

ZOOTAXA

1489

**A revision of the Australian species of the water beetle genus
Hydraena Kugelann (Coleoptera: Hydraenidae)**

PHILIP D. PERKINS



Magnolia Press
Auckland, New Zealand

PHILIP D. PERKINS

A revision of the Australian species of the water beetle genus *Hydraena* Kugelann (Coleoptera: Hydraenidae)

(*Zootaxa* 1489)

207 pp.; 30 cm.

31 May 2007

ISBN 978-1-86977-127-0 (paperback)

ISBN 978-1-86977-128-7 (Online edition)

FIRST PUBLISHED IN 2007 BY

Magnolia Press

P.O. Box 41-383

Auckland 1346

New Zealand

e-mail: zootaxa@mapress.com

<http://www.mapress.com/zootaxa/>

© 2007 Magnolia Press

All rights reserved.

No part of this publication may be reproduced, stored, transmitted or disseminated, in any form, or by any means, without prior written permission from the publisher, to whom all requests to reproduce copyright material should be directed in writing.

This authorization does not extend to any other kind of copying, by any means, in any form, and for any purpose other than private research use.

ISSN 1175-5326 (Print edition)

ISSN 1175-5334 (Online edition)



A revision of the Australian species of the water beetle genus *Hydraena* Kugelann (Coleoptera: Hydraenidae)

PHILIP D. PERKINS

Department of Entomology, Museum of Comparative Zoology, Harvard University, Cambridge, MA 02138 USA.

E-mail: perkins@oeb.harvard.edu.

Table of Contents

Abstract	5
Introduction	6
Distribution Patterns	6
Microhabitats	7
Pronotum and Elytra	7
Metaventral Plaques	8
Male Genitalia	8
Species Groups	9
Aids to Identification	9
Methods and Conventions	10
Depositories	11
<i>Hydraena</i> Kugelann, 1794	12
<i>Reticulata</i> Group	12
<i>Hydraena reticulata</i> Zwick	12
<i>Hydraena mitchellensis</i> new species	13
<i>Hydraena reticulooides</i> new species	14
<i>Hydraena reticulositis</i> new species	15
<i>Magnetica</i> Group	16
<i>Hydraena magnetica</i> Zwick	16
<i>Hydraena miniretia</i> new species	17
<i>Hydraena immuda</i> new species	18
<i>Porchi</i> Group	19
<i>Hydraena porchi</i> new species	19
<i>Hydraena millerorum</i> new species	20
<i>Hydraena tenuisoror</i> new species	21
<i>Hydraena latoror</i> new species	22
<i>Hydraena williamensis</i> Deane	23
<i>Simplicicollis</i> Group	24
<i>Hydraena simplicicollis</i> Blackburn	24
<i>Hydraena brittoni</i> Zwick	26
<i>Hydraena converga</i> new species	27
<i>Castanea</i> Group	28
<i>Hydraena castanea</i> Deane	28
<i>Hydraena clavigera</i> Zwick	31
<i>Hydraena tricantha</i> Zwick	33
<i>Hydraena spinissima</i> new species	35
<i>Hydraena dorrigoensis</i> new species	36
<i>Hydraena antaria</i> new species	36
<i>Hydraena luminicollis</i> new species	38
<i>Billi</i> Group	39
<i>Hydraena hynesi</i> Zwick	39
<i>Hydraena monteithi</i> new species	41

