



United States
Department of
Agriculture

Agricultural
Research
Service

Beltsville Area
Beltsville Agricultural
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Beltsville, Maryland
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November 4, 1991

Dr. Kenneth Snader, Ph.D.
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Dear Ken:

The taxonomic key to the species of *Taxus*, which I gave to you during your visit to my office (Oct 31), needs work before it can be published. This is especially true of the cultivated species, Eurasian species, and the unrecognized taxa in the Pacific Northwest. Sometime ago I submitted a key for the North American species north of Mexico to one of the editors of the *Flora of North America*, John Thieret, who has since indicated that they will not use the information because they prefer not to use microscopic or anatomical characters in their taxonomic treatments (of vascular plants). I am not sure just how they will identify the American species on the basis of gross morphology; I have seen herbarium specimens of *Taxus baccata* identified as *Taxus canadensis*, possibly assumed to be native because the collector did not state on the herbarium label that the plant was cultivated. Also a nursery in Beltsville sells "Pacific yew", "*Taxus brevifolia*," but I was able to identify it as *Taxus baccata* on the basis of my unpublished work employing anatomical characters.

I became involved in the taxonomy of Taxaceae because I was asked to supply samples of Taxaceae species. More than a year ago Dave Kingston asked me to submit a list of species of the Taxaceae as prospects for collection for a proposed chemical analysis study. Similarly, Ching-jer Chang requested samples of all Taxaceae for analysis of taxol content. A number of samples that I have collected for you and them were identified as *Taxus* sp. Dr. Chang complains when he receives an identification only to genus. I complain when someone expects me to resolve the identification without an accounting of the amount of effort that is required. Sometimes, in working with natural product chemists through meetings and correspondence, I get the impression they feel that all plants have been clearly described, and if a botanist can not provide a species name, it is because he or she does not have the literature and specimens at hand, or an understanding of the taxonomic information in the literature. But as you probably realize through your experiences with *Taxus*, the species concepts are not always that clear. One can probably get away with identifying a single sample of a cultivar of *Taxus* as *T. baccata*, but when it comes to collecting all species in the family, then the species must be clearly defined from one another in order for the experimental results to be meaningful. Many scientists (horticulturalists, chemists, geneticists, etc.) simply put names on samples without references, or fail to describe how the organism is distinguished, and in many cases they do not bother to prepare or cite voucher specimens (e.g., authors of papers in the *Journal of Natural Products*).

Taxus is in serious need of revision, and in considering the importance of maintaining a supply of taxol to cancer patients who are in desperate need, the taxonomy of the Taxaceae might also receive a monetary boost to speed up its resolution.

I have done a lot work on the taxonomy of Taxaceae outside the USDA, evident in the key that I left with you. I have made some discoveries in the field, and these, along with my findings from a study of herbarium specimens at US, (Smithsonian Institution) NA (National Arboretum), HSC (Humboldt State University), and at F (Chicago Museum of Natural History), were given to you without charge.

A revision of the Taxaceae might be pursued in the ARS Systematic Botany Laboratory. Since species of *Taxus* are economically important, taxonomic research on this genus would fall within the laboratory's mission. An economic botanical monograph of *Taxus* was proposed more than 20 years ago within the New Crops Research Branch of ARS; Robert Perdue suggested that Lloyd Spetzman do this work. Lloyd has since retired and passed away. I would now hope to be the one to continue this assignment.

If funding a revision of the Taxaceae is temporary, then the money would probably go to an existing CRIS unit, and some other person's name would be assigned to the project since I am not an SY. This would not exclude me from doing the work. However, an SY position could also be created if a long term need exists. The most logical place would be in the Systematic Botany and Mycology Laboratory under the research leadership of Amy Rossman (301-344-3364). In my position as a support scientist, it is not what I can do, but what my slot can do for ARS that counts! If you wish to learn more about possible organizational scenarios, you might contact Henry Shands in the National Program Staff (301-344-3311).

I might add that Jim Duke, in another laboratory, has expressed interest in sampling BARC yews, systematically, to identify germplasm with high taxol content, and he may also wish to be involved in the taxonomic revision.

Sincerely yours,

Richard Spjut
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cc:

G. Cragg
J. Duke, with *Taxus* key and Notes
A. Rossman, with *Taxus* key and Notes
H. Shands, with *Taxus* key; reprints of *Economic Botany* 39: 266-288
(1985), "Limitations of a Random screen: Search for New Anticancer
Drugs in Higher Plants"; *Chemical & Engineering News* "Scientists
Mobilize To Increase Supply of Anticancer Drug Taxol" (Sep 2, 1991)