Anti-hyperglycemic and hepato-protective effects of thymoquinone (Nigella sativa oil) in diabetes

W. Sobhi (1,2), N. Boutrid (3), A. Rezgui (2), H. Rahmoune (3), Y. Benguerba (4)

1: Laboratory of Applied Biochemistry, Ferhat Abbas Setif 1 University (UFAS 1), Setif, Algeria
2: Centre de Recherche en Biotechnologie (CRBT), Constantine, Algeria
3: LMCVGN Laboratory, Ferhat Abbas Setif 1 University (UFAS 1), Setif, Algeria
4: Laboratoire des Matériaux Polymériques Multiphasiques (LMPMP), Ferhat Abbas Setif 1 University (UFAS 1), Setif, Algeria

INTRODUCTION

Thymoquinone is the major component of Nigella sativa volatile oil, with antioxidant, antitumoral and anti-inflammatory properties.
We explored the glycemic and hepatic effects of thymoquinone in streptozotocin-treated rats.

MATERIAL & METHODS

Thymoquinone was administrated to streptozotocin-induced diabetic female rats (25mg /kg/day) during 21 days.

Glycemic fluctuation was scrutinized and hepatic effects were assessed through biochemical analysis.

RESULTS & DISCUSSION

Thymoquinone significantly reduced (-26%) the hyperglycemia induced by Nicotinamide/Streptozocin.
In vitro enzymatic evaluation showed that thymoquinone inhibited the α-glucosidase with an estimated half maximal inhibitory concentration (IC 50) = 125.03 µg / ml
This hypogmycemic effect seems strong with a Thymoquinone IC 50 much lower than the IC 50 of the reference hypoglycemic drug, acarbose = 388.8 µg / ml)
Biologically, thymoquinone improved the hepatic markers in treated diabetic rats :

ALT: 39.9 ± 2 IU / L, GGT: 1.2 ± 0.5 IU / L, Total bilirubin: 0.045 ± 0.01 mg / dL, alkaline phosphatase 305.7 ± 83 IU /L

versus non-diabetic rats:

ALT: 22.1 ± 2, GGT: 0.87 ± 0.1 IU / L, Total bilirubin: 0.023 ± 0.004 mg / dl, alkaline phosphatase 430 ± 75 IU /L

CONCLUSION

Thymoquinone significantly reduced blood sugar in diabetic murine models and acts as an oral anti-diabetic drug: its anti-hyperglycemic action is partly explained by a potent α-glucosidase inhibition.

Thymoquinone might also have positive effects on the hepatic biological and histological parameters.

REFERENCES (UPON REQUEST): rahmounehakim@gmail.com