Antibacterial Substances from Larvae of Drosophila melanogaster

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The bottom part of the nutrient medium-filled test tube where Drosophila melanogaster larvae are kept doesn’t become moldy, while its upper part where adult flies are dwelling becomes moldy. In order to clarify a possible mechanism of suppressing bacterial proliferation in nutrient agar by fly larvae, materials covering larval body surfaces were precisely analyzed. Antibacterial property of fly larvae was clearly exhibited in agar plates supplemented with Micrococcus luteus, a gram-positive bacterium, where fly larvae had been kept. In agar plates where proliferation of Micrococcus luteus was suppressed by fly larvae, colonies of a Genus bacillus bacterium were formed. Since some Genus bacillus bacteria are known to produce antibiotics against gram-positive bacteria, it is highly probable that an antibacterial property came from the Genus bacillus bacterium detected in the agar where fly larvae were kept. In the next experiment, it was found that proliferation of Micrococcus luteus was significantly suppressed by adding materials covering larval body surfaces into the culturing medium of Micrococcus luteus. As these material samples were completely heat-sterilized, the larvae might have another antibacterial substance excreted out of their bodies. These results strongly suggested that Drosophila melanogaster larvae protected their lives by keeping an antibiotics-producing Genus bacillus bacterium in and around their bodies and by excreting an antibacterial heat-resistant substance from their bodies. Identification and isolation of a new antibiotic and a new antibacterial substance from Drosophila melanogaster larval bodies will surely add another progress to our biomedical research.

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