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Accessory Publication

The Australian species of *Macrocheles* (Acarina : Macrochelidae)

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Abstract

The Australian fauna of the mite genus *Macrocheles* Latreille is revised. The fauna is shown to comprise 49 species, 26 of which are here described as new: *M. agilis*, sp. nov., *M. angustus*, sp. nov., *M. borealis*, sp. nov., *M. denhamensis*, sp. nov., *M. eta*, sp. nov., *M. forceps*, sp. nov., *M. fungicolus*, sp. nov., *M. gamma*, sp. nov., *M. guttatus*, sp. nov., *M. halli*, sp. nov., *M. holmi*, sp. nov., *M. howdenorum*, sp. nov., *M. lama*, sp. nov., *M. lambda*, sp. nov., *M. omicron*, sp. nov., *M. peckorum*, sp., nov., *M. rimbija*, sp., nov., *M. siderolophus*, sp. nov., *M. spatei*, sp., nov., *M. spiculatus*, sp. nov., *M. tessellatus*, sp. nov., *M. undoolya*, sp., nov., *M. upsilon*, sp. nov., *M. waitei*, sp. nov., *M. wallacei*, sp. nov., *M. zeta*, sp. nov. A further 23 previously described species are now known from Australia: *M. aestivus* Halliday, *M. boudreauxi* Krantz, *M. faveolus* Halliday, *M. feehani* Halliday, *M. glaber* (Müller), *M. kappa* Halliday, *M. kraepelini* (Berlese), *M. krantzi* Evans & Hyatt, *M. mammifer* Berlese, *M. merdarius* (Berlese), *M. muscaedomesticae* (Scopoli), *M. mykytowyczi* Womersley, *M. novaezelandiae* Emberson, *M. paralius* Halliday, *M. penicilliger* (Berlese), *M. peniculatus* Berlese, *M. peregrinus* Krantz, *M. perglaber* Filipponi & Pegazzano, *M. robustulus* (Berlese), *M. similis* Krantz & Filipponi, *M. subbadius* (Berlese), *M. tenuirostris* Krantz & Filipponi, *M. virgo* Halliday. *Macrocheles hyatti* Krantz & Filipponi has been recorded from Australia in error, and occurs only in New Zealand. *Macrocheles scutatus* (Berlese) is known from Australia only from a quarantine interception. *Macrocheles lyallpurensis* nom. nov. is proposed as a replacement name for *M. krantzi* Anwarullah & Irshad from Pakistan (preoccupied by *M. krantzi* Evans & Hyatt). A key is provided for the identification of all Australian species.

Introduction

This accessory publication accompanies a published revision of the Australian species of the mite genus *Macrocheles* Latreille (Acarina : Macrochelidae) (Halliday 2000). The purpose of this publication is to make available fully detailed collecting data for two species for which the data were presented in summary form in the original paper. The first of these is *Macrocheles holmi* Halliday, 2000, which I described from eastern Australia, and for which I examined numerous non-type specimens from southern Western Australia. The second is *Macrocheles peregrinus* Krantz, 1981, which was introduced from South Africa into northern Australia in 1981, and for which I examined large numbers of specimens from northern Australia and southern Africa. All specimens are in the Australian National Insect Collection, CSIRO Entomology, Canberra.

