

**Title** Genetic variation among *Amorphophallus* sp. from Northern Thailand and their glucomannan content

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### Abstract

*Amorphophallus* sp. is known under the common name of konjac or elephant foot yam. Some of the species have potential to become highly profitable crops for South East Asia region due to amount of glucomannan present in their tubers as important and economically useful raw material for various industries. For the purpose of this study various species of this genus were collected in the north of Thailand. However, considerable variation of morphological features of many species of *Amorphophallus* makes it difficult to identify them in the vegetative form. Randomly Amplified Polymorphic DNA (RAPD) and DNA Sequencing are often used to determine the genetic relationship of plants. The aim of this study was to determine genetic variation of various accessions of *Amorphophallus* sp. collected in northern regions of Thailand. Forty-three samples were characterized by RAPD with four primers (ERIC1R, ERIC 2, BOXA1R, RPO1) the data from which were used to calculate genetic distances which were then visualized using multidimensional scaling and cladogram. The *psbM-trnD* region of their chloroplast genome was also sequenced from which phylogenetic relationships were determined using parsimony analysis. In addition, glucomannan content was determined to find the relationship between genetic variation and glucomannan content. The results from the RAPD analysis show that the genetic distance values vary between 0.075 and 0.949 and that can *A. muelleri* from *A. paeoniifolius* be separated. However, the separation of the other species was ambiguous. The DNA sequence data suggested the presence of 5 different clades. All genetic data indicated that genetic variation was high. Glucomannan content was between 2.04-55.78% (w/w) based on their species and the identification of regions which are associated with glucomannan content, enabling these markers to be used as selection tools aiming at improving industrial konjac glucomannan production.