Cephalobyrrhus brevipalpis Pütz
Cephalobyrrhus emeishanensis Pütz
Cephalobyrrhus jaechi Pütz
Cephalobyrrhus jiangxiensis Pütz
Cephalobyrrhus jinggangshanensis Pütz
Cephalobyrrhus longipalpis Pütz
Cephalobyrrhus nepalensis Pütz
Cephalobyrrhus schillhammeri Pütz
Cephalobyrrhus schuelkei Pütz
Cephalobyrrhus sichuanensis Pütz
Ectopria chikuni Lee, Yang & Satô
Ectopria lobata Lee, Yang & Satô
Eumetopus acutimontis Ji & Jäch
Eumetopus tibialis Ji & Jäch
Hydraena bilobata Jäch & Díaz
Hydraena compressipilis Jäch & Díaz
Hydraena curtipalpis Jäch & Díaz
Hydraena inopinata Jäch & Díaz
Hydraena isolinae Jäch & Díaz
Hydraena jengi Jäch & Díaz
Hydraena leei Jäch & Díaz
Hydraena orchis Jäch & Díaz
Hydraena plurifurcata Jäch & Díaz
Hydraena porcula Jäch & Díaz
Hydraena undulata Jäch & Díaz
Hydraena wangi Jäch & Díaz
Hydrocassis anhuiensis Ji & Schödl
Hydrocassis pseudoscapha Ji & Schödl
Hydrocassis sichuana Ji & Schödl
Hydrocassis uncinata Ji & Schödl
Lacconectus hainanensis Hendrich
Macronychus jaechi Ciampor & Kodada
Macronychus jendeki Ciampor & Kodada
Macronychus kubani Ciampor & Kodada
Macronychus reticulatus Ciampor & Kodada
Macronychus sulcatus Ciampor & Kodada
Macronychus ultimus Ciampor & Kodada
Microdytes lotteae Wewalka
Ochthebius formosanus Jäch
Ochthebius jengi Jäch
Ochthebius nipponicus Jäch
Ochthebius strigoides Jäch
Ochthebius (? *Enicocerus*) *ilanensis* Jäch
Ochthebius (? *Enicocerus*) *japonicus* Jäch
Ochthebius (? *Enicocerus*) *nakanei* Jäch
Orectochilus jaechi Mazzoldi
Orectochilus jilanzhui Mazzoldi
Orectochilus schillhammeri Mazzoldi
Orectochilus wangi Mazzoldi
Orientelmis sinensis Shepard
Platynectes hainanensis Nilsson
Platynectes javanus Nilsson
Platynectes ranongensis Nilsson
Schinostethus albosulcus Lee, Jäch & Yang
Schinostethus brevicornis Lee, Jäch & Yang
Schinostethus jii Lee, Jäch & Yang
Schinostethus laosensis Lee, Jäch & Yang
Schinostethus luzonicus Lee, Jäch & Yang
Schinostethus maculatus Lee, Jäch & Yang
Schinostethus malickyi Lee, Jäch & Yang
Schinostethus medius Lee, Jäch & Yang
Schinostethus minutus Lee, Jäch & Yang
Schinostethus nepalensis Lee, Jäch & Yang
Schinostethus niger Lee, Jäch & Yang
Schinostethus pacholatkoi Lee, Jäch & Yang
Schinostethus priscus Lee, Jäch & Yang
Schinostethus sakaii Lee, Jäch & Yang
Schinostethus sichuanensis Lee, Jäch & Yang

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COSTA, C. & VANIN, S.A. 1998. Eulichadidae: Description of the larva of *Eulichas dudgeoni* Jäch, with comparative notes on larvae of other *Eulichas* spp., and on *Stenocolus scutellaris* LeConte (Coleoptera). 327-336.

HENDRICH, L.. 1998. Dytiscidae. 4. Notes on Chinese *Lacconectus* Motschulsky, 1855 with description of a new species from Hainan (Coleoptera). 101-105.

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JÄCH, M.A. 1998. Annotated check list of aquatic and riparian/littoral beetle families of the world (Coleoptera). 25-42.

JÄCH, M.A. 1998. Hydraenidae. 2. The Taiwanese and Japanese species of *Ochthebius* Leach (1995-1998). 173-193.

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JÄCH, M.A. & DÍAZ, J.A. 1998. Hydraenidae. 1. The Taiwanese species of the genus *Hydraena* Kugelann (1995-1998). 147-171.

JÄCH, M.A. & JI, L. 1998. China water beetle survey (1995-1998). 1-23.

JI, L. & JÄCH, M.A. 1998. Epimetopidae: Synopsis of the genus *Eumetopus* Balfour-Browne (Coleoptera). 195-205.

JI, L. & SCHÖDL, S. 1998. Hydrophilidae: Faunistic notes on *Hydrocassis* Deyrolle & Fairmaire and *Ametor* Semenov, with descriptions of new species (Coleoptera). 207-218.

LEE, C.-F., YANG, P.-S. & SATÔ, M. 1998. Psephenidae: 1. Notes on the east Asian species of *Ectopria* LeConte (Coleoptera). 297-301.

LEE, C.-F., JÄCH, M.A. & YANG, P.-S. 1998. Psephenidae: 2. Synopsis of *Schinostethus* Waterhouse, with descriptions of 14 new species (Coleoptera). 297-301.

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PÜTZ, A. 1998. Limnichidae: 2. Check Taxonomic revision of the genus *Cephalobyrrhus* Pic (Coleoptera). 341-371.

ROUGHLEY, R.E., XIE, W. & YU, P. 1998. Amphizoidae. Description of *Amphizoa smetanai* sp.n. and supplementary description of *A. davidi* Lucas (Coleoptera). 123-129.

SHEPARD, W.D. 1998. Elmidae: 2. Description of *Orientelmis* gen.n. and new synonymy in *Cleptelmis* (Coleoptera). 289-295.

TOLEDO, M 1998. Dytiscidae: 2. The genus *Nebrioporus* Régimbart in China (Coleoptera). 69-91.

VONDEL, B.J. van 1998. Haliplidae: Additional notes on the Haliplidae of China and neighbouring countries (Coleoptera). 131-136.

WEWALKA, G. 1998. Dytiscidae: 1. The Chinese species of *Microdytes* Balfour-Browne with description of a new species (Coleoptera). 61-67.

EPIMETOPIDAE INCLUDING A NEW GENUS

This revision includes a checklist of 27 species, and a new African genus, *Eupetomus*, based on *Eumetopus limicola* Delève and *Georissus carinaticollis* Basilewsky.

JI, L. & JÄCH, M.A. 1998. Description of *Eupetomus* gen. nov. (Coleoptera: Epimetopidae) and world check list of the species of Epimetopidae. *Entomological Problems* **29** (2) 95-97.

***LIMNEBIUS NITIDUS* GROUP**

The nine known members of the *nitidus* group are revised, with three new species being described, *monfortei* from the Sierra Nevada, *ordunyai* from Teruel and *millani* from Albacete. The phylogenetic relationships are discussed on the basis of aedeagal characters and in relation to their distributions, which are mainly in Mediterranean Iberia, largely in isolation from each other. Where different species of the group coexist, they are always from different phyletic lines, though *nitidus* itself ranges widely. It is predicted that more species will be found between Albacete and Teruel.

FRESNEDA, J. & RIBERA, I. 1999. Revision of the *Limnebius nitidus* (Marsham) subgroup (Coleoptera: Hydraenidae), with description of two new species and comments on their phylogeny and biogeography. *Entomologica scandinavica* **29** 395-409.

RIBERA, I. & HERNANDO, C. 1998, Description of *Limnebius millani* sp. n. (Insecta: Coleoptera: Hydraenidae) from the Sierra de Alcaraz (Southeast Spain). *Ann. Naturhist. Mus. Wien* **100 B** 199-202.

WATER BEETLES ON LLANDEILO HILL, RADNORSHIRE: A CORRECTION AND A SPECIES NEW TO WALES

by John Bratton

Hydroglyphus geminus and *Dryops striatellus* were first found at Aberedw Rocks, within Llandeilo, Rhulen & Llanbedr Hills Site of Special Scientific Interest, during the Myriapod and Isopod Study Groups meeting in April 1988. *Hydroglyphus*, found by Rosy Key, was reported in *Records Received* in the *Balfour-Browne Club Newsletter* **45** as it was only the second Welsh record. At the time it was thought the site of capture was the small pool Henllyn Mawr. Later, consulting a more detailed map, I found there was another pool in the vicinity, west of Henllyn Mawr. An opportunity to revisit the area arose in August 1997 and on this occasion the second, un-named pool was visited. This pool was very reminiscent of the one visited in 1988 and *H. geminus* and *D. striatellus* were again found. A third visit to both pools in 1998 established that a) the pool visited in 1988 was not Henllyn Mawr but the un-named pool at SO077451; b) *H. geminus* and *D. striatellus* occur in both. In 1998 water beetles were also collected from two further pools east of Aberedw Rocks but within the same SSSI. The findings from all visits are given below.

Site descriptions (geological notes from Cherns 1993)

The hill is sheep-grazed and the pools clearly attract the sheep, producing a very close-cropped sward around the pools and in the shallow water. The water is thus fully exposed to the sun and quickly becomes lukewarm on sunny summer days.

