



The bioactivity of Kombucha fermented *Camellia sinensis*, *Coffea arabica* and *Ganoderma lucidum* extracts

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Background

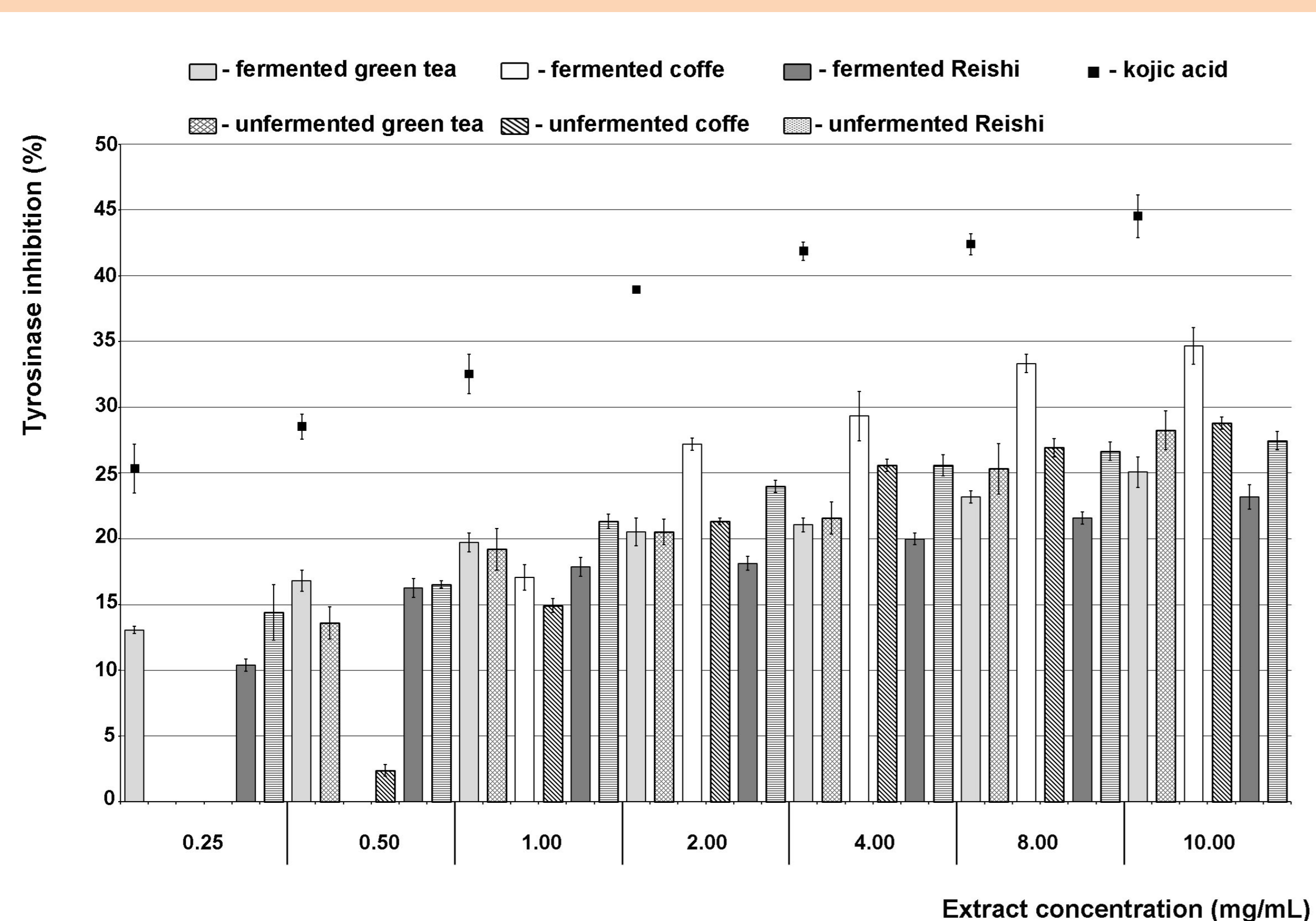
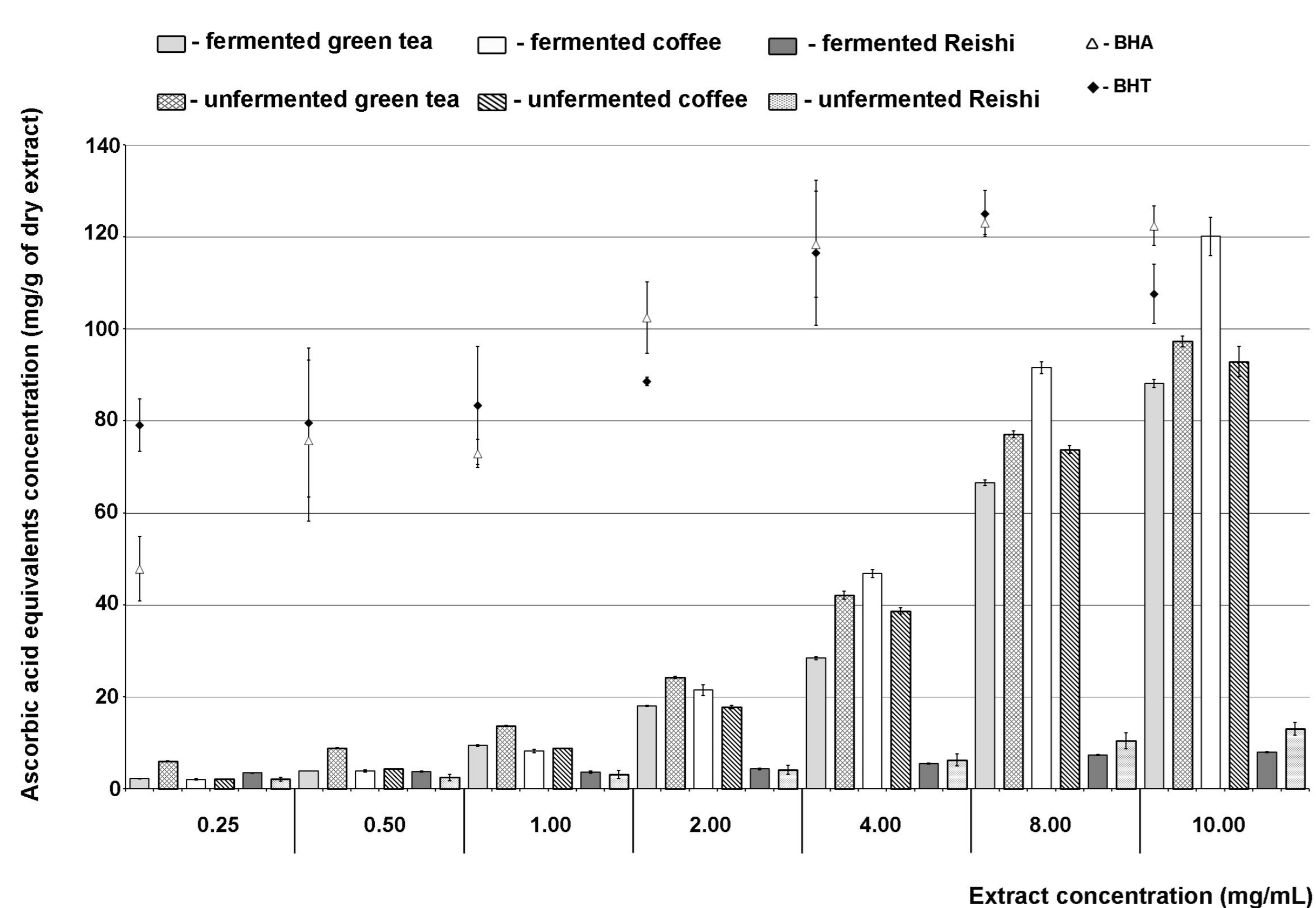
The scientific interest in the medicinal properties of Kombucha beverages, a carbonated drink with live microorganisms, has increased recently. Hence, this study aimed to examine the antioxidant, antidiabetic, and antineurodegenerative potential of Kombucha fermented *Camellia sinensis* (green tea), *Coffea arabica* (coffee), and *Ganoderma lucidum* (Reishi) extracts which medicinal effects are already known.



