



رقم البحث: (الرابع)

عنوانه الانجليزي: Effect of baking process on the benzoquinones secreted by the confused flour beetles, *Tribolium confusum* (Du Val), in biscuits made from different types of infested flour

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ملخص البحث (الرابع) باللغة الانجليزية

The experiment was conducted to estimate the levels of benzoquinones in biscuits that were baked at $180 \pm 5^{\circ}\text{C}$ for 20 minutes with five different types of flour: wheat flour, barley, white maize, sorghum and oats, infested with the confused flour beetles, *Tribolium confusum* (Du Val) and stored for three months. The results showed the presence of high levels of benzoquinones in all types of biscuits. Barley biscuits recorded the highest percentage at 11.10 mg/g, followed by wheat 6.27 mg/g, white maize 5.10 mg/g, sorghum 2.72mg/g and oats 0.95 mg/g, respectively. Also the data showed a positive correlation between the total number of insects in the infested flour before baking and the level of benzoquinones after baking. The cracking of benzoquinone by the heat of the oven during the baking of biscuits resulted in many harmful organic compounds, which were identified by analysing it on GC/MS. All of the major compounds were present in large percentages in all of the biscuit samples, namely: 1,4,4-trimethylcyclohexa-2-en-1-ol, which represented the highest percentage of the separated compounds, with a peak area percentage ranging from 41.95-50.92%; 2-Octenal, 2-butyl, which represented a percentage of 21.85-23.64%; 7-Octen-4-one, 2,6-dimethyl, which represented a percentage of 12.55-17.54%; valeric acid, 4-tridecyl ester, represented by 6.25– 9.14%; phenol area percentage was 3.53–7.48% and area percentage of Carbamic acid phenyl ester was 0.55–3.03%. In addition to 6 other minor compounds. We concluded that made from infested flour are extremely dangerous due to the presence of benzoquinone and many other organic compounds produced by heat cracking. It also showed the sensory evaluation of the biscuits made from infected flour revealed an undesirable taste, odor and darkening in color. Commercial fraud exposes us to the same risk by combining infested flour or bran with non-infested flour.