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A NOMENCLATURAL NOTE IN THE GENUS TRAGOPOGON*

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While examining specimens of the genus *Tragopogon* (Goatsbeard) occurring in Ontario, it was found that in the species with lemon-yellow ligules (*T. major* Jacq. in the recent edition of Gray's Manual, and *T. dubius* in the new Britton and Brown "Illustrated Flora" 1952) there was great variation in the size of the plants, the amount of branching, the size of the heads, and the number of involucral bracts. The plants varied from 15 to 76 cm. in height; some were single-stemmed, while others were almost bushy in character; the mature heads ranged from 2.5 to 7.5 cm. in diameter, and the number of involucral bracts varied from 8 to 13.

The question arose whether these were all *T. major* as described by Jacquin, whether some were *T. major* and others the *T. dubius* of Scopoli, whether the variations should be considered as sub-species of *T. dubius* as recognized by some European authors or whether they all should be classified simply as *T. dubius*. Shinners has argued for the use of *T. major* as the name for our species, but his inferences concerning the specific distinctness of the original *T. dubius* do not seem to be clearly established.

Recourse to Hegi's "Illustrierte Flora von Mittel–Europa" did not help to solve these difficulties. Hegi's description of *T. dubius* ssp. *major* and his fig. 732 do not agree, and the identity of the figure is doubtful. It is not similar to Jacquin's illustration of *T. major*, nor to the plants growing in this province which we believe to be similar to Jacquin's species. Furthermore, Hegi's

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fig. 733a of *T. dubius* ssp. *dubius* illustrates the larger plants which are growing in Ontario (fig. 1a) and his fig. 733b is characteristic of the smaller plants (fig. 1b).

To clarify the nomenclature of the species and to determine the relationship, if any, between *T. dubius* Scop. and *T. major* Jacq., a review was made of the literature pertaining to the origin and use of the nomenclature by former authors. Also, information was assembled concerning the life history and ecology of the species to determine the effect of these on the nature of the plants. Considerable effort was made to obtain photographs of Scopoli's types, but after much correspondence with European herbaria, we were informed by Prof. R. Ciferri of the University of Pavia that most of Scopoli's types have been lost. It is realized, then, that the basic problem of the identity of Scopoli's *T. dubius* remains unsolved, and must remain so under these circumstances. The understanding of the species, therefore, must be based upon the interpretation of literature relating to this species.

Scopoli (1772) described *T. dubius* from material collected in the region of Trieste. From his brief description and an accompanying comparison with *T. pratensis*, the plant may be described as small, unbranched, somewhat flocculose, leaves flat, having no undulations on the margins and no curling of the tips of the blades; heads about 2.5 cm. in diameter; the ligules sulphur-colored and shorter than the involucral bracts.

In 1773, Jacquin, with greater detail, described and illustrated *T. major*. It did not differ essentially from *T. dubius* except for its greater size, its branching habit and larger heads.

For nearly 100 years European authors of floras used Jacquin's name *T. major* and placed *T. dubius* in synonymy. In 1859 Grenier stated that the specific name should be *T. dubius* because of the earlier publication of this name. Index Kewensis, 1895, reduced *T. major* to synonymy under *T. dubius* and in his "Flore de France," 1903, Coste used this nomenclature. About this time, botanists also began to take note of the two forms of the species and in 1908 Rouy, although retaining *T. major*, made a sub-species *dubius* to accommodate the smaller plants. *T. dubius* was taken up by Vollman, 1910, but in his "Flora von Bayern," 1914, he said only the ssp. *major* was

found in that area. This combination was followed by later German authors. Schinz and Thellung disagreed with Rouy that the smaller plants were a ssp. of *T. major*, and made the combination *T. dubius* ssp. *dubius*, and this nomenclature was included in the works of Schinz and Keller, and Hegi. From this literature review it would seem that *T. dubius* ssp. *major* was intended to cover large specimens of this species, and these seemed to be the more common in the areas covered by the floras: *T. dubius* ssp. *dubius* was used to indicate the smaller plants.

The species shows great plasticity, and this is particularly evident under varying environmental conditions. Where growing conditions are optimum, large vigorous plants are the most frequent; but where soil conditions are poor, or where normal growth is interrupted, e. g. by mowing of the roadsides, only depauperate plants occur. Where soil conditions are variable, as along road or railroad embankments, near gravel pits, or where only a part of a roadside is mowed, plants of both forms are to be found. Sometimes they may grade from extremely small plants to large plants.

Ownbey (personal correspondence) has found that the time of germination of the seeds is also a factor affecting plant characteristics. Seeds germinating in the spring may flower the same year, and the plants are annual and of the reduced type. If they germinate late in the season and survive the winter, they flower the following spring, but have not yet reached their greatest maturity and are therefore small in character. Ownbey has grown seeds of both large and small plants under similar conditions in experimental plots in the State of Washington, and the resulting offspring have been indistinguishable. In the absence of genetic factors that would cause the extreme variations that have been mentioned here, he is not inclined to assign taxonomic value to these differences.

From the literature reviewed, field studies, and genetical studies it appears that *T. dubius* Scop. and *T. major* Jacq. are identical, and that a separation into sub-species by Schinz and Keller, Hegi and others is unnecessary. Since *T. dubius* Scop. has priority, our lemon-yellow *Tragopogon* species should receive this name.

I wish to thank Dr. Reed C. Rollins, Director of the Gray Herbarium, and Dr. I. M. Johnston of the Arnold Arboretum for permission to use the library facilities of these institutions; Miss Marjorie Stone, Librarian of the Gray Herbarium for her generous assistance while working in the library; Dr. Marion Ownbey for reading the manuscript, and numerous helpful suggestions.—Department of Botany, Ontario Agricultural College, Guelph, Ontario.

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CHROMOSOME STUDIES IN KUHNIINAE (EUPATORIEAE). I. BRICKELLIA

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(*Continued from p. 321*)

It is considered that there has been consistency in the effects of temperature on meiotic coiling (Swanson, 1942). He found that both high and low temperature caused a greater than normal contraction of chromosome length. We cannot explain what caused one cell of *B. glomerata* in a Feulgen preparation to contract as much as many resulting from pretreatment with paradichlorobenzene in *B. microphylla*. Both gave evidence of the possibility of contraction of the chromosome length normal to these species, by chemical means. Thus it may be that by genic action the same has been accomplished under natural