Table 1

	Puddles in wheel ruts	Pool west of Henllyn Mawr			Henllyn Mawr	Ex-quarry pools NW of Blaenhow	Glannau Pool
Grid reference	SO079449	SO077451			SO080452	SO092458	SO103471
Date	8 8.1988	8 .4.1988	11.8.1997	8.8 1998	8.8 1998	8.8 1998	8.8 1998
Hygrobia hermanni					+		
Laccophilus minutus			+	+	+		
Hydroglyphus geminus		+	+	+	+		
Hygrotus inaequalis					+		
Hydroporus palustris					+		
Hydroporus pubescens	+		+			+	+
Agabus bipustulatus			+			+	
Agabus nebulosus						+	+
Helophorus brevipalpis			+		+	+	
Helophorus flavipes	+	+	+		+	+	+
Helophorus grandis	+						
Helophorus longitarsis					+		
Helophorus minutus			+	+	+		
Paracymus scutellaris			+				
Hydrobius fuscipes					+		
Anacaena lutescens			+				
Laccobius ytenensis (= *atrocephalus*)					+		
Laccobius minutus			+		+		
Helochares lividus			+	+	+		
Ochthebius minimus			+		+		
Limnebius truncatellus	+						
Dryops luridus			+				
Dryops striatellus	+	+	+	+	+		
Pelenomus olssoni						+	

Un-named pool 200 metres west of Henllyn Mawr: a shallow and very gently shelving pool, probably never exceeding 20 cm at its deepest, of very clear water with a bed of fine inorganic sediment and a few boulders. The bedrock is calcareous siltstone. The aquatic vegetation is dominated by diminutive *Littorella uniflora* which extends as a lawn above the water level. The area of the pool clearly varies greatly, reaching about 40 m x 15 m in wet periods. 200 metres altitude. Surroundings are grassy moorland dominated by bracken.

Henllyn Mawr: Deeper than the previous pool, probably exceeding 60 cm, with slightly steeper sides and thus less of a *Littorella* lawn. Geology as above. Water tinged brown. Of variable area, reaching about 70 m x 20 m. 220 m altitude. Surroundings as above.
Quarry pools northwest of Blaenhow: When visited, water levels were low and there were five pools of 1-2 metres diameter and a similar number of dry depressions, all peaty, overlying siltstone with lenses of sandy limestone. In wet periods the pools coalesce. *Lythrum portula* and *Juncus bulbosus* were abundant. 320 m altitude. Surrounded by bracken over *Calluna* and grass.
Glannau Pool: Shallow, probably not exceeding 30 cm depth and gently shelving. Vegetation mainly *L. uniflora*, *J. bulbosus* and *L. portula*. About 15 m diameter. Immediately surrounded by a close-cropped lawn of grass. Set in *Calluna* moorland. 420 m altitude.
Species of note (status as in Hyman & Parsons 1992)
Hydroglyphus geminus Nationally Notable B. Rarely recorded in Wales but abundant in two of the pools examined. A pioneer species. Most numerous in the shallowest warmest water.
Helophorus longitarsis RDB 3. Many small *Helophorus* of various sizes and colours were collected in the hope of taking *H. griseus*. Instead, a single male *H. longitarsis* was found, tentatively recognisable in the field by its more brightly shining pronotum. Not previously recorded in Wales. It is an extreme form of pioneer species (Foster in press), probably finding Henllyn Mawr suitable because of the constant sheep grazing and light poaching of the pond margin. As *Helophorus* larvae are terrestrial, it may be the habitat above the water line that is unusual and makes this site suitable for *H. longitarsis*. Or its discovery may have been pure luck.
Paracymus scutellaris, ***Laccobius ytenensis*** and ***Helochares lividus*** are all in the category Nationally Notable B but not particularly uncommon in Wales. *P. scutellaris* is the rarest of the three, being known from seven Welsh localities (Foster in press).
Dryops striatellus RDB 3. Known from only three Welsh localities. Clearly well-established on Aberedw Rocks. Collected by dragging a sieve or fingers through the saturated turf at the pond edges.
Pelenomus olssoni RDB 3. A weevil, first described in 1972, and added to the British list by Johnson (1982). Probably under-recorded. Here found in low numbers on *Lythrum portula* in the dry hollows.

Acknowledgements
Thanks are due to CCW's staff at Llandrindod Wells for information about the SSSI, including some botanical records; to Adrian Fowles for identifying the *Pelenomus*; to Garth Foster for identifying the original *Dryops striatellus* and checking subsequent specimens, and Tony Rogers for geological information.

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FOSTER, G.N. In press. *A review of the scarce and threatened Coleoptera of Great Britain. Part 3. Aquatic Coleoptera.* Peterborough, Joint Nature Conservation Council (UK Nature Conservation series).
HYMAN, P.S. & PARSONS, M.S. 1992. *A review of the scarce and threatened Coleoptera of Great Britain. Part 1.* Peterborough, Joint Nature Conservation Council (UK Nature Conservation, No. 3).
JOHNSON, C. 1982. *Phytobius olssoni* Israelson (Coleoptera, Curculionidae) new to Britain. *Entomologist's Gazette* **33** 221-222.

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✞JOAN MORGAN
Mrs M J Morgan died on 28 December 1998. She was a stalwart supporter of the Club from its inception until, typical of her organised approach to life, she withdrew her membership on 27 November. I knew her as a recorder of water beetles in North Wales from the 1962 onwards, when she reported *Dytiscus lapponicus* in North Wales. She has subsequently left a significant legacy of records in the mapping scheme. I remember her being particularly pleased to find *Hydrochus brevis* on Anglesey, possibly, I suspect, because neither I nor David Bilton had taken it despite intensive sampling effort.
MORGAN, M.J. 1991. *Hydrochus brevis* in Wales. *Balfour-Browne Club Newsletter* **50** 11.

HYDROPORUS GLABRIUSCULUS AUBÉ - A REVIEW OF RECENT STUDIES

by David Bilton

Garth's recent discovery of this RDB species in the Norfolk Broads (Foster 1998) significantly extends its known range in the British Isles, and has prompted this review of studies on *Hydroporus glabriusculus* emanating from my PhD. Bilton (1993b) provides a review of the species' ecology and distribution on a global scale, highlighting the relict nature of British colonies. *H. glabriusculus* has a wide northern Palaearctic range, occurring from Ireland in the west to the Irkutsk and Yakutsk regions of Siberia in the east. In the British Isles, and other areas of western Europe south of Scandinavia the species is rare, and largely confined to ancient mesotrophic wetlands which, in the British Isles at least, mostly began to form in the early Postglacial. Here the species is therefore considered as a Postglacial relict. Most of the other papers document the results of genetic studies of British, Irish and Swedish populations using allozyme electrophoresis. Bilton (1992) provides details of the population structure of the *H. glabriusculus*, which appears to exist within sites as small semi-isolated demes, between which there is a limited amount of gene flow. These demes may correspond to the clusters of individuals found in the field, where the species tends to occupy patches of wet moss in a microspatially heterogeneous fenland environment. Populations in the Norfolk Breckland share very limited genetic diversity, indicating a past period of low population size. Genetic differentiation between localities (as measured by Wright's Fst) is higher than that reported for human populations worldwide, and indicates limited gene flow between colonies. Relict populations are effectively isolated entities in Britain today. The dispersal ability of *H. glabriusculus* was explored directly through structural investigation of the flight apparatus and flight tests on a range of beetles from various localities and of varying ages (Bilton, 1994a). The flight apparatus is well developed, but most individuals had degenerate flight muscles. Almost intact musculature was found in some individuals from samples collected relatively early in the season, suggesting that at least a proportion of adults emerge with well developed musculature, which is rapidly autolysed during development. Flight tests on British populations failed, although individuals from Sweden made short hopping glides. The species therefore appears to have limited flight capabilities, which may differ both between individuals and geographically, findings which are in keeping with the relatively high genetic differentiation reported earlier. Genetic inter-relationships between populations and their possible interpretation are explored in Bilton (1994b). Values of Nei's genetic distance between colonies are used to construct a UPGMA dendrogram of genetic relationships. Three lineages can be recognised on the basis of allozyme differentiation, these being represented by populations from Ireland, Scotland and Norfolk + Sweden respectively. Molecular clock estimations suggest that these three lineages separated well before the end of the Last glaciation, suggesting that the British Isles were colonised on deglaciation by the species in three separate waves, one of which also entered parts of Scandinavia. The low levels of variation common to the Norfolk Breck populations point to them having experienced a common bottlenecking event after separation from their Swedish relatives, something which may have occurred in the Lateglacial. Similar cases of apparent multiple recolonisation of Britain and Ireland by organisms in the Postglacial are discussed. A parallel morphometric study of the populations subjected to genetic analysis is detailed in Bilton (1993a). Some morphological differentiation was reported between localities, although the patterns of population relatedness differed from those revealed by genetics, possibly being more influenced by present climatic regime than population history. A high degree of overlap between samples was revealed by discriminant functions analysis. Such a low degree of morphological differentiation between populations which have apparently been isolated for much of the late Pleistocene is in keeping with subfossil studies of insects indicating limited phenotypic change during this period of climatic fluctuation.

BILTON, D.T. 1992. Genetic population structure of the Postglacial relict diving beetle *Hydroporus glabriusculus* Aubé (Coleoptera: Dytiscidae). *Heredity* **69** 503-511.

BILTON, D.T. 1993a. A morphometric study of the diving beetle *Hydroporus glabriusculus* (Coleoptera, Dytiscidae) in Western Europe, including a comparison of morphological and genetic divergence patterns. *Zoologischer Anzeiger* **231** 111-124.

BILTON, D.T. 1993b. The distribution and ecology of *Hydroporus glabriusculus* Aubé (Col., Dytiscidae), with particular reference to the British Isles and its status as a relict species. *Entomologist's monthly Magazine* **129** 207-220.

BILTON, D.T. 1994a. The flight apparatus and flying ability of *Hydroporus glabriusculus* (Coleoptera, Dytiscidae), with a brief review of structural modifications in flightless beetles. *Entomologisk Tidskrift* **115** 23-32.

BILTON, D.T. 1994b. Phylogeography and recent historical biogeography of *Hydroporus glabriusculus* Aubé (Coleoptera: Dytiscidae) in the British Isles and Scandinavia. *Biological Journal of the Linnean Society* **51** 293-307.
FOSTER, G.N. 1998. *Hydroporus glabriusculus* Aubé (Col., Dytiscidae) new for the Norfolk Broads. *Entomologist's Monthly Magazine* **134** 264.

