

A redescription of *Dipetalonema finlayi*
(Mazza and Fiora, 1932)
from a Viscacha, *Lagidium peruanum*, of Peru

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Résumé

Des spécimens de *Dipetalonema finlayi* (Mazza et Fiora, 1932) provenant d'un viscacha, *Lagidium peruanum* ayant succombé au Zoo de Londres sont décrits et les relations taxinomiques de l'espèce sont discutées.

Je suis heureux d'apporter ma contribution au « livre jubilaire » de mon distingué Collègue et ami, le Professeur Henri Galliard, à l'occasion de son 80^e anniversaire.

Summary

Specimens of *Dipetalonema finlayi* (Mazza and Fiora, 1932) from a viscacha, *Lagidium peruanum*, that died at the London Zoo are described and the relationships of the species are discussed.

I have much pleasure in contributing this article to the « livre jubilaire » in honour of my good friend and distinguished colleague, Professor Henri Galliard, on the occasion of his 80th birthday.

* † Le décès du Professeur Buckley, survenu au cours du délai nécessité par la réunion des articles constituant ce numéro jubilaire, a été ressenti avec une profonde tristesse par ses collègues français. Au moment de la parution de cet article, nous tenons à exprimer à nouveau la peine que nous a causée la disparition de ce grand savant (N.D.L.R.).

The host of the filarial worms described herein belongs to the genus *Lagidium* Meyen, 1833 of which there are 4 different species in South America and commonly bear the name viscacha or chinchilla. They are rodents of the suborder Hystrichomorpha, family Chinchillidae, inhabiting Argentina and Peru.

The worms were found in the peritoneal cavity of a specimen of *L. peruanum* that had been captured in Peru and died at the London Zoo in January 1971. I am indebted to Dr. Barbara J. Weir of the Wellcome Institute of Comparative Physiology and to Dr. Ian Keymer of the Zoological Society of London for making the specimens available to me and to Dr. Weir for the data on the taxonomy of *Lagidium*. Thanks are also due to Dr. B. R. Laurence of the London School of Hygiene and Tropical Medicine for his help with the structure of the microfilariae.

Description.

This is based on 6 specimens, 3 females and 3 males. The body in both sexes is of uniform width for most of its length, with a distinct narrowing anteriorly and posteriorly (Figs. 1 A and B). The cuticle is perfectly smooth throughout. The anterior end in outline resembles a very shallow cone with a rounded flattened apex (Figs. 1 E and 2 A). The head has a faint tendency to be bulbous which is so slight as to be hardly measurable. Around the mouth the cuticle is slightly raised to form a disc or shield of about 40 μm in diameter. At the periphery of the shield and at the same level are the papillae and amphids. The papillae are difficult to discern and in the best specimen available for the *en face* view formed a single group of 3 from which one of the dorso-dorsals was missing (Fig. 1 F). The amphids are large, distinct and their ducts are clearly seen in the dorso-ventral view (Fig. 1 E). The mouth opening is small, circular in outline and expands internally forming the buccal cavity. There is a chitinous buccal capsule attached in a concavity to the anterior end of the oesophagus. The buccal capsule (Figs. 1 E and 2 A) is roughly triangular in side view and measures 21 μm in diameter and 6 μm in depth. The oesophagus is not in 2 parts and neither the nerve ring nor the excretory pore could be seen.

THE FEMALE:

The 3 specimens are respectively 66.5, 67 and 93 mm long and 0.4-0.45 mm in maximum breadth. The head end is 0.1 mm in diameter. The principal dimensions of the specimens are given in Table I. The vulva is a crescentic opening, non-salient, situated just anterior to the junction of the oesophagus and intestine and opens into a well defined ovejector (Fig. 1 G). The vagina is long, at least 3 mm; its full extent is obscured by overlapping coils of the uterus. The intestine is very clearly seen in the posterior 3 mm of the body in a space devoid of genitalia (Fig. 1 B). As it approaches the anus it becomes more and more indistinct and instead of a rectum there is a very minute duct that opens to the exterior by a small pore that represents the anus. This is situated on a slight cuticular prominence. The tail tip is blunt, asymmetrical and rather angular (Figs. 1 C, D). The terminal bosses are inconspicuous and lacking in one specimen.

