A new histiostomid mite (Acari: Astigmatina: Histiostomatidae) from blue penguin burrows.

J.M. Clark

Canterbury Museum, Rolleston Avenue, Christchurch 8001, New Zealand, and Faculty of Health and Science, Christchurch Polytechnic Institute of Technology, P.O. Box 540, Christchurch, New Zealand. Corresponding author’s email: clarkj@cpit.ac.nz

(Received 7 December 2009, revised and accepted 3 February 2010)

Abstract

Histiostoma mantelli new species is described and illustrated from females and males collected from moulting burrows of blue penguin Eudyptula minor at Tongaporutu, North Taranaki, New Zealand.

Keywords: Histiostomatidae - Histiostoma - new species - guano mite - blue penguin – Eudyptula minor – New Zealand

Introduction

Mites of the family Histiostomatidae are often collected as phoretic deutonymphs on insects but the feeding life-history stages use damp temporary habitats. Histiostomatidae is one of the largest families of the Astigmatina with about 500 species in 58 genera (Kurosa & Tagami 2006; O’Connor 2009). They frequently feed on bacteria, fungi or nematodes in habitats such as guano or dung. The family is regarded as a basal group to the astigmatine mites (O’Connor 2009). Some are aquatic (Fashing 2002). However few genera are described from both the deutonymphs and trophic forms (larva, nymphs and adults) and about 85% of named species are described only from the deutonymph. Thus two taxonomies of the family exist. The native New Zealand histiostomids are poorly known, although a member of the Histiostoma feroniarium group, a cosmopolitan synanthrope, was reported by Womersley (1941) and Ramsay (1966). Fain & Galloway (1993) described the trophic forms of the guano mite, Myanoetus antipodus from white-flippered penguin Eudyptula minor albosignata burrows or moulting sites on Motunau Island and Banks Peninsula. Clark (2009) described the deutonymph of that species. This paper describes a second histiostomid species from blue penguin E. minor burrows.

Methods and Conventions

Penguin burrow floor material consisting of compacted guano and feathers from two vacant blue penguin E. minor moulting chambers was removed and examined under a dissecting microscope. Mites were collected, cleared in Nesbitt’s fluid; slide mounted in Hoyer’s gum chloral; viewed under phase contrast optics and illustrated with the aid of a camera lucida. Myanoetus antipodus was present, in addition to a second histiostomid species that is described...
here. All measurements given are in micrometres. Adult leg nomenclature, including coxal setae, follows Bongers et al. (1985); adult body setae use Grandjean’s system (Griffiths 1990); propodosomal setae nomenclature follows OConnor (2009) i.e. rostral (ro), lamellar (le), for the setae formerly ve and vi and the two posterior pairs are the interlamellar (in) and the exbothridial (ex) formerly called si and se.

**Systematics**

Family diagnoses of Histiostomatidae Berlese, 1897 (= Anoetidae, Oudemans, 1904) are given in OConnor (2009) and Schuecher (1957). Generic diagnoses are given in Scheucher (1957) and Hughes & Jackson (1958). While Scheucher (1957) provided keys to genera and species based on male, female and deutonymph characters, Hughes & Jackson (1958) and other workers, notably Mahunka (1972), based their keys solely on the deutonymph. The deutonymph was not available for description in this new species.

The generic diagnosis for females of Histiostoma Kramer, 1876 in Scheucher (1958) is translated from German as: ovipore (vulva) transverse between coxa II & III; anterior genital papillae on same level; posterior genital papillae high in coxal field IV or medial between III & IV: and for males as; genital apparatus hardly protrusible; tarsus I with one dorsal terminal setiform setae; tibia I & II with solenidion ω short. Hughes (1976) provided a similar generic diagnosis in English. The species described below bears these characters. A list of 300 species of the Histiostomatidae is available online (Hallan 2008). Histiostoma contains 95 species on that list.

