

Fish Sniffer

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Abstract : Formaldehyde is unethically used by some fishermen and fish vendors to preserve the fish and seafood from microbial spoilage. An attempt was taken to detect the formalin in wet fish markets by our device. We go through in recent surveys based on the formalin, then we develop this project in efficient manner. Our device will detect the release of gas from formalin affected fishes. The values of detected by gas sensors will update in mobile application using Blynk. The mobile device will connected by hotspot in PC's were the arduino IDE was installed. That blynk application receive the values from the sensor through the arduino IDE and check with constraints. Therefore we can get the optimal solution and aware from formalin affected fishes.

Key Words: Fish, Formaldehyde, Formalin, Gas Detecting Sensor, Arduino IDE, Blynk Mobile Application.

1. INTRODUCTION

Fish and seafood are an important part of a healthy diet and are considered as the biggest source of protein. The role of fish products and life stock sectors in the development of agro based economy is very important and promising. Fish culture has been contributing significantly to the export earning, employment generation, poverty alleviation and to the economic development.

In india, Fish and fish products are the “**third largest export commodity**”. In Bangladesh has a vast fisheries resources comprising of fresh and marine waters inhabited by 296 fresh and 511 marine species, 14 exotic species of fish and 24 species of prawn. Available endemic species includes 13 species of carps and 4 species of catfishes. It is still not sufficient to meet up the growing economic demand of the country. For this in sufficient economic demand, our have entering imported fishes from neighboring countries into the domestic market. By the survey, It was reported that more than 80 MT of fish and fishery products enter into our country every day through the Teknaf border from Myanmar.

By composition, fish has contain fat free amino acids and water which is susceptible to spoilage by micro organisms. So they can test by biochemical reactions during post mortem process. Thus, fish and seafood are very perishable and can only be kept fresh in ice for 8 to 14 days.

In order to keep the freshness of fish and seafood, fish vendors tend to intentionally apply formaldehyde as preservative agent. By survey, added formalin fishes are transporting to domestic marketing to prevent from spoilage and increase the economic growth. Some traders injected formalin in the fish body or spray formalin mixed water on the surface while the fish are displayed in the retail market. Through that we can prevent form the fishes from local areas.

In Formalin, Solution of 37% formaldehyde gas dissolved in water. Solution of formalin for use in fish should contain 10-15% methanol which inhibits formation of a highly toxic compound. Recently, International Agency for Research on Cancer (IARC) has published that group 1 cancer carcinogenic is affected to humans. By recent survey, According to the United States, formaldehyde of daily dose will increase the body weight drastically. So it cause many non curable diseases. Now-a-days reports in the newspaper, the corporate businessmen are using formalin in fish to preserve and increase the economic with less expense. So many fish trading companies are supporting this illegal process to increase their trading growth. Some foreign countries are not allowed to formalin applied fish products. Intake of formalin injected fishes causes blindness, asthma and even cancer.

By this problems, we entered do this project based on the updated technology. By recent survey, Existing projects are done the research for how to detect the formalin in fish and how to improve the storage conditions in the exported fish. One project survey done in Dhaka, Sylhet cities in Bangalore,

were they found the 60% of fishes affected by formalin and they sell by local markets through the help of fish vendors.

So that we have developed the project based on the “**gas detecting sensors**”. Gas sensors have improved and their detecting values are very accurate. Formalin fish release the hazardous gas called formaldehyde. This gas can be detected by MQ4 gas sensor and it gets the values within a second. So these values will be screened and monitored and compared with the limit of formalin content.

“**Blynk IoT mobile application**” is one of the best data transfer between hardware devices and easily control the hardware devices and manage the thousands of deployed projects. By these we can do many projects in an efficient manner. This mobile application will connect with Arduino IDE in PC's through hotspot authentication and name and password.

2. LITERATURE REVIEW

Riaz Uddin [1] and his team went to fish markets in Dhaka city at Bangalore. They found that 60% of fishes preserved by formalin.

And Ioannis S. Boziaris [2] researched that fish is spoiled due to microbiological activity, chemical oxidation and autolysis. Through that he gave awareness of how the fish is spoiling.

And Farah Faiqah Fazial, Tan Ling Ling, Azfar [3] found the new method of preserving fish using storage conditions without affecting the fish but the fish get decomposing quickly.

In genotoxicity studies, formaldehyde is considered to be a weak genetic toxicant at the first contact, genetic effects of formaldehyde were not observed in lymphocytes peripheral [24].

There are also cases of systemic or localized allergic reaction attributed to formaldehyde have been reported in clothing and textiles [16].

In the other hand, formaldehyde has been used as food additive in processed seafood such as herring and caviar in some countries [10].

Formaldehyde levels were observed among four species squid, which was generally far higher in viscera than in muscle of frozen squid [7].

Through that we got the idea of detecting the “Formaldehyde affected fish” through the gas detecting sensors by using the values of fish [5][7].

By getting the values we can identify the difference of fresh fish and formalin fish. Through that user can get idea of what is the current scenario is going on in fish markets.

By above table descriptions we can get the accurate values of formaldehyde fishes in different countries. Through that we set the values and identify the difference.

By using “Blynk” we can exchange the data between hardware and Blynk mobile app.

Blynk is very easy to interact the IoT devices and get the values based on the hardware configuration.

It is the most popular IoT platform and it can control the projects from cloud and it can manage the thousands of projects.

