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A REVIEW OF THE INDIAN RANUNCULACEAE

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The family Ranunculaceae includes many attractive plants of the cold temperate regions and the heights of tropical mountains. They are particularly characteristic of the moist habitats and aquatic environments, as for example, the marsh marigolds and the buttercups. Incidentally, *Ranunculus*, meaning 'little frog', was so named by Pliny alluding to the aquatic and marshy habitats of many of the members. The Himalaya, in our sub-continent, is one of the main centres of distribution of the family in the world and as many as 50% of the genera and about 10% of the species of the world's 50 genera and 1900 species are represented here. Hooker f. & Thomson (1872), in their account of the family in the Flora of British India, had described 114 species and about 30 infra-specific taxa from within the limits set for that Flora. Subsequent to the publication of this account, during the last one hundred years, many new species have been described, including one new genus, the dioecious *Paroxygraphis* and new knowledge has been gained about the extension of distribution of species already known. The taxonomic and nomenclatural aspects of several taxa have also undergone considerable revision as a result of critical studies. The present position is that there are as many as 174 species and about 27 infra-specific taxa belonging to 27 genera represented in our flora. Of these, only about 10% occur in the Peninsular region and belong to only 6 genera.

The history of the study of the family in 'ian region goes back to about 150 years when De Candolle (1824) published the monographic account of the family in his Prodromus. Royle (1834) included an account of 71 species, some of them new to science in his work on the Botany of the Himalayan Mountain. Many species which had been included earlier in Wallich's Catalogue were also validly described here. The next important treatment of the family for the Indian flora was in Hooker & Thomson's Flora Indica (1855) followed by the account in the first volume of Flora of British India (1872). The publication of the Flora of British India led to the preparation of provincial Floras which included accounts of the Ranunculaceae of the respective provinces. During the last decade of the 19th century, Paul Brühl (1892, 1896) described several new species and infra-specific taxa of the Indian Ranunculaceae as part of his comprehensive studies on the family. Finet & Gagnepain (1904-5) and Handel-Mazzetti (1929-36, 1939) have described several Ranunculaceae of importance to the Indian Flora. In recent years, the scientific expeditions in the Himalaya undertaken by botanists and others from the United Kingdom, Germany, Switzerland, Japan and other countries and the extensive explorations carried out by Indian workers, particularly of the Botanical Survey of India, have brought to light many new facts about taxa new to science and extension of distribution of taxa already known. An extensive literature scattered in numerous publications all over the world has accumulated. There have also been monographic studies on several genera at

various times; the taxonomic treatment of the taxa involved has also varied.

One striking feature that is noticed while persuing the literature on the Ranunculaceae of India is the bewildering number of infra-specific taxa described. To cite one instance, O. Kuntze (1885), in his monograph on *Clematis*, described as many as 13 varieties under the subspecies *normalis* of *Clematis montana*. Some of these varieties were named by him, *incisa, obtusipetala, pubescens* etc., based on the characters present in the particular specimens. In view of the fact that some specimens may, in some cases, possess more than one of these characters in different parts or in different ages and if one should give a taxonomic status and formal names to such individual characters, it would lead to absurdities. Brühl (1896) was constrained to remark, "we should thus have performed the remarkable fact of making a single specimen belong to a dozen or more named varieties. That would be Systematic Botany with a vengeance" Brühl himself described a large number of infra-specific categories often based on single specimens and one comes across a large number of names of such sub-species, varieties, forms on the sheets annotated by him (CAL). Later monographers have, however, merged many such infra-specific taxa in their respective species.

Another aspect of importance and which offers considerable difficulty while studying the Indian Ranunculaceae is the fact that many of the genera occurring in the Himalaya are also widely distributed in all the cold temperate regions of the northern hemisphere. The Himalaya has been the route for the migration of many plants and consequent mixing of the floras; there are centres of active speciation here. One should take into consideration the possibility of the occurrence of hybrid forms, particularly in those regions where different floras meet. Extensive knowledge in the field is also necessary before one can assess the taxonomic status of some of the recently described species, particularly in those genera which possess polymorphic species and species complexes, as for example, the genus *Aconitum*. This may be illustrated with reference to one of the species of this genus, *A. ferox*.