Received February 1999

FOSSIL STUDIES

A raid on our President's stronghold released a few reprints. Coope and Lemdahl (1995) show that the end of the last glacial period was characterised by highly unstable climates oscillating between warm temperate and cold Arctic conditions in northern Europe. Reconstructions of climate are presented in this paper based on beetle fossils found in Britain, Norway, Sweden and Poland, demonstrating considerable regional differences probably associated with the varying effects of the Fennoscandian ice sheet and the ice free parts of the Continent. Coope *et al.* (1998) reconstruct Late-glacial and early Holocene climatic changes on the basis of the beetle faunas of 77 sites. Thermal gradients for the last 45,000 years are the basis of the paper by Witte et al. (1998); this indicates that there was a significant delay in warming in the northern part of Europe during the last glacial stage. The paper by Vandenberghe *et al.* (1998) overviews this series of reconstructions.

The Frog Hall deposit (Keen *at al.* 1997) is Interglacial, and its water beetles are dominated by elmids. The Gröbern deposit (Walkling *et al.* 1996) runs through three major climate oscillations associated with the Eemian and early Weichselian period; the beetles present indicate a July temperature 5-6° C cooler in the cold intervals than in the warmer periods, but with much greater depression in winter temperatures. During the coldest periods water beetles such as "*Potamonectes griseostriatus*" (one part of the *Stictotarsus multilineatus* complex), *Colymbetes dolabratus* (Paykull) and *Ochthebius lenensis* (Poppius) were present; donaciines were the commonest water beetles of the intervening warmer periods. The Sandy deposit (Gao *et al.* 1998) is from the harsh climate of the Middle Devensian, about 30,000 years ago;

COOPE, G.R. & LEMDAHL, G. 1995. Regional differences in the Lateglacial climate of northern Europe based on coleopteran assemblages. *Journal of Quaternary Science* **10** (4) 391-395.
COOPE, G.R., LEMDAHL, G., LOWE, J.J.* & WALKLING, A. 1998. Temperature gradients in northern Europe during the last glacial-Holocene transition (14-9 ^{14}C kyr BP) interpreted from coleopteran assemblages. *Journal of Quaternary Science* **13** (5) 419-433.
GAO, C., COOPE, G.R., KEEN, D.H. & PETIT, M.E. 1998. Middle Devensian deposits of the Ivel valley at Sandy, Bedfordshire, England. *Proceedings of the Geologists' Association* **109** 127-137.
KEEN, D.H., COOPE, G.R., JONES, R.L., FIELD, M.H., GRIFFITHS, H.I., LEWIS, S.G. & BOWEN, D.Q. 1997. Middle Pleistocene deposits at Frog Hall Pit, Stretton-on-Dunsmore, Warwickshire, English Midlands, and their implications for the age of the type Wolstonian. *Journal of Quaternary Science* **12** (3) 183-208.
VANDENBERGHE, J.E.F., COOPE, [G.] R. & KASSE, K. 1998. Quantitative reconstructions of palaeoclimates during the last interglacial-glacial in western and central Europe: an introduction. *Journal of Quaternary Science* **13** (5) 361-366.
WALKLING, A.P. & COOPE, G.R. 1996. Climatic reconstructions from the Eemian/Early Weichselian transition in Central Europe based on the coleopteran record from Gröbern, Germany. *Boreas* **25** 145-159.
WITTE, H.J.L., COOPE, G.R., LEMDAHL, G. & LOWE, J.J.* 1998. Regression coefficients of thermal gradients in northwestern Europe during the last glacial-Holocene transition using beetle MCR data. *Journal of Quaternary Science* **13** (5) 435-445.
* address for correspondence

***HAENYDRA* IN IRAN**

Six species of *Hydraena* s. str. have previously been recorded from Iran. The first *Haenydra* species is new to science. It was found in limestone springs in Shiraz.

BILTON, D.T. & JÄCH, M.A. 1998. *Hydraena* (*Haenydra*) *hosseinieorum* sp.n. (Insecta: Coleoptera: Hydraenidae) from Iran. *Ann. Naturhist. Mus. Wien* **100** B 343-348.

NEW INDONESIAN *LACCOPHILUS*

Laccophilus flores is described from the Sunda Islands, Indonesia.

HENDRICH, L. & BALKE, M. 1998. Ein neuer Schwimmkäfer der Gattung *Laccophilus* Leach 1815 von der Sundainsel Flores, Indonesien (Coleoptera: Dytiscidae). *Entomol. Z.* **108** (11) 437-442.

WATER BEETLING AT WICKEN FEN AND CHIPPENHAM FEN IN 1999

1999 is the 100th Anniversary of Wicken Fen National Nature Reserve and as part of the celebrations the National Trust is organising a beetling weekend at Wicken Fen and Chippenham Fen.

Beetles have been collected at Wicken for over 150 years by some of the greats such as Darwin, Jenyns, Omer-Cooper, Balfour-Browne and Donisthorpe. It would therefore seem very apt to celebrate 100 years of National Trust ownership of the Fen with a coleopterists' meeting at Wicken. Over 1000 species have been recorded at Wicken and a checklist will be published in 1999. During June the Fen will be good for various of the reed ground beetles, weevils, water beetles, leaf beetles and staphs. Tony Drane - Wicken's Coleoptera recorder will be present for the weekend.

Chippenham Fen on the other hand has been worked much less intensively but nevertheless offers huge potential to the coleopterist.

Please join us for this special weekend - if sufficient interest is shown we will try and organise a meal in a local pub on the Saturday evening.

Saturday 19th June - 10.30 am Chippenham Fen - courtesy of English Nature.
Sunday 20th June - 9.30 am Wicken Fen - courtesy of the National Trust.

If you would like to attend or require further details please contact me. I can also supply details of bed and breakfast accommodation lists, etc.

Adrian Colston, Property Manager, Wicken Fen NNR, The National Trust, Lode Lane, Wicken, Ely, Cambs, CB7 5XP. 01353 720274.

WICKEN FEN

FRIDAY, L. (ed.) 1997. *Wicken Fen. The making of a wetland nature reserve.* Harley Books, Colchester. ISBN 0 946589 33 x (hardback) 0 946589 58 5 (paperback). Available from Harley Books, Martins, Great Horkesley, Colchester, Essex CO6 4AH, England, UK. Price is between £30 and £40 + postage.

Wicken Fen became Britain's first nature reserve in 1899, when part of it became the property of the National Trust. Water beetles have always featured as specialities of the fen, specially five of the six British *Dytiscus* species, *Agabus undulatus* (Schrank), *Hydraena palustris* Erichson and *Dryops anglicanus* Edwards. This book brings us up-to-date on J Stanley Gardiner's *The Natural History of Wicken Fen*, published from 1923 to 1932. One of the thirteen chapters is devoted to insects but they feature throughout. Everything now depends on the definition of "few" as in Professor Balfour-Browne's prognosis of 1926 "Various efforts have been, and are being, made to preserve the fauna and flora in the small area of Wicken Fen, efforts which I venture to think, will prolong the existence of the remnant, at most, for a few years." The major difference between Gardiner's work and the present, apart from the copious illustrations, specially colour photographs of beetles and a photograph of an immature Michael Chinery, is the emphasis on management and education. I wonder what Balfour-Browne's views would be about figure 74, which shows that visitor numbers now exceed 30,000 a year and have doubled since 1970? Laurie Friday, as editor, and Basil and Annette Harley, as publishers, are to be congratulated and thanked for setting up the task for the next workers in, say, 2060.

WATER BEETLE MAPS FOR NORTHERN IRELAND

Two large paper summarise what is known of the modern distribution of water beetles in Northern Ireland. The maps demonstrate some interesting distribution patterns, with species such as *Gyrinus distinctus* confined to Fermanagh and *Acilius canaliculatus* not found north of Lough Neagh. Unfortunately it appears that reprints are not provided by the journal, so a supply of copies is very restricted.

NELSON, B., FOSTER, G., WEYL, R. & ANDERSON, R. 1997. The distribution of aquatic Coleoptera in Northern Ireland, Part 1: families Haliplidae, Hygrobiidae, Noteridae, Dytiscidae and Gyrinidae. *Bulletin of the Irish biogeographical Society* **20** 179-296.

NELSON, B., FOSTER, G., WEYL, R. & ANDERSON, R. 1998. The distribution of aquatic Coleoptera in Northern Ireland, Part 2: families Hydraenidae, Helophoridae, Hydrochidae, Elmidae and Dryopidae. *Bulletin of the Irish biogeographical Society* **22** 128-193.

NEBRIOPORUS CANALICULATUS (LACORDAIRE IN BOISDUVAL & LACORDAIRE) NEW TO BRITAIN

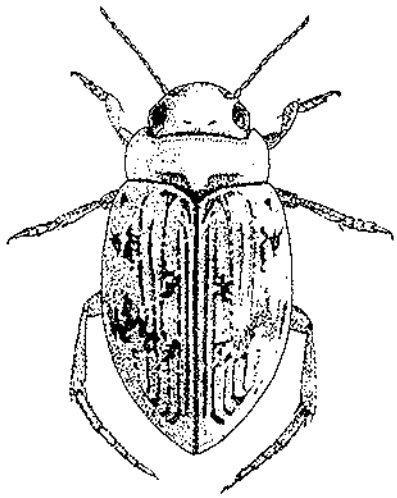
by Ron CARR

During the summer of 1998 I carried out a survey of aquatic Coleoptera on behalf of the Royal Society for the Protection of Birds at their Dungeness reserve, East Kent.

The reserve is situated within an extensive area of storm beach gravel deposits which have been extensively quarried for building materials over many years. Flooded gravel pits of both recent and historic origin containing various stages of successional vegetation are present within the reserve, some of the recent excavations having been artificially silted along their margins in order to improve the habitat for birds.

