An updated checklist of helminth and protozoan parasites of birds in New Zealand

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Author(s): McKenna P

Abstract

A combined and updated checklist of helminth and protozoan parasites of birds in New Zealand is provided. This checklist, which is divided into two parts, includes a total of 203 parasites (68 nematodes, 40 cestodes, 44 trematodes, 11 acanthocephalans and 40 protozoans) from 116 hosts.

Introduction

Since publication of checklist of helminth and protozoan parasites of birds in New Zealand over 10 years ago [1], there have been a number of new records. This update includes these additional records and allows for the correction of those errors and omissions that were present in the preceding version. In the main, the taxonomic names assigned to those parasites recorded in the previous checklist have been kept in the present list also. Thus, the generic name Capillaria continues to be used in its widest sense despite such revisions as those suggested by Moravec [2] in which some Capillaria species were retained in this genus while others were provisionally reassigned to a number of different genera including Eucoleus (Capillaria annulata, Capillaria contorta, Capillaria perforans), Baruscapillaria (Capillaria emberizae, Capillaria obsignata), or Aonchotheca (Capillaria caudinflata). In contrast, the generic nematode names of Stomachus and Filicapsularia, which are lapsed names [3], have been replaced by Contracaecum and Anisakis, respectively. Likewise, the generic protozoan name Spironucleus is used rather than Hexamita as suggested by Levine [4] and the apparent spelling error of Eimeria kovoidi recorded by Williams [5] has been corrected to Eimeria kofoidi [6]. As well, the acanthocephalan parasite recorded in the pied stilt as Polymorphus sp.by McDonald [7] has been changed to Profilicollis sp. following the proposal of Nickel [8]. Finally, some of the formerly used bird names have also been modified and now more generally conform to those in Avibase [9].

As in the previous publication, the checklist is divided into two parts. In both parts, and where applicable, the parasite listings are divided into the major groups of Nematoda, Cestoda, Trematoda, Acanthocephala and Protozoa. In the first part the parasites are listed alphabetically under the common name of the host and in the second they are listed alphabetically according to parasite. To try to make it easier to find a particular host and to attempt to ensure that similar type hosts are generally grouped together, in Part I the common host names are presented as “Duck, mallard” or “Penguin, blue” rather than the more conventional “Mallard duck” or “Blue penguin” format used in the second part of the document. In addition and for similar reasons, the Paradise shelduck is simply referred to as Paradise duck.

In keeping with the previous version of this checklist, only those parasites identified to at least generic level have been included. Each parasite record in Part I is supported by a reference (although not necessarily the first New Zealand record), whereas such citations are omitted from Part 2. Parasites considered to be of uncertain or questionable identity are indicated by a question mark while all new parasite records or new host-parasite links representing additions to those provided in the previous checklist [1], are accompanied by the symbol †.

Acknowledgements

Work carried out in gathering information for this paper was supported by MAF Biosecurity New Zealand.

References

41. Mason PC, Hodgkinson NL, McAllum HJF. Acuaria
51. Brockerhoff AM, Smales LR. Proficollis novaezelandensis n.sp. (Polymorphidae) and two other acanthocephalan parasites from shore birds (Haematopidae and Scolopacidae) in New Zealand, with records of two species in intertidal crabs (Decapoda: Grapsidae, Ocypodidae). Syst Parasitol 2002; 52: 55-65.
121. Laird M. Atoxoplasma paddae (Aragao) from several south Pacific silvereyes (Zoesteropidae) and a New Zealand rail. J Parasitol 1959; 45: 47-52.
Illustrations

