Health and Life Risks in Large Palaeovertebrate Tunnel Research

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In South America, tunnels dug by mammals of the Pleistocene megafauna survived to present days in several stages of preservation. Working inside these ichnofossils, which may be more than 50 meters long, implies in several physical and biological life and health risks. (a) Oxygen starvation is a serious problem in tunnels of smaller sizes (Ø < 0.8 m). In a few minutes, an obvious difficulty for breathing becomes evident. (b) Collapsing of the entrance, and of the roof itself, imprison researchers inside the tunnels and hurt due to the weight of the falling slabs, respectively. (c) In rainy periods, drowning of the usually already wet tunnels constitutes an additional risk. (d) Very dry tunnels, excavated in sandstones, may contain a powdery whitish dust accumulated on the floor. This dust is highly allergenic, developing an acute contact dermatitis that have not been recognized even by experienced dermatologists and that vanishes, even with continuous medical treatment, only after several weeks. (e) Poisonous animals hide inside the tunnels: big, very fast moving spiders pose a potential grave risk of biting. (f) Fungi at the walls and the roof of the tunnels are very common; some tunnels have completely white walls and seem frosted. Fungi DNA analysis identified a *Trichoderma* that may develop lung diseases in individuals with low personal immunity. (g) The presence of bats in the tunnels increase the potential risks. Insectivore and frugivore bats produce feces whose dust contains fungi that cause severe health problems (criptococcosis and histoplasmosis). Acute contamination may occur after an exposure of only a few minutes to the dust of the feces. (h) Hematophagous bats, besides leptospirosis virus in its feces, may also carry the rabies virus. Due to the navigation system of the bats, the air inside the tunnels may contain aerosolized virus-contaminated saliva microdroplets, infecting humans through its mucous membranes (eye, nose, mouth). (i) The presence of armadillos, reoccupying the tunnels, arise the possibility of contamination with leprosy. (j) The neighborhood of most of the tunnels to domestic livestock and the possibility of accidents require an additional previous injection against tetanus. These summed hazards recommend avoid entering the tunnels without security equipments.