The stability and degradation products of polyhydroxy flavonols in boiling water

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Polyhydroxy flavonols readily degraded during thermal processing. In this study, the UPLC-Q-tof-MS/MS was applied to explore the stability of dietary polyhydroxy flavonols, myricetin, kaempferol, galangin, fisetin, myricitrin, quercitrin and rutin, in boiling water. The decomposition of flavonols was mainly caused by the heterocyclic ring C opening to form simpler aromatic compounds. The degradation products mainly included 1,3,5-benzenetriol, 3,4,5-trihydroxybenzoic acid, 2,4,6-trihydroxybenzoic acid and 2,4,6-trihydroxybenzaldehyde, etc. Compared with myricetin with a pyrogallol-type structure on the ring B, the glycoside in myricitrin slightly affects the stability. However, the glycosides in rutin and quercitrin dramatically improved the stability in water. During the boiling process, flavonols underwent a series of chemical reactions, such as hydroxylation, dehydroxylation, deglycosidation, deprotonation, and C-ring cleavage.

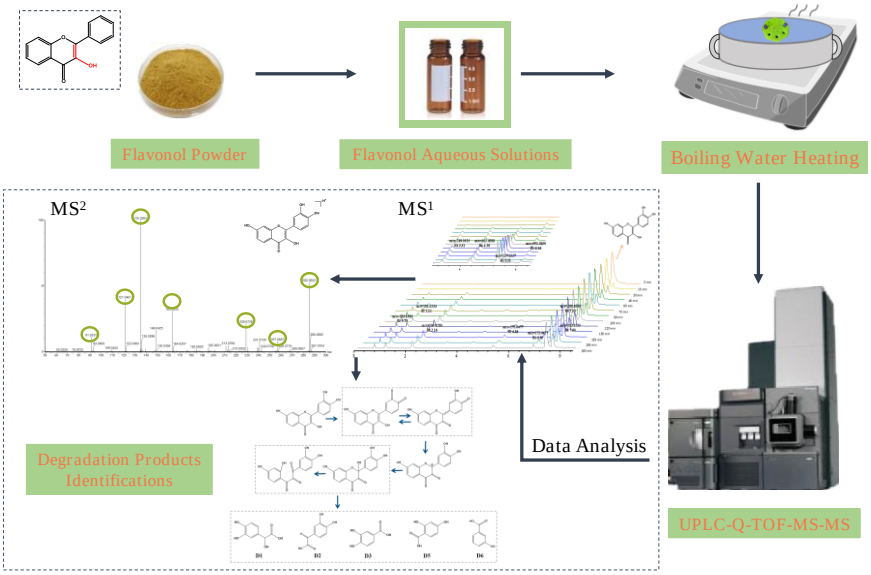

Figure 1. Flow diagram demonstrating the stability of flavonols during heating.