

RESEARCH ARTICLE

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Quality Assessment of Cheese in Markets of Tirana City

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Abstract

Mycological control of cheese is considered an important process related to food safety. Food borne disease in our days remains an important issue for public health because they causes infection to the consumers and an important economic damage. A mycological survey of different kind of cheeses sold at five big markets in Tirana is conducted during March - Septembre 2013, in order to identify if potentially toxicological and pathogenic fungi were or were not present. A total 140 samples of cheeses (soft, hard, semi hard, edam cheese etc), were tested for mold and yeast counts.

For level ($<10^4$ cfu/gr) results in 78 cases or 55.8%, in unsatisfactory level ($<10^5$ cfu/g) in 38 cases, or 27.1% and in potentially hazardous level ($>10^6$ cfu/gr) results in 24 cases or 17.1%. From the total number of 140 cases, 24 samples have resulted to be in a load thrush ($> 10^6$ cfu /gr) which are considered as samples with high potential risk. In 9 samples or (37.5%) *Aspergillus spp* gender was present in 9 samples or 37.5% , *Penicillium spp* was present in 7 samples or 29.1%, *Fusarium* was present 2 samples or 8.4% and *Mucor* was present 6 samples or 25% of samples. Pathogenic genders of moulds were found mostly in white cheese and in edam chesse that have been produced in craft way.

Keywords: Mould, cheese, aspergillus, penicillium, mucor, fusarium.

1. Introduction

Mold increase in all food products at all stages of processing and conservation, changing not only food protein values caloric, but organoleptic properties such as color, smell, taste [5]. Cheese consumption, requirements now days are growing and it is especially focused not only in terms of quality, but also in terms of security [4]. Determination of incidence and quantitative assessment of mold pollution [8] at cheese traded at some areas of Tirana, poses the purposes of this study. Consequences presence of molds and pathogenic yeasts are quite heavy. Studies conducted by various authors have shown that some of molds pathogens have toxic effects, teratogene to cancerogene [8]. In our country thrush pollution studies in food products of animal origin are part on very limited data. Cheese may be contaminated during production technology, processing, packaging, storage, transport, marketing

and storage [6]. The consequences of the presence of pathogenic mold cheese are quite severe [7]. Identifying pathogenic mold present in the cheese which are considered high risk to consumer health, doing the prevention, minimization and elimination of risk in this product, as well as to determine the potential factors that influence the destruction of this product from mold.

Food borne disease in our days remains an important issue for public health because they causes infection to the consumers and an important economic damage.

2. Material and Methods

In total we analyzed 140 samples of. Samples were tested for the presence identification of mold we referred the method ISO 6611:2004 [10], the international standard.

This study was carried out on samples taken at five points of cheese wholesale traders and retails in

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Tirana, during March 2013 - September 2013. To analyze the samples we used ISO 7218: 2007 [9], and referring ISO 6887-1.-2: 2004 [11] made the preparation of the sample. We took 25 gr Slice cheese [1] and homogenization using 225ml water pepton buffer. After preparing decimal dilutions and did extension in the ground plate selective CYEA (Czapek Yeast Extract Agar) and incubation at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$ for 5 days. After incubation counted the colonies and evaluated the samples for the presence of molds [2]. For the calculation of N (number of colonies) is used the equation reference to as ISO 6611:2004 [10].

3. Results and Discussion

Referring table No.1 chart illustrating No.1 in total were analyzed for the presence of mold 140 samples, where 78 samples or 55.8 % of them resulted in rate $<10^4$ cfu/gr within rate, 38 samples or 27.1% of them resulted in a rate of $<10^5$ cfu/gr, beyond rate and 24 samples or 17.1% of them have resulted in a rate $>10^6$ cfu/gr which are considered as potentially high-risk samples. In table No.2 illustrated with chart No.2 is noted the presence of pathogenic mold respectively in 24 Slice cheese samples no seasoned traditionally manufactured. During the study referring to the testing food product of animal origin, where cheese seasoned and no seasoned produced in our country traditionally

and industrially craft and traded in five points of Tirana city, we did testing for the presence of mold and identifying pathogenic mold for the period of time March - September 2013.

