

## ONCHOCERCA RAMACHANDRINI N. SP. FROM THE WARTHOG IN CAMEROON<sup>1</sup>

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### SUMMARY

*O. ramachandrini* n. sp., a parasite of the subcutaneous tissues of the feet of *Phacochoerus aethiopicus* in Cameroon, is described. The female has 3 to 5 giant coelomocytes which form swellings in the anterior part of the body. Together with *O. dewittei* Bain, Ramachandran, Petter et Mak, 1977, this species constitutes a small

group of parasites of the Suidae, which are morphologically well characterized, and of which the African species seems to be the most primitive one (conservation of a female cuticle without transverse ridges).

### RÉSUMÉ: *Onchocerca ramachandrini* n. sp., chez le phacochère au Cameroun.

Description de *O. ramachandrini* n. sp., parasite du tissu sous-cutané des pattes de *Phacochoerus aethiopicus* au Cameroun. La femelle a 3 à 5 coelomocytes géants qui font des renflements dans la région antérieure du corps. Cette espèce et *O. dewittei* Bain,

Ramachandran, Petter et Mak, 1977, en Malaisie, forment un petit groupe parasite de suidés, bien caractérisé morphologiquement, où l'espèce africaine apparaît la plus primitive (persistance d'une cuticule sans côtes transversales chez la femelle).

Adult worms of a new *Onchocerca* species were found in warthogs, during a survey of game animals in February 1992 in a hunting lodge on the river Vina du Nord (« Campement de Vogzum »), 160 km to the North-East of Ngaoundéré, North-Cameroon.

The rate of parasitism was high: three warthogs infected out of 6 examined. The filariae were found in the subcutaneous tissues of the front and hind feet, in the metacarpal and metatarsal regions and once in the radial region. The worms were loosely looped on the inside of the skin. Small nodules containing more or less degenerated fragments of these worms were also seen.

Microfilariae similar to those found in the uteri of the female worms were found in the skin of the warthogs (neck,

back, feet). They coexisted with another species of dermal microfilariae, which was more abundant but of which the adults are presently unknown.

### MATERIAL

Adult worms (collection number 48 SE): — the female holotype. It was extracted from alcohol-preserved skin after short digestion with pepsin. It was obtained in two pieces, but seems complete. — The male allotype. — Female paratypes. These are five anterior fragments with microfilariae (three long fragments with head, two short ones without head) and two posterior fragments. — One male paratype.

Dermal microfilariae, mounted in glycerin: one slide (collection number 46 SE). Dermal microfilariae of the unknown species are also present on this slide.

All the specimens are deposited in the collection of the MNHN, Paris.

### DESCRIPTION

The body is slightly curled in both sexes. Head: external labial papillae arranged in a rectangle stretched in the

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median plane. Cephalic papillae arranged in a rectangle slightly stretched in the lateral plane. Oesophagus not divided.

Female: 3 to 5 swellings on the first 2 to 3 cms of the anterior body. Every swelling is caused by one big ventral coelomocyte (Fig. 1 B, L, M). The cuticle has transverse well defined striae in the first 5 to 6 mms of the anterior region, which are poorly marked more posteriorly; no transverse ridges, but discontinuous longitudinal crests (Fig. 1 H, I, K). The uteri are straight and parallel to each other (Fig. 1 M).

Male: anterior region without body-swellings. Transverse striae of the cuticle are present but inconspicuous. The arrangement of the caudal papillae is shown in Fig. 2 H, I, G; the papillae are arranged symmetrically, there are 5 pairs near the cloaca and 6 pairs on the distal half of the tail; the second most distal pair is cuticularized and conical and corresponds to the phasmids, with the phasmidial pore at its base. The last pair is situated on the tip of the tail.

Uterine microfilariae: head slightly attenuated when the hook is seen from above and blunt when hook is seen from the side. Tail curved. Last caudal nucleus elongated or small and round. After fixation, the uterine and the dermal microfilariae may be S shaped.

#### MEASUREMENTS

Female holotype: 128 mm long and 210  $\mu\text{m}$  wide. There are 3 body-swellings which are at 14,100-20,700-30,600  $\mu\text{m}$  from the apex. Nerve ring at 250  $\mu\text{m}$  from the apex. Oesophagus 1,250  $\mu\text{m}$  long. Vulva at 650  $\mu\text{m}$  from the apex. Tail 170  $\mu\text{m}$  long. Female paratypes: body-swellings at 6,300-11,100-16,500-22,500  $\mu\text{m}$  respectively from the apex (measurements on one of the anterior fragments). Cuticle 15-20  $\mu\text{m}$  thick. Nerve ring at 250-270  $\mu\text{m}$  from apex. Oesophagus 1,480-1,510  $\mu\text{m}$  long. Vulva at 550-800  $\mu\text{m}$  from apex; ovejector 6,000  $\mu\text{m}$  long (measured on one specimen). Tail 170-180  $\mu\text{m}$  long.

