

**Title :** Hematological Effect of Thai Herbal Formulas in High Fat-Diet and Streptozotocin-Induced Obesity and Diabetes in Male Rats.

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## ABSTRACT

Obesity is a significant risk factor for the progression of metabolic disorders and type 2 diabetes. Diabetes-related anemia has been reported due to the elevation of non-enzymatic glycosylation of erythrocyte membrane proteins. Polyherbal mixtures have a long history of being used to alleviate obesity and its related metabolic disorder, particularly type 2 diabetes. Thus, the aim of this research was to study the effects of novel herbal formulas on hematological parameters in high-fat diet-and streptozotocin-induced obesity and diabetes in male rats. Two Thai herbal formulas were used in this study. Formula 1 consisted of *Dracaena cochinchinensis*, *Milium velutinum*, *Emblia officinalis*, *Piper interruptum*, and *Albizia procera*, whereas Formula 2 consisted of *Cinnamomum bejolghota*, *Milium velutinum*, *Acacia concinna*, *Ocimum gratissimum*, and *Albizia procera*. Rats were divided into normal and obesity/diabetes-induced groups. The normal groups consisted of one normal control and two herbal formulas-treated groups. The obesity- and diabetes-induced groups consisted of one negative control, herbal formulas-treated groups, and three standard medication-treated groups (orlistat, metformin and atorvastatin). All treatments were administered orally for one month. The hematological parameters, including total red blood cell (TRBC) count, total white blood cell (TWBC) count, differential white blood cell counts, hemoglobin (Hb), hematocrit (Hct), mean corpuscular volume (MCV), mean corpuscular hemoglobin (MCH), and mean corpuscular hemoglobin concentration (MCHC) were measured. The results indicated that the induction of obesity and

diabetes caused a significant ( $p < 0.05$ ) increase in Hb level. TRBC, Hct, MCV, and MCH showed no significant differences among the herbal formulas-treated, standard drugs-treated, and control groups. However, Formula 2 significantly ( $p < 0.05$ ) decreased Hb levels in obesity- and diabetes-induced rats, whereas Formula 1 significantly ( $p < 0.05$ ) increased Hb levels. Metformin significantly decreased TRBC and markedly increase MCV and MCH in obesity- and diabetes-induced rats. There were no statistically significant differences in TWBC and MCHC among the treatments and control groups. In conclusion, the novel Thai herbal formulas did not significantly alter hematological parameters in either obesity- and diabetes-induced rats or normal rats.