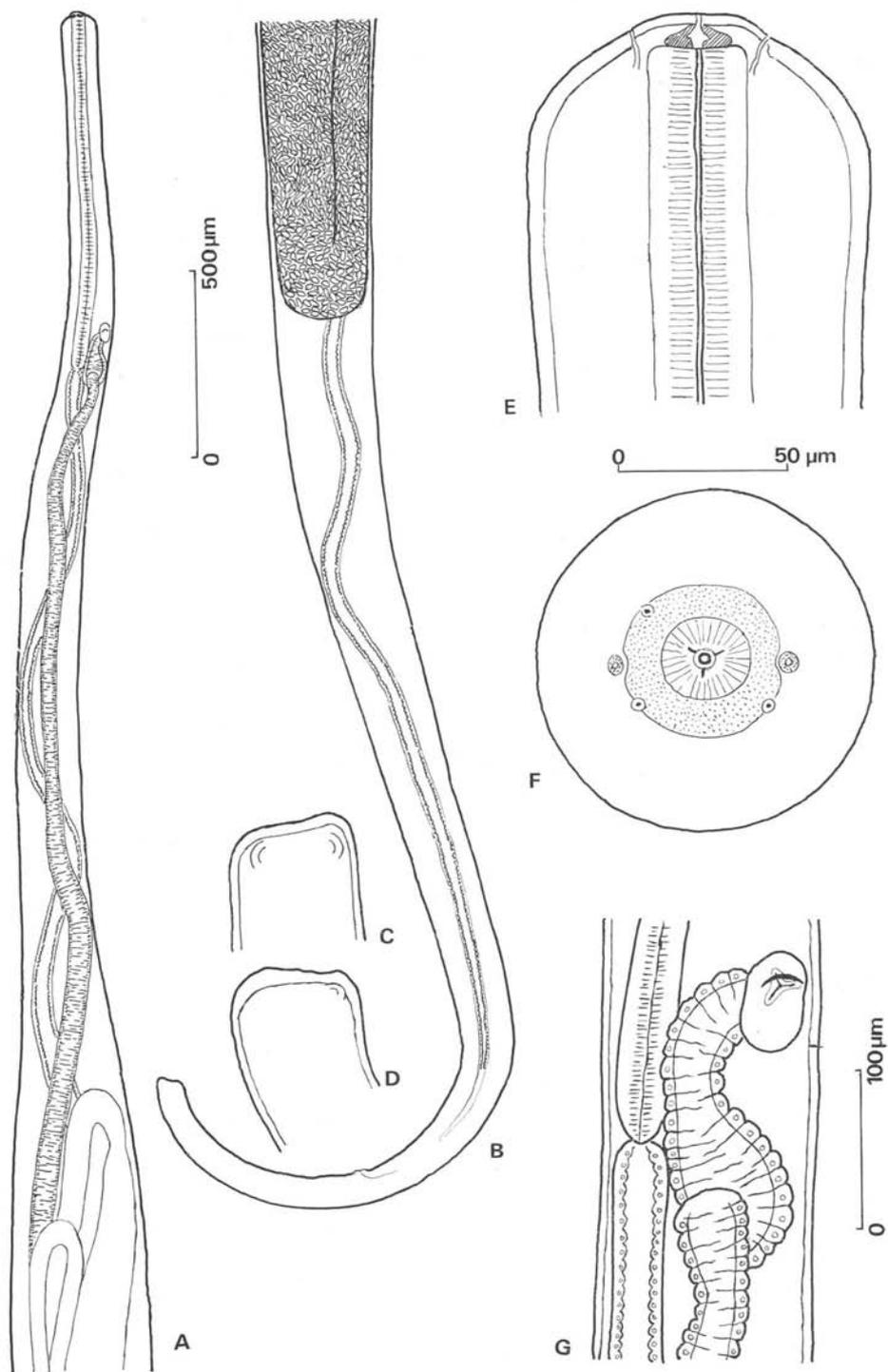


FIG. 1. — *D. finlayi*. Female. A. Anterior extremity, lateral view. B. Posterior extremity, lateral view. C. Tip of tail, ventral view. D. Tip of tail, lateral view. E. Head, dorsoventral view. F. Head, *en face* view. G. Vulva, lateral view. (A, B: Scale 0-500 μ m. E, F: Scale 0-50 μ m. G: Scale 0-100 μ m)

THE MALE :

The 3 specimens are respectively 38.2, 30.2 and 39 mm long and 0.2-0.3 mm in maximum breadth. The head end is about 0.08 mm in diameter. The posterior end is coiled in 3-4 loops (Fig. 2 B) and in the final 1 1/2 loops (Fig. 1 D) can be seen the cloacal aperture and papillae, the spicules and the cuticular bosses. The cloacal aperture is slightly raised and immediately anterior to it there is an unpaired papilla. Then come 2-3 pairs of sessile papillae close to the midventral line. There are no post cloacal papillae. The pair of ventral bosses at the tail tip are globular, about 8 μ m in diameter and are composed of cuticle and hypodermis. The tail tip is rather truncated, as in the female. The spicules are unequal and dissimilar, the left one being in 3 parts as in many other members of the Onchocercidae. The proximal tubular part is less than half the total length; it tapers gradually from its widest diameter at the proximal end. The middle section is flat and leaf-like (resembling that in *Brugia* spp.) and the distal part is filamentous and bears a fine, narrow striated membrane (Fig. 2 C). The right spicule is heavily sclerotised, tubular throughout its length with a ventral angular bend at the middle. At this point there is a ventral opening through which the distal part of the left spicule passes; the latter emerges at another opening near the tip of the right spicule which is shaped like the beak of a bird of prey. There is no gubernaculum.

