A-10: Survey of UK water cooling towers for Legionella, Legionella-like amoebal pathogens and associated protozoa

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Water cooling towers have been associated with outbreaks of legionellosis. Naturally, legionellae are protozoonotic and some of the free living hosts are themselves pathogenic in humans.

Legionella-like amoebal pathogens (LLAP) also infect amoebae, but fail to grow on standard legionella media. Some of these bacteria have been associated with human disease.

Amoebic cysts with their confined legionellae, can withstand adverse conditions, desiccation and biocide concentrations which would destroy free living legionellae.

A selection of 18 cooling towers in the UK were consistently sampled from the pond water, packing, distribution channels and sediment. Each sample was duplicated and analysed for legionellae, LLAPs and protozoa. Legionellae were isolated from BCYE agar and identified by a fluorescent antibody test. LLAPs were isolated from acid treated amoebae and grown on selective agar. Amoebae were grown on non-nutrient agar and identified microscopically.

Free living amoebae were isolated from all towers and 70 of the 71 water samples. Legionellae were isolated from 5 of the towers and 7 of the 71 samples. Five of the towers contained infected amoebae and 2 of these were subsequently positive for legionellae. Three towers, negative by conventional standards yielded evidence for LLAPs.

In view of these findings there is a need to re-evaluate the effectiveness of biocidal treatments of cooling towers and the sampling methods which are routinely used.

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