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الأرجوت في عينات عشوئية من القمح والشعير

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● المستخلص:

الأرجوت هو الاسم المتعارف عليه لفطر كلافيسبس بوربوريا وهو فطر يتطفل على بعض أصناف الحبوب فهو يصيب القمح والشعير والشيلم وغيرها من الحبوب الأخرى وذلك منذ بداية تكون الأزهار. وفي حالة وجود أجسام هذا الفطر في الحبوب فهي تؤدي إلى تلوث منتجاتها بالأرجوت وخاصة عند الطحن والتصنيع مثل الدقيق والسميد وبالتالي الخبز وجميع المنتجات المصنعه منها ، حيث يتناولها الأنسان أو الحيوان فتحدث له التسمم بالإرجوت والتي من أعراضه الغرغرينة (موات الأطراف) ، وأعراض أخرى مثل الإضطرابات الحسية ، صداع ، قيء ، إسهال ،هلوسة ، الارتعاش والتشنجات . و تهدف هذه الدراسة للبحث عن الأرجوت في الحبوب المعروضة للبيع في بعض أسواق الحبوب بمدينة طرابلس حيث أخذت عينات عشوائية وبحث عن أجسام الفطر بها وكانت النتائج خلو هذه العينات من الأرجوت باستثناء عينتين أحدهما بها نسبة منخفضة تتراوح بين 0.005 ٪ و0.02 ٪.

the other 0.02 percent consequently. More surveying studies are necessary to investigate the presence of ergot in Libya until we can avoid of the ergotism..

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May , 2011. (10 kg for every 10 sacs of grains , the grains are packed in sacs) . Each consignment include between 10 and 12 sacs of wheat or barley were found for each seller) [17]

About thirty kilograms of wheat and thirty kilograms of barley samples had been collected from each of those markets .The test samples are cleaned manually for the investigation of ergot sclerotia.

Results

All the samples are cleaned with hands to collect all the sclerotia of ergot , we did not find any of these sclerotia in all samples of wheat and barley , except a few pieces of broken scleretia were found in two samples of wheat with a range of less than 0.02%.

Discussion

Presence of scleretia of ergot means this fungus is present in our environment, that will cause a harmful effect for human and livestock production , there is not mentioned before to find this fungus in Libyan grains, except for the imported grains.

Ergot can cause a direct yield loss in proportion to the number of kernels infected. The disease causes reduced yield and quality of grains and hay and also causes a human and livestock disease called ergotism, if infected grains or hay are fed. The disease generally is more prevalent in rye wheat and barley than in other cereals. Although the crop loss caused by this disease is important, the effects of the ergot's alkaloid toxins on man and animals is of much greater significance. The cereal grains are brought for sale in those markets produced in different regions of Libya , therefore we can not , know the production area of the two samples containing ergot , and due to the broken sclerotia for one of the two samples , that make difficulty to decide if these sclerotia originated from infected wheat or from other grasses grown with wheat. the alkaloids produced by ergot and ingestion of small amounts daily over a period of several weeks longer results in chronic poisoning [17]

Ergoty wheat. was defined according the United States Standards As Wheat that contains more than 0.05 percent of ergot.[18] .

The ergot (percent of net weight) assessed in wheat according to Canadian Grain Commission alowable levels of ergot in wheat considering 0.02% of ergot as grade name No 2 [17, 19]

Conclusion

We conclude on the basis of these results we conclude that all the samples are free of ergot except of two samples one was containing 0.005 percent and

lysergic acid (ergoline) moiety, and other alkaloids of the ergoline group that are biosynthesized by the fungus. [7]

***Figure 2 Dry gangrene of the foot and** hand*

Effect of Ergot on Animal health

Ergotism exist in animals including cattle consume the sclerotia of ergot present in contaminated feed . The acute form of ergot toxicity characterized by convulsions, and a chronic form characterized by gangrene. A third form of ergotism is characterized by hyperthermia (increased body temperature) in cattle, and a fourth form is characterized by agalactia (no milk) and lack of mammary gland development, prolonged gestations, and early foal deaths in mares fed heavily contaminated feed. Animals fed large amounts of ergot over time lose portions of their hooves, ears, tails, combs, and wattles. (Figure 2 and 3), Spontaneous abortion and loss of milk has occurred in cows and sows fed even small amounts of ergot.[15]

