Chapter 9

Zoogeography

The geographical distribution of marine parasites has not been well studied and is largely, although not entirely, limited to some aspects of the zoogeography of parasites of marine fishes. Some effort has gone into studying latitudinal, longitudinal and depth gradients of fish parasites. Interestingly, ectoparasites and endoparasites of marine fishes show different latitudinal patterns. Whereas the relative species richness (number of parasite species per host species) increases markedly from high to low latitudes for ectoparasites, this is not the case for endoparasites. The latter also show greatest diversity in the tropics, but this is entirely due to an increased diversity of host species at low latitudes. Thorson's rule, which states that benthic marine invertebrates tend to produce large numbers of small pelagic larvae in warm waters, but small numbers of large offspring by various mechanisms at high latitudes, applies to monogenean gill parasites of marine fishes. Furthermore, host ranges (but not host specificity) are greater for digeneans at high than at low latitudes, whereas monogeneans do not show differences between latitudes.

Concerning longitudinal gradients, a study of scombrid ectoparasites has shown that there is a primary centre of diversity in South-East Asian waters, and a secondary one in the Caribbean, with diversity decreasing with distance from these centres.

Concerning gradients with depth, relative species diversity of monogeneans is several times greater in surface than in deep waters off eastern Australia. Parasites can be used to study host populations and their migration, not only of marine fish but also of various invertebrates. Such parasite tags are much cheaper than other methods, such as comparative genetic studies, as discussed (on pages 351–355). The section discusses general methodology, selection criteria for tag parasites and application of the method to different host groups. Parasites also are useful for making inferences about long-term historical dispersal. The relevant section describes the only two examples studied (i.e. that of scombrid dispersal with emphasis on the role of oceanic barriers, and that on the historical migrations of Indo-Pacific whiting, Sillaginidae). The section on introduced marine parasites addresses a very important problem (i.e. that of the many parasites introduced into new regions, where they have become important pests). It also discusses the use of deliberately introduced parasites to control introduced free-living pest species, such as crabs or echinoderms. The Chapter concludes with a concise discussion of deep-sea parasites. Very little is known about the diversity and distribution of free-living deep-sea organisms (probably more than 99% of invertebrates have not yet been described), and deep-sea parasites have been studied even less. They are of great importance, considering the huge spaces of the deep-seas, and the many species of fish and invertebrates found there.