Macrocheles holmi Halliday*Specimens examined (not types)*

Western Australia: 1 ♀, Katanning, 10.x.1951, on *Onthophagus ferox*, I. F. B. Common, DB193; 1 ♀, Katanning, 10.x.1951, on *Onthophagus ferox*, I. F. B. Common, DB194; 1 ♀, Bremer Bay, 10 miles W, 4.xi.1967, on *Onthophagus ferox*, E. G. Matthews, DB195; 1 ♀, Bremer Bay, 10 miles W, 4.xi.1967, on *Onthophagus ferox*, E. G. Matthews, DB196; 1 ♀, Mogumber, 18 miles W, 13.iv.1968, on *Onthophagus ferox*, I. F. B. Common and M. S. Upton, DB201; 1 ♀, Mogumber, 18 miles W, 13.iv.1968, on *Onthophagus ferox*, I. F. B. Common and M. S. Upton, DB202; 1 ♀, Moora, 24 miles W, 14.iv.1968, on *Onthophagus ferox*, I. F. B. Common and M. S. Upton, DB204; 1 ♀, Moora, 24 miles W, 14.iv.1968, on *Onthophagus ferox*, I. F. B. Common and M. S. Upton, DB205; 1 ♀, Northampton, 47 miles N, 23.iv.1968, on *Onthophagus ferox*, I. F. B. Common and M. S. Upton, DB210; 1 ♀, Northampton, 47 miles N, 23.iv.1968, on *Onthophagus ferox*, I. F. B. Common and M. S. Upton, DB211; 1 ♀, Yuna, 24.iv.1968, on *Onthophagus ferox*, I. F. B. Common and M. S. Upton, DB212; 1 ♀, Yuna, 24.iv.1968, on *Onthophagus ferox*, I. F. B. Common and M. S. Upton, DB213; 2 ♀, Wilga, 10.vi.1972, on *Onthophagus ferox*, K. & E. Carnaby, HWD51; 1 ♀, Wanneroo, 10 miles E, 21.vii.1972, on *Onthophagus ferox*, H. F. Howden, HWD48; 3 ♀, 32 miles E of Kalbarri, near Murchison River, 30.vii.1972, on *Onthophagus ferox*, H. F. Howden, HWD50; 2 ♀, West Pinjar, 23.v.1975, light trap, J. A. Mahon; 9 ♀, West Pinjar, 25 km N of Perth, 30.v.1975, with dung beetles in light trap, J. A. Mahon; 2 ♀, Esperance, 135 km east, 6.ii.1977, sheep dung, J. Feehan, WA2/7; 9 ♀, Esperance, 20 km E by N, 8.ii.1977, on *Onthophagus ferox*, J. Feehan, WA2/8A-D; 1 ♀, Gibson, 5 km north, 9.ii.1977, cow dung, J. Feehan, WA2/9; 3 ♀, Scaddin, 8 km north, 9.ii.1977, horse dung, J. Feehan, WA2/10; 1 ♀, West Pinjar, 9.ix.1977, on *Onthophagus ferox*, J. Ridsdill-Smith; 1 ♀, 117 km east of Esperance, Orleans Farm, 28.x.1977, J. Feehan, WA2-2; 5 ♀, Mt Ragged, 37 km SW, 2.xi.1977, on *Onthophagus ferox*, J. Feehan, WA2-4; 1 ♀, Esperance, 55 km east, 4.xi.1977, J. Feehan, WA2-6; 2 ♀, Esperance, 135 km east, 6.xi.1977, sheep dung, J. Feehan, WA2-7; 2 ♀, Cunderdin, 1 km N, 3.v.1978, in soil with *Onthophagus ferox*, J. Ridsdill-Smith, W41-5, 41-8; 1 ♀, Jerramungup, 13.vi.1978, in soil with *Onthophagus ferox*, G. P. Hall, W69-1; 1 ♀, Jerramungup, 13.vi.1978, in soil with *Onthophagus ferox*, G. P. Hall, W69-2; 1 ♀, Jerramungup, 13.vi.1978, in soil with *Onthophagus ferox*, G. P. Hall, W69-3; 1 ♀, Yallingup, 15 km S, 20.vi.1978; 1 ♀, Eneabba, 10 km S, 20.vi.1978, in soil with *Onthophagus ferox*, J. Matthiessen, W62-1; 1 ♀, Yallingup, 30 km S, 21.vi.1978, on *Onthophagus ferox* in soil, G. P. Hall, W57-5; 4 ♀, Cunderdin, 1 km N, 29.vi.1978, Howden trap, J. Matthiessen, W54-9, W54-12, W54-13, W54-14; 2 ♀, Cunderdin, 1 km N, 13.vii.1978, Howden trap, J. Matthiessen, W72-1, W72-10; 1 ♀, Dandaragon, 10 km S, 1.viii.1978, in soil with *Onthophagus ferox*, J. Ridsdill-Smith, W64-9; 3 ♀, Cunderdin, 24.viii.1978, G. P. Hall; 1 ♀, Nabawa, 5 km N, 11.ix.1978, in soil with *Onthophagus* sp., G. P. Hall, W96-4; 1 ♀, Walkaway, 16 km E, 12.ix.1978, in soil with *Onthophagus ferox*, G. P. Hall, W101-4; 1 ♀, Walkaway, 20 km SE, 13.ix.1978, in soil with *Onthophagus ferox*, G. P. Hall, W90-1; 1 ♀, Walkaway, 20 km SE, 13.ix.1978, in soil with *Onthophagus ferox*, G. P. Hall, W90-5; 1 ♀, Walkaway, 20 km SE, 13.ix.1978, in soil with *Onthophagus ferox*, G. P. Hall, W90-6; 1 ♀, Cunderdin, 1 km N, 27.x.1978, Howden trap, J. Matthiessen; 1 ♀, Cunderdin, 2.xi.1978, on *Onthophagus ferox*; 2 ♀, Dardanup, 5 km NE, 15.ii.1979, G. P. Hall; 3 ♀, Cunderdin, 1 km N, 17.v.1979, Howden trap, J. Matthiessen, W13-1, 2, 3; 8 ♀, Busselton, 15 km S, 22.v.1979, Howden trap, G. P. Hall, W2-92-W2-95; 2 ♀, Busselton, 15 km S, 7.vi.1979, Howden trap, G. P. Hall, W136-3, 4; 1 ♀, Geraldton, 15 km E, 12.vi.1979, Howden trap, J. Matthiessen, W130-4; 2 ♀, Busselton, 15 km S, 14.vi.1979, Howden trap, G. P.

Hall, W2-54, 55; 1 ♀, Busselton, 15 km S, 21.vi.1979, Howden trap, G. P. Hall; 3 ♀, Busselton, 15 km S, 5.vii.1979, Howden trap, Ridsdill-Smith; 2 ♀, Boallia, 10 km S of Busselton, 5.vii.1979, G. P. Hall; 1 ♀, Busselton, 15 km S, 16.viii.1979, Howden trap, G. P. Hall; 2 ♀, Cunderdin, 1 km N, 30.viii.1979, Howden trap, J. Matthiessen, W4-77, W4-78; 1 ♀, Cataby, 18.ix.1979, G. P. Hall; 1 ♀, Cataby, 7 km N, 18.ix.1979, Howden trap, J. N. Matthiessen, W3-5; 1 ♀, Cataby, 7 km N, 18.ix.1979, Howden trap, J. N. Matthiessen, W3-6; 1 ♀, Cunderdin, 28.ix.1979; 2 ♀, Cunderdin, 1 km N, 11.x.1979, Howden trap, J. Matthiessen; 3 ♀, Boallia, 17.i.1980; 4 ♀, Busselton, 15 km S, 1.v.1980, Howden trap, G. P. Hall, W2-92-W2-95; 1 ♀, Manjimup, 40 km ESE, 6-10.vii.1980, jarrah forest, dung baited trap, S. & J. Peck, SBP89; 5 ♀, Stirling Range NP, north entrance, 7-15.vii.1980, open sclerophyll, dung baited trap, S. & J. Peck, SBP32; 2 ♀, Boranup SF, Augusta, 19-22.vii.1980, Karri forest, on *Onthophagus ferox* in dung baited trap, S. & J. Peck, SBP123; 8 ♀, Yallingup NP, 18-21.vii.1980, Marri forest, dung baited trap, S. & J. Peck, SBP121; 2 ♀, Hopetown, 86 km E, 13.x.1980, on *Onthophagus ferox*; 1 ♀, Mt Howick, 14.x.1980; 2 ♀, Canal Rocks, 27-30.iv.1983, on *Onthophagus ferox*, C. Codd; 11 ♀, Watheroo NP, 9-16.v.1984, on mouthparts of *Onthophagus ferox*, G. P. Hall; 30 ♀, Rottneest Island, 22/23.viii.1984, G. P. Hall, sites 2, 4, 10; 1 ♀, Dongara, 15 km S, 29.ix.1986, on *Onthophagus ferox*, E. Holm; 4 ♀, Stirling Range NP, 16-26.viii.1989, in pit trap with *Onthophagus ferox*, G. P. Hall; 2 ♂, 3 DN, lab culture, Perth, 5-9.viii.1982, on *Onthophagus ferox* in dung, G. P. Hall; 5 ♀, 5 ♂, 3 DN, lab culture, Perth, founders Scott River, 16-19.v.1981, on *Onthophagus ferox*, G. P. Hall.

