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Jianghua Kucha black tea with theacrine attenuates depression-like behaviors in CUMS mice by regulating gut microbiota-brain neurochemicals and cytokines

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Tea (Camellia sinensis) is a widely consumed nonalcoholic beverage with known antidepressant effects. Black tea, particularly due to its theaflavins, has been shown to benefit both depression and cognition. Additionally, theacrine, a purine alkaloid present in some teas, may help prevent depression. Jianghua Kucha, a specific type of black tea, contains theacrine, yet its antidepressant effects remain underexplored. This study aimed to investigate the antidepressant properties of Jianghua Kucha black tea in mice subjected to chronic unpredictable mild stress (CUMS), evaluating changes in gut microbiota, neurochemicals, and cytokines.

Mice were divided into seven groups and treated with either Jianghua Kucha or Zhuyeqi black tea at low and high doses. Behavioral tests such as the sugar preference test (SPT), open-field test (OFT), and forced swimming test (FST) were conducted. Jianghua Kucha tea significantly improved depression-like behaviors, with better outcomes compared to Zhuyeqi tea. Further analysis showed that Jianghua Kucha tea alleviated gut microbiota dysbiosis and altered fecal metabolites, suggesting a role in modulating the gut-brain axis.

Correlation analysis revealed that Jianghua Kucha tea positively affected brain neurochemicals like 5-HT, DA, and BDNF, while reducing pro-inflammatory cytokines such as IL-6 and TNF-α. The tea also increased microbial diversity and abundance, reversing gut dysbiosis associated with depression. The findings indicate that Jianghua Kucha tea exerts its antidepressant effects through a gut microbiota-brain neurochemical-cytokine interaction, highlighting its potential as a natural therapeutic option for depression.

Biography

Wenliang Wu, associate professor, supervisor of postgraduate in Hunan University, Hunan Agricultural University and Sichuan Agricultural University. Research area is tea quality chemistry and nutritional health, has accumulated rich experience in chromatography-mass spectrometry analytical methodology, tea quality chemistry, metabolomics and bioinformatics.