A total of 54 species of aquatic Coleoptera were recorded during the survey, including *Hygrotus nigrolineatus* (von Steven), a relatively new addition to the British fauna (Carr 1984; Eyre & Foster 1998) and the ground beetle *Omophron limbatum* (Fab.). Both these "pioneer" species colonise newly formed sand and gravel workings.

I subsequently obtained permission to revisit the reserve on 7 November 1998, in order to collect beetles and aquatic Hemiptera. Owing to lack of time, the visit was intentionally short but in the lengthening shadows of late afternoon I obtained one female and two male specimens of *Nebrioporus canaliculatus*, hitherto not recorded in the British Isles.



The beetles were collected from the shallow, sparsely vegetated margins of a flooded gravel pit (national grid reference TR 01) approximately seven years old, the edges of which have been artificially silted.

N. canaliculatus is well known to me as I have previously taken specimens in the Netherlands and France. It is easily distinguished from closely related British species by its relatively large size (5-6 mm in length), pale yellow-brown coloration and weakly ridged elytra. Longitudinal broken, dark brown lines of varying intensity may also be present along the elytra.

The species is keyed and well illustrated by Nilsson and Holmen (1995), and the larva is keyed by Nilsson (1992) and illustrated by him (Nilsson 1996). The habitus illustration here is from Holmen (1970).

N. canaliculatus is largely a western European species which has undergone a gradual northerly and north-easterly extension in range since the 1920's (Šťastný 1995).

Its appearance in south-east England is not surprising (Carr 1986), and further occurrences of the species in similar habitats throughout southern England can be anticipated in the near future.

References

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CARR, R. 1986. The effects of human activity on the distribution of aquatic Coleoptera in southeastern England. *Entomologica Basiliensia* **11** 313-325.

EYRE, M.D. & FOSTER, G.N. 1984. Beetles in a new pond in County Durham, and the continuing spread of *Hygrotus nigrolineatus* in England. ***Latissimus* 10** 28.

HOLMEN, M. 1970. *Deronectes canaliculatus* Lac. ny for Danmark. *Flora og Fauna* **76** 19-20.

NILSSON, A.N. 1982. A key to the larvae of the Fennoscandian Dytiscidae (Coleoptera). *Fauna Norrlandica* **2** 1-45.

NILSSON, A.N. *ed.* 1996. *Aquatic insects of north Europe - a taxonomic handbook.* Volume **1**: Ephemeroptera, Plecoptera, Heteroptera, Megaloptera, Neuroptera, Coleoptera, Trichoptera and Lepidoptera. Apollo Books, Stenstrup.

NILSSON, A.N. & HOLMEN, M. 1995. *The aquatic Adephaga (Coleoptera) of Fennoscandia and Denmark. II. Dytiscidae,* Leiden, E.J. Brill. (Fauna Entomologica Scandinavica, No. 32.)

ŠTASTNÝ, J. 1995. *Nebrioporus canaliculatus* (Lac.) in Czechoslovakia. ***Latissimus* 5** 15.

Received November 1999

AFRICAN *AMPHIOPS* AMPLIFIED

Amphiops are common in Africa. The nine known species are keyed and their genitalia illustrated.

HEBAUER, F.1998. An updated determination key to the African species of the genus *Amphiops* Erichson, 1843 (Coleoptera, Hydrophilidae). *Acta Coleopterologica* **14** (1) 33-36.

NEW MOROCCAN BEETLES

The Moroccan Anti-Atlas appears to have a special fauna. The first species is a member of *Aulacochthebius*, which is how we must now address what were formerly *Ochthebius exaratus* Mulsant and *O. narentinus* Reitter. The opportunity is taken to compare the three species. The second species to be described is *Oulimnius jaechi*, which, at 2.3 to 2.5 mm, looks very large in comparison with the nearest species, *O. fuscipes* (Reiche) and *O. aegyptiacus* (Kuwert). The aedeagophore is extremely unusual, resembling that of *Dryops*. The larvae are also described.

In the third paper, *Hydraena riberai* and *H. antiatlantica* are described from Morocco. The status of the species concept of *H. africana* Kuwert is discussed.

The fourth paper describes a new species of *Limnebius* in the *nitidus* group and the fifth paper reports the rediscovery of *Amphiops senegalensis* in north-west Morocco. The life cycle of *Amphiops* is described, and the adult is illustrated.

AGUILERA, P., RIBERA, I. & HERNANDO, C. 1998. Notes on the Palaearctic species of *Aulacochthebius*, with a description of *A. libertanus* sp. n. from the Moroccan Anti Atlas (Coleoptera: Hydraenidae). *European Journal of Entomology* **95** 629-637.

HERNANDO, C., RIBERA, I. & AGUILERA, P. 1998. Description of the adults and larvae of a remarkable new *Oulimnius* Gozis from the Anti-Atlas (S.W. Morocco) (Coleoptera: Elmidae). *Ann. Soc. Entomol. Fr.* **34** (3) 253-258.

JÄCH, M.A., AGUILERA, P. & HERNANDO, C.1998. New and little known Palearctic species of the genus *Hydraena* (s.l.). V. (Coleoptera: Hydraenidae). *Entomological Problems* **29** (2) 99-105.

RIBERA, I. & MILLÁN, A. 1998. *Limnebius aquilerai* sp. nov. from south Morocco (Coleoptera: Hydraenidae). *Entomological Problems* **29** (2) 109-110.

RICHOUX, P. & GOURVES, J. 1998. Présence d'*Amphiops senegalensis* (Castelnau, 1840) au Maroc (Coleoptera, Hydrophilidae). *R.A.R.E.* **7**(2) 65-68.

PEAT POOL FAUNA IN THE FLOW COUNTRY

This survey, based on the use of unbaited traps, was also reported in ***Latissimus* 10**, page 10. In the present paper, the species composition of the bug and beetles faunas is investigated in relation to pool type. Seven times as many invertebrates and five times more beetle adults were taken in deep, permanent pools than in shallow pools, and bugs were almost exclusively confined to the deep pools. The composition of the beetle fauna differed between the two types of pools, smaller species being found in both types and species longer than 11.6 mm being confined to the larger pools. There was little difference in catches of the edges and centres of the pools. Horizontally placed bottle traps caught more beetles than traps sited vertically with the mouths facing down.

DOWNIE, I.S., COULSON, J.C., FOSTER, G.N., & WHITFIELD, D.P. 1998. Distribution of aquatic macroinvertebrates within peatland pool complexes in the Flow Country, Scotland. *Hydrobiologia* **377** 95-105.

TWO BAYS PROJECT-APPEAL FOR INFORMATION FOR BAIE DE SOMME

Two bays, Rye Bay in Sussex and the Baie de Somme in Picardy, have been linked in a project funded by the European Community through INTERREG II. The Rye area is famous for its beetle life in Britain; we have over 7,000 records of 145 species for the ten km grid square TQ91. It seems that the fauna of the Baie de Somme is less well known. The aim of the project is to compare methods of wildlife management on shingle, sand dunes, saltmarsh and other wetlands. The French partner is Syndicat Mixte pour l'Aménagement de la Côte Picarde (SMACOPI). The project organiser is Dr Barry Yates, Rye Harbour Nature Reserve, 2 Watch Cottages, Nook Beach, Winchelsea, East Sussex TN36 4LU (yates@clara.net) You can visit the Web page **http://home.clara.net/yates/2bays.html**.

NEW SPECIES OF *LACCOBIUS*

A new species, *gloriana*, is described from Castellón and Valencia; it is near to *neapolitanus* Rottenberg and *obscuratus* Rottenberg. The species is named in honour of Gloria Tapia and Ana Pujante, whose survey work around Valencia resulted in the first finds.

L. ytenensis Sharp is reinstated as a species distinct from *atrocephalus* Reitter. *L. atrocephalus* is known from south-east Spain, Sicily, Morocco, Algeria, Tunisia, Libya, Egypt, Sudan, Israel, and Syria. *L. ytenensis* ranges from Scotland to the Alps and the Anti Atlas.

GENTILI, E. & RIBERA, I. 1998. Description of *Laccobius glorianae* sp. n. from Spain, and notes on *L. ytenensis* Sharp, 1910 and *L. atrocephalus* Reitter, 1872 (Insecta: Coleoptera: Hydrophilidae). *Annalen des Naturhistorischen Museums in Wien* **100 B** 193-198.

BAGOUS REVIEW

The subeditor's pen hovered over "*Bagous* in the bag" but one must try not to be facetious about such an excellent breakthrough in understanding this most difficult and elusive group of water beetles in the major work. The first point to make is that one should try to obtain a copy as I fear that the photographs of whole beetles will not photocopy too well. These plates, and the line drawings of genitalia, tarsi and other features greatly strengthen this first effective overview and key of the group. Eighty two western Palaearctic species are recognised, including 13 new ones, all of the latter from the east, and reinstatement of *Hydronomus* as a subgenus of *Bagous*, thus restoring the well known water plantain weevil, *B. alismatis* (Marsham), to the genus. A few "species" are lost, in particular the British endemic *B. arduus* Sharp, synonymised to *B. longitarsis* Thomson.

CALDARA, R. & O'BRIEN, C.W. 1998. Systematics and evolution of weevils of the genus *Bagous*. 6. Taxonomic treatment of the species of the Western Palearctic Region (Coleoptera Curculionidae). *Memorie della Società entomologica italiana* **76** (1997) 131-347.

THE LAST SÜßWASSER FAUNA? THE REST OF THE HYDROPHILOIDEA

HEBAUER, F. & KLAUSNITZER, B. 1998. Insecta: Coleoptera: Hydrophiloidea (exkl. *Helophorus*). *Süßwasserfauna von Mitteleuropa* **20** (7, 8, 9, 10-1). Gustav Fischer, Stuttgart. ISBN 3-437-25488-X. Available from SFG-Servicecenter Fachverlage GmbH, Holzwienstraße 2, 72127 Kusterdingen, Germany, at DM 112 + Postage.

