SYPHACIA LONGAECAUDA N. SP. (NEMATODA: OXYURIDAE) SYPHACINEA FROM MELOMYS SPP. (MURIDAE: HYDROMYINAE) FROM PAPUA NEW GUINEA AND IRIAN JAYA, INDONESIA

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Summary :

A new oxyurid nematode *Syphacia* (*Syphacia*) *longaecauda* n. sp. is described from the caecum and colon of the hydromyine rodents *Melomys monktoni* (type host) and *M. rubex* from Papua New Guinea and Irian Jaya, Indonesia. *Syphacia longaecauda* has an oval, laterally extended, relatively large cephalic plateau and can be distinguished from other species of *Syphacia* with similar characters by, amongst other features, tail length. The significance of the distribution of *S. longaecauda*, apparently restricted to New Guinea, is discussed.

KEY WORDS : Nematoda, Oxyuridae, *Syphacia*, murid, hydromyine, *Melomys*, Papua New Guinea, Irian Jaya, biogeography.

Résumé : *SYPHACIA LONGAECAUDA* N. SP. (NEMATODA : OXYURIDAE) SYPHACINEA DE *MELOMYS* SPP. (MURIDAE : HYDROMYINAE) DE PAPOUASIE NOUVELLE-GUINÉE ET INDONÉSIE

Une nouvelle espèce d'oxyure, *Syphacia* (*Syphacia*) *longaecauda* n. sp., est décrite au niveau du caecum et de l'intestin grêle des rongeurs hydromyins *Melomys monktoni* (hôte type) et *M. rubex* de Nouvelle Guinée et d'Indonésie Irian Jaya. *Syphacia longaecauda* possède un plateau céphalique qui est relativement grand, ovale, et prolongé latéralement. Elle peut être distinguée des autres espèces de *Syphacia* qui possèdent des caractères semblables par la longueur de la queue. L'importance de la distribution de cette espèce, apparemment limitée à la Nouvelle Guinée, est discutée.

MOTS CLÉS : Nematoda, Oxyuridae, *Syphacia*, Muridae, Hydromyinae, *Melomys*, Papouasie Nouvelle Guinée, Irian Jaya, Indonésie, biogéographie.

INTRODUCTION

During investigations into the helminth fauna of endemic rodents from the island of New Guinea specimens of an oxyurid (Nematoda: Oxyuridae) were found in individuals of *Melomys monktoni* Thomas, 1904 and *Melomys rubex* Thomas, 1922 collected in Irian Jaya, Indonesia and Papua New Guinea. Having characters typical of the genus *Syphacia* that occurs in rodents (Hugot, 1988) these specimens were sufficiently different to be considered a new species, described below.

MATERIAL AND METHODS

Digestive tracts from whole bodies of *Melomys* sp. which had previously been collected and stored in 70 % ethanol in the Bernice Bishop Museum, Honolulu, Hawaii (BBM), and The Australian Museum, Sydney, (AM) were removed and examined

for helminths. All parasites found were stored in 70 % ethanol prior to clearing in lactophenol for identification. Measurements of 10 specimens of each sex taken using an ocular micrometer, are given as the range followed by the mean in parentheses, in micrometers unless otherwise stated. Drawings were made with the aid of an Olympus microscope drawing tube. The rodent bodies have remained in the museums in which they were registered and all helminth specimens have been deposited in the BBM, AM or South Australian Museum, Adelaide (SAM). The terminology used follows Quentin (1971) and Hugot (1988).

RESULTS

SYPHACIA (*SYPHACIA*) *LONGAECAUDA* SP. N.
(Figs 1-13)

Description: small nematodes, typical oxyurid shape, with transverse cuticular striations. Cephalic inflation distinct. Cephalic plateau oval, extended laterally in *en face* view; amphids situated between cephalic papillae on the two lateral projections; mouth opening simple, three pseudo-labia rather shallow. Oesophagus with distinct isthmus, terminating in a spherical bulb. Excretory pore posterior to oesophageal bulb.

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Figs 1-13. – *Syphacia (Syphacia) longaecausta* n. sp.

1. Female, right lateral view. 2. Cephalic end of female ventral view, optical section. 3. En face view of female. 4. Anterior end of female, right lateral view. 5. Cephalic end of male, left lateral view. 6. Hand cut transverse section of female, at level of oesophagus. 7. Vagina, left lateral view. 8. Vulva, ventral view. 9. Spicule and gubernaculum. 10. Female tail, left lateral view. 11. Male tail, ventral view. 12. Mamelon, ventral view. 13. Male, left lateral view.

