Vascular Health and Risk Management

Dovepress

open access to scientific and medical research

Open Access Full Text Article

LETTER

The Effectiveness of *Nigella sativa* and Ginger as Appetite Suppressants: An Experimental Study on Healthy Wistar Rats [Letter]

Adam Arditya Fajriawan[1,*], Risqa Novita[1,2,*]

[1]Research Center for Pharmaceutical Ingredients and Traditional Medicine, National Research and Innovation Agency (BRIN), Cibinong, Indonesia; [2]Primatology Study Program, Graduate School of IPB University, Bogor, Indonesia

*These authors contributed equally to this work

Correspondence: Risqa Novita, Research Center for Pharmaceutical Ingredients and Traditional Medicine, Research Organization for Health, National Research and Innovation Agency, Genomic Building, Cibinong Science Center, Jl. Raya Bogor No. 490, Cibinong, West Java, Indonesia, Email risq001@brin.go.id; my_risqa@apps.ipb.ac.id

Dear editor

We appreciate the authors for their publication titled "The Effectiveness of Nigella sativa and Ginger as Appetite Suppressants: An Experimental Study on Healthy Wistar Rats" in the esteemed journal Vascular Health and Risk Management. 2023;19:1–11. This study offers valuable insights into the potential of utilizing Nigella sativa and ginger, two herbal remedies, for mitigating obesity. The significance of this research is particularly pertinent considering the alarming statistics provided by the World Health Organization (WHO) indicating that, as of 2022, over one billion individuals worldwide suffer from obesity. Among them, 650 million are adults, 340 million are adolescents, and 39 million are children. Notably, these numbers are projected to rise further. Given the well-established association between obesity and various non-communicable diseases, such as Coronary Heart Disease, Diabetes Mellitus Type 2, Hypertension, and Stroke, it is imperative to emphasize the necessity of preventative interventions targeting obesity.[1,2]

Based on the background, it is mentioned that *Nigella sativa* and ginger are herbs used as anti-obesity, so it would be nice if the research is carried out in accordance with the research objectives, namely to determine the effect of consumption of *Nigella sativa* and ginger to lose weight and suppress appetite. According to our thinking, it would be nice to use obese animals so that weight loss can be known due to consumption of the two herbs. There are several ways to get obese animals; 1) genetic modifications, encompassing the use of transgenic and knockout mice; 2) monogenic models, exemplified by OC/OD mice, The Zucker fatty rat, and Otsuka Long-Evans rat; 3) polygenic models such as New Zealand obese mice and Kuo Kondo-Ay mice; 4) induction through high-carbohydrate diets; and 5) administration of specific chemical compounds or surgical interventions such as monosodium glutamate, ovariectomy, or the creation of lesions in the ventromedial hypothalamus.[3,4] Notably, rats lack a gallbladder, impeding the efficient digestion of fats within the gastrointestinal tract.[4,5] Despite both belonging to the Rodentia order, this divergence from mice underscores the need for careful interpretation of findings and generalization of results between these rodent models. The function of the gallbladder is to store and concentrate bile, which is released into the duodenum during digestion.[6] Bile is an alkaline fluid continuously produced by the liver whose main function is to aid in the digestion and absorption of lipids, as it is insoluble in water. It consists of cholesterol, bilirubin, water, bile salts, phospholipids, and ions. Cholesterol excreted into bile removes most of the cholesterol in the body. So, the absence of a gallbladder in rats allows the digestion of lipids from food to be incompletely absorbed by the body.

Despite the extensive research conducted on obesity in rodent models, it is essential to acknowledge the physiological and metabolic disparities that exist between rodents and non-human primates (NHPs). Consequently, it is not always feasible to directly extrapolate findings from rodent studies to human populations. Notably, NHPs offer distinct

Received: 31 May 2023
Accepted: 12 October 2023
Published: 24 October 2023

advantages as models for obesity research due to their capacity to spontaneously develop obesity when subjected to a high-fat, high-sugar diet. This dietary intervention induces perturbations in lipid and glucose metabolism, resulting in the accumulation of adipose tissue within visceral organs, insulin resistance, hypertension, dyslipidemia, and a disease pathogenesis that closely resembles the human condition.[5] However, it is imperative to adhere to the guiding principles of the 3Rs (Replace, Reduce, and Refinement) when selecting appropriate animal models for obesity-related investigations. In line with these principles, the utilization of lower-order organisms, such as the nematode *Caenorhabditis elegans*, can serve as a valuable tool for pharmacological assessments of anti-obesity agents.[7] This approach allows for initial screening and evaluation of drug efficacy prior to advancing to more complex animal models.

Acknowledgments

We would like to thank Dr. Sofa Fajriah and Dr. Kurnia Agustini for their suggestions and advice throughout the publication.

Disclosure

The authors report no conflicts of interest in this communication.

References

1. Al Asoom L, Alassaf MA, Alsulaiman NS, et al. The effectiveness of nigella sativa and ginger as appetite suppressants: an experimental study on healthy Wistar rats. *Vasc Health Risk Manag*. 2023;19:1–11. doi:10.2147/VHRM.S396295
2. World Health Organization. World obesity day 2022. World Health Organization [Internet]; 2022: 3–4. Available from: https://www.who.int/news/item/04-03-2022-world-obesity-day-2022-accelerating-action-to-stop-obesity. Accessed October 13, 2023.
3. Martins T, Castro-Ribeiro C, Lemos S, et al. Murine models of obesity. *Obesities*. 2022;2(2):127–147. doi:10.3390/obesities2020012
4. Higashiyama H, Uemura M, Igarashi H, Kurohmaru M, Kanai-Azuma M, Kanai Y. Anatomy and development of the extrahepatic biliary system in mouse and rat: a perspective on the evolutionary loss of the gallbladder. *J Anat*. 2018;232(1):134–145. doi:10.1111/joa.12707
5. Kruepunga N, Hakvoort TBM, Hikspoors JPJM, Köhler SE, Lamers WH. Anatomy of rodent and human livers: what are the differences? *Biochim Biophys Acta Mol Basis Dis*. 2019;1865(5):869–878. doi:10.1016/j.bbadis.2018.05.019
6. Hofmann AF. Bile acid secretion, bile flow and biliary lipid secretion in humans. *Hepatology*. 1990;12(3 Pt 2):17S-22S; discussion 22S–25S.
7. Haerkens F, Kikken C, Kirkels L, et al. A new use for old drugs: identifying compounds with an anti-obesity effect using a high through-put semi-automated Caenorhabditis elegans screening platform. *Heliyon*. 2022;8(8):e10108. doi:10.1016/j.heliyon.2022.e10108

https://doi.org/10.2147/VHRM.S423812