The new volume completes the task of reviewing all central European hydrophiloid water beetles, this process having been started with the Helophoridae, the treatment of which was rather different, covering the whole Palaearctic fauna and being in English. The work is well illustrated but there are few original figures (13-18, 27, 34-36). Whilst the use of old but good figures is acceptable, the reproduction without updating of Michael Hansen's maps of the distributions of *Helochares*, published in 1982, is unacceptable in such a costly paperback book. There is an even older map of the supposed distribution of *Cymbiodyta marginella*, dating from Smetana (1974). Equally, in an expensive new production, one would expect good illustrations to support identification of the five species of *Georissus*; there is none. Nevertheless the work is to be welcomed in that it brings together a modern checklist, a complete array of keys, a good set of figures, a commentary on evolution of the group, and a synopsis of what is known about the larvae.

This work should result in a significant name change within the European fauna, the use of *Laccobius colon* (Stephens 1829) for *L. biguttatus* Gerhardt.

THE SPECIES AREA RELATIONSHIP + 1

A reminder that we need more entries for a reworking of Dave Larson's description of the species-area relationship for diving beetles.

	km²	no. spp.		km²	no. spp.
Alaska	1,518,800	92	Canada	9,976,139	262
Yukon	536,324	113	California	411,013	127
Northwest Territories	3,379,683	119	Florida	151,670	84
British Columbia	948,596	168	Minnesota	217,735	79
Alberta	661,185	153	Nevada	286,297	39
Saskatchewan	651,900	124	North Dakota	183,022	60
Manitoba	650,087	145	Oregon/Washington	427,796	114
Ontario	1,068,582	155	Utah	219,931	81
Quebec	1,540,680	147	Wisconsin	145,438	140
New Brunswick	73,437	82	England	130,359	86
Nova Scotia	55,491	78	Scotland	78,772	65
Prince Edward Island	5,657	32	France	543,998	169
Labrador	250,000	74	Australia	7,686,849	180
Newfoundland	150,000	78	Iberia	591000	150

LARSON, D.J. 1997. Dytiscid water beetles (Coleoptera: Dytiscidae) of the Yukon. 491-522 in: H.V. Danks and J.A. Downes (eds) *Insects of the Yukon. Biological Survey of Canada (Terrestrial Arthopods)*. Ottawa.

MORE ON *NEPTOSTERNUS*

This paper updates the revision by Hendrich and Balke reported in ***Latissimus* 10**. *N. chumphon* is described from Thailand. Fifty four species of *Neptosternus* are now known from SE Asia.

BALKE, M. & HENDRICH, L. 1998. Updating the southeast Asian *Neptosternus* Sharp fauna II (Coleoptera: Dytiscidae). *The Raffles Bulletin of Zoology* **46** (1) 135-138.

BOHEMIAN RHAPSODY - THE CLUB MEETING AT LIBEREC, CZECH REPUBLIC, JUNE 1998

With my daughter, Anne, I arrived at Prague Airport on a Czech Airline plane to the accompaniment of Smetana (My country - Vltava) playing on the PA. This set the scene for a couple of days in Prague intoxicated by Baroque architecture, Budvar, carp and more Smetana at the National Academy of Music before driving to this year's meeting in the Jizerské mountain area, expertly organised by Jaroslav Stastný. The Dutch capped this by visiting en route areas devastated by Lignite mining where they found *Aulacochthebius narentinus*. When the Czech Republic joins the EU, there is now sufficient data to designate some of the worst affected areas as Special Areas of Conservation under the Habitats Directive.

Accommodation was located at the hospitable U Kačera, a penzion situated on a small track in the hills which provided an exciting challenge for navigators in cars. Some club members arrived early on Thursday where they were greeted by numerous *Hydroporus kraatzi* in a ditch by the car park. Late on Friday, 19 participants from 9 countries had assembled in the meeting room adjacent to the bar. These sessions increasingly take on the air of a drinking bout in Valhalla, where members recount past deeds in the field and reminisce on previous meetings. This year, for example, I learnt from Michael Balke that on the way to the Polish meeting, Mick Eyre, sadly not present at the Czech meeting, had demolished a Greek Restaurant in Berlin and carried off one of the waitresses as booty.

On Saturday morning the Club Secretary welcomed everybody and Helen Shaverdo gave a talk to accompany her poster display on the compilation of the checklist of Belarus Dytiscidae. No further talks being forthcoming, members with an enthusiasm for fieldwork were delighted to take an early lunch and embark on the afternoon excursion to some ponds chiefly remarkable for their proximity to a wedding party. The trip was also unique among Balfour~Browne Club excursions by car because everybody went to the same site.

On the Sunday, there was an excursion by coach to various sites in the Jizerské National Park, notable for its coniferous forests devastated by acid rain. *Ilybius crassus* was found in numbers in a backwater of the River Pařezový. *Deronectes platynotus* occurred at two sites and *Crenitis punctatostriata* was abundant at most sites. A convivial lunch was taken in a mountain hostelry and in celebration, Hans Huijbregts entertained club members with a gymnastics display on a pile of logs containing the stag beetle *Platycerus caraboides*. On a sadder note, Ron Carr lost a wet sock which he had hung up to dry. To some members it must have seemed that a general state of lawlessness is spreading across post-communist Eastern Europe, but others favoured an alternative hypothesis: the proprietor may have considered that a wet sock hung over the gutter above the main hostel entrance might deter potential customers.

On Monday, the group dispersed, grateful to Jaroslav Stastný for his efficient organisation and to the interpreter, Ludic. We must also thank our hosts at U Kačera for their hospitality and for mending Jochen Mölle's car.

Derek Lott, Club Orator

PS: The editor must regrettably record that the Orator failed in his duties this year by proving unable to render a speech of gratitude in the native tongue. We should note more seriously our gratitude to the Czech Entomological Society for provision of the bus to tour the Jizerské National Park.

GERMAN RED LIST

GEISER, R.(ed.) 1998. Rote Liste der Käfer (Coleoptera). In: *Rote Liste gefährdeter Tiere Deutschlands*. Schriftenreihe für Landschaftspflege und Naturschutz **55**. Bundesamt für Naturschutz, 434 pp. ISBN 3-89624-110-9. Available from Bundesamt für Naturschutz, Komstamtimstr. 110, 53179 Bonn at DM39.80.

A large number of experts have contributed to the beetle section of this, the most comprehensive faunal Red List in Europe. Given the scope of the book, one should not expect to see detailed accounts of each species but we have here a basis for reviewing Red List status across Europe. One of the problems we have had with British list is the apparent need for concocted common names; this problem is obviously shared in Germany where some names such as *Schwarzbauch* for *Dytiscus semisulcatus* Müller may be considered useful whilst others, e.g. Kaspischer Tummelkäfer (Caspian Whirligig = *Gyrinus caspius* Ménétriés) are possibly unhelpful. Both of these examples are rated as *stark gefährdter* (= Vulnerable or Red Data Book 2) in Germany, emphasising the value of comparing lists across Europe. But shall we ever be in a position to give each species a European rating? I am grateful to Ronald Bellstedt for gifting a copy to the Club library, and to Lars Hendrich for supplying information on how to obtain further copies.

DUTCH *BEROSUS*

Four species of *Berosus* were known from the Netherlands, *B. affinis* Brullé, *B. luridus* (L.), *B. signaticollis* (Charpentier) and *B. spinosus* (Steven). This review establishes the presence of *B. hispanicus* Küster, found in 1981 by Arno van Berge Henegouwen, and *Berosus fulvus* Kuwert, known only from records up to 1942. The account is accompanied by a key, figures of the genitalia and the mesosternal profile, and maps of distributions. Sufficient data are available for *B. luridus* and *B. signaticollis* to establish that they have wide tolerances of pH, conductivity and chloride concentration, though *B. luridus* is largely associated with acid waters.

CUPPEN, J.G.M. & VAN MAANEN, B. 1998. Distribution and habitats of *Berosus* in the Netherlands (Coleoptera: Hydrophilidae). *Entomologische Berichten, Amsterdam* **58** 213-223.

INDIAN *COPELATUS*

Copelatus boukali is described from southern India and *C. schuhi* for western India. *C. schuhi* was named after Rudolf Schuh and was presumably not intended to provide consolation for Schuhi failing to win the Formula 1 Championship in 1998.

HENDRICH, L. & BALKE, M. 1998. Zwei neue Schwimmkäfer der Gattung *Copelatus* Erichson 1832 aus Indien (Coleoptera: Dytiscidae). *Entomol. Z.* **108** (9) 356-362.

SE ASIAN *LACCOPHILUS*

Laccophilus chini is described from the Malaysian Peninsula, South Vietnam and Sabah in forest pools. *L. mahakamensis* is described from East Kalimantan in primary forest streams.

BALKE, M., MAZZOLDI, P. & HENDRICH, L. 1998. Two new *Laccophilus* species (Coleoptera: Dytiscidae) from southeast Asia, and notes on other species of the genus. *The Raffles Bulletin of Zoology* **46** (1) 71-77.

IBERIAN ELMIDAE

The main paper would appear to provide the first attempt to create Iberian distribution maps for a whole family. It also gives the record data in detail. Of particular interest is the continued survival of *Oulimnius echinatus* on Menorca and the occurrence of *O. cyneticus* in Spain. Below is the new Iberian checklist.