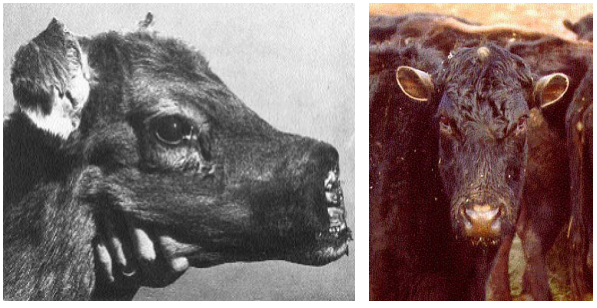

Figure 3. Animals fed large amounts of ergot over time lose portions of their ears or other extremeties. (15)

Method

Samples of wheat and barley were taken from Tripoli markets , Tajora, suk El Juma, suk Gaser Ben Geshir , Suk Tarhuna , Suk al khames , according to L.S No. 348 [17] for methods of sampling for cereal grains.. During April |

Ergotism

Egotism is the name for the group of symptoms in human or animal after ingestion of the fungus. There are two types of ergotism--gangrenous and convulsive. As the name implies, gangrenous ergotism is characterized by dry gangrene of the extremities followed by the falling away of the affected portions of the body. (11)

The symptoms, such as severe burning sensations in the limbs (7) derived from the regional ischemia of more poorly vascularized distal structures, desquamation, weak peripheral pulse, loss of peripheral sensation, edema and ultimately the loss of affected tissues and death.(12). (Figures 2 and 3.)

The neurotropic activities of the ergot alkaloids may also cause hallucinations and attendant irrational behaviors. Convulsive ergotism is characterized by a number of symptoms. These include painful seizures and spasms, diarrhea, paresthesias, itching, headaches, nausea , vomiting. crawling sensations in the skin, tingling in the fingers , vertigo, tinnitus aurium, disturbances in sensation and hallucination. There can be hallucinations resembling those produced by LSD(lysergic acid diethylamide), . and mental effects including mania or psychosis. Painful muscular contractions leading to epileptiform convulsions, vomiting, diarrhea and even death. The convulsive symptoms are caused by clavine alkaloids. (11).

Ergot contains alkaloid of the ergoline group, which has a high biological activity and a broad spectrum of pharmacological effects; that have adrenoblocking, antiserotonin and dopaminomimetic properties. (13) . Effects on circulation and neurotransmission have a therapeutic effect on some forms of migraine, post-partum haemorrhages, mastopathy, and a sedative effect on the central nervous system. (14) They may cause vasoconstriction of blood vessels, sometimes severely restricting blood circulation (small and large blood vessels) induced by the ergotamine-ergocristine alkaloids of the fungus, leading to gangrene and loss of limbs. (14)

Historically, controlled doses of ergot were used to induce abortions and stop maternal bleeding after childbirth, but simple ergot extract is no longer used as a pharmaceutical drug. LSD was derived from ergot, and has a powerfully hallucinogenic that affects the serotonin system. In contrary to some rumors, ergot contains no LSD, but there are links between the two substances: LSD was synthesized from Lysergenic acid is still prepared from ergot. The ergot sclerotium (Figure.1) contains high concentrations (up to 2% of dry mass) of ergotamine, a complex molecule consisting of a tripeptide-derived cyclol-lactam ring connected via amide linkage to a

The ergot alkaloids have a high biological activity and a broad spectrum of pharmacological effects, hence they are of considerable importance to medicine. And have a therapeutic effect on some forms of migraine, post-partum haemorrhages, mastopathy, and a sedative effect on the central nervous system They have adrenoblocking, antiserotonin and dopaminomimetic properties. [5].