Aconitum ferox Wall. : This is not only taxonomically but nomenclaturally also very complicated. The name first attributed to Wallich (his Cat. No. 4721) was validly published by Seringe in 1823 and this was also included in De Candolle's Prodromus. Wallich, however, published the same name in his Plantae Asiaticae Rariores in 1831 for the plant which was listed in his Catalogue under the number 4721 A (this was later treated by Hooker f. & Thomson as var. *rigidum* under their *A. napellus* in the Flora of British India) Hooker f. & Thomson, in their treatment of *A. ferox* in the Flora of British India, included a number of elements besides Seringe's and the *Aconitum ferox* Wall. ex Ser. of this Flora is now shown by Stapf (1906) and others to include *A. spicatum* from the alpine zone of Sikkim; the western elements from Garhwal etc., were brought under other species like *A. balfourii* and *A. falconeri* by Stapf. Earlier Brühl (1896) had described a number of varieties under *A. ferox* Wall. ex Ser. like vars. *atrox, crassicaulis, heterophylloides, laciniata, leucanthum, laxiflora, spicatum* etc. Some of these have been raised to specific rank by Stapf and var. *atrox* was shown to consist of two elements which were raised to the level of species, *balfourii* and *falconeri*. Lauener (1964) states that the true *A. ferox* Wall. ex Ser. is confined mainly to Nepal and as far as known to him, has been collected only once outside Nepal, in Bhutan. *A. ferox* Wall. Pl. Asiat. Rar. 1931 (Cat. 4721A) is now named *A. wallichianum* by Lauener. The situation being as stated above, the appearance in recent literature about studies on *A. ferox* Wall. from localities outside Nepal for chromosome numbers

other aspects will not be of much significance unless the taxonomic status and nomenclature of the plant investigated is made clear. Another species of such complicated nomenclature and taxonomy in our Indian flora is the aquatic *Ranunculus trichophyllus* complex.

A study of the Indian Ranunculaceae also brings in its wake certain aspects of the phytogeography of its members, particularly of the Himalayan elements. There is only one endemic genus among them, the unique, dioecious *Paroxygraphis* at present known only from Sikkim, Nepal and Bhutan. There are many species of other genera with affinities to western Chinese elements and these are mostly distributed in the eastern sectors. *Calathodes* and *Coptis* are genera whose species are known only from Sikkim eastwards in the Himalayas; the former extends to China and Formosa while the latter has its species represented widely in the north temperate and arctic regions. Among the aconites, the situation is rather complicated, many species complexes occurring in eastern Himalaya and adjacent Tibetan and Chinese territories. At the same time, there are others which are predominantly western Himalayan in distribution. The *Aconitum ferox* of authors like Hooker f. & Thomson in Flora of British India, who gave its distribution as temperate Himalaya from Sikkim to Garhwal, has now been interpreted as consisting of many elements, some of which like *A. balfourii, A. falconeri* and *A. deinorrhizum* are purely west Himalayan while others like *A. spicatum, A. laciniatum* and *A. heterophylloides* are found only in the eastern Himalaya; *A. ferox* Wall. (s. str.) is stated to be largely confined to Nepal, having been collected only once outside Nepal, in Bhutan (*see* Lauener, 1964). Lauener (1964) has given an analysis of many recent collections from Nepal including recently described species and states that specimens from eastern Nepal are identifiable with species already known from east of that area and those from central and western Nepal may show a high degree of endemism; they all occur in the region of transition mentioned by Stearn (1960). Species like *A. laeve, A. rotundifolium* and others occurring in western Himalaya have got affinities with the European species further west. A similar situation exists in the case of genera like *Anemone* and *Delphinium*. The *Isopyrum* of Hook. f. & Thomson in Flora of British India is now interpreted as consisting of the three genera, *Isopyrum* L., *Paraquilegia* Drumm. & Hutch. and *Dichocarpum* W. T. Wang & Hsiao. The former two are confined to western Himalaya and further west while *Dichocarpum* has one species in Sikkim and eastwards with others in China and other eastern Asian localities. It is thus clear that the Ranunculaceae in the Himalaya, particularly those which occur in high altitude evidently bear close relationship to those occurring further west, north and east and as such offer difficulties in the assessment of their systematic status.

As stated earlier, the family is predominantly Himalayan in distribution and only about 20 species have been recorded from the Peninsular region, mostly from the Nilgiris, Pulneys and the Western Ghats. Most of them are clearly defined. Dunn (Kew Bull. 81. 1924) described a *Clematis* from Kerala under the name, *C. bourdillonii*. It is stated to have been collected from the Merchiston Estate and so far this is the only collection known. It would be interesting to know if the workers in the region have come across this species from any other locality. It is a very distinct species and has been described as a 'handsome creeper'.

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