Tittle

Epidemiology and Taxonomy of Diplostomum Species (Trematoda: Diplostomatidae) Infecting Fish of Llyn Tegid, North Wales and the Ruvu Basin, Tanzania.

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Abstract

This study investigated the epidemiology and taxonomy of Diplostomuni species in the deeper parts of the eye (DPE) of roach Rutilus rutilus (L.), perch Perca fluviatilis L., ruffe Gymnocephalus cernua (L.) and gwyniad Coregonus lavaretus (L.) at Llyn Tegid, North Wales, and in the cranium of catfish Clarias gariepinus (Burchell, 1822) and the vitreous humour of Oreochromis species at Mindu dam and river Ruvu, Tanzania. At Llyn Tegid, two species of Diplostomum metacercariae, large and small forms, coexisted in DPE of perch, ruffe and gwyniad but only one, large forms, occurred in roach. Large forms were distinguished by their large size, oval body tapering at both ends and pseudosuckers at the level of the oral sucker. Small forms were distinguished by their smaller size, oval body with parallel sides and pseudosuckers occurring below the level of the oral sucker. The taxonomy of the two forms was not resolved even after obtaining adults from chickens. Tentatively, small forms keyed close to D. gasterostei Williams, 1966 and large forms to D. volvens Nordmann, 1832. Inadequate identification manuals and remarkable similarity between Diplostonlum species confounded identification. Mean intensity of metacercariae was highest in ruffe and lowest in perch and increased with host size in all hosts. Factors responsible for differences in mean intensity between hosts were discussed. There was no seasonality of occurrence. Recruitment occurred from May - November correlating with water temperatures. Immature metacercariae occurred throughout the period of investigation. Metacercariae were overdispersed in all three hosts. At Mindu and Ruvu two species were present, D. sp. X (1,2) in the cranium of catfish and D. sp. Y in the vitreous humour of Oreochromis sp. D. sp. X (1,2) were distinguished by their elongate body, oval calcareous corpuscles and long hindbody. D. sp. Y were distinguished by a vestigial ventral sucker, glandular Brandes organ, short hindbody and spherical calcareous corpuscles. D. sp. X (1,2) were identified as D. mashonense Beverley - Burton, 1963. Adults cultured in chickens confirmed identification. D. sp. X (1,2) developed to ovigerous adults within 24h. Percent recovery of adults from chickens declined with days p. i. Miracidia developed in eggs in six days. D. sp. Y is considered an undescribed taxon. Prevalence and mean intensity of D. sp. Y in Oreochromis sp. were low and did not fluctuate seasonally. Prevalence of D. mashonense in catfish was similar at Mindu and Ruvu and exhibited no seasonal fluctuations. Mean intensity of D. mashonense in catfish of Mindu fluctuated seasonally, increased with host size and was higher than in catfish from Ruvu. Causes of high intensity and seasonal changes at Mindu were discussed. D. mashonense was overdispersed in catfish at both localities but only data from Mindu fitted the negative binomial model. Small samples and the dynamism of forces creating overdispersion were considered responsible for the situation at Ruvu. Using SEM ciliated-pit and dome-shaped papillae were observed on the surface of metacercariae and adults of D. mashonense . Ciliated-pit papillae occurred only on metacercariae. Dome-shaped papillae, in adults and metacercariae, were aggregated on

suckers, excretory and genital atria. Spines were multipointed in adults but single pointed in metacercariae