Methods

Dried and ground green tea, coffee, or Reishi basidiocarp (20 g) was extracted in 1L of boiling water for 30 min. The material was then filtered, amended with 50 g of sucrose, and poured into 2L glass jars which were covered with multiple sterile gauze, sterilized, and inoculated with Kombucha. After 20 days of incubation, the extracts were separated from the floating "cake", lyophilized and redissolved to initial concentration of 10 mg/mL. The uninoculated extracts were used as a control. The **antioxidant** activity was assessed by DPPH, β -carotene bleaching, and total reducing power (TRP) assays. The inhibition of α -amylase and α -glucosidase activity was used to estimate the **antidiabetic** potential, while the level of inhibition of acetylcholinesterase and tyrosinase was used to evaluate the **antineurodegenerative** activity.

Results



The results suggested that the fermented extracts of green tea, coffee, and Reishi showed significant **antioxidant**, **antidiabetic** and **antineurodegenerative** effects, although in some cases they were lower compared to the unfermented extracts.

- ✓ Thus the fermented coffee extract showed the highest TRP (120.14 mg AAE/g) at 10 mg/mL while the unfermented green tea extract exhibited the highest DPPH-scavenging activity (87.46%) as well as the highest preservation of β -carotene (92.41%).
- ✓ The α -amylase inhibition was significantly lower than expected, however the extracts were quite effective in inhibiting α -glucosidase, especially the unfermented Reishi extract, inhibiting 95.16% of α -glucosidase activity, which was higher than the positive control.
- ✓ The most effective tyrosinase inhibitor was fermented coffee extract (10 mg/mL) which inhibited 34.66% of its activity while unfermented green tea extract inhibited acetylcholinesterase for 68.51%.



Conclusions

The obtained results have shown remarkable bioactivities of Kombucha fermented extracts, especially coffee, which is very important given the popularity of this beverage which bioactivity could be further improved by Kombucha. However, chemical background and more detailed mechanisms of action are expected to be revealed in future research.