Macrocheles peregrinus Krantz

Specimens examined (not types)

Australia: Australian Capital Territory: 4 ♀, CSIRO Entomology, in lab culture in quarantine, (origin Kwazulu Natal, South Africa, on *Sisypus spinipes*, 30.x.1980), 4.xi. to 5.xii.1980; 13 ♀, CSIRO Entomology, lab culture in quarantine, -.x. to.xi.1979. **New South Wales:** 1 ♀, Wee Jasper, Church Cave, 24.iv.1985, bat guano, E Holm; 8 ♀, Bourke, 10 km north, 18.ix.1985, cow dung, S Runko; 5 ♀, Bourke, -.xi.1985, on *Onthophagus tamworthi* in dung, S Runko; 2 ♀, Biddon, 5 km north, 16.xi.1985, dung, K Houston; 8 ♀, Cobar, 55 km east, 24.iv.1987, cattle dung, RB Halliday; 2 ♀, Wilcannia, 24 km east, 14.iv.1987, cattle dung, RB Halliday; 9 ♀, Nevertire, 26 km NW, 25.iv.1987, cattle dung, RB Halliday; 2 ♀, Murwillumbah, 3 km SW, 29.iii.1983, dung, E. Holm, NSW80-24; 2 ♀, Broadwater, 22.i.1985, cow dung, RB Halliday, NSW88-1; 1 ♀, Ballina, 8 km north, 24.i.1985, cow dung, RB Halliday, NSW88-3; 3 ♀, Casino, 5 km east, 26.i.1985, horse dung, RB Halliday, NSW88-11; 5 ♀, Mummulgum, 25 km west of Casino, 26.i.1985, horse dung, RB Halliday, NSW88-12; 5 ♀, Tabulam, 27.i.1985, cow dung, RB Halliday, NSW88-13; 15 ♀, Warrana HS, 75 km south of Goondiwindi, 22.xi.1985, dung, Barton-Browne, Loughnan and Edwards, NSW90-10; 13 ♀, Moree, 26 km south, 22.xi.1985, dung, Barton-Browne, Loughnan and Edwards, NSW90-11; 17 ♀, Narrabri, 22 km west, 22.xi.1985, dung, Barton-Browne, Loughnan and Edwards, NSW90-12; 26 ♀, Narrabri, 12 km south, 23.xi.1985, dung, Barton-Browne, Loughnan and Edwards, NSW90-13; 10 ♀, Biddon, 22 km NE of Gilgandra, 23.xi.1985, dung, Barton-Browne, Loughnan and Edwards, NSW90-15. **Northern Territory:** 2 ♀, Prague Station, 100 km south of Darwin, 26.ii.1981, dung baited trap, M. Bainbridge; 6 ♀, Port Essington, Coburg Peninsula, 22.iv.1984, G. Hall; 2 ♀, Adelaide River, 20 km south, 2.iii.1982, dung baited trap, J. Harmer, NT18A; 3 ♀, 5

km south of Katherine, CSIRO Research Station, 15.iv.1982, cow dung, E. Holm, NT19-2; 4 ♀, 15 km south of Darwin, Berrima Research Station, 16.iv.1982, cow and buffalo dung, E. Holm, NT19-5; 2 ♀, Annaburroo Station, 18.iv.1982, cow dung, E. Holm, NT19-6; 1 ♀, Annaburroo Station, 60 km east, 18.iv.1982, cow dung, E. Holm, NT19-7; 3 ♀, South Alligator River homestead, 20 km east, 18.iv.1982, cow dung, E. Holm, NT19-8; 2 ♀, Mudginberri Station, 18.iv.1982, horse and buffalo dung, E. Holm, NT19-9; 2 ♀, Humpty Doo, 20.iv.1982, horse and buffalo dung, E. Holm, NT19-10; 2 ♀, Bachelor, old Rum Jungle, 20.iv.1982, cow dung, E. Holm, NT19-11; 1 ♀, Daly River Mission, 63 km east, 20.iv.1982, cow dung, E. Holm, NT19-12; 2 ♀, Daly River Mission, 20.iv.1982, cow dung, E. Holm, NT19-13; 2 ♀, Hayes Creek, airstrip, 20.iv.1982, cow dung, E. Holm, NT19-14; 2 ♀, Pine Creek, 12 km NE, 21.iv.1982, buffalo dung, E. Holm, NT19-15; 2 ♀, Pine Creek (South Alligator River), 96 km NE, 21.iv.1982, buffalo dung, E. Holm, NT19-17; 2 ♀, Katherine, 25 km north, 21.iv.1982, cow dung, E. Holm, NT19-18; 2 ♀, Katherine, 52 km SW, 21.iv.1982, cow dung, E. Holm, NT19-19; 2 ♀, Katherine, 95 km SW, 21.iv.1982, cow