Abstract

This research aims to advance knowledge on the impact of four processing methods on volatile compounds from insect-based baked products (cookies) to provide insights on consumer acceptance. Samples were exposed to double step enzyme digestive test, volatiles characterized through headspace analysis, while semi-trained panelists were recruited for the sensory test. Blanched and boiled samples of *R. differens* had considerably higher digestibility (83.42% and 81.61%, respectively) ($p < 0.05$) than toasted and deep-fried samples. Insect-based cookie products integrated with blanched and boiled *R. differens* meal expressed higher digestibility (80.41% and 78.73%, respectively) that was comparable to that of commercial cookie products (control cookies-CTRC with 88.22%). Key volatile compounds common between the various cookie products included, nonanal, octanal, methyl-pyrazine, hexanal, tetradecane, 2-pentylfuran, 2-heptanone, 2*E*-octenal, 2*E*-heptenal and dodecane. Among the volatile compounds, pleasant aromas observed were 2*E*,4*E*-dodecadienal, pentanal, octanal, methyl pyrazine, furfurals, benzaldehyde, and 2-pentyl furan, which were more pronounced in cookies fortified with boiled, toasted and deep-fried *R. differens* meal. There was a greater resemblance of sensory characteristics between control cookies and those fortified with deep-fried *R. differens*. These findings underscore the significant influence of aroma compounds on consumer acceptability and preference for insect-based baked food products, which allows for future process-modification of innate aromas of insect-based meals to produce high-valued pleasant consumer driven market products.