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Production of citric acid and vinegar using normal yeast and irradiated yeast saccharomyces cervaise

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Review Article

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ABSTRACT

The usage of citric acid and vinegar from the past histories is used in food, pharma industry, and research and in different areas. Production of citric acid and vinegar using yeast is a very simple technique, but the production into large amounts of product with less expensive can be possible with the microorganism yeast.

The initial process was carried out at the laboratory scale, to test whether the normal yeast or irradiated yeast can produce the high yield of citric acid and vinegar. Firstly, the baker's yeast normal yeast- not irradiated was taken and used as an inoculum in the sources grapes and barley seeds into 3 different flasks simultaneously for both grapes and barley. The flasks with grapes and barley separately were fermented for 3, 6 and 9 days. After the fermentation for 3 days the fermented source of grapes and barley were distilled using the distillation unit.

The same technique was carried out for 6 and 9 days fermented in the source grapes and barley, and distilled using the distillation unit. The obtained distilled product was taken and stored at cool temperatures around 10 to 11 degrees Celsius.

Now the same process was carried out by the irradiated yeast, here before adding the yeast into the source the yeast saccharomyces cervasie was been irradiated using UV light. The yeast has been transferred into the distilled water into 3 different petriplates, and irradiated under UV light with different length and time 3cm, 6cm, 9cm and time 2min, 4 min, 6 min. Using the irradiated yeast the fermentation process was carried out as with normal yeast at different days.

The production was so high for certain range of time but getting degraded due to the degradation of source as it is batch fermentation.

After the complete fermentation process, the amount of yield was tested using the biochemical test. But surprisingly the amount of yield was high with the process carried out by the irradiated yeast rather with normal yeast.

INTRODUCTION

Citric acid and vinegar [1-6] have been in use since many histories, here we used yeast has a main content for production of citric [7-11] and vinegar [12-15]. But not only the normal yeast, here we also used the irradiated yeast for production and compared with both the normal yeast and irradiate yeast. Surprisingly we can see the production increase in one of the technique which we used new. The biochemical test confirmed the amount of citric acid and vinegar [16-18] production.

MATERIALS AND METHODS

Initially 100gms of both grapes [19] and Barley seeds [20-26] were separately into the conical flask with distilled water of 200ml.

To this normal yeast saccharomyces species was used as inoculum and with the help of the cotton it is closed air tight and kept at room temperature and fermented for 3days. Now again another 100gms of same barley and grapes separately fermented [27-31] for 6 days, and other for 9 days randomly taken
These were allowed to ferment under the normal room temperature only, now the other work was carried with the irradiated yeast [32-37], the irradiation of yeast was done using the Ultra violet light.

Irradiation of Yeast

Yeast saccharomyces C was firstly cultured by using the potato dextrose media and this was taken into the double distilled water.

Now it is transferred into the 3 different petri plates with equal volume, and it is irradiated using the UV light by this mutations can occur which we have overcome [38-43] by the immediate removal by the UV radiation. The irradiation was carried out for 3 different lengths to the petri plates, the first plate was carried out for irradiation at 3cm length, the second petri plate was carried out for irradiation at 6cm length under UV light, and finally the third plate was carried out irradiation at 9cm length under UV light.

The total irradiation was carried out for 5min under the UV light to complete the irradiation process, and now it is taken as inoculum [44-46] for the process of fermentation.

The irradiated yeast at 3cm length was taken as inoculum for fermentation into both barley and grapes sources for fermentation of 3,6 and 9days. And the same was carried out for the yeast irradiated at 6 and 9cm length into fermentation for 3,6 and 9 days fermentation.

Distillation

Now initially 3 days fermented grapes and barley was distilled using the distillation unit at 120°C for 2hours and the distilled product was collected into the conical flask. And the same was carried out with the 6 and 9 days fermented source.

Even with the irradiated yeast the distillation process was carried out, same as the process carried out with the normal yeast fermented product.
The present report reviews the potential and applicability of industrial microbe side streams produced in Finnish bioprocess industries for biosorption of heavy metals from waste waters. Microbial side stream biomasses are formed worldwide in e.g. food, brewing, biofuel, pharmaceuticals, wood processing and enzyme manufacturing industries. Although these streams are typically used for low-valued animal feed or biogas production, they would also have potential for biosorbent materials to be used in in situ water treatment [47-52]. Harmonized collaborative validation of a simultaneous and multiple determination method for nivalenol, deoxynivalenol, T-2 toxin, HT-2 toxin, and zearalenone in wheat and barley by liquid chromatography tandem mass spectrometry LC-MS/MS was conducted by participants from 12 laboratories [53-55].
The phase formation processes in the zone of directional laser irradiation of compacted Al2O3–TiO2–Y2O3 mixtures have been investigated. It has been established that the formed ceramic material track has a complex structure. Its surface layer contains α-Al2O3 as the main phase and Y2Ti2O7 inter layers [56-59]. This editorial innovatively establishes circadian timing of rumen fermentation properties as a natural probiotic and modulator of nutrient efficiency and microbial-host health in food-producing ruminants. Inspired by nature, circadian availability of differently nutritious plants is a major driving factor in maintaining near-to-optimal rumen conditions and microbial health and integrity [60-66]. Short-chain organic acids also occur as inhibitory compounds in industrial fermentation processes, for example the detrimental effect of acetic acid and on the production of bioethanol from lignocellulosic material in a fermentation using Saccharomyces cerevisiae [67-74]. A progressive basipetal desiccation of shoots, branches, and trunk follows and, finally, the whole plant may die. The infected xylem of young shoots as well as of main and secondary branches and trunk show a yellow or pink-salmon to reddish discoloration
The principal host species is lemon Citrus limon L., but the fungus has also been reported on many other Citrus spp [75-80]. Fungal keratitis is one of the major causes of visual loss and blindness, especially in developing countries, characterized by ulceration, suppuration, destruction of and even perforation of corneal tissues.