dung, E. Holm, NT19-20; 3 ♀, Katherine, 152 km SW, 21.iv.1982, cow dung, E. Holm, NT19-21; 2 ♀, Victoria River, 17 km west, 21.iv.1982, cow dung, E. Holm, NT19-22; 1 ♀, Timber Creek, 7 km west, 22.iv.1982, cow dung, E. Holm, NT19-23; 2 ♀, Timber Creek, 63 km SW, 22.iv.1982, E. Holm, NT19-24; 3 ♀, Rosewood Station, 93 km SE of Kunnunura, 23.iv.1982, E. Holm, NT19-26; 2 ♀, Jasper Gorge, 28 km north, 24.iv.1982, cow and horse dung, E. Holm, NT19-27; 2 ♀, Willeroo HS, 30 km south, 24.iv.1982, cow dung, E. Holm, NT19-29; 2 ♀, Willeroo, 98 km south, 24.iv.1982, horse and cow dung, E. Holm, NT19-31; 2 ♀, Katherine, 54 km south, 25.iv.1982, cow dung, E. Holm, NT19-35; 2 ♀, Mataranka HS, 25.iv.1982, cow dung, E. Holm, NT19-36; 2 ♀, Mataranka, 61 km east, 25.iv.1982, cow dung, E. Holm, NT19-37; 2 ♀, Mountain Valley, 30.vi.1982, J. Harmer, NT21-2; 1 ♀, Muckaty Station, Muckaty Bore, -.viii.1982, J. Harmer, NT22-25; 2 ♀, Dungowan Station, No 12 bore, -.viii.1982, J. Harmer, NT22-28; 2 ♀, Top Springs, 18 km west, -.viii.1982, J. Harmer, NT22-30; 2 ♀, Victoria River Downs Station, -.viii.1982, J. Harmer, NT22-31; 3 ♀, Kidman Springs Research Station, South Paddock, -.viii.1982, J. Harmer, NT22-32; 3 ♀, Kidman Springs Research Station, North Paddock, -.viii.1982, J. Harmer, NT22-33; 2 ♀, Kidman Springs Research Station, 8 km north of waterhole, -.viii.1982, J. Harmer, NT22-34; 2 ♀, Innesvale Station, -.viii.1982, J. Harmer, NT22-35; 1 ♀, Litchfield HS, -.vii.1983, J. Harmer-Purdie, NT23-1; 2 ♀, Litchfield Station, 39 km SE, -.vii.1983, J. Harmer-Purdie, NT23-3; 2 ♀, Daly River Crossing, 20 km east, -.vii.1983, J. Harmer-Purdie, NT23-4; 1 ♀, Elizabeth Downs, 10 km west of Daly River Crossing, -.vii.1983, J. Harmer-Purdie, NT23-5; 3 ♀, Elizabeth Downs, 3 km east of steel yards, -.vii.1983, J. Harmer-Purdie, NT23-6; 2 ♀, Peppimenarti Station, Pandella area, -.vii.1983, J. Harmer-Purdie, NT23-8; 2 ♀, Port Keats aboriginal reserve, 35 km east of mission station, -.vii.1983, J. Harmer-Purdie, NT23-11; 2 ♀, Port Keats aboriginal reserve, 29 km east of mission station, -.vii.1983, J. Harmer-Purdie, NT23-13; 3 ♀, Alexandria Downs, -.xi.1983, M. Bainbridge, NT25-12; 1 ♀, Avon Downs Station, -.xi.1983, M. Bainbridge, NT25-14; 1 ♀, Austral Downs Station, -.xi.1983, M. Bainbridge, NT25-15; 2 ♀, Argadargada Station, -.xi.1983, M. Bainbridge, NT25-16; 2 ♀, Tennant Creek, 95 km north, -.xi.1983, M. Bainbridge, NT25-29; 1 ♀, Dumarra, Hayfield Station, -.xi.1983, M. Bainbridge, NT25-33; 1 ♀, 150 km south of Darwin, Douglas Daly Research Farm, 24.xi.1983, J. Purdie, NT26-1; 2 ♀, Montejinni Station, Garibaldi Yard, 8.vii.1984, M. Bainbridge, NT29-3; 2 ♀, Timber Creek Common, 10.vii.1984, M. Bainbridge, NT29-6; 3 ♀, 150 km north of Alice Springs, Aileron Station, Native Gap Bore, 27.ii.1985, M. Bainbridge, NT30B; 2 ♀, 70 km north of Alice Springs, Yambah Station, 27.ii.1985, M. Bainbridge, NT30C; 1 ♀, Newcastle Waters Station, Causeway, 5.iii.1985, M. Bainbridge, NT30K. **Queensland:** 9 ♀, Craighoyle, 30 km north of Rockhampton, -.xi.1981, dung baited trap; 6 ♀, Craighoyle, 30 km north of Rockhampton, 24.ii.1982, dung

