
Aspects of the ecology, life cycle and pathology of *Lamproglena clariae*
(Copepoda:Lernaeidae), collected from the gills of *Clarias gariepinus* from the Vaal
River system, South Africa

by

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THESIS

submitted in fulfillment of the requirements for the degree

PHILOSOPHIAE DOCTOR



in

ZOOLOGY
OF
JOHANNESBURG
in the

FACULTY OF SCIENCES

at the

Rand Afrikaans University

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February 2005

DEDICATION

This thesis is dedicated to my family for the love and support they always gave me, and above all to God for the strength he has given me till this far.



ACKNOWLEDGEMENTS

I am greatly indebted to my promoters Prof. A. Avenant-Oldewage and Prof. S.N.

Mashego for their encouragement and guidance.

I would like to acknowledge the support and assistance provided by the following people:

Dr. Willie Oldewage, Karien Brink, Johannes van Wyk, Riette Eiselen, Richard Greenfield, Edie Lutsch, Mkhacani Mathonsi, Lerato Masetle, Lolo Mokae, Maxwell Barson, Solomon Tshabalala, Zacharia Khambule, Simphiwe Ntombela, Ntswaki Khoza, Moleboheng Motsi, Oriel Thekiso, Billy Phologane, Ronaldo Retief and Quinton Tam.

This study was funded by the National Research Foundation and Rand Afrikaans University.

TABLE OF CONTENTS

CONTENTS	PAGE
TITLE.....	i
DEDICATION.....	ii
ACKNOWLEDGEMENTS.....	iii
TABLE OF CONTENTS.....	iv
ABSTRACT.....	v
OPSOMMING.....	vi
CHAPTER 1: PREAMBLE OF THE STUDY	
1.1 Rationale.....	1
1.2 Description of the study area.....	3
1.3 Objectives of the study	6
1.4 An outline of sription of the document.....	7
CHAPTER 2: LITERATURE REVIEW	
2.1 Classification of <i>Lamproglena clariae</i>	9
2.2 Occurrence of copepods.....	11
2.3 The family Lernaeidae.....	15
2.4 The genus <i>Lamproglena</i> Von Nordmann, 1822.....	23
2.5 Occurrence and distribution of <i>Lamproglena clariae</i>	25
2.6 Description of the attachment site of <i>Lamproglena clariae</i>	27

CHAPTER 3: ASPECTS OF THE ECOLOGY OF <i>Lamproglena clariae</i>	
Introduction.....	29
Material and Methods.....	29
Results.....	31
Discussion and Conclusion.....	38
CHAPTER 4: ASPECTS OF THE LIFE CYCLE OF <i>Lamproglena clariae</i>	
Introduction.....	43
Material and Methods.....	43
Results.....	46
Discussion and Conclusion.....	63
CHAPTER 5: ASPECTS OF THE PATHOLOGY OF <i>Lamproglena clariae</i>	
Introduction.....	69
Material and Methods.....	70
Results.....	71
Discussion.....	77
CHAPTER 6: GENERAL DISCUSSION AND CONCLUSION.....	84
REFERENCES.....	90

ABSTRACT

Female adult specimens of *Lamproglena clariae* attach to gill filaments of freshwater fish of the family Clariidae, penetrate the gill tissue and consume blood. Previously, studies have been done on the taxonomy of this parasite, but little research has been published on biological aspects. Hence, it was the aim of this study to determine and record *L. clariae*'s aspects of biology such as ecology, life cycle and pathology. The study was conducted through both field and laboratory observations with specimens collected from the Vaal Dam and Vaal River Barrage. A positive correlation was observed between the host's physical dimensions and the size of the parasite, parasites from both sites preferred the fourth gill and the median part of the gill arch for attachment. There was no significant host gender preference by parasites. Three free living nauplius stages, four copepodite, a cyclopoid and adult stages were recorded as life stages of this parasite. Observations suggested that development of larval stages of *L. clariae* is influenced by both photoperiod and temperatures. Furthermore low infestation success of the experimental fish was observed. This parasite caused localised infestation as varying degrees of swelling of gill filaments were observed only in the vicinity of its attachment site. Histological examination revealed epithelial hyperplasia, resulting in fusion of gill lamellae and necrosis of the host tissue in the vicinity of the parasite. No correlation exists between the infestation intensity and fish haematocrit values. Although *L. clariae* causes localized infestation, high intensity of infestation may be detrimental to the fish. Hyperplasia of epithelial tissue resulting in fusion of lamellae would result in restriction of oxygen passage and thus hinder the process of respiration of the host.

OPSOMMING

Wyfies van *Lamproglena clariae* heg aan die kieu filament van die visse in die Clariidae familie vas, dring die kieuweefsel binne en verbruik bloed. Vantevore is studies wat oor die taksonomie van die parasiet handel gedoen, maar min navorsing is oor aspekte van die biologie soos die ekologie, lewensiklus en patologie gepubliseer. Hierdie studie is deur veld- en laboratoriumwaarnemings uitgevoer met eksemplare wat uit Vaaldam en Vaalrivierkeerwal versamel is. 'n Positiewe korrelasie is aangeteken tussen die gasheer se fisiese kenmerke en die grootte van die parasiet, parasiete op beide kante het die vierde kieu boog verkies en wel die middelste gedeelte daarvan. Geen noemenswaardige voorkeur van die parasiete ten opsigte van die geslag van die gasheer is aangetoon nie. Drie nauplius-, vier copepodiet-, 'n siklopied- en volwasse stadium is aangeteken in die lewensloop van die parasiet. Waarnemings dui daarop dat die ontwikkeling van die larwes van *Lamproglena clariae* deur fotoperiodisiteit en temperatuur beïnvloed word. Voorts is 'n lae besmettingsukses van eksperimentele visse waargeneem. Die parasiet veroorsaak plaaslike infestasië soos gedemonstreer deur die swelling van kieu filamente slegs in die direkte omgewing van die parasiet. Histologiese ondersoek toon hiperplasia van die epiteel wat die versmelting van kieu lamellae tot gevolg het en nekrose van die gasheerweefsel in die omgewing van die parasiet. Geen korrelasie is gevind tussen die intensiteit van infestasië en die hematokritwaardes van die visse nie. Alhoewel *L. clariae* lokale infestasië veroorsaak mag hoë intensiteite van besmetting nadelig vir die vis wees. Hiperplasia van epiteelweefsel wat die versmelting van die lamellae tot gevolg het, sal lei tot 'n beperking in suurstofopname en dus respirasie in die gasheer verhinder.