

Identification of Odoriferous Compounds from Adults of a Swallowtail Butterfly, *Papilio machaon* (Lepidoptera: Papilionidae)

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Adults, particularly males, of a papilionid butterfly, *Papilio machaon hippocrates*, emit a fairly strong scent perceivable by humans. We have identified a variety of volatile compounds (hydrocarbons, alcohols, aldehydes, ketones, esters, and so on) from the wings and bodies of both sexes of the butterfly. Male wings secreted *n*-dodecane, linalool and geranylacetone as major components together with small amounts of camphene, limonene, *p*-cymene, 2-phenylethanol, *n*-hexanal, *n*-decanal, isoamyl acetate, *p*-allylanisole, 2-pyrrolidone and other characteristic volatiles. The overall profile of volatile compounds detected from male body was quite different from that of the wings. Male body was devoid of camphene, 2-phenylethanol, *n*-hexanal but instead contained limonene, acetoin, a sesquiterpene hydrocarbon (C₁₅H₂₄), methyl *n*-octanoate, (*E,E*)-hepta-2,4-dienal, and another isomer of heptadienal as principal components, of which the last four compounds were specific to the body. All these substances seem to concurrently characterize the male odor. The chemical patterns of compounds found from female wings and body were essentially the same in quality as those of male wings and body, respectively, although their quantities in females were generally smaller than in males. Females, however, had a larger amount of acetamide than males. The chemical compositions of volatiles from the fore and hind wings of males were not greatly different from each other, and every component was considered to be present on all parts of the wings. This suggests that the scent-producing organs or scent-emitting pores are widely distributed on the whole wings. EAG responses of both sexes to 12 selected compounds identified from the butterfly were not strong at a dose of 1 µg, while both sexes showed relatively stronger responses to *n*-nonanal, methyl *n*-octanoate, D-limonene and linalool at a higher dose (10 µg). Although sexual difference in EAG response was not prominent, females appeared a little more sensitive, and *n*-nonanal and acetoin evoked significantly higher responses from females at 1 µg.