

THE QUALITY ASSURANCE OF EDIBLE BIRD'S NEST

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Edible bird's nest (EBN; 燕窩, Yan Wo) is a glue-like substance secreted by the specific glands of the swiftlets (e.g. *Aerodramus fuciphagus*), which is valuable Chinese delicacy for several hundreds of years. Despite of the long history of human consumption, the detail chemical compositions of EBN are largely unknown. Here, is presented a comprehensive research on EBN including food safety and quality control. The traditional processing method in EBN cooking was evaluated for the efficiency of the nitrite removal. Up to 98% of nitrite was removed in the first step of soaking, with further removal after stewing. The nitrite content of EBN collected from the production sites were similar to that of EBN purchased from Hong Kong market. The high content of nitrate (NO₃⁻) found in the environment of production sites suggested that nitrate might be involved in the cause of high content of nitrite found in EBN. By proteomic analysis, it was identified that nitrate reductase derived from microbes converted nitrate to nitrite within EBN. The addition of specific inhibitor of nitrate reductase successfully abolished the formation of nitrite in EBN. In addition, the change in colour of EBN (i.e. from white to red) was also related to the nitrite content in EBN. An advance and reliable EBN authentication method developed, using free N-acetyl-D-neuraminic acid (NANA) as indicative marker, could also classify different classes of EBN, quantitatively. Besides chemical identification, 31 monoclonal antibodies, specifically targeting different epitopes of EBN, are able to differentiate different types of EBN, as well as identify the targeting peptide(s) through LC-MS/MS QTOF system.