

A Study on Contamination of Nitrite in Edible Bird's Nest (Swiftlets)

Maizatul Farhain Ismail^a, Nurul 'Azyyati Sabri^a, Saiful Nizam Tajuddin^a

^aFaculty of Industrial Sciences & Technology, Universiti Malaysia Pahang, Lebuhraya Tun Razak, 26300 Gambang, Pahang.

ABSTRACT

Edible bird's nest (EBN) derived from the hardened saliva of swallows and considered as high-end health food with organic nutrients. Excessive of nitrite were found in EBN imported from Malaysia to China in past few years and still an issue till today. Therefore the purpose of this study is to investigate the source of EBN contamination. EBNS were collected in Aspa Cottage, Kuantan and divided into two treatment (a) treated EBN (tEBN), which exposed to bird soil; (b) untreated EBN (uEBN). The nitrite (NO_2^-) and nitrate (NO_3^-) level were analyzed using ion chromatography for 14 days. Result showed the level of NO_2^- and NO_3^- level for treated EBN reported significantly more than untreated EBN. The source of NO_2^- and NO_3^- could have been derived mainly from the bird soil. It is suspected also the color of EBN change from yellowish and brownish simultaneously as levels of NO_2^- and NO_3^- of EBN increased. Thus, the bird soil could be the source of the NO_2^- contamination in EBN.

METHODS

Samples preparations (EBN & wet bird soil)

Samples were placed in a container and put in incubator with temperature of 50°C .

Color of EBNS was monitored; NO_2^- and NO_3^- in EBN were analyzed using IC for 14 days.

PRELIMINARY RESULTS & DISCUSSIONS

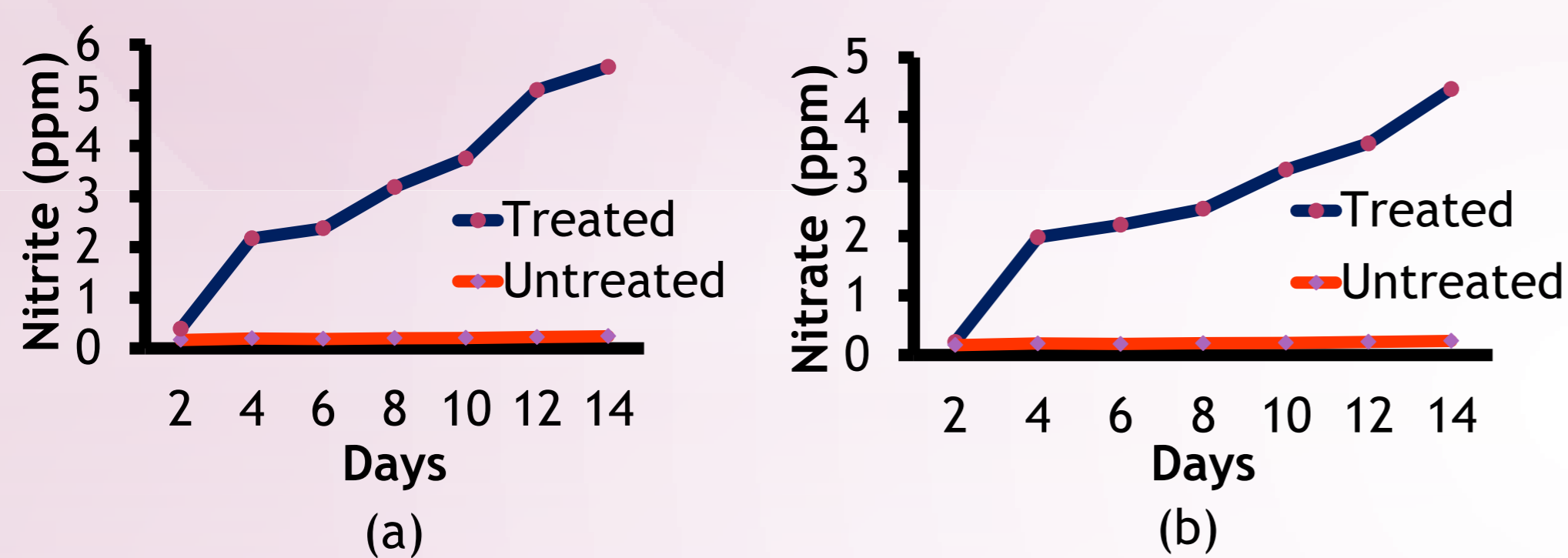


Figure 1: (a) Nitrite (NO_2^-) level for treated (tEBN) and untreated EBN (uEBN); (b) Nitrate (NO_3^-) levels for treated (tEBN) and untreated EBN (uEBN).

- The NO_2^- and NO_3^- level for tEBN reported significantly higher more than uEBN.
- The source of NO_2^- and NO_3^- could have been derived from ammonia through anaerobic fermentation by the bacteria in bird soil.
- A high amount of NO_3^- from bird soil was triggered to form NO_2^- under the enzymatic conversion by nitrate reductase.
- Nitrate (NO_3^-) is more stable form of oxidized nitrogen but can be reduced by microbial action to NO_2^- , which is moderately reactive chemically.



Figure 2: (a) Color changes of tEBN induced by bird soil on day 14; (b) No color changes of uEBN on day 14.

- The present findings seem to be consistent with those of other studies indicate that bird soil could induce a color change in EBN.
- From wet decayed organic of bird soil, NO_2^- gas would evaporates and this is the main air pollutant in swiftlet farm. In spite of this, it leads to food safety issue as EBN could adsorb NO_2^- gas.
- In general, yellowish and brownish EBNS showed high reading of NO_2^- and NO_3^- level compared to some swiftlet house owners claimed that incubating the EBN in bird soil could induce EBNS' color changes from white into yellowish and brownish.

CONCLUSION

From this preliminary study, the contamination of NO_2^- in EBN mainly comes from the bird-soil, which involved enzymatic reaction by bacteria in natural environment at certain temperature, and humidity. Color of EBN also would become an indicator of NO_2^- level. The higher the level of NO_2^- , the color of EBN changes from white to yellowish and brownish.

REFERENCES

- Administration of Quality Supervision, Inspection and Quarantine (AQSIQ). 2011. Edible-Birdnest (EBN) Processing.
- But, P.P.H., Jiang, R.W., Shaw, P.C. 2013. Edible bird's nests-how do the red ones get red? *J. Ethnopharmacol.* **145**: 378-80.
- Malaysian Standard (MS 2509:2012(P). 2012. Test method for Edible-birdnest (EBN)- Determination for nitrite (NO_2^-) and nitrate (NO_3^-) contents.

CONTACT INFORMATION



Name: Maizatul Farhain Binti Ismail
Nurul 'Azyyati Binti Sabri
Saiful Nizam Bin Tajuddin
Faculty: Faculty of Industrial Sciences & Technology (FIST), UMP.



Tel: +609-549 2429
Fax: +609-549 2766
Email: ainfarhain_biotech@hotmail.com