عنوان مقاله:

Plant cells technology as an effective biotechnological approach for high scale production of pharmaceutical natural compounds; A meta-analysis study

محل انتشار:

مجله تحقیقات دارویی و بیومدیک, دوره 5, شماره 2 (سال: 1398)

تعداد صفحات اصل مقاله: 9

نویسندگان:

Ali Davoodi - Department of Pharmacognosy, Faculty of Pharmacy, Mazandaran University of Medical Sciences, Sari, Iran

Elnaz Khoshvishkaie - Pharmaceutical Cares Department, Ayatollah Khamenei Hospital, Mazandaran University of Medical Sciences, Abbas Abad, Iran

Mohammad Azadbakht - Department of Pharmacognosy, Faculty of Pharmacy, Mazandaran University of Medical Sciences, Sari, Iran

خلاصه مقاله:

Natural-based drugs are the important bioactive substances that have been used for prevention and treatment of diseases. Natural products should be prepared in commercial scale from relevant medicinal plants. Hence, large amounts of the plants have been needed for extraction and isolation of compounds of natural origin. Plant cells technology is the best strategy for the production of the plant-derived drugs, which have difficulty in high scale preparation. This study was conducted for types, frequencies and efficacies of production methods for natural-based drugs in plant cell technology as alternative method to whole herb. Pharmaceutical and biomedical databases including PubMed/Medline, Scopus, Web of Science, Embase, ProQuest and Google Scholar were searched in this study. Moreover, keywords words were "secondary metabolite production", "pharmaceutical natural compounds", "high scale production", "cell suspension", "immobilized plant cell", "hairy root", "elicitor", "substrate", "plant cell", "callus", "medicinal plants", "isolation and purification". The correlations have been investigated by random effect model in an Excel program. Findings of this meta-analysis study showed all production methods had high efficacies and percentages of high scale production from ۹۰ to ۱۰۰%, which were comparable with conventional direct extractions. In addition to, median efficacy values for cell suspension, callus, hairy root and immobilized plant cell methods in production of selected drugs (atropine, paclitaxel, vincristine, camptothecin and colchicine) with ۱۱۲۴, ۲۵۷, ۷۹۷ and ۹۶۹ events were ۹۲.۴۹ (CI۹۵%: ۸۹.۷۸-۹۵.۸۶), ۹۱.۹۸ (CI۹۵%: ۸۹.۱۳-۹۵.۲۵), ۹۵.۶۹ (CI۹۵%: ۹۲.۸۴-۹۸.۶۸) and ۹۳.۸۶% (CI۹۵%: ۹۱.۱۲-۹۶.۳۵), respectively. The plant cell technology for production of secondary metabolites has various advantages including high accuracy, repeatability and productivity, that is a best strategy for production of natural-based drugs.

کلمات کلیدی:

Plant cell, hairy root, callus, immobilized cell, meta-analysis