

**SPATIAL AND TEMPORAL ASPECTS OF MACROFUNGAL
COMMUNITY STRUCTURE**

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Spatial and Temporal Aspects of Macrofungal Community Structure

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Declaration of Authorship

These doctoral studies were conducted under the supervision of Prof. Alan C. Gange. The work presented in this thesis is the result of original research carried out by myself, whilst enrolled in the School of Biological Sciences as a candidate for the degree of Doctor of Philosophy. This work was conducted independently and has not been submitted for any other degree of award in any other university or educational establishment. Where I have consulted the work of others, this is always clearly stated.

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Abstract

The thesis contains an analysis of spatial and temporal aspects of macrofungal fruiting. In total, the thesis contains 8 chapters with 5 experimental chapters. These chapters involved studies of i) fungal phenology (Chapter 3), ii) fungal-host associations (Chapter 4), iii) the relationship between fungi and climatic variables (Chapter 5), iv) seasonal dynamics of fungal interactions (Chapter 6) and v) fungal species co-occurrence patterns (Chapter 7). Most data, analysed in the studies of phenology, host associations and influences of climate on fungi were obtained from a long term fungal dataset with records gathered by local mycologist, Edward G. Gange from more than 1000 localities within a 30 km radius of Salisbury, Wiltshire, UK over 50 years. Chapter 3 describes analyses that I have conducted in order to detect changes in fruiting phenology of ten common fungal functional groups extracted from the dataset. Meanwhile, in Chapter 4, host ranged of 8 common fungal genera were explored and responses of mycorrhizas and saprotrophic fungi were compared. Moreover, the question of whether changes in fungal fruiting patterns in the UK could be affected by climatic factors over recording period are discussed in Chapter 5. For spatial aspects of fungal community structure, field studies have been conducted in Chapter 6 and Chapter 7 of the thesis where samples were obtained from study sites in Windsor Forest (Windsor Great Park), Royal Holloway College (Egham, Surrey) and Wivelsfield (West Sussex). Chapter 6 describes experiments on a model species, *Hypholoma fasciculare* to examine whether fruit bodies that fruit in the same place have fruit more than once a year. Chapter 7 contains explanations of an attempt to answer the question whether some individuals have gaps/off-year during their fruiting seasons while there are other individuals belonging to the same species that occur elsewhere. This then followed by identifying factors that could triggers the fruit body formation.