

Overexpression of *Arabidopsis thaliana* gibberellic acid 20 oxidase (AtGA20ox) gene enhance the vegetative growth and fiber quality in kenaf (*Hibiscus cannabinus* L.) plants

ABSTRACT

Kenaf (*Hibiscus cannabinus* L.; Family: Malvaceae), is multipurpose crop, one of the potential alternatives of natural fiber for biocomposite materials. Longer fiber and higher cellulose contents are required for good quality biocomposite materials. However, average length of kenaf fiber (2.6 mm in bast and 1.28 mm in whole plant) is below the critical length (4 mm) for biocomposite production. Present study describes whether fiber length and cellulose content of kenaf plants could be enhanced by increasing GA biosynthesis in plants by overexpressing *Arabidopsis thaliana* Gibberellic Acid 20 oxidase (AtGA20ox) gene. AtGA20ox gene with intron was overexpressed in kenaf plants under the control of double CaMV 35S promoter, followed by in planta transformation into V36 and G4 varieties of kenaf. The lines with higher levels of bioactive GA (0.361.52 ng g⁻¹ fresh weight) were further characterized for their morphological and biochemical traits including vegetative and reproductive growth, fiber dimension and chemical composition. Positive impact of increased gibberellins on biochemical composition, fiber dimension and their derivative values were demonstrated in some lines of transgenic kenaf including increased cellulose content (91%), fiber length and quality but it still requires further study to confirm the critical level of this particular bioactive GA in transgenic plants.

Keyword: Biocomposite; Fiber quality; GA20ox gene; *Hibiscus cannabinus*; Overexpression; Transgenic kenaf