baited trap; 2 ♀, Willowbank Research Station, 10 km west of Ipswich, 12-16.x.1982, cow dung, G. Maywald; 5 ♀, Willowbank Research Station, 10 km west of Ipswich, 26-30.x.1982, cow dung, G. Maywald; 1 ♀, Kuranda, 8.xi.1982, dung, N. Bidwell; 4 ♀, 1 ♂, 20 km west of Ipswich, 3 km west of Haigslea, 23.xi.1982, cow dung, K. Huxham and B. Halliday; 3 ♀, 30 km west of Ipswich, 23.xi.1982, cow dung, B. Halliday and K. Huxham; 1 ♀, 4 km east of Gatton, Queensland Agricultural College, 24.xi.1982, cow dung, B. Halliday and K. Huxham; 1 ♀, Rathdowney, 16 km NNE, 29.xi.1982, cow dung, B. Halliday and K. Huxham; 2 ♀, 1 ♂, Rathdowney, 16 km NNE, 29.xi.1982, cow dung, B. Halliday and K. Huxham; 3 ♀, Stapylton, 4 km south of Beenleigh, 30.xi.1982, cow dung, B. Halliday and K. Huxham; 3 ♀, Beaudesert, 13 km north, 30.xi.1982, dung, B. Halliday and K. Huxham; 2 ♀, Aratula, 7 km SW, 30.xi.1982, cow dung, B. Halliday; 3 ♀, Longreach, -.iv.1984, cow dung, S. Runko; 8 ♀, Mount Isa, 17.v.1983, cattle dung, E. Prickett; 1 PN, 1 DN, 2 ♂, lab-reared progeny, parent Mareeba, 27.vii.1984; 1 ♀, Craighoyle, 30 km north of Rockhampton, 2.v.1985, dung baited trap, A. Macqueen; 10 ♀, Cecil Plains, 27°31'S 151°12'E, 17.xi.1985, dung, K. Houston; 1 ♀, Clare, Burdekin Rural Education Centre, 30.xi.1985, A. Macqueen; 2 ♀, Clare, Burdekin Rural Education Centre, 6.xii.1985, A. Macqueen; 6 ♀, Roma, 30 km WNW, 27.xii.1985, cow dung, M. Loughnan; 1 ♀, Clare, Burdekin Rural Education Centre, 16.ii.1986, A. Macqueen; 3 ♀, Mount Webb, 10.v.1986, trap baited with pig dung, E. Holm; 4 ♀, Cooktown, Mount Cook, 12.v.1986, trap baited with pig dung, E. Holm; 5 ♀, Mount Tozer, 11 km ENE, 15.vii.1986, T. Weir; 8 ♀, Cooktown, 14.vii.1995, dung, M. Morris; 3 ♀, Gympie, 16 km south, 5.iii.1982, M. Porter, QLD12-34; 1 ♀, Biloela, 6.i.1982, P. Hart, QLD13-7; 4 ♀, Biggenden, 48 km NE, 2.ii.1982, cow dung, E. Holm, QLD14-4; 3 ♀, Childers, 13 km south, 2.ii.1982, cow dung, E. Holm, QLD14-5; 2 ♀, Howard, 2.ii.1982, cow dung, E. Holm, QLD14-6; 2 ♀, Pialba, 10 km west, 3.ii.1982, cow dung, E. Holm, QLD14-7; 1 ♀, Tiaro, 7 km SW, 3.ii.1982, cow dung, E. Holm, QLD14-8; 3 ♀, Gin Gin, 3 km south, 3.ii.1982, cow dung, E. Holm, QLD14-10; 4 ♀, Gin Gin, 53 km north, 3.ii.1982, cow dung, E. Holm, QLD14-11; 5 ♀, Bororen, 2 km north, 3.ii.1982, cow dung, E. Holm, QLD14-12; 3 ♀, Rockhampton, 48 km south, 3.ii.1982, cow dung, E. Holm, QLD14-13; 3 ♀, Rockhampton, 84 km west, 4.ii.1982, cow dung, E. Holm, QLD14-14; 5 ♀, Duaringa, 30 km west, 4.ii.1982, cow dung, E. Holm, QLD14-16; 2 ♀, Black Water, 4.ii.1982, cow dung, E. Holm, QLD14-17; 1 ♀, Emerald, 10 km east, 4.ii.1982, cow dung, E. Holm, QLD14-18; 5 ♀, Clermont, 7 km north, 5.ii.1982, cow dung, E. Holm, QLD14-22; 1 ♀, Clermont, 3 km west, 5.ii.1982, cow dung, E. Holm, QLD14-23; 1 ♀, Clermont, 27 km west, 5.ii.1982, cow dung, E. Holm, QLD14-24; 3 ♀, Clermont, 90 km NNE, 5.ii.1982, cow dung, E. Holm, QLD14-26; 4 ♀, Mackay, 110 km SW, 5.ii.1982, cow dung, E. Holm, QLD14-27; 2 ♀, Sarina, 50 km WSW, 5.ii.1982, cow dung, E. Holm, QLD14-28; 2 ♀, Sarina, 16 km north, 5.ii.1982, cow dung, E. Holm, QLD14-29; 2 ♀, Mackay, 19 km NW, 5.ii.1982, cow dung, E. Holm, QLD14-30; 3 ♀, Mackay, 70 km north, 5.ii.1982, cow dung, E. Holm, QLD14-31; 2 ♀, Proserpine, 4 km south, 5.ii.1982, cow dung, E. Holm, QLD14-32; 3 ♀, Proserpine, 31 km north, 6.ii.1982, cow dung, E. Holm, QLD14-33; 2 ♀, Bowen, 9 km north, 6.ii.1982, cow dung, E. Holm, QLD14-34; 2 ♀, Bowen, 70 km north, 6.ii.1982, cow dung, E. Holm, QLD14-35; 3 ♀, Bowen, 32 km west, 7.ii.1982, cow dung, E. Holm, QLD14-40; 3 ♀, Collinsville, 3 km north, 7.ii.1982, cow dung, E. Holm, QLD14-41; 2 ♀, Collinsville, 34 km south, 7.ii.1982, cow dung, E. Holm, QLD14-42; 2 ♀, Collinsville, 71 km south, 7.ii.1982, cow dung, E. Holm, QLD14-43; 2 ♀, Collinsville, 118 km SW, 7.ii.1982, cow dung, E. Holm, QLD14-44; 3 ♀, Mount Coolon, 34 km SW, 7.ii.1982, cow dung, E. Holm, QLD14-45; 2 ♀, Clermont, 103 km north, 7.ii.1982, cow dung, E. Holm, QLD14-49; 1 ♀, Mount Morgan, 17 km SW, 8.ii.1982, cow dung, E. Holm, QLD14-51; 3 ♀, Biloela, 43 km north, 8.ii.1982, cow dung, E. Holm, QLD14-52; 3 ♀, Biloela, 5 km west, 8.ii.1982, cow dung, E. Holm, QLD14-53; 3 ♀, Moura, 61 km west, 8.ii.1982, cow dung, E. Holm,

