

AN ECOLOGICAL CONTRIBUTION TO THE TAXONOMY OF ARTEMISIA

A. A. BEETLE

Beetle (1960) recognized three species of *Artemisia* (*A. arbuscula*, *A. nova*, and *A. longiloba*) as distinct because they were "distinguishable on the basis of morphology, distribution, and ecology in addition to being reasonably disjunct." Holmgren and Reveal (1966) in a checklist recognized only one species, *Artemisia arbuscula*. This they divided into ssp. *arbuscula* (with *A. longiloba* as a synonym) and ssp. *nova* implying that these taxa are not as distinct as maintained by Beetle.

In recent years the woody species of *Artemisia* have been studied intensively both in the field and in the herbarium. Most of the field work has resulted from the emergence of a new field of science, range management. Woody species of sagebrush are unproductive in terms of domestic animal carrying capacity, and because various taxa respond differently to chemical spraying, to protection, to burning, to various degrees of ungulate grazing and to mechanical treatments they have received much attention.

Range managers have been able to describe differences in phenology, and in edaphic distributions. This remarkably productive area of field observation, carried out in at least five different states and by independent workers representing different institutions and using varying research techniques, has resulted in a western consensus about the number of species and the degree of subspecific variation.

Passey and Hugie (1962) recognized *A. arbuscula* (low sagebrush), *A. nova* (black sagebrush) and *A. longiloba* (alkali sagebrush) as species. They described the different soils on which each occurs "on the foothills and plains of the Great Basin."

Robertson, et al. (1966) found that "in North Park, Colorado, the alkali sagebrush (*A. longiloba*) plant community stands out in sharp contrast from adjacent sagebrush range." In a similar study of sites in Wyoming, Thatcher (1959) found *A. nova* equally distinct on its own site. In Nevada Zamora (1968) found *A. arbuscula*, *A. longiloba* and *A. nova* distinct.

In Oregon, Gates (1964) recognized leaf defoliating moths as occurring on both *A. nova* and *A. arbuscula*.

Young, et al. (1963) studied chemically the three species in question as they occurred in Wyoming and recognized all three as distinct. A similar study in Nevada (Holbo and Mazingo, 1965) achieved similar results. More recently, in Idaho, Winward and Tisdale (1969) have agreed with both Young and Holbo.

There may be an explanation for the fact that floral lists usually disagree with the conclusions of field workers. Often field identification of sagebrush is definitive, but the same plant on a pressed specimen in the herbarium may be quite confusing. Field students are largely concerned with mapable units of vegetation and study pure stands. Collectors who contribute to herbaria are more likely to be concerned with variation. Variation is easy to find since all species hybridize when given the opportunity. These hybrids have a longer survival value in the herbarium than they do in the field. Herbarium material of the woody species of *Artemisia* does not reflect accurately the field situation. In the herbarium the percentage of sheets representing hybrid variants is much higher and relatively more significance is placed on them because of the taxonomic difficulty of pigeonholing such specimens.

While most of the species in this section of *Artemisia* are old, conservative, and derived from diploid populations (e.g., *A. nova* and *A. longiloba*), some of the entities (e.g., *A. arbuscula*) are synthetic. Unless these differences are understood the taxonomic treatment may fail to reflect the true situation.

Eventually the two groups (field ecologists and herbarium taxonomists) will find a common meeting ground but for the present, it may be expected that a difference in taxonomic treatment of the same group of plants will continue.

Range Management, University of Wyoming

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