

SHORT COMMUNICATION

Gastrointestinal helminths of *Choerophryne proboscidea* and *Xenorhina parkerorum* (Anura: Microhylidae) from Papua New Guinea

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Microhylidae is a widely distributed anuran family mainly found on the southern continents and associated islands (Duellman 1999); more than half the diversity of Microhylidae is contained within the subfamily Asterophryiinae. With at least 257 species of microhylid frogs, the microhylid fauna of the Papuan Region is particularly rich (Kraus, unpub. data). Although microhylids from Papua New Guinea have been the subject of numerous helminthological studies (Johnston 1967, Moravec and Sey 1986, 1990, Moravec 1990, Bursey *et al.* 2006, 2007, 2008, 2009, 2013, 2014a,b, Goldberg *et al.* 2007, 2009a,b,c, 2010, 2013), most species have not been examined for helminths. Herein we report the initial helminth list for *Choerophryne*

proboscidea and *Xenorhina parkerorum* as part of a survey of the helminth parasites of amphibians and reptiles from Papua New Guinea.

Choerophryne proboscidea Van Kampen, 1914 is known from foothills between central west New Guinea and the Adelbert Range, up to 1450 m (Menzies 2006). *Xenorhina parkerorum* Zweifel, 1972 occurs in the mountains of central New Guinea from the Eipomek Valley to the upper Kikori—and upper Sepik—river catchments between 1200 and 2200 m (Menzies 2006, FK, unpubl. data).

Twenty-seven *Choerophryne proboscidea* were collected at Keki Lodge, Madang (4.7408°S, 145.4042°E), Madang Province Papua New Guinea, from September–October 2009 and 29 *Xenorhina parkerorum* from the east slope of Mount Itukua (5.6695°S, 142.6233°E), Muller Range, Southern Highlands Province, Papua New Guinea in March 2009. All specimens were

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deposited in the herpetology collection of the Bernice P. Bishop Museum (*C. proboscidea* BPBM 34650-34676; *X. parkerorum* BPBM 33780-33794, 33796-33809) Honolulu, Hawaii, and all were examined for helminths. The digestive tracts were removed from the euthanized frogs that were fixed in neutral-buffered 10% formalin, stored in 70% ethanol and shipped to Whittier College, Whittier, California, USA. The esophagus, stomach, small intestine, and large intestine were opened using a razor blade, and the contents examined under a dissecting microscope. A total of 1722 nematodes was found. Each was cleared in a drop of lactophenol on a microscope slide, cover slipped, and examined under a compound microscope. Nematodes were assigned to genus based upon the keys of Anderson *et al.* (2009); parasitological terminology is according to Bush *et al.* (1997).

The following five species of Nematoda were identified: *Bakeria bakeri* (Moravec and Sey, 1986); *Cosmocerca novaeguineae* Moravec and Sey, 1990; *Icosiella papuensis* Johnston, 1967; *Aplectana macintoshii* (Stewart, 1914); and *Cosmocercella phrynomantisi* Moravec, 1990. Helminths were deposited in the Harold W. Manter Laboratory (HWML), University of

Nebraska, Lincoln, USA as *Choerophryne proboscidea*: *Bakeria bakeri* (HWML 69011), *Cosmocerca novaeguineae* (HWML 69012), *Icosiella papuensis*; (HWML 69013); and *Xenorhina parkerorum*: *Aplectana macintoshii* (HWML 69014), *Cosmocercella phrynomantisi* (HWML 69015). Site of infection, number of helminths, prevalence (%), mean intensity \pm 1 SD, and range are in Table 1.

Originally described as *Oxysoma macintoshii*, specimens of *Aplectana macintoshii* were taken from *Hoplobatrachus tigerinus* (as *Rana tigrina*) and *Duttaphrynus stomaticus* (as *Bufo stomaticus*) from India by Stewart (1914) and reassigned to *Aplectana* by Travassos (1931). It is the most widespread member of the genus and has been recorded from 53 anuran species in the following Realms: Afrotropical, Indomalayan, Neotropical, Oceanian and Palearctic (McAllister *et al.* 2010). It has been reported in anurans from Papua New Guinea in the following families: (Limnodynastidae) *Lechriodus melanopygus* (Goldberg *et al.* 2007); (Hylidae) *Nyctimystes pulcher* (Goldberg *et al.* 2009c) and (Ceratobranchidae), *Cornufer papuensis* (as *Platymantis papuensis*) (Goldberg *et al.* 2009b). In addition, *A. macintoshii* has been found in two species of

Table 1. Site of infection, number (N), prevalence (%), mean intensity \pm 1 SD, and range for Nematoda in the microhylid frogs, *Choerophryne proboscidea* and *Xenorhina parkerorum* from Papua New Guinea; *from residue in vial with gut contents.

