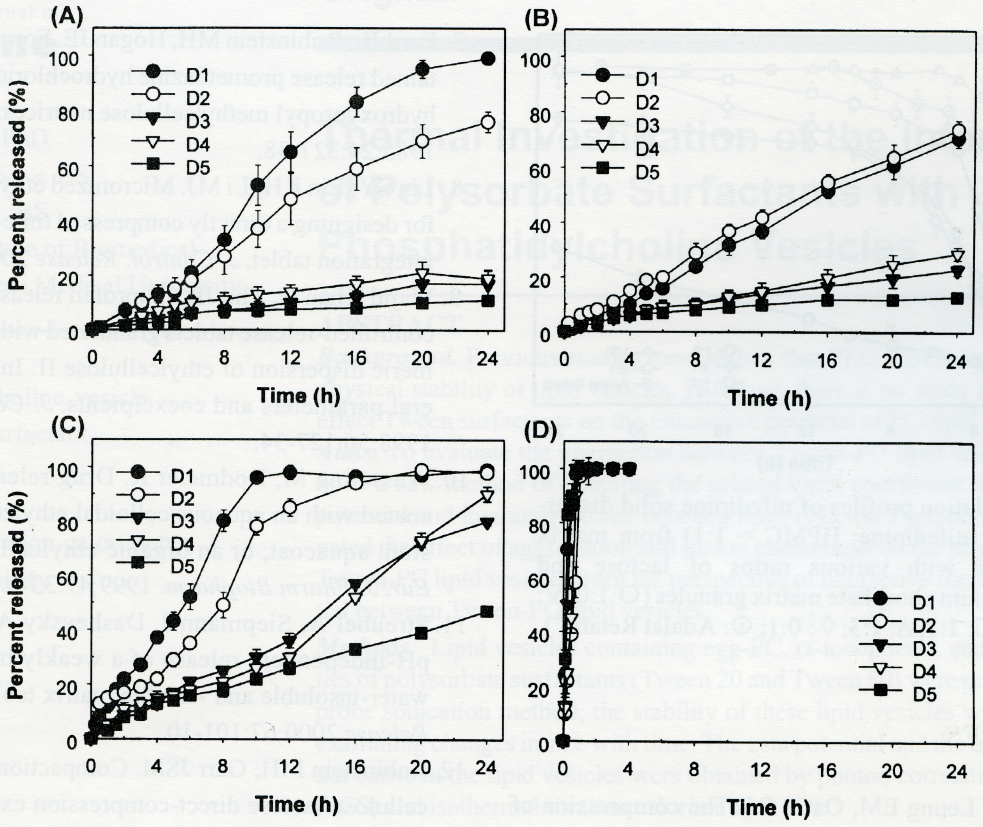

Fig. 4. Dissolution profiles of nifedipine (A) and its solid dispersions (B) nifedipine: PVP (1:1); (C) nifedipine: HPMC (1:1); (D) nifedipine: HPMC (1:3) from dicalcium phosphate matrix tablets (D1:●; D2:○; D3:▼; D4:▽; D5:■.

both matrix granules. A limited interaction between these 2 matrix granules is suspicious. However, this was further verified by the fact that the hardness of matrix tablets composed of these 2 matrix granules in a ratio of 1:3 was the lowest among the matrix tablets tested. Because of that, the dissolution rate of nifedipine from matrix tablets produced by mixing D5 and L5 in a ratio of 1:3 was the fastest among the matrix tablets produced by mixing these 2 matrix granules at these 5 ratios.

CONCLUSIONS

It is evident that granulated excipients produced with a hydrophobic polymer, such as ethylcellulose, are suitable as a matrix material for developing controlled-release dosage forms. With these types of matrix materials, a controlled-release dosage form of nifedipine can be prepared by direct compression. However, the water-soluble polymers (PVP and HPMC) used to improve the solubility of nifedipine in water further interactively affected the dissolution rate of nifedipine from these matrix tablets. The in vitro sustainability of nifedipine was also dependent on its solubility and weight fraction of the total tablet weight which are important for maintaining the integrity of the matrix tablet during dissolution. Results indicate that the dilution capacity of granulated excipients for direct compression is justified for the effective controlled-release of any drug with a higher water solubility, especially for those drugs enhanced by solid dispersion systems.

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