SHORT COMMUNICATIONS

A NOTE ON THE SYSTEMATIC POSITION OF SANTONIN-CONTAINING ARTEMISIA OF KURRAM

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Statement of Qazilbash[5] that *Artemisia kurramensis* Qazilbash has been confused by me[1] with *Artemisia maritima* L and that my conclusion is arbitrary and not based on any original judicious scientific studies does not seem to be justified in the least. These remarks have necessitated a more detailed report on the results of my investigations which lead me to the conclusion that *Artimisia kurramensis* is not a new species different from *Artemisia maritima*. The author has worked on the systematic position of Kurram *Artemisia* at the herbaria of Royal Botanical Gardens, Kew and British Museum, London. The specimens investigated besides his own collection also included two specimens of Qazilbash's *Artemisia kurramensis* sent by him. On the basis of these investigations it has been established that Qazilbash's enthusiasm[7] to create a new species under the name of *Artemisia kurramensis* is not based on scientific facts. The perusal of his various publications[5-9] reveals his confused and shifting basis for creating this new species. He has split up santonin-containing and santonin-free plants growing side by side and hybridising freely as separate species in spite of his admission that no botanical distinction was made between the santonin-containing and santonin-free form of *Artemisia maritima* in the principal herbaria of Europe.[7]

According to Qazilbash[7] the santonin-containing species of the Kurram is characterised by the following diagnostic features.

(i) Leaves and flower heads are hoary and tomentose.
(ii) Involucral bracts 16 to 24 in number, the commonest number in typical cases is 22.
(iii) The usual number of florets is 3 in a capitulum. The colour of the corolla tube is yellow.
(iv) Apical marginal hairs are present on the involucral bracts.
(v) A well marked unbranched midrib is present in the bracts.

The author after his extensive observations on a large number of plants has failed to find any correlation between the above mentioned characters and presence of santonin in the Kurram plants. The leaves and flowers are hoary and tomentose in both the santonin-containing and santonin-free plants. The number of involucral bracts varies from 11 to 34 showing great variations from plant to plant and also within the same plant. The common number of flowers per capitulum is 3 but in the same plant it was found to vary from 2 to 6 in some cases. As far as the colour of the corolla tube is concerned the observations showed that only 84.7 per cent plants have yellow flowers and the rest have pinkish to purple tinge. Apical marginal hairs were generally found to be present on the involucral bracts in both santonin-containing and santonin-free plants. The well marked unbranched midrib in the bracts was observed in all the plants examined without any exception. In addition to the above mentioned characteristic features Qazilbash[8] also made distinction between santonin-containing and santonin-free plants on the basis of intensity of camphor like smell and colour of the stem but he does not make use of this as diagnostic feature in his subsequent publication.[7] In view of the above mentioned facts there seem to be no reliable morphological differences between the santonin-containing and santonin-free plants. In one of his later publications Qazilbash himself admits[6] that there are no reliable botanical features on the basis of which it is possible to distinguish the santonin-containing from the santonin-free *Artemisia*. In the same manner Shah has found[10] no correlation between the morphological characters and santonin. So it is clear that the mere fact that some plants contain santonin does not justify its being treated as a new species. This is specially so when it is known that santonin is not a reliable character as it shows great fluctuations in different stages of plant growth in the santonin-containing plants.

A comparison of the specimens of santonin-containing *Artemisia* from Kurram in the Herbaria of the Royal Botanical Gradens, Kew, and the British Museum, London, showed that these plants were in fact *Artemisia maritima* L. var. *fragrans* (Willd) Ledeb. This includes both the santonins containing and santonin-free plants of Kurram. *Artemisia maritima* is a very widely distributed species growing under extreme ecological conditions. The study of the morphology reveals great variations in the population of *Artemisia*

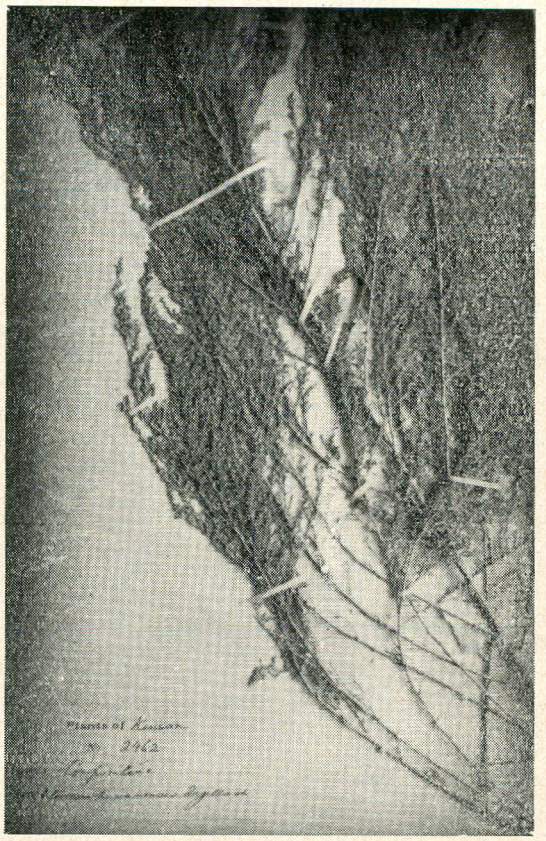

Fig. 1.—Santonin-containing *Artemisia* from Kurram named as *A. kurramensis* by Qazilbash and determined by the author to be *A. maritima* L. var. *fragrans* (Willd) Ledeb.

