Concinnocotyla (Monogenea: Polystomatidae), a new genus for the polystome from the Australian lungfish Neoceratodus forsteri

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Accepted for publication 6th June, 1990

Abstract

Pseudopolystoma australensis is redescribed from new material from the Australian lungfish Neoceratodus forsteri (Dipnoi) from a natural population in Queensland, Australia. It is transferred to a new genus, Concinnocotyla, as Concinnocotyla australensis n. comb. in a new subfamily, the Concinnocotylinae. The genus Concinnocotyla differs from all other polystome genera in each of the following characters: haptoral suckers bilaterally symmetrical rather than radially symmetrical, with elaborate skeleton of sclerites rather than no sclerites; hamuli, a single pair between marginal hooklets I and II rather than between II and III; a pocket posteriorly on each caecum that opens dorsally; sperm-filled sac between pockets; testes numerous, discrete, cylindrical; seminal vesicle large, discrete, muscular; penis elongate, muscular, unarm ed, extensile; penis-bulb large, muscular, with intrinsic glands; host, a dipnoan. A detailed description of the adult parasite is presented and its unique features are discussed. The absence of a true oral sucker is noted. Confirmation of a polystome from a natural population of Australian lungfish has interesting evolutionary implications.

Introduction

Polystome monogeneans generally parasitise tetrapods, both aquatic and semi-aquatic forms, namely amphibians and reptiles. The sole polystome known from fish is Pseudopolystoma australensis (Reichenbach-Klinke, 1966) Euzet & Combes, 1967 which was recorded from the gill lamellae, outer opercula and lips of an Australian lungfish from an aquarium at Hellabrunn Zoo, Munich, FRG (Reichenbach-Klinke, 1966). The species has not been recorded again since its discovery.

In 1981, Dr R.J.G. Lester was brought a dead lungfish from Enoggera Creek, Queensland and in 1986, Dr T.H. Cribb caught live lungfish in the Brisbane River, Queensland: all the lungfish were parasitised by a polystome. A study of these parasites and those from our own collections (1987–88) revealed that the specimens varied considerably from the description given by Reichenbach-Klinke (1966). This prompted a detailed study of the species.

Materials and methods

Lungfish were killed, the opercula, gills, and upper and lower jaws were removed, placed separately in vessels containing aged water at room temperature (18–24°C), and examined using a stereomicroscope. Living monogeneans were removed and placed in vessels containing clean, aged water.

Some living parasites were studied slightly compressed beneath a coverslip using bright-field and Nomarski microscopy. Other specimens were preserved in hot 10% buffered neutral formalin or
slightly flattened and fixed in either Schaudinn’s fixative or Bouin’s fluid made up in fresh water. Preserved specimens were stained in Mayer’s carmalum, Mayer’s haematoxylin, Ehrlich’s haematoxylin or Heidenhain’s iron haematoxylin: some specimens were left unstained. Serial sections of some unflattened formalin-fixed specimens were cut at a thickness of 4 or 7 μm and stained with H & E or PAS. All preparations were cleared in either methyl salicylate or toluene, and mounted in Canada balsam.

Some specimens were preserved and processed for scanning electron microscopy (SEM) following the procedure described by Whittington et al. (1989) and examined with a Philips SEM 505 operating at 20 kV.

Measurements, presented as the range with the mean in brackets, are given in micrometres; where measurements are presented in paired sets separated by a multiplication sign, the first figure is length, the second width. The marginal hooklets are numbered in Roman numerals from the posterior end of the haptor following Llewellyn (1963). The haptoral suckers, denoted by Arabic numerals, are also numbered from the posterior end of the haptor. Drawings were made using a camera lucida and added to by hand.

Sources of specimens and locations in which specimens have been deposited are abbreviated as follows: BM(NH), British Museum (Natural History), London, UK; MNHN, Muséum National d’Histoire Naturelle, Paris, France; MPM, Meguro Parasitological Museum, Tokyo, Japan; QM, Queensland Museum, Brisbane, Australia; USNMHC, United States National Museum Helminthological Collection, Beltsville, Maryland, USA; ZPIMU, Zoological-Parasitological Institute of Munich University, Munich, FRG.

Subfamily Concinnocotylinae n. subfam.

Subfamily diagnosis
With characters of the genus
Concinnocotyla n. g. as defined below.
Type- and only genus: Concinnocotyla n. g.

Genus Concinnocotyla n. g.

Generic diagnosis

Type- and only species: Concinnocotyla australensis (Reichenbach-Klinke, 1966) n. comb.

Etymology: Latin concinnus, skilfully joined, beautiful; Latin cotyla, a cup. Named for the striking array of sclerites in the haptoral suckers.