

EFFECT OF NITRITES AND NITRATES ON EDIBLE BIRD NEST COLOUR

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Edible bird nests (EBNs) are important ethnomedicinal commodity in the Chinese community. Recently, a study showed that the white EBNs could turn red by vapors from sodium nitrite (NaNO_2) in acidic condition or from bird soil, but this color-changing agent remained elusive. The aim of this study was to determine the prevalence of nitrite and nitrate contents and its effects on EBN's color. EBNs were collected from swiftlet houses or caves in Southeast Asia. White EBNs were exposed to vapor from NaNO_2 in 2% HCl, or bird soil. The levels of nitrite (NO_2^-) and nitrate (NO_3^-) in EBNs were determined through ion chromatography analysis. Vapors from NaNO_2 in 2% HCl or bird soil stained white bird nests to brown/red colors, which correlated with increase nitrite and nitrate levels. Moreover, naturally formed cave-EBNs (darker in color) also contained higher nitrite and nitrate levels compared to white house-EBNs, suggesting a relationship between nitrite and nitrate with EBN's color. Of note, we detected no presence of hemoglobin in red "blood" nest. Using infrared spectra analysis, we demonstrated that red/brown cave-EBNs contained higher intensities of C-N and N-O bonds compared to white house-EBNs. Together, our study suggested that the color of EBNs was associated with the prevalence of the nitrite and nitrate contents.