Cocoon Care : Transformative Monitoring For Sericulture

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CHAPTER 1

INTRODUCTION

Sericulture is the process of cultivating silkworms and extracting silk from them. The caterpillars of the domestic silk moth (also called „Bombyx Mori") are the most commonly used silkworm species in sericulture. Other types of silkworms (such as Eri, Muga, and Tasar) are also cultivated for the production of „wild silks".

Silk is known as the queen of textiles due to its softness, durability, and luster. Furthermore, the silk fibers provide characteristics that are superior toany other type of fiber (e.g., water absorbency, heat resistance, dyeing efficiency, and luster). This textile is obtained from cocoons spun by larvae known as silkworm (Bombyx mori), which were discovered in China between 2600 and 2700 BC. The process of silk production is known as sericulture, beginning with the rearing of the silkworm1

1.The silkworm is of great interest to the sericulture industry and the academic community. Because of this, there is an increased interest in knowing the combination of factors that affect growth and development of silkworms in different life stages, which in turn affects productivity, and quality of silk

2.The insects can only survive in specific conditions, defined by environmental factors such as temperature, relative humidity,or durationlight. These environmental factors directly affect different activities such as feeding, dispersal,

laying or development. Temperature is probably the environmental factor that exerts the most significant effect on thedevelopment of the insects.

3.It is well known that the silkworm is highly sensitive to environmental variation Indeed, in an extreme natural fluctuation, it could be unable to survive because of its extended period of domestication, of about 5000 years

4.The biological as well as physiology-related, characteristics (e.g., growth, development, productivity, and quality of silk), are influenced by the combination of temperature, air circulation, humidity, light duration, and gases. The study of the effects of varying environmental conditions, will generate essential biological information that will allow production of cocoons in areas where the silkworm is of economic value. Recent progress in electronics, wireless communications, andproduction of small size sensors provides new opportunities to develop different monitoring systems (e.g., forhomes, crops and the environment

5.A sensor is a device that can measure physical attributes and convert them into signals for the user. Sensors are the essential components of the environmental monitoring system of this proposal in addition to the embedded systems

6.To monitor the environmental conditions during the silkworm incubation and rearing process, we proposed an environmental conditions monitoring system that makes full use the concept of an open source and low-cost data acquisition and transmission system. We used an embedded platform to control the temperature and humidity using heater and humidifier.

CHAPTER 2

LITERATURE SURVEY

[1] **Nagy Anton, Alexandru Mărghitaş, Daniel Dezmirean : DIAPAUSE STORAGE TEMPERATURE INFLUENCE ON SILKWORM LARVAHATCHING RATE:** The mulberry silkworm (BombyxmoriL.) is very delicate, highly sensitive to environmental fluctuations, and unable to survive extreme natural fluctuation in temperature and humidity because of their long years of domestication since 5000 years. Thus, the adaptability to environmental conditions in the silkworm is quite different from those of wild silkworm and other insects. Temperature, humidity, air circulation, gases, light, and so forth, show a significant interaction in their effect on the physiology of silkworm depending upon the combination of factors and developmental stages affecting growth, development, productivity, and quality of silk

[2] **Alejandra Duque-Torres, Juan Ruiz-Rosero : A New Environmental Monitoring System For Silkworm Incubators:** A newly Monitoring Environmental Conditions System is proposed based on Raspberry-Pi. This proposal monitors the temperature, humidity, and luminosity in a silkworm incubator. The monitoring data are collected and save in the cloud for the subsequent analysis. The monitoring environmental system is based on Raspberry Pi due to capabilities, features, and low cost. The preliminary tests were realized in a real scenery and the results demonstrating its reliability.

[3] **V K Rahmathulla : Management of Climatic Factors for Successful Silkworm (Bombyx mori L.) Crop and Higher Silk Production:** The seasonal differences in the environmental components considerably affect the genotypic expression in the form of phenotypic output of silkworm crop such as cocoon weight, shell weight, and cocoon shell ratio. The variationsin the environmental conditions day to day and season to season emphasize the need of management of temperature and relative humidity for sustainablecocoon production. The present review paper discuss in details about the role of temperature and humidity on growth and development of silkworm including recent studies on heat shock protein. Study also discusses the influence of air and light on silkworm development. In addition to this study emphasis on the role of various environmental factors on embryonic development of silkworm egg, nutritional indices of silkworm larva and reproductive potential of silkworm moth. The study also highlights about the care to be required during silkworm spinning and influence of temperature and humidity on post cocoon parameters of silkworm. The study included future strategies to be taken for the management climatic condition forsuccessful cocoon crop. The paper covers 140 references connected with the topic.