Frogs	Helminths	Infection site	N	Prevalence (%)	Mean intensity	Range
<i>C. proboscidea</i>	<i>Bakeria bakeri</i>	Stomach	2	4	2.0	–
	<i>Cosmocerca novaeguineae</i>	Small, large intestine	37	48	2.8 \pm 1.9	1–7
	<i>Icosiella papuensis</i>	Body cavity*	5	7	2.5 \pm 0.7	2–3
<i>X. parkerorum</i>	<i>Aplectana macintoshii</i>	Small intestine	10	7	5.0	–
	<i>Cosmocercella phrynomantisi</i>	Small, large intestine	1668	48	107.9 \pm 68.9	4–220

scincid lizards from Papua New Guinea—*Emoia atrocostata* and *Eugongylus rufescens* (Goldberg *et al.* 2010). *Xenorhina parkerorum* is a new host record for *A. macintoshii*.

Bakeria bakeri originally was described as *Oswaldocruzia bakeri* from the microhylid frog, *Callulops stictogaster* (as *Phrynomantis stictogaster*), collected in Papua New Guinea by Moravec and Sey (1986); the species was reassigned to *Bakeria* by Ben Slimane *et al.* (1996). A host list will be found in Bursey *et al.* (2014a) under the heading “*Oswaldocruzia bakeri*”. *Choerophryne proboscidea* is a new host record for *Bakeria bakeri*.


Cosmocerca novaeguineae was described by Moravec and Sey (1990) from specimens taken from *Cornufer papuensis* (as *Platymanthis papuensis*) collected in West Sepik Province, Papua New Guinea. It is widespread in the New Guinean helminth community and has been reported in five species of ranid frogs (Goldberg *et al.* 2009b), seven species of ceratobatrachid frogs (Goldberg *et al.* 2009b), seven species of hylid frogs (Bursey *et al.* 2009, Goldberg *et al.* 2009c), twelve species of microhylid frogs (Goldberg *et al.* 2009a) and one species of limnodynastid frog (Goldberg *et al.* 2007) from Papua New Guinea. Both *C. novaeguineae* and *C. phrynomantisi* had prevalences of 48% (Table 1). *Choerophryne proboscidea* is a new host record for *Cosmocerca novaeguineae*.

Cosmocercella phrynomantisi was described from *Callulops* (as *Phrynomantis*) *humicola* by Moravec (1990). *Cosmocercella phrynomantisi* has been reported from six species of microhylid frogs from Papua New Guinea (Goldberg *et al.* 2009a, Bursey *et al.* 2014b), *Cosmocercella phrynomantisi* had the highest mean intensity (107.9 ± 68.9 SD) and number of helminths (1668) (Table 1). *Xenorhina parkerorum* is a new host record for *Cosmocercella phrynomantisi*.

Icosiella papuensis was described by Johnston (1967) from the ceratobatrachid frog, *Cornufer papuensis* from New Guinea. *Icosiella papuensis* has also been reported from three

species of hylid frogs (Bursey *et al.* 2009, Goldberg *et al.* 2009c) and three species of ranid frog (Bursey *et al.* 2008, Goldberg *et al.* 2009b) from Papua New Guinea. We noted in Table 1, that *I. papuensis* was found in two separate vials containing the digestive tracts of BPBM 34656 and BPBM 34669. The site of infection was assumed to be the body cavity. *Choerophryne proboscidea* is a new host record for *I. papuensis* and the first record for a microhylid host.

Based on previous studies (Goldberg *et al.* 2007, 2009a,b,c, Bursey *et al.* 2008, 2014a,b) it is apparent that anurans from Papua New Guinea are infected by a community of generalist helminths capable of infecting a variety of hosts. There is a high level of endemism, with at least 27 species of these helminths infecting endemic frogs in Papua New Guinea; five are known from both Australia and Papua New Guinea, and seven are known from Australia, Papua New Guinea and other areas (Goldberg *et al.* 2009a).

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