

***Alocostoma propinqua* sp. n. (Nematoda, Strongyloidea)
from *Macropus* spp. (Marsupialia) from Queensland, Australia,
with a redescription of *A. clelandi* (Johnston & Mawson, 1939)**

by Ian BEVERIDGE

Abstract. — *Alocostoma propinqua* sp. n. (Nematoda, Strongyloidea) is described from the stomach of *Macropus giganteus* Shaw, 1790, and *M. robustus* Gould, 1841, from north Queensland, Australia. The new species is distinguished from *A. clelandi* (Johnston and Mawson, 1939) by slightly longer spicules, by the length and shape of the dorsal ray and the greater length of the dorsal lobe of the bursa in the male and by a longer vagina in the female. *A. clelandi* is redescribed from the same hosts and localities, where it occurs in mixed infections with *A. propinqua*. Additional details of cephalic morphology are provided and the relationships of the genus within the tribe Macropostrongylinea Lichtenfels, 1980 discussed.

Résumé. — *Alocostoma propinqua* sp. n. (Nematoda, Strongyloidea), parasite de l'estomac de *Macropus giganteus* Shaw, 1790, et *M. robustus* Gould, 1841, du nord Queensland, Australie, est décrit. La nouvelle espèce se distingue de *A. clelandi* (Johnston et Mawson, 1939) par la longueur des spicules, la longueur et la forme de la côte dorsale, la longueur du lobe dorsal de la bourse caudale du mâle et par la longueur du vagin chez la femelle. *A. clelandi*, trouvé en infestations mixtes avec *A. propinqua*, est redécrit des mêmes hôtes et des mêmes localités. Des données nouvelles sur la morphologie de la tête du genre *Alocostoma* sont comparées avec les structures céphaliques des genres proches.

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The genus *Alocostoma* Mawson, 1979, was created for *Cyclostrongylus clelandi* Johnston and Mawson, 1939, a distinctive parasite of *Macropus giganteus* Shaw, 1790, characterised by a non sclerotised buccal capsule and cylindrical cephalic papillae. MAWSON (1979) considered the new genus close to *Macropostrongylus* Yorke and Maplestone, 1926, and *Macropostrongylus* Mawson, 1978, and it was subsequently included in the tribe Macropostrongylinea Lichtenfels, 1980, by BEVERIDGE (1981). MAWSON (1979) noted considerable variation in her specimens, but having only a limited range of material refrained from erecting any new species. More extensive collections now available confirm MAWSON's (1979) observations, but it is possible to distinguish two separate species, one of which is new and is described herein. A redescription of *A. clelandi* is also given.

Specimens have been deposited in the collections of the South Australian Museum, Adelaide (SAM), the Muséum national d'Histoire Naturelle, Paris (MNHN), and the Australian Helminthological Collection, Adelaide (AHC). Measurements are given in mm as the range followed in parentheses by the mean of five specimens.

***Alocostoma propinqua* sp. n.**

(Fig. 1)

Types : Holotype ♂, allotype ♀, from stomach of *Macropus giganteus* Shaw, 1790, Pallamana Station via Charters Towers, Queensland, 28.III.1983, coll. R. SPEARE, in SAM n^{os} V3560, 3561. Paratypes, same data : 1 ♂, 3 ♀, in AHC n^o 13386 ; 1 ♂, 1 ♀, in MNHN n^o 20 HC.

LOCATION IN HOST : Stomach.

MATERIAL EXAMINED : From *Macropus giganteus* : Queensland : types ; 3 ♂, 1 ♀, Harvest Home Station via Charters Towers, 3.III.1983, coll. R. SPEARE (AHC 13367, 13369). — From *Macropus robustus* : Queensland : 2 ♂, 4 ♀, Pallamana Station via Charters Towers, 28.III.1983, coll. R. SPEARE (AHC 13361 ; MNHN 528HD).