[4] **Terence L Wagner, Hsin-I Wu, Peter J H : Sharpe Modeling Insect Development Rates:** A Literature Review and Application of a Biophysical Model:The importance of predicting the seasonal occurrence of insects has led to the formulation of many mathematical models that describe development rates as a function of temperature. Yet many of the widely used models do not provide acceptable results for predicting development times. After a careful review of the literature, we believe the biophysical model of Sharpe and DeMichele (1977; J. Theor. Biol. 64: 649–670) is the

most suitable for this purpose. This model provides an excellent description of development rates over a full range of temperatures, and can be modified easily to describe rates over a portion of that range. Herein we review the literature on modeling insect development rates, describe the Sharpe and DeMichele model, and present easy instructions for its use.

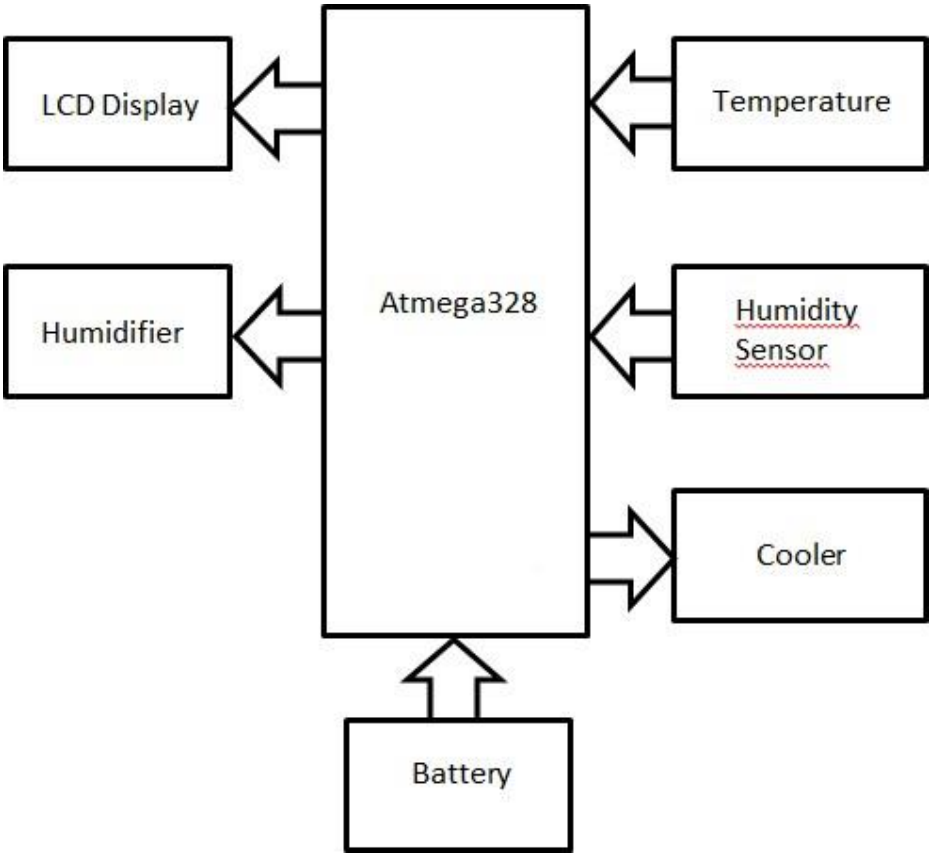
PROBLEM STATEMENT

- Proper maintenance of moistness and temperature which take part a critical position in the progression of solid silkworm in each stages.
- Silkworm Disease Management: Develop strategies to mitigate the impact of diseases affecting silkworms, such as flacherie and muscardine, through improved breeding techniques or effective disease control measures.
- Enhancing Silk Yield and Quality: Explore methods to increase silk production and enhance the quality of silk threads, focusing on factors like nutrition, environmental conditions, and selective breeding for superior silk characteristics.

