

Supplementary material

Possible drivers of a *Chrysosporum ovalisporum* bloom in the Murray River, Australia, in 2016

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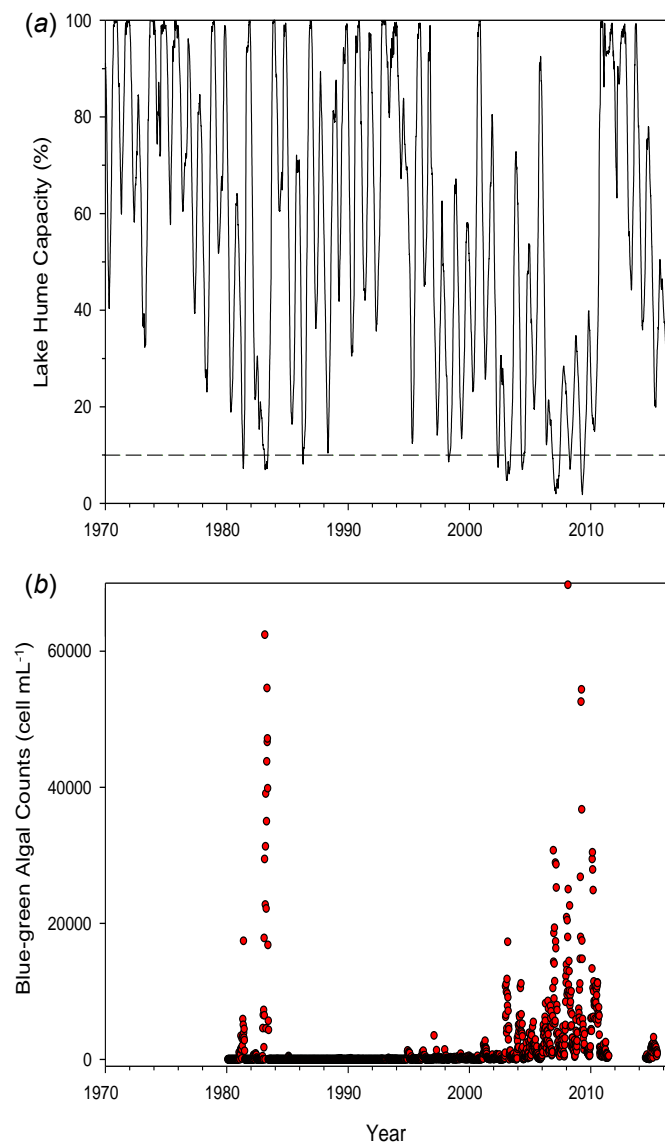


Fig. S1. Lake Hume capacity (a) and cyanobacterial abundance (cells mL⁻¹) at Heywoods Bridge immediately downstream of Lake Hume (b). Significant cyanobacterial abundance at Heywoods Bridge only occurred when capacity in Lake Hume fell below ~10% (dashed line top panel).

