



## Cultivation of *Stropharia rugosoannulata* on rice straw

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According to statistics, the annual output of crop straw in China attains more than 900 million tons. A C/N ratio of the straw of grass crops is too high to be bio-degraded rapidly when it returns to fields, adversely affecting the next rotation of crops. Therefore, the straw on the fields after harvesting is often treated with burning in China since the early history. The open-air burning, however, often causes the severe pollution of atmosphere, and has thus been forbidden by the Chinese government. However, the treatment of straw has become a headache problem since then. *Stropharia rugosoannulata* is one of the top ten mushrooms in the international mushroom market, as well as one of the important edible fungi recommended by the Food and Agriculture Organization of the United Nations to the developing countries. The rice straw, mainly composed of cellulose, hemicellulose, lignin, protein, resin and nutrient elements of Ca, P, K, Fe, Cu, Mn, Zn and Co, provides sufficient nutrients to *Stropharia rugosoannulata*. 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. The cultured mycelia of *Stropharia rugosoannulata* were evenly sprinkled over fresh rice straw, and covered with a thin layer of soil and again with a layer of rice straw. The culture bed was kept at humidity of 70%-75% and temperature of 22°C-28°C. After two months, the sporophores of *Stropharia rugosoannulata* came out abundantly. This suggests that *Stropharia rugosoannulata* can grow and produce sporophores on fresh rice straw without addition of any organic manure. 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. Moreover, 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. With high content of organic matter and available nutrients, free of toxic heavy metals, the fungal-degraded rice straw is high-quality organic manure and will be

chosen to be applied to the organic farming system in Shanghai in the future.