Polypedilum vanderplanki: an anhydrobiotic insect as a potential tool for space biology

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Life and death are mutually exclusive states. But some organisms showing no sign of living due to complete desiccation are nevertheless able to resume active life after rehydration. This peculiar biological state is referred to as “anhydrobiosis”. Larvae of the sleeping chironomid, *P. vanderplanki* living in temporary pools in semi-arid areas on the African continent become completely desiccated upon drought, but can revive after water becomes available upon the next rain. The anhydrobiotic larvae can stand other extreme conditions, such as exposure to 100˚C, -270˚C, 100% ethanol, 7kGy gamma-rays and vacuum. As space environment is a typical extreme condition, we propose that the sleeping chironomid could be a potential experimental animal for space-related study, and indeed such experiments are rightly underway at ISS.