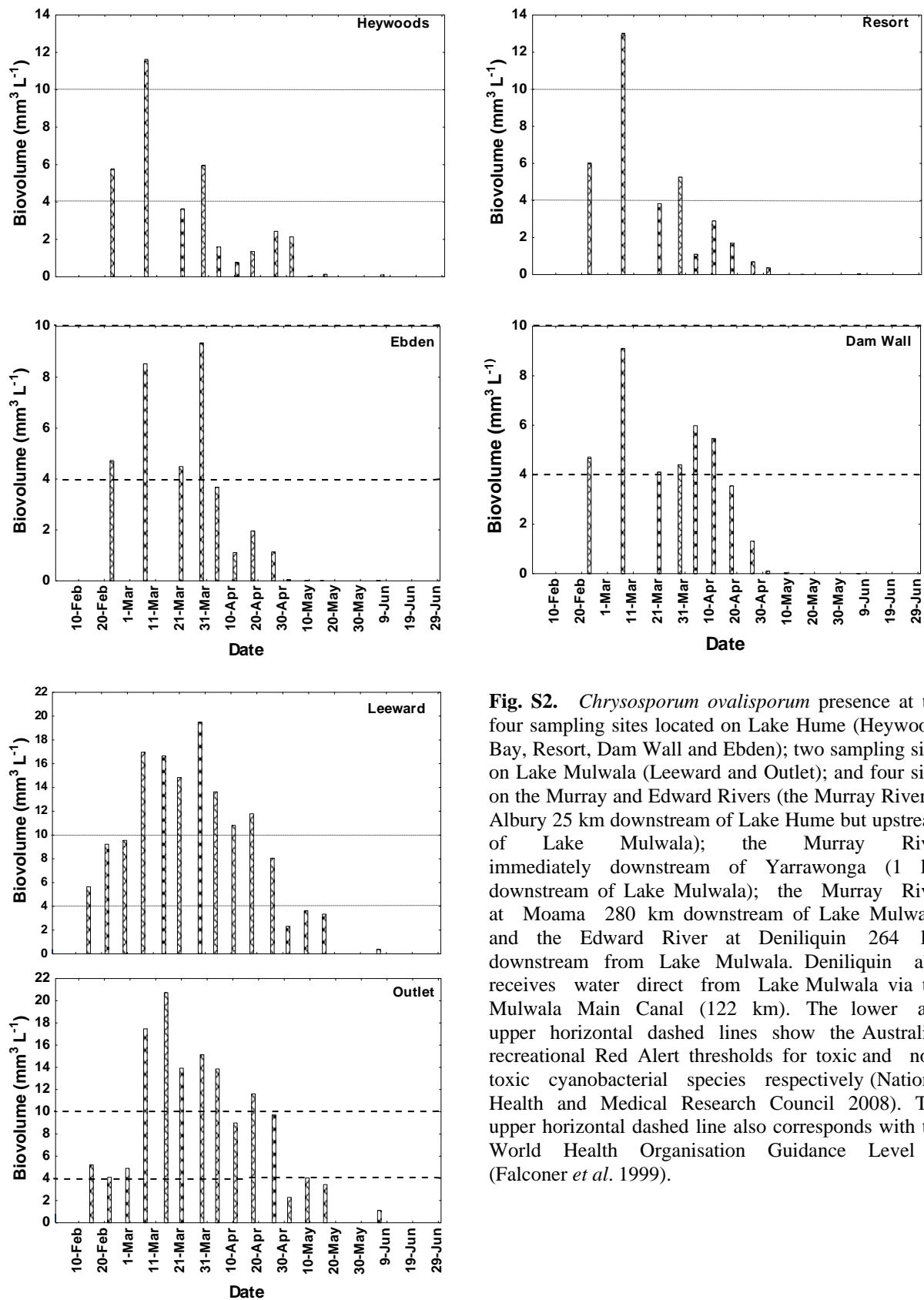


Fig. S2. *Chrysosporum ovalisporum* presence at the four sampling sites located on Lake Hume (Heywoods Bay, Resort, Dam Wall and Ebden); two sampling sites on Lake Mulwala (Leeward and Outlet); and four sites on the Murray and Edward Rivers (the Murray River at Albury 25 km downstream of Lake Hume but upstream of Lake Mulwala); the Murray River immediately downstream of Yarrowonga (1 km downstream of Lake Mulwala); the Murray River at Moama 280 km downstream of Lake Mulwala, and the Edward River at Deniliquin 264 km downstream from Lake Mulwala. Deniliquin also receives water direct from Lake Mulwala via the Mulwala Main Canal (122 km). The lower and upper horizontal dashed lines show the Australian recreational Red Alert thresholds for toxic and non-toxic cyanobacterial species respectively (National Health and Medical Research Council 2008). The upper horizontal dashed line also corresponds with the World Health Organisation Guidance Level 2 (Falconer *et al.* 1999).

