

## **Energetically autonomous robots: Food for thought**

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### **Abstract**

This paper reports on the robot EcoBot-II, which is designed to power itself solely by converting unrefined insect biomass into useful energy using on-board microbial fuel cells with oxygen cathodes. In bench experiments different 'fuels' (sugar, fruit and dead flies) were explored in the microbial fuel cell system and their efficiency of conversion to electricity is compared with the maximum available energy calculated from bomb calorimetry trials. In endurance tests EcoBot-II was able to run for 12 days while carrying out phototaxis, temperature sensing and radio transmission of sensed data approximately every 14 min.

**Keywords** Artificial autonomy, Energy autonomy, Pulsed behaviour, Microbial fuel cells, Oxygen cathode