Antioxidant actions of polyphenol QGR and its building blocks on unopsonized
zymosan-induced oxidative stress in murine macrophages Raw264.7
Byung Hak Kim⁴, AM Reddy, Kyung Rak Min, Youngsoo Kim
College of Pharmacy, Chungbuk National University

Polyphenol QGR (quercetin 3-O-beta-(2'-galloyl)-rhamnopyranoside) was isolated from Persicaria lapathifolia
(Polygonaceae). In this study, we investigated inhibitory effects of QGR and its building blocks (quercitrin,
quercetin and gallic acid) on superoxide anion and NO productions in unopsonized zymosan-stimulated murine
macrophages Raw264.7. QGR and quercetin showed potent inhibitory effects on unopsonized zymosan-induced
superoxide anion production with IC50 values of 3.2 uM and 4.8 uM, respectively. Quercitrin and gallic acid also inhibited
the superoxide anion production with IC50 values of 30.9 uM and 21.7 uM, respectively. QGR showed scavenging effect on
superoxide anion with an IC50 value of 56.1 uM but quercetin did not exhibit. All of the polyphenols except quercetin did
not show inhibitory effects on unopsonized zymosan-induced NO production. Furthermore, quercetin suppressed the
expression of iNOS transcript in unopsonized zymosan-stimulated murine macrophages Raw264.7 but QGR and the other
building blocks did not inhibit. Quercetin inhibited the NF-kB transcriptional activity in a dose-dependent manner with 77.3%
inhibition at 100 uM, 52.6% at 39 uM and 29.3% at 10 uM.

Inhibitory Effect of the Extract from the Three Crude Drugs, Kalopanax pictus,
Pueraria thunbergiana and Rhus verniciflua on NO and TNF-a production in LPS-
induced Macrophage 264.7 Cells
Kim In-Tae⁵, Lee kyung-Tae, Choi Jong-won, Park Hee-Juhn
College of Pharmacy, Kyung Hee University, College of Pharmacy Kyungsung University

We previously reported the antimutagenicity, anti-lipid peroxidation and antiinflammatory properties of the three
Chinese herb medicine, Kalopanax pictus, Pueraria thunbergiana and Rhus verniciflua, which have been used as
therapeutics for diabetes mellitus and inflammation in Korea. Since these drugs have been used for the
prescriptions consisted of several crude drugs, we investigated whether the extract of the three drugs could
increase the individual drugs or not. The three extracts were independently prepared from K. pictus, P.
thunbergiana, and R. verniciflua, which extracts were named the K-1, P-1 and R-1 in this order and the extract
(KPR-1) was also prepared from the combined plant materials with each same weight of the three drugs. The three
extracts, K-1, P-1 and R-1 were fractionated into the EtOAc extracts named K-2, P-2 and R-2 in this order. The
extract of KPR-2 was also obtained from KPR-1 by the same way of fractionation. These eight samples were
subjected to the nitrite assays in LPS-induced macrophage 264.7 cells and MTT assays. KPR-2 exhibited the most
pronounced effect on the inhibition of NO production (IC50:5.1 mg/ml) but showed the weakest cytotoxicity with the
value of IC50 434.5 mg/ml on the macrophage 264.7 cells among all the EtOAc extracts. It was evaluated that
KPR-2 is a promising inhibitor of NO production, and it also significantly decreased PGE2, and TNF-a release.
Consistent with these observations, the expression NO synthase (iNOS) and cyclooxygenase-2 (COX-2) enzymes
was significantly inhibited by KPR-2 in a concentration-dependent manner. These results suggested that the
mixture extract and successive fractionation could lead to the better use of anti-inflammatory medicinal crude
drugs.

Effects of Wogonin, a Plant Flavone from Scutellaria Radix, on Skin Inflammation:In
Vivo Regulation of Inflammation-associated Gene Expression
Yeon Sook Chi, Hyun Lim, Haeil Park, Hyun Pyo Kim