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A stress associated NAC transcription factor *MpSNAC67* from banana (*Musa x paradisiaca*) is involved in regulation of chlorophyll catabolic pathway

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ACCEPTED MANUSCRIPT

1	A stress associated NAC transcription factor MpSNAC67 from banana (Musa x
2	paradisiaca) is involved in regulation of chlorophyll catabolic pathway
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10	
11	Abstract
12	Process of senescence includes multiple steps involving break-down of chlorophyll to degrade
13	photosynthetic machinery. In this study, we showed that a stress-associated NAC transcription
14	factor MpSNAC67 regulates senescence by promoting chlorophyll-catabolic genes. MpSNAC67
15	encodes a transcriptional activator and its promoter activity is restricted to vascular tissue of
16	banana. Expression of MpSNAC67 showed positive responses to multiple abiotic stress
17	conditions suggesting that MpSNAC67 is a stress associated NAC transcription factor. Transgenic
18	banana lines overexpressing MpSNAC67 showed highly senesced phenotype including yellowing
19	and de-greening of leaves similar to etiolated leaves. Transgenic leaves possessed low
20	chlorophyll content and failed to retain normal chloroplast morphology including loss of granum
21	thylakoid, non-uniform chloroplast membrane and increased number as well as size of
22	plastoglobulins. In a gel shift assay MpSNAC67 could retard the mobility of chlorophyll
23	catabolic genes such as PAO-like (Pheophorbide-a-oxygenase), HCAR-like (hydroxymethyl

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