Potamophilus acuminatus (Fab.)
Dupophilus brevis Mulsant & Rey
Elmis aenea Latreille
Elmis maugetii Latreille
Elmis obscura (Müller)
Elmis perezi Heyden
Elmis rioloides (Kuwert)
Esolus angustatus (Müller)
Esolus parallelepipedus (Müller)
Esolus pygmaeus (Müller)
Limnius intermedius Fairmaire
Limnius opacus Müller
Limnius perrisi perrisi (Dufour)
Limnius perrisi carinatus (Pérez-Arcas)
Limnius volckmari (Panzer)
Macronychus quadrituberculatus Müller
Normandia nitens (Müller)
Normandia sodalis (Erichson)
Oulimnius aegyptiacus (Kuwert)
Oulimnius bertrandi Berthélemy
Oulimnius cyneticus Berthélemy & Terra
Oulimnius echinatus Berthélemy
Oulimnius fuscipes (Reiche)
Oulimnius major (Rey)
Oulimnius rivularis (Rosenhauer)
Oulimnius troglodytes (Gyllenhal)
Oulimnius t. tuberculatus (Müller)
Oulimnius tuberculatus perezi (Sharp)
Riolus cupreus (Müller)
Riolus illiesi Steffan
Riolus subviolaceus (Müller)
Stenelmis canaliculata (Gyllenhal)
Stenelmis consobrina Dufour

The second paper provides a detailed appraisal of *Limnius perrisi*. Two subspecies are recognised, *perrisi carinatus* in the north-eastern quadrant of Iberia and the nominate form in the Pyrenees.

RICO, E. 1996. Distribución de los Elmidae (Coleoptera: Dryopoidea) en la Península Ibérica e Islas Baleares. *Graellsia* 52 115-147.

RICO, E. 1998. A revision of the *Limnius perriri* subspecies group (Coleoptera: Elmidae) in the Iberian Peninsula. *Aquatic Insects* 20 (3) 133-139.

OLIGOCENE IBERIAN DYTISCIDAE

A larva of the subfamily Colymbetinae is described from an Oligocene deposit in Spain, a first for the Iberian Peninsula

ORTUÑO, V.M. & ARILLO, A. 1997. Primer dato de un estadio preimaginal de Colymbetinae del oligoceno de Izarra (Alava, España) (Coleoptera, Dytiscidae). *Nouv. Revue Ent.* **14** (2) 141-145.

WORLD HYDRAENIDAE

HANSEN, M. 1998. *World Catalogue of Insects. 1. Hydraenidae (Coleoptera).* Apollo Books, Stenstrup. ISBN 87-88757-27-7. Available from Apollo Books, Stenstrup, Denmark.

As water beetlers I think that we should be proud that the first world catalogue of insects in this series should concern one of our groups. OK, so both Michael and Apollo Books are Danish, but they both are to be congratulated on such a venture. The nearest we can ever get to an answer in the debate about the actual number of insect species in the world is to start counting on the grand scale. There are only 1,163 species of Hydraenidae described so far, nearly half (504) in the genus *Hydraena*. And yet the growth in the number of Palaearctic species of *Hydraena* shows no sign of decreasing.

Hansen uses Perkins' 1997 classification, though not without some reservations. Thus *Enicocerus* is taken out of *Ochthebius* into Enicocerina, and *Aulacochthebius* is recognised as a genus distinct from *Ochthebius*. Keeping *Haenydra* as a subgenus of *Hydraena* results in a few new combinations. The greatest surprise is the need to replace *Hydraena minutissima* with *H. flavipes* Sturm, This is because Stephens used *minutissima* as a name applied by Gyllenhal. The name is not available so the 1836 name achieves priority. *Limnebius extraneus* d'Orchymont is reinstated as the name for what Manfred Jäch named *externus* on the basis that he, Manfred, considered that d'Orchymont had applied the name below the subspecific level. Michael notes that d'Orchymont did not apply the name "infrasubspecifically", merely stating that he didn't think that it was sufficiently different from *evanescens* Kiesenwetter to justify species status. I expect that Michael has applied the rules correctly in regard to Ieniştea's disastrous 1988 treatment of *Ochthebius*; all that tells me is that the rules must be changed! We cannot have a situation where a species - *malaganus* - has to be accepted even though the type locality is unknown and the type is probably lost for ever. It also extremely unfortunate that *balcanicus*, *emilianus*, *hellenicus*, *indicus*, *izmiranus*, and *mediterraneus* - all Ieniştea - have to be accepted in the absence of differential diagnosis and on the basis of such appalling taxonomic work.

Very few omissions and errors can be detected in this replacement of Knisch's 1924 catalogue. Nevertheless I suspect that it will be rather less than 75 years before a revised edition is needed in order to keep up with the rate of describing new species.

COLYMBETINE PHYLOGENY

Analysis of the primary setae and pores of first instars was used to deduce phylogeny (Alarie 1998), indicating two monophyletic lineages - (1) *Agabus* + *Ilybius* + *Agabinus*; (2) *Colymbetes* + *Rhantus* + *Neoscutopterus* + *Matus*. The pattern in Colymbetinae is similar to what has been observed in Carabidae but Hydroporinae differ strongly in having many secondary losses. Study of *Hydrotrupes* larvae indicate that this genus is very close to *Agabus* and *Ilybius*, but differ strongly from all other colymbetines in the absence of mandibular channels and in the presence of some uniquely lanceolate setae on the 8th abdominal segment. Again on the basis of larval studies, *Agabinus* is postulated as being the sister-group of *Agabus* + *Ilybius* + *Hydrotrupes*.

ALARIE, Y. 1998. Phylogenetic relationships of Nearctic Colymbetinae (Coleoptera: Adephaga: Dytiscidae) based on chaetotaxic and porotaxic analysis of head capsule and appendages of larvae. *The Canadian Entomologist* **130** 803-824.

ALARIE, Y., SPANGLER, P.J. & PERKINS, P.D. 1998. Study of the larvae of *Hydrotrupes palpalis* Sharp (Coleoptera: Adephaga, Dytiscidae) with implications for the phylogeny of the Colymbetinae. *The Coleopterists Bulletin* **52** (4) 313-332.

ALARIE, Y. & LARSON, D.J. 1998. Larvae of *Agabinus* Crotch: genetic characteristics, description of *A. glabrellus* (Motschulsky), and comparison with other genera of the subfamily Colymbetinae (Coleoptera: Adephaga: Dytiscidae). *The Coleopterists Bulletin* **52** (4) 339-350.

***OCHTHEBIUS RUGULOSUS* COMPLEX**

A reappraisal of *O. rugulosus* indicates that it is a species complex . The complex is tentatively put at 12 species, three new to science, plus one subspecies new to science. *O. rugulosus* itself is endemic to Madeira and the Canaries. *O. alpinus* (Ienistea) is reinstated as a full species known from Scandinavia, Switzerland, Ukraine and Russia. *O. hungaricus* Endrödy-Younga is also reinstated as a species, being known from eastern Europe. The new species are from Japan (*O. hokkaidensis*), China (*O. lurugosus*) and Kazakhstan (*O. nonaginta*).

JÄCH, M.A. 1998. Revision of the Palearctic species of the genus *Ochthebius* Leach XX. The *O.* (*Asiobates*) *rugulosus* Wollaston species complex (Coleoptera: Hydraenidae). *Koleopterologische Rundschau* **68** 175-187.

SPERMATHECAL ANATOMY OF DYTISCIDAE

Some Hydroporinae and Laccophilinae are supposed to have a spermathecal duct allowing sperm to reach the oviduct directly. The author demonstrates that this duct does not exist. The duct-like extension of the spermatheca is in fact the tendon of a muscle. This muscle is a remarkable feature of the two tribes, being particularly long and duct-like in *Graptodytes*.

MARZO, L. de 1997. Revisione anatomica della spermateca nei Ditiscidi (Coleoptera). *Entomologica, Bari* **31** 207-219.

***CYPHON* SYNONYMIES**

Tournier's material is in the Pic Collection in Paris. *Cyphon laevipennis* Tournier 1868 is recognised as a valid species from the Jura, resulting in reduction to a junior synonym for that great tongue-twister *C. phragmiteticola* Nyholm. *C. siculus* Tournier is the name by priority for *C. impressus* Kiesenwetter. Fortunately other names are reduced to synonyms of species with well known names

KLAUSNITZER, B. 1998. Über die *Cyphon*-Arten Henri Tourniers. *Beitr. Ent. Berlin* **48** (2) 411-415.

CUTICULAR HYDROCARBONS

Strangely, though more than 100 terrestrial species of beetle have had their cuticular hydrocarbons assessed, this is the first study of an aquatic species. The basic profile is similar to that of terrestrial Coleoptera but there is a relatively higher proportion of short chain *n*-alkanes, more *n*-alkenes and less methylalkanes.

ALARIE, Y., JOLY, H. & DENNIE, D. 1998. Cuticular hydrocarbon analysis of the aquatic beetle *Agabus anthracinus* Mannerheim (Coleoptera: Dytiscidae). *The Canadian Entomologist* **130** 615-629.

NEPALESE POLYPHAGAN WATER BEETLES

Although the fauna of Nepal has been fairly well recorded, the authors note the possibility of about 50 species of *Hydraena* awaiting description, putting the 44 species of six families so far known into a different perspective. *Helophorus mervensis* Semenov is recorded from Nepal for the first time.

JÄCH, M.A. & SHARMA, S. 1997. Nepalese water beetles (Coleoptera) Dryopidae, Elmidae, Helophoridae, Hydraenidae, Heteroceridae, and Hydroscaphidae. *Proceedings, International Conference on Ecohydrology of High Mountain Areas* 599-607.

KURIL *CERCYON*

Cercyon saluki is described from Kunashire Island in the Kuril Islands. The species has been found at light and under elm bark.

RYNDEVICH, S.K. 1998. New species of beetles of the genus *Cercyon* (Coleoptera: Hydrophilidae) from Russian Far East. *Pakistan J. Zool.* **30** (1) 63-64.

THURINGIAN BEETLES

Data are presented by Ronald Bellstedt and André Skale for *Ochthebius metallescens* Rosenhauer, *Limnebius nitidus* (Marsham), *Hydrochus angustatus* Germar, *Helophorus strigifrons* Thomson, *H. asperatus* Rey, *Hydrochara flavipes* Stevens, *Berosus geminus* Reiche & Saulcy, *Elmis rioloides* Kuwert, *Elodes koelleri* Klausnitzer, *Hydrocyphon deflexicollis* Müller, and *Heterocerus intermedius* Kiesenwetter. Jan Cuppen's paper notes several species including *Hydroporus morio* Aubé, *Helophorus paraminutus* Angus and *Chaetarthria similis* Wollaston.

