OCCURRENCE AND IDENTIFICATION OF *UNCINARIA* (FROHLISH, 1789) (NEMATODA : ANCYLOSTOMIDAE) PARASITES IN STRAY CATS (*FELIS CATUS*) FROM RIO DE JANEIRO - BRAZIL.

C.M.A. UCHÔA[1], C.M.S. PEIXOTO[2], D.G. MATTOS JUNIOR[2] & A.V. BARCELOS[3]

(1) UFF - Instituto Biomédico - Departamento de Microbiologia e Parasitologia, Rua Professor Hernani de Mello 101, São Domingos, Niterói. Rio de Janeiro, RJ, Brasil. Cep 24210-130; (2) UFF - Faculdade de Veterinária - Departamento de Patologia e Clínica; (3) Secretaria Municipal de Saúde do Rio de Janeiro - Instituto Municipal de Medicina Veterinária Jorge Vaitsman - Setor de Internação.

SUMMARY: At the examination of 30 fecal samples from Rio de Janeiro stray cats, were found two positive animals for eggs of Genus *Uncinaria*, in mixed infections with *Ancylostoma braziliensis*, *Toxocara* sp, *Cystoisospora felis* e *Cystoisospora rivolta*. Both cats were necropsied and adults of *Uncinaria* sp. were found. Such finding is important since *Uncinaria* eggs are easily confounded with the ones of other ancylostomides, and has a higher prevalence in temperate and arctic areas. The first occurrence of *Uncinaria* in cats from Rio de Janeiro, Brazil, is reported.

KEY WORDS: *Uncinaria*, ancylostomides, cats, helminths, intestinal parasitism.

INTRODUCTION

Parasites of the Ancylostomidae (Nematoda : Ancylostomatoidea) family are nowadays of major importance in human and veterinary medicine. Both animals and man are parasitized by species with a certain degree of specificity and which can cause from asymptomatic cases until severe anemia, depending upon several factors as parasite species, host nutritional status and challenge levels (MILLER, 1971; URQUHART *et alii*, 1990).

Larval stages of animal species can parasitize man, causing cutaneous larva migrans (REY, 1991). In some cases the parasite can reach the adult stage and determine eosinophilic enteritis (CROESE *et alii*, 1994, SCHAD, 1994).

Routine diagnosis for ancylostomides is done by the search of eggs on feces. Sometimes it is difficult to identify which is the species involved, a fecal culture procedure being then necessary for the identification through larval stages (REY, 1991).

In such cases, the clinical examination can help the identification of the species involved. For example, *Ancylostoma caninum* infections are usually more serious than *Ancylostoma braziliensis* in dogs. Geographical occurrence can also be useful, but the increase in migrations have changed the usual distributions, as seen in human ancylostomiasis (REY, 1991).

Despite these difficulties, some ancylostomides can be easily identified through a careful examination of slides. The *Uncinaria* genus is a good example. Their eggs are bulkier and slightly larger than *Ancylostoma* ones, being then recognizable (SOULSBY, 1963).

Parasites of *Uncinaria* genus are usually found in temperate and arctic areas (WALKER & JACOBS, 1981), on several species of domestic carnivorous as dogs (ROBINSON *et alii*, 1989) and cats (URQUHART *et alii*, 1990) as well as wild carnivorous as arctic fox (RAUSII *et alii*, 1990), red fox (PETAVY *et alii*, 1990) and wolves (GUBERTI *et alii*, 1993). Their prevalence changes according to host species and geographical area. For MILLER (1971), *Uncinaria stenocephala* is a non-haematophagous ancylostomide, and there are no records of anemia in infected cubs, although fecal blood losses occurs 21 days after infection, what leads to a decrease in plasma protein levels.

The objective of this work is to record the occurrence in cats of concomitant infections by ancylostomides with the participation of *Uncinaria* genus, which eggs are normally morphologically confounded with eggs of other ancylostomides

MATERIALS AND METHODS

Thirty fecal samples of cats kept at the "Instituto Municipal de Medicina Veterinária Jorge Vaitsmam (IMMVJV)", Rio de Janeiro, Brazil, were studied. The animals were of both sexes and were captured in the streets.

The samples were collected either individually or in pools of at most 4 cats, according to the distribution of the animals in cages, and were then processed by simultaneous floating and centrifugation in saturated sugar solution (FIGUEIREDO, 1982).