<i>Hydraena biimpresa</i> new species	42
<i>Hydraena billi</i> Zwick	43
<i>Bidefensa</i> Group	44
<i>Hydraena bidefensa</i> new species	44
<i>Hydraena revelovela</i> new species	46
<i>Hydraena pugillista</i> new species	46
<i>Weiri</i> Group	47
<i>Hydraena weiri</i> new species	48
<i>Hydraena arcta</i> new species	48
<i>Hydraena tenuisella</i> new species	49
<i>Ypsilon</i> Group	50
<i>Hydraena ypsilon</i> Zwick	50
<i>Invicta</i> Group	51
<i>Hydraena invicta</i> new species	52
<i>Barbipes</i> Group	52
<i>Hydraena barbipes</i> Zwick	53
<i>Luridipennis</i> Group	54
<i>Hydraena luridipennis</i> MacLeay	54
<i>Hydraena impercepta</i> Zwick	62
<i>Hydraena simplipes</i> Zwick	63
<i>Hydraena robusta</i> Zwick	64
<i>Hydraena appetita</i> new species	65
<i>Cunninghamensis</i> Group	66
<i>Hydraena cunninghamensis</i> new species	67
<i>Hydraena hypipamee</i> new species	68
<i>Rudallensis</i> Group	68
<i>Hydraena rudallensis</i> Blackburn	69
<i>Hydraena blackburni</i> Zaitzeff	71
<i>Hydraena australica</i> Zwick	73
<i>Hydraena parciplumea</i> new species	75
<i>Hydraena australula</i> new species	76
<i>Hydraena athertonica</i> new species	77
<i>Hydraena parva</i> Zwick	77
<i>Hydraena lucernae</i> Zwick	79
<i>Hydraena ferethula</i> new species	80
<i>Hydraena ambrosina</i> new species	81
<i>Hydraena kakadu</i> new species	82
<i>Textila</i> Group	83
<i>Hydraena textila</i> new species	83
<i>Hydraena capetribensis</i> new species	84
<i>Hydraena storeyi</i> new species	85
<i>Hydraena intraangulata</i> new species	86
<i>Hydraena finniganensis</i> new species	87
<i>Hydraena ascensa</i> new species	88
<i>Ambiflagellata</i> Group	89
<i>Hydraena ambiflagellata</i> Zwick	89
<i>Hydraena decipiens</i> Zwick	90
<i>Hydraena cygnus</i> Zwick	91
<i>Hamifera</i> Group	92
<i>Hydraena inancala</i> new species	93
<i>Hydraena capacis</i> new species	94
<i>Hydraena extorris</i> Zwick	94
<i>Hydraena hamifera</i> Zwick	95
<i>Hydraena larsoni</i> new species	99
<i>Affirmata</i> Group	100
<i>Hydraena affirmata</i> new species	100
<i>Cultrata</i> Group	102
<i>Hydraena cultrata</i> new species	102
<i>Zwicki</i> Group	103
<i>Hydraena zwicki</i> new species	103
<i>Hydraena triloba</i> new species	104
<i>Hydraena disparamera</i> new species	105
<i>Queenslandica</i> Group	106
<i>Hydraena queenslandica</i> new species	107

<i>Hydraena pilipes</i> Zwick	109
<i>Hydraena deliquesca</i> new species	111
<i>Hydraena cubista</i> new species	112
<i>Hydraena darwini</i> new species	113
<i>Hydraena forticollis</i> new species	113
<i>Trapezoidalis</i> Group	114
<i>Hydraena trapezoidalis</i> Zwick	115
<i>Hydraena ruinosa</i> Zwick	116
<i>Hydraena fundata</i> new species	117
<i>Hydraena fundaequalis</i> new species	118
<i>Hydraena metzeni</i> new species	119
<i>Tridisca</i> Group	120
<i>Hydraena tridisca</i> new species	120
<i>Wattsi</i> Group	121
<i>Hydraena wattsi</i> new species	121
Acknowledgments	122
References	122