QLD14-55; 2 ♀, Theodore, 42 km SW, 9.ii.1982, cow dung, E. Holm, QLD14-59; 2 ♀, Eidsvold, 38 km NE, 10.ii.1982, cow dung, E. Holm, QLD14-69; 6 ♀, Middleton, 23 km east, 27.iv.1982, E. Holm, QLD16-9; 3 ♀, Barcardine, 28.iv.1982, E. Holm, QLD16-10; 3 ♀, Blackall, 5 km south, 28.iv.1982, cow dung, E. Holm, QLD16-11; 2 ♀, Ipswich, 10 west, 23.xi.1982, R. B. Halliday and K. Huxham, QLD17-8; 3 ♀, Cunningham's Gap, 6 km south, 18.iii.1983, E. Holm, QLD18-8; 5 ♀, Yelarbon, 6 km east, 6.x.1983, cow dung, R. B. Halliday, QLD19-2; 2 ♀, Inglewood, 8 km east, 6.x.1983, cow dung, R. B. Halliday, QLD19-3; 6 ♀, Warwick, 51 km west, 6.x.1983, cow dung, R. B. Halliday, QLD19-4; 6 ♀, Warwick, 12 km west, 6.x.1983, cow dung, R. B. Halliday, QLD19-5; 2 ♀, Warwick, 11 km south, 6.x.1983, cow dung, R. B. Halliday, QLD19-6; 14 ♀, 14 ♂, 3 DN, lab-reared progeny, parent Warwick, -.x.1983, lab culture, R. B. Halliday, progeny of ♀ from QLD19-6; 3 ♀, Longreach, -.iv.1984, cow dung, S. Runko, QLD20; 2 ♀, Townsville, 47 km south, 17.v.1984, R. Sutherland, QLD21-7; 3 ♀, Atherton, 20 km south, 16.v.1984, cow dung, R. Sutherland, QLD21-8; 6 ♀, Malanda, 2 km south, 8.vii.1984, cow dung, R. B. Halliday, QLD22-10; 6 ♀, 3 ♂, 1 DN, lab-reared, Malanda, lab culture, R. B. Halliday, progeny of ♀ from QLD22-10; 6 ♀, Atherton, 10 km east, 9.vii.1984, cow dung, R. B. Halliday, QLD22-11; 11 ♀, Mareeba, 30 km north, 13.vii.1984, cow dung, R. B. Halliday, QLD22-26; 2 ♀, Mount Carbine, 13.vii.1984, cow dung, R. B. Halliday, QLD22-27; 6 ♀, 1 ♂, 1 DN, Atherton, 6 km SW, 14.vii.1984, horse dung, R. B. Halliday, QLD22-28; 2 ♂, lab reared, -.vii. 1984, lab culture, R. B. Halliday, progeny of ♀ from QLD22-28; 2 ♀, Atherton, 44 km south, 14.vii.1984, cow dung, R. B. Halliday, QLD22-29; 1 ♀, 2 ♂, lab-reared progeny, parent from 44 km south of Atherton, -.vii. 1984, lab culture, R. B. Halliday, progeny of ♀ from QLD22-29; 2 ♀, Cloncurry, 35 km north, 10.vii.1984, cow dung, E. Holm, QLD22A-1; 3 ♀, Gregory Downs, 10.vii.1984, cow dung, E. Holm, QLD22A-2; 1 ♀, Burketown, 3 km east, 11.vii.1984, cow dung, E. Holm, QLD22A-3; 1 ♀, Burketown, 165 km east, 11.vii.1984, cow dung, E. Holm, QLD22A-4; 4 ♀, Karumba, 12.vii.1984, cow dung, E. Holm, QLD22A-6; 2 ♀, Normanton, 104 km north, 13.vii.1984, cow dung, E. Holm, QLD22A-7; 2 ♀, 1 ♂, Normanton, 155 km north, 13.vii.1984, cow dung, E. Holm, QLD22A-8; 3 ♀, Dunbar Homestead, 13.vii.1984, cow dung, E. Holm, QLD22A-9; 2 ♀, Highbury Station, 14.vii.1984, cow dung, E. Holm, QLD22A-10; 2 ♀, Wrotham Park, 14.vii.1984, old cow dung, E. Holm, QLD22A-11; 3 ♀, Coen, 10 km south, 16.vii.1984, cow dung, E. Holm, QLD22A-12; 2 ♀, Coen, 100 km north, 17.vii.1984, cow dung, E. Holm, QLD22A-13; 2 ♀, Iron Range, 50 km west, 18.vii.1984, cow dung, E. Holm, QLD22A-14; 1 ♀, Musgrave, 77 km west, 19.vii.1984, cow dung, E. Holm, QLD22A-15; 2 ♀, Musgrave, 145 km west, 19.vii.1984, cow dung, E. Holm, QLD22A-16; 2 ♀, Edward River, 30 km east, 19.vii.1984, cow dung, E. Holm, QLD22A-17; 2 ♀, Musgrave, 70 km east, 20.vii.1984, cow dung, E. Holm, QLD22A-18; 2 ♀, Cooktown, 3 km west, 21.vii.1984, cow dung, E. Holm, QLD22A-19. **Western Australia:** 6 ♀, Kununurra, 40 km east, 22.iv.1982, E. Holm, WA-4; 4 ♀, Kimbolton, near Derby, 1.i.1983, dung baited trap, C. Sambell; 1 ♀, Kimbolton, near Derby, 1.ii.1983, dung baited trap, C. Sambell; 5 ♀, Kimbolton, near Derby, 1.iv.1983, dung baited trap, C. Sambell; 1 ♀, 4 km SbyW of Mining Camp, Kimberley area, 14°52'S 125°50'E, 13.v.1983, D. Rentz and J. Balderson; 6 ♀, Mining Camp, Mitchell Plateau, Kimberley area, 14°49'S 125°50'E, 14.v.1983, D. Rentz and J. Balderson; 3 ♀, Kimbolton, 160 km NE of Derby, 7.vii.1983, in cattle dung, G. P. Hall; 1 ♀, Julia Creek, 6.iii.1984, in dung, T. Prickett; 5 ♀, Mulyie Station, near Goldsworthy, 18.v.1984, dung baited trap, J. Buckland; 2 ♀, Mulyie Station, near Goldsworthy, 27.iii.1984, dung baited trap, J. Buckland; 10 ♀, Newman, Balfour Downs, 16.iii.1985, dung baited trap, R. Lang.

