

Orissa: Barua river mouth, L. K. Banerjee 10279.

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## 41. SOME OBSERVATIONS ON THREE LITTLE KNOWN SPECIES ENDEMIC TO BHUTAN AND NORTHEAST INDIA

During field studies on the flora of Jalpaiguri District in West Bengal, in 1975-76, I collected three rare endemic species from the hilly tracts in the north-eastern part of the district, from the Buxaduar and Jainti forest ranges.

*Ardisia bhotanica* (Myrsinaceae) was described by C. B. Clarke in 1882, based on a single collection of William Griffith from Bhutan in 1838. The species appears to have eluded plant explorers from that time onwards for almost 138 years. Then on May 16th, 1976, I came across this plant growing in moist, cool and shaded situations in the semi-evergreen forests on the upper hills of Buxaduar forest range at about 1700 m elevation. It was found growing abundantly in association with *Ardisia undulata* Clarke, *Begonia laciniata* Roxb. and *Polygonum chinense* L., but was restricted to a very small patch of

land about 3 sq. m. in area only *A. bhotanica* is an undershrub, 1-1.75 m tall, which is characterised by its lanceolate, crenate membranous and gland-dotted leaves and rosy-white flowers borne in simple panicles on decurved peduncles. I reported it from India as a new record (Sikdar 1979) and provided a detailed description and illustration for it.

All the relevant literature pertaining to Griffith's (1839, 1848) collections and travels in Bhutan were examined carefully and it is quite evident that the type locality Murichom is just north of Buxaduar. I also collected the plant in the Buxaduar forest range practically on the Indo-Bhutanese border. So, after a span of nearly one and a half centuries, *A. bhotanica* has been collected very near the type locality, and it may so happen that the two localities may be within a stone's throw of each other.



Even though quite a number of explorations, some of them extensive, have been conducted in Bhutan and neighbouring regions (13 by British between 1914 and 1975, 14 by Indians between 1963 and 1965 and 9 by Japanese between 1952 and 1970 and in the Buxaduar areas by K. P. Biswas in February-March 1934 and V. Narayanaswami and party in May-June 1949) none of them have collected and reported *A. bhotanica* so far. The species is presumably extremely localised and rare and thrives in a specific restricted ecological niche where alone all conditions favourable for its growth are found.

From the above studies it is concluded that *A. bhotanica*, now known as *Amblyanthopsis bhotanica* (Clarke) Mez, is a rare and endemic species confined to small patches and is adjacent to a mule track which was not a main thoroughfare in 1976 leading from Buxaduar past this locality towards the Bhutan border. At present, there is a major development programme called Chukha Project Authority, in Bhutan, which is hardly a day's march from Murichom northwards (mentioned by Griffith). The Chukha Hydel Project is already coming up. This project would necessarily involve road constructions, clearing of forests, etc. up to the project site which are factors quite likely to disturb the natural vegetation and ecological balance of the region. Hence any upset of the existing conditions is likely to threaten its very existence and it is very much in danger of becoming extinct.

It is significant to note that the only two gatherings of the species were in flowering conditions and the fruits (berries) of the species are not known till today.

**Senecio bhot** (Compositae) was described by C. B. Clarke in 1876, also based on a single collection of G. Griffith from Bhutan in 1837-

38. It was collected again after a long gap of nearly a century, in 1912, by R. Lister, also from Bhutan. However, the precise localities for both the collections were not indicated. It has also not been possible to trace out the locality of Griffith's collections from literature. *S. bhot* was collected for the third time after another half a century, in 1964, by D. B. Deb from lower central Bhutan, enroute from Rani Camp to Tama, between 1650 m and 1350 m. Subsequently, there does not appear to be any further record of *S. bhot* from Bhutan or elsewhere till 1975.

In November 1975, I found this species growing in three separate localities in the hilly tracts of two adjacent forest ranges of Jalpaiguri district, namely, Jainti and Buxaduar, between 950 m and 1400 m. This is also the tropical semi-evergreen sub Himalayan foot hills region and is commonly known as the Duars. *S. bhot* occurred here sporadically along the open rocky forest paths and it also formed isolated patches on the hill slopes. The occurrence of the species in these two forest ranges covered an area approximately 10 kms long and 8 km wide. The presence of *S. bhot* in India was duly reported (Sikdar & Ghosh 1978) and it was accompanied by a detailed description and illustration. *S. bhot* is a herb or an undershrub, upto 1 m or more in height. It is characterised by its angled and ribbed stems covered with loose cottony hairs, sessile serrated leaves and showy yellow flower heads.