**Histiostoma mantelli new species**

**FEMALE:** Figures 1 & 2. Length x width means 275 x 150; range 250-310 x 130-200 (6 paratypes). Box to egg shaped; guanine white, with thin shiny cuticle and pale legs. Gnathosoma: Figure 2. Chelicerae much flattened to a blade 6 deep, fixed digit with a hoe-like apical tooth 5 long and two equal sub-apical teeth 1 long; movable digit with at least one strong apical tooth. Solenidion ω 35 with eupathidia ul’8; sub-capitular m 8.

**Dorsum:** Figure 1. Prodorsal shield 60 x 60 punctate, domed. Rostral setae ro filiform spiralled c.30 long; lamellar le flagelliform 14 long pressed to shield. Propodosomal shield interlamellar setae in 15, exbothridial ex 25 long both pectinate arising on the shield margin; shield 55 wide. Sejugal furrow entire, deep. Hysterosomal cuticle thick, warty or striated bearing 4 pair of dorsal shields as illustrated; Setae d1, e2 and e3 not inserted to shields; all dorsal setae curved, pectinate 15 – 25 long on shield lateral or posterior edges. Vestigial alveoli present on shields of segment E. Setae h1 and h2 (obscured on caudal bulge) appear to be on pedestals, not shields. Bursa copulatrix is on a level with seta e1 inserted on a raised cone and connected to a long ductus. Internal spermathecal sclerites not seen. Cupules ia and im as illustrated; ip not seen.

**Venter:** Figure 2. Ovipore transverse, flanked by sejugal apodemes slightly in front of the anterior genital papillae (agp): posterior genital papillae (pgp) mid-way between ovipore and anus anterior. All papillae circular, 3 in diameter. Coxal, genital and pseudanal setae all 12 long. All coxae with a punctate triangular pattern. Epimeres I meet to be weakly fused: Epimeres II, III and IV short and free. Never more than one egg /female.
**Legs:** Figure 2. All pretarsi have pulvilli. On legs III and IV there is a ventral pullvillus lobe which is pointed in a lateral view (Figure 2C). The average length of leg segments; tarsus (incl. pretarsus), tibia, genua, femur for legs I – IV; I, 65 25 20 35; II, 60 20 20 35; III, 55 20 20 20; IV, 70 20 20 30; (Σ, 145 135 115 140) n = 3 paratypes. Leg chaetotaxy, I – IV: Tarsus, 13 12 10 10; Tibia, 2 2 1 1; Genua, 2 2 0 0; Femora, 1 1 0 1; Trochanters, 1 1 1 0. Setae aa and ba fan like, fluted and flattened. On legs I and II setae gT, hT, cG, mG and on legs III and IV, kT, d and w are all flattened, curved, asymmetrical and hyaline as illustrated. Other leg setae are conical spines except d and pR that are setiform, on legs I and II; Solenidiotaxy (genua-tibia-tarsi): Leg I, 2 3 1; II, 1 1 1; III, 0 1 0; IV, 0 1 0. On leg I, σ1, σ2 both 15, φ22, ω122, ω2, 12, ω3, 10. On leg II, σ1, 10, φ20, ω1, 27. On leg III, φ20. On leg IV, φ20.

**MALE:** Figures 3 & 4. Sexual dimorphism marked. Length (incl. gnathosoma) x width 240 x 130, n=4 paratypes. Box like body shape; male is smaller and more sclerotised than female. Cerotegument with detritus attached. Legs of female form - unmodified.

**Dorsum:** Figure 3. Rugose, pigmented with rostral setae (ro) and lamellar

![Female dorsum](image-url)
(le) as for female. Setae in and ex equal 12 long but flagelliform, not pectinate as in female. Raised thicker cuticle holding setae in and ex forming indistinct shield margins – not illustrated. Sejugal furrow distinct. Hysterosomal setae are all curved flagelliform, equal, 12 long, set in thickened cuticle; not on shields as in female. No vestigial alveoli fl seen. Cupules as illustrated; cupule ip not seen.