DESCRIPTION

Robust nematodes ; body covered with fine, regularly-spaced striations ; mouth opening rounded to sub-triangular, with apex of triangle ventral ; cephalic collar distinct, separated from body by prominent suture ; collar bears 4 prominent, elongate, but truncate sub-median papillae and 2 amphids ; labial collar internal to cephalic collar, finely striated internally, not subdivided but may be pursed into 8 lobes when mouth partially closed ; internal surface of collar continuous with internal lining of buccal capsule. Buccal capsule cylindrical, longer than wide, walls poorly sclerotised, anterior region narrower due to labial collar ; buccal capsule hexagonal to approximately triangular in transverse section ; lining of anterior part of buccal capsule corrugated, appearing as striae in lateral and median views, broader than striae on internal surface of labial collar ; wall of buccal capsule slightly thickened posteriorly, without distinct annulus, supported externally by 8 prominent muscle bands passing from wall of buccal capsule to somatic musculature, 2 bands dorsal, 2 ventral, 2 left lateral, 2 right lateral. Oesophageal corpus elongate, cylindrical ; anterior extremity of corpus attached by 8 muscle bands to somatic musculature ; lining of anterior extremity of oesophagus with 3 sclerotised lappets ; oesophageal bulb elongate, lining not sclerotised ; anterior extremity of intestine thickened, with enlarged intestinal cells ; nerve ring in anterior oesophageal region ; deirids immediately posterior to buccal capsule ; excretory pore posterior to nerve ring, in mid-oesophageal region.

Male (specimens from *Macropus giganteus*)

Length 7.9-12.3(9.8) ; width 0.40-0.58(0.47) ; buccal capsule 0.030-0.060(0.045) × 0.030-0.050(0.040) ; oesophagus 1.15-1.55(1.36) ; nerve ring to anterior end 0.40-0.55(0.45) ; deirids to anterior end 0.24 ; excretory pore to anterior end 0.48-0.86(0.63) ; spicules 1.84-2.39 (2.10). Dorsal lobe of bursa elongate, much longer than lateral lobes ; ventral lobes joined ventrally ; internal surface of bursa covered with fine striae ; sclerotised bosses absent. Ventral rays apposed, reach margin of bursa ; posterolateral and mediolateral rays apposed, reach margin of bursa ; externolateral ray divergent, shorter, not reaching margin of bursa ; externodorsal ray arises close to lateral trunk, not reaching margin of bursa ; dorsal ray slender, divides at 1/3 length, main branches long, slender, arcuate, reach margin of bursa ; lateral branches very short, arise near distal extremity of main branch, terminate

