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## A Taxonomic Study by Chemical Differentiation of the Genus *Artemisia*

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Identification of the hypothalamic melanophore-stimulating substance is still to be determined. Localization of the source of this substance in the brain of the adult salamander may cast some light on this subject. Certainly the extensive work of Judson Herrick on, "The Brain of the Tiger Salamander", as well as Paul G. Roofe's work on the circulation of the brain in this animal will aid significantly in localizing the area of activity of this melanophore-stimulating substance in the brain.

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A Taxonomic Study by Chemical Differentiation of the Genus Artemisia  
Alvin Young  
University of Wyoming  
Project Number 128

Work this past summer has involved a study of the chemical composition of sagebrush and how this composition varies within species. The particular area in and around Teton County was selected because of the availability of eight distinct types of Sagebrush.

1. A. arbuscula subsp. arbuscula - (Low Sagebrush)
2. A. arbuscula subsp. thermopola - (Hotsprings Sagebrush)
3. A. longiloba - (Alkali Sagebrush)
4. A. cana subsp. cana - (Silver Sagebrush)
5. A. cana subsp. viscidula - (Mountain Silver Sagebrush)
6. A. tridentata subsp. vaseyana - (Big Sagebrush)
7. A. tridentata subsp. vaseyana f. spiciformis - (Subalpine Sagebrush)
8. A. tripartita subsp. tripartita - (Threetip Sagebrush)

Leaf and flower extracts were prepared in ethanol. Two drops of the extracts were then applied to thin layers (Silicon oxide) chromatographic plates. The prepared plates were then run in a 65:30:5 solvent of n-propanol, water, and ammonium hydroxide. While the plates were still wet they were examined under ultra violet light and all fluorescent spots were marked off and  $R_f$  values determined.

Results showed that each of eight species varied distinctly both in color and number of fluorescent spots. Variations in complexes and forms were obvious. It was found also that these spots varied only slightly when examining a given population, and where variation occurred, it was found that these plants were different morphologically as well as chemically. In some cases these abnormal plants could be shown to be hybrids between two known species, i.e. A. tridentata subsp. vaseyana X A. cana subsp. cana, in this particular case the resultant proved to give the same chromatographic patterns as those obtained for A. tridentata subsp. vaseyana f. spiciformis.

Attempts are now underway to examine a given species over a variety of growth stages, and soil conditions. As a result of this summer's work, it is felt that this chromatographic method will prove to be more valuable as a means of examining populations rather than as a sure method of taxonomy.

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Plant Ecological Studies in Grand Teton National Park  
John H. Rumely  
Montana State University  
Project Number 123

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