Male allotype and male paratype: 34-32.3 mm long and 72-65  $\mu\text{m}$  wide. Nerve ring at 175-190  $\mu\text{m}$  from apex. Oesophagus 1,050-1,000  $\mu\text{m}$  long. Left spicule 220-240  $\mu\text{m}$  long with handle 100-120  $\mu\text{m}$  long. Right spicule 78-78  $\mu\text{m}$  long. Tail 105-125  $\mu\text{m}$  long.

Microfilariae from uteri of holotype and paratypes: body 290 à 325  $\mu\text{m}$  long (325, 320, 320, 315, 290, 315, 320, 315, 305, 310, 320  $\mu\text{m}$ ) and 7-7,5  $\mu\text{m}$  wide. Cephalic space 10-12  $\mu\text{m}$  long. Nerve ring at 75  $\mu\text{m}$  from the apex. Last caudal nucleus at 10-15  $\mu\text{m}$  from tip tail. Dermal microfilariae: 305, 287, 318  $\mu\text{m}$  long and 7  $\mu\text{m}$  wide.

#### DISCUSSION

The genus *Onchocerca* comprises the 24 species listed in the most recent dichotomous key (Bain, 1981), and in addi-

tion *O. stilesi* Eberhard, 1979, the description of which has been completed (Bain, 1993), *O. denkei* Bain, Vassiliades et Delbove, 1982 and *O. alcis* Bain et Reh binder, 1985.

Of all species only two have females without cuticular transverse ridges as in our specimens. These are *O. railletii* Bain, Muller, Khamis, Guilhon, Schillborn van Veen, 1976 et *O. bohmi* (Supperer, 1953). Both are parasites of the Equidae, the first in Africa, the second in Europe. These two species are distinct from our material due to several characters: *O. railletii* has a long oesophagus ( $\geq 2$  mm) with a well developed glandular part, the arrangement of its caudal papillae is similar to the primitive spirurid pattern, its spicules are bigger than in our specimens (440-500 et 150-170  $\mu\text{m}$ , for the left and the right spicules respectively) and it has a smaller microfilaria (180-215/4  $\mu\text{m}$ ). *O. bohmi* has a female cuticle without longitudinal crests, the left spicule is bigger (275-300  $\mu\text{m}$ ), and its microfilaria has a long caudal filament.

If one disconsiders the morphology of the female cuticle, the species in *Sus scrofa jubatus* in Malaisia, *O. dewittei* Bain, Ramachandran, Petter et Mak, 1977 is particularly close to the specimens from the warthog: oesophagus shorter than 2 mm and not divided, anterior vulva, arrangement of caudal papillae rather similar to that of the primitive spirurid pattern, papillae of the head arranged in an evolved pattern (the external labial papillae form a rectangle stretched in the median plane). But this species has transverse ridges on the female cuticle and its microfilaria is smaller (228-248  $\mu\text{m}$  vs 290-325  $\mu\text{m}$ ).

Moreover, these three species, like all other *Onchocerca* species, do not have the body-swellings caused by coelomocytes as in our female specimens.

The specimens from the warthog are therefore a new species *Onchocerca ramachandrini* n. sp., which we dedicate to Dr. C. P. Ramachandran, Secretary of the Steering Committee of Filariases, from the World Health Organization.

#### CONCLUSIONS

*O. ramachandrini* n. sp., from the warthog in Cameroon, seems to constitute, together with *O. dewittei* in Malaisia, a small group of parasites of the Suidae, which show some primitive characters (anterior vulva, arrangement of caudal papillae) along with more evolved ones (oesophagus shorter than 2 mm and not divided, arrangement of the papillae of the head). The fact that the African species has conserved a cuticle without transversal ridges, like the « ancestral » species *O. railletii* of the donkey in Africa, is in agreement with the hypothesis that the genus has spread from the Ethiopian region (Bain, 1981).

