



資源植物の特性解明と利用面の開発

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専門分野： 作物学、育種学、雑草学

キーワード： 赤米、紫黒米、香り米、アレロパシー、食味、大豆

●研究内容

イネを中心とした植物遺伝資源を収集、栽培し、その形態的、生理生態的特性を調べるとともに、含まれる成分を分析して、利用面の開発に当たっている。とくに、赤米、香り米など由来イネに力を入れている。

これまでの主な研究テーマは以下のとおり。

○イネの品種特性の解明

- ・米が有する香気成分と色素の品種間差異
- ・栽培環境と香気、色素発現の関係
- ・米の食味の品種間差異と栽培環境の影響
- ・抗酸化活性の比較

○植物間相互作用（他感作用、アレロパシー）の研究

- ・薬用植物、雑草、樹木のアレロパシー活性
- ・イネ、コムギのアレロパシー活性
- ・ハーブの抗菌効果

○広島県特産大豆の開発

- ・広島県農業ジーンバンクおよび広島文教女子大学との共同研究
- ・おいしく健康によい豆腐、納豆の試作

●期待される成果と応用

- ・新規加工原料の開発
- ・地域おこしへの利用
- ・学校教育への活用



図4 景観用イネ品種

●想定される連携先

- ・県内米・大豆の加工業者と営農集団



図1 赤米（タンニン系）と紫黒米（アントシアニン系）



図2 紫黒米は高温条件で色素ができない（左）



図3 変異に富む大豆品種（色、粒大）

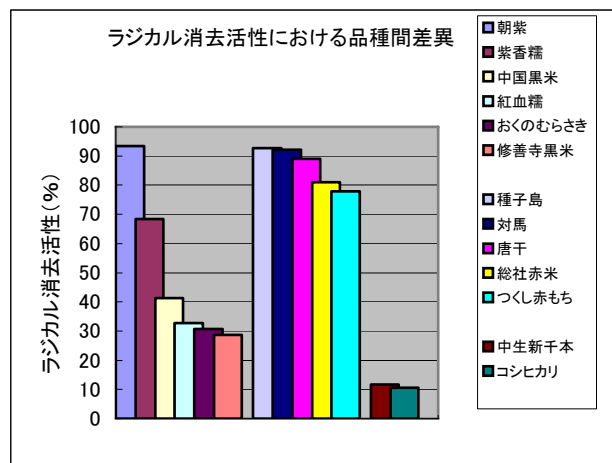


図5 有色米は抗酸化活性が強い



Elucidation of Characteristics of Plant Resources and Development of their Utilization

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Research Fields : Crop Science
Keywords : Allelopathy, Aromatic Rice, Eating Quality, Native Cultivar, Purple-black Rice, Red Rice, Soy Bean

● Research Topics

1. Aromatic Rice (Fig. 1)

Aroma strength of aromatic rice varies with the genetic and environmental conditions. We determined 2-acetyl-1-pyrroline (2AP), a key compound of the aroma of aromatic rice, and evaluated the intensity of characteristic aroma of them using a sensory test. We showed, 1) cultivar difference, 2) change after heading, 3) effect of temperature during ripening.

2. Red Rice and Purple-black Rice (Fig. 2 and 3)

Ethanol extracts prepared from red and purple-black rice exhibited remarkably high superoxide anion- and radical- scavenging activities compared with those from white rice. In addition, these activities were localized mostly in pericarp and testa, namely, rice bran. The major active substances in red and purple-black rice were tannin pigments and anthocyanin pigments, respectively.

3. Eating Quality of Cooked Rice

We compared "early-harvest rice" which was harvested 10 days before the ordinary harvest time and "ordinary-harvest rice" which was harvested at the usual time. The cooked "early-harvest rice" evaluated as being sweeter and more delicious than the cooked ordinary-harvest rice. The greater sweetness in the former rice was primarily due to the formation of glucose, maltose and maltoigosaccharides from starch, probably by starch degradation enzymes during soaking and/or cooking. The cooked early-harvest rice also contained more L-glutamic acid.

4. Allelopathy of Plants

We screened for allelopathic activities among weeds, trees and medicinal plants using the 'Sandwich Method'. The method

enables to assay the allelopathic activity of the leaf litter of a donor plant inserted in a agar medium by measuring the radicle growth of a receptor plant.

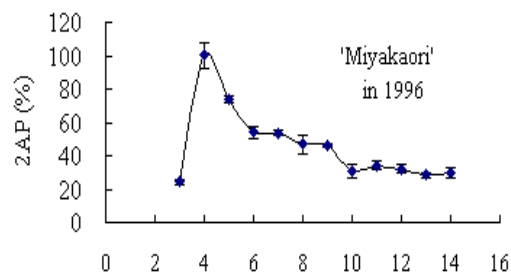


Fig.1. Change in 2AP concentrations in brown rice after heading.



Fig.2 The ice cream, noodle and cakes using purple-black rice.



Fig.3 Beautiful blooming of a rice cultivar.

● Expected Results and Application

- Development of new food materials

● Potential Partners

- Local farmer groups and food maker

