

Sex change in *Piper thomsoni* Hook. (Piperaceae)

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Abstract

Piper thomsoni, a dioecious *Piper* species endemic to north eastern India, was collected from Totopara forests (New Jalpaiguri District, West Bengal), multiplied and maintained at the Germplasm Conservatory, Experimental Farm, Indian Institute of Spices Research, Peruvannamuzhi (Kerala). The male plants conserved under partial shade exhibited sex change and a few berries developed on the spike. This appears to be the first report of sex change in the genus *Piper*.

Key words: *Piper thomsoni*, sex change.

Piper thomsoni Hook. (Piperaceae), a scandant, bushy dioecious species is endemic to north eastern Himalayas, Naga Hills and Golapara (Hooker 1886; Kanjilal *et al.* 1940) in India. It is a dioecious wild species and propagation is either through seeds or through runners in the natural habitat. Male spikes are long, erect and filiform (5-11 cm), whereas, female spikes are short, erect and sub-globose (1.5-2.0 cm) with 30-40 closely packed minute berries subtended by peltate bracts. The genus *Piper* contains species that are dioecious, monoecious, bisexual or unisexual in sex and flowering habits. In *P. nigrum*, all the above expressions can be noticed. Though environment induced sex change has been reported in some species such as *Carica papaya* (Caricaceae) (Ram 1999), *Campanula rapunculoides* (Campanulaceae) (Vogler *et al.* 1999) and *Bischofia javanica* (Euphorbiaceae) (Yamastha & Abe 2002), no such report has been made in the genus *Piper*. The present report pertains to an incidence

of change in sex of the vegetatively propagated male plants in *P. thomsoni*.

A germplasm exploration and collection trip was made to Totopara forests (25° 58' to 27° 45' N, 89° 08' to 89° 55' E; 60-140 m MSL; average annual temperature range: 2-41°C; average annual rainfall: 900 mm) in New Jalpaiguri District of West Bengal at the foothills of Himalayas during February 2003. The authors collected both male and female live samples and respective herbarium specimens of both wild female (IC 398867) and male (IC 398868) plants of *P. thomsoni* from the forests. The herbarium specimens were compared with those maintained at National Herbarium, Kolkatta, and their identity was confirmed. The live plants were maintained by vegetative means at the Experimental Farm of Indian Institute of Spices Research (IISR), Peruvannamuzhi (Kerala) (11°36'N, 75°49'E; 39 m MSL; average annual temperature range: 23-41°C; average annual rainfall: 3500

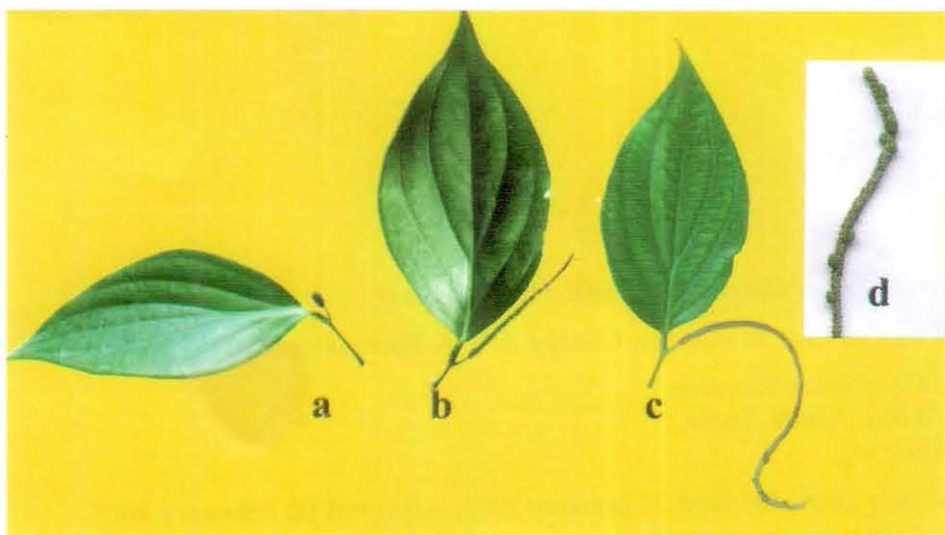


Fig. 1. Sex change in *Piper thomsoni*
(a) Female spike (b) Male spike (c) Sex changed male spike (d) Close-up of sex changed spike showing berries

mm). The herbarium specimens were deposited at IISR, Calicut.

The established live specimens of female (IC 398867) and male plants (IC 398868) generated from original samples flowered under partial shade during July 2004. In the case of plants belonging to IC 398868, 70% to 80% of the spikes were persistent, became semi-persistent and bore berries. Except for the change in sex, the plants did not vary much from the original male specimen. Spike length varied from 5 to 11 cm and berry number varied from 11 to 30 per spike. Those spikes without berries acted like typical male spikes in male plants by falling off. However, the female plants generated from the original female sample maintained their sexual identity. Thus in the case of male plants of *P. thomsoni*, apparently there is a situation of transient sex expression in vegetatively generated plants as against the report of Ravindran *et al.* (2000) that most members of the genus are stable male, female or bisexual types except in *P. silentvalliensis* Ravindran, Nair & Asokan, thus posing an interesting problem for further investigation.

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