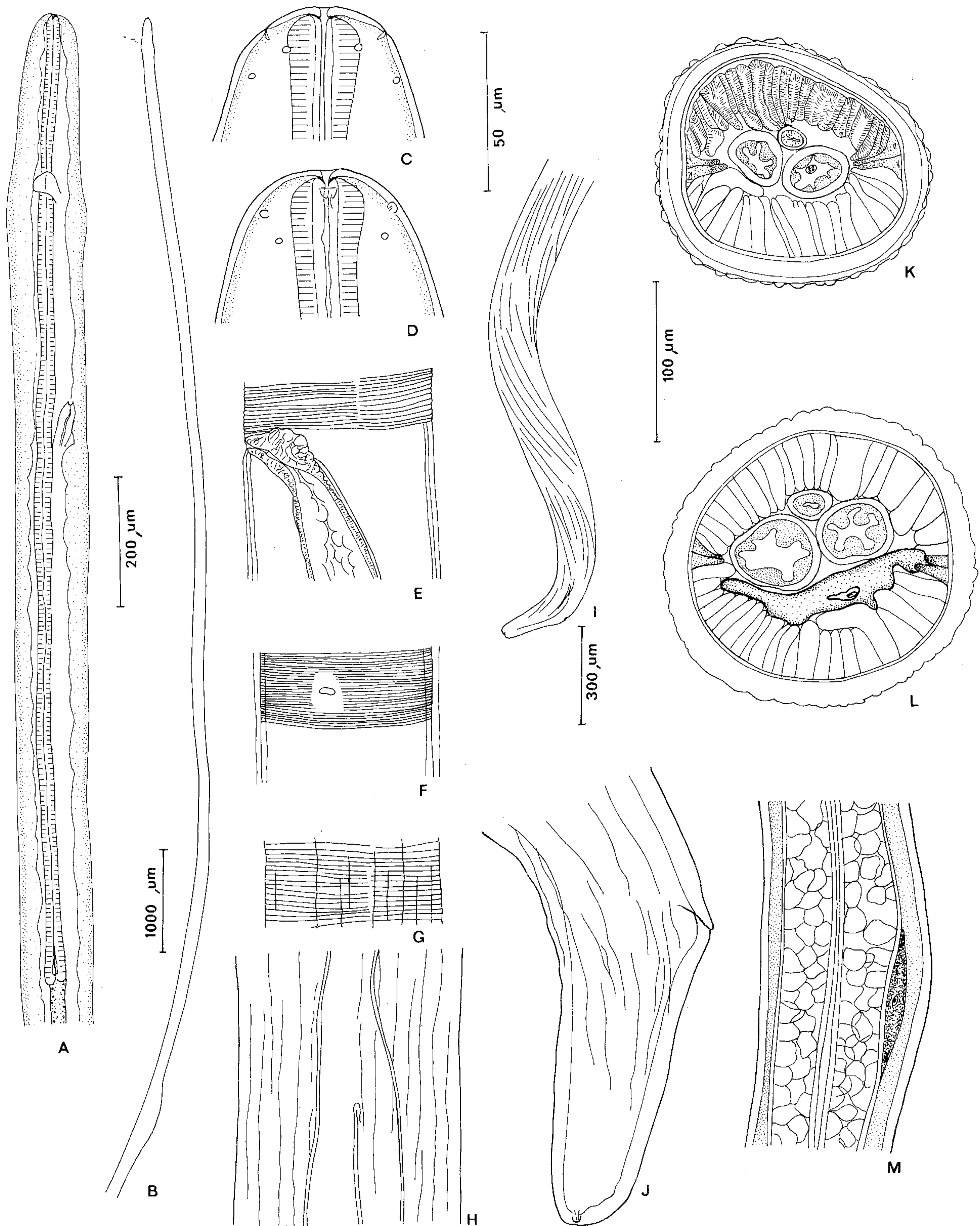


FIG. 1. — *Onchocerca ramachandrini* n. sp., female. A: anterior region, latero-ventral view; B: anterior region including the first body-swelling; C, D: head, median and lateral views, respectively; E, F: cuticle with transversal striae at the level of the vulva, lateral and median views, respectively; G: cuticle with longitudinal crests and transversal striae at 5,250  $\mu\text{m}$  from head, lateral view; H: idem, at the level of the fusion of the uteri; I: posterior region; J: tail, lateral view; K: cross-section of the body, anterior to the first swelling at 6,100  $\mu\text{m}$  from apex; L: idem, in the middle of the first swelling with one giant coelomocyte; M: idem, right lateral view (Scales: A, M, 200  $\mu\text{m}$ ; B, 1,000  $\mu\text{m}$ ; C, D, 50  $\mu\text{m}$ ; E, F, G, H, J, K, L, 100  $\mu\text{m}$ ; I, 300  $\mu\text{m}$ ).