Male: Length 1.6-2.05 (1.8) mm, maximum width 102-156 (125). Oesophagus 240-355 (287) long; oesophageal bulb 60-93 (74) in diameter. Nerve ring 111-148 (126), excretory pore 375-436 (390) from anterior end. Three mamelons with prominent annulations, spines not observed; first mamelon 80-90 (84) long, 600-850 (728) from anterior end; second mamelon 70-85 (79) long, 100-225 (115) behind first; third mamelon 70-90 (78) long, 250-425 (305) behind second. Tail 370-490 (430) long. Spicule needle shaped 76-97 (85) long; gubernaculum 39-47 (41) long; ventral barb not observed. Two pairs preanal, one pair large caudal papillae.

Female: Length 4.0-4.4 (4.3) mm, maximum width 306-357 (342). Oesophagus 408-456 (431) long; oesophageal bulb 121-127 (123) in diameter. Nerve ring 119-127 (121); excretory pore 470-636 (550); vulva 765-986 (915) from anterior end. Tail 616-850 (740) long. Eggs, 94-100 (97) by 34-42.5 (39).

Type host: *Melomys moniktoni*: Thomas, 1904 (Muridae: Hydromyinae).

Site of Infection: caecum and colon.

Prevalence: three of nine *M. moniktoni*, 10 of 31 *M. rubex*.

Type locality: Bulldog Road 12 miles south of Edie Creek Morobe Province, Papua New Guinea, coll. A.B. Mirza 13. vii 1972.

Deposition of types: holotype ♂ allotype ♀ SAM AHC 31373, AHC 31374, paratypes AHC 31375, BBM reg no 101220.

Etymology: the specific name refers to the long tail characteristic of this species.

Material examined: from Papua New Guinea: *Melomys moniktoni* 4 ♀, 1 ♂ Mt Kaindi, Wau, coll. A.B. Mirza 24. viii. 1972 BBM 97688; 2 ♀, 1 ♂ Bulldog Road six miles from Edie Creek, Morobe Province, coll. A.B. Mirza, 5. xii. 1970 BBM 99496. From *Melomys rubex* 3 ♀, 1 ♂ Bafunmin, Sandaun Province, coll. A.B. Mirza 30. iii. 1980 108087; 1 ♂, 26 ♀ Bokubet, Sandaun Province, coll. T. Bukam, 7. vii. 1976 BBM 105251, 105232. 2 ♂, 11 ♀ Somoro summit, Toricelli Mts, Sandaun Province, coll. T. Flannery 6. vi. 1988, T. Ennis 7. i. 1988 AM W26276, W26277; 1 ♀, Telefomin, Sanduan Province, coll. T. Flannery 6. vi. 1988 AM W26278; 5 ♂, 24 ♀ Tifalmin, Sanduan Province, coll. T. Flannery 15. iv. 1986 AM W26280, W26281; 1 ♀, 1 ♂ Dokfuma Star Mts, Sanduan Province, coll. T. Flannery 6. iv. 1987 AM W26282.

From Irian Jaya. *Melomys rubex* 1 ♀ Urong Forest, Arfak Mts, coll. T. Flannery AM W26279.

DISCUSSION

The specimens described herein belong to the genus *Syphacia*, (parasites of Cricetidae and Muridae) and the subgenus *Syphacia* Seurat,

1916. They have neither a rectangular shaped cephalic plateau and well developed triangular shaped lateral alae, as found in the subgenus *Cricetoxyluris* Hugot, 1988 nor a short conical tail characteristic of the subgenus *Seuratoxyluris* Hugot, 1988.

Of the 14 species comprising *Syphacia* (*Syphacia*), *Syphacia* (*Syphacia*) *longaecauda* n. sp. most closely resembles a group of *Syphacia* spp. *S. arctica* Tiner & Rausch, 1950; *S. montana* Yamaguti, 1943; *S. nigeriana* Baylis, 1928; *S. obvelata* (Rud, 1802) and *S. venteli* Travassos, 1937; characterized as Group V by Quentin (1971); having an oval cephalic plateau bordered laterally by the submedian papillae. *Syphacia longaecauda* most closely resembles *S. arctica*, *S. montana* and *S. obvelata* in having a relatively large cephalic plateau measuring 45-50 µm between the amphids but these species have cuticular embossing surrounding the cephalic plateau and *S. longaecauda* does not. *Syphacia nigeriana* and *S. venteli* have a smaller plateau, 30-40 µm between the amphids. Each of the species differs in *en face* view, *S. longaecauda* differing in particular from each of the other species in the group in the position of the amphids relative to the papillae (see Quentin, 1971). Furthermore *S. longaecauda* differs in one or more of the measurements of spicule, gubernaculum, eggs, or tail from the other species in the group (Table I).