Illustration 1

PART 1: PARASITE LIST BY HOST

<table>
<thead>
<tr>
<th>Host</th>
<th>Phylum</th>
<th>Genus/Species</th>
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<tr>
<td>Albatross, black-browed (Thalassarche melanophrys)</td>
<td>Nematoda</td>
<td>Anisakis sp.?</td>
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<td></td>
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<td>Contracaecum scotti</td>
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<td>Albatross, light-mantled sooty (Phoebetria palpebrata)</td>
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<td>Protozoa</td>
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<tr>
<td>Bellbird (Anthornis melanura melanura)†</td>
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<td>Plasmodium sp. †</td>
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<td>Bittern, Australasian (Botaurus poiciloptilus)</td>
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<td>Echinoparyphium recurvatum</td>
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<td>Blackbird (Turdus merula)</td>
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<td>Haemoproteus danilewsky</td>
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<td>Isospora turd †</td>
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<td></td>
<td></td>
<td>Plasmodium relictum</td>
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Conure, sun
(*Aratinga solstitialis*)† Nematoda Capillaria sp.† [24]

Cuckoo, shining
(*Chrysococcyx lucidus*) Nematoda Ascaridia zelandica [25]
Microtetrameres sp. [25]

Dotterel, New Zealand
(*Charadrius obscurus*) Acanthocephala Plagiorhynchus sp.† [26]
Protozoa Plasmodium elongatum [27]
Plasmodium relictum [27]

Duck, blue
(*Hymenolaimus malacorhynchos*)† Nematoda Capillaria sp.† [24]
Cestoda Sobolevicanthus sp.† [28]

Duck, grey
(*Anas superciliosa superciliosa*)† Nematoda Amidostomum acutum† [29]
Capillaria anatis† [29]
Contracaecum microcephalum [30]
Echinuria australis [31]
Echinuria uncinata [31]
Epomidiostomum uncinatum† [29]
Tetrameres sp.† [29]
Cestoda Anomotaenia ciliata† [29]
Aploparaksis furcigera† [29]
Dicranotaenia coronula† [32]
Diorchis flavescens† [29]
Diorchis inflata† [32]
Fimbriaria fasciolaris† [29]
Gastrotaenia cygnif [29]
Hymenolepis megalops [10]
Sobolevicanthus gracilis† [29]
Trematoda Catatropis sp.† [29]
Cotylurus cornutus† [29]
Dendritobilharzia pulverulenta [10]
Echinostoma revolutum† [29]
Protozoa Notocotylus gippyensis [33]
Psilochasmus oxyurus† [29]
Psilotrema sp.† [29]
Trichobilharzia sp. [10]
Plasmodium sp.
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<td>Echinostoma revolutum</td>
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<td>Psilotrema sp.</td>
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<td>Duck, muscovy (Cairina moschata)</td>
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<td>Dendritobilharzia pulverulenta</td>
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<td>Notocotylus tadornae</td>
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<td>Typhlocoelum cucumerinum</td>
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<td>Duck, &quot;wild&quot; (Anas spp.)</td>
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<td>Cotylurus sp.</td>
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Godwit (Limosa sp.)
Trematoda Ornithobilharzia kowalewskii [34]

Godwit, bar-tailed (Limosa lapponica)†
Acanthocephala Profilicollis antarcticus† [51]
Profilicollis novaezelandensis† [51]

Godwit, eastern bar-tailed (Limosa lapponica baueri)†
Cestoda Capsulata edenensis† [52]
Ophryocotyle proteus† [52]
Trematoda Acanthoparyphium spinulosum† [52]
Curtuteria australis† [52]
Himasthla leptosoma† [52]
Maritrema gratiosum† [52]
Parorchis acanthus† [52]
Wardianum taxorchis† [52]

Goose, Canada (Branta canadensis)
Nematoda Amidostomum anseris† [29]
Trichostrongylus tenuis† [29]
Trematoda Cotylurus cornutus† [29]
Echinoparyphium recurvatum [13]
Echinostoma revolutum [13]
Notocotylus attenuatus† [29]
Notocotylus gippyensis [33]