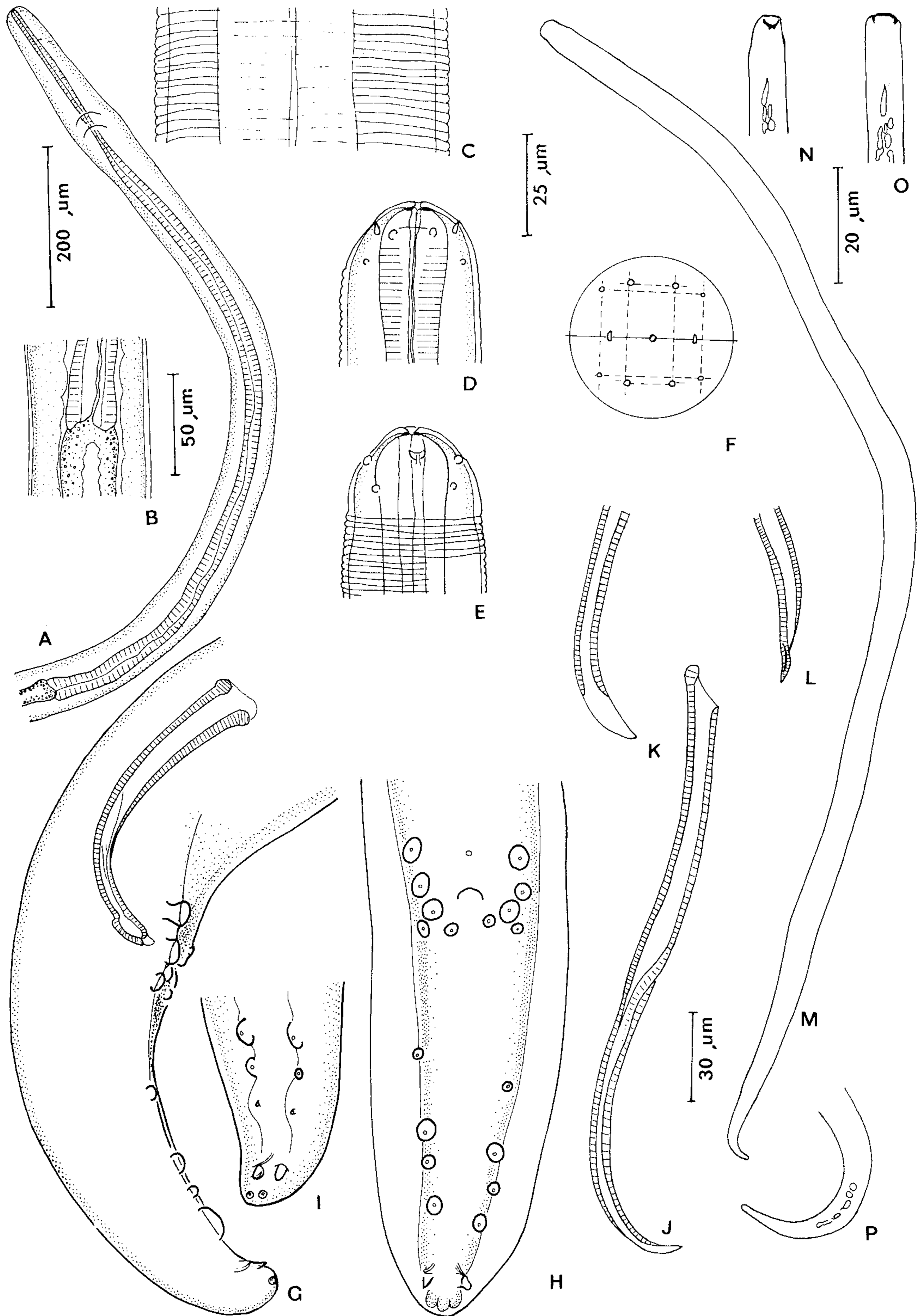


FIG. 2. — *Onchocerca ramachandrini* n.sp., A to L, male allotype. A: anterior region; B: region of the oesophagal-intestinal junction; C: cuticle and lateral chord at mid-body, lateral view; D, E, F: head, in median view, lateral view, and en face view respectively; G: tail, lateral view; H: *idem*, ventral view; I: *idem*, extremity; J: left spicule; K: *idem*, distal extremity, lateral view; L: *idem*, ventral view. M to P, uterine microfilaria. M: general aspect; N, O: anterior extremity, hook seen from above or from the side, respectively; P: caudal extremity (Scales: A, 200  $\mu$ m; B, 50  $\mu$ m; C, D, E, G, H, I, K, L, M, 25  $\mu$ m; N, O, P, 20  $\mu$ m; J, 30  $\mu$ m; F, diagrammatic representation).

The giant coelomocytes and the body-swelling in *O. ramachandrini*, which were so far unknown in the genus, are characters playing a role in the copulation, which have appeared in different phylogenetic lines (Bain et Chabaud, 1988) and are therefore without profound phylogenetic significance.

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