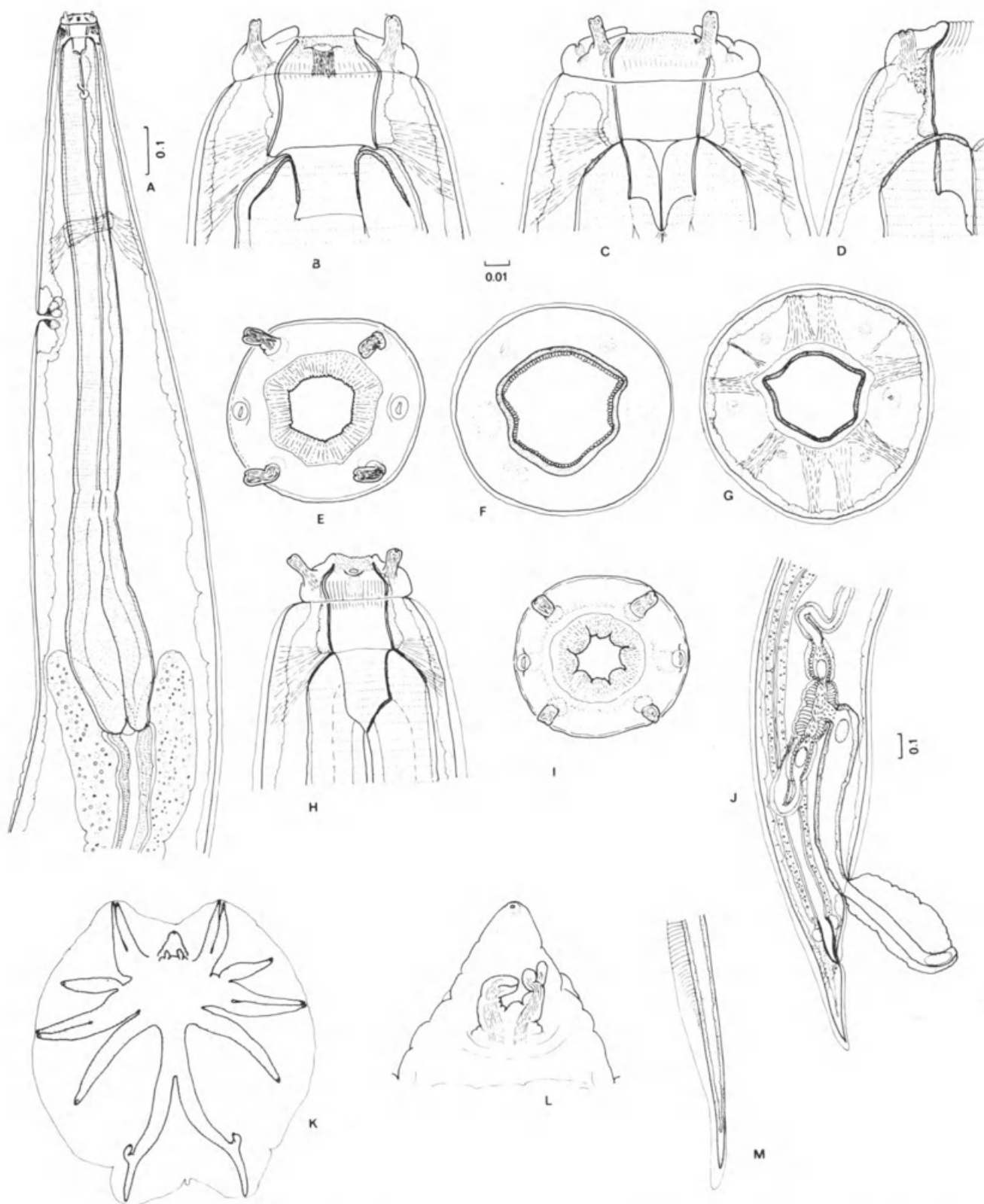


FIG. 1. — *Alocostoma propinqua* n. sp. : A, oesophageal region, lateral view ; B, cephalic extremity, lateral view ; C, cephalic extremity, dorsal view ; D, optical section through buccal capsule and labial collar, lateral view ; E, mouth opening, apical view ; F, optical transverse section through anterior region of buccal capsule ; G, optical transverse section through posterior part of buccal capsule showing musculature ; H, cephalic extremity, lateral view, showing variation in width of collars ; I, mouth opening, apical view, with mouth partially closed, showing labial collar arranged in lobes ; J, female tail, lateral view ; K, bursa, apical view ; L, genital cone, dorsal view ; M, spicule tip, lateral view. (Figs B-I, L, M to same scale ; figs A, K to same scale ; scale lines in mm.)

in small elevations on internal surface of bursa. Anterior lip of genital cone prominent, bearing single terminal papilla ; posterior lip with 2 bilobed appendages. Spicules elongate, alate ; alae striated ; spicule tip blunt ; ala diminishes gradually in width towards tip ; gubernaculum absent ; central cordate and 2 lateral elongate thickenings of spicule sheaths present.

Female (specimens from *Macropus giganteus*)

Length 9.6-14.2(12.0) ; width 0.46-0.63(0.56) ; buccal capsule 0.040-0.050(0.046) \times 0.040-0.060(0.049) ; oesophagus 1.51-1.68(1.58) ; nerve ring to anterior end 0.45-0.54(0.49) ; deirids to anterior end 0.09, 0.14 ; excretory pore to anterior end 0.62-0.73(0.69) ; tail 0.35-0.39(0.37) ; vulva to posterior end 0.53-0.73(0.60) ; vagina vera 0.85-1.06(0.98) ; egg 0.09-0.10(0.09) \times 0.04-0.06(0.05). Tail short, conical ; vulva immediately anterior to anus ; vagina vera short, straight, with small, anterior blind pocket ; vestibule longitudinally disposed ; egg ellipsoidal ; vulva with cylindrical aggregation of cementum through which eggs pass to exterior.

Alocostoma clelandi (Johnston & Mawson, 1939)

(Fig. 2)

Types : Holotype σ , allotype \varnothing , from stomach of *Macropus giganteus* Shaw, 1790, Coonamble, New South Wales, coll. A. S. LE SOUEF, in SAM n° V1696.

