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## XXXVII.—FLOWERING OF ARUNDINARIA FALCATA IN THE TEMPERATE HOUSE.

J. S. GAMBLE.

Recent visitors to the Temperate House may have noticed, in several places, the interesting event of the flowering of *Arundinaria falcata*, Nees, one of the small bamboos of the Western Himalaya. The drawings by Miss D. K. Hughes, which accompany this note, will give an idea of the flowers. They bring out the peculiar feature that the panicles from the lower nodes of the flowering culm are lax and much branching, while those from the upper nodes are of the ordinary fascicled type as is figured in Plate II of the "Bambuseae of British India" and in Fig. 199 of Sir Henry Collett's "Flora Simlensis." The clumps which have now flowered, all at the same time, are practically without leafy culms and will, presumably, die completely when the flowers are over. It is too soon to say whether or not they will afford ripe seed capable of giving plants to replace the old ones.

The history of *Arundinaria falcata* and its confusion, in European nurseries and gardens, with another species, *A. Falconeri*, was fully gone into in Dr. Stapf's paper on "Himalayan Bamboos" published in the "Gardeners' Chronicle" in their numbers for May 14 and 21 and June 4, 1904, and need not again be recapitulated; but there is reason to think that, in spite of the question having been so fully cleared up, there are still to be found cases where the much more common and more hardy *A. Falconeri* is still called in error *A. falcata*. The present note and Miss Hughes' pictures may therefore be of use. *A. Falconeri* was figured in the Botanical Magazine for 1904 in Plate No. 7947, also in Plate 18 of the "Bambuseae of British India."

So far as is known at present, there are 4 species of *Arundinaria* in the North-Western Himalaya and *A. falcata*, Nees, is a comparatively low-level one found in moist valleys and ravines in the undergrowth chiefly of oak forests at from 4000 to 7000 ft. elevation, rarely higher up. It has caespitose stems in close clumps and the culms are slender, up to 10 or 15 ft. long and about half an inch in diameter. They are not much used, unless other stronger kinds are not available. They do not, as has sometimes been stated, die down every year, though, of course, in exceptionally cold winters those not fully protected by overhead cover may sometimes get cut back. This bamboo has been successfully grown at Dehra Dun, alt. 2000 ft., also in the Nilgiri hills of South India at 6000 ft. In this country it can scarcely be called "hardy." Lord Redesdale said that it would only do for the "most favoured spots," and Mr. Bean says that it is "only suitable for the mildest parts of

the kingdom." Here, in the hills of East Hampshire, I have succeeded in keeping it alive for several years with the help of protecting branches in winter and shelter from the north winds, but the upper parts of the culms do get cut back by frost, so that the clumps, though soon recovering and looking very pretty, will probably never grow as tall as those of other species do. In S. Ireland I believe it thrives quite well as I have received specimens from Miss French, of Cuskinny, Co. Cork. Though cut back by the winter frosts it succeeded in flowering in August, 1917, in the garden of Mr. G. W. E. Loder of Wakehurst Place, Ardingly, Sussex; and near this I have seen it in the gardens at Grayswood, Haslemere and Hollycombe, W. Sussex. Mr. Bean, quoted by Dr. Stapf, says that he did not see it in any of the gardens in S. Cornwall that he visited in 1893. In a conservatory it will undoubtedly thrive, witness the fine clumps in the Temperate House at Kew which have given the flowering culms now being discussed. And there, as with other artificially-protected kinds, it gives longer culms with a greater diameter, looking so unlike the plant in its native wilds, that for some years I have had doubts whether it really was the true species.

The other three kinds of *Arundinaria* of the North-West Himalaya are much more hardy. *A. Falconeri*, which has been found as far west as the Tons river in Tehri-Garhwal, is a caespitose species of high elevation as Dr. Stapf has so fully described, is grown in many parts of this country and thrives, though it, too, as Lord Redesdale has remarked for the Midlands, may suffer in very severe winters by having its culms cut back for some distance. I keep very beautiful clumps of it as well protected by branches as I can and, more important still, try to shelter them from cold north winds, those enemies of all but the strongest of shrubs. *A. spathiflora*, Trin., is the commonest and chief species of the North-West Himalayan region and is known as the high-level Ringal, *A. falcata* being the low-level Ringal. It is also a caespitose species, but the clumps grow closely and gregariously in the underwood of the forest, chiefly of spruce and silver fir and deodar, above 7000 ft. It can be at once recognised by the tessellated nervation of the leaves and the yellowish or reddish culms, and is hardy in this country, at any rate in the Southern Districts, but it wants overhead shade and likes well-drained slopes protected from the North.

