afforded the corresponding ester (V) along with a small quantity of an unidentified compound m.p. 121°. All the compounds gave expected C, H analysis and IR- and NMR-spectra. The ester (V) on reduction with lithium aluminium hydride afforded the corresponding primary alcohol (VI) which on oxidation with manganese dioxide afforded the aldehyde (VII, semicarbazone m.p. 167°). This aldehyde on Wolff Kishner reduction afforded a quantitative yield of 1,6-dimethyl-4-ethyl naphthalene (III m.p. and mixture m.p. with the TNB complex of an authentic sample of III, 135°).

It is interesting to note that when the acid (IV) was subjected to dehydrogenation with selenium at 280° most of it invariably escaped and was deposited on the cooler surface of the apparatus. The reacted material after 20 h was again found to be the same mixture of the two naphthalenes (II and III). The acid (IV) thus represents the second example where a carboxyl group is reduced to a methyl during selenium dehydrogenation.

Zusammenfassung. Neue Befunde zur Interpretation der Selendehydrierung.

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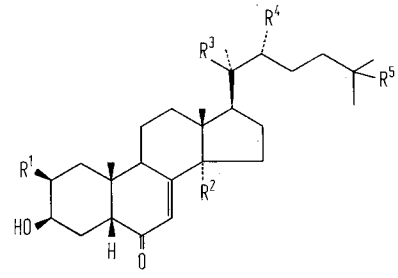
Biological Activity of Synthetic Moulting Hormone Analogues in the Blowfly *Calliphora stygia*

An early study[1] of the biological activity of synthetic ecdysone analogues with fewer hydroxy groups than α-ecdysone (I) indicated that such compounds are of greatly reduced biological activity. However, our observation[2] that the 2-deoxy compounds (II) and (III) are as active in the *Calliphora* bioassay as β-ecdysone (IV) has led us to examine the activities of other less hydroxylated 2-deoxyecdysone analogues for comparison with those of several 2-hydroxy analogues. It was found that 2, 22, 25-trideoxy-α-ecdysone (V)[3] showed remarkably high activity (see Table). Even the simple ketol (VI)[3] showed a response, though much weaker. The 5α-analogues of these compounds were inactive. Surprisingly 22, 25-dideoxy-α-ecdysone (VII)[4] is less active than (V) indicating that the presence of the 2-hydroxy group actually reduces the activity. The analogues (VIII)[5] and (IX)[5] with additional side-chain hydroxyls were also less active than (V).



	R^1	R^2	R^3	R^4	R^5
(I)	OH	OH	H	OH	OH
(II)	H	OH	H	OH	OH
(III)	H	OH	OH	OH	OH
(IV)	OH	OH	OH	OH	OH
(V)	H	OH	H	H	H
(VI)	H	H	H	H	H
(VII)	OH	OH	H	H	H
(VIII)	OH	OH	H	H	OH
(IX)	OH	OH	H	OH	H

Biological activity in the *Calliphora* bioassay of ecdysone analogues compared with β-ecdysone

Compound[a]	Concentration (%) required to produce 60–70% response	Relative activity
(IV) β-ecdysone	0.001	1
(V) 2,22,25-trideoxy-α-ecdysone	0.003	1/3
(VI) 2,14,22,25-tetradeoxy-α-ecdysone	0.1	1/100
(VII) 22,25-dideoxy-α-ecdysone	0.01	1/10
(VIII) 22-deoxy-α-ecdysone	0.02	1/20
(IX) 25-deoxy-α-ecdysone	0.01	1/10

[a] Administered as a 3 µl dose of aqueous solution containing Tween 80 (5%) and ethanol (5%).

The high activity of (V) could be due to its effectiveness as a moulting hormone per se or, perhaps more likely, to its more efficient metabolism to β-ecdysone in the test abdomens than 2-hydroxy analogues. It is thus likely that biosynthesis of β-ecdysone in *Calliphora* proceeds through 2-deoxy intermediates at the early stages of the pathway[6].

Résumé. L'activité biologique de la 2, 22, 25-trideoxy-α-ecdysone chez *Calliphora* est plus élevée que celle de toutes les substances analogues examinées.

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[1] P. Hocks, A. Jäger, U. Kerb, R. Wiechert, A. Furlenmeier, A. Fürst, A. Langemann and G. Waldvogel, Angew. Chem. int. edn; *5*, 673 (1966).

[2] Y. K. Chong, M. N. Galbraith and D. H. S. Horn, Chem. Commun. *1970*, 1217.

[3] Prepared from the 5α-epimer by base catalyzed equilibration and separation of the epimers produced by alumina chromatography.

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