

Spatial Bi-hourly Variation of *Alternaria* Spore Concentration in Worcester, UK.

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Introduction

Alternaria is a pathogenic and allergenic fungus¹. Daily variation of *Alternaria* spore counts between locations is known². However, bi-hourly variation of closely located places is not reported. This study, therefore, investigated variation of bi-hourly spore counts of closely located areas.

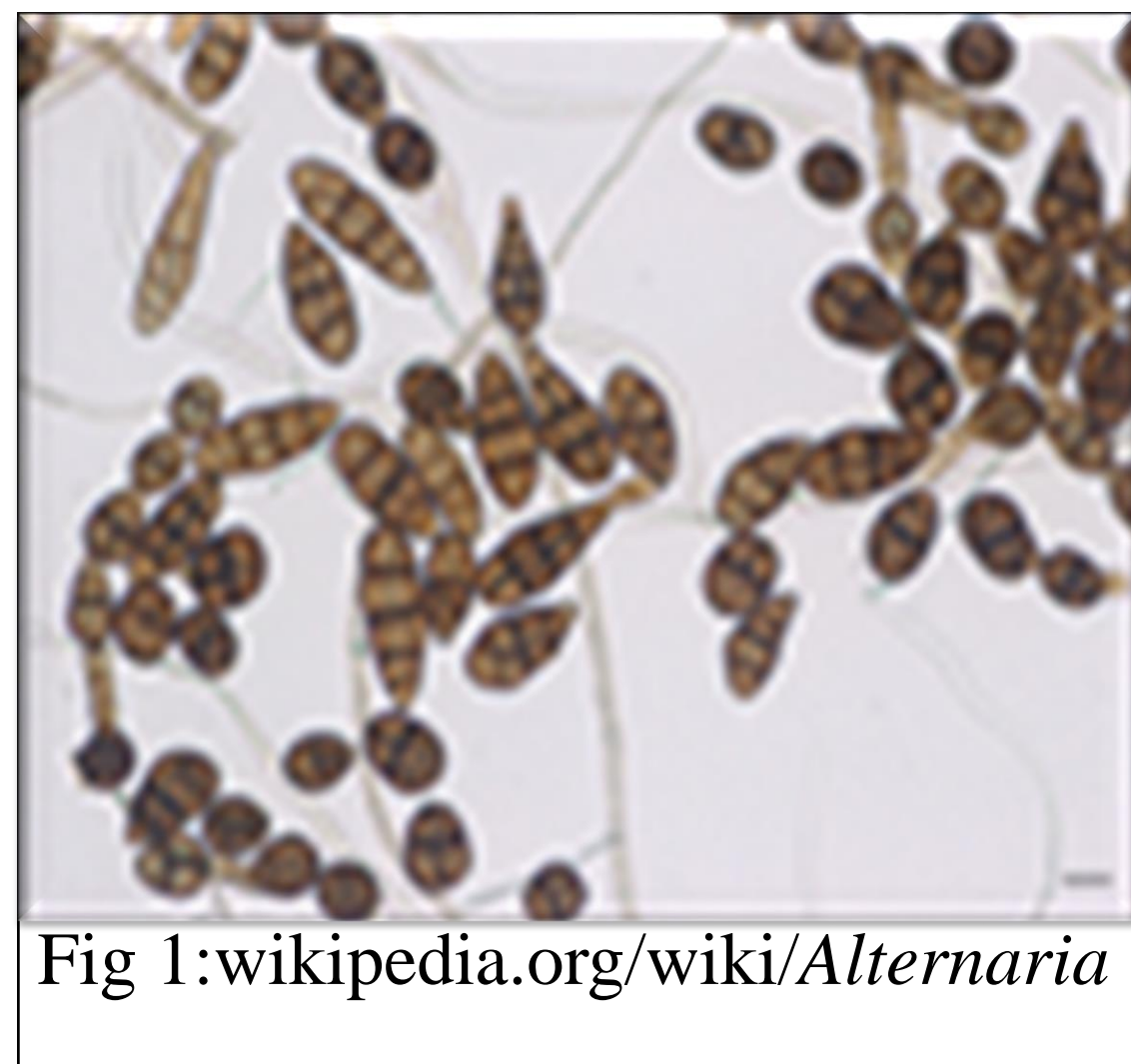


Fig 1: wikipedia.org/wiki/Alternaria

Table 1: Bi-hourly seasonal mean

Year	Lakeside	St Johns
2016	56	73
2017	175	108
2018	44	19

Hypotheses

- Closely located areas vary in bi-hourly *Alternaria* spore concentration.
- Rural/agricultural areas experience high amount of *Alternaria* spores than urban/residential areas.

Method

Two Burkard traps³ located at St Johns and Lakeside Campuses of the University of Worcester sampled *Alternaria* spores from 2016-2018. Lakeside (rural area; 52.2537, -2.2535) is 7 km away from St Johns (urban; 52.1970, -2.2421). Slides were counted according to standard procedures⁴. Spearman's correlation was calculated using R. The 2 sites' bi-hourly spore values were plotted in scatter plot to display spatial and temporal variation in spore concentrations. The 95% method determined *Alternaria* spore season⁵.

