

A SUMMARY OF A SURVEY OF THE LITERATURE: TRIPTERYGIUM WILFORDII HOOK

Tripterygium wilfordii Hook, "The Thunder God Vine", is a perennial twining vine of the Family Celastraceae. It is cultivated extensively in several south eastern provinces of China, especially in Chekiang Province. Chinese horticulturists have used the root bark of the the plant as an insecticidal powder for centuries. In 1931, T. wilfordii came to prominence when the chinese experts were asked to study the plant after it became the center of a disagreement between the horticulturists who resided on the hills, cultivated the plant and harvested by digging, and the land owners who lived in the valley below and suffered from the inevitable erosion resulting from the digging.

(adapted from Swingle SCIENCE Jan 17, 1941 p 60)

In the decade to follow the 1931 incident, many researchers tested the toxicity of preparations of root bark on various insect species, both as a contact and stomach poison. Investigations concerning tripterygium were not limited to insects. Lo and Wong (CHINESE JOURNAL OF SCIENTIFIC AGRICULTURE Sept 1943 p 60-62) tested powdered root preparations as a vermifuge in chickens. Gaw and Wang (SCIENCE July 1, 1949 p 11-12) found preparations of T. wilfordii to be bacteriostatic to staphylococcus and nontoxic to human leucocytes. Chow and Mei (CHINESE JOURNAL OF PHYSIOLOGY 1936 p 529-34) injected a root bark preparation into white mice.

From the data at the National Herbarium, it is possible to establish a region where Tripterygium wilfordii and other species of tripterygium may be found. This region lies between 20 and 40 degrees north latitude and between 100 and 140 degrees east longitude. T. wilfordii occurs west of Shanghai and on the island of Formosa. T. regelii, considered by some to be very close to T. wilfordii has been found regularly on the Korean penninsula and southern Japan.

Also, the Nursery of Hesse, East Friesland, W. Germany, the Botanic Garden, Koishi Kawa, Tokyo, the Arboretum of the Barnes Foundation, Merion, Pa., the Arnold Arboretum, and the Plant Introduction Station, Glen Dale, Md., have plants in cultivation.

With emphasis on T. wilfordii as a source of a new insecticide, attempts were made to grow the plant at the plant introductions stations in the United States. This project was mostly unsuccessful due to climatic conditions. From established plants, chemical analysis of the active compounds began. Most of this work was done by Beroza at the Bureau of Entomology and Plant Quarantine, Beltsville, Md., during the years 1950-63. From a root bark preparation, Beroza isolated four similar alkaloids with high atomic weights, named wilfordine, wilforine, wilforgine, and wilfortrine, and occurring in respective percentages of 44%, 25%, 13%, and 7%. (AMERICAN CHEMICAL SOCIETY JOURNAL Jan.5, 1953 p 44-49) The effectiveness of the individual alkaloids as insecticides became known through the work of Beroza and Bottger (JOURNAL OF ECONOMIC ENTOMOLGY Feb. 1954 p 188-9) who found that on select insect species, wilforine and wilfordine were 100% effective over a three-day period while wilforgine and wilfortrine were 54% and 73% effective over the same period. Investigations brought out the fact that the alkaloids were much too complex to make synthesis profitable for use as an insecticide, and interest in T. wilfordii declined. (CONVERSTATION with BEROZA Sept. 24, 1971).