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Benzoquinones in the Defensive Secretion of *Leichenum caniliculatum variegatum* (Coleoptera: Tenebrionidae)[1]

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Like many other members of the family Tenebrionidae, *Leichenum caniliculatum variegatum* (Klug)[3] possesses abdominal defensive glands. When a leg of this beetle is pinched, the insect responds by everting a pair of glandular sacs from the tip of its abdomen and applying a dark, odorous secretion to the site of the attack. So that the components of this secretion might be determined, specimens of the *Leichenum* were collected as they came to a lighted sheet on the grounds of the Archbold Biological Station near Lake Placid, Florida.

Analogy with the defensive secretions of other tenebrionids (Roth and Eisner 1962, Schildknecht 1963) suggested that the secretion might contain quinones. To test this possibility, 4 *Leichenum* were caused to evert their defensive glands directly into a drop of 2,4-dinitrophenylhydrazine reagent (Vogel 1956). This solution was evaporated almost to dryness and the chloroform-soluble derivatives were spotted onto Eastman Chromatogram Sheets. After multiple development in ethylene dichloride-hexane (1:1), the chromatograms were exposed to ammonia vapor. On the basis of both the characteristic colors and the migration rates, derivatives of *p*-benzoquinone, methyl-*p*-benzoquinone, and ethyl-*p*-benzoquinone were identified in the chloroform-soluble material (Fig. 1).

The presence of quinones was confirmed by infrared spectroscopy of a methylene chloride extract of several hundred beetles. The concentrated extract showed the usual carbonyl absorption of *p*-benzoquinones (6.05μ), in addition to peaks at 11.02μ and 12.0μ characteristic of ethyl-*p*-benzoquinone and at 9.2μ and 12.35μ suggestive of methyl-*p*-benzoquinone.

The pronounced odor of the secretion indicated the presence of additional components such as have been found in the defensive secretion of *Eleodes longicollis* LeConte (Chadha et al. 1961, Hurst et al. 1964, Meinwald and Eisner 1964), but the limited number of *Leichenum* available for this study did not permit investigation of such components.

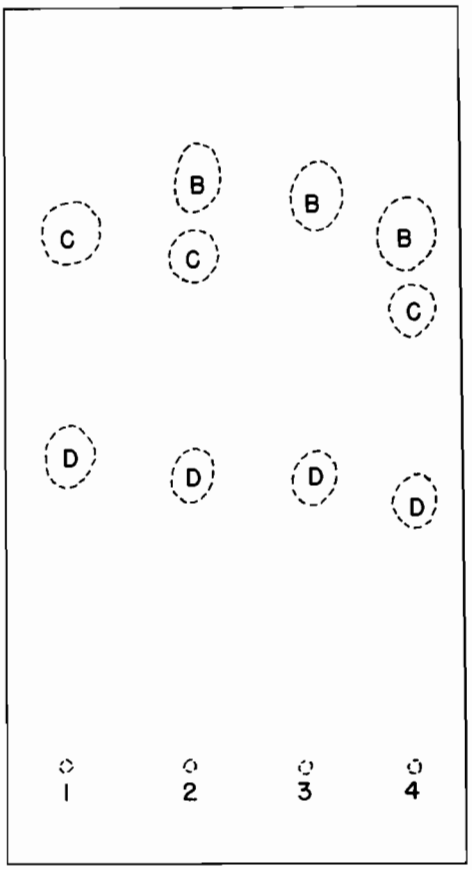

FIG. 1.—Thin-layer chromatogram of 2,4-DNP-quinone derivatives. 1, *p*-benzoquinone and methyl-*p*-benzoquinone. 2, *Leichenum* secretion, showing *p*-benzoquinone, methyl-*p*-benzoquinone, and ethyl-*p*-benzoquinone. 3, *p*-benzoquinone and ethyl-*p*-benzoquinone. 4, *p*-benzoquinone, methyl-*p*-benzoquinone, and ethyl-*p*-benzoquinone. (B = greenish; C = bluish; and D = reddish, when exposed to ammonia.)

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