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HIGH-THROUGHPUT CARBON SUBSTRATE PROFILING OF *MYCOBACTERIUM ULCERANS* SUGGESTS POTENTIAL ENVIRONMENTAL

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Background: *Mycobacterium ulcerans* is a close derivative of *Mycobacterium marinum* and the agent of buruli ulcer in some tropical countries. Epidemiological and environmental studies pointed towards stagnant water ecosystems as potential sources of *M. ulcerans*, yet the ultimate reservoirs remain elusive. We hypothesized that carbon substrate determination may help elucidating the spectrum of potential reservoirs.

Methodology & Results: In a first step, high-throughput phenotype microarray BIOLOG was used to profile carbon substrates in one *M. marinum* and five *M. ulcerans* strains. A total of 131/190 (69%) carbon substrates were metabolized by at least one *M. ulcerans* strain, including 28/190 (15%) carbon substrates metabolized by all five *M. ulcerans* strains of which 21 substrates were also metabolized by *M. marinum*. In a second step, 131 carbon substrates were investigated, through a bibliographical search, for their known environmental sources including plants, fruits and vegetables, bacteria, algae, fungi, nematodes, mollusks, mammals, insects and the inanimate environment. This analysis yielded significant association of *M. ulcerans* with bacteria ($p=0.000$), fungi ($p=0.001$), algae ($p=0.003$) and mollusks ($p=0.007$). In a third step, the Medline database was cross-searched for bacteria, fungi, mollusks and algae as potential sources of carbon substrates metabolized by all tested *M. ulcerans*; it indicated that 57% of *M. ulcerans* substrates were associated with bacteria, 18% with alga, 11% with mollusks and 7% with fungi.

Conclusions: This first report of high-throughput carbon substrate utilization by *M. ulcerans* would help designing media to isolate and grow this pathogen. Furthermore, the presented data suggest that potential *M. ulcerans* environmental reservoirs might be related to micro-habitats where bacteria, fungi, algae and mollusks are abundant. This should be followed by targeted investigations in buruli ulcer endemic regions.

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