

Project No. 100011

Distribution and population genetics of the genus *Tenuibranchiurus*

Kathryn Dawkins
Honours Student
Griffith University

Supervisors: Assoc. Prof. Clyde Wild
Prof. Jane Hughes
Mr. James Furse

Research Brief

Introduction

Tenuibranchiurus (Decapoda: Parastacidae) is a little known crayfish genus found along the eastern coast of Australia. This genus is regarded as the world's second smallest freshwater crayfish genus found worldwide, growing to a maximum total size of 25mm. Individuals within this genus inhabit coastal *Melaleuca quinquenervia* swamps where they are thought to construct deep burrows in the soil. It is an unremarkable looking crayfish, being grey-brown in colour and cryptic in habit; however, crayfish from the genus *Tenuibranchiurus* can easily be distinguished from most other crayfish by the orientation of the chelae, which open vertically instead of horizontally. *Tenuibranchiurus* was first described in two locations, Mt Gravatt and Caloundra, Queensland. Since then, the literature reports this genus as occurring in a total of six locations, all within the northern distribution of this genus. Although the full extent of the geographic distribution is not known, *Tenuibranchiurus* has been found as far north as Maryborough, Queensland, and as far south as Woolli, New South Wales (this study).

There is limited information available on this genus of crayfish, as studies to date have concentrated mainly on taxonomy and phylogenetic relationships with other Australian crayfish genera, rendering the genus poorly understood at a basic level. For example, to date there has been no concentrated effort to determine the actual distribution of this genus, as well almost no information being available on the basic biology and ecology of this genus (eg. reproductive biology, life history, diurnal/seasonal activity etc.).

Because of the coastal distribution of *Tenuibranchiurus*, the genus is threatened with habitat loss, destruction, and fragmentation caused by coastal developments. There is currently one species recognised from this genus, *Tenuibranchiurus glypticus*. However, it is possible that as a result of geographic isolation, sub-populations of *Tenuibranchiurus* have undergone genetic divergence, possibly resulting in distinct species within this genus.

Current status of *Tenuibranchiurus*

Although some of the environmental factors that influence whether *Tenuibranchiurus* individuals are present at a site have been explored, there is still much that remains unknown about this genus. Because of the lack of information available for this genus, incorrect information is often published, particularly within the mass media.

For example, it is frequently cited as being the smallest crayfish in the world, as well as being quoted as having only one known population worldwide. This misreporting of information can have negative effects for the conservation of a species. Therefore, it is imperative that accurate and correct information is available for *Tenuibranchiurus*, as it may require conservation efforts in the future, if not immediately.

It is feasible to expect that populations of *Tenuibranchiurus* may require management. Presently, this genus has no conservation status assigned to it and it is therefore only protected where it occurs in areas such as national parks and conservation areas. Because of its coastal distribution, appreciable areas of its habitat have been cleared for development such as housing, business and infrastructure. It is therefore possible that this genus may currently require protection due to significant habitat loss restricting its distribution and eliminating isolated sub-populations. However, *Tenuibranchiurus* may also warrant conservation efforts on the basis of geographically isolated sub-populations being considered to be ESUs.

Objectives of the project

Considering the lack of information available on this genus of crayfish, this study aims to (1) identify areas that appear to be suitable habitat and determine if *Tenuibranchiurus* are found within these areas, (2) to explore and develop sampling techniques appropriate for sampling this genus, (3) to determine the actual distribution of this genus (as far as possible) and confirm their presence/absence at historical locations, (4) to determine what effect, if any, habitat variables can have on the distribution and/or abundance of this genus, and (5) to determine whether individuals at one site differ genetically to those individuals from another site (ie. genetically distinct populations).

Significance of the study

Previous to this study there has been no concentrated effort made to determine the exact distribution of *Tenuibranchiurus*. This basic information is vital as it provides a baseline from which further studies can be undertaken. This study has currently found seven populations of this crayfish, ranging from Maryborough, Queensland, to Wooli, New South Wales (approximately 500km). All specimens collected throughout this study will be preserved and lodged with the Queensland Museum in order for them to be available for future studies.

This study will investigate the distribution of this genus, as well as possibly identifying genetically distinct populations or groups of populations within *Tenuibranchiurus*, which may contribute information that can be used for any future taxonomic revision of this genus.