These cheese samples are considered potentially high-risk sample, where:

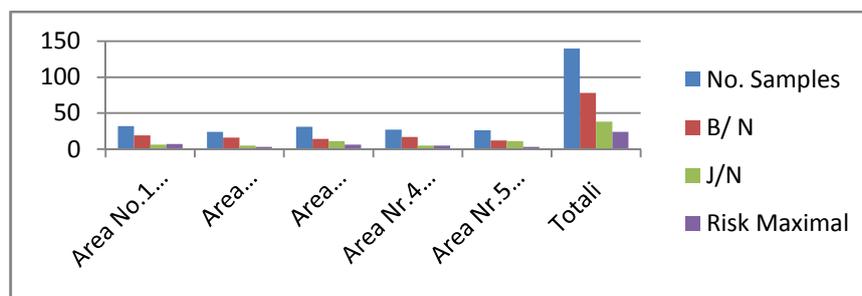
Aspergillus Gender [13] was present in 9 Slice cheese samples non seasoned produced in traditional and industrial craft or 37.5% of the samples considered potentially high risk. This kind of gender pathogenic mold is found more in Area No. 1 and No.3.

Penicillium Gender [14] was present in 7 Slice cheese samples non seasoned produced in traditional craft or in 29.1% of the samples considered as high-risk samples. Gender Penicillium spp is found more in the Area No. 3 and No.4.

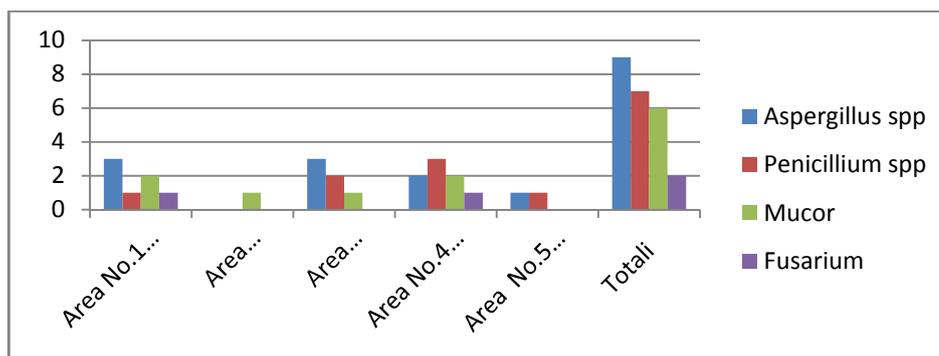
Mucor Gener [16] was present in 6 samples Slice cheese produced in the traditional craft or 25% of the samples considered high-risk samples. Also, gender Mucor is found in Area No.1. No.2, No3, and Area No.4.

Fusarium Gender [15] was present in 2 samples Slice cheese produced in the traditional craft or 8.4% of the samples considered high-risk samples. Gender Fusarium is found in Area No. 1 and No.4.

Graph. 1. Areas included in the study, the number of samples tested and laboratory results



