

Chapter 2

Protistan parasites and Myxozoa

Coverage of 'lower' organisms in this book is restricted to protistan and metazoan parasites and excludes fungi and other organisms such as bacteria and viruses, many of which are *parasitic* as defined in the Introduction. The boundary between fungi and protistans is ill-defined, however. Protistan taxonomy, based on molecular phylogeny, is continually changing. For example, the 'Sarcomastigophora' (still treated as such in this chapter), has disintegrated into many separate, high ranking taxa. Among them, the Opalinata belongs to a class of Heterokonta, these themselves are a subphylum of the phylum Chromista. This Chapter includes groups that have commonly been considered to be protistan. The Chapter also includes the Myxozoa, which have the appearance of protistans and were for a long time considered to belong to that group. Recent DNA and ultrastructural studies have shown that they are metazoan, although their exact position within the metazoans has not been resolved. Like the Cnidaria, they possess nematocysts (or nematocyst-like structures), but molecular evidence points to a position among the bilaterian metazoan. All the groups discussed in this Chapter have considerable importance as agents of disease, particularly in aquacultured fish and molluscs. Some of them, in particular the Microsporidia and Apicomplexa, are important as infective agents in immunocompromised people. Species richness is practically unknown for Sarcomastigophora, Microsporidia, Ciliophora and Myxozoa: new species are being described continually. In Australia, for example, less than 5% of the thousands of fish species have been examined for these parasites, and sample sizes of those which have been examined, were small. Fish of African, South American and many Asian countries have been examined even less. It may well be that these parasites belong to the most speciose groups of parasites in the marine environment and, as such, have considerable ecological importance. Also, at least some of the vast number of marine invertebrates that are yet to be examined are likely to have protistan parasites, probably including large numbers of sarcomastigophorans and ciliophorans.

In view of the great morphological and taxonomic diversity of the protistans, this chapter begins with a brief overview of this kingdom before proceeding to the various sections dealing with the groups in greater detail.

Protistan biodiversity

Peter O'Donoghue

Introduction

The kingdom Protista (syn. Protoctista) comprises unicellular eukaryotic organisms which exist as structurally and functionally independent individual cells (including those species which are gregarious or form colonies). None have adopted multicellular somatic organisation characteristic of