



Latent potentials of camel's milk

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Abstract

In a recent study (Zhang et al. in Eur Food Res Technol <https://doi.org/10.1007/s00217-021-03952-2>, 2022), a detailed description of the endogenous bioactive peptides in the milk of Dromedary and Bactrian camel was reported. The authors described multiple endogenous peptides that may contribute to the therapeutic benefits of camel milk thereby uncovering latent potential of camel milk.

Keywords Camel milk · Peptidomics · Bioactive peptides

We have read with great interest a recent work of Zhang et al. [1] analyzing the profiles of low molecular weight (≤ 10 kDa) endogenous peptides of raw camels milk using powerful proteomics and peptidomics tools. The importance of this work is in its focus on the raw and not the fermented milk, hence the majority of consumers of camel milk use the raw milk and in the analysis of the very low molecular weight peptidome, which often remains neglected in proteomics studies. In addition to its nutritional potential, the camel milk has distinguished nutraceutical potentials, some of which already reviewed in the current article [1]. As Zhang et al. [1] indicated, the anti-diabetic function, ACE inhibitors, and anti-oxidative potential are the most abundant functionalities ascribed to the biopeptidome, which is in line with the recent report demonstrating that the antidiabetic properties of camel milk may be due to the action of milk lactoferrin via its interaction with the insulin receptor (IR) followed by induction of phosphorylation of IR, AKT, and ERK1/2 [2]. The expression of all these endogenous bioactive peptides in raw camel milk would might explained our previous results [3], where the consumption of raw camel milk (from *Camelus dromedary*) for three months (250 ml/

day) by patients infected with hepatitis C virus, at different disease stages, promoted a significance reduction in the viral load, as well as improved the general health fitness biomarkers, may be due to the existence of the arrays of bioactive peptides with the potential to regulate and control various cellular pathways. The significance differences in both qualitative and quantitative levels of endogenous peptides are not restricted to the differences in the Dromedary and Bactrian camel milk [1], but it is also found between the intraspecies “breeds” of the Dromedary [4]. Recently, the purified and/or formulated samples of lactoferrin (which may contain some of the endogenous bioactive peptides) was used for COVID-19 control [5]. It is likely that in the near future, the bioactive peptides will become important agents for management of our lifestyle-related diseases, as indicated by many clinical trials [6]. Therefore, bioactive peptides of camel's milk origin are expected to uncover their numerous latent potentials.

And the last point, throughout this study, the authors used a wrong classification term for the Dromedary (also known as one-humped camel or Arabian camel, *Camelus dromedarius*) and Bactrian camel (or two-humped camel or simply camel, *Camelus bactrianus*). The term “breed” was used, while the Dromedary and the Dromedary represent two separate species. In fact, it was established that the camel taxonomical position can be described as follows: Kingdom–Animalia, Phylum–Chordata, Class–Mammalia, Order–Ariodactyla, Family–Camelidae, Genus–Camelus, and there are three exists species: *Camelus bacterianus*, *Camelus dromedarius*, and *Camelus ferus*, with any taxonomical differences within one of these species being known

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as “breeds” [7–9]. Therefore, using the term “breed” instead “species” might lead to the misunderstanding.

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Declarations

Conflict of interest The authors have no competing interests to declare that are relevant to the content of this article.

Compliance with ethics requirements This article does not contain any studies involving human/animals performed by any of the authors.

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