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## Morphogenetic Biodiversity and Local Use of the Himalayan Pear *Pyrus pashia* in Central Bhutan

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### Abstract

Little is known about the morpho-genetic diversity and use of the Himalayan pear (*Pyrus pashia*) cultivars grown in home gardens of smallholder farmers in Bhutan. Outside of Bhutan *P. pashia* is found in the Chinese provinces of Guizhou, Sichuan and Yunnan, in India, Kashmir, Laos, Myanmar, Nepal, W Pakistan, Sikkim, Thailand and Viet Nam. To study the biodiversity of *P. pashia* in Bhutan, a survey of 170 trees in two valleys of Bumthang in Central Bhutan was conducted in late autumn 2004. Its aim was the identification and description of the pear trees native to Bumthang following morphological traits such as colour, size and shape of fruits and leaves and the growth type of the trees. The survey also comprised farmers' knowledge of the use and origin of their trees and a semi-quantitative assessment of fruit quality and yield to discuss possibilities for income generation for the farmers, if proper marketing channels could be identified. Fruit samples of 170 trees were analysed for shape, size, colour, texture, taste and BRIX values (sugar content in percent by weight concentration of total soluble solids). The informal survey and semi-structured interview conducted in the two neighbouring valleys Tang and Chokhor of Bumthang revealed a high morphological diversity in *P. pashia*. The fruit shape varies from globose to pyriform, the fruit skin colour from light yellow and glossy to brown and dull. BRIX values range from 7.3% to 15.5%. The variation of yields over three years (2002 to 2004) ranges from 5 kg per tree and year to 1000 kg. The position of all trees was mapped with a hand-held GPS to include altitude as an integrating proxy for agro-ecological site conditions. The data were used to develop a simple classification key, which allowed a proper grouping of trees. Future work should include molecular approaches to verify the classification scheme and finally lead to an effective strategy to maintain the genetic diversity of the Himalayan pear at the farm level.

**Keywords:** Bhutan, Morphological diversity, *Pyrus pashia*