Republic of South Africa: 4 ♀, Hannover, 23 km E, 30.xii.1973, on *Onitis aygulus* in cow dung, H. H. Aschenborn, ZAF-538, 540, 544, 539; 1 ♀, Middleburg, 17 km S, 31.xii.1973, on *Onitis alexis* in cow dung, A.

L. V. Davis, ZA-409; 1 ♀, Middleburg, 17 km S, 31.xii.1973, on *Onitis alexis* in cow dung, A. L. V. Davis, ZA-400; 1 ♀, Middleburg, 17 km S, 31.xii.1973, on *Onitis crenatus* in cow dung, A. L. V. Davis, ZA-596; 1 ♀, Middleburg, 17 km S, 31.xii.1973, on *Onitis caffer* in cow dung, A. L. V. Davis, ZA-583; 3 ♀, Pietersburg, 22 km north, 1.i.1974, on *Onitis alexis* in dung, A. L. V. Davis, ZA426, 442, 425; 1 ♀, Punda Milia, 15 km SW, 2.i.1974, on *Onitis alexis* in horse dung, A. L. V. Davis, ZA-420; 1 ♀, Punda Milia, 15 km SW, 2.i.1974, on *Onitis alexis* in horse dung, A. L. V. Davis, ZA-422; 1 ♀, Loius Trichardt, 36 km N, 2.i.1974, on *Onitis alexis* in cow dung, A. L. V. Davis, ZA-414; 1 ♀, Ellisras, 43 km W, 4.i.1974, on *Onitis alexis* in cow dung, A. L. V. Davis, ZA-437; 1 ♀, Alldays, 30 km N, 4.i.1974, on *Onitis alexis* in cow dung, A. L. V. Davis, ZA-459; 1 ♀, Alldays, 30 km W, 4.i.1974, on *Onitis alexis* in cow dung, A. L. V. Davis, ZA-458; 5 ♀, Swartwater, 33 km NE, 4.i.1974, on *Onitis alexis* in dung, A. L. V. Davis, ZA-430, 429, 431, 450, 449; 1 ♀, Rooibekraal, 37 km SW, 5.i.1974, on *Onitis alexis* in cow dung, A. L. V. Davis, ZA-461; 1 ♀, 15 km S of Twee Rivieren, N. Cape, 31.i.1974, on *Chironitus* in donkey dung, A. L. V. Davis, ZAF-778; 1 ♀, Pretoria, 9.ii.1974, on *Euoniticellus intermedius* in horse dung, G. F. Bornemissza, ZAF-787; Catalogue no 112; 2 ♀, Messina, 7 km S, 11.iii.1974, on *Onitis alexis*, G. F. Bornemissza, ZA-500, 505; 3 ♀, De Wildt, 23.v.1974, on *Onitis caffer* in cow dung, A. L. V. Davis, ZAF561-563; 1 ♀, Pilgrims Rest, 27.v.1974, on *Onitis caffer* in cow dung, A. L. V. Davis, ZAF-570; 3 ♀, De Wildt, 24.x.1974, on *Onitis viridulus* in cow dung, A. L. V. Davis, ZAF-735, 736, 742; 2 ♀, Messina, 8 km N, 3.xii.1974, on *Onitis alexis*, A. L. V. Davis, ZA488, 491; 1 ♀, Messina, 19 km S, 3.xii.1974, on *Onitis alexis*, A. L. V. Davis, ZA-453; 1 ♀, Messina, 19 km E, 3.xii.1974, on *Onitis alexis*, A. L. V. Davis, ZA-433; 1 ♀, Messina, 59 km N, 3.xii.1974, on *Onitis alexis*, A. L. V. Davis, ZA-485; 2 ♀, Messina, 8 km S, 3.xii.1974, on *Onitis alexis*, A. L. V. Davis, ZA-418, 419; 4 ♀, Maclear, 5.xii.1974, on *Onthophagus binodis* in cow dung, H. H. Aschenborn, ZA-210 to ZA-213; 2 ♀, Brandfort, 3 km south, 24.xi.1975, on *Onitis crenatus* in cow dung, I. D. Temby, ZAF-617, 618; 3 ♀, Craddock, 9 km S, 20.i.1976, on *Onitis aygulus*, C. F. Dewhurst, ZAF545-547; 1 ♀, Moloto, 4.iii.1976, P. D. Stickler; 15 ♀, Moloto, 30 km NE of Pretoria, 4.viii.1976, mite trap with cow dung, P. D. Stickler, ZAF-542 to ZAF-564, Catalogue no 325 to 329; 4 ♀, 1 ♂, Pretoria, Rietondale experimental farm, 14.ix.1976, mite trap with cow dung, P. D. Stickler, ZAF-575 to ZAF-579, Catalogue no 339; 1 ♀, Moloto, 9.x.1978, on *Onitis alexis*, B. M. Doube; 6 ♀, Moloto, 11.x.1978, B. M. Doube; 3 ♀, Kruger Nat Park, 16.x.1978, on *Onitis alexis*, B. M. Doube; 1 ♀, Mkuze, 24.x.1978, on *Onitis* sp., B. M. Doube; 4 ♀, Hluhluwe, 26.x.1978, B. M. Doube; 2 ♀, 26.x.1978, on *Euoniticellus intermedius*, BMD66, DMSA1078-30; 5 ♀, East London, 30.x.1978, on *Onitis pecuarius*, B. M. Doube; 7 ♀, George, 9.xi.1978, on *Onitis pecuarius*, B. M. Doube; 2 ♀, Rietondale, 10.xi.1978, on *Liatongus militaris*, B. M. Doube; 1 ♀, Rietondale, 10.xi.1978, on *Euoniticellus triangularis*, B. M. Doube; 3 ♀, Monzi, 9.vii.1979, on *Euoniticellus triangularis*, G. W. Krantz, DMSA1080; 1 ♀, Natal, lab culture, Nov. 1979, K. A. Huxham, DMSA1179-31; 2 ♀, Pretoria, lab culture, origin Hluhluwe, Natal, -xii.1979, scarab beetle, K. A. Huxham, Paratypes; 2 ♂, Pretoria, lab culture, origin Hluhluwe, Natal, Nov. 1979, scarab beetle, K. A. Huxham, Paratypes; 9 ♀, Hluhluwe Game Reserve, lab culture, 30.viii.1980, on *Sisyphus spinipes*, B. M. Doube, DMSA1080; 1 ♀, East London, 60 km north, 15.iii.1981, in dung, R. B. Halliday, DMSA0381-38; 12 ♀, Mngaza mouth, 12 km SW of Port St Johns, 16.iii.1981, on *Onitis viridulus*, R. B. Halliday, RBH81-TK15 - RBH81-TK18; 4 ♀, Mngaza mouth, 12 km SW of Port St Johns, 16.iii.1981, on *Onthophagus gazella*, R. B. Halliday, RBH81-TK29 - RBH81-TK34; 1 ♀, Gemvale, 5 km SW, 16.iii.1981, in dung, R. B. Halliday, RBH81-ID19-1; 1 ♀, Palmerston, 25 km north, 17.iii.1981, in dung, R. B. Halliday, DMSA0381-40; 50 ♀, Hilton, 11 km NW of Pietermaritzburg, 17.iii.1981, on *Onitis caffer*, R. B. Halliday, RBH81-TK1 - RBH81-TK15; 1 ♀, Fort Donald, 5 km south, 17.iii.1981, in

