Supplements of chicken essence increase sleep in fruit flies

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Background

Brand's Essence of Chicken® (BEC) has been used for its general health benefits for over 180 years and has been incredibly popular since its sale to the public. The goal of this project was to answer three questions.

1. What effect does BEC® have on sleep?
2. What is the active ingredient in BEC® that is causing changes in sleep?
3. Does the manufacturing process of the food have any effect on fly sleep?

Abstract

Sleep is a conserved behavior and has vital functions among animal species. Many drugs or natural ingredients have been used to increase amount of sleep or improve sleep quality. The extract of BEC® contains many free amino acids, and has been shown to help improve memory and mood. It is not known whether BEC has beneficial effects on human sleep. The fruit fly, *Drosophila melanogaster*, has been well used as a model for sleep and circadian studies. Here we used fruit flies to investigate the effects of BEC® on sleep.

Methodology

Newly eclosed flies were fed for 10 days with cornmeal food supplemented with controls (0.1% of Reserpine or DMSO) or BEC® components at a concentration of 5%. The flies were transferred into glass tubes containing sucrose agar with the same concentrations of treatments and placed into *Drosophila* Activity Monitors (DAM) for 7 days (Figure 1b). The last 4 days of activity data were included in the data analysis (Figure 1c).

Figure 1. BEC and methodology of the project. (a) Brand's Essence of Chicken®. (b) The *Drosophila* Activity Monitor system. (c) A typical sleep profile of a wildtype (yw) fly.

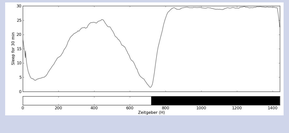
(a)

("Products- Health & Wellness Supplements" n.d.)

(b)

("TriKinetics," 2018)

(c)



Results

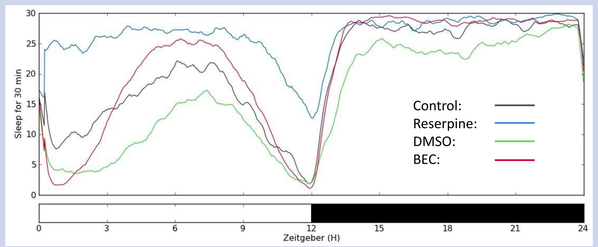


Figure 2. Supplementing food with BEC® increases fly sleep. The sleep profile of flies with either control food (no supplement), Reserpine, DMSO, or BEC®.

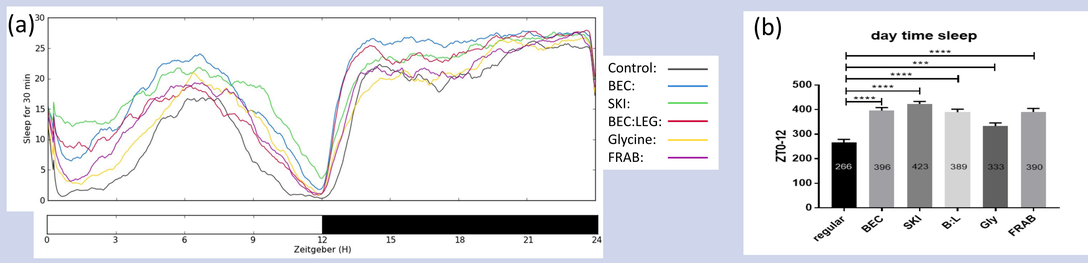


Figure 3. Supplementing food with SKI increases fly sleep. (a) The sleep profile of flies on food with either no supplement, Glycine, or different parts of BEC®. (b) Daytime sleep for flies on different supplements.

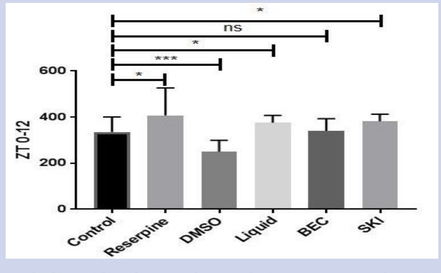


Figure 4. Supplementing food with liquified SKI (liquid) increases daytime sleep of flies. Daytime sleep (ZT 0-12) of flies on food with either no supplement, Reserpine, DMSO, Liquid, BEC®, or SKI.

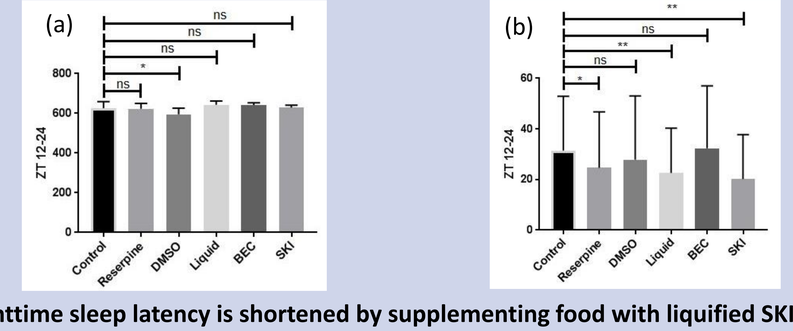


Figure 5. Nighttime sleep latency is shortened by supplementing food with liquified SKI. (a) Total nighttime fly sleep (ZT 12-24). (b) Nighttime sleep latency for the flies (ZT 12-24).

Conclusions

Here are several conclusions that can be made based on our current data.

1. BEC® generally increases fly sleep.
2. SKI appears to contain the active ingredient in BEC®.
3. SKI treated with the liquifying process leads to an increase in sleep.

Future Directions

The data for each of the components of the samples is preliminary and needs further trials to determine what the active ingredient is in BEC®. The next step is to identify the active ingredient in the liquid SKI samples that increase fly sleep, and to study whether these sleep changes are conserved in mammals.

Acknowledgements

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