The examinations were repeated, and where eggs morphologically compatible with *Uncinaria* genus were found, the animals were necropsied and the total contents of both small and large intestines were kept apart. Adult helminths were separated in saline and fixed with an alcohol - formol - acetic acid (AFA) solution, being further cleared with lactofenol for morphological analysis based upon the methods developed by GIBBS (1961) and NEVEU-LEMAIRE (1936). The structures of adult nematodes of both sexes were measured with the help of a calibrated micrometric ocular. Some individuals were photographed.

RESULTS

Among the 30 experimental animals, only 2 (6.66%) were parasitized by *Uncinaria* genus associated with *A. braziliensis*, *Toxocara* sp, *Cystoisospora felis* and *Cystoisospora rivolta*. These animals presented nor clinical neither gastrointestinal symptoms. At microscopic examination *Uncinaria* eggs were larger (46,8 mm until 57,2 mm wide- mean of 51,7 mm (S = 1,82), and a length from 80,6 mm until 101,4 mm - mean of 91,9 mm (S= 4,97)) than *Ancylostoma* eggs (mean of 39 mm wide and a mean length of 59,8 mm). Morphological differences in the embryonic masses and in egg shells were also observed between genera. *Uncinaria* eggs were elliptical, pale, with a easy-to-see double thin shell, and blastomers in the embryonic mass (Figures 1 and 2).

At necropsy no macroscopic findings at intestinal mucosa were recorded in both animals. From small intestines 20 whitish ancylostomide were recovered, being 13 *Ancylostoma braziliensis* (11 females e 2 males) and 7 *Uncinaria* sp.(2 females e 5 males).

Adult identification was based on presence of characteristic structures from the cuticle of each specie, located at the bucal capsule in the nematode anterior ending, as for example structures like a teeth pair in *Ancylostoma braziliensis* (Figure 3) or cutting plates and two sub-triangular spear-shaped structures at the bottom of the cavity in *Uncinaria* (figure 4). Size measuring of *Uncinaria* adults was also took in account (Table 1). Males of this genus have a copulatory bursa well developed, identical spicula (mean length of 805,7 mm) and gubernaculum with a mean length of 24,8 mm (Table 1).

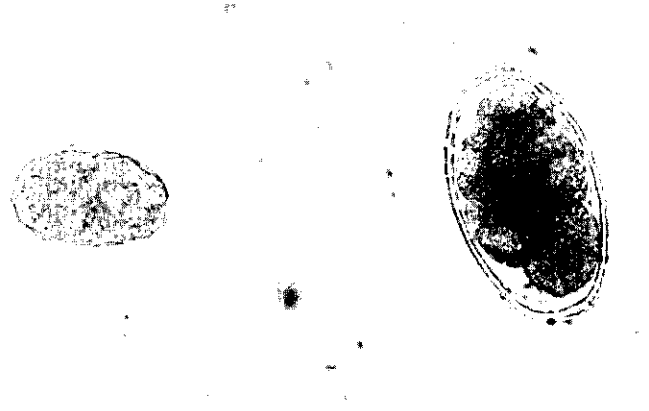

Fig. 1 - Egg of *Uncinaria* sp (A) found in feces of cats from Rio de Janeiro, showing clearly a double shell and a larger size than the eggs of *Ancylostoma* sp (B). Magnify 400 X.

Fig. 2 - Egg of *Uncinaria* sp with an oval shape, double shell and embryonic mass already with blastomers. Magnify 400 X.

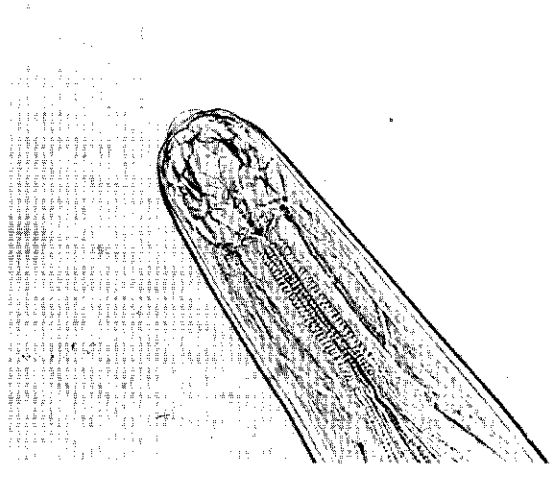

Fig. 3 - *Ancylostoma braziliensis* adults, showing in their anterior ending with bucal capsule, where a pair of teeth like structures can be see. Magnify 100 X.