THE MICROFILARIA :

These were numerous in blood smears. They are sheathed, rather stumpy in appearance, 60-70 μ m long and up to 8 μ m in breadth. The cephalic space is 5-6 μ m long and the tail nuclei extend nearly to the tip. Two spaces in the body nuclei, presumably the nerve ring and the anal pore divide the body into 3 approximately equal parts. In the cephalic space there is a hook like that described by Laurence (1968) in the microfilaria of *Litomosoides* and *Dipetalonema*.

Discussion.

The tip of the tail in both sexes bears a pair of ventral bosses which are inconspicuous in the female but very prominent in the male.

In the year 1932 Mazza and Fiora published the finding of several specimens of a filarial worm in the peritoneal cavity of a viscacha, *Lagidium tucumanus* Thos. from the province of Jujuy in northern Argentina. (Dr. Weir is of the opinion that this is probably *L. viscacia tucumanum*, a different species from *L. peruanum* from Peru, the host of the worms described in the present article). Mazza and Fiora briefly described their material and included some useful illustrations of both adults and microfilariae, which they named *Acanthocheilonema finlayi*. The species was removed to the genus *Dipetalonema* Diesing, 1861 by Chabaud in 1952. Comparison of the description of *D. finlayi* with that of the present specimens from *L. peruanum* leaves little doubt that they are one and the same species but a redescription seems justifiable in view of (a) the rather unusual host, and (b) the more exacting standards of completeness and accuracy required by present-day problems in taxonomy, especially with reference to the filarial worms. For example, the presence of a chitinous buccal capsule has now been confirmed; formerly, as pointed out by Chabaud (*loc*

