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SSS10.5 Sustaining soil functions in organic and
inorganic farming

Cultivation of *Stropharia rugosoannulata* on rice straw

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01 Research Question

- ◆ the annual output of crop straw in China attains more than 900 million tons. the straw on the fields after harvesting is often treated with burning in China since the early history. The open-air burning often causes the severe pollution of atmosphere.
- ◆ A field experiment was conducted to study the feasibility of growth of *Stropharia rugosoannulata* on fresh rice straw in the suburb of Shanghai after rice was harvested in late 2019.



02 Material and Methods

S. rugoso-annulate belongs to Basidiomycota, Hymenomycetes, Agaricales, Strophariaceae, Stropharia. It is one of the top ten mushrooms in the international mushroom trading market and one of the important edible fungi recommended by the United Nations Food and Agriculture Organization (FAO) to developing countries.



S. rugoso-annulate

02 Material and Methods

- ① The cultured mycelia of *Stropharia rugosoannulata* were evenly sprinkled over fresh rice straw
- ② and covered with a thin layer of soil
- ③ and again with a layer of rice straw
- ④ The culture bed was kept at humidity of 70%-75% and temperature of 22°C-28°C.



03 Results

- The sporophores of *Stropharia rugosoannulata* are treasures in food and highly enriched in human nutrients, with 25.75% of crude proteins, 2.19% of crude fat, 7.99% of crude fiber, 45.93% of carbohydrates and 16.72% of amino acids, as well as some antioxidants such as flavonoids, saponins and phenols.
- the cellulose, hemicellulose and other non-biodegradable substance in rice straw were highly decomposed after the growth of *Stropharia rugosoannulata*, thus making it rapidly available to crops when returning to fields.



04 Conclusions

- **With high content of organic matter and available nutrients, free of toxic heavy metals, the fungal-degraded rice straw is high-quality organic manure.**
- **The sporophores of *Stropharia rugosoannulata* are treasures in food and highly enriched in human nutrients. Through this cultivation method, it will be chosen to be applied to the organic farming system in Shanghai in the future.**