Graph. 2. Identified gender moulds patogene



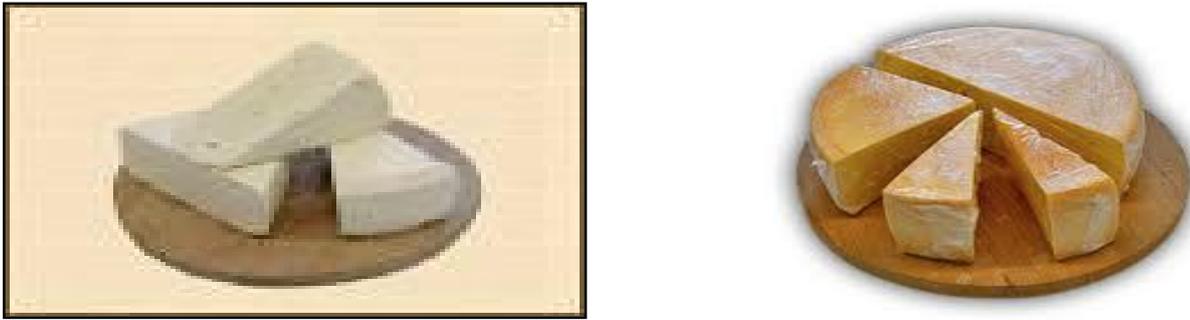


Figure 1. Cheese samples

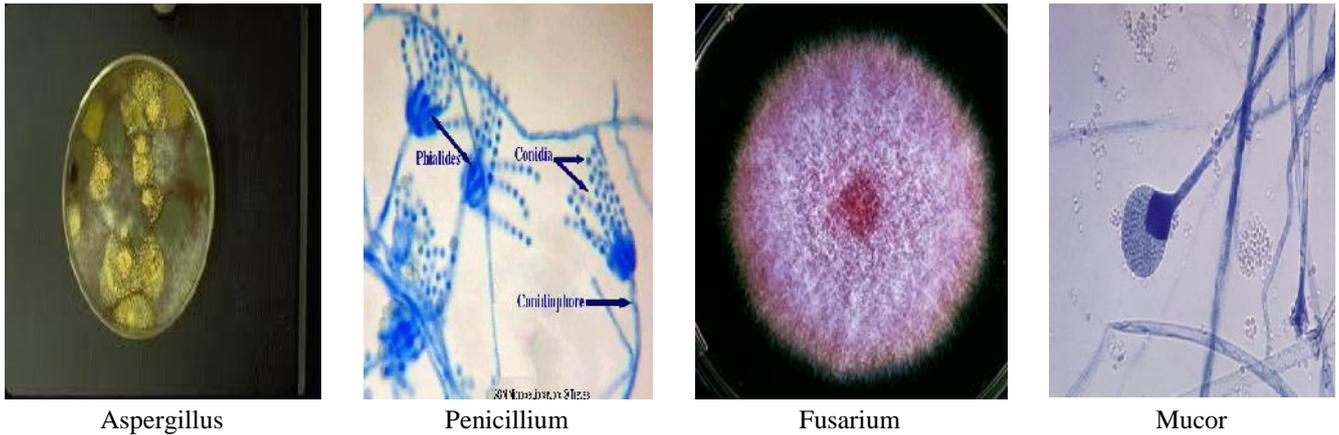


Figure 2. View from moulds gender being present in samples of chesse.

4. Conclusions

In 140 samples cheese tested for the presence of mold during the period of time Mach - Septembre 2013, 55.8% of them have resulted within the allowed rate ($<10^4$ cfu/g) and 44.2% of the samples have results ranging from $<10^5$ cfu/gr - $> 10^6$ cfu/g), that is out of the allowed rate.

Pathogenic mold present in non-seasoned cheese produced in traditional craft, were Genders *Aspergillus spp* and *Penicillium spp*.

Areas where genders of pathogenic mold were more present, were Area No.1 and No.4 and less polluted areas were Nr.2 and No.5.

Referred cheese under study traded in 5 points of Tirana city, is worth to be noted that among the predisposing factors which have contributed to the mold contamination and decay of cheese are not good sanitary of storage and commercial conditions.

5. References

- Guidelines No.12 Dt. 9.29 2010: "Method of sampling food products of animal origin and no animal for the presence of mold and peaks in these food products".
- Regulation (EC) No. 401/2006 "Thrush criteria in food products".
- Regulation (EC) 2073: 2005 "Microbiological Criteria for Food Products".
- Dragon I., Pope A., Vallone L. "Standards of mycological quality of cheese" 1997 Vol48, No.4
- Dragon I. CANTONI C., "Mold food" Ed. Clesav.
- Cafarchi C. Celano G. V., Tiecco G. " Fungal flora of some type of cheese" Food industry XXXIII (1994) June 651-654.
- Samson R. A., Van Reenen-Hoekstra E. S. "Introduction to Food-Borne Fungi" CBS. Centraalbureau Voor Schimmelcultures Baarn, Netherland, 1988.
- Ammazzalorso P., Giorgi G., Trotta I., Vitali C., Ceccarelli C., Tronconi P. " Molds and mycotoxins in special foods with chilli" Proceedings of the National Conference " Microbiological hazards in the food sector in 2000. Molds, yeasts and mycotoxins "Posters" Section, Bologna, May 5, 1994.
- International Standard, ISO7218:2007 " General requirements for the performance of laboratory tests".
- International Standard, ISO6611: 2004, describes the Method of counting molds and peaks

through the realization of colonies count technique at 25°C.

11. Technical Commmitte ISO 68871-2:2005 “**Microbiology of food and animal feeding stuffs**” . **Preparation of test samples, initial suspension and decimal dilutions for microbiological examination.**
12. Cabeli P. Bacteriology and Veterinary Mykologjia UBT, 2006.
13. Raper K. B., Fennel D. I. “**The genus *Aspergillus spp***” Ed. Williams and Wilkins Company, Baltimore, USA 1965.
14. Pitt J. I. “**The genus *Penicillium spp* and its Teleomorphic States *Eupenicillium* and *Talaromyce***” London: Academic Press 1979.
15. Booth C. “**The genus *Fusarium***” Ed. Commonwealth Mycological Institute, Kew England 1997.
16. **The genus *Mucor*.** in cheese manufacturing. Yegin S, Fernandez-Lahore M, Jose Gama Salgado A, Guvenc U, Goksungur Y, Tari C. Source; “Department of Food Engineering, Ege University, 35100 Bornova, Izmir, Turkey.
17. Ammazalorso P, Giorgi G, Trotta I, Vitali C, Ceccarelli C, Tronconi P: **Muffe e micotossine in prodotti alimentari speciali al pepperoncino.** Atti della Conferenza Naziona