The last of the four species is *A. jaunsarensis*, Gamble, which was described from leaf and stem specimens gathered in the forest near Mundali in Jaunsar beyond Chakrata at about 7000 to 8000 ft. by Mr. U. N. Kanjjeal and myself in 1891. It is at once recognisable by having single stems arising at intervals from a long underground rhizome. I am strongly of opinion that it is the same as the well-known *A. anceps*, Freeman-Mitford, which is hardy in this country and flowered in 1910 in the garden of Mr. C. H. Cave at Mangotsfield near Bristol. Lord Redesdale, in the "Bamboo Garden," p. 181, says that

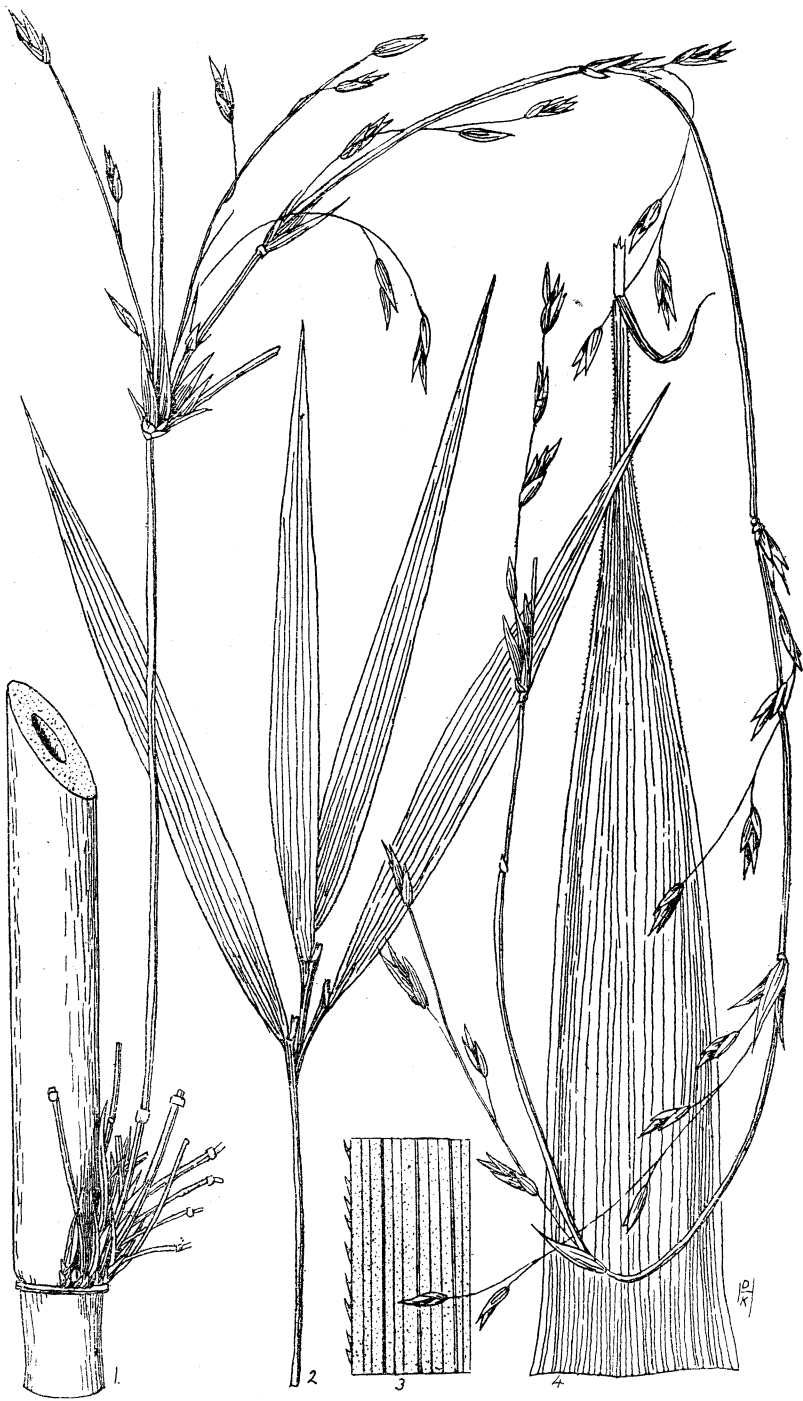


FIG. 1.

1. lower portion of a stem with part of a long, very loosely flowering branch (natural size); 2. leafy branch, taken from same plant, before flowering set in (natural size); 3. portion of a blade with margin (5 x); 4. spathe (natural size).

