

SWEET POTATO BREEDING IN INDIA – PROBLEMS AND PROSPECTS

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SUMMARY

A new, comprehensive breeding programme has so far produced six new high yielding sweet potato cultivars using Japanese, American and Indian parental material. Cytological studies based on pachytene analysis have elucidated the degree of chromosome homeology among three genomes of hexaploid sweet potatoes. Tetraploid *Ipomoea biloba*, which appears to be a segmental allotetraploid may be a bridging form between diploid taxa and the sweet potato. Diploid *Ipomoea biloba* shows a high level of homeology with diploid *Ipomoea crassicaulis*.

RESUME

Un vaste nouveau programme de sélection et d'amélioration a permis d'obtenir six nouveaux cultivars de patate douce aux rendements élevés à partir de matériel parental japonais, américain et indien. Des études cytologiques basées sur l'analyse pachytène ont permis de clarifier le degré d'homéologie des chromosomes entre trois génomes de patate douce hexaploïde. *Ipomoea biloba* tétraploïde qui semble être un allotétraploïde doit être une forme intermédiaire entre les diploïdes et la patate douce. *Ipomoea biloba* diploïde révèle un niveau élevé d'homéologie avec *Ipomoea crassicaulis* diploïde.

RESUMEN

Un nuevo y amplio programa de mejoramiento genético ha producido hasta ahora seis nuevos cultivares de camote de alto rendimiento usando material parental japonés, americano e hindú. Los estudios citológicos basados en análisis en fase de paquiteno han permitido elucidar el grado de homología cromosómica entre tres genomas de papa dulce hexaploide. El tetraploide *Ipomoea biloba*, que parece ser un alotetraploide segmental, puede ser un puente entre la forma diploide y el camote. El diploide *Ipomoea biloba* muestra un alto nivel de homología con el diploide *Ipomoea crassicaulis*.

INTRODUCTION

Sweet potato (*Ipomoea batatas*) has a long history of cultivation in India and its present area of cultivation is about 160,000 hectares. Bihar and Uttar Pradesh states account for nearly 60 percent of the total area under this crop in India. Sweet potatoes contain useful quantities of carotene or provitamin A, Vitamin C, calcium and phosphorous as well as starch. The nutritive value of sweet potato proteins compares well with other vegetable proteins⁴.

Little genetic improvement of this crop has been attempted in India⁵. The average yield is only 8 tons per hectare. A few high yielding clones of sweet potato were identified amongst introductions and have given increased yields in certain parts of the country¹⁵.

Most of the introductions made so far, as well as indigenous sweet potato cultivars, flower little and seed set is rare. Recently, however, the induction of flowering has engaged the attention of research workers and treatments such as girdling, training of vines over trellises, varying photo-period, applying growth hormones and grafting on root stocks of related ornamental plants have been successfully tried^{10,11}.

There is a new, multi-disciplined, problem-and-production oriented research programme at the Central Tuber Crops Research Institute, Trivandrum, with sub-centres elsewhere in the country. Year-round cultivation of sweet potato is possible at Trivandrum, and a germplasm collection is maintained at the Institute. A high percentage of accessions produce flowers.

BREEDING OBJECTIVES

Objectives are higher tuber yield, responsiveness to fertilizers, low sugar and high starch content of tubers for industrial use, high sugar and carotene content for tubers for human consumption, resistance to diseases and to the sweet potato weevil, (*Cylas formicarius* Fab), drought resistance, wider adaptability and insensitivity to photo-period.

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