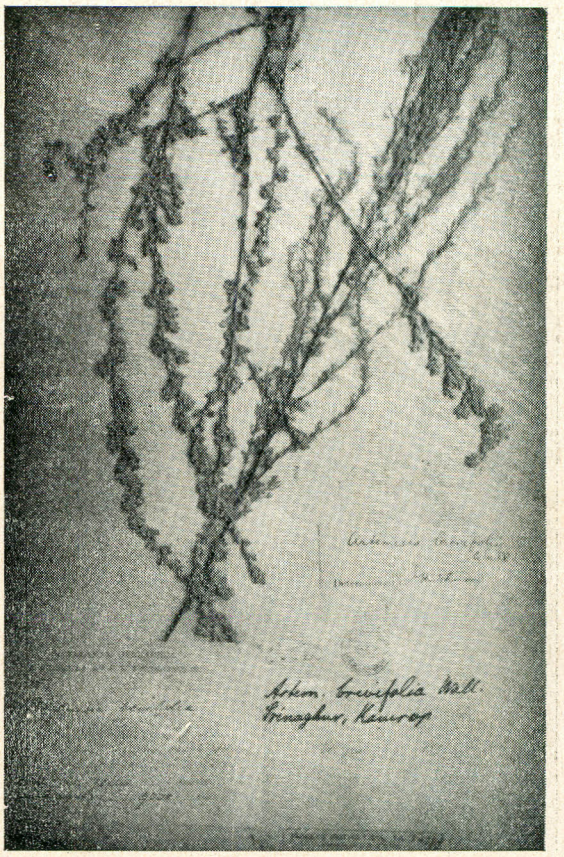

Fig. 2.—*A. maritima* L. var. *genuina* Ledeb. f. *suberecta* (Ledeb) Pamp. This specimen from the herbarium of Royal Botanic Gradens, Kew, was identified by Sir J. D. Hooker as *A. maritima*, L. and *A. brevifolia* Wallich was considered synonym by him.

maritima. This is probably due to apomixis, hybridization, polyploidy and mutations. Observations show that *Artemisia maritima* population in West Pakistan follows a definite pattern of variations with gradual transition from one type to the other. When specimens of *Artemisia maritima* from Baluchistan are compared with those from Gilgit, they look so different that it would seem natural for one not familiar with the full range of variations in *Artemisia maritima* to treat these as distinct species but on study of specimens from the intervening regions gradual transition from one form to the other can be observed. The variable nature of the population makes the taxonomic studies difficult. The only satisfactory way of dealing with such variable species is by experimental analysis when the exact relationship of the members of the various groups can be elucidated. The chromosome studies have already thrown some light on the possibility of *Artemisia maritima* being a single huge polyploid complex. [3, 11, 12] Weinedel and Polya have determined the basic somatic chromosome number of *Artemisia maritima* as 18.[2] So it is not true that *Artemisia maritima* in typical cases is a hexaploid as has been claimed by Qazilbash.[5] Suzuka[12] determined the chromosome numbers of both so-called species *Artemisia kurramensis* and *Artemisia brevifolia* from the seeds supplied by Qazilbash and found them to be diploid and tetraploid respectively with basic chromosome number as 9. According to Pampanini[4] the correct name of santonin-containing *Artemisia* of Gilgit is *Artemisia maritima* L. var. *genuina* Ledeb f. *suberecta* (Ledeb) Pamp and not *Artemisia brevifolia* Wall as stated by Qazilbash.[5] *Artemisia maritima* L. subsp. *monogyna* Waldst et Kit., which is a source of santonin in Japan, was found to be hexaploid with 54 chromosomes. According to Kawatani et al[3] santonin-free *Artemisia* from Kurram has 36 chromosomes. The somatic chromosome numbers of *Artemisia maritima* thus vary from 18 to 54 and the chromosome number alone has no basis for the separation of species. The following statement of Qazilbash[5i] tself clearly removes the confusion created unnecessarily

Fig. 3.—Specimen of *A. brevifolia* Wallich from the herbarium of British Museum, London, named as *A. maritima* L. var. *genuina* Ledeb. f. *suberecta* (Ledeb) Pamp. by Pampanini.

that *Artemisia kurramensis* is nothing but *Artemisia maritima*.

"It is interesting to note in this connection that hexaploids derived artificially from *Artemisia kurramensis* Qazilbash, on treatment with acenapthene resembled *Artemisia maritima* L. morphologically as well as genetically in all important respects. The artificially produced plants were sent to the Kew Botanic Gardens for confirmation. They were identified as similiar to *Artemisia maritima* L. (P. 68)". This statement of Qazilbash is self explanatory and even a person not connected with science of systemtic botany knows that mere change in the number of chromosomes does not justify creation of a new species. According to Qazilbash's own statements[5, 7] *Artemisia kurramensis* has never been recognised by the herbaria of the Royal Botanical Garden, Kew, and other principal herbaria of Europe. The fact that this name has been adopted by some pharmaceutical scientists without critically examining its validity does not make it a universally recoginsed valid species as claimed by Qazilbash.[5]

Pending the determination of the fixed nature of various varieties and subspecies of *Artemisia maritima* it is not desirable to split it into a number of species on the basis of unreliable contrasting characters like the presence or absence of santonin. On the basis of the above facts it is clear that santonin-containing *Artemisia* is just a variety properly named as *Artemisia maritima* L. var. *fragrans* (Willd) Ledeb. It is for the taxonomists to judge whether these investigations carried out at the herbaria of the Royal Botanical Garden, Kew, and the British Musuem, London, constitute judicious scientific studies or not. On the other hand one would wonder what led Qazilbash to create a new species without any valid basis.

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