**Venter:** Figure 4. Thickened pigmented cuticle stronger anteriorly with
punctuation. Epimeres I fused to short sternum c. 20 long; epimeres II faintly enclosing entire coxal field, almost fused to epimeres III. Epimeres III weak but enclosing almost entire coxal field and having stronger epimerite. Copulatory organ level with posterior genital papilla, CxIV seta and posterior of coxa IV field. Both pgp and agp set as to form a trapezium in a trench with superficial rings agp and pgp 3 in diameter but opening into larger chitinous cones, not illustrated, inside the mite. Setae Cx I, CxIII, CxIV, ga, ps2 and h3 all equal about 12 long; ps2, 20 long.

Legs: Figure 3 & 4. Segment lengths of tarsus (incl. pretarsus), tibia, genua, femur for legs I – IV; I 50 20 20 25; II, 45 15 15 30; III, 45 15 15 25; IV, 50 20 20 25; (Σ 115 105 100 115). Chaetotaxy as for female. Setae form as for female but shorter; tibial and genual spines on I and II not conical, but flattened, often lying near the cuticle of leg segment. Solenidi-
otaxy as for female. On leg I, $\sigma_1$ 10, $\sigma_7$ 7, $\phi$ 25, $\omega_1$ 20, $\omega_2$ 15, $\omega_3$ (curved rod with membrane) 10. On leg II, $\sigma_1$ 10, $\phi$ 15, $\omega_1$ 27. On leg III, $\phi$ 15. On leg IV, $\phi$ 15.

**DEUTONYMPH:** Unknown

**Etymology**

The mite is named for the late Mr. Lynley Mantell; farmer and conservationist of Tahora and Tongaporutu.

**Notes**

The new species occurred at Tongaporutu with another guano mite, *Myianoetus antipodus* Fain & Galloway (1993). On Nov 14 2009 *Myianoetus antipodus* was collected from an *E. minor* burrow entrance under the Matiatia wharf, Waiheke Island, Auckland. Thus *M. antipodus* is now recorded from Hauraki Gulf, North Taranaki Bight and Pegasus Bay/Banks Peninsula.

*Histiotoma mantelli* differs from the
cosmopolitan *H. feroniarum* reported from New Zealand (Womersley 1941) as follows: *H. mantelli* adult females bear pectinate hysterosomal setae whereas *H. feroniarum* has simple setae; the four genital papillae of *H. mantelli* males form a trapezium; *H. feroniarum* are arranged in a rectangle. *Histiostoma piloseta* Hughes & Jackson (1958) which was collected from compost at Ellerson, Virginia, USA, is similar to *H. mantelli*; both are sexually dimorphic; males are smaller, and they both lack the shield mounted pectinate hysterosomal setae. However, *H. mantelli* has one prodorsal shield while *M. piloseta* has two and *H. piloseta* lacks the shield of C segment. The new species is not similar to any histiostomids described from Australia (Australian Faunal Directory 2009).

**Type material**

Holotype female and a male paratype on the same slide; paratype females and a tritonymph euviae holding a pharate female are deposited in the Canterbury Museum, Christchurch, New Zealand. Male and female paratypes are deposited at NZ Arthropod Collection, Landcare Research, Tamaki Campus, Auckland, New Zealand. All material collected 38° 50’S, 174° 36’E, Tongaporutu, North Taranaki from moulting burrows of blue penguin *Eudyptula minor* 4 March, 1994 by J.M.Clark.

**Acknowledgements**

I thank the two anonymous referees for detailed and helpful comments that have greatly improved the paper. David Hawke of the Christchurch Polytechnic provided encouragement.

**References**


Hughes, A.M. 1976. The Mites of Stored Food and Houses. Ministry of Agriculture, Fisheries and Food,