There are two types of alkaloids . The first type, the clavine-type alkaloids, are derivatives of 6,8-dimethylergoline. The second type is the isoergine (lysergic acid diethylamide). The ritual hallucinogenic drugs [6], which are peptide alkaloids. All ergot alkaloids can be considered as derivatives of the tetracyclic compound 6-methylergoline [7] Each active alkaloid occurs with an inactive isomer involving isolysergic acid. Ergotoxine had been accepted as a pure substance, and in the form of ergotoxine ethanosulphate was formerly used as a standard. It was shown to be a mixture of the three alkaloids ergocristine, ergocornine and ergocryptine.[8](Table 1). The total alkaloid content and individual alkaloid composition for triticale and barley ergot bodies were highly variable between individual sclerotia from the same or different sources, for example in Canadian triticale and barley was ranged from 0.042 to 0.752% for triticale and from 0.082 to 1.04% for barley. Ergocristine and its isomer ergocristinine were the major constituents in both grains.[9] Naturally growing . ergots strains are capable of producing predominantly a single alkaloid or a certain group of alkaloids: ergotamine, ergotoxine, ergocristine etc. [9]

Table 1. Alkaloids of the ergot sclerotium[6,10]

Group	Alkaloid	Formula
.Ergometrine Group	Ergotmetrine	$C_{19}H_{22}O_2N_3$
	Ergotmetrinine	
.Ergotamine Group	Ergotamine	$C_{33}H_{35}O_5N_5$
	Ergotaminine	
	Ergosine	$C_{30}H_{37}O_5N_5$
	Ergocornine	
	Ergocristine	$C_{35}H_{39}O_5N_5$
	Ergocristinine	
.Ergotoxine Group	Ergocryptine	$C_{32}H_{41}O_5N_5$
	Ergocryptinine	
	Ergocornine	$C_{31}H_{39}O_5N_5$
	Ergocorninine	

Results

Our study indicated that all the samples of barley and wheat are free from ergot bodies , except two samples of wheat are containing broken sclerotia of ergot (0.02% -0.005%) ,

Conclusion

We conclude on the basis of these results that, all the samples are free of ergot except of two samples one was containing 0.005 percent and the other 0.02% consequently.

Keywords

Ergot, ergotism, ergot alkaloids.

Introduction

Ergot is a plant disease which produces elongated fungus bodies with a purplish black exterior, a purplish white to off-white interior, and a relatively smooth surface texture.[1]

In Libya the majority of people get the food from cereal crops as a main sources of carbohydrates, such as wheat , barley and rice. But sometime these grains are infected with ergot fungus .This fungus is replacing the grains in the heads of cereals just prior to the harvest to the dark purple and black colour sclerotia (ergot bodies) (See figure 1 a, b c and d). If bread is prepared from infected wheat flour without removing the sclerotia epidemics of ergotism might be occurred. However , economically important species of this fungus is *Claviceps purpurea* and more recently by the action of a number of ergoline –based drugs.

.Figure.1.a. Ergot sclerotia on wheat spikes[2] , (b) Wheat kernal [3]., (c.and d). Ergot bodies.[3]

a.

b.

c .

d.

Composition of ergot

The naturally occurring ergot sclerotium contains up to 30-40% of fatty oils and up to 2% of alkaloids. The other components of sclerotium are free amino acids.[4].

Ergot in Random Samples of Wheat And Barley

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Abstract

Objectives

The objective of this study was to investigate of grain contaminated with ergot, which is produced by the fungus *Claviceps purpurea* as the probably cause of the outbreak of ergotism, so that control measures could be applied.

Background

Due to the harmful effects if the presence of ergot in the contaminated grain products and an expect for the occurrence of ergotism besides to the number of cases of gangrene in our hospitals specially between diabetics .In our study we investigated the presence of ergot in the wheat and barley available for sale (locally cultivated or imported).

Ergot is the common name of a fungus in the genus *Claviceps purpurea* that is parasitic on certain grains and grasses. It has infects wheat, barley, rye and other cereals since the time of flowering. More ever , when industrialize the infected cereal grains, flours and other cereal products might contaminated and when ingested by man . through clinical symptoms of ergotism include gangrene, abortion, convulsions, suppression lactation, hypersensitivity, ataxia, disturbances in sensation, headaches, , hallucination, vomiting, , diarrhea and even death. On the other hand , since discovered ergot alkaloids, they have used in some medical cases.

Methods

This study was conducted , during May and June, 2009. Thirty random samples were collected for both wheat and barley from each of the local cereal markets in Tripoli . The sample weighing 1kg , ten samples from each single-seller in the market. The most sellers have approximately 10-12 sacs of wheat and the same of barley. The samples were tested for ergot sclerotia.