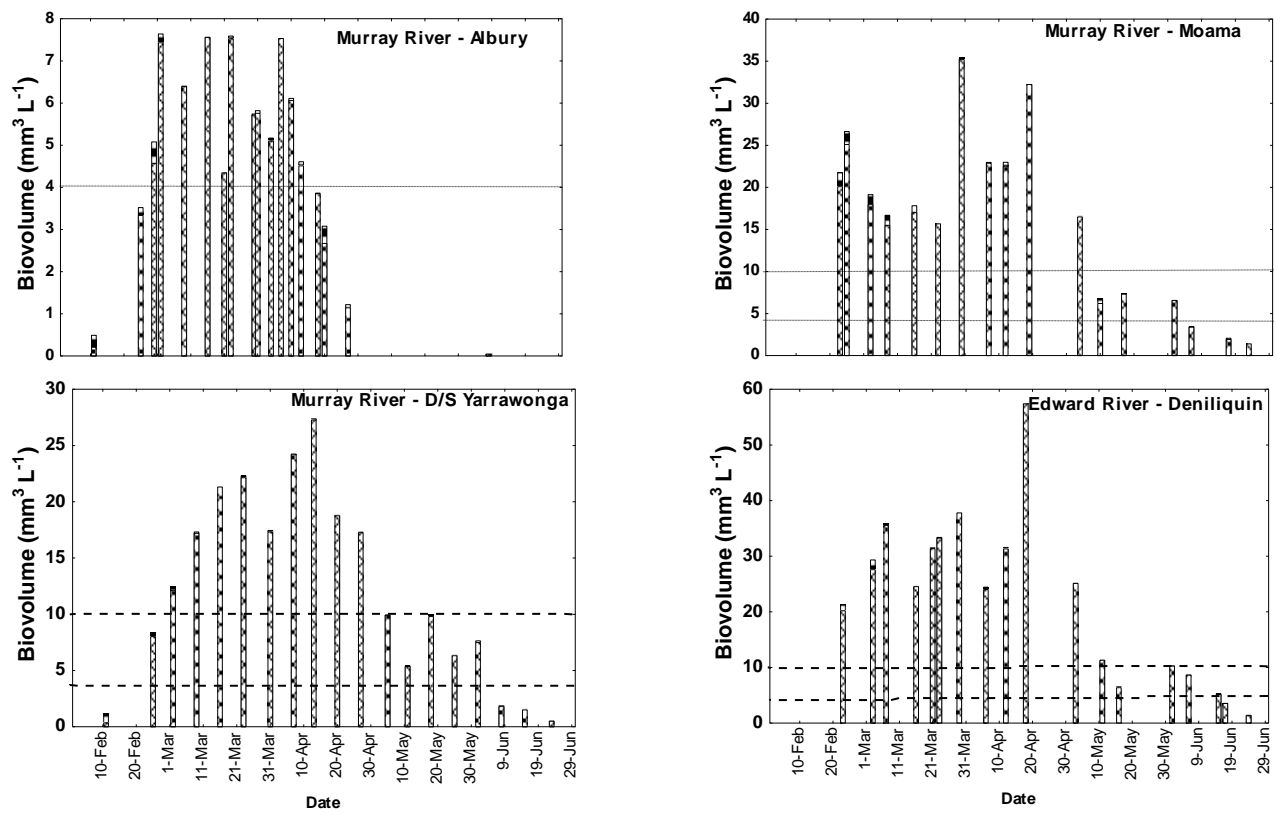


Fig. S2. (Cont.)

