Figure 1. *a*, Tobacco callus growing in the poly-bag bottle. *b*, mass production of aseptic (corn) seedlings for *in vitro* culture studies.

Table 1. Advantages of poly-bag bottles in tissue culture

Poly-bag bottle	Glassware
Low-cost	High-cost
Unbreakable	Breakable
Flexible (more number of bags can be accommodated per unit area)	Not flexible
Sterilizable (120°C)	Yes
No additional labour cost for cleaning as the bags are used new	Additional labour cost is necessary for cleaning for reuse
To protect the environment, the used poly-bag bottle (if contaminated or after use) with medium can be sealed and disposed	Not possible

Following this work, attempts will be made to realize the use of poly-bag bottles in various aspects such as (i) post-tissue culture aspects such as shoot multiplication, rooting and acclimation, (ii) micropropagation of florist flower crops and (iii) storage of valuable germplasm. The used poly-bag bottle with medium (if contaminated/after use) can be sealed, autoclaved and disposed, without causing any hazard to the environment.

1. Reinert, J. and Bajaj, Y. P. S., *Applied and Fundamental Aspects of Plant Cell, Tissue and Organ Culture*, Springer-Verlag, Berlin, 1977.
2. Sathiyamoorthy, P. and Shanmugasundaram, S., *Poly-bag Bottle – A Culture System for Cyanobacteria*, 32nd Annual Conference of the Association of Microbiologists of India, 1992, AMPI-35, p. 39.
3. Murashige, T. and Skoog, F., *Physiol. Plant.*, 1962, **15**, 473–497.

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Comments on 'A critical appraisal of the type locality of a rare palm from Kumaon Himalaya, India'

In the article referred to above, Rana *et al.* (*Curr. Sci.*, 1995, **68**, 590–592) have raised queries about the existence of *Trachycarpus takil* Becc. in wild state in Indian flora, its type locality and its affinity. As a part of the DST-sponsored project on the status of endemic and endangered palms of India, we had an opportunity to track this palm in 1993 in Kumaon Himalayas in collaboration with Botanical Survey of India, Northern Circle, Dehra Dun. A brief resume of our observations is given below to clarify the queries raised by Rana *et al.* for the benefit of naturalists interested in this endemic endangered taxon of Himalayan flora.

The widely growing population of this palm is found in Badkot forest (about 2000 m) between Pandavkuli and Badkot of Almora district. The palms grow along the slopes of the limestone mountain under the shades of *Quercus dilatata* associated with *Rhododendron arboreum*, *Ilex* sp., *Acer* sp., *Berberis artistata*, *Paeonia emodi*, etc. They are 5–6 m high; their stems are tightly covered with a network of persistent leaf-sheath fibres up to the base; a 6–12 leaved crown lies above the cover of persistent reflexed green older leaves.

The palms are distantly distributed. Seeds or seedlings were very infrequent on the forest floor. The palms are locally

called as 'Jamar'. Their leaves are employed for preparation of brooms.

The forest guide of Kukuchina revealed that there was an abundant growth of these palms until ten years back when a number of them succumbed to the forest fire leaving the hardy ones. The type locality of this species is probably 'Takal' situated near Kalamuni pass, between Kalamuni pass and Munsai in Pithoragarh region of Kumaon Himalayas where palms have been noted in abundance. Taller, profusely flowering and fruiting palms are found in Chaubattia gardens at Ranikhet, Almora district, where taller tree trunks are devoid of the mantle of leaf-sheath fibres at the base. The palm has almost naturalized here with seedlings of various ages found growing in shades of *Quercus incana* associated with *Cedrus deodara* and *Asculis indica*. The superintendent of Chaubattia gardens has been informed about the importance of this species and the strategies to be adopted for its conservation.

The mature seeds of this palm germinate readily under nursery conditions in well-drained porous soil and the seedlings are surviving satisfactorily in the departmental glass house.

There is some confusion in the literature about *T. martianus* Wendl., a more widely distributed tropical Himalayan species and *T. takil* Becc.[1,2]. The description and localities of both these are mixed up. The species is close to *T. fortunei* (*T. excelsa*) from which it can be readily distinguished[1].

1. Beccari, O., *Asiatic Palms-Corypheae* (ed. Martelli, U.), *Ann. R. Bot. Gard (Calcutta)*, 1991, **13**, 1–356.
2. Blatter, E. S. T., *The Palms of British India and Ceylon*, Oxford University, London, 1926.

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T. S. Rana et al.'s reply:

It is certainly heartening to know the existence of one more population of this rare palm (*Trachycarpus takil* Becc.) in wild state in Badkot forest of Almora District. Kulkarni and Pawar are to be commended for this search.

However, they are not correct in stating that the type locality of this palm is 'Takal' which, according to them, is 'probably' situated near Kalamuni pass, between Kalamuni pass and Munsai. As such, there is no place like Munsai in Pithoragarh but it could be Munsiyari, where they have stated to have noticed these palms in abundance. But no such population could be noticed during our surveys (one of the authors of the paper happens to belong to this area). Kulkarni and Pawar are perhaps not aware of a publication by Gibbons[1]. Gibbons has also clearly mentioned in his article 'Thalkedar' rather than 'Thakil' and not 'Takal' as stated by Kulkarni and Pawar. Further, Gibbons has stated that Thalkedar lies south of Pithoragarh town, some 15 km away. Thus, there is no confusion regarding its type locality. In our paper we had stated that we could not locate any mature palm trees in that area except for a few hundred seedlings. But in our subsequent survey during July, 1994 we could also locate five adult trees of *T. takil* in the same locality as mentioned by Gibbons. The trees in Chaubattia gardens at Ranikhet have been planted as stated by Kulkarni and Pawar.

We, therefore, reaffirm our conclusion as regards the type locality of this rare palm in India. However, more studies, particularly on the taxonomy of this as well as the allied species (*Trachycarpus fortunei* H. Wdl. and *T. martianus* H. Wdl.) can throw more light on this topic.

1. Gibbons, M., *Principes*, 1993, **37**, 19–25.

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