

Chlorophytum nepalense (Lindl.) Baker – An unexplored plant of potential economic value?

Chlorophytum nepalense (Lindl.) Baker is a perennial herb belonging to the family Liliaceae. The plant generally grows along the forest margins, grassy slopes and rocky places along valleys (between 1300 and 2800 m)¹. In India the species is restricted to the Eastern Himalayas and is found in the North East Frontier regions². Morphologically this species resembles *Chlorophytum borivillianum* Sant et. Fern, another medicinally important member of the same genus. *C. nepalense* has an erect scape (30–60 cm), a short inconspicuous rhizome, sessile fasciculate glabrous leaves (8–60 × 0.6–2 cm), clustered cylindrical roots (length: 5.6–15.9 cm; 25–30 numbers per plant) (Figure 1 c), and a branched, many-flowered paniculate raceme inflorescence (Figure 1 b). The plant principally belongs to the temperate Himalayas and no previous report exists about its occurrence in the lower Gangetic Plains. During field study we collected *C. nepalense* in flowering condition (Figure 1 a; in November) from different parts of west Sikkim (avg. altitude ± 2070 m) and successfully established them in the experimental garden

of Presidency College, Kolkata (in December). Interestingly, the plants thrived well and adapted quickly to the climatic conditions (22–28°C temperature and 85–90% RH) and soil provided, and produced flowers during January–February (which is highly unusual for this species). Seed setting was noticed after two weeks of flowering. The obovoid, subglobose capsules produced 6–9 seeds per valve and the black, angular seeds had low viability and poor germination rate. Keeping in mind the tremendous morphological, chromosomal and cytotypic diversity exhibited by other Indian species of *Chlorophytum*, the plants were subjected to detailed cytological analysis and chromosome counts were made from somatic and gametic cells. Mitotic analysis from root-tip cells revealed high degree of polysomaty ($2n = 28$: 10.7%, $2n = 50$: 10.7%, $2n = 54$: 8.1%, $2n = 56$: 56.4% and $2n = 63$: 14.2%), the mode number was however found to be $2n = 56$ (Figure 1 e). Analysis of pollen mother cells also revealed $n = 28$ chromosomes (Figure 1 d) with varying degrees of secondary association at metaphase I. Karyo-

morphological studies revealed an asymmetrical karyotype consisting of 20 long and 36 short chromosomes. Previous reports on cytology of this material have revealed the existence of two cytotypes, one having $2n = 42$ chromosomes³ and the other having $2n = 56$ chromosomes⁴. The chromosome number of $2n = 56$ is in agreement with previous reports^{4,5}. The haploid number of $n = 28$ and the occurrence of high polysomaty along with secondary association reported by us is also in agreement with previous reports⁴. The high adaptability exhibited by this Himalayan species may be attributed to its polysomatic nature. The remarkable ecological tolerance exhibited by *C. nepalense* is still an open question which needs to be resolved in future.

C. nepalense is an unexploited and unexplored plant having remarkable adaptability and tolerance. Like other medicinally important members of the same genus (*C. borivillianum* and *C. arundinaceum*), the fasciculated roots of *C. nepalense* (which are produced in large numbers) can also emerge as an important source of valuable bioactive compounds in future. Therefore, chemical screening of this unexplored plant is strongly advocated.

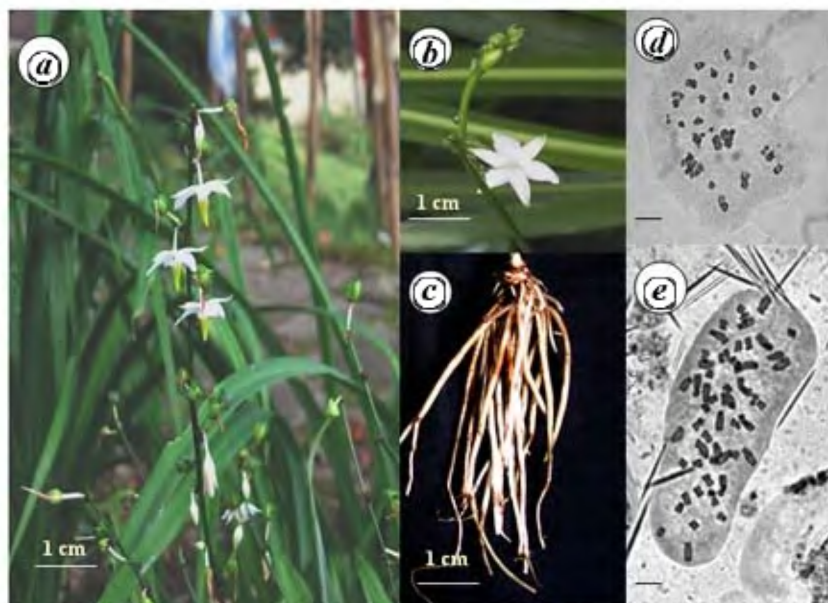


Figure 1. a, *Chlorophytum nepalense* in flowering condition. b, A portion of the inflorescence with a solitary flower. c, Clustered roots of *C. nepalense*. d, PMC showing $n = 28$ (bar: 5 µm). e, A scattered metaphase plate showing $2n = 56$ chromosomes (bar: 5 µm).

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