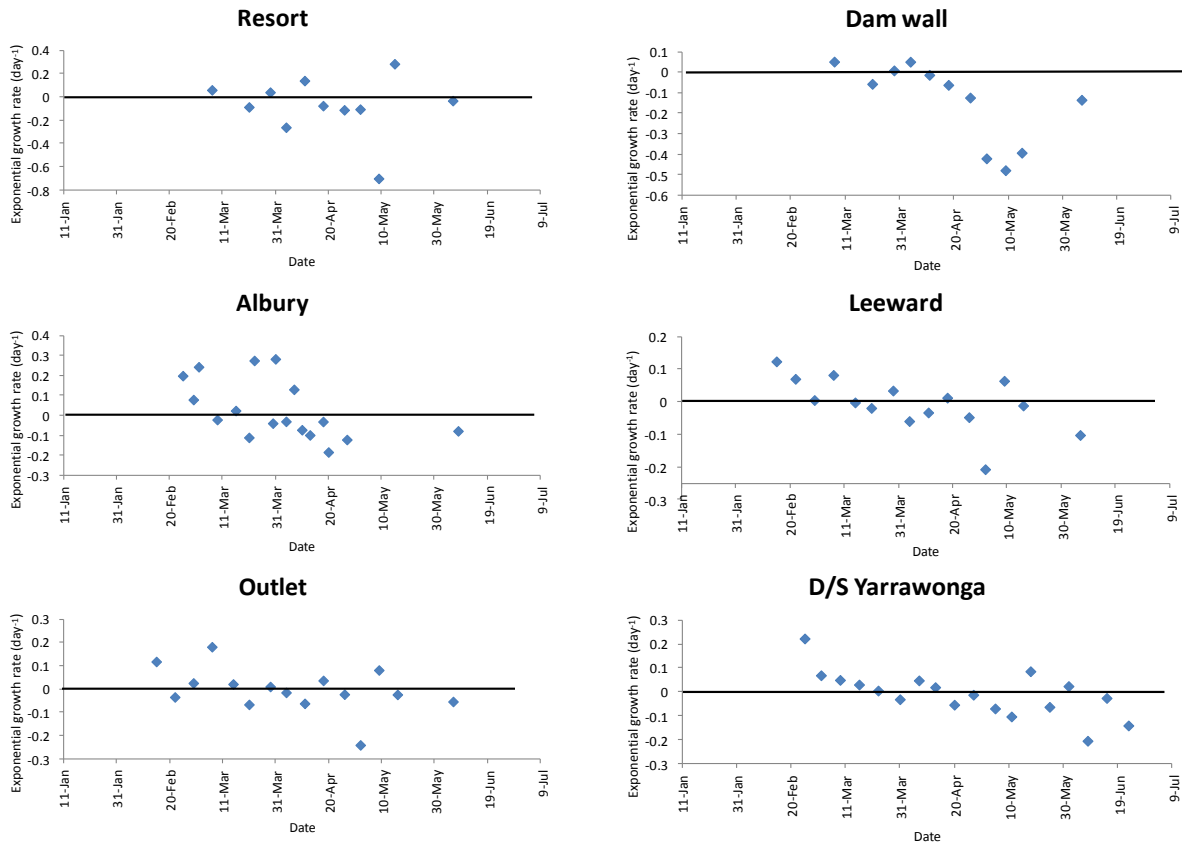


Fig. S3. Exponential growth rates (and decline rates) of *C. ovalisporum* at two sites on Lake Hume (Resort and Dam wall); on the Murray River at Albany 25 km downstream of Lake Hume; two sites on Lake Mulwala (Leeward and Outlet); and on the Murray River immediately downstream of Yarrawonga (Lake Mulwala). The horizontal line indicates zero rate of growth or decline.

