Wild Tiger Health Centre Information Sheet

Disease threat: Hepatozoon felis

Hazard description: *Hepatozoon* spp. are apicomplexan protozoa in the family Hepatozoidae. Over 340 species have been detected and are known to infect a wide range of mammals, birds, reptiles and amphibians (Baneth 2011; Taylor et al. 2007). *Hepatozoon* spp. have a blood-feeding arthropod final host, (e.g. ticks, fleas, lice, sandflies, mosquitos, mites, tsetse flies, reduviid bigs and leeches), and a vertebrate intermediate host. Following infection of the vertebrate intermediate host (commonly by oocyst ingestion), asexual reproduction (schizogony) occurs in various host tissues, followed by release of gamonts into the haemolymphatic system (leucocytes in the case of mammals and birds). The life cycle is completed by gamont ingestion by the blood-feeding arthropod final host (Baneth 2011), in which sexual parasite reproduction then takes place. The most well described mode of transmission to a vertebrate intermediate host involves ingestion of oocysts in the arthropod final host (Baneth 2011).

Host species: *H. felis* has been isolated from domestic cats, and there is evidence that *H. canis* can also infect cats. The arthropod host for *H. felis* is unknown. Infection in domestic cats is associated with outdoor access (Baneth et al. 2013).

Hepatozoon species have been detected in samples from captive and free-ranging felids ranging from South America (Gaspari 2010; Metzger et al. 2008) to Iran (Khoshnegah et al. 2012), Southern Africa (McCully et al. 1975; Williams et al. 2014; Averbeck et al. 1990), India (Pawar et al. 2012), Korea (Kubo et al. 2010; Kubo et al. 2006) Japan (Tateno, Nishio, Matsuo, et al. 2013) and the Russian Far East (*pers. comm*. J. Lewis). Full speciation requires molecular techniques. Where molecular techniques have been performed both *H. felis*-like and *H. canis*-like organism have been isolated. Neo-tropical felids from Brazil (Metzger et al. 2008), leopard cats from Korea (Kubo et al. 2010), wild felids, including captive Bengal tigers from India (Pawar et al. 2012), and a free-ranging Amur leopard in the Russian Far East (*pers. comm*. J. Lewis) were all found to be infected with *H. felis*-like *Hepatozoon*. In a study of wild free-ranging carnivores in Zambia, lions were found to be infected with both *H. canis*-like and *H. felis*-like organisms (Williams et al. 2014).

Pathogenesis: Disease, hepatozoonosis (inflammatory lesions in skeletal/myocardial muscle) appears to be more likely in association with immunosuppressive viral infection (e.g. FeLV or FIV). (Taylor et al. 2007; Baneth et al. 2013) or concurrent disease (Khoshnegah et al. 2012). Despite concerns over potential pathogenicity in association with immunosuppression, no reports of confirmed disease in wild felids were found.

Diagnosis: Molecular methods (PCR) on peripheral blood samples, or peripheral blood smear examination (far less sensitive).

Vaccination: None.

Free-ranging tiger occurrence: No reports found.

Distribution: Widespread in many countries (see above), including India and the RFE. Also found by PCR in *Haemaphysalis* and *Ixodes* ticks collected from Amur tigers in RFE (Thomas 2012). Assume it is likely to be present in all tiger range states.

Assumptions: Assessments assume low pathogenicity in immunocompetent felids.

Limitations: Lack of data in free-ranging tigers.