Title: *IN SILICO* CHARACTERIZATION AND EXPRESSION PROFILING OF THE DIACYLGLYCEROL ACYLTRANSFERASE GENE FAMILY (DGAT1, DGAT2, DGAT3 and WS/DGAT) FROM OIL PALM, *Elaeis guineensis*

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IN SILICO CHARACTERIZATION AND EXPRESSION PROFILING OF THE DIACYLGLYCEROL ACYLTRANSFERASE GENE FAMILY (DGAT1, DGAT2, DGAT3 and WS/DGAT) FROM OIL PALM, *ELAEIS GUINEENSIS*.

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Highlights

- Genes encoding four distinct functional families of diacylglycerol acyltransferases (DGAT) enzymes were characterised in the genome of the African oil palm, *Elaeis guineensis* and in 12 other oil crop or model/related plants.
- The oil palm genome contains respectively three, two, two and two distinctly expressed functional copies of the DGAT1, DGAT2, DGAT3 and WS/DGAT genes.
- Comparison of the predicted DGAT sequences was consistent with the *E. guineensis* DGAT1 being ER located with its active site facing the lumen while DGAT2, although also ER located, had a predicted cytosol-facing active site.
- In contrast, DGAT3 and WS/DGAT in *E. guineensis* are predicted to be soluble, cytosolic enzymes.
- Evaluation of *E. guineensis* DGAT gene expression in different tissues and developmental stages suggests that the four DGAT groups have distinctive physiological roles and are particularly prominent in developmental processes relating to reproduction, such as flowering, and in fruit/seed formation especially in the mesocarp and endosperm tissues.