Abstract

The Australian species of the water beetle genus *Hydraena* Kugelann, 1794, are revised, based on the study of 7,654 specimens. The 29 previously named species are redescribed, and 56 new species are described. The species are placed in 24 species groups. High resolution digital images of all primary types are presented (online version in color), and geographic distributions are mapped. Male genitalia, representative female terminal abdominal segments and representative spermathecae are illustrated. Australian *Hydraena* are typically found in sandy/gravelly stream margins, often in association with streamside litter; some species are primarily pond dwelling, a few species are humicolous, and one species may be subterranean. The areas of endemicity and species richness coincide quite closely with the Bassian, Torresian, and Timorian biogeographic subregions. Eleven species are shared between the Bassian and Torresian subregions, and twelve are shared between the Torresian and Timorian subregions. Only one species, *H. impercepta* Zwick, is known to be found in both Australia and Papua New Guinea. One Australian species, *H. ambiflagellata*, is also known from New Zealand. New species of *Hydraena* are: *H. affirmata* (Queensland, Palmerston National Park, Learmouth Creek), *H. ambiosina* (Queensland, 7 km NE of Tolga), *H. antaria* (New South Wales, Bruxner Flora Reserve), *H. appetita* (New South Wales, 14 km W Delagate), *H. arcta* (Western Australia, Synnot Creek), *H. ascensa* (Queensland, Rocky Creek, Kennedy Hwy.), *H. athertonica* (Queensland, Davies Creek), *H. australula* (Western Australia, Synnot Creek), *H. bidefensa* (New South Wales, Bruxner Flora Reserve), *H. biimpressa* (Queensland, 19.5 km ESE Mareeba), *H. capacis* (New South Wales, Unungar State Forest, near Grevillia), *H. capetribensis* (Queensland, Cape Tribulation area), *H. converga* (Northern Territory, Roderick Creek, Gregory National Park), *H. cubista* (Western Australia, Mining Camp, Mitchell Plateau), *H. cultrata* (New South Wales, Bruxner Flora Reserve), *H. cunninghamensis* (Queensland, Main Range National Park, Cunningham's Gap, Gap Creek), *H. darwini* (Northern Territory, Darwin), *H. deliquesca* (Queensland, 5 km E Wallaman Falls), *H. disparamera* (Queensland, Cape Hillsborough), *H. dorrigoensis* (New South Wales, Dorrigo National Park, Rosewood Creek, upstream from Coachwood Falls), *H. ferethula* (Northern Territory, Cooper Creek, 19 km E by S of Mt. Borradaile), *H. finniganensis* (Queensland, Gap Creek, 5 km ESE Mt. Finnigan), *H. forticollis* (Western Australia, 4 km W of King Cascade), *H. fundaequalis* (Victoria, Simpson Creek, 12 km SW Orbost), *H. fundata* (Queensland, Hann Tableland, 13 km WNW Mareeba), *H. hypipamee* (Queensland, Mt. Hypipamee National Park, 14 km SW Malanda), *H. inancala* (Queensland, Girraween National Park, Bald Rock Creek at "Under-ground Creek"), *H. innuda* (Western Australia, Mitchell Plateau, 16 mi. N Amax Camp), *H. intraangulata* (Queensland, Leo Creek Mine, McIlwrath Range, E of Coen), *H. invicta* (New South Wales, Sydney), *H. kakadu* (Northern Territory, Kakadu National Park, Gubara), *H. larsoni* (Queensland, Windsor Tablelands), *H. latoror* (Queensland, Lamington National Park, stream at head of Moran's Falls), *H. luminicollis* (Queensland, Lamington National Park, stream at head of Moran's Falls), *H. metzeni* (Queensland, 15 km NE Mareeba), *H. millerorum* (Victoria, Traralgon Creek, 0.2 km N 'Hogg Bridge', 5.0 km NNW Balook), *H. miniretia* (Queensland, Mt. Hypipamee National Park, 14 km SW Malanda), *H. mitchellensis* (Western Australia, 4 km SbyW Mining Camp, Mitchell Plateau), *H. monteithi* (Queensland, Thornton Peak, 11 km NE Daintree), *H. parciplumea* (Northern Territory, McArthur River, 80 km SW of Borroloola), *H. porchi* (Victoria, Kangaroo Creek on Springhill Rd., 5.8 km E Glenlyon), *H. pugillista* (Queensland, 7 km N Mt. Spurgeon), *H. queenslandica* (Queensland, Lacey's Creek, 10 km SE El Arish), *H. reticuloides* (Queensland, 3 km ENE of Mt. Tozer), *H. reticulosis* (Western Australia, Mining Camp, Mitchell Plateau), *H. revelovela* (Northern Territory, Kakadu National Park, Gungurul

