

SEAG-Symposium, 27.-31.8.2001, Los Baños, The Philippines

“Resource Management:

Private-Public Partnership and Knowledge Sharing”

Somatic hybridization between potato (*S.tuberosum*) and *S.phureja* to transfer bacterial wilt (*Ralstonia solanacearum*) resistance traits

Agus Purwito¹⁾, Asnawati¹⁾, M. Machmud²⁾ and G.A. Wattimena

¹⁾Laboratorium Biotechnology, Dept. of Agronomy and Laboratorium Plant Cellular and Molecular, Research Center for Biotechnology, Bogor Agricultural University (IPB), Jl. Puspa, Kampus IPB Darmaga Bogor, 16680, Indonesia.

²⁾Research Institute for Food Crops Biotechnology, Jl. Tentara Pelajar 3A, Bogor 16111, Indonesia

ABSTRACT

To sustain potato production in tropical region, new cultivars resistant to number of diseases must be available. One of most important diseases in the tropical regions is bacterial wilt caused by *Ralstonia solanacearum*. The loss of production due to the disease is up to 90 percent. The possibility to Introgress of the resistance genes is come from wild species of *Solanum phureja*. However, crossing between *S.tuberosum* X *S.phureja* is limited by incompatibility between them. Somatic hybridization is expected to provide a new possibility for increasing genetic variability, and also a means of transferring desirable agronomic traits into potato. The objective of this research is to produce high yield cultivars of potato resistance to bacterial wilt that adapted in the tropical region.

Somatic hybrid plants were produced after protoplast fusion between a dihaploid ($2n=2x=24$) potato cv. BF15 and a wild tuber-bearing diploid ($2n=2x=24$) species *S.phureja*. There were 50 plants produced after transferring protoplast-derived microcalli to fresh VKM medium supplemented with 2 mg/l BAP and 0.1 mg/l 2,4-D for 2 weeks followed by transferring into regeneration medium MS supplemented with 0.1 mg/l IAA and 2.0 mg/l zeatin. Emerging shoots were then excised from callus and plantlets were multiplied by subculturing leafly node cutting on hormone-free MS medium. A total 10 somatic hybrid were revealed after confirmed by examining isoenzyme pattern, RAPD analysis, chromosome counting and number of chloroplasts in guard cell. The five of tetraploid ($2n=4x=48$) of somatic hybrids were then evaluated their performance for resistances by inoculating bacterial wilt races 1 and race 3 *in vitro*, production of microtubers *in vitro*, and their performance in the field.

The cultivated potato cv. BF15 was susceptible to both races tested. All somatic hybrid were susceptible to race 3 strain and three of somatic hybrids were susceptible to race 1 strain except two somatic hybrids were tolerant to race 1 strain. All the five of somatic hybrids were able to produce microtubers, however there were variation in the number of tubers, earliness of tuberization, fresh weight as well as dry weight. Tuber production in the field by planting minicutting as propagule revealed that one of somatic hybrid was very promising as compared to Indonesian popular cultivar Granola.

Keywords: *Solanum tuberosum*, *Solanum phureja*, Somatic hybrids; Bacterial Wilt; *Ralstonia solanacearum*

Corresponding author. Tel.: +62-251-624491; Fax: +62-251-621724;
Email: apurwito@indo.net.id