

フラボノイド類のスーパーオキシドラジカル 消去効果と酸化還元電位や還元性との相関

古野浩二、赤迫豊一、杉原成美

Biol. Pharm. Bull. 25, 19-23 (2002)

The correlation of the superoxide radical scavenging activity of flavonoids with their oxidizability

Koji Furuno, Toyokazu Akasako and Narumi Sugihara

ABSTRACT : Flavonoids from major structural subclasses and flavonoidal components were examined for their ability to scavenge superoxide radical ($O_2\cdot$) generated enzymatically in a xanthin-xanthinoxidase system and non-enzymatically in a phenazine methosulfate-NADH system. It can be concluded that pyrogallol moiety is an active component of flavonoids for displaying high $O_2\cdot$ scavenging activity. Flavonoids and their components were also examined to correlate their $O_2\cdot$ scavenging activity with their oxidizability, which is measured on the basis of the electrochemical redox potential and the reducing ability of the Cu^{2+} ion. Flavonoidal components such as pyrogallol, gallic acid and its ester, and flavonoids such as baicalein, epicatechin gallate and epigallocatechin gallate, in which the $O_2\cdot$ scavenging activity is enhanced by the presence of a pyrogallol moiety which does not belong to the B-ring, reduced the correlation between the higher $O_2\cdot$ scavenging activity and the lower redox potential. The $O_2\cdot$ scavenging activity was well correlative with the Cu^{2+} reducing ability of flavonoids and their components.

抄録 フラボノール、フラボン、フラバノール及びカテキンなど16種のフラボノイド類と5種のフェノール化合物のスーパーオキシドラジカル消去効果、酸化還元電位、及び銅イオン還元効果についてその相関性を調べた。ピロガロール基の存在はフラボノイド骨格のA,B及びC環のいずれにおいてもスーパーオキシドラジカル消去効果を発揮するのに最も重要であった。スーパーオキシドラジカル消去効果と酸化還元電位との相関性は、ピロガロール基がフラボノイド骨格のB環にあるもののみが酸化還元電位が低いため、認められなかった。スーパーオキシドラジカル消去効果と銅イオン還元効果の間には高い相関性が認められた。