Goose, domestic (Anser anser)
Nematoda Amidostomum anseris† [11]
Capillaria anatis† [11]
Heterakis gallinarum† [11]
Trichostrongylus tenuis† [11]
Trematoda Echinoparyphium recurvatum [13]
Echinostoma revolutum [13]
Notocotylus gippyensis [13]
Notocotylus tadornae [33]

Greenfinch (Carduelis chloris)
Protozoa Atoxoplasma sp. [53]
Isospora sp.? [53]
Plasmodium relictum† [22]

Guineafowl (Numida meleagris)†
Echinoparyphium recurvatum† [56]
Maritrema novaezelandensis† [56]
Parorchis acanthus [59]
Acanthocephala Arhythmorhynchus sp.† [24]
Profilicollis novaezelandensis† [56]

Gull, southern black-backed
(Larus dominicanus)
Nematoda Cosmocephalus tanakai [60]
Sciadiocara tarapunga† [61]
Cestoda Cladogynia latovarium† [61]
Hymenolepis alaskensis† [61]
Trematoda Echinoparyphium recurvatum† [61]
Echinostoma revolutum† [61]
Ornithobilharzia canaliculata [62]
Parorchis acanthus† [61]
Philophthalmus sp. [63]
Acanthocephala Profilicollis antarcticus† [61]
Profilicollis novaezelandensis† [61]

Harrier, Australasian
(Circus approximans gouldi)†
Nematoda Capillaria sp.† [64]

Kaka
(Nestor meridionalis)
Nematoda Capillaria sp.† [65]
Microtetrameres nestoris [66]
Oxyspirura sp.† [67]
Syngamus trachea† [65]
Protozoa Atoxoplasma sp.† [68]
Giardia sp. [69]
Toxoplasma gondii? [70]

Kakapo
(Strigops habroptila)
Nematoda Capillaria sp.† [65]
Cestoda Stringopotaenia psittacea [10]
Protozoa Eimeria sp.† [71]

Kea
(Nestor notabilis)
Nematoda Capillaria plagiaticia [71]
Procymea kea [72]
Cestoda Syngamus trachea [73]
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Illustration 2