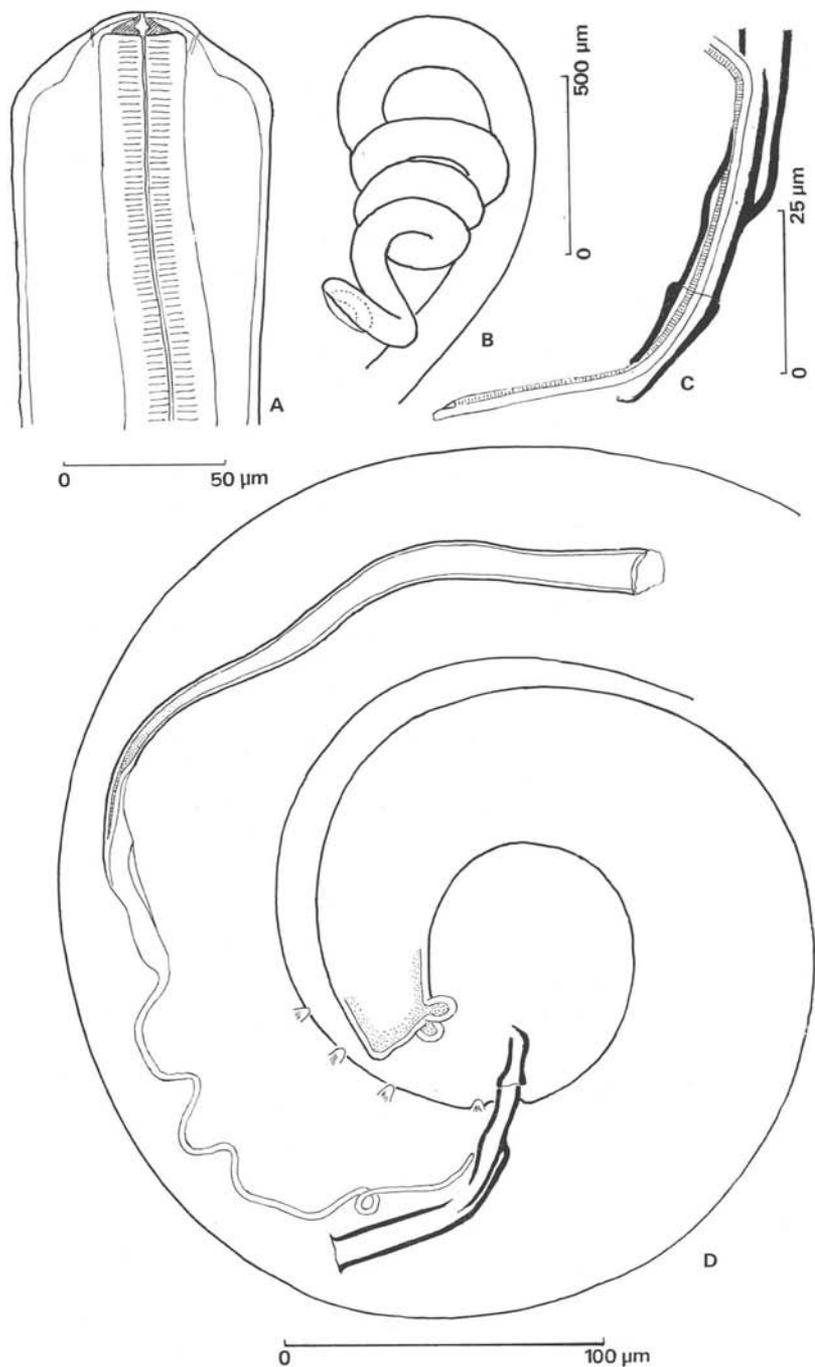


FIG. 2. — *D. finlayi*. Male. A. Head, dorsoventral view. B. Terminal coils of the posterior extremity. C. Distal part of the spicules. F. Posterior extremity, lateral view. (A: scale 0-50 μm . B: scale 0-500 μm . C: scale 0-25 μm . D: scale 0-100 μm)

cit., p. 268), its existence was in doubt. Secondly, the important cephalic papillae are now better known.

