



# IN-VIVO TOXICITY OF PROPHET'S MEDICINAL PLANT, *Lawsonia inermis* (HENNA) LEAVES

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## INTRODUCTION

### 1) Background of study:

*In-vitro* anti-urolithiatic effect (proven<sup>1</sup>)

**Toxicity of henna (present study)**

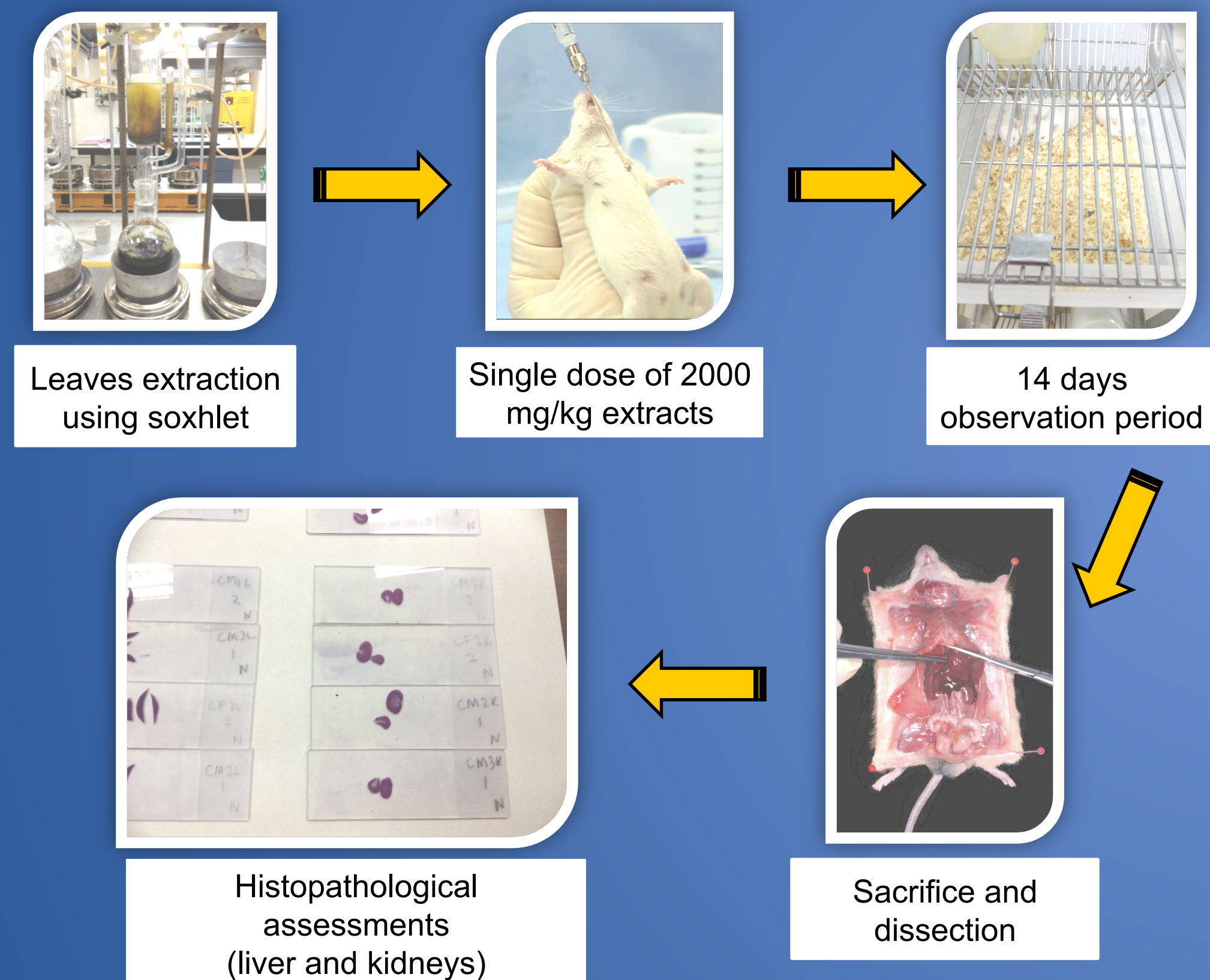
*In-vivo* anti-urolithiatic effect (future)

- only scant toxicity studies about Malaysia henna
- hardly any study on histopathological changes of liver and kidneys of mice due to henna leaves extracts administration.