PART 2: PARASITE LIST BY PARASITE

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<td>Canada goose†, domestic goose†</td>
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<td>Amidostomum sp.</td>
<td>black swan</td>
</tr>
<tr>
<td>Anisakis sp.?</td>
<td>Auckland Island shag, black-browed albatross, gentoo penguin, Macquarie Island shag, royal penguin</td>
</tr>
<tr>
<td>Ascaridia columbiae†</td>
<td>rock pigeon†</td>
</tr>
<tr>
<td>Ascaridia galli</td>
<td>domestic fowl, red-legged partridge†</td>
</tr>
<tr>
<td>Ascaridia platycerci</td>
<td>Chatham Island red-crowned parakeet, masked lovebird, rose-ringed parakeet†</td>
</tr>
<tr>
<td>Ascaridia sp.</td>
<td>budgerigar, cockatiel, domestic turkey, galah, parakeet, peach-faced lovebird, peafowl, regent parrot, rosella</td>
</tr>
<tr>
<td>Ascaridia zelandica</td>
<td>shining cuckoo</td>
</tr>
<tr>
<td>Ascaris apterycis?</td>
<td>brown kiwi</td>
</tr>
<tr>
<td>Capillaria annulata</td>
<td>domestic goose†, grey duck†, mallard duck†, paradise duck†</td>
</tr>
<tr>
<td>Capillaria cadovulvata</td>
<td>grey partridge, ring-necked pheasant</td>
</tr>
<tr>
<td>Capillaria caudinflata</td>
<td>domestic fowl</td>
</tr>
<tr>
<td>Capillaria contorta</td>
<td>grey partridge</td>
</tr>
<tr>
<td>Capillaria emberizae</td>
<td>yellowhammer</td>
</tr>
<tr>
<td>Capillaria obsignata</td>
<td>domestic fowl, rock pigeon</td>
</tr>
<tr>
<td>Capillaria perforans†</td>
<td>Guinea fowl†</td>
</tr>
<tr>
<td>Capillaria plagiatricia</td>
<td>kea</td>
</tr>
<tr>
<td>Capillaria sp.</td>
<td>Avustralasian harrier†, blackbird, black stilt, black swan, blue duck†, blue penguin†, bobwhite quail†, brown teal†, Campbell Island teal†, chukor partridge, kaka†, kakapo†, kiwi, kokako†, masked lovebird, morepork†, peafowl†, pied stilt, pukeko†, red-billed gull†, rosella, shore plover†, song thrush, starling†, stitchbird†, sun conure†, takahē (Notornis)†</td>
</tr>
</tbody>
</table>
Echinuria australis  grey duck
Echinuria uncinata  grey duck, mallard duck
Epomidiostomum uncinatum†  grey duck†, mallard duck†, paradise duck†
Eustrongylides sp.  Australasian bittern, black shag (black
cormorant), spotted shag
Hedruris spinigera  black shag (black cormorant)
Heterakis gallinarum  brown quail, domestic fowl, domestic goose†,
domestic turkey, guinea fowl†, morepork, ring-necked pheasant
Heterakis gracilicauda  brown kiwi, kiwi
Heterakis isolonche  ring-necked pheasant
Heterakis sp.  peafowl
Heterakis vesicularis?  domestic fowl
Libyostrongylus douglassii†  ostrich†
Microtetrostrangulides nestoris  kaka
Microtetrostrangulides sp.  shining cuckoo
Omnistrostrongylus quadridiatus  rock pigeon
Oxyspirura sp.†  kaka†
Pectinospirura sp.  black swan
Pelecitus sp.  rock pigeon
Porrocaecum crassum  paradise duck
Porrocaecum ensicaudatum  blackbird, kiwi, song thrush
Porrocaecum sp.  brown kiwi, saddleback†, starling†
Procymea kea  kea
Scadilocara tarapunga  red-billed gull, southern black-backed gull†
Serratospiculum guttatum†  New Zealand falcon†
Streptocara cirrohamata  Auckland Island shag
Syngamus trachea  blackbird, chukor partridge, domestic fowl,
kaka†, kea, kiwi†, parson finch, pictorella finch, ring-necked pheasant, silvereye, starling,
stitchbird†
Terranova sp.?  royal penguin
Tetrameres sp.  grey duck†, kiwi, mallard duck†, paradise
duck†
Tetrameres tarapungae  red-billed gull
Toxocara cali  brown kiwi
Trichostrongylus tenuis  brown quail, Canada goose†, domestic
goose, emu†, paradise duck, peafowl
Viktorocara torea  South Island pied oystercatcher

