Recycling of superfine resolution agarose gel

Abstract

Genetic markers are now routinely used in a wide range of applications, from forensic DNA analysis to marker-assisted plant and animal breeding. The usual practice in such work is to extract the DNA, prime the markers of interest, and sift them out by electrically driving them through an appropriate matrix, usually a gel. The gels, made from polyacrylamide or agarose, are of high cost, limiting their greater applications in molecular marker work, especially in developing countries where such technology has great potential. Trials using superfine resolution (SFR) agarose for SSR marker screening showed that it is capable of resolving SSR loci and can be reused up to 14 times, thus greatly reducing the cost of each gel run. Furthermore, for certain applications, low concentrations of agarose sufficed and switching to lithium borate buffer, instead of the conventional Tris-borate-ethylenediaminetetraacetic acid buffer, will further save time and cost. The 2.5% gel was prepared following the Agarose SFR™ manual by adding 2.5 g agarose powder into 100 mL 1X lithium borate buffer in a 250-mL flask with rapid stirring. Two midigels (105 x 83 mm, 17 wells) or 4 minigels (50 x 83 mm, 8 wells), 4 mm thickness can be prepared from 100 mL gel solution. A total of 1680 PCR products amplified using 140 SSR markers from oil palm DNA samples were tested in this study using SFR recycled gel. As average, the gel can be recycled 8 times with good resolution, but can be recycled up to 14 times before the resolutions get blurred.

Keyword: Agarose gel; Microsatellite markers (SSR); Recycling; Superfine resolution.