dung, R. B. Halliday, RBH81-ID25-2; 1 ♀, Thornville, 10 km south, 17.iii.1981, in dung, R. B. Halliday, RBH81-ID29-1; 2 ♀, Clydesdale, Transkei, 17.iii.1981, in dung, R. B. Halliday, RBH81-ID32-3 - RBH81-ID-35-2; 2 ♀, Transkei, 17.iii.1981, in dung, R. B. Halliday, RBH81-ID37-1, 2; 1 ♀, Estcourt, 9 km north, 18.iii.1981, in dung, R. B. Halliday, RBH81-ID27-1; 1 ♀, Mooi River, 3 km S, 18.iii.1981, in dung, R. B. Halliday, RBH81-ID24-1; 11 ♀, Klerksdorp, Transvaal, 2.iii.1982, on *Sisyphus rubrus*, K. Huxham, RBH82-KH2; 21 ♀, Wolmaranstaad, Transvaal, 2.iii.1982, on *Liatongus militaris*, K. Huxham, RBH82-KH3; 25 ♀, Christiana, OFS, Alt 4000 feet, 2.iii.1982, K. Huxham, RBH82-KH4; 4 ♀, Boshoff, OFS, Alt 4300 feet, 3.iii.1982, on *Chironitis* sp. nr *scabrosus*, K. Huxham, RBH82-KH6; 3 ♀, Kimberley, 25 km east, 3.iii.1982, on *Liatongus militaris*, K. Huxham, RBH82-KH5; 20 ♀, Sannaspos, Orange Free State, 3.iii.1982, on *Liatongus militaris*, K. Huxham, RBH82-KH8; 19 ♀, Uitvlugt, 20 km NW of Bloemfontein, 3.iii.1982, on *Liatongus militaris*, K. Huxham, RBH82-KH7; 3 ♀, Thaba Nchu, Bophutatswana, 3.iii.1982, Alt 5000 feet, K. Huxham, RBH82-KH9; 1 ♀, Witsieshoek, O.F.S. Alt 5500 feet, 4.iii.1982, in dung, K. Huxham, RBH82-KH13; 1 ♀, Magudu Natal, 10 km west, 8.iii.1982, K. Huxham, RBH82-KH18; 2 ♀, Scheepersnek, Natal, 8.iii.1982, on *Liatongus militaris*, K. Huxham, RBH82-KH19; 2 ♀, Perdekop, Transvaal, 9.iii.1982, in dung. alt 5500 feet, K. Huxham, RBH82-KH21; 2 ♀, Perdekop, Transvaal, 9.iii.1982, in dung. alt 5500 feet, K. Huxham, RBH82-KH22; 3 ♀, 2 ♂, Monzi, near St Lucia, Natal, on *Euoniticellus triangularis*; 3 ♀, Moloto, 30 km NE, on *Onitis alexis*, B. M. Doube; 2 ♀, Rietondale, B. M. Doube; 15 ♀, 2 ♂, Makatini Flats, Zululand.

Lesotho: 3 ♀, Butha Buthe, 4.iii.1982, on *Liatongus militaris*, K. Huxham, RBH82-KH11; 2 ♀, Libano, 4.iii.1982, on *Onitis caffer*, K. Huxham, RBH82-KH12.

Tanzania: 1 ♀, M'bagoni village, edge of Kenya Forest, 12.iii.1911, on *Onitis* sp. nr *vanderkelleni*, T. J. Anderson, 1911-384; RBH82.BM-6; 2 ♀, Lake Manyara, 1.v.1975, on *Heteronitis castelnaui* in elephant dung, A. L. V. Davis and C. F. Dewhurst, ZAF-803, 812; 4 ♀, Songea, Litembo, Alt 1500m, 15.ix.1952, on *Onitis vanderkelleni*, Lindeman and Paulitzki.

Kenya: 2 ♀, Galana Game Ranch, Koromodo area, 3.vi.1975, on *Onitis alexis* in cow dung, PC1952-3, 6; 1 ♀, Tsavo West National Park, Tsavo River, near Tsavo Gate, 31.v.1975, on *Onitis alexis* in buffalo dung, PC1942-1; 3 ♀, Kikuyu, Muguga Research Station, 4.iv.1975, on *Onitis antheraci* in cow dung, A. L. V. Davis and C. F. Dewhurst, ZA390-392; 1 ♀, Kikuyu, Muguga Research Station, 4.iv.1975, on *Onitis vanderkelleni* in cow dung, A. L. V. Davis and C. F. Dewhurst, ZAF-732; 2 ♀, Galana Game Ranch, 11.xii.1975, on *Catharsius* sp. in elephant dung, C. F. Dewhurst, ZAF768, 769; 2 ♀, Serengeti Lodge, 14 km south, 25.xi.1975, on *Onitis planatus* in black rhino dung, C. F. Dewhurst, ZAF675, 680.

Zimbabwe: 3 ♀, Salisbury, Mashonaland, on *Onitis* sp. nr. *crenatus* in British Museum, G. A. K. Marshall, RBH82-BM1, 2, 3; 1 ♀, Rusape, 43 km NE, 17.i.1976, on *Onitis crenatus*, A. L. V. Davis, ZAF-634; 2 ♀, Reckontyre, Zambesi Valley, 20.x.1978, B. M. Doube; 1 ♀, Penhalonga, 1 km south, 10.xi.1972, on *Onitis alexis* in cow dung, PC750-1.

Namibia: 1 ♀, Outje, 79 km N, 2.ii.1974, on *Heteronitis audens* in cow dung, A. L. V. Davis, ZAF-799; 1 ♀, Koes, 39 km NE, 2.ii.1974, on *Onitis alexis* in cow dung, A. L. V. Davis, ZA-464; 1 ♀, Goageb, 23 km E, 3.ii.1974, on *Onitis alexis* in cow dung, A. L. V. Davis, ZA-468; 2 ♀, Aus, 58 km NE, 4.ii.1974, on *Onitis alexis* in cow dung, A. L. V. Davis, ZA-470, 471; 3 ♀, Aus, 172 km NW, 5.ii.1974, on *Onitis alexis* in cow dung, A. L. V. Davis, ZA-474, 473, 478; 1 ♀, Aus, 112 km NW, 5.ii.1974, on *Scarabaeus* sp. in gemsbok dung, A. L. V. Davis, ZA-222; 2 ♀, Rehoboth, 30 km N, 13.ii.1974, on *Onitis alexis* in cow dung, A. L. V. Davis, ZA-482, 483; 2 ♀, Etosha, 10.iv.1974, on *Chironitis* sp in dung, H. H. Aschenborn, ZAF783, 785; 4 ♀, Witvlei, 30 km W,

23.xii.1975, on *Onitis uncinatus* in dung, H. H. Aschenborn, ZAF699-706; 5 ♀, Hohental, 20 km SW of Otavi, 25.xii.1975, on *Onitis uncinatus* in dung, H. H. Aschenborn, ZAF712-724; 10 ♀, 5 km SW of Abenab, Ilmenan Farm, 26.xii.1975, on *Onitis alexis* in dung, H. H. Aschenborn, ZA510-ZA528; 1 ♀, Okahandja, 32 km SW, 29.xii.1975, on *Onitis alexis* in cow dung, H. H. Aschenborn, ZA-530; 1 ♀, Witvlei, 30 km W, 29.xii.1975, on *Heliocopris japetus* in dung, H. H. Aschenborn, ZA-359; 2 ♀, Okahandja, 32 km SW, 30.xii.1975, on *Onitis uncinatus* in cow dung, H. H. Aschenborn, ZAF-729, 730.

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References

Halliday, R. B. (2000). The Australian species of *Macrocheles* (Acarina : Macrochelidae). *Invertebrate Taxonomy* **14**, 273–326.