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Rationale of Transketolase from *Orthosiphon aristatus* having Anti-Diabetic Potential

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From the year 2009 to 2012, there were 657, 839 diabetic patients registered in National Diabetes Report. Almost 99% of them were diagnosed with type II diabetes mellitus. Diabetes is a metabolic disorder characterised by high-blood glucose level resulting from defects in insulin secretion, insulin action or both. It might lead to death if it is not treated and managed correctly. Intensive studies on new lead have been conducted, mainly because of limitations and side effects contributed by the existing synthetic drugs. The leaves of *Orthosiphon aristatus* are traditionally used to treat diabetes. The anti-diabetic activity could be attributed to secondary metabolites, possibly rosmarinic acid and sinensetin. Rosmarinic acid rich extract from the plant achieved IC_{50} 0.34 mg/mL which was found to be 5 times more active than the drug, acarbose (IC_{50} 1.66 mg/mL) in the inhibition of α-glucosidase. Fractions with 50% rosmarinic acid (IC_{50} 1.48 mg/mL) had a comparable inhibitory capacity with acarbose. Therefore, it is believed that peptides of the plant could also exert Anti-Diabetic activity. Proteomic profiling of white and purple flowers variety of *O. aristatus* found to have the potential transketolase. The presence of transketolase in maize, bacteria, fungi and human have been reported and the peptide was found to prevent diabetic retinopathy through blocking three major pathways of hyperglycemic damage; the hexosamine pathway, the advanced glycation end product (AGE) formation pathway and the diacylglycerol (DAG)–protein kinase C (PKC) pathway. The activity of transketolase was highly regulated by thiamine and its derivatives. Transketolase of *O. aristatus* is likely to be a potential therapeutic agent to prevent diabetes.

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