Cestoda
Anomotaenia ciliata†  grey duck†, mallard duck†, paradise duck†
Anomotaenia minuta  brown kiwi
<table>
<thead>
<tr>
<th>Species</th>
<th>Common Names</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dilepis undula</td>
<td>blackbird, song thrush</td>
</tr>
<tr>
<td>Diorchis flavescens†</td>
<td>grey duck†</td>
</tr>
<tr>
<td>Diorchis inflata†</td>
<td>grey duck†, mallard duck†</td>
</tr>
<tr>
<td>Diplophallus polymorphus</td>
<td>black stilt, pied stilt</td>
</tr>
<tr>
<td>Echinolepis carioca</td>
<td>domestic fowl</td>
</tr>
<tr>
<td>Fimbriaria fasciolans</td>
<td>grey duck†, mallard duck†, paradise duck</td>
</tr>
<tr>
<td>Gastrotaenia cygnii†</td>
<td>grey duck†, mallard duck†</td>
</tr>
<tr>
<td>Hymenolepis alaskensis</td>
<td>South Island pied oystercatcher, southern black-backed gull†, variable oystercatcher</td>
</tr>
<tr>
<td>Hymenolepis megalops</td>
<td>grey duck, mallard duck†, paradise duck</td>
</tr>
<tr>
<td>Hymenolepis serpentulus</td>
<td>blackbird</td>
</tr>
<tr>
<td>Nadejdolepis lauriei†</td>
<td>South Island pied oystercatcher†, variable oystercatcher†</td>
</tr>
<tr>
<td>Nematoparataenia paradoxa</td>
<td>black swan</td>
</tr>
<tr>
<td>Ophryocotyle proteus†</td>
<td>eastern bar-tailed godwit†, South Island pied oystercatcher†</td>
</tr>
<tr>
<td>Parabisaccanthes bisacculina†</td>
<td>black swan†</td>
</tr>
<tr>
<td>Paricterotaenia apterygis?</td>
<td>brown kiwi</td>
</tr>
<tr>
<td>Proterogynotaenia dougi†</td>
<td>South Island pied oystercatcher†</td>
</tr>
<tr>
<td>Proterogynotaenia haematopodis</td>
<td>South Island pied oystercatcher</td>
</tr>
<tr>
<td>Pulluterina nestoris</td>
<td>kea</td>
</tr>
<tr>
<td>Raillietina cesticillus</td>
<td>domestic fowl</td>
</tr>
<tr>
<td>Raillietina graeca</td>
<td>chukor partridge</td>
</tr>
<tr>
<td>Raillietina sp.</td>
<td>brown kiwi, saddleback†</td>
</tr>
<tr>
<td>Sobolevicanchus gracilis†</td>
<td>grey duck†, paradise duck†</td>
</tr>
<tr>
<td>Sobolevicanchus sp.†</td>
<td>blue duck†, &quot;wild&quot; duck†</td>
</tr>
<tr>
<td>Stringopotaenia psittacea</td>
<td>kakapo</td>
</tr>
<tr>
<td>Taenia apterycis?</td>
<td>brown kiwi</td>
</tr>
<tr>
<td>Taenia increscens?</td>
<td>variable oystercatcher</td>
</tr>
<tr>
<td>Tetrabothrius sp.†</td>
<td>blue penguin†</td>
</tr>
</tbody>
</table>

**Trematoda**

<table>
<thead>
<tr>
<th>Species</th>
<th>Common Names</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acanthoparyphium sp.</td>
<td>black stilt, pied stilt, South Island pied oystercatcher</td>
</tr>
<tr>
<td>Acanthoparyphium spinulosum†</td>
<td>eastern bar-tailed godwit†</td>
</tr>
<tr>
<td>Catatropis sp.</td>
<td>black stilt, grey duck†, mallard duck†, New Zealand shoveler, paradise duck, pied stilt, &quot;wild&quot; duck</td>
</tr>
<tr>
<td>Cloacitrema sp.</td>
<td>South Island pied oystercatcher†, variable oystercatcher</td>
</tr>
<tr>
<td>Cotylurus cornutus</td>
<td>Canada goose†, grey duck†, paradise duck</td>
</tr>
<tr>
<td>Cotylurus sp.</td>
<td>black stilt, black swan?, New Zealand scaup?, &quot;wild&quot; duck?</td>
</tr>
<tr>
<td>Cotylurus unicolor</td>
<td>black stilt, pied stilt, South Island pied oystercatcher</td>
</tr>
<tr>
<td>Echinoparyphium cinctum†</td>
<td>New Zealand scaup†</td>
</tr>
<tr>
<td>Echinoparyphium recurvatum</td>
<td>Australasian bittern, black swan, Canada goose, domestic goose, New Zealand scaup, New Zealand shoveler, paradise duck, red-billed gull†, southern black-backed gull†, &quot;wild duck&quot;</td>
</tr>
</tbody>
</table>
Echinostoma revolutum  Canada goose, domestic goose, grey duck†, mallard duck†, New Zealand scaup†, New Zealand shoveler, paradise duck, rock pigeon, southern black-backed gull†, “wild” duck