OBJECTIVES

- The objective of our project is to create a low cost incubator silk worm which helps farmer to have a better yield of silkworm and tominimize the mortality rate of silk worm.
- Implementing advanced sericulture techniques to enhance silk production, aiming for a specific percentage increase over a defined period.

CHAPTER 3
METHODOLOGY



System monitoring overview

The proposed conceptual model of the monitoring system. There are three main stages: the reading of sensors,the communication channel, which sends real time status using bluetooth to mobile phone . It consists of several sensors that record environmental parameters such as moisture, temperature,and luminosity in a silkworm incubator. We used two different sensors to collect data on temperature, humidity, and luminosity. Bluetooth communication was used to upload the information to mobile. Users obtain information about the data recorded through a smartphone.

Silkworm incubator

The silkworm incubator structure keeps the environment in uniform conditions for temperature and humidity and these are measured using temperature and humiditysensor.

These are the most important variables to control.

The temperature and humidity levels can be set using mobile. The system measures the temperature and humidity constanatly. when temperature falls below set temperature the microcontroller is programmed to turn on relay which turns on the heater coil.

when humidity falls below the value the humidifier is turned on which humidifies the incubator. All the values can be set using mobile and can alsobe monitored in mobile.

Components

- Arduino
- Temperature sensor
- Humidity sensor
- cooler
- Humidifier
- Arduino IDE
- C++

ARDUINO UNO

The Arduino Uno is an open-source microcontroller board based on the Microchip ATmega328P microcontroller and developed by Arduino.cc.The board is equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards (shields) and other circuits.The board has 14 digital I/O pins (six capable of PWM output), 6 analog I/O pins, and is programmable with the Arduino IDE (Integrated Development Environment), via a type B USB cable. It can be powered by the USB cable or by an external 9-volt battery, though it accepts voltages between 7 and 20 volts. It is similar to the Arduino Nano and Leonardo.

While the Uno communicates using the original STK500 protocol, it differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it uses the Atmega16U2 (Atmega8U2 up to version R2) programmed as a USB-to-serial converter. Absolutely! Let's dive into the details of the Arduino Uno. It's a microcontroller board that uses the ATmega328P chip, which is the brain of the board. The ATmega328P runs at a clock speed of 16 MHz, allowing it to perform tasks quickly and efficiently.

The board has a total of 14 digital input/output pins, marked as digital pins 0 to 13. These pins can be used for both input and output operations. You can connect various components like sensors, LEDs, and motors to these pins to interact with the physical world.

Additionally, the Arduino Uno has 6 analog input pins, labeled as A0 to A5. These pins can read analog signals, such as those from temperature sensors or light sensors. This allows you to measure and respond to real-world values.

To power the Arduino Uno, you have a couple of options. You can connect it to your computer using the USB port, which not only powers the board but also allows you to upload your code and communicate with it. Alternatively, you can use the power jack to connect an external power source, such as a battery or a wall adapter.

The board also features a reset button, which you can press to restart your program or put the board into a known state. Furthermore, there's an ICSP (In-Circuit Serial Programming) header that enables you to program the ATmega328P using an external programmer if needed.

Overall, the Arduino Uno is a fantastic board for beginners and experienced makers alike. It provides a solid foundation for building all sorts of projects, from simple blinking LED experiments to complex robotic systems. Let me know if you have any more questions or if there's something specific you'd like to explore

Features

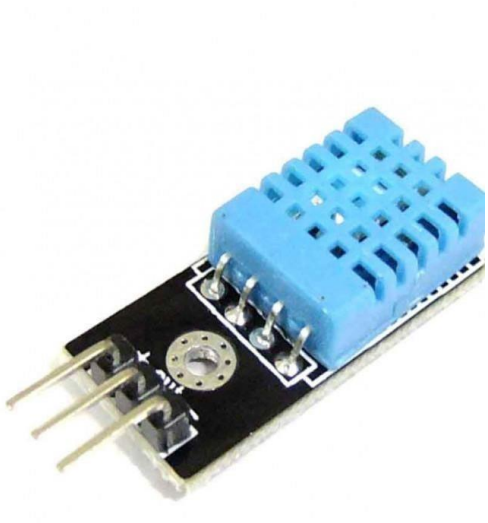
- Arduino boards are able to read analog or digital input signals from different sensors and turn it into an output such as activating a motor, turning LED on/off, connect to the cloud and many other actions.