The most common causative pathogens areFusarium spp, Aspergillus spp and Candida albicans varying geographically among areas. Fusarium spp and Aspergillus spp are common in tropical and subtropical eastern countries and southern US. Candida albicans is more common in temperate areas such as the northern US [81-86], This paper proposes a fault detection approach, which combines a statistical test as GLRT with ANNs to quickly detect faults in a distillation column. Firstly, this study consists to obtain a reduced and reliable model of this chemical process in steady-state and dynamic conditions. The chosen model is NARX model for forecasting the process dynamics. The performance of this neural model was then evaluated using the performance criteria [87-91]. Fermentation of seaweed to produce larval feed was developed using an in situ fermentor. Marine single cell detritus MSCD, a seaweed based fermented product is an ideal material for feeding shrimp larvae. This paper deals with the development of protocol for the preparation of MSCD using the fermentor. Enzymatic hydrolysis of the seaweed cell wall is a procedure used in many applications. It has been described for improving protein digestibility by removing anti-nutritional factors such as polysaccharides [92-97]. Co-culture processes present the opportunity to establish stable and profitable biotechnological bioprocesses and produce valueadded products from economical raw materials such as agricultural residues. Mixed culture systems have demonstrated promise in hydrogen, methane, ethanol and polyhydroxyalkanoates productions from renewable resource, increasing potential revenue and reducing environmental impacts [98-103]. The use of controlled mixed fermentation usingSaccharomyces and non-Saccharomyces yeasts has been implemented in winemaking to alter both chemical and the aromatic composition of wines.

O. sinensis, called Cordyceps or Dong Chong Xia Cao in China, is one of the most valuable traditional Chinese medicinal fungi. It is generally used to nourish the kidney, moisten the lung, fight fatigue and enhance immunity. Furthermore, the wild O. sinensis is exiguity and expensive in the market, so the mycelia fermentation has become to an economical method to meet large requirement of the market. Several Intracellular Polysaccharides IPS have been purified from the mycelia of O. sinensis, and the molecular structures have been elucidated [103-109]. ungi of the genus Hericium contain various ingredients with antibacterial activity, cytotoxic effect on cancer cells and compounds that stimulate the synthesis of the Nerve Growth Factor NGF. Although quite a few species of Hericium are known, the fruiting bodies cultivation on the waste sawdust was developed for H. abietis and H. erinaceus only [110-115]. The general metabolic path of historical assumptions is pretty limited from ammonia to nitrite, to nitrate, and to nitrogen Gas N2, which has been widely acknowledged. In the presence of ammonia-oxidizing bacteria AOB and nitrite-oxidizing bacteria NOB, ammonium is converted to nitrite and further to nitrate. These two reactions are collectively called nitrification. Denitrification, conversely, performed by denitrifying community, is an anaerobic respiration process using nitrate as a final electron acceptor and result in stepwise microbiological reduction of nitrate, nitrite, nitric oxide NO, nitrous oxide N2O and nitrogen gas [116-120]. Several micro-organisms including Serratia marcescens produce Lasparaginases with antitumor activity. Although extensive studies have been carried out on the isolation and on the anti leukemia properties of this enzyme, very little information is available on the production of this enzyme by S. marcescens. A large amount of research has been conducted upon the biosynthesis of L-asparaginase since Masburn and Wriston demonstrated antitumor activity. Kinetic studies would allow the prediction of fermentation rate, product yield, and the control of the fermentation process [121-127]. The effects of CO2 on growth and product formation in submerged cultures have been investigated in various microorganisms, and the controversy results were always encountered. Researches of Gill and Lacoursiere had revealed that cell growth and metabolism of Pseudomonas fluorescens and Escherichia coli could be stimulated at low dissolved CO2level not more than 100 mm Hg pressure or 5% inlet gas phase respectively, while it could be greatly inhibited by the increased CO2 concentration [128-138]. Several whole microorganisms, live or not, such as bacteria, fungi or algae, increase disease resistance in mammals and fish. In fish, as in other aquatic organisms, the whole microorganisms administered have mainly been bacterial species, which in the form of feed additives, have been shown to improve the intestinal microbial balance and increase the health status of fish, seemingly by colonising the gut and acting as antagonists to pathogens and so increasing resistance to pathogens [139-140].

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