That *S. bhot* is a rare species cannot be denied. It is also endemic and confined to Bhutan and the Duars adjacent to it.

J. D. Hooker, in 1882, described *Aganosma gracilis* (Apocynaceae) based on two collections, namely, his own collection in c. 1830 from Sikkim Himalayas (2000-4000 ft) and that of Lobb in c. 1850 from Khasi hills (1000-



3000 ft). In the Central National Herbarium (CAL), there are only 5 subsequent collections of *A. gracilis*. Three are from Sikkim, collected by T. Thomson in 1857, T. Anderson in 1867 and G. King's collector in 1885. The fourth is Simons collection from Assam. Simons had been collecting in Assam valley approximately between 1830 and 1850 (cf. Burkill 1965). None of the above specimens indicated actual localities. The fifth specimen is collected from 'Rishi river' at 2500 ft. altitude, but collectors name and number have not been indicated. It has not been possible to ascertain the location of this river or to identify the collector.

Apart from Hooker, only Cowan & Cowan (1929) and Kanjilal *et al.* (1939) have reported *A. gracilis* from northern Bengal and Khasi hills respectively. Cowan & Cowan stated that it was found in the lower hill forests upto 5000 ft. in northern Bengal, without citing any specimen. Though J. M. Cowan had collected in India and Burma between 1919 and 1924 (Index Herbarium, 1954) and in north Bengal, it is not clear whether *A. gracilis* was actually collected by him or it was reported on the strength of Hooker's collection from Sikkim. Botanists then, usually considered Darjeeling and Kalimpong districts of Bengal as parts of Sikkim and this has also been stated by Cowan & Cowan in the introduction to their book. Since Cowan's collections are scattered in different foreign herbaria, it has not been possible to ascertain whether he collected the plant at all.

Kanjilal *et al.*, while recording *A. gracilis* from Khasi hills, stated that there were no specimens of *A. gracilis* in the Assam Forest herbarium and they must have included it in their flora on the basis of Lobb's collection from that area.

On May 14th, 1976, I came across a few

plants of *A. gracilis* growing on hill slope at c. 1600 m, on way to Chunabhati of Buxaduar forest range. Though the species has been described as an evergreen climber, the plants here were probably in juvenile condition yet to acquire the climbing habit or perhaps unable to do so due to lack of suitable trees nearby or due to other factors. The plants bore beautiful white flowers, with long linear sepals, obliquely oblanceolate corolla lobes twisting to the right, borne in terminal corymbose cymes, with slender stems and branches and membranous leaves partially folded along the midrib near the tips. It had not been found anywhere else in this region in earlier or subsequent visits. This locality is in the same region as mentioned for the earlier two species.

*A. gracilis* is now known to be an endemic species confined to Sikkim, north Bengal, Assam and Meghalaya (Khasi hills) in the tropical and sub-tropical zone from the plains up to nearly 1600 m. It is represented by very scanty collections made mostly in the previous century even though some states like Sikkim have been explored many times. If we accept that Cowan collected the plant, then his collection had been made thirty five years after the previous collection by King's collector. I collected *A. gracilis* nearly fifty years after Cowan's report.

Unless the forests are retained in their present form many more rare elements like these, mentioned now, are likely to disappear with the forests. The Chuka Project Authority north of Buxaduar forest range and similar other development projects simultaneously with road constructions in the project sites, deforestation resulting in landslides, etc. are factors threatening the biospheres today. It is suggested that the hilly tracts of Buxaduar forest division, comprising of Buxaduar and



Jainti forest ranges, which are still comparatively rich in flora, semi-evergreen by nature, be declared as a Nature or Biosphere Reserve. The only redeeming feature is that Buxa forest has been selected by the W. Bengal Govt. for its second Tiger Project, covering an area of 600 sq. km. This project is awaiting approval and sanction of funds from the Centre. However, it is not known whether this area includes the hilly tracts in the northern part of Buxa division or the plains area in the south.

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## 42. ORCHIDS NEWLY DISCOVERED AND ADDED TO THE ORCHIDACEAE FROM INDIA

India having multivaried plant habitats including those of climatic extremes and having frontiers with countries like Pakistan, China, Nepal and Burma on the Himalayan range

has been a continual and potential source of new plant species. Orchidaceae being rated as the largest flowering plant family in India and because of systematic plant exploration pro-





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