CHAPTER V

CONCLUSION

Crude rice bran oil from 4 rice varieties, Pathumthani 1, Kao Dok Mali 105, Sunpatong 1, and Go Ko Chai Nat 1, was obtained from first extraction by MeOH and then partition in hexane/ MeOH/ H_2O (19: 19: 2 v/v/v). The total content of oryzanol in each partitioned fraction was investigated by UV spectrophotometry. The specific extinction coefficient was calculated from standard oryzanol. The molecular weight of cycloartenyl ferulate, a major component of oryzanol, was used for calculation in this study.

With chromatographic and crystallization techniques, crude rice bran oil was further purified and yielded five oryzanol mixtures from all varieties. Two oryzanol mixtures were obtained from Pathumthani 1 bran, whereas Kao Dok Mali 105, Sunpatong 1 and Go Ko Chai Nat 1 yielded only one oryzanol mixture from each cultivar. After identification of individual oryzanol using MS/MS, two major components of oryzanol, 24-methylenecycloartanyl ferulate and cycloartenyl ferulate, were found in all varieties.

At least 10 constituents of oryzanol were found in Pathumthani 1 rice bran, i.e., 24-methylenecycloartanyl ferulate, cycloartenyl ferulate, campesteryl and/or Δ^7-campesteryl ferulate, campestanyl ferulate, campesteryl caffeate, sitosteryl and/or Δ^7-sitosteryl ferulate, stigmastanyl ferulate, 24-methylenecholesteryl ferulate, 24-hydroxy-24-methylcycloartanol ferulate and 24-cycloart-25-ene-3β,24-diol-3β ferulate. Moreover, at least 7 components of oryzanol mixture from Kao Dok Mali 105 were identified as 24-methylenecycloartanyl ferulate, cycloartenyl ferulate, cycloartenyl caffeate, campestanyl ferulate, sitosteryl and/or Δ^7-sitosteryl ferulate, campesteryl and/or Δ^7-campesteryl ferulate and 24-methylenecholesteryl ferulate. Furthermore, at least 5 components of oryzanol from Sunpatong 1 were identified as 24-methylenecycloartanyl ferulate, cycloartenyl ferulate, campesteryl and/or Δ^7-campesteryl ferulate, sitosteryl and/or Δ^7-sitosteryl ferulate and stigmastanyl ferulate. Also, 2 oryzanol components, 24-methylenecycloartanyl ferulate and cycloartenyl ferulate were identified from Go Ko Chai Nat 1 bran.

Antioxidative potency of oryzanol mixtures were also investigated using 2,2'-diphenyl-1-picrylhydrazyl (DPPH) radical system and compared to vitamin E and standard oryzanol. Scavenging ability of all tested compounds, i.e., standard oryzanol, α-tocopherol (positive control), oryzanol mixture PF1, PF2, WF1, SF1, and CF1, increased with concentration in the range of 0-200 μg/ml. Almost all oryzanol mixtures exhibited IC_{50} about 25-40 μg/ml and there were slight different activities among tested rice varieties. The antioxidant activity decreased in the order of α-tocopherol > oryzanol mixture SF1 > standard oryzanol > oryzanol mixture CF1 > oryzanol mixture PF1 > oryzanol mixture WF1 > oryzanol mixture PF2.