MATERIAL EXAMINED : From *Macropus giganteus* : Queensland : 3 σ , 7 \varnothing , Harvest Home Station via Charters Towers, 3.III.1983, 29.III.1983, coll. R. SPEARE (AHC 13368, 13370, 13371) ; 1 \varnothing , Pallamana Station via Charters Towers, 28.III.1983, coll. R. SPEARE (AHC 13729). — From *Macropus robustus* : Queensland : 5 σ , 7 \varnothing , Pallamana Station via Charters Towers, 28.III.1983, coll. R. SPEARE (AHC 13362, 13363, MNHN 526HD).

DESCRIPTION

Robust nematodes ; body covered with fine, regularly-spaced transverse striations ; mouth opening rounded to sub-triangular, with apex of triangle ventral ; cephalic collar distinct, separated from body by prominent suture ; collar bears 4 prominent, elongate but truncate submedian papillae and 2 amphids ; labial collar internal to cephalic collar, finely striated internally, not subdivided ; internal surface of collar continuous with lining of buccal capsule. Buccal capsule cylindrical, longer than wide, walls poorly sclerotised, anterior region narrower, lining directed medially as part of labial collar ; buccal capsule approximately triangular in transverse section ; lining of anterior part of buccal capsule corrugated, appearing as striae in lateral and median views, broader than striae on internal surface of labial collar ; wall of buccal capsule thickened posteriorly, supported externally by 8 muscle bands passing from wall of buccal capsule to somatic musculature, 2 bands dorsal, 2 ventral, 2 left lateral, 2 right lateral. Oesophageal corpus elongate, cylindrical ; anterior extremity of corpus attached by 8 muscle bands to somatic musculature ; lining of anterior extremity of oesophagus with 3 sclerotised lappets ; oesophageal bulb elongate, lining not sclerotised ; anterior extremity of intestine thickened with enlarged intestinal cells ; nerve

