RNAi (*RNA Interference*) dengan Target Gen 18S *Ribosomal RNA* pada *Ganoderma boninense* untuk Pengendalian Busuk Pangkal Batang Kelapa Sawit (*Elaeis guieneensis*)

INTISARI

Busuk pangkal batang (BPB) oleh *Ganoderma boninense* mengancam industri kelapa sawit di Indonesia dan Malaysia, dengan perubahan iklim memperburuk infeksi. Kerugian di Sumatera dan Malaysia diperkirakan mencapai 41-100% pada tahun 2100. Berbagai metode pengendalian BPB telah dicoba dengan hasil bervariasi, namun biokontrol berbasis RNAi menjanjikan solusi ramah lingkungan dan ekonomis. Penelitian ini meneliti efek RNAi menarget gen 18S ribosomal RNA pada Ganoderma boninense terhadap berat kering dan ekspresi gen 18S. Isolat Ganoderma boninense KM8 dan B93 ditumbuhkan di media PDB dengan kontrol dan perlakuan dsRNA (P1:20 ng/µL dan P2:75 ng/µL). Berat kering diukur pada hari ke-8, dan ekspresi gen dianalisis menggunakan qRT-PCR. Hasil menunjukkan penurunan berat kering pada KM8 di P1 dan B93 di P2 ($p<0.05$). Penurunan ekspresi gen terlihat pada Isolat KM8 pada kedua perlakuan, dengan tingkat terendah di P1 ($p>0.05$). Desain dsRNA yang tepat meningkatkan efikasi RNAi, terutama pada KM8, menjadikannya metode pengendalian BPB yang potensial.

Kata kunci: RNAi, 18S ribosomal RNA, *Ganoderma boninense*, Berat kering, Ekspresi gen

RNAi (RNA Interference) Targeting the 18S Ribosomal RNA Gene in Ganoderma boninense for Controlling Basal Stem Rot in Oil Palm (Elaeis guineensis)

ABSTRACT

Stem rot caused by *Ganoderma boninense* threatens the palm oil industry in Indonesia and Malaysia, with climate change exacerbating the infection. Losses in Sumatra and Malaysia are estimated to reach 41-100% by 2100. Various stem rot control methods have been tried with varying results, but RNAi-based biocontrol promises an environmentally friendly and economical solution. This study examines the effects of RNAi targeting the 18S ribosomal RNA gene in Ganoderma boninense on dry weight and 18S gene expression. Ganoderma boninense isolates KM8 and B93 were grown in PDB medium with control and dsRNA treatments (P1: 20 ng/µL and P2: 75 ng/µL). Dry weight was measured on day 8, and gene expression was analyzed using qRT-PCR. The results showed a reduction in dry weight in KM8 at P1 and B93 at P2 ($p<0.05$). Gene expression decreased in KM8 isolates in both treatments, with the lowest level in P1 ($p>0.05$). Proper dsRNA design enhances RNAi efficacy, particularly in KM8, making it a potential stem rot control method.

Keywords: RNAi, 18S ribosomal RNA, *Ganoderma boninense*, Dry weight, Gene expression