MOLECULAR ORGANIZATION OF THE CHLOROPLAST GENOME AND TAXONOMIC POSITION OF *STELLARIA DICHOTOMA* VAR. *LANCEOLATE*

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Stellaria dichotoma L. var. lanceolata Bunge is a typical rare medicinal plant commonly used in therapeutic formulations. To reveal the structural arrangents and variation of complete chloroplast genomes between S. dichotoma var. lanceolata and its related species is of great significance for the study of its evolutionary status. In this study, evolutionary relationships between S. dichotoma var. lanceolata and its related species of Caryophyllaceae were documented based on the complete chloroplast genome sequence of S. dichotoma var. lanceolata. The result showed that the whole circular genome of S. dichotoma var. lanceolata was 150,461 bp in length, annotated 129 genes, possessing RSCU of 21 types of amino acids and 64 codons encoding. By comparing and analyzing the SSR and variation region of the chloroplast gene of S. dichotoma var. lanceolata and its related genus pseudostellaria, we found that the divergent regions of trnk-rps16, atpH-atpI, rpoC1-rpoB, rbcL-accD, trnS-trnG, psaA-ycf3, trnV-trnM, ycf4-cemA, petL-petG, trnL-ccsA, ndhF, ndhA, and ycf1 fragments were highly obvious, which could be used as DNA barcodes for the taxonomic evidence of S. dichotoma var. Lanceolata and Pseudostellaria in Caryophyllaceae. A maximum likelihood (ML) phylogenetic tree elucidated that S. dichotoma var. lanceolata was closely related to pseudostellaria, and cluster into a branch with Cerastium. Our results lay a robust foundation for future phylogenetic and evolutionary status of S. dichotoma var. lanceolata and among relatives within Caryophyllaceae.

Key words: *Complete chloroplast genome; Stellaria dichotoma var. lanceolata; Caryophyllaceae; Pseudostellaria; phylogenetic analysis.*

МОЛЕКУЛЯРНА ОРГАНІЗАЦІЯ ХЛОРОПЛАСТНОГО ГЕНОМУ І ТАКСОНОМІЧНЕ ПОЛОЖЕННЯ *STELLARIA DICHOTOMA* VAR. *LANCEOLATE*

Stellaria dichotoma L. var. *lanceolata* Bunge – це типова рідкісна лікарська рослина, яку зазвичай використовують у складі терапевтичних препаратів. Виявлення структурних особливостей і відмінностей повних хлоропластних геномів *S. dichotoma* var. *lanceolata* від споріднених видів є надзвичайно важливим для вивчення його еволюційного статусу. У цьому дослідженні було задокументовано еволюційні взаємовідносини між *S. dichotoma* var. *lanceolata* та спорідненими видами Caryophyllaceae на основі послідовності повного хлоропластного геному *S. dichotoma* var. *lanceolata*. Результат продемонстрував, що повний циклічний геном *S. dichotoma* var. *lanceolata* мав довжину 150 461 п.н., 129 генів, відносну частоту використання синонімічного кодону (RSCU) 21 типів амінокислот і 64 кодони. Шляхом порівняння й аналізу простих повторюваних послідовностей (SSR) і ділянки мінливості хлоропластного гену *S. dichotoma* var. *lanceolata* і його спорідненого роду *Pseudostellaria* ми виявили, що дивергуючі області *trnk-rps16*, *atpH-atpI*, *rpoC1-rpoB*, *rbcL-accD*, *trnS-trnG*, *psaA-ycf3*, *trnV-trnM*, *ycf4-cemA*, *petL-petG*, *trnL-ccsA*, *ndhF*, *ndhA* та *ycf1* фрагментів були надзвичайно очевидними, що можна використати як ДНК-штрихкоди для таксономічного доведення *S. dichotoma* var. *Lanceolata* та *Pseudostellaria* в Caryophyllaceae. Філогенетичне дерево максимальної правдоподібності показало, що *S. dichotoma* var. *lanceolata* тісно пов'язана з *Pseudostellaria* і кластером на гілці із *Cerastium*. Наші результати закладають міцне підґрунтя для майбутнього філогенетичного і еволюційного статусу *S. dichotoma* var. *lanceolata* та положення серед Caryophyllaceae.

Ключові слова: повний хлоропластний геном; *Stellaria dichotoma* var. *lanceolata*; Caryophyllaceae; *Pseudostellaria*; філогенетичний аналіз.

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