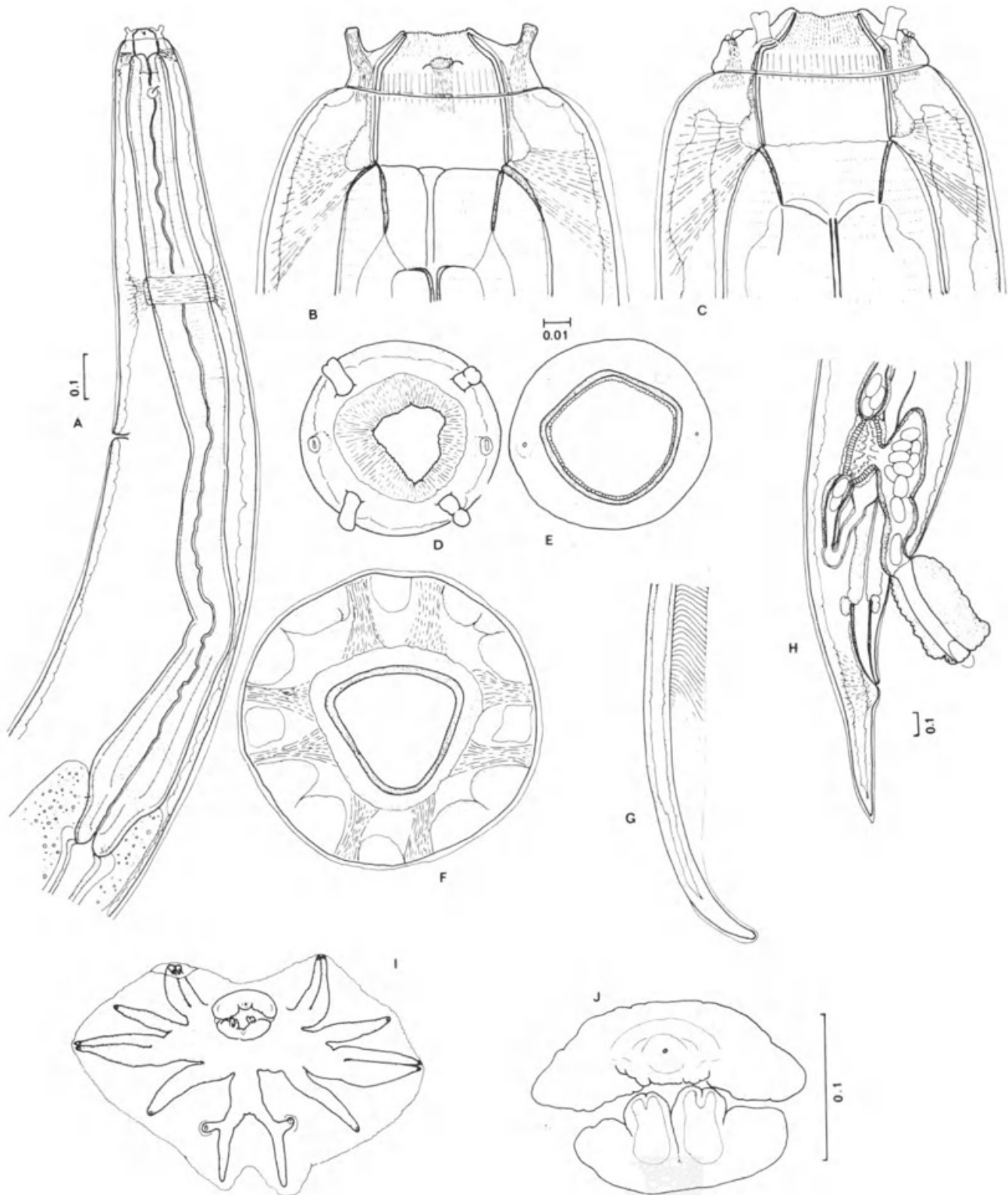


FIG. 2. — *Alocostoma clelandi* (Johnston & Mawson, 1939) : A, oesophageal region, lateral view ; B, cephalic end, lateral view ; C, cephalic end, dorsal view ; D, mouth opening, apical view ; E, transverse optical section of anterior end of buccal capsule ; F, optical transverse section of buccal capsule at level of muscle bands ; G, spicule tip, lateral view ; H, female tail, lateral view ; I, bursa, apical view ; J, genital cone, apical view. (Figs B-G to same scale ; figs A, I to same scale ; scale lines in mm.)

ring in anterior oesophageal region ; deirids immediately posterior to buccal capsule ; excretory pore posterior to nerve ring, in mid-oesophageal region.

Male (specimens from *Macropus robustus*)

Length 7.8-14.5(11.6) ; width 0.47-0.62(0.55) ; buccal capsule 0.040-0.075 (0.060) \times 0.050-0.065(0.060) ; oesophagus 1.90-2.37(2.15) ; nerve ring to anterior end 0.51-0.72(0.62) ; deirids to anterior end 0.12-0.17(0.14) ; excretory pore to anterior end 0.91-1.08(0.99) ; spicules 1.67-1.90(1.79). Dorsal lobe of bursa short, slightly shorter than lateral lobes ; ventral lobes joined ventrally ; internal surface of bursa covered with fine striae ; sclerotised bosses absent. Ventral rays apposed, reach margin of bursa ; posterolateral and mediolateral rays apposed, reach margin of bursa ; externolateral ray divergent, shorter, not reaching margin of bursa ; externodorsal ray arises close to lateral trunk, not reaching margin of bursa ; dorsal ray stout at origin, short, divides at midlength, main branches slender, arched, do not reach margin of bursa ; lateral branches very short, arise soon after main bifurcation, terminate in small conical projections on internal surface of bursa. Anterior lip of genital cone prominent, elongate, with single terminal papilla ; posterior lip with 2 bifid projections. Spicules elongate, alate ; alae striated ; spicule tip simple, slightly recurved ; ala diminishes gradually in width towards tip ; gubernaculum absent ; central cordate and 2 lateral elongate thickenings of spicule sheaths present.