- You can control your board functions by sending a set of instructions to the microcontroller on the board via Arduino IDE (referred to as uploading software).

- Unlike most previous programmable circuit boards, Arduino does not need an extra piece of hardware (called a programmer) in order to load a new code onto the board. You can simply use a USB cable.

- Additionally, the Arduino IDE uses a simplified version of C++, making it easier to.

DHT11 - Temprature and Humidity SensorModule



DHT11 is a Humidity and Temperature Sensor, which generates calibrated digital output. DHT11 can be interface with any microcontroller like Arduino, Raspberry Pi, etc. and get instantaneous results. DHT11 is a low cost humidity and temperature sensor which provides high reliability and long term stability.

It uses a capacitive humidity sensor and a thermistor to measure the surrounding air, and outputs a digital signal on the data pin (no analog input pins needed). Its very simple to use, and libraries and sample codes are available for Arduino and Raspberry Pi.

This module makes is easy to connect the DHT11 sensor to an Arduino or microcontroller as includes the pull up resistor required to use the sensor. Only three connections are required to be made to use the sensor - Vcc, Gnd and Output.

It has high reliability and excellent long-term stability, thanks to the exclusive digital signal acquisition technique and temperature & humidity sensing technology. Ah, the DHT11 Temperature and Humidity Sensor Module! It's a popular sensor module used to measure temperature and humidity in various projects. The DHT11 sensor module consists of a small sensor connected to a circuit board with three pins: VCC, data, and GND. To use the DHT11 sensor module, you'll need to connect it to your Arduino or other microcontroller board.

The VCC pin is connected to the 5V power supply, the data pin is connected to a digital input/output pin on your board, and the GND pin is connected to the ground .

To read the temperature and humidity values from the DHT11 sensor, you'll need to use a library that supports the DHT11 sensor. The library provides functions to communicate with the sensor and retrieve the temperature and humidity data.

Once you have the sensor connected and the library installed, you can start reading the temperature and humidity values. By sending specific commands to the sensor, you can retrieve the data and use it in your projects. You can display the values on an LCD, log them to a file, or even control other components based on the readings

It's a handy little sensor module that can be used in various applications, such as weather monitoring, home automation, and greenhouse control.

Specifications :-

Power Supply：3.3~5.5V DC Output：
4 pin single row
Measurement Range：Humidity 20-90%RH， Temperature 0~50℃Accuracy：Humidity +-5%RH， Temperature +-2℃
Resolution：Humidity 1%RH， Temperature 1℃Interchangeability：Fully Interchangeable
Long-Term Stability：<±1%RH/year

Pin Description :-

- Pin 1:Power +Ve (3.3VDC to 5.5VDC Max wrt. GND)
- Pin 2:Serial Data Output
- Pin 3:Power Ground or Power –Ve

COOLER

Simple air conditioners are really nothing more than a heat exchanger that move heat—or cold— from one place to another. Usually, they take warm air and move it across ice or chilled water where it warms the ice and continues on, in a cooled state. The most common DIY air conditioners are made out of coolers, with some type of fan to blow air in through a hole, and out through another. If you have most of the parts for this type, they're easy to make and don't take much time. Keep in mind that DIY air conditioners, while easy to make, aren't necessarily very efficient, because over long periods of use, they need to continually be refilled with ice. Of course, the bigger the cooler, the more ice it holds, and the longer it will last.

If you don't want to cut holes in your cooler, there is another type of DIY air conditioner you can make. This type essentially uses a radiator, like your car, except instead of pulling heat out of your engine, it pulls cold out of your cooler. This type is more complex and requires copper or aluminum tubing, a small water pump, some flexible tubing, as well as a fan and a cooler. The metal tubing is arranged in a coil, flat against the fan, and ice water is pumped through it, from the cