

**A new species of *Hygrobia* LATREILLE,
from peatlands of south-western Australia
(Coleoptera: Hygrobiidae)**

L. HENDRICH

Abstract

Hygrobia watsi sp.n. (Coleoptera: Hygrobiidae) is described from south-west Western Australia. The species appears to be restricted to peatland swamps and lakes. It is the sixth species of the genus in the world, the fourth in Australia. The habitat and its water beetle coenosis are described in detail. *Hygrobia watsi* sp.n. is presumably a true relict species and thought to be endangered by peatland swamp drainage and dramatic increases in salinity. Additional distributional notes for all Australian species are given. *Hygrobia nigra* (CLARK, 1862) is reported for the first time for northern Queensland.

Key words: Coleoptera, Hygrobiidae, *Hygrobia*, new species, peatland swamps, Australia.

Introduction

The family Hygrobiidae is comprised of only one genus (*Hygrobia* LATREILLE) with five species in the world (JÄCH 1995). The species exhibit a highly disjunct distribution, with *H. hermanni* (FABRICIUS) in Europe, northern Africa (Morocco, Algeria and Tunisia), and Israel, *H. davidi* BEDEL in Jiangxi, southeastern China (JÄCH 1995), and three species in Australia (BRITTON 1981). The wide separation of such closely allied species suggests that they are relicts of a formerly wider distribution, but no explanation of the disappearance of *Hygrobia* species from intermediate regions is forthcoming. All Australian *Hygrobia* species are rare in collections and almost nothing is known of their biology, in contrast to the relatively well-known West Palearctic species (e.g. CUPPEN 2000). It appears that they are rarely attracted to lights and that their population density is much lower than in *H. hermanni*.

Water beetles of different families were collected during a four-week period in the south-western part of Western Australia in December 1999 and January 2000 by Lars Hendrich and Stephan Gottwald. Many parts of the area have not been well investigated previously for water beetles, therefore the study provided a number of new regional records as well as new species (BALKE et al. 2000, HENDRICH 2000, 2001). Additional data were provided by Adrian Pinder (Conservation and Land Management, Perth) and C.H.S. Watts (South Australian Museum, Adelaide). The aim of this paper is to report on and describe another Australian species, its habitat and its remarkable water beetle coenosis. The distribution of all Australian *Hygrobia* species is mapped.

The Study Area

The study area is located in the mesic far south-west corner of Western Australia. The climate is temperate, summers being warm and dry, winters cold and wet. Rainfall is lowest inland (where the median annual value is about 250 mm) and greatest and most reliable near the coast

(1400 mm). "Symphyomyrtus" winter-rain sclerophyllous forest is the major vegetation in the region. Coastal fringes and exposed sandy patches of the Darling Escarpment region carry species-rich shrubland and *Banksia*-*Corymbia*-*Monocalyptus* woodland. The moist south-west corner of Western Australia is of outstanding interest from the viewpoint of both phytogeography (HOPPER 1979, NELSON 1981) and zoogeography (KIKKAWA et al. 1979, WILLIAMS & ALLEN 1987). With respect to the freshwater fauna, there is a high degree of endemism in Western Australia, and a high proportion of these endemics occur in, or are restricted to, the south-west part of the State (PUSEY & EDWARD 1990, BAYLY 1992, WATTS 1997, WATTS & PINDER 2000, HENDRICH 2001).

Material and Methods

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

CH	Collection Lars Hendrich, Berlin, Germany
CGW	Collection Prof. Dr. Günther Wewalka, Vienna, Austria
NMW	Naturhistorisches Museum Wien, Vienna, Austria
SAMA	South Australian Museum, Adelaide, South Australia, Australia
WAM	Western Australian Museum, Perth, Western Australia, Australia

The habitus drawing was produced by the Czech artist Radek Beran (Ústí nad Labem). The median lobe was traced from color slides. The style of the descriptive notes follows BRITTON (1981).

Taxonomy

The following species of *Hygrobia* are recorded from Australia:

<i>Hygrobia australasiae</i> (CLARK, 1862)	SA, VIC, TAS, NSW, S-QLD
<i>Hygrobia maculata</i> BRITTON, 1981	NT, N-QLD
<i>Hygrobia nigra</i> (CLARK, 1862)	VIC, NSW, ACT, QLD
<i>Hygrobia watti</i> sp.n.	WA (SW-Australia)

Abbreviations: ACT = Australian Capital Territory, NSW = New South Wales; NT = Northern Territory; QLD = Queensland; SA = South Australia; TAS = Tasmania; VIC = Victoria; WA = Western Australia.

The distribution map (Fig. 6) is based on the locality data published by BRITTON (1981) and unpublished records from the author, Chris H.S. Watts (SAMA, Adelaide), Gilbert L. Challet (Florida, U.S.A.) and Günther Wewalka (Vienna, Austria).

Hygrobia watti sp.n.

TYPE LOCALITY: *Melaleuca* peatland swamp, Byenup Lagoon, Muir Lakes Nature Reserve, south-western Australia.

TYPE MATERIAL. Holotype: ♂: "AUSTRALIA/ WA: Albany Hwy, Muir Lakes Nature Reserve, SW part of Byenup Lagoon, 4. & 5.1.2000 [34°29'S 116°44'E], Hendrich leg. (loc. WA 11/157)" (WAM). **Paratypes:** 2 ♀♀, 1 ♂, same data as holotype; 3 ♀♀, 3 ♂♂: "AUSTRALIA/ WA: Lane Poole Conservation Reserve, Nalyerin Lake, 300 m, 29. & 30.12.1999 [Darling Range: 33°8.51'S 116°22.15'E], Hendrich leg. (loc. WA 4/151)" (CH, NMW, SAMA, WAM).

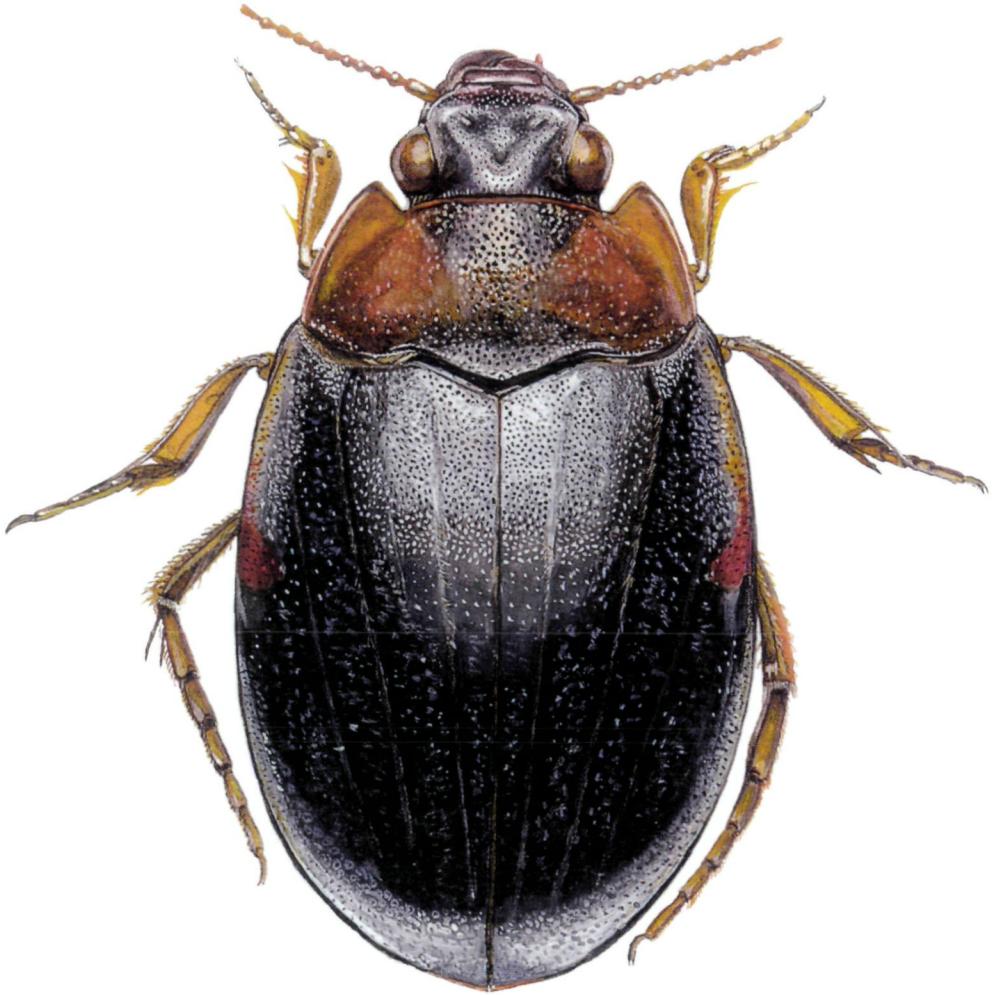


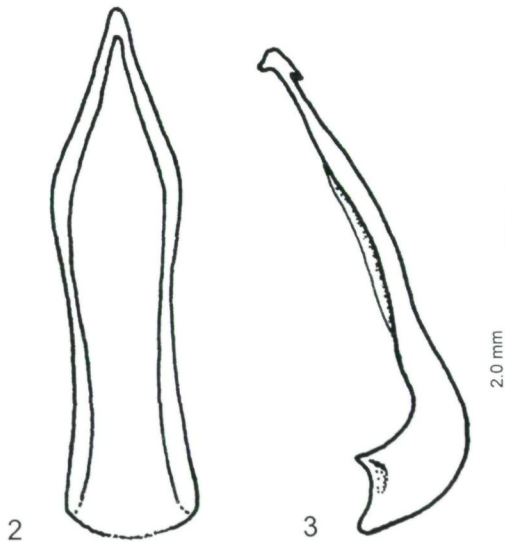
Fig. 1: Habitus of *Hygrobia wattsi* sp.n. (paratype, ♀)

Additional locality (not type material, specimens not seen): Four adults and numerous first and second instar larvae: SW-Australia, Albany, 3 km ENE Manypeaks, Lake Pleasant Nature Reserve, 17th September 2000 [34°49'S 118°10'E], C.H.S. Watts leg. (SAMA) (Watts in litt.).

DIAGNOSIS: Roundish-oval, black with reddish patches on elytra, pronotum lighter (Fig. 1).

DESCRIPTION: Measurements (N = 10). Total length of beetle 10.6 – 11.0 mm (holotype 11.0 mm); length without head 8.8 – 9.0 mm (holotype 9.0 mm); greatest width of beetle 5.8 – 6.1 mm (holotype 6.1 mm).

Colour. Clypeus black, frons, labrum, palpi and antennae reddish brown, mandibles reddish brown at base with apices black; pronotum reddish brown with black irregular patch; scutellum black; elytra black with a small to medium sized reddish patch medio-laterally; sutural margin black; ventral surface black, epipleuron, legs, pronotum and head reddish-brown.



Figs. 2 - 3: 2, Dorsal view of median lobe of aedeagus *Hygrobia watsi* sp.n.; 3, same, lateral view.

Sculpture. Clypeus and frons finely punctured, density of punctures ca 300/mm², surface shining, without microsculpture. Pronotum with lateral edges slightly convex, surface more coarsely punctured than frons, density ca 350/mm² in middle, becoming coarser and less dense (ca 320/mm²) towards margin. Elytral surface like that in *H. australasiae* and *H. maculata*, without a swelling in middle of basal half; punctuation of elytra dense and confused on disc and sides, becoming less dense towards suture and apex; punctures of two sizes, the larger ones about 1.5 x as wide as the smaller punctures. Discal row of serial coarse punctures dense and well defined, 1st and 2nd lateral rows less distinct, punctures with recumbent setae, a sutural row not present; ventral surface, except pronotal hypomera and hind coxae beneath trochanters, very densely and coarsely punctured.

Male. Segments 1 and 2 of tarsi of fore and mid legs very slightly and asymmetrically expanded; segments 1-4 with dense setae on inner edges, setal length approximately equal to half segment width. Median lobe of aedeagus as in Figs. 2-3.

Female. Segments of fore and mid tarsi in female symmetrical, setal length approximately one third segment width.

ETYMOLOGY: Named after Chris H.S. Watts, the "creator" of countless Australian water beetles, and who drew my attention to the new species.

DISTRIBUTION: South-western Australia. South of a line from Perth to Albany.

HABITAT: **Nalyerin Lake** (Loc. 4/151): Freshwater *Baumea articulata*/sedge seasonal peatland swamp, with a permanent central water body (up to 1 m depth). Maximum area of wetland inundated: 63 ha. Aquatic vegetation dominated by dense stands of *Ruppia* (floating plant), thin sedges over most of lake area and a large area of *Baumea articulata*. *Melaleuca* trees on fringe, then eucalypt woodland. Bottom consisted of peat and rotten plant debris (Fig. 4). **Byenup Lagoon** (Loc. 11/157): Paperbark (*Melaleuca raphophylla*) freshwater swamp. Rich in aquatic vegetation (e.g. *Baumea articulata*, *Montia australasica*, *Utricularia* spp.) and mats of native

floating grasses. The whole area is surrounded by Jarrah/Marri woodland. Depth up to 40 cm (Fig. 5). The larvae collected at Lake Pleasant are from an exposed seasonal lake area, with some permanent and deeper water bodies. Completely covered with thin sedges; the deeper and more permanent ponds surrounded by *Baumea articulata*. Depth 10 to 80 cm. Bottom consisted of mud and rotten plant debris (Hendrich vid.).

Apart from the *Hygrobia*, the water beetle coenosis included the following species: **Nalyerin Lake** (Loc. 4/151): DYTISCIDAE: *Uvarus pictipes* (LEA), *Liodessus inornatus* (SHARP), *Antiporus femoralis* (BOHEMAN), *A. gilberti* (CLARK), *A. hollingsworthi* WATTS, *Sternopriscus browni* SHARP, *Megaporus solidus* (SHARP), *Lancetes lanceolatus* (CLARK), *Rhantus suturalis* (MACLEAY), *Homoeodytes scutellaris* (GERMAR); HYDROPHILIDAE: *Limnoxenus zealandicus* (BROUN), *Paracymus pygmaeus* (MACLEAY). **Byenup Lagoon** (Loc. 11/157): HALIPLIDAE: *Halipilus gibbus* (CLARK); DYTISCIDAE: *Uvarus pictipes* (LEA), *Liodessus inornatus* (SHARP), *Antiporus femoralis* (BOHEMAN), *Sternopriscus browni* SHARP, *Sternopriscus minimus* LEA, *Sternopriscus* sp., *Megaporus solidus* (SHARP), *M. howitti* (CLARK), *Necterosoma darwini* (BABINGTON), *Copelatus ater* SHARP, *Platynectes aenescens* (SHARP), *Rhantus simulans* RÉGIMBART, *Rhantus suturalis* (MACLEAY), *Homoeodytes scutellaris* (GERMAR), *Spencerhydrus pulchellus* SHARP; HYDROPHILIDAE: *Enochrus eyrensis* (BLACKBURN), *Limnoxenus zealandicus* (BROUN), *Paracymus pygmaeus* (MACLEAY), *Hydrophilus albipes* CASTELNAU.

AFFINITIES: A distinct species, separated from all other Australian species by its isolated distribution, colouration (almost unicolorous black with reddish markings on elytra), the broad median lobe and the distinct rows of punctures on elytra (see BRITTON 1981).

Faunistics

Hygrobia australasiae (CLARK, 1862)

Pelobius australasiae CLARK, 1862: 402.

Material examined: 1 ex.: "AUSTRALIA / VICTORIA Grampians, 10 N Dunkeld, Victoria Valley Road, Bryan's Swamp, 100m, 20.2.1998 Hendrich leg./ (Lok. 54/95) " (CH).

Hygrobia maculata (BRITTON, 1981)

Hygrobia maculata BRITTON, 1981: 85-86.

Material examined: 1 ex.: "AUSTRALIA, No. Terr. Pond @ Arnhem Hwy 57 km W Kakadu Oct. 3, 1992 G.L. Challet" (CH).

Hygrobia nigra (CLARK, 1862)

Pelobius niger CLARK, 1862: 403.

Material examined: 1 ex.: "AUSTRALIEN, QL (15) Innot Hot Springs, 900m 100 km W Innisfail 20.1.1993 leg. Wewalka" (CGW). This is the first record for northern Queensland !

Discussion

Hygrobia watsi appears to be a true relict species, and is restricted to peaty swamps and lakes of the "Southwest Coast Division" of Western Australia (WILLIAMS & ALLEN 1987). *Hygrobia nigra* extends from southern Victoria to the Atherton Tableland of northern Queensland, whereas *H. australasiae* goes further into Tasmania and South Australia. Both species have overlapping distributions and can be found in the same pond (BRITTON 1981). On the data available it appears that the Torresian *H. maculata* is distributed in the river floodplains of the Northern Territories and the lowlands of northern Queensland (Cape York Peninsula) (Fig. 6).



Figs. 4 - 5: 4 (above), loc. 4/151: Nalyerin Lake, Darling Range, 300 m. Aquatic vegetation dominated by dense stands of *Ruppia* (floating plant in middle) and *Baumea articulata*; 5 (below), loc. 11/157: Muir Lakes Nature Reserve, south-western edge of Byenup Lagoon. Vegetation dominated by Paperbark trees (*Melaleuca raphophylla*) and *Baumea articulata*.

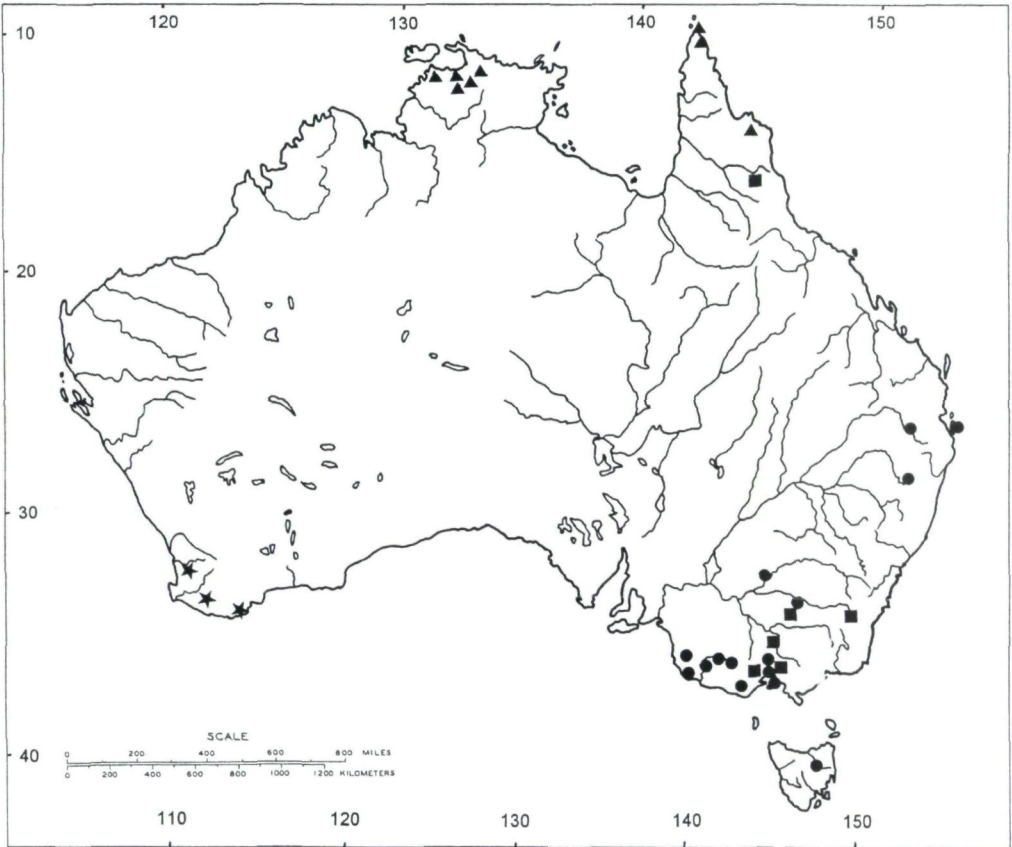


Fig. 6: Map showing the distribution of all Australian *Hygrobia* species: *Hygrobia watsi* sp.n. (black stars), *H. australasiae* (black dots), *H. nigra* (black squares) and *H. maculata* (black triangles).

Nineteen species of Hydradephaga and four species of Hydrophilidae were recorded from the Nalyrin Lake and Byenup Lagoon in the Muir Lake Area. All Hydradephaga except *Antiporus femoralis*, *Rhantus suturalis*, *Lancetes lanceolatus* and *Homoeodytes scutellaris* are endemic species of south-western Australia, whereas the four Hydrophilidae are widely distributed over the southern parts of the continent and Tasmania. In addition to the new *Hygrobia* remarkable species are an undescribed *Sternopriscus*, together with *S. minimus* the smallest species of the genus (HENDRICH & WATTS in prep.), and *Rhantus simulans*, of which only a few historical specimens were known before (BALKE et al. 2000).

The new *Hygrobia* and the other endemic species mentioned above are thought to be endangered by peatland swamp drainage (drains, peat mining), nutrient enrichment, fire, riparian buffer and catchment clearing, increased inundation and increases in salinity (DAVIS & CHRISTIDIS 1997). All across Southern Australia freshwater swamps are drying out and show signs of dramatic increases in salinity. Degradation in general and salinity in particular is now one of Australia's most critical environmental problems. Both type localities of the new *Hygrobia* are protected as Nature Reserves (Muir Lakes) or are within State Forest (Lake Nalyrin). In addition, Lake Muir is included in the List of Wetlands of International Importance developed under Ramsar

Convention. Local landowners, the Department of Conservation and Land Management (CALM), Agriculture WA, the water and Rivers Commission and other agencies are combining forces to save these swamps (CLEWS 1999).

Acknowledgements

Dr. Chris H. Watts is warmly thanked for an invitation to the South Australian Museum (November-December 1999) under financial support of the "Museum Board Fellowship" where this work was initiated, and to Stephan Gottwald (Berlin, Germany) for his assistance and enthusiastic encouragement in the field. The author thanks Adrian Pinder (CALM, Perth) and Rod Simmonds (CALM, Manjimup) for valuable information concerning field studies in SW-Australia. The Department of Conservation and Land Management is acknowledged for giving permission to conduct scientific research in Nature Reserves [Permit numbers: SF 003017 and NE 002348]. I am also indebted to Radek Beran (Ústí nad Labem, Czech Republic) for the habitus illustration, to Prof. Dr. Günther Wewalka (Vienna, Austria) for lending specimens and to Dr. David Bilton (Plymouth, England) for correcting the manuscript.

Zusammenfassung

In der vorliegenden Arbeit wird die vierte in Australien und die sechste weltweit bekannte Art aus der Familie Hygrobiidae beschrieben. *Hygrobia wattsi* lebt in permanenten Mooreseen, mit stark schwankenden Wasserständen und in Verlandungsmooren größerer Süßwasserseen Südwestaustraliens. Die Art ist durch ihre lebhaft schwarz-oranger Färbung sowie den Bau des Medianlobus leicht von allen anderen australischen Vertretern der Familie zu unterscheiden. Der Lebensraum der neuen Art sowie die dort nachgewiesenen Gemeinschaften aquatischer Käfer werden beschrieben. Die Verbreitung aller australischen Arten der Gattung wird kurz umrissen und diskutiert. Grundwasserabsenkungen durch meliorative Maßnahmen sowie die schleichende Versalzung vieler Oberflächengewässer Südwestaustraliens bedrohen nicht nur die Existenz der hier beschriebenen *Hygrobia*-Art sondern auch die zahlreicher hochendemischer Dytiscidae.

References

- BALKE, M., KOVAC, D., HENDRICH, L. & FLECHTNER, G. 2000: Rediscovery of the New Zealand diving beetle *Rhantus plantaris* Sharp, and notes on the south west Australian *R. simulans* Régimbart, with an identification key (Coleoptera: Dytiscidae). - New Zealand Journal of Zoology 27: 223-227.
- BAYLY, I.A.E. 1992: The micro-Crustacea and physio-chemical features of temporary ponds near Northcliffe, Western Australia. - Journal of the Royal Society of Western Australia 75 (4): 99-106.
- BRITTON, E.B. 1981: The Australian Hygrobiidae (Coleoptera). - Journal of the Australian Entomological Society 20: 83-86.
- CLARK, H. 1862: Catalogue of the Dytiscidae and Gyrinidae of Australasia with descriptions of new species. - Journal of Entomology 1: 399-421.
- CLEWS, M. 1999: Saving the Swamps. - Landscape 14 (3): 43-47.
- CUPPEN, J.G.M. 2000: Distribution, phenology, food and habitat of *Hygrobia hermanni* in The Netherlands (Coleoptera: Hygrobiidae). - Entomologische Berichten, Amsterdam 60 (4): 53 - 60.

- DAVIS, J. & CHRISTIDIS, F. 1997: A Guide to Wetland Invertebrates of South-western Australia. - Perth: F. Daniels, 1-177.
- HENDRICH, L. 2000: Contributions to the knowledge of the predaceous water beetle fauna of the Southern Peatlands and Shrublands of South-western Australia. - Unpublished report prepared for Department of Conservation and Land Management (CALM), Perth, Western Australia, 30 pp.
- HENDRICH, L. 2001: A new species of *Antiporus* Sharp, 1882 from peatland swamps of south-western Australia (Coleoptera: Dytiscidae). - Linzer biologische Beiträge 33 (1): in press.
- HENDRICH, L. & WATTS, C.H.S. (in prep.): Taxonomic Revision of the genus *Sternopriscus* Sharp.
- HOPPER, S.D. 1979: Biogeographical aspects of speciation in the south-west Australian flora. - Annual Review of Ecology and Systematics 10: 399-422.
- JÄCH, M. 1995: HYGROBIIDAE (Coleoptera), pp. 109-110. - In: M.A. JÄCH & L. Ji (eds.): Water Beetles of China. Vol. I. - Wien: Zoologisch-Botanische Gesellschaft in Österreich and Wiener Coleopterologenverein, 410 pp.
- KIKKAWA, J., INGRAM, G.J. & DWYER, P.D. 1979: The vertebrate fauna of Australian heathlands – an evolutionary perspective. - In: R.L. Specht (ed.): Heathlands and Related Shrublands of the World A. Descriptive Studies, Amsterdam: Elsevier, pp. 231-279.
- NELSON, E.C. 1981: Phytogeography of southern Australia. - In: A. Keast (ed.): Ecological Biogeography of Australia, The Hague: Junk, 735-759.
- PUSEY, B.J. & EDWARD, D.H. 1990: Limnology of the southern acid peat flats, south-western Australia. - Journal of the Royal Society of Western Australia 73: 29-46.
- WATTS, C.H.S. 1997: Four new species of *Antiporus* Sharp (Coleoptera; Dytiscidae) from Australia, with notes on *A. femoralis* (Boheman) and *A. interrogationis* (Clark). - Records of the South Australian Museum 30 (1): 35-42.
- WATTS, C.H.S. & PINDER, A. 2000: Two new species of *Antiporus* from Western Australia (Coleoptera: Dytiscidae). - Records of the South Australian Museum 33 (1): 17-19.
- WILLIAMS, W.D. & ALLEN, G.R. 1987: Origins and Adaptations of the Fauna of Inland Waters. - In: Dyne, G.R. & Walton, D.W. (eds.) Fauna of Australia. General Articles. - Canberra: Australian Government Publishing Service Vol. 1 A., 184-201.

Lars HENDRICH

Mörchinger Str. 115 A, D - 14169 Berlin, Germany (hendrich1@aol.com)

ZOBODAT - www.zobodat.at

Zoologisch-Botanische Datenbank/Zoological-Botanical Database

Digitale Literatur/Digital Literature

Zeitschrift/Journal: [Koleopterologische Rundschau](#)

Jahr/Year: 2001

Band/Volume: [71_2001](#)

Autor(en)/Author(s): Hendrich Lars

Artikel/Article: [A new species of Hygrobia, from peatlands of south-western Australia \(Hygrobiidae\). 17-25](#)