

# Exocrine Secretions of Wheel Bugs (Heteroptera: Reduviidae: *Arilus* spp.): Clarification and Chemistry

Jeffrey R. Aldrich<sup>a,b,\*</sup>, Kamlesh R. Chauhan<sup>c</sup>, Aijun Zhang<sup>c</sup>, and Paulo H. G. Zarbin<sup>d</sup>

<sup>a</sup> Affiliate Department of Entomology, University of California, Davis, CA, USA

<sup>b</sup> J. R. Aldrich consulting LLC, 519 Washington Street, Santa Cruz, CA 95060, USA.  
E-mail: drjeffaldrich@gmail.com

<sup>c</sup> USDA-ARS Invasive Insect Biocontrol & Behavior Laboratory, 10300 Baltimore Avenue, Bldg. 007, rm301, BARC-West, Beltsville, MD 20705, USA

<sup>d</sup> Universidade Federal do Paraná, Departamento de Química, Laboratório de Semioquímicos, CP 19081, 81531-980, Curitiba – PR, Brazil

\* Author for correspondence and reprint requests

Z. Naturforsch. **68c**, 522–526 (2013); received August 21/November 6, 2013

Wheel bugs (Heteroptera: Reduviidae: Harpactorinae: *Arilus*) are general predators, the females of which have reddish-orange subrectal glands (SGs) that are eversible like the osmeteria in some caterpillars. The rancid odor of *Arilus* and other reduviids actually comes from Brindley's glands, which in the North (*A. cristatus*) and South (*A. carinatus*) American wheel bugs studied emit similar blends of 2-methylpropanoic, butanoic, 3-methylbutanoic, and 2-methylbutanoic acids. The *Arilus* SG secretions studied here are absolutely species-specific. The volatile SG components of *A. carinatus* include (*E*)-2-octenal, (*E*)-2-nonenal, (*E*)-2-decenal, (*E,E*)-2,4-nonadienal, (*E*)-2-undecenal, hexanoic acid, 4-oxo-nonanal, (*E,E*)-2,4-decadienal, (*E,Z*)-2,4- or (*Z,E*)-2,4-decadienal, and 4-oxo-(*E*)-2-nonenal; whereas in *A. cristatus* the SG secretion contains -pinene, limonene, terpinolene, terpinen-4-ol, thymol methyl ether, -terpineol, bornyl acetate, methyl eugenol, -caryophyllene, caryophyllene oxide, and farnesol. *Arilus* spp. SG secretions may be sex pheromones, but verification of this hypothesis requires further testing.

*Key words:* *Arilus*, *Halyomorpha*, Pheromone