INTISARI

Nanas kultivar ‘MD2’ atau yang biasa disebut dengan *golden ripe* merupakan nanas dengan minat tertinggi karena memiliki rasa asam yang rendah serta memiliki rasa yang lebih manis dengan kandungan asam askorbat yang tinggi. Akan tetapi dalam perkembangannya, nanas memiliki permasalahan seperti kejadian translusensi yang berakibat pada 10-30% hasil panen. Kejadian translusensi tersebut belum dapat dipastikan penyebabnya, sehingga perlu dikaji lebih lanjut dengan deteksi molekuler menggunakan analisis *quantitative real-time polymerase chain reaction* (qRT-PCR) untuk mengetahui ekspresi gen yang terjadi pada translusensi nanas ‘MD2’. Pada penelitian ini bertujuan untuk mengetahui metode yang tepat dalam menentukan penyebab dari nanas yang terkena translusensi serta pengaruh gen pengkode enzim metabolisme gula dengan nanas yang terkena translusensi. Penelitian ini diawali dengan ekstraksi RNA buah nanas dengan total 11 buah digunakan tiga sampel yaitu *core*, daging dan kulit. Dilakukan sintesis cDNA untuk menggandakan rantai RNA yang selanjutnya dianalisis qRT-PCR dengan enam primer yang terdiri dari lima gen target yaitu *sucrose phosphate synthase* (SPS), *sucrose synthase* (SUSY), *invertase* (INV), *calcium-dependent protein kinase* (cDPK), *citrate synthase* (CS) dan satu gen referensi yaitu actin (ACT). Diperoleh hasil eskpresi gen melalui qRT-PCR untuk mengetahui kenaikan atau penurunan ekspresi gen. Nanas translusensi tidak dapat diketahui berdasarkan perbedaan fisiknya, tidak ada perbedaan yang signifikan terhadap warna nanas translusensi dengan nanas normal. Metode perendaman air dapat mengetahui nanas translusensi, dimana nanas translusensi akan tenggelam akibat kelebihan larutan pada daging. Diperoleh regulasi bahwa sampel daging dan kulit mengalami *down regulated* pada ekspresi gen SUSY, SPS, dan INV. Sedangkan sampel core mengalami *up regulated* pada ekspresi gen SUSY dan SPS. Ketidakstabilan metabolisme sukrosa tersebut, dimana pada sampel core menyebabkan penyaluran sukrosa yang berlebihan pada jaringan sink yaitu daging dan kulit (basal). Ekspresi gen cDPK mengalami *down regulated* sehingga dapat disimpulkan translusensi pada sampel bukan akibat stress tanaman. Gen CS mengalami *down regulated* akibat substrat glukosa yang minim dari regulasi metabolisme sukrosa yang tidak stabil.

Kata kunci : ekspresi gen, nanas, qRT-PCR, translusensi

ABSTRAC

The pineapple cultivar 'MD2' or commonly referred to as the golden ripe is one of the elite varieties of pineapple since it tastes sweet with low sour taste and high ascorbic acid content. However, the most challenge in MD2 cultivation is a physical disorder translucency that affects around 10-30% of crop production. The cause of this translucency is still unknown, thus, study on translucency through molecular analysis using qRT-PCR is required to determine the genes involved in translucency mechanism. It has reported that sugar metabolism enzymes is related to translucency in pineapple. This study was conducted by RNA extraction from 11 pineapple fruit and each sample was extracted in the part of core, flesh and skin. The cDNA synthesis was prepared to further analysis using quantitative real-time polymerase chain reaction (qRT-PCR). The targeted genes for qRT-PCR analysis consist of five target genes; sucrose phosphate synthase (SPS), sucrose synthase (SUSY), invertase (INV), calcium-dependent protein kinase (cDPK), citrate synthase (CS) and one reference gene, actin (ACT). Based on morphological characteristic, translucency in pineapple is hard to be seen since there is no significant difference between translucency and normal pineapple. Based on qRT-PCR analysis, the expression level of SPS, SUSY, and INV genes were down regulated in flesh and skin samples of translucency compared to the normal pineapple. However, the expression level of SPS and SUSY genes in core samples were up-regulated. The unstable gene expression encoding enzyme that involved in sucrose metabolism affects excessive distribution of sucrose in the sink tissue such as flesh and skin basal. The CDPK gene expression was down regulated, thus it suggested that the translucency in pinneapple was not caused by the environmental stress, such as biotic and abiotic stresses. The CS was down regulated and indicated that minimum glucose substrate accumulation and unstable sucrose metabolism. Based on this results, it might be assummed that translucency in pineapple was caused by sugar metabolism disorder.

Keyword : gene expression, pineapple, translucency, qRT-PCR