Table I.
MEASUREMENTS IN MM OF *D. finlayi* FROM *Lagidium peruanum* (A, B & C), AND FROM THE ORIGINAL DESCRIPTION BY MAZZA & FIORA

Females	A	B	C	Average	Mazza & Fiora
L	66.5	67	93	75.5	53
Br	0.95	0.41	0.4	0.42	0.11
Oes	—	—	0.76	0.76	—
*V	0.79	0.8	0.75	0.78	0.85
T	0.61	0.34	0.6	0.51	—
Males	A	B	C	Average	Mazza & Fiora
L	38.6	30.2	39	35.9	37
Br	0.26	0.3	0.2	0.25	—
Oes	0.86	—	—	0.86	—
L. spic. ..	0.52	0.53	0.47	0.51	0.55
R. Spic. ..	0.09	0.105	0.1	0.098	0.125
T	0.3	0.34	0.31	0.32	0.25
Microfilaria (in blood): 62 μ m.					88-95 μ m
Microfilaria (in vagina): 71,75 μ m.					
* Distance from anterior end.					

In Table I, the principal dimensions of the specimens from *L. peruanum* can be compared with those of the original description of *D. finlayi*. A discordance between the two is immediately apparent in the length of the female, which in the originals is given as 53 mm and is considerably less than the average length, 75.5 mm, of the new ones. However, the illustration of the entire female worm (Fig. 5 of Mazza and Fiora) shows this worm to be 60 mm long according to the scale, and this, if correct, makes the difference more acceptable. But the body width of the originals, given as 0.11 mm in the text, is so different from the average width of the 3 new females (0.42 mm) as to demand an explanation. Fortunately there is one at hand, viz. that the dimension 0.11 mm probably refers to the width of the body at the anterior end and is not necessarily the maximum width. This is evident from the scale alongside Fig. 2 of M. and F. illustrating the anterior end of a female worm, which makes it 0.1 mm in width. (Incidentally, Fig. 1 of M. and F. of the same part of the worm is 0.12 mm in width according to the scale. In the legend it is a male but the figure bears the female symbol).

More serious differences exist in the dimensions and structure of the microfilariae of the 2 forms under comparison. Mazza and Fiora give the size as 88-95 μm long and 6-7.5 μm wide. The new specimens are 60-70 μm long and 8 μm wide from blood and 2 specimens dissected out from the vagina are 71 and 75 μm . There is a clear cephalic space in the new specimens; it seems to be missing or much reduced in the original pictures. Whether these differences between the microfilariae of the 2 forms are significant or not must remain in abeyance until such time as comparable blood films can be obtained and prepared by the same techniques from the 2 different hosts.

It is of interest to examine the relationships of this rather unusual worm. The genus *Dipetalonema* as defined by Chabaud accommodates it readily but no near relatives are apparent in that group. However it has much in common with *Litomosa filaria*, a parasite of bats, and were it not for the difference in hosts it would seem reasonable to place *D. finlayi* in the genus *Litomosa*. (The latter is recognised by Chabaud and ranked close to *Dipetalonema*). There is a strong resemblance between the buccal capsule of *L. filaria* as illustrated by Anderson (1968) in his excellent study of cephalic structures in the Filarioidea and the present specimens of *D. finlayi*. Moreover the unusually small number of cephalic papillae, 3 with one missing plus a pair of amphids in the latter species approaches that of 6 in *L. filaria*, 2 of which may in reality be small amphids. Other characters in common are the unstriated cuticle, the undivided oesophagus, the very long vagina, the position of the vulva, the structure of the spicules and the absence of an accessory piece. On the other hand *L. filaria* does not possess a circumoral cephalic shield nor prominent cuticular bosses on the male tail.

It is of interest too to note the similarity in the number and arrangement of the cephalic papillae and amphids in *D. finlayi* with those of Anderson's (1968) « end point » (Fig. 81 f) in his representation of the possible evolution of these structures in the Filarioidea, and to speculate on its significance.

Finally, *D. finlayi* is of interest not only on account of its highly evolved characters (*sensu* Chabaud, 1952) but because having advanced a long way in evolution it appears to be showing sign of degeneration, as suggested by the atrophy of the rectum and anus in the female, the absence of an excretory pore and the reduced number of cephalic papillae.

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