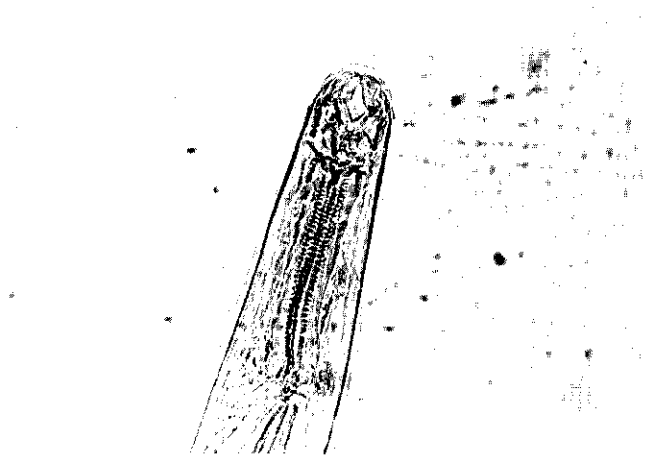

Fig. 4 - *Uncinaria* sp adults, showing in their anterior ending with bucal capsule, where a pair of cutting plates and sub-triangular spear-shapped structures can be see. Magnify 100 X.

Table 1 - Measurements of 7 *Uncinaria* sp adults, recovered from intestinal contents of Rio de Janeiro two stray cats.

	nº of	length (mm)			width (mm)		
sex	specimens	values	mean	std-dev	values	mean	std-dev
male	5	6,08-8,02	6,77	0,82	148,2-166,4	156,5	7,21
female	2	7,01-9,63	8,32	1,85	195,0-205,4	200,2	7,35

DISCUSSION

Although the great majority of reports dealing with *Uncinaria* sp. infections were made at temperate or arctic areas (WALKER & JACOBS, 1981), some authors described their occurrence in warmer countries, like a human report in Spain (ALONSO-SANZ *et alii*, 1995), a dog report in Greece (HARALABIDIS *et alii*, 1988) and a report about the Crab-eating fox for Brazil (MUNDIM *et alii*, 1991).

OLSEN (1968) describes 12 species in the *Uncinaria* genus. The specimens collected in this work present the characteristics of the *Uncinaria* genus as stated by GIBBS (1961) and NEVEU-LEMAIRE (1936). Nevertheless, great morphological detail would be necessary in order to achieve a species diagnosis. Several authors report the prevalence of *Uncinaria stenocephala* in dogs (HARALABIDIS *et alii*, 1988; MILLER, 1971; ROBINSON *et alii*, 1989; VANPARIJS *et alii*, 1991) and cats (URQUHART *et alii*, 1990). It is likely that the specimens found in this work belong to this species, although the measurings made presented some results in disagreement with GIBBS (1961) and NEVEU-LEMAIRE (1936).

The lack of data in Brazilian literature regarding the occurrence of *Uncinaria* sp. in domestic cats, could be explained by the greater adaptation of this parasite to temperate and arctic climates, but also due to the ignorance of diagnosis technicians and/or lack of experience of these professionals in such identification. The occurrence of concomitant infections by *Uncinaria* e *Ancylostoma* in cats from Rio de Janeiro, comes to emphasize the importance of a well done laboratorial diagnosis. This report is the first to found this nematode in cats from Rio de Janeiro, Brazil.

SUMÁRIO

Num estudo com amostras fecais de 30 gatos errantes, do Rio de Janeiro, foram encontrados 2 (6.66%) animais apresentando ovos de nematóides do gênero *Uncinaria* associados com ovos de *Ancylostoma braziliensis*, *Toxocara* sp e oocistos de *Cystoisospora felis* e *Cystoisospora rivolta*. Os dois gatos foram necropsiados sendo encontrados nematóides adultos pertencentes ao gênero *Uncinaria*. Este encontro torna-se importante, visto que os ovos de *Uncinaria* sp podem ser confundidos com os de outros ancilostomídeos e apresenta maior prevalência em países de clima temperado e ártico. Os autores reportam o primeiro achado da *Uncinaria* em gatos no Rio de Janeiro, Brasil.

PALAVRAS-CHAVE: *Uncinaria*, ancilostomídeos, gatos, helminto, parasitismo intestinal.

REFERENCES

ALONSO-SANZ, .M.; CHAVES, F.; DRONDA, F.; CATALAN, S. & GONZALES-LOPES, A.. 1995 Parasitosis intestinales em la poblacion penitenciaria del area de Madrid (1991-1993).*Enfermedaes Infecciosas y Microbiologia Clinica* 13(2):90-95.

