Orphan drug may help control transmission of African Trypanosomiasis

Study suggests nitisinone is toxic to tsetse flies, but harmless to pollinator insects

African trypanosomiasis is a disease transmitted by tsetse flies and is both fatal to humans and animals, however, there is no vaccine. A study published in *PLOS Biology* by Alvaro Acosta-Serrano at Liverpool School of Tropical Medicine, United Kingdom and colleagues suggests that the drug nitisinone (NTBC) could be repurposed to kill tsetse flies without harming important pollinator insects.

Currently, the most effective method of controlling the transmission of African trypanosomiasis is through aerial spraying of neurotoxic insecticides. However, in addition to killing tsetse flies, insecticides may harm the environment by reducing populations of insect pollinator species. The orphan drug NTBC safely treats the human genetic disease, HT-1, but has not previously been used as a vector control. To evaluate NTBC's efficacy in killing tsetse, researchers allowed tsetse flies to feed on rats treated orally with NTBC. The researchers then investigated the drug's impact on captive bumblebees using NTBC-treated sugar water as their hydration source.

After feeding on NTBC-treated rats, 90% of tsetse flies died within 26 hours. The study also indicated that NTBC is not toxic to bumblebees, as the bees who ingested the drug had a mortality rate similar to the control group. While NTBC appears to be effective in slowing the transmission of African trypanosomiasis, mass administration of NTBC to humans and livestock may be less effective in controlling tsetse flies in areas where wildlife are the primary reservoir and human bites account for less than 20% of bloodmeals. This limitation suggests that NTBC might be most effectively implemented as part of an integrated vector control strategy.

According to the authors, "Our results provide evidence that NTBC could be used as an eco-friendly synergistic strategy alongside current tsetse control practices".

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