BELLSTEDT, R. & SKALE, A. 1998. Interessante Wasserkäfer-Funde in Thüringen und angrenzenden Bundesländern (Coleoptera). *Thür. Fauna Abhandlungen* **5** 163-167

CUPPEN, J.G.M., VORST, O. & BELLSTEDT, R. 1998. Five beetles new for Thuringia, and records of endangered water beetles (Coleoptera: Dytiscidae, Helophoridae, Hydrophilidae, Staphylinidae). *Thür. Fauna Abhandlungen* **5** 169-178.

***DERONECTES* PART 2**

The second of this revision treats the *D. parvicollis* group. This is divided into four subgroups. Fourteen species are newly described, from Iran, Afghanistan, Turkey, Iraq, Syria, and Pakistan. All members of the group are fully described, illustrated and keyed. This brings the known number of species in *Deronectes* to 53, which are indexed for parts I and II of the revision. *D. parvicollis* (Schaum) is newly recorded from Macedonia, Armenia, Georgia and Iran, and *D. abnormicollis* Semenow from China. Females of three species are described for the first time.

FERY, H. & HOSSEINIE, S. 1998. A taxonomic revision of *Deronectes* Sharp, 1882 (Insecta: Coleoptera: Dytiscidae) (part II). *Ann. Naturhist. Mus. Wien* **100 B** 219-290.

INSECTS AS BIOINDICATORS

Philippe Richoux points out the problems and the potential of insects as bioindicators. In particular he draws attention to an inventory of the aquatic insects of France. This is dominated by flies but it is often difficult to identify material to generic level, let alone identify life-cycle characteristics.

Orders	Families	Genera	Species
Ephemeroptera	16	37	149
Plecoptera	7	27	105
Odonata	9	34	93
Heteroptera	11	25	78
Trichoptera	21	108	402
Coleoptera	17	117	610
Planipennia	3	3	5
Lepidoptera	1	5	5
Megaloptera	1	1	3
Hymenoptera	1	1	1
Diptera	24	372	1933
Totals	111	730	3,384

In discussing various biotic indices, Philippe concludes that the best compromise is to analyse data to the generic level. He also redevelops the idea of using life-cycle traits of insects in indexing the state of health of aquatic systems.

RICHOUX, P. 1997. Les insectes: bioindicateurs de la qualité des milieux aquatiques continentaux. *Actes du Colloque "Les Insectes, bio-indicateurs de la qualité des milieux", Dijon, 2-4 décembre 1997. Cahiers de l'AIDEC* **36** 93-101.

SUCKERS IN DYTISCINI

A phylogeny for *Dytiscus* is developed based on 28 morphological characters and is used to trace the evolution of the numbers or pro- and mesotarsal suckers of the male. The number tarsal suckers is shown to have great variation within species, up to 70%. The numbers of suckers in *D. dimidiatus* Bergsträsser and *D. lapponicus* Gyllenhal could weakly correlated with body size. Higher number of suckers are principally associated with the evolution of female sulcate elytra, increased puncturation and additional microsculpture of female pronota, and increased frequency of sulcate females. This supports the idea that there is a coevolutionary "arms race" between the sexes. The phylogeny points to an origin in North America and three separate dispersals to Eurasia, and at least one dispersal via the Beringian Strait. For copies, contact Anders Nilsson initially.

BERGSTEN, J. 1999. *Dytiscus* phylogeny and the evolution of secondary sexual characters (Coleoptera: Dytiscidae). Master Thesis in Biology, University of Umeå.

TREEHOLE CHEMISTRY

Atmospheric deposition was expected to and did cause variation in the water chemistry of treeholes across Pennsylvania, but there were no related regional differences in the treehole fauna. Despite this, the density and species richness of the insect community was related to water volume, sulphate, sodium and dissolved organic carbon (Paradise & Dunson 1997a). Sodium concentration was inversely related to mosquito and scirtid beetle densities, suggesting that sodium - and perhaps other cations - partly dictate treehole community structure (Paradise & Dunson 1997b). The beauty of these studies is that they can be simulated quite easily in laboratory cultures. In one such study (Paradise 1998), low leaf litter mass had the greatest effect on community development, indicating that colonisation was most effective when leaf litter mass was low and water volume was high. In another simulation (Paradise & Dunson 1998) scirtid survival was less affected by low pH than for other organisms. Scirtids appear to be the most robust component of the treehole community.

PARADISE, C.J. & DUNSON, W.A. 1997a. Effects of pH and sulfate on insects and protozoans inhabiting treeholes. *Arch. Environ. Contam. Toxicol.* **33** 182-187.

PARADISE, C.J. & DUNSON, W.A. 1997b. Effects of water cations on treehole insect communities. *Ann. Entomol. Soc. Am.* **90** (6) 798-805.

PARADISE, C.J. 1998. Colonization and development of insects in simulated treehole habitats with distinct resource and pH regimes. *Écoscience* **5** (1) 39-45.

PARADISE, C.J. & DUNSON, W.A. 1998. Relationship of atmospheric deposition to the water chemistry and biota of treehole habitats. *Environmental Toxicology & Chemistry* **17** (3) 362-368.

IBERIAN HETEROCERIDAE

Eight *Aulogyles* and nine *Heterocerus* species were studied. As such, this study is useful well beyond the Iberian peninsula in that the western European fauna is included except for *H. maritimus* Guérin-Méneville. The genitalia of each species are illustrated. Sixteen species are known from mainland Spain, but only seven from Portugal and three from the Balearics. The accompanying key is heavily based on colour markings, and also the pronotal posterior border character, which I can never make out. It is doubtful whether there can ever be an effective key to such a difficult group. A reference collection is essential for confirmation of identity, plus, of course, dissected males. The maps might be considered by some to be premature but they do demonstrate distributional variation, and will undoubtedly stimulate further work on this group.

AGUILERA, P., MASCAGNI, A. & RIBERA, I. 1998. The family Heteroceridae MacLeay, 1825 (Coleoptera, Dryopoidea) in the Iberian peninsula and the Balearic Islands. *Miscel.lània Zoològica* **21** (1) 75-100.

CONSERVATION IN THE UK

Roger Key reviews work in 1997 and 1998 on the conservation of water beetles under the UK Biodiversity Action Plan. Work has been funded on *Agabus brunneus, Graphoderus zonatus Laccophilus poecilus*, and *Hydrochara caraboides*.

KEY, R. 1998. Conservation news. *The Coleopterist* **7** (3) 99-102.

NUMBERS AND SIZE IN ARGENTINA — by Adriana OLIVA

In December 1997 Edgrado Trémouilles and I went to the National Park Mburucuyá in Corrientes in the north-east of Argentina Now, for a long time I had been puzzled that the smallest species of *Berosus* should appear often, but in small numbers. I readily found out why, when I saw them swimming about in a puddle made by rain in tractor tracks, very matey with some bidessines. In a few minutes I had scooped out 27 *B. minimus* Knisch with a small plastic strainer. Depth was not more than a couple of centimetres - well, less than an inch - so no one could have made a "proper" sweep with the ordinary net! Moral: collecting techniques do affect the abundance of species in collections; we all know it!

Received January 1999

AUSTRALIAN PAPERS

Chris Watts has supplied a series of papers, the titles of most of which are self-explanatory. The new dytiscid genus is based on the hydroporine *Sekaliporus kriegi*, described from Northern Australia. For the visitor to Australia, the most welcome paper will be the guide to genera, which should provide an excellent first "fix" on what there is to find. My copy has several useful annotations (for example, the undescribed genus on page 16 is based on *Cybister weckwerthi* (see ***Latissimus* 10** 37).

WATTS, C.H.S. 1997. A new genus and species of Australian Dytiscidae (Coleoptera). *Records of the South Australian Museum* **29** (2) 121-123.

WATTS, C.H.S. 1996. Three new *Berosus* Leach (Coleoptera: Hydrophilidae) from Australia. *Records of the South Australian Museum* **29** (2) 147-152.

WATTS, C.H.S. 1997. Four new species of *Antiporus* Sharp (Coleoptera, Dytiscidae) from Australia, with notes on *A. femoralis* (Boh.) and *A. interrogationis (*Clark). *Records of the South Australian Museum* **30** (1) 35-42.

WATTS, C.H.S. 1998. Revision of Australian *Amphiops* Erichson, *Allocotocerus* Kraatz and *Regimbartia* Zaitzev (Coleoptera: Hydrophilidae). *Records of the South Australian Museum* **30** (2) 93-106.

WATTS, C.H.S. 1998. Revision of Australian *Enochrus* Thomson (Coleoptera: Hydrophilidae). *Records of the South Australian Museum* **30** (2) 137-156.

WATTS, C.H.S. 1998. *Preliminary guide to the identification of adult and larval Dytiscidae and adult aquatic Hydrophilidae (Insecta: Coleoptera).* Cooperative Research Centre for Freshwater Ecology Identification Guide No.19, Thurgoona, New South Wales.

THURINGIAN LIST

A survey of the flora and fauna of some lime ponds on the outskirts of Erfurt includes a list of water beetles, the most notable being *Hydrochara caraboides* (L.).

BÖßNECK, U. & WEIPERT, J. 1997. Die Schutzgebiete der Landeshauptstadt Erfurt (Thüringen). Teil 1: Flora und Fauna des GLB "Kalkhügel und Fasanenjagdgebiet". *Veröffentlichungen Naturkundemuseum Erfurt* **1997** 37-40.

IBERIAN ADVANCES

Cercyon laminatus Sharp is recorded from the Iberian peninsula, from Girona, for the first time. Other additions to the Iberian list are discussed, in particular confirmation by new records of *Paracymus phalacroides* (Wollaston), *Cercyon subsulcatus* Rey and *Hydraena riparia* Kugelann. One species, *Hydroglyphus confusus* (Klug) is removed from the list.