Through this we can easily create our own front end in any mobile platform.

3. PROPOSED SYSTEM

The illegal use of formalin for quality control purposes is a widespread practice in today's fish industry. Therefore the proposed system uses an MQ4 sensor which detects the addition of formaldehyde on fish. The detected is processed on gas sensor connected in “**arduino**” and it will process the value of gas sensor. This arduino board of **nodeMCU** connected in PC's by installing arduino IDE. This **arduino IDE** is used to program the code for corresponding parameters. And it will update to “**Blynk**” application on mobile devices.

A gas detector is a device that detects the presence of gases in an area, often as part of a safety system. This type of equipment is used to detect a gas leak or other emissions and can interface with a control system. Gas leak detection is the process of identifying potentially hazardous gas leaks by sensors.

Features

- High sensitivity to CH₄, Natural gas
- Small sensitivity to alcohol, smoke
- Fast response
- Stable and long life

- Simple drive circuit

Through Arduino board of nodeMCU, We can get the values from MQ4 gas sensor and it update the values in “Blynk” IoT mobile application.

Blynk application is one of the best designing application for front end developers. Through this our project get the best view in design, that create the increasing the values in design and message displaying in innovative manner.

Features

- Drag and drop method
- Easily interact with Arduino IDE
- Simply usage
- Platform Independent

Through that we can identify the level of increasing, that designed in blynk application. If it is less than “limit” then it is “Formalin content is in limit. So this fish is good for health” or else if it is indicate as more than the “limit” then it is “Formalin content is high. So this fish is not good for health”. By then we can aware by those kind of fishes. And also we have tested decomposing stage of fishes, by release of gas. That also we detected and monitor the values. Based on the values we can aware by decomposing fishes.

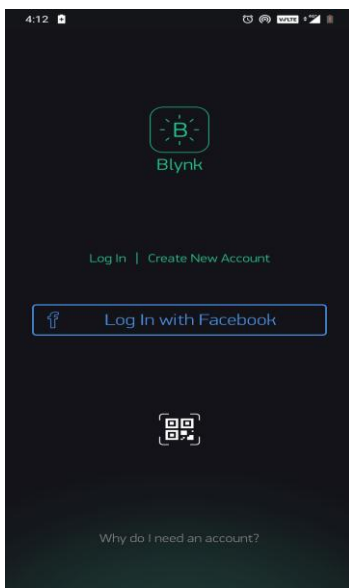


Fig1. SCREENSHOT OF BLYNK APPLICATION

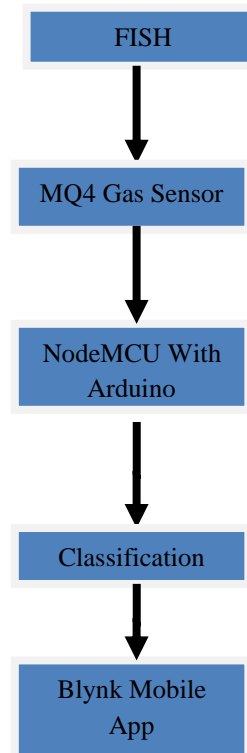


Fig2. BLOCK DIAGRAM OF FISH SNIFFER USING GAS DETECTING SENSOR

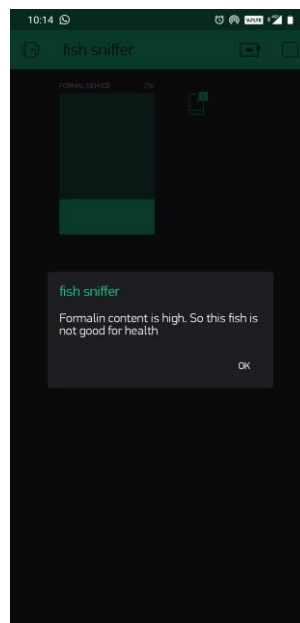


Fig3. SCREENSHOT EXAMPLE THAT SHOWS “FORMALIN CONTENT IS HIGH IN FISH” DETECTED BY MQ4

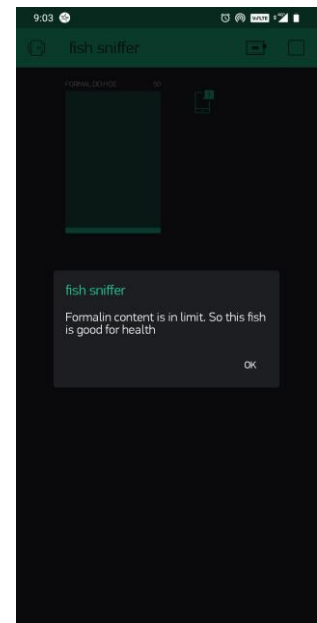


Fig4. SCREENSHOT EXAMPLE THAT SHOWS “FORMALIN CONTENT LIMIT IN FISH” DETECTED BY MQ4

4. CONCLUSION

In conclusion, the formaldehyde is the chemical hazard that was found in high concentration in fish products. Through this project we can detect the formalin and we can monitor the value of formalin affected fishes. By those we can aware of those kind of fishes. In future references, We will store the values of formalin fishes in the database based on the areas of markets. Then we found in which markets formalin fishes monitored maximum and then we can report or complaint those markets to the government bodies to take the actions and control by applying this kind of preservatives.

5. REFERENCES

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