Contribution ID: **22** Type: **not specified**

# The development of next-generation rice varieties for carbon cultivation

*Monday, October 14, 2024 10:10 AM (20 minutes)*

Rice is widely cultivated in Japan, East and South-East Asia, and fixes enormous amounts of CO2 and produces biomass. Under the SDGs, there is a need to make effective use of unutilized biomass such as rice husk and straw, reduce chemical fertilizers and pesticides, and reduce greenhouse gases such as methane from paddy fields. Of the carbon fixed by rice, about 30% is contained in the rice grain and 70% in the husk, straw and roots. With roots, husk and straw are ploughed into the soil, and used as the main source of methane production. There is a need to increase rice biomass production under reduced chemical fertilizers and pesticides, and to develop the next-generation rice varieties for carbon cultivation with low accumulation of starch and other carbohydrates in the rice straw for repressing methane production from rice residues. However, such varieties have not been developed yet. Japonica rice varieties widely cultivated in Japan have perennial characteristics, and accumulate high amounts of starch and other storage carbohydrates in the stem at harvest, while indica rice varieties derived from the annual-type wild rice (Oryza rufipogon) accumulate little carbohydrates. The characteristics of indica are expected to contribute to the suppression of methane emission from rice straw. In addition, methane is produced under reductive conditions in paddy fields, and methane production can be suppressed by controlling oxidative conditions. The objectives of this research are (1) to develop the next generation rice varieties with high biomass production, lodging resistance, nitrogen use efficiency and methane suppression under reduced chemical fertilizers and pesticides through genome breeding, (2) to utilize bioplastics from nonstandard rice grain, husk and straw, and (3) to study the effects of the soil stirring function of the 'Aigamorobo'on weed suppression and methane production.

**Presenter:** OOKAWA, Taiichiro

**Session Classification:** Session 1: Social Acceptability