RIBERA, I., HERNANDO, C., AGUILERA, P. & MILLAN, A. 1997. Especies poco conocidas o nuevas para la fauna ibérica de coleópteros acuáticos (Coleoptera: Dytiscidae, Hydrophilidae, Hydraenidae, Dryopidae). *Zapateri, Revta. aragon. ent.* **7** 83-90

***OCHTHEBIUS LOBICOLLIS* GROUP**

This group was previously revised in 1990. Two of the names then used, *O. tuniseus* Normand and *O. longipes* Fiori, should be removed as *tuniseus* is now regarded as a synonym of *O. cuprescens* Guillebeau and *longipes* is synonymised with *O. quadrifossulatus* Waltl. Another species, *O. delgadoi* Jäch, has been described from Spain. *O. caesaraugustae* is also described from Spain, its name deriving from the original Latin version of Zaragoza; it is another species with a tin-opener aedeagus. The Canarian endemic, *O. lapidicola* Wollaston, is regarded as a member of this group.

JÄCH, M.A., 1990. Revision of the palearctic species of the genus *Ochthebius* Leach IV. The *lobicollis* group. *Entomol. Blatter* 86 26-40.

JÄCH, M.A., RIBERA, I. & AGUILERA, P. 1998. Revision of the Palearctic species of the genus *Ochthebius* Leach (Coleoptera: Hydraenidae). XV. Additional notes on the *lobicollis* group. *Aquatic Insects* **20** 197-202.

EASTERN *OOCYCLUS*

Oocyclus are part of the Laccobiini, Six species are known from the Neotropical region and six new species are described to add to the three already known from the Old World. The Old World species are keyed and illustrated.

HEBAUER, F. & WANG, L.-J. 1998. New species of the genus *Oocyclus* Sharp, 1882 from India, Sri Lanka and Taiwan with a key to all known species (Coleoptera: Hydrophilidae). *Acta Coleopterologica* **14** (1) 37-46.

BROWSING SECTION

Élégie

Coléo, dit une excellence,
Toi qui fus le preu des lézards,
Le pays t'attend: je te lance
Droit à la tête des Beaux-Arts.
Prends un bain, puis au ministère
Tout de ce pas tu peux courir.
- Me baigner ! J'aime mieux mourir.

E. IMBERT

CORRECTIONS - *LATISSIMUS* 10

- The title of Anne Töyrä's thesis (page 34) should have been:
  TÖYRÄ, A. 1997. *Samvariation mellan honliga och hanliga sekundära könskaraktärer hos* Graphoderus zonatus verrucifer *(Coleoptera: Dytiscidae).* Degree Thesis in Biology, University of Umeå.
- In Jochen Mölle's article (page 8), for *Hydraena subimpressa*, read *Hydraena assimilis*.

Papers in brief

ALARIE, Y. & FRITZ, K. 1998. Description of the larval stages of *Heterosternuta diversicornis* (Sharp) (Coleoptera: Dytiscidae, Hydroporinae). *Entomologica Scandinavica* **29** 39-46.

HEBAUER, F. 1998. Taxonomische Studien zur Hydrophiliden-Gattung *Enochrus* Thomson, 1850. 1. Teil: Zwei afrikanische Arten aus den Untergattungen *Enochrus* s. str. und *Hydrotrephis* MacLeay (Coleoptera, Hydrophilidae). *Ent. Bl.* **94** 143-146.

HEBAUER, F. 1998. Six new species of the genus *Helochares* Mulsant, 1844, subgenus *Hydrobaticus* MacLeay, 1871 from Africa and Asia. (Coleoptera: Hydrophilidae). *Acta Coleopterologica* **14** (2) 38-43.

JÄCH, M.A. 1997. Description of *Laorina*, a new laraine genus from Laos (Coleoptera Elmidae). *Tropical Zoology* **10** 393-398.

JÄCH, M.A. 1998. *Sebasthetops omalinііniformis* gen. et sp. nov. from South Africa (Coleoptera: Hydraenidae). *Entomological Problems* **29** (1) 23-25.

JÄCH, M.A. & DÍAZ, J.A. 1998. Description of a new species of *Hydraena* Kugelann (Coleoptera: Hydraenidae) from the southeastern USA. *Linzer biol. Beitr.* **30** (1) 299-304.
KODADA, J. 1997. Check-list of riffle beetles of Slovakia (Coleoptera: Elmidae, Dryopidae). *Acta Zool. Univ. Comenianae* **41** 33-35.
KODADA, J. 1998. *Franzyops longipalpis*, a new genus and species of terrestrial Dryopidae from Venezuela (Coleoptera: Dryopidae). *Koleopterologische Rundschau* **68** 211-216.
MAKHAN, D. 1998. A new *Limnebius* and a new *Hydraena* for Turkey (Coleoptera: Hydraenidae). *Phegea* **26** (4) 151-154.
OLIVA, A. 1997. *Berosus corumbanus* Knisch, 1921 (Coleoptera, Hydrophilidae) nueva cita para la Argentina. *Physis (Buenos Aires) Secc. B* (1996) **54** 18.
WEWALKA, G & WANG, L.-J. 1998. Three new species of *Microdytes* Balfour-Browne from Laos and Borneo (Coleoptera: Dytiscidae). *Koleopterologische Rundschau* **68** 65-69.

The e-mail file: emboldened text indicate changes from ***Latissimus* 10**.

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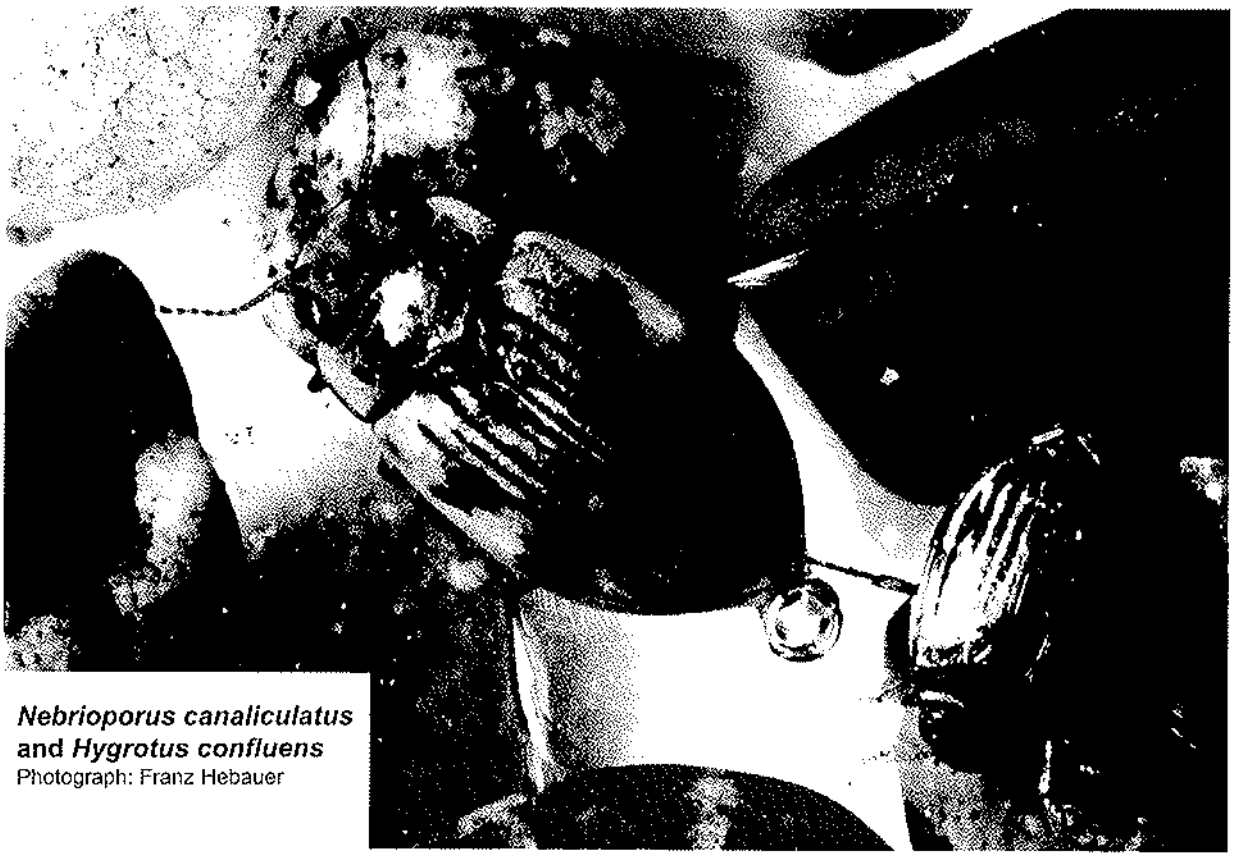

Nebrioporus canaliculatus* and *Hygrotus confluens
Photograph: Franz Hebauer

WATER BEETLE MORE NUTRITIOUS THAN DUNG BEETLE

An odd Website is **www.ent.iastate.edu/misc/insectnutrition.html**, which compares the nutritional value of various insects per 100 grams. A "Giant Water Beetle" provides 19.8 g protein, 8.3 g fat and 2.1 g carbohydrate. The equivalent figures for a dung beetle are 17.2, 4.3, 0.2. There's more, but don't rush.

An Iberian checklist has been prepared by Miguel Angel Alonso Zarazaga and others. See it on

http://www.fauna-iberica.mncn.csic.es/htmlfauna/faunibe/zoolist/insecta/coleoptera/coleoptera.html

Till Tolasch has prepared a list of e-mail addresses of coleopterists. Visit his web page on

http://www.entomologie.de

Michael Balke is now in Nabire, Irian Jaya. You can visit the website for the Insects of Irian Jaya on

http://www.irjaya.or.id

Latissimus is a publication of the Balfour~Browne Club.

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