Syphacia longaecauda also differs from the two species of *Syphacia*, *S. darwini* Hugo & Quentin, 1985 and *S. muris* (Yamaguti, 1935) previously known from the region. *Syphacia darwini* has two rather than three mamelons. *Syphacia muris* has a square rather than oval cephalic plateau as found in *S. longaecauda*. The spicules and gubernaculum of *S. longaecauda* 76-97 and 39-47 are longer than those of *S. muris* 30-61 and 20-36 respectively. The male tail is longer 390-490 compared with 115-285 and the eggs are larger 94-100 × 32-43 compared with 64-90 × 23-40 (Measurements of Ow Yang, 1971; Hugot & Quentin, 1985; Hasegawa & Tarore, 1996).

The tail of *Syphacia longaecauda* males is longer than that recorded for any species of *Syphacia* (*Syphacia*) thus far. *Syphacia darwini* is found in *Melomys* spp. hosts endemic to Australia (Hugot & Quentin, 1985; Smales, 1997). *Syphacia muris* is a cosmopolitan species occurring in the cosmopolitan hosts *Rattus rattus* L. and *R. norvegicus* (Berkenhout) as well as *R. fuscipes* Waterhouse, *R. tunneyi* (Thomas) and *R. sordidus* (Gould) from Australia (Smales, 1997). *Syphacia longaecauda* has been found only in *Melomys* spp. hosts endemic to Papua New Guinea and Irian Jaya.

The host genus *Melomys* Thomas, with four representatives found in Australia and 13 in Irian Jaya and Papua New Guinea, is referred to the polyphyletic tribe

	<i>S. arctica</i>		<i>S. montana</i>		<i>S. nigeriana</i>		<i>S. obvelata</i>		<i>S. venteli</i>		<i>S. longaecauda</i>	
	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀
Body length mm	1.52 – 2.01	5.41 – 5.55	1.8 – 2.0	3.7 – 5.9	1.2 – 1.45	5.3	1.15 – 1.5	3.4 – 5.8	0.9 – 1.1	2.2 – 2.6	1.6 – 2.05	4.0 – 4.4
width mm	0.10 – 0.15	0.30 – 0.32	0.15	0.25 – 0.3	0.14	0.25 – 0.30	0.13	0.24 – 0.4	0.10	0.22 – 0.33	0.1 – 0.16	0.31 – 0.36
Nerve ring	98 – 121	120 – 152	130 – 140	100 – 160	120	180	–	–	60 – 70	110	111 – 148	119 – 127
Excretory pore	310 – 410	450 – 540	440 – 450	390 – 550	340	600	302	523	220 – 230	510 – 700	375 – 436	470 – 632
Oesophagus length	250 – 280	254 – 300	270	300 – 400	250	350 – 420	–	–	–	–	240 – 355	408 – 456
Oesophagus bulb width	75 – 84	115 – 119	72 – 75	75 – 102	–	–	–	–	–	–	60 – 93	121 – 127
Tail	180	0.9 – 1.01	170	150 – 900	100 – 110	850 – 950	120 – 140	530 – 762	150 – 160	500	370 – 490	616 – 850
Vulva												
from anterior		640 – 780		650 – 775		700 – 800		874		510 – 700		765 – 986
Eggs		90-96		108-125		113-125		118-153		78-82		94-100
		× 38-39		× 29-40		× 35-40		× 33-55		× 22-33		× 34-42
Spicule	80 – 94		81 – 87		75 – 95		68 – 90		52 – 60		76 – 97	
Gubernaculum	33 – 48		44 – 45		35 – 37		28 – 34		30		39 – 47	

Table 1. – Measurements of *Syphacia longaecauda* this study, compared with those of *S. arctica*, *S. montana*, *S. nigeriana*, *S. obvelata* and *S. venteli* as given by Baylis (1927), Hussey (1957), Tiner & Rausch (1950), Travassos (1937), Yamaguti (1943) and Quentin (1971).

Uromyini Watts & Aslin, 1981. This group is assumed to be derived from the earliest, possibly Miocene, murid invasion of New Guinea. *Melomys* is suggested to have subsequently migrated from New Guinea to Australia over land bridges between the two land masses that formed during The Pleistocene (Flannery, 1995). The finding of *S. darwini* only in Australian and now *S. longaecauda* only in New Guinean *Melomys* is indicative of speciation in Australia after *Melomys* migrated from New Guinea without any reverse migration. It may be, however, that these two species of *Syphacia* are sympatric since the helminth fauna of rodents in both areas is poorly known. Additional surveys of rodents across the region are needed before firm conclusions can be drawn.

ACKNOWLEDGEMENTS

My thanks go to T. Flannery and T. Ennis of the Australian Museum and C. Kishinami of The Bishop Museum for allowing me to dissect out *Melomys* bodies. This project was supported by an Australian Research Council Grant.

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Reçu le 28 mars 2000
Accepté le 7 août 2000