Trematodes

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Unlike other helminths, flukes are exclusively internal parasites and include liver flukes, intestinal flukes, blood flukes, and lung flukes (Ash and Orihel 2007). Their body has two suckers: the oral sucker used for feeding and the ventral sucker (acetabulum) used for attaching to the host. The majority of studies of parasitism in wild primates have focused on detection of gastrointestinal parasites from non-invasively collected fecal samples. As a result, our understanding of the diversity and impact of parasites on wild primates is heavily skewed toward those inhabiting the gastrointestinal tract. Unlike the majority of other helminths, trematode eggs are too heavy to rise in floatation solution and must be recovered via fecal sedimentation. Unfortunately, most previous studies of primate parasites only employed floatation, and, as a result, trematodes are less well understood compared to other primate parasites (Gillespie 2006).

Most previous studies of trematodes in wild primates have focused on potential reservoirs of Schistosoma mansoni, the agent responsible for schistosomiasis in humans. Natural infections of S. mansoni have been reported in olive baboons (Papio anubis) in Kenya, Tanzania, and Ethiopia. Schistosomes have also been found in Hamadryas baboons (Papio hamadryas) in Saudi Arabia and Guinea baboons (Papio papio) in Senegal. Natural infections of S. mansoni have been reported in vervet monkeys (Cercopithecus aethiops) in Tanzania and Ethiopia. Baboons and vervet monkeys are susceptible to schistosomiasis because they often come into contact with water. They also defecate promiscuously in water bodies, thereby maintaining the parasite’s life cycle in areas where suitable intermediate host snails exist.

Although high infection rates of S. mansoni have been reported from baboon groups interacting regularly with humans, it is not yet clear whether primate schistosomiasis can cross over into humans and vice versa (Bakuza 2012). Curiously, S. mansoni has not been observed in wild chimpanzees, despite its presence in sympatric baboons and its presence in captive chimpanzees.

Other trematodes infecting primates include Paragonimus species, which, although they generally affect humans (Ash and Orihel 2007), have been detected in drill (Mandrillus leucophaeus) in Cameroon and crab-eating monkeys in Malaysia. At Gombe, Paragonimus was first reported in baboons as an unidentified trematode, and later confirmed by Bakuza (2012). The confirmation of Paragonimus at Gombe in western Tanzania is of great significance as it indicates the parasite’s wider distribution in wild baboons in areas east of the Congo basin (Bakuza 2012). Other trematode species of lesser importance that infect primates include members of the Strigoida family, which have been reported in guinea baboons in Mount Assirik, Senegal, and Dicrocoelium (family Dicrocoeliidae) in guenon monkeys in Uganda and chimpanzees in Lope Reserve, Gabon.

It is still unclear why fewer trematodes exist in primates compared to other helminths. It is probably a result of the complex life cycles of most trematodes, such as subclass Digenea that undergoes successive developmental stages in up to three intermediate hosts, which in most cases are invertebrates (Ash and Orihel 2007). The hosts may have to be eaten by primates for the parasite life cycle to continue. The primates’ limited range of invertebrate diet may thus contribute to their dearth in trematode parasites.

Our current understanding of the zoonotic potential of S. mansoni and other trematodes in natural systems is limited; thus further work is needed to determine the risk of zoonotic impacts from trematodes on endangered primates and global health. Integration of standardized empirical data collection and DNA amplification-based molecular diagnostics has the potential to rapidly
improve our knowledge of primate trematodes and the factors that influence infection.

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ABSTRACT

Trematodes (class Trematoda), also known as flukes, are flatworms belonging to the phylum Platyhelminthes, characterized by a dorsal-ventrally flattened and unsegmented body. Surprisingly few trematode species are known from primates; however, commonly reported trematodes in wild primates include *Schistosoma mansoni*, *Fasciola hepatica*, *Dicrocoelium* species, and, less commonly, *Metagonimus yokogawai* and *Paragonimus* species. Integration of standardized empirical data collection and DNA amplification-based molecular diagnostics has the potential to rapidly improve our knowledge of primate trematodes and the factors that influence infection.

KEYWORDS

disease; parasites; pathogen