CROESE, J.; LOUKAS, A.; OPDEBEECK, J. & POCIV, P.. 1994. Ocult enteric infection by *Ancylostoma caninum* : A previously unrecognized zoonosis. *Gastroenterology* 106(1):3-12.

FIGUEIREDO, P.C. 1982. Infecções naturais por eimerias em bovinos de raças leiteiras no Estado do Rio de Janeiro. Tese de Mestrado (MSc.). Univer. Fed. Rural do Rio de Janeiro. 83p..

GIBBS, H.C.. 1961 Studies on the life cycle and developmental morphologies of *Dochimoides stenocephala* (Railliet, 1884) (Ancylostomidae:Nematoda). *Canadian Journal of Zoology* 39(3):325-348.

GUBERTI, V.; STANCAMPIANO, L. & FRANCISCI, F.. 1993 Intestinal helmint parasite community in wolves (*Canis lupus*) in Italy. *Parasitologia* 35(1-3):59-65.

HARALABIDIS, S.T.; PAPAZACHARIADOU, M.G.; KOUTINAS, A.F. & RALLIS, T.S.. 1988. A survey on the prevalence of gastrointestinal parasites of dogs in the area of Thessaloniki, Greece. *Journal of Helmintology* 62(1):45-49.

MILLER, T.A.. 1971. Vaccination against the canine hookworm diseases. *Advances in Parasitology* 9:153-183.

MUNDIM, M.J.S.; MACHADO, M.I.; BEVILAQUA, E.; MUNDIM, A.V.; MAYWALD, P.G. & OLIVEIRA, M.G.. 1991. Ocorrência e identificação de ancilostomatídeos em lobo-guará (*Chrysocyon brachyurus* Illiger, 1811) da região do Triângulo Mineiro, Minas Gerais, Brasil. *Brazilian Journal of Veterinary Research and Animal Science*, 28(1):39-43.

NEVEU-LEMAIRE, M.. 1936. Nèmathelminthes. In : *Traité D'Helmintologie Médicale et Vétérinaire*. Vigot fréres, Editeurs. Paris. 955-956.

OLSEN, O.W. 1968. *Uncinaria rauschi* (Strongyloidea: Nematoda), a new species of hookworm from Alaska bears.*Candian Journal of Zoology* 46:1113-1117.

PETAVY, A.F.; DEBLOCK, S. & PROST, C.. 1990. Epidemiologie de l'echinococcose alveolaire en France. I. Helminthes intestinaux du renard commum (*Vulpes vulpes L.*) en Haute-Savoie. *Annual Parasitological Human Compendium* 65(1):22-27.

RAUSCH, R.L.; FAY, F.H. & WILLIAMSON, F.S.. 1990. The ecology of *Echinococcus multilocularis* (Cestoda: Taeniidae) on St. Lawrence Island, Alaska. Ii Helminth populations in the definitive host. *Annual Parasitological Human Compendium*. 65(3):131-140.

REY, L. 1991. Nematelmintos parasitos do homem. In: PARASITOLOGIA : parasitos e doenças parasitárias do homem das Américas e da África. 2a ed., Guanabara Koogan, Rio de Janeiro, Brasil. 510-536.

ROBINSON, R.D.; THOMPSON, D.L. & LINDO, J.F.. 1989. A survey of intestinal helminths of well-cared-for dogs in Jamaica, and their potencial public health significance. *Journal of Helmintology* 63(1):32-38.

SCHAD, G.A.. 1994. Hookworms : Pets to humans. *Annual International Medicine*. 120(5):434-435.

SOULSBY, E.J.L.. 1963. Nematoda. In:*Helminths. Arthropods & Protozoa of domesticated animals*. 6a edition. Baillière, Tindall and Cassel, London,. United Kigdon. 215-219.

URQUHART, G.M.; ARMOUR, J.; DUNCAN, J.L.; DUNN, A.M. & JENNINGS, F.W.. 1990. Helmintologia Veterinária. In: *Parasitologia Veterinária*. Guanabara Koogan, Rio de Janeiro, Brasil. 57-58.

VANPARIJS, O.; HERMANS, L. & VAN-DER-FLAES, L.. 1991. Helminth and protozoan parasites in dogs and cats in Belgium. *Veterinary Parasitology* 38(1):67-73.

WALKER, M.J. & JACOBS, D.E.. 1981. Studies on the epidemiology of *Uncinaria stenocephala* infections in British greyhounds : development and persistence of larvae on herbage. *Research in Veterinary Science*. 31(2):264-265.

(Received 15 September 1997, Accepted 16 February 1998)