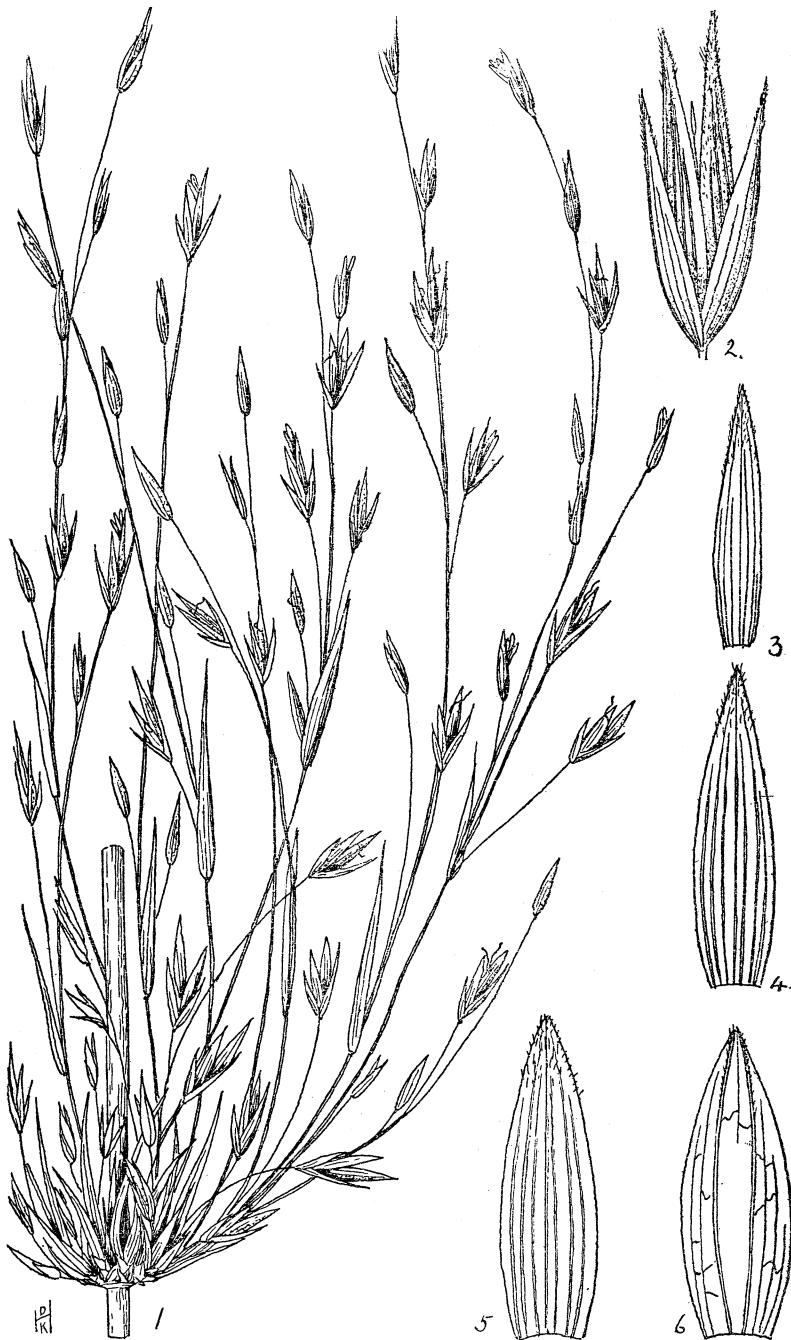


FIG. 2.

1. inflorescence from the upper part of the same stem (natural size);  
 2. spikelet (4 x); 3. lower glume (4 x); 4. upper glume (4 x); 5. valve  
 (flowering glume) (4 x); 6. valvule (palea) (4 x); 3-6 flattened out.

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"it was picked up at the sale of a dead nurseryman's effects by Mr. Jordan, the Superintendent of Regent's Park, who very wisely bought the whole stock." He gives no date, however. Mr. Bean's account of it is different; he says: "introduced by Col. Edmund Smyth\* from Garhwal about 1865 and first cultivated at Elkington Hall, Lincolnshire." I have also another account of its origin from the late Mr. T. W. Webber, who was in the sixties of last century a forest officer in Kumaon and whose book "The Forests of Upper India," published in 1902, is an interesting account of work, travel and sport in the Himalaya and Central India at that time. Mr. Webber wrote in May 1907 to Mr. J. W. Oliver, who sent his letter on to me some years later, as follows: "The straight, upright *Arundinaria anceps* (so named at Kew) which I sent you was from seed which I procured myself in Kumaon high up, and it has been growing in the garden here (Athy, Ireland) for 25 years. There is a clump 30 yards round. It sends out lateral suckers and spreads itself rapidly." Mr. Webber, with whom I had already got into communication myself in 1907, sent me specimens of the culms, culm-sheaths and leaves from his clump, and they were undoubtedly *A. anceps*. Mr. Webber was in Kumaon from 1861 to 1864, in which latter year it is probable that the bamboo flowered and seeded, and that Mr. Webber and others collected the seed and distributed it. I think it may be useful to put this information on record. Though I myself believe that the Kumaon *A. anceps* and the Jaunsar *A. jaunsarensis* are the same, we cannot be quite sure until flowers of the latter are available. It is to be hoped that the Forest Botanist to the Dehra Dun Research Institute will keep an eye on the plants at Mundali. The flowers of *A. anceps* are remarkable for having spikelets often 4 ins. long, with 8 to 9 flowers in each, and resemble those of some Japanese species and notably *A. japonica* and *A. Simoni*.

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\* According to letters preserved at Kew, written by Colonel Edmund Smyth of Elkington Hall, Louth, Lincolnshire, and dated Nov. 16, and Dec. 18, 1898, he introduced *Arundinaria anceps* between 1862 and 1865. He says he sent a small sack of seeds to his father at Elkington and that when he came home in 1868 he found a large seed bed of plants there about one foot high growing quite vigorously; some of these were distributed amongst various friends. Colonel Smyth observes that the seed was gathered for him by a native official of Joshimuth, in British Garhwal.