References

¹D'Amato *et al.*, 1997 *Allergy* 52:711-716. ²O'Connor *et al.*, 2014 *Aerobiologia* 30:397-411. ³Hirst, 1952 *Annals of Applied Biology* 39(2): 257-265. ⁴Galán *et al.*, 2014, *Aerobiologia* 30(4): 385-395. ⁵Goldberg *et al.*, 1988 *Grana* 27:209-217. ⁶Skjøth *et al.*, 2016 *Aerobiologia* 32(1): 3-22. ⁷Corden *et al.*, 2003 *Aerobiologia* 19:191-199.

Results

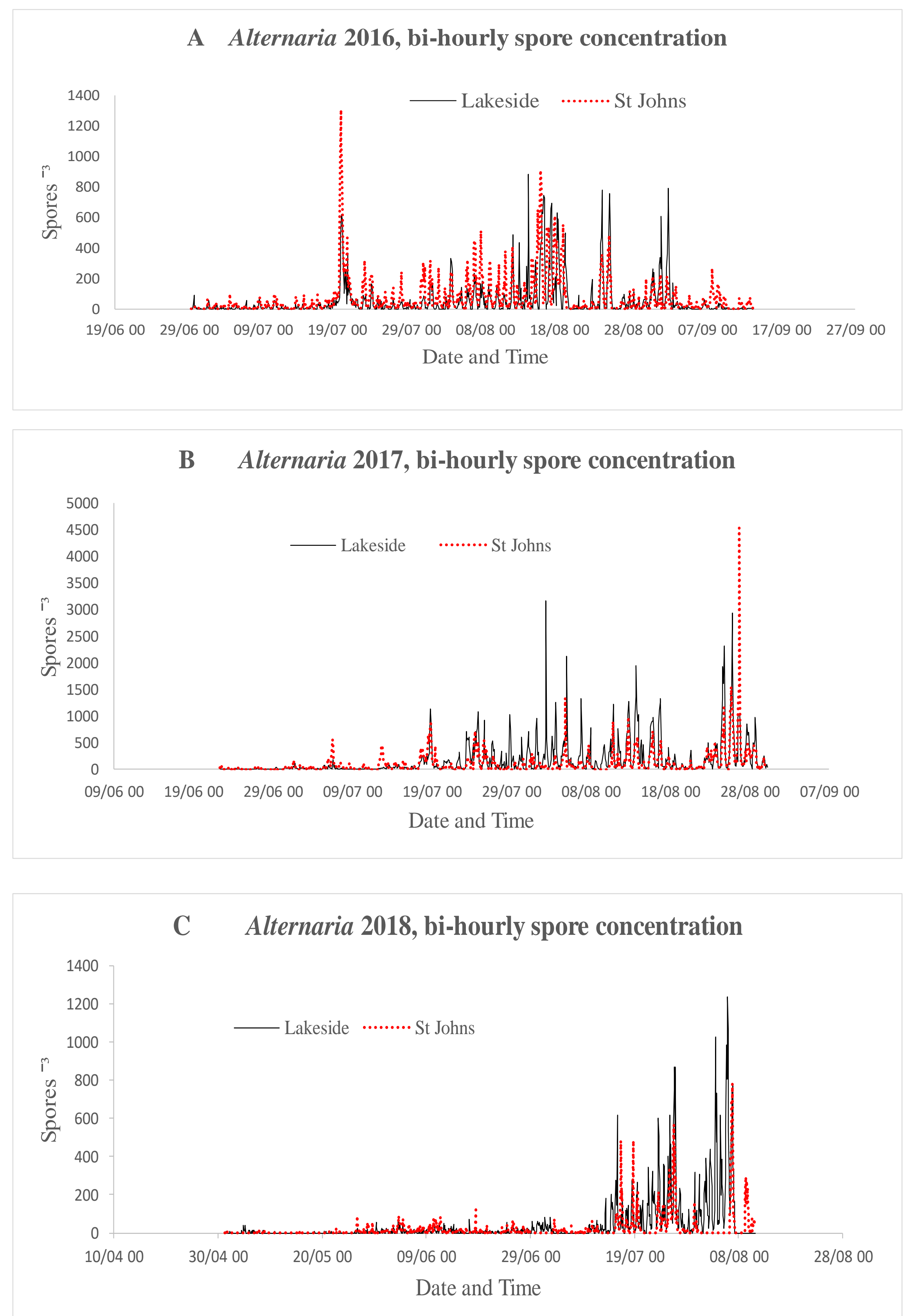


Fig 2 A-C: Comparison of bi-hourly *Alternaria* spore concentrations between sampling sites of St John's and Lakeside for 2016, 2017 & 2018.

Discussion and Conclusion

In 2016, St Johns sampled more spores than Lakeside (**Fig 2A & Table 1**), with a correlation of **0.60**, $p < 0.001$. Thus, bi-hourly spore counts showed low variation between the two sites. In 2017 & 2018, Lakeside sampled more spores than St Johns, with a correlation of **0.58**, $p < 0.001$ and **0.27**, $p < 0.001$, respectively (**Fig 2B,C & Table 1**). The higher spore counts in Lakeside could originate from crop harvesting within the area^{6,7}. Future study will include investigating factors that affect spore emission and complete 2018 spore season.