Female (specimens from *Macropus robustus*)

Length 8.8-19.0(15.5) ; width 0.42-0.78(0.65) ; buccal capsule 0.055-0.080 (0.070) \times 0.030-0.080(0.060) ; oesophagus 1.20-2.70(2.29) ; nerve ring to anterior end 0.43-0.76(0.63) ; deirids to anterior end 0.09, 0.10 ; excretory pore to anterior end 0.54-1.23(1.03) ; tail 0.30-0.62(0.48) ; vulva to posterior end 0.50-1.12(0.93) ; vagina vera 0.55-0.68(0.62) ; egg 0.09-0.12(0.11) \times 0.05-0.06(0.06). Tail short, conical ; vulva immediately anterior to anus ; vagina vera short, straight, with anterior blind pocket ; vestibule longitudinally disposed ; egg ellipsoidal. Vulva with cylindrical aggregation of cementum through which eggs pass to exterior.

DISCUSSION

A. propinqua sp. n. is most readily distinguished from *A. clelandi* by characters of the male tail. The dorsal lobe of the bursa of *A. propinqua* is much longer than that of *A. clelandi* and the dorsal ray is consequently much longer and more slender, with the lateral branches arising close to the distal extremity, well after the main bifurcation. The spicules of *A. propinqua* (1.84-2.39 mm) are slightly longer than those of *A. clelandi* (1.67-1.90 mm), though the ranges overlap. However, in MAWSON's (1979) descriptions, specimens now referable to *propinqua* from *M. robustus* in Western Australia had spicules (1.7-1.9 mm) identical in length to specimens described in the same paper which clearly belong to *clelandi*. Because of this, spicule length may not be a reliable character for separating the two species. The females of the two species are very similar, but in the material examined, could be separated by the length of the vagina vera which was 0.85-1.06 mm

long in *A. propinqua* and 0.55-0.68 mm long in *A. clelandi*, corresponding with the differences in spicule lengths. A wider range of material needs to be examined to establish whether this difference is a reliable one or not.

No reliable differences were found in the morphology of the cephalic region between the species, but both species show a remarkable degree of variation in the morphology of the cephalic collars. MAWSON (1979) described the mouth opening of *A. clelandi* in detail, showing the variation that occurs with the mouth in various states of closure, and the variation in the morphology of the labial collar. Comparable variation occurs in *A. propinqua* and is illustrated in figure 1. In addition to the variation described by MAWSON (1979), partial closure of the mouth opening of *A. propinqua* can produce eight lobelike protrusions of the cephalic collar (fig. 1, I), resembling those seen in species of *Macropostrongylus* Yorke & Maplestone, 1926.

MAWSON (1979) had a limited range of specimens available for her description, taken from hosts collected in widely different parts of the continent. Although she accurately described differences in the male bursa, the possibility that they were due to geographic variation within the species could not be discounted. The new collections described above come from sympatric populations of *M. giganteus* and *M. robustus* from north Queensland, with the two distinct forms described by MAWSON (1979) present, sometimes in mixed infections. Because of this and because the males at least can be separated by characters of the bursa, they are described here as distinct species. Of the material seen by MAWSON (1979), all from *M. giganteus* is clearly referable to *A. clelandi* and conforms closely with the original description, also from *M. giganteus*, given by JOHNSTON and MAWSON (1939). Specimens from *M. robustus* collected at Rivertree, New South Wales (AHC 6781, 6782) were re-examined, and also belong to *A. clelandi*. Specimens from *M. robustus* from the Kimberley region of Western Australia (AHC 6775) are now considered to belong to *A. propinqua*.

In both species of *Alocostoma*, a cylindrical mass of cementum was attached to the vulva, with the eggs passing to the exterior via a central canal, as noted earlier by MAWSON (1979).

The description of the two species of *Alocostoma* allows some re-assessment of the position of the genus within the Macropostrongylinea. The non sclerotised buccal capsule supported externally by muscle bands indicates a clear affinity with *Macropostrongylus*, *Monilonema* Beveridge and Johnson, 1981, *Foliosoma* Beveridge and Johnson, 1981, and *Trigonostonema* Beveridge, 1981. In addition the subtriangular form of the buccal capsule in transverse section associates *Alocostoma* with this same group of genera. *Alocostoma* differs from all of these genera in its truncate submedian papillae, and in addition differs from *Monilonema* in the absence of a labial crown, from *Trigonostonema* in lacking a tiny external leaf crown, from *Foliosoma* in lacking a similar leaf crown, and from *Macropostrongylus* in lacking the eight lobes of the anterior part of the buccal capsule wall.

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