### 2) Objective:

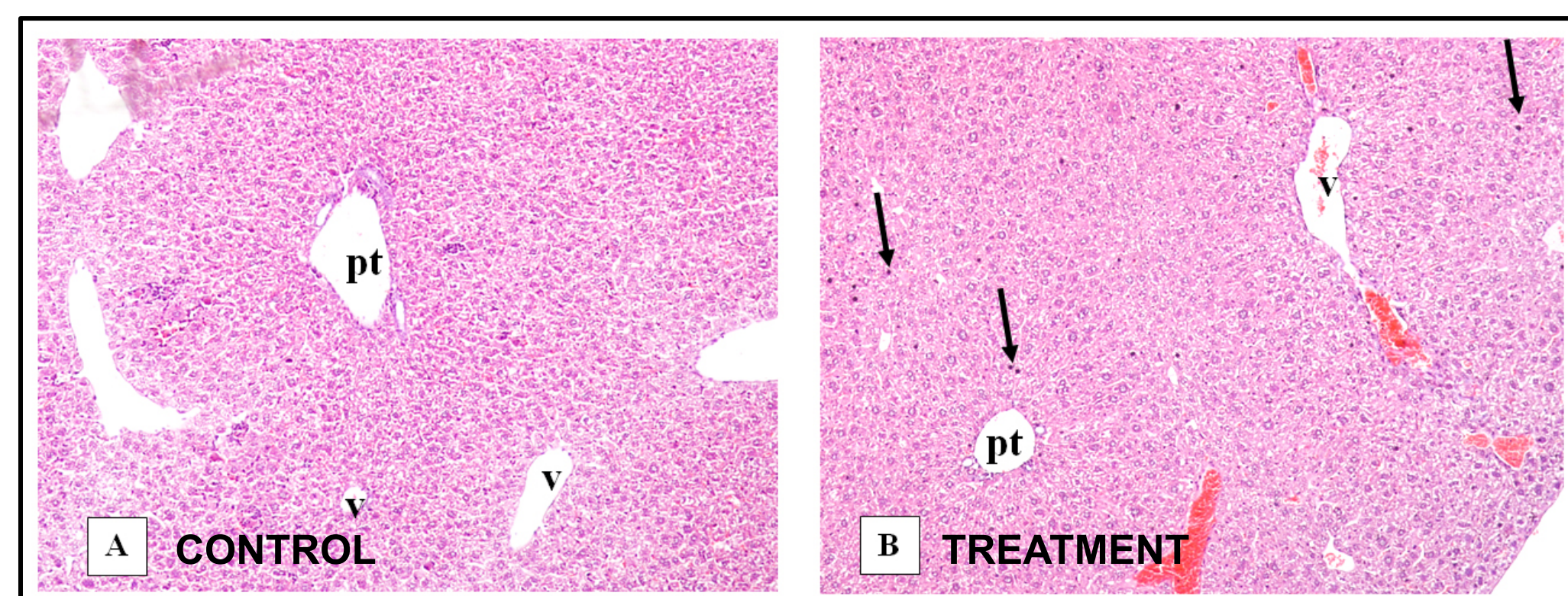
To compare the histopathological changes of liver and kidneys between control and treatment groups of the mice due to the administration of hydroethanolic extract of henna leaves.

