Eskimo Uses of *Artemisia tilesii* (Compositae)¹

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A plant used by the southwestern Alaskan Eskimos for treatment of skin infections, chest colds and arthritis was identified as *Artemisia tilesii* Ledeb. (Compositae). The volatile constituents of this plant were identified as an 80:20 mixture of thujone and isothujone. Isothujone has codeine-like properties, which may help arthritic pain.

The Yupik Eskimos of southwestern Alaska have only a few herbal remedies (Nelson, 1899). This is undoubtedly due in part to the limited flora of the tundra on which they live. The tundra area of the Yukon and Kuskokwim River delta region consists of low-lying marsh, shallow lakes, willow brush, occasional spindly spruce, and an abundance of berry bushes. Discontinuous permafrost underlies the country, accounting for the abundance of wetland. Rarely does the country rise more than 100 ft above sea level.

This country and its waters support good numbers of fish (salmon, lingcod, whitefish), some large game and sea animals (moose, bear, seal) and many small game animals (beaver, mink, muskrat, mice). The Eskimo diet consists primarily of fish and game. Some wild plants and berries are also eaten. Practical treatment of disease reflects this reliance on fish and game. Seal oil, beaver castor, fox fat, otter dung and human urine are popular remedies (Kelly, 1974; Michael, 1967; Spencer, 1959). Occasionally herbal remedies are used, but unless these items are in season or have been stored for the purpose, they are not readily available.

*Artemisia tilesii* Ledeb. (Compositae) is one of the few plants employed by the Eskimos for medicinal purposes. It is used in a fresh state and is also dried and stored for use in the off seasons. Yupik Eskimos, living along the Kuskokwim River, use this plant for skin infections and for relief of joint pain (Oswalt, 1957; Lantis, 1959). The Inupik Eskimos of northern Alaska are reported to use *A. tilesii* for similar purposes (Anderson, 1939). Besides the two uses mentioned above, the Yupik Eskimos, living along the Yukon River, use the plant for treatment of chest colds.

*Artemisia tilesii* grows profusely around many southwestern Eskimo villages. This plant has numerous, small, greenish-brown, button-like composite flower heads on very tall, branched, spikes. Its leaves are large, much-dissected, toothed, glabrous above and tomentose beneath (Hultén, 1968). This plant and its uses were brought to the attention of one of the investigators (T.O.), an anthropologist and nurse, while she was carrying on a population genetics study.

The first use observed was as follows: fresh leaves of *Artemisia tilesii* were boiled in water until they became a green pulp. This thick, green pulpy solution was used to soak the severely infected hand of a young child. The investigator inquired about the child’s infection and the treatment being given. The child was soaking her hand in this solution, three or four times a day. The investigator was
delighted to see a native remedy being used, but made a mental note to check on the child in a day or two, to see if antibiotics might be needed. Two days later, the infection had cleared up, much faster probably, than with most antibiotics. This alerted the investigator to inquire about and further observe the uses of the plant.

In the next several weeks, it was observed that the plant was successfully used to treat impetigo of the face and scalp, an infection on the inside of the nose and an infection of a fingernail bed.

Specific inquiry regarding its use, verified this topical use for infections. Other common uses, which the investigator was not able to observe, were: 1. boiling the fresh or dried leaves for 30 minutes, straining the mixture and taking a few teaspoonsful for chest colds, several times a day; 2. flailing arthritic joints with the leafy stalks after taking a sauna. This was said to relieve joint pain.

MATERIALS AND METHODS

Air dried *Artemisia tilesii* (Voucher specimen is deposited in the University of Utah Herbarium [UT]), gathered by Eskimos and mailed from two lower Yukon villages, was prepared by pentane extraction followed by a closed system, vacuum bulb to bulb distillation (Noble and Epstein, 1977). This method was used instead of the steam distillation technique which can cause degradation or rearrangement of some labile components.

The volatile materials were initially analyzed by gas chromatographic-mass spectroscopic technique (Epstein et al., 1976). The gas chromatography trace was extremely simple with greater than 95% being an 80:20 mixture of two close peaks. The gas chromatographic-mass spectroscopic study suggested a thujone-isothujone mixture, which was confirmed by isolation of each compound via preparative gas chromatography and comparison of the respective spectral properties (infrared, proton nuclear magnetic resonance) with known material. The remaining volatile material was a complex mixture, with no component being greater than 1%. Cineole, camphor and artemisia ketone were implied by the gas chromatographic-mass spectroscopic study and positively identified by isolation and comparison with known compounds. It is of interest to note that the gas chromatographic trace is virtually identical to that from the volatile portions of another *Artemisia* species, *A. tridentata* subsp. *vasyana* (Rydb.) Beetle.

A typical isolation is given: air-dried (165 g) *Artemisia tilesii* was extracted in a soxhlet system with pentane for 4 days, the pentane evaporated in vacuo to give a yellow oil. A closed system, vacuum transfer (0.005 mm Hg) yielded a colorless oil containing some pentane. Preparative gas chromatography (10 ft, 5% Carbowax 20M column at 110°) gave 82 mg of a two component (80:20) mixture which was rechromatographed and thujone and isothujone identified by comparison with known compounds. Trace amounts of cineole, camphor and artemisia ketone were isolated by preparative gas chromatography and compared with known samples.

Other nonvolatile material was not studied because facilities were not available. We are attempting to find a laboratory interested in testing for anti-infective and anti-inflammatory properties, which are the main activities mentioned by the Eskimo informants.