Aspects of myodocopin (Ostracoda) biology and crustacean iridescence

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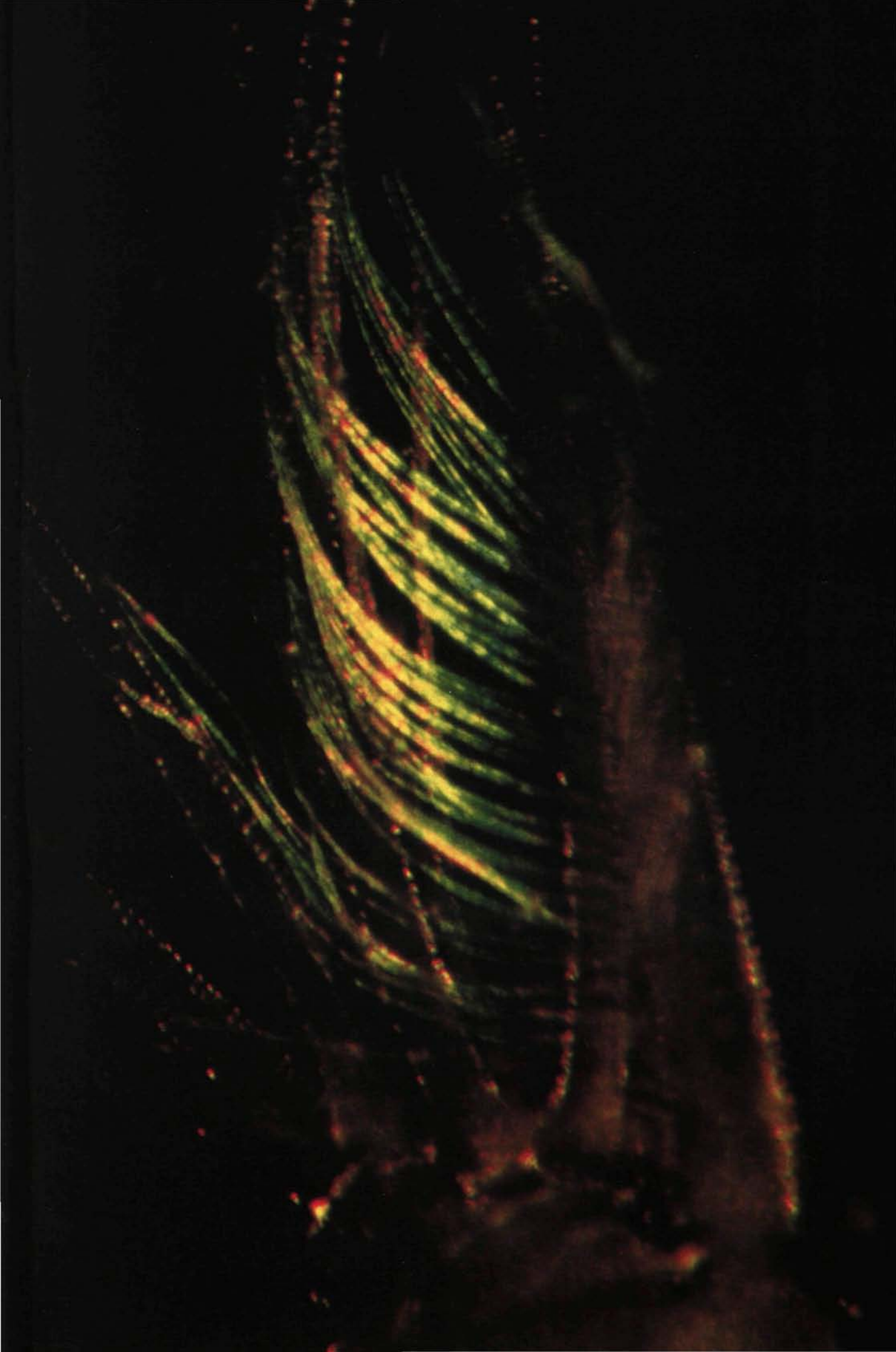
The Academic Senate on 21/2/96 resolved that the candidate had satisfied requirements for admission to the degree of PhD. This thesis represents a major part of the prescribed program of study.

One of the iridescent colours displayed from halophores of a first antenna of *Azygocypridina lowryi* (Ostracoda: Myodocopina: Cypridinidae); 100x magnification.



Summary

This study describes the following discoveries I made while working on cypridinid ostracods, and subsequently other crustaceans.

Two new cypridinid genera, *Cohenia* and *Lowrya*, containing the species *C. taiti* and *L. kornickeri*, and a new species of cypridinid, *Vargula karamu*, are established. The genus *Cohenia* bears an unusual type of sensilla, termed a trichocoel. Trichocoels may be velocity detectors, which detect either steady fluid drainage motion or acoustic motion in the surrounding water. The furca is used as a major feeding tool in scavenging cypridinids. The hard section of the dorsal body wall almost adjacent to the furca in all myodocopins is termed the sclerosome. The sclerosome provides support for certain furcal muscles, and protection for the soft body when the carapace is opened. The central adductor muscles of myodocopins, are arranged as a group of small muscles, rather than a single large muscle, allowing different areas of the anterior, ventral, and posterior carapace margins to open almost independently of each other. The sensory seta of the fifth article of the myodocopin first antenna is termed the s-seta. Setules of the s-seta, and some from other long first antennal setae, have a finely ringed ultrastructure and are termed halophores. The halophores of one first antenna are collectively termed the halothalium. The grooved external surface of a halophore acts as a diffraction grating, and causes highly efficient iridescence. This iridescence is

functional during courtship in at least some cypridinids. Some cypridinids copulate in a position where ventral carapace margins are juxtaposed, and anterior ends are opposite. Copulation in these ostracods is completed in about five seconds. The cypridinids have evolved with light as a major stimulus. Based on phylogenetic studies, iridescence appears to be a precursor to cypridinid bioluminescence, and the myodocopin compound eye may have evolved independently. Iridescence is widespread throughout the Crustacea, occurring as a result of external diffraction gratings, or internal multilayer reflectors.

Declaration

This thesis contains no material that has been previously submitted for the award of a higher degree to any other university or institution.

Andrew R. Parker

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