

Table 6 and the enzyme group with the composition shown in Table 1, the 200 kb circular DNA, RecG, and RecJ were added to result in concentrations of 0.5 pM (67 pg/μl), 0 nM or 100 nM, and 0 U/μl or 0.5 U/μl, respectively. The temperature of the obtained amplification reaction solution (10 μl) was retained at 30°C for 3 hours or 25 hours, so as to carry out an amplification reaction. After completion of the reaction, the reaction product was subjected to agarose gel electrophoresis in the same manner as that of Example 1, so that DNA was detected.

[0221] The results are shown in Figure 32. By addition of RecG and RecJ, generation of a low-molecular-weight amplification product was reduced, and the improvement of the generated amount of a circular DNA amplification product having a supercoiled structure of interest was observed. In particular, when long-chain circular DNA having a low concentration is amplified, addition of RecG-type helicase and single-strand DNA-specific exonuclease to the amplification reaction is effective as a means for solving the problem that is amplification of a low-molecular-weight by-product.

[0222] Example 11: Addition of RecBCD and exo I

Linear DNA-specific exonuclease and single-strand DNA-specific exonuclease were further added to the amplification reaction solution, and the effects obtained by the addition of the linear DNA-specific exonuclease and the single-strand DNA-specific exonuclease were studied.

As template DNA, the 200 kb circular DNA described in Example 1 was used.

As linear DNA-specific exonuclease, RecBCD was used. Such RecBCD was obtained from NEB.

As single-strand DNA-specific exonuclease, exo I was used. Such exo I was obtained from NEB.

[0223] To a reaction solution comprising the reaction buffer with the composition shown in Table 6 and the enzyme group with the composition shown in Table 1, the 200 kb circular DNA, RecBCD, and exo I were added to result in concentrations of 0.5 pM (67 pg/μl), 0, 1.5, 5.0, 15.0, or 50.0 mU/μl, and 200 mU/μl, respectively. The obtained amplification reaction