Echinostoma sp.  blue penguin?, paradise duck†
Galactosomum sp.†  blue penguin†
Himasthla leptosoma†  eastern bar-tailed godwit†
Hydrodermia sp.?  blue penguin?
Hypoderaeum conoideum†  paradise duck†
Hyp管理工作us magnus  black swan
Levinseniella sp.?  “wild” duck?
Lyperosomum megacotylosum  brown kiwi
Maritrema gratiosum†  eastern bar-tailed godwit†, South Island pied oystercatcher†
Maritrema novaezelandensis†  red-billed gull†
Melogymnophallus sp.†  “oystercatcher”†
Metorchis sp.  “wild” duck
Microphallus sp.†  brown teal†, “wild” duck†
Notocotylus attenuatus  Canada goose†, paradise duck
Notocotylus gippyensis  Canada goose, domestic goose, grey duck, New Zealand shoveler, paradise duck, “wild” duck

Notocotylus sp.  South Island pied oystercatcher, variable oystercatcher†
Notocotylus tadornae  domestic goose, paradise duck
Ornithobilharzia canaliculata  southern black-backed gull
Ornithobilharzia kowalewskii  godwit
Ornithobilharzia sp.  New Zealand shoveler
Parorchis acanthus  eastern bar-tailed godwit†, red-billed gull, South Island pied oystercatcher†, southern black-backed gull†
Philophthalmus sp.  southern black-backed gull
Pittacium pittacium†  variable oystercatcher†
Psilochasmus oxyurus  black swan, grey duck†, New Zealand scaup, New Zealand shoveler, “wild” duck
Psilotrema sp.†  grey duck†, mallard duck†
Spelotrema sp.?  “wild duck”?
**Protozoa**

Atoxoplasma adiei?
Atoxoplasma paddae
Atoxoplasma sp.

Babesia kiwiensis†
Balantidium coli†
Cryptosporidium sp.

Eimeria acervulina
domestic fowl
Eimeria brunetti
domestic fowl
Eimeria duodenalis†
Eimeria kofoidi
Eimeria labbeana
Eimeria maxima
domestic fowl
Eimeria meleagridentis
domestic turkey
Eimeria meleagridis
domestic turkey
Eimeria necatrix
domestic fowl
Eimeria pacifica†
Eimeria phasiani†
Eimeria sp.

Eimeria tenella
domestic fowl
Eimeria truncata?
kiwi
Giardia sp.

Haemoproteus danilewsky
Haemoproteus sp.†
Hepatozoon albatrostiti†
Hepatozoon kiwi†
Histomonas meleagridis
Isospora sp.
<table>
<thead>
<tr>
<th>Protozoa</th>
<th>Hosts</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Plasmodium sp.</strong></td>
<td>Australasian gannet†, Australian magpie†, bellbird†, brown kiwi†, fantail†, grey duck, grey warbler†, Himalayan monal pheasant†, New Zealand pigeon†, New Zealand robin†, pipit, rose-ringed parakeet†, saddleback†, silvereye†, skylark, tomtit†, weka†, yellow-fronted parakeet†, yellowhead†</td>
</tr>
<tr>
<td><strong>Sarcocystis sp.</strong></td>
<td>New Zealand pigeon (cysts)</td>
</tr>
<tr>
<td><strong>Spironucleus sp.†</strong></td>
<td>ostrich†</td>
</tr>
<tr>
<td><strong>Toxoplasma gondii</strong></td>
<td>canary, domestic fowl, kaka?, little spotted kiwi?, tawny frogmouth†</td>
</tr>
<tr>
<td><strong>Trichomonas gallinae</strong></td>
<td>rock pigeon</td>
</tr>
<tr>
<td><strong>Trichomonas sp.</strong></td>
<td>New Zealand pigeon</td>
</tr>
</tbody>
</table>
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