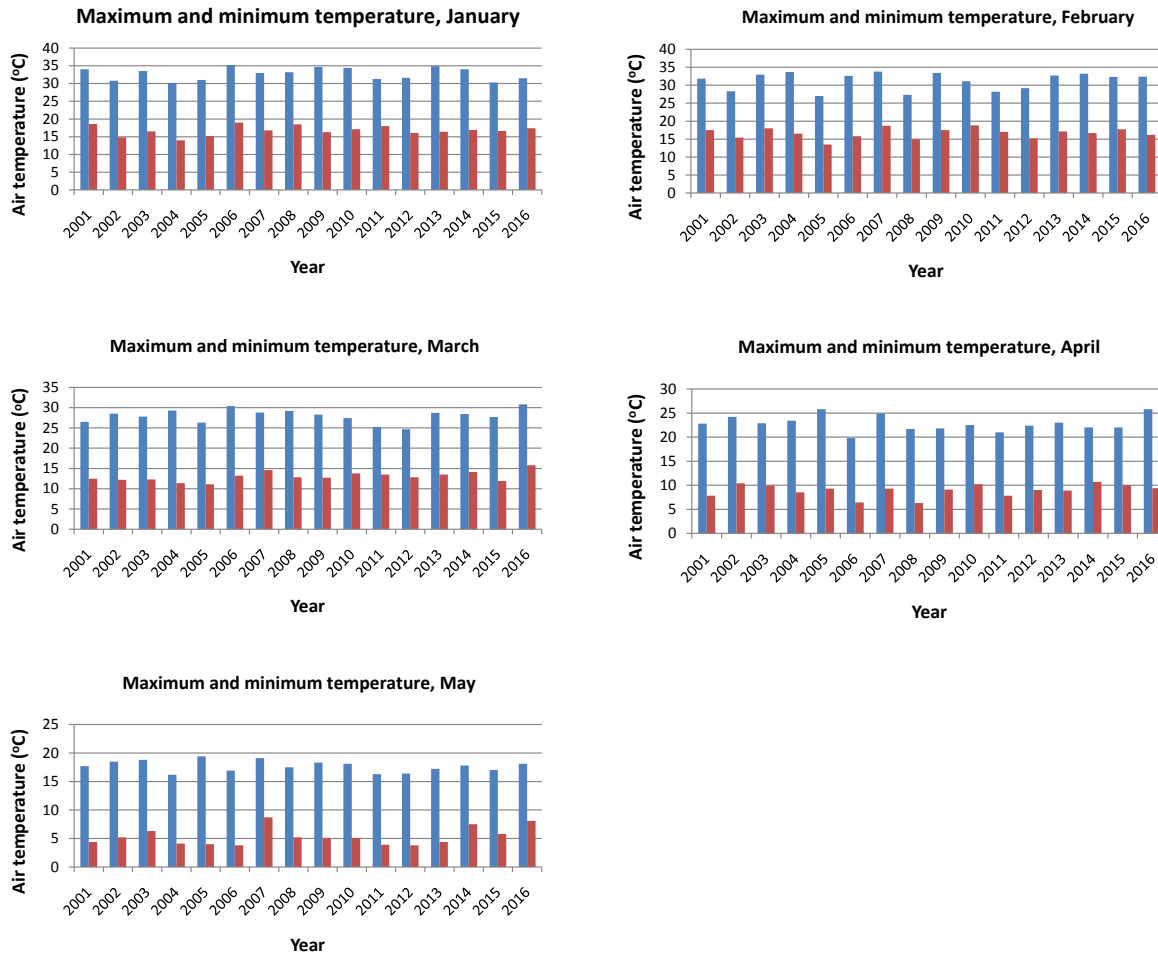


Fig. S4. Monthly average maximum and minimum air temperatures at Albury for January, February, March, April and May from 2001 through to 2016.

Table S1. Pearson correlation coefficients (r) between *Chrysosporium ovalisporum* biovolume and environmental attributes recorded for the Murray River at Albury, the Murray River immediately downstream (D/S) of Yarrawonga Weir, and for the two sites combined

No meteorological data were available for the downstream Yarrawonga site

Location	Attribute	r	n	P
Albury	Min. air temp.	0.0424	16	0.88
Albury	Max. air temp.	0.1775	16	0.51
Albury	Rainfall	0.2613	16	0.33
Albury	Solar irradiance	0.1245	15	0.66
Albury	Discharge	0.5810	16	0.018
Albury	EC	0.0447	16	0.87
Albury	Water temp.	0.5530	16	0.026
Albury	Turbidity	0.1221	16	0.65
Albury	pH	0.1597	16	0.55
Albury	TN	0.0387	16	0.89
Albury	TP	0.3282	16	0.21
Albury	DO	0.0849	16	0.75
D/S Yarrawonga	Discharge	0.0361	19	0.88
D/S Yarrawonga	EC	0.1797	19	0.46
D/S Yarrawonga	Water temp.	0.4496	19	0.053
D/S Yarrawonga	Turbidity	0.8130	19	0.00003
D/S Yarrawonga	pH	0.8756	19	<0.00001
D/S Yarrawonga	TN	0.8479	19	<0.00001
D/S Yarrawonga	TP	0.4432	19	0.057
D/S Yarrawonga	DO	0.0600	19	0.81
Combined	Discharge	0.2627	35	0.13
Combined	EC	0.2102	35	0.22
Combined	Water temp.	0.2093	35	0.23
Combined	Turbidity	0.7977	35	<0.00001
Combined	pH	0.8806	35	<0.00001
Combined	TN	0.8106	35	<0.00001
Combined	TP	0.5695	35	0.0004
Combined	DO	0.3164	35	0.06

References

- Falconer, I., Bartram, J., Chorus, I., Kuiper-Goodman, T., Utkilen, H., Burch, M., and Codd, G. A. (1999). Safe levels and safe practices. In 'Toxic Cyanobacteria in Water: a Guide to Their Public Health Consequences, Monitoring and Management'. (Eds I. Chorus and J. Bartram.) pp. 155–178. (E & FN Spon: London, UK.)
- National Health and Medical Research Council (2008). 'Guidelines for Managing Risks in Recreational Water.' (NHMRC: Canberra, ACT, Australia.)