## METHODOLOGY



## RESULTS AND DISCUSSION

### 1) Liver

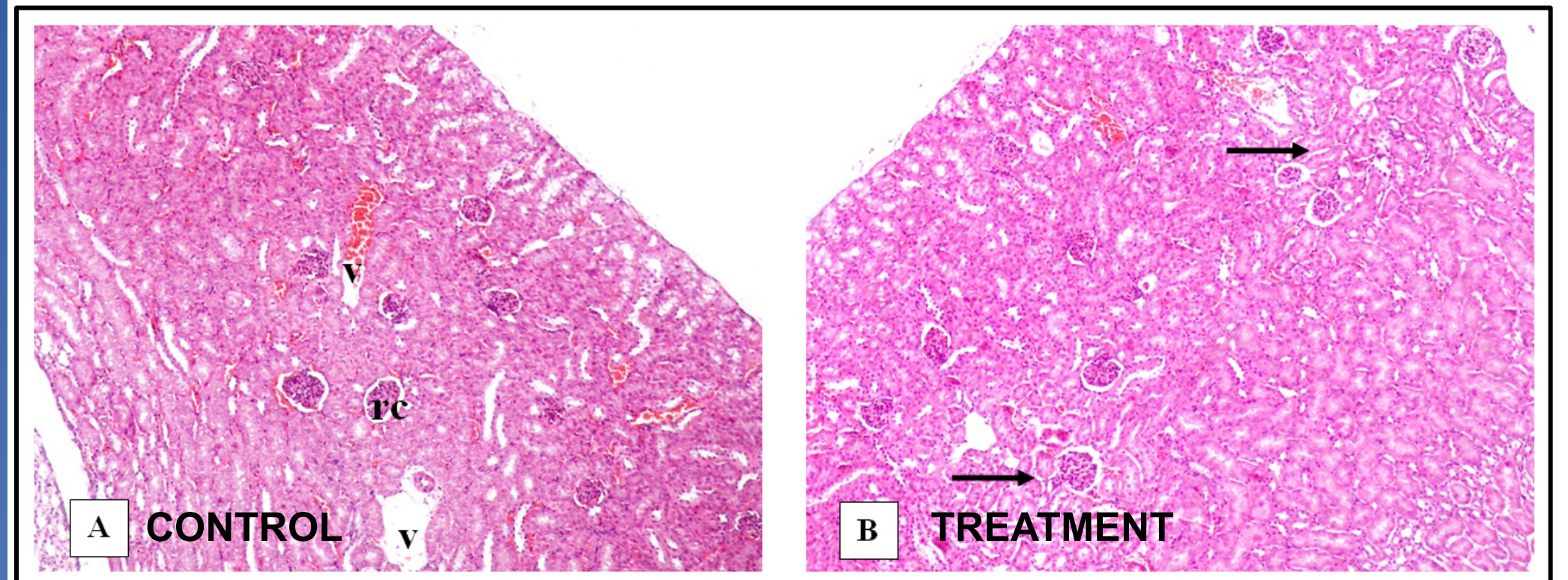


**Figure 1. (A)** Control section showing normal histology consisting portal triad (pt), veins (v), and cords of hepatocytes with sinusoids at the sides. **(B)** Treated mouse section showing pyknotic nuclei (arrows). H & E stained. 100x.

- Presence of pyknotic nuclei indicated occurrence of apoptosis.
  - could be triggered by quercetin or naringenin that present in Malaysian henna extracts<sup>2</sup>.
  - Quercetin was established as a pro-apoptotic agent<sup>3</sup>
  - Naringenin could elicit cytotoxic effect and deter the metabolism of toxic compound by inhibiting cytochrome P450 enzymes<sup>4</sup> present in liver and kidneys.

## RESULTS AND DISCUSSION

### 2) KIDNEYS



**Figure 2. (A)** Control section showing normal histology, with the presence of renal corpuscles (rc), veins (v), arteries (a) and convoluted tubules. **(B)** Treated mouse section showing area in which degeneration of connective tissues between the tubules happened (arrows). H & E stained. 100x.

- Degeneration of connective tissues between the tubules
  - possibly occur due to flavone apigenins that present in Malaysian henna extracts<sup>2</sup>.
  - Gradolatto *et al.* (2005) detected 1.18% and 0.32% apigenins in livers and kidneys on the 10<sup>th</sup> day following oral administration<sup>5</sup>.

**Table 1** Comparing Organs Weight between Control and Treatment (Independent t-test)

Organs Weight (g)	Means Control (n=8)	Means Treatment (n=10)	p-value (Sig.)
Kidneys	0.546 ± 0.106	0.538 ± 0.051	0.816
Liver	2.028 ± 0.353	2.135 ± 0.220	0.442
Heart	0.165 ± 0.030	0.201 ± 0.068	0.186
Spleen	0.225 ± 0.045	0.187 ± 0.025	0.036
Lung	0.382 ± 0.061	0.264 ± 0.059	0.529

- The mean weight of spleen between the control and treatment groups are considered statistically significant ( $p$ -value < 0.05).
  - There might be immune reactions happened in spleen due to the administration of henna extracts<sup>6</sup>
  - May be justified as the effect of phytochemical saponins<sup>7</sup>.

## CONCLUSION

It is scientifically proven that single dose of ethanolic extract of *L. inermis* (henna) leaves can cause toxicity towards liver and kidneys of the mice.

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## REFERENCES

- Nur Azfa, M. S. (2013). *Anti-urolithiatic Effect of Five Selected Prophetic Plants*. (Unpublished final year project). International Islamic University Malaysia.
- Mustafa, R. A., Abdul Hamid, A., Mohamed, S., Abu Bakar, F. (2010). Total Phenolic Compounds, Flavonoids, and Radical Scavenging Activity of 21 Selected Tropical Plants. *Journal of Food Science*. 75 (1), p.28-34.
- Nguyen, T. T. T., Tran, E., Nguyen, T. h., Do, P. T., Huynh, T. H., Huynh, H. (2004). The role of activated MEK-ERK pathway in quercetin-induced growth inhibition and apoptosis in A549 lung cancer cells. *Oxford University Press*. 25 (5), p.647-659.
- Szkudelska, K., Nogowski, L., Nowicka, E., Szkudelski, T. (2007). *In-vivo* metabolic effects of naringenin in the ethanol consuming rat and the effect of naringenin on adipocytes *in-vitro*. *J Anim Physiol Anim Nutr*. 91, p.91-99.
- Gradolatto, A., Basly, J., Berges, R., Teyssier, C., Chagnon, M., Siess, M., Canivec-Lavier, M. (2005). Pharmacokinetics and Metabolism of Apigenin in female and male rats after a single oral administration. *J Pharmacol Exp Ther*. 33 (1), p.49-54.
- Mikhaeil, B. R., Badria, F. A., Maatooq, G. T., & Amer, M. M. (2004). Antioxidant and immunomodulatory constituents of henna leaves. *Journal of Biosciences*, 59, p.468-476.
- Oda, K., Matsuda, H., Murakami, T., Katayama, S., Ohgihara, T., Yoshikawa, M. (2005). Adjuvant and Haemolytic Activities of 47 Saponins Derived from Medicinal and Food Plants. *Biological Chemistry*. 381 (1), p.67-74.