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Review

A review of the cat liver fluke *Platynosomum fastosum* Kossack, 1910 (Trematoda: Dicrocoeliidae)

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ABSTRACT

Platynosomum fastosum is a small hepatic trematode found in the biliary ducts and gall bladder of cats and other mammals. It is commonly found in tropical and subtropical regions. Some aspect of the life cycle of this parasite is not fully understood, however terrestrial snails, lizards and isopods are implicated as intermediate/paratenic hosts. The disease caused by *P. fastosum* is platynosomiais (named after the parasite) or 'lizard poisoning' since it is assumed that affected cats acquire the parasite by eating infected lizards. The clinical signs due to infection with *P. fastosum* may range from asymptomatic to progressive disease and at times death due to biliary tract obstruction and hepatic failure. Infection with this parasite should, therefore, be included in the differential diagnosis of cats with signs of hepatic diseases.

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Contents

1. Introduction

Platynosomum fastosum is a hepatic trematode which causes 'lizard poisoning' in cats (Catcott, 1964). This fluke is found in tropical and sub-tropical regions of the world (Bielsa and Greiner, 1985; Ferreira et al., 1999; Rodriguez-Vivas et al., 2004). Previous studies have revealed that *P. fastosum, P. concinnum* and *P. illiciens* infect the liver, gallbladder and bile ducts of cats and may all be synonymous (Maldonado, 1945). *P. fastosum* is also thought to be synonymous to *Platynosomum planicipitus, Dicrocelium concinnum, D. lanceolatum* var *symmetricum* and *Concinnum concinnum* (Braun, 1901; Purvis, 1933; Bowman et al., 2002).

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P. fastosum is a parasite of veterinary importance especially in domestic cats, however the information is scattered. This paper seeks to glean the relevant information from previously published literature on this parasite in an effort to elucidate the potential risk of hepatobiliary disease and possibly death in domestic cats.

2. Prevalence studies of *P. fastosum*

Parasitic infections have been reported in several countries such as Brazil (Mundim et al., 2004; Vieira et al., 2009; Ramos et al., 2013), British Guyana (Bielsa and Greiner, 1985), Caymen Islands (Headley et al., 2012), Colombia (Lenis et al., 2009), Cuba (Greve and Leonard, 1966), Curacao, Bonaire and Aruba (Rep, 1975), Florida, USA (Levine and Beamer, 1957; Eckerlin and Leigh, 1962; Robinson and Ehrenford, 1962; Powell, 1970), Honolulu, Hawaii (Hall, 1936; Swanson, 1939; Dikmans, 1945; Alicata, 1947; Palumbo et al., 1974; Ash, 1962; Chung et al., 1977), Illinois, USA (Greve and Leonard, 1966; Levine and Beamer, 1957), Indonesia (Warren et al., 1998), Malaysia (Purvis, 1931, 1933; Shanta, 1970), Mexico (Cardenas et al., 1990; Papua New Guinea (Talbot, 1969; O'Sullivan et al., 1976), Nigeria (Ikede et al., 1971), Puerto Rico (Bielsa and Greiner, 1985; Rodriguez-Vivas et al., 2004), Siberia, Russia (Gonzalez et al., 2007), St. Kitts (Krecek et al., 2010), Thailand (Jittapalapong et al., 2007), Trinidad and Tobago (Montserin et al., 2013) and Venezuela (Soto et al., 1991). The summary of the prevalence of infection, geographical location and diagnostic methods used are mentioned in Table 1.

3. Location in host

P. fastosum is most commonly found in the gallbladder and biliary ducts of the liver of domestic and wild cats (*Felis catus domestica* and *F. minuta*) (Taylor and Perri, 1977; Headley et al., 2012). Ectopic sites including the small intestine, pancreas and lungs have been reported in a few cases (Purvis, 1931, 1933).

4. Other infected hosts

Other mammals including marmosets (*Callithrix jachhus*) (Sousa et al., 2008) orangutans (*Pongo pygmaeus*) (Warren et al., 1998), opossums (*Didelphis marsupialis virginiana*) (Eckerlin and Leigh, 1962), siberian tigers (*Panthera tigris altaica*) (Gonzalez et al., 2007), civets (*Viverra zibetha*), ferrets (*Grisson vittatus*), white mice (*Mus musculus*) (Eckerlin and Leigh, 1962; Foley, 1994) and monkeys (*Macaca* spp.) (Shanta, 1970) were also found to show hepatic infection.

5. Description of adult parasite and egg

The morphology of *P. fastosum* was studied and described in detail in previous studies (Purvis, 1931; Lapage, 1962; Greve and Leonard, 1966; Ikede et al., 1971). Adult flukes are lanceolate and covered by a thin cuticle (Fig. 1). Their sizes varies from 2.9 to 8 mm long and 0.9 to 2.5 mm wide. These flukes possess a sub-terminal oral sucker and a ventral sucker about one quarter the body length from the anterior end. The parasite is also hermaphroditic with paired longitudinal testes located in a horizontal position on either side of the ventral sucker. The ovary is transversally elongated and situated behind one of the testes. The centrally located uterus is coiled and may contain numerous clear to golden brown eggs. The vitelline glands are very prominent and lie mainly on the lateral portions of the mid body. This is the widest part of the fluke. The intestinal caeca are simple and extend towards the posterior end of the body with the genital pore located just anterior to it (Soulsby, 1982; Vieira et al., 2009; Montserin et al., 2013).

Fig. 1. *P. fastosum*: adult trematode characterised by a thin, cuticle, lanceolate shape, two suckers and both male and female, reproductive organs.

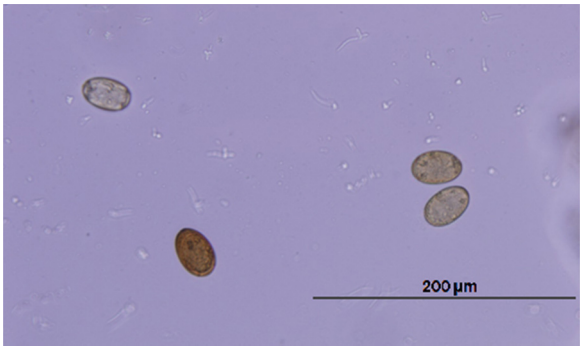

Fig. 2. *P. fastosum*: eggs (golden brown, oval, thick-shelled and embryonated).

Mature eggs are shed in the faeces of the infected definitive host. Eggs are golden brown (unstained) oval, thick-shelled and embryonated (Fig. 2). An operculum is situated on one end and may be difficult to delineate at times. They measure 34.0–50.0 µm × 23–35 µm. Immature eggs are transparent and elliptical and measure 27.2–30.0 µm × 16.3–20.0 µm (Palumbo et al., 1976; Montserin et al., 2013).

6. History and life cycle

The first recorded attempt to describe the life cycle of *P. fastosum* was done by van Volkenberg (1937) and later by Maldonado (1945) (Fig. 3). The terrestrial snail (*Subulina octona*), the lizard (*Anolis cristatellus*) and terrestrial isopods are all believed to be intermediate hosts of *P. fastosum* (van Volkenberg, 1937; Maldonado, 1945; Eckerlin and Leigh, 1962). Other intermediate hosts that have been identified were reptiles (*Anolis equistris, A. sagrei, A. carolinensia, Eumecesin expectadus* and *Hemidactylus frenatus*),

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