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PULCHELLINS-*C* AND -*E* IN *GAILLARDIA ARISTATA*

DAVID R. MITCHELL and R. OWEN ASPLUND
Department of Chemistry, University of Wyoming, Laramie, WY 82070, U.S.A.

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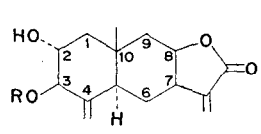
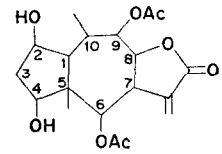
Key Word Index—*Gaillardia aristata*; Compositae; sesquiterpene lactones; pulchellins.

Plant. Gaillardia aristata Pursh. Voucher specimen No. ROA 71-17 (RM) deposited in Rocky Mountain Herbarium. Occurence. Western North America. Two sesquiterpene lactones were isolated from the voucher collection which proved to have physical and spectral properties identical with those of pulchellins-*C* (I) and -*E* (II).[1,2] These compounds have not been previously reported to be present in this species. Examination by TLC of other stands of this species indicates a very similar content of lactones in those distributed geographically to the north, east and west to a distance of approximately 70 km. However, stands about 27 km to the south have quite a different lactone content and probably contain mainly spathulin (III) as has been previously reported for Colorado species.[3,4] This would support the existence of a chemical race of quite extensive distribution which is distinct from others of this species.[4,5]



(I) R = H
(II) R = Ac



(III)

EXPERIMENTAL

Whole plants were collected near Centennial, Albany County, Wyoming and extracted after Herz *et al.*[1,3,4] Other stands having very similar TLC patterns of lactones were collected near Wheatland, Rock River, Garrett, Encampment and Cheyenne, Wyoming. Stands of the same morphology but having a very different TLC pattern were collected near Tie Siding, Wyoming and Red Feather Lakes and Glendevey, Colorado.

Physical and spectral criteria for identification of the compounds were m.p., opt. rot.; and IR, NMR and MS.

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[1] HERZ, W. and ROY, S. K. (1969) *Phytochemistry* **8**, 661.
[2] YOSHIOKA, H., MABRY, T. J., DENNIS, N. and HERZ, W. (1970) *J. Org. Chem.* **35**, 627.
[3] HERZ, W., RAJAPPA, S., LAKSHMIKANTHAM, M. V., RAULAIS, D. and SCHMID, J. H. (1967) *J. Org. Chem.* **32**, 1042.
[4] HERZ, W., SUBRAMANIAM, P. S. and GEISSMAN, T. A. (1968) *J. Org. Chem.* **33**, 3743.
[5] HERZ, W. personal communication.