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Polymorphism of *CAD* and *CESA* genes in flax (*Linum usitatissimum* L.)

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Flax (*Linum usitatissimum* L.) is used for production of fiber and seed. The content of lignin and cellulose is an essential characteristic that determines the suitability of fiber for textile and composite productions. It has been shown that cinnamyl alcohol dehydrogenases (CADs) are involved in the processes of lignin formation, while cellulose synthases (CESAs) play a key role in cellulose biosynthesis. In the present work, polymorphism of *CAD* and *CESA* genes was estimated in 288 flax cultivars and lines with lignin content varied from 2 % to 7.5 % and cellulose content varied from 82 % to 88 %. DNA was extracted from pools of seedlings for each sample using CTAB protocol. Primers were designed for amplification of *CAD1* and *CESA4* genes and their putative promoter regions with 450–500 bp DNA fragments. DNA libraries were obtained using two successive PCRs which allowed us to add sequences that are necessary for sequencing on the Illumina platform. Quality and concentration of DNA libraries were evaluated by Agilent 2100 Bioanalyzer (Agilent Technologies) and Qubit 2.0 fluorometer (Life Technologies). Deep sequencing was performed on MiSeq Illumina with 300+300 read length. The average coverage for studied *CAD* and *CESA* genes in an individual sample was over 100x. The pipeline was developed for analysis of the sequencing data, and genetic polymorphism of *CAD1* and *CESA4* genes was assessed within 288 flax samples. Obtained data contribute to the evaluation of genetic diversity of flax, determination of association between *CAD* and *CESA* allelic variants and fiber qualities, and could be used in breeding of improved cultivars.

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