

10 mM KH_2PO_4 , 5 mM MgCl_2 , 20 mM Tris and 1 mM EDTA) and centrifuged at 2° C for 15 min at 10,000g. The pellet was washed twice and resuspended in the same buffer. There was a low rate of oxygen uptake by the particles which was stimulated by 10^{-2} M succinate or 10^{-2} M glutamate plus 10^{-3} M malate. There was little effect of ADP (1.8×10^{-4} M) on this preparation, but in the presence of 0.5% defatted bovine serum albumin ADP caused a marked stimulation of oxygen uptake. In the absence of ADP the respiration of the particles with succinate as substrate was stimulated by 2×10^{-4} M 2:4 dinitrophenol. In the presence of ADP and succinate the respiration of the particles was completely inhibited by 2×10^{-4} M cyanide and 10^{-6} M antimycin A. Using glutamate plus malate as substrate respiration was partly inhibited (59% reduction) by 10^{-3} M amygdal and completely by 10^{-6} M rotenone. Worms, therefore, appear to possess a coupled functional cytochrome system.

The reduced coenzymes oxidized by the cytochrome pathway may be generated from two main sources. The first two enzymes of the pentose phosphate pathway have been assayed in schistosomes⁷, although the remaining enzymes have yet to be demonstrated. The use of inhibitors⁸ and the presence of some enzymes of the citric acid cycle, including three-D₃-isocitrate: NADP oxidoreductase (1.1:1.42) and citrate oxaloacetate-lyase (4.1:3.7), (unpublished results, G. C.), suggests the worms possess a functional citric acid cycle.

The transformation of carbohydrate metabolism from the fully aerobic cercarial stage of *S. mansoni* to the parasitic stage in the mammal is thus only a partial transformation, and oxygen seems to be used in the adult for oxidative phosphorylation. Until a medium has been produced in which adult worm pairs lay eggs at the same rate as *in vivo* it will not be possible to determine the relative importance of glycolysis and oxidative phosphorylation in ATP formation.

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Purity Effects and Distilled Water Taste

THE taste of distilled water has been shown to depend on previous adaptation¹⁻⁵. In studies where an exact description of purity is necessary, only the number of distillations are quoted, which is inadequate because purity varies with distillation efficiency. Measures such as specific conductivity for ionic impurities and surface tension for surfactants are better

indications of purity. Variation in tapwater solutes makes it possible to distinguish samples by taste so that the same criterion may be true for purity variations in distilled water. This was tested here using once and twice distilled water.

Three subjects who were non-smokers were adapted to twice distilled water with once distilled water used as a stimulus and to once distilled water with a tapwater stimulus. A constant flow (330 ± 1 ml. min⁻¹) gravity system delivered adapting and stimulus solutions, at mouth temperature ($34 \pm 0.5^\circ$ C), to the anterior dorsal surface of the tongue. When the subject was adapted, the stimulus solution was presented or the adapting solution continued. The signal detection rating procedure⁶, using a 6-point scale, was used to construct receiver operator characteristics (ROC) curves and calculate d' and nonparametric $P(A)$ values. 600 trials were performed for each subject at each adaptation level.

The tapwater was a typical sample⁷ from Bristol Waterworks, in the higher range for total hardness (160-228 p.p.m.), Cu (0.6 p.p.m.) and Pb (0.2 p.p.m.) with a low surfactant level. Once distilled water was produced in a 'Manesty Still' (type OBE), and twice distilled water was produced by redistillation in 'Pyrex' after passage through an 'Elgastat Cartridge C203' mixed bed ion exchange resin. The mean specific conductivity values for tap, once and twice distilled water were $24.6 (\pm 0.7) \times 10^{-6}$, $2.3 (\pm 0.1) \times 10^{-6}$ and $< 10^{-6}$ mho cm⁻¹, while the corresponding mean surface tensions were 72.0 (± 0.4), 71.4 (± 0.4), and > 71.5 dyne cm⁻¹. The polythene apparatus and storage vessels were cleaned with concentrated nitric acid and steamed until they showed minimal surface activity.

Signal strengths with the tapwater stimulus were as high as expected with $P(A)$ values of 0.99, 0.98 and 0.99. The second subject only had a realistic d' (3.0). The distilled water stimulus gave d' values of 2.53, 1.71 and 2.27 with corresponding $P(A)$ values of 0.96, 0.90 and 0.97 also indicating relatively easy detection. Complete adaptation was not always obtained, especially to twice distilled water, and was not necessary for signal detection. An initial trial period was also found necessary, confirming earlier studies⁸, which could be as many as fifty for the once distilled water stimulus, perhaps due to the difficult adaptation involved. Qualitative judgments were made and tapwater was described as "bitter" or "metallic" while once distilled water was described as "bitter", "metallic", "tingly" or "sweet". This reflects the inadequacy of a descriptive language for low signal levels.

Here I use once distilled and tapwater as supra-adapting stimuli for the first time. My results show that purity, as well as pre-adaptation, is an important factor in the distilled water taste.

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