Lookout), *H. spinissima* (Queensland, Main Range National Park, Cunningham's Gap, Gap Creek), *H. storeyi* (Queensland, Cow Bay, N of Daintree River), *H. tenuisella* (Queensland, 3 km W of Batavia Downs), *H. tenuisoror* (Australian Capital Territory, Wombat Creek, 6 km NE of Piccadilly Circus), *H. textila* (Queensland, Lacey's Creek, 10 km SE El Arish), *H. tridisca* (Queensland, Mt. Hemmant), *H. triloba* (Queensland, Mulgrave River, Goldsborough Road Crossing), *H. wattsi* (Northern Territory, Holmes Jungle, 11 km NE by E of Darwin), *H. weiri* (Western Australia, 14 km S by E Kalumburu Mission), *H. zwicki* (Queensland, Clacherty Road, via Julatten).

Key words: Coleoptera, Hydraenidae, *Hydraena* Kugelann, new species, Australia, aquatic insects, aquatic microhabitats, holotype digital images

Introduction

This is the sixth contribution in a series revising the Hydraenidae of Australia and Papua New Guinea. Previous papers have revised the genera *Gymnanthelius* Perkins (Perkins 2004a), *Tympalopatrum* Perkins (Perkins 2004b), *Limnebius* Leach (Perkins 2004c), *Gymnochthebius* Orchymont (Perkins 2005), and *Tympanogaster* Perkins (Perkins 2006). The remaining revisions, of *Hughleechia* Perkins, *Ochthebius* Leach, and *Hydraena* (Papua New Guinea), are nearing completion. About 27,000 specimens have been identified and databased, representing about 290 hydraenid species from Australia and Papua New Guinea. All revisions will include digital images of all primary types. An illustrated key to and synopsis of the genera of Australian and Papuan Hydraenidae will be presented following publication of the revisionary studies.

The Australian species of the genus *Hydraena* were last revised by Zwick (1977), who delineated 29 species and seven species groups. The synonymies and species established by Zwick are followed herein. Many new species are added to the species groups established by Zwick, a few of the species groups are modified in composition, and the characterizations of the groups are expanded. An additional 17 species groups are characterized to accommodate other new species. The 29 previously named species are redescribed, and 56 new species are described, based on the study and databasing of 7,654 specimens.

Distribution Patterns

The areas of endemism and species richness of Australian *Hydraena* (Figs. 235–237) coincide quite closely with the mesic, peripheral biogeographic subregions of the continent (Heatwole 1987). The numbers of endemics/total species for each of the subregions are as follows: Bassian 25/38, Torresian 15/34, and Timorian 16/28. The Bassian and Timorian subregions each show some additional concentrations of endemism (Fig. 236). In general, the Bassian, Torresian, and Timorian subregions have a heterogeneous mixture of species. A few groups (e.g., *rudallensis*, *textila*, and *ypsilon* groups) have 50%, or more, of the included species restricted to one subregion. Only a single species, *H. impercepta*, is currently known to be shared with Papua New Guinea (Perkins, in preparation). Likewise, only a single species, *H. ambiflagellata*, is known to be shared with Australia and New Zealand (Delgado & Palma 1997). Both of these species are probably relatively recent additions to the fauna of their respective islands. *H. impercepta* is a relatively large species with well developed wings; it probably jumped the gap between Australia and Papua New Guinea. I concur with Delgado and Palma (1997) that *H. ambiflagellata* probably reached New Zealand in very recent times, by human agency.

Many of the distribution records in the arid Eyrean subregion are of species that are primarily distributed in one peripheral, mesic area, or are records of species whose distributions span two peripheral areas. The far western part of the Eyrean subregion has two endemic species, *H. barbipes* and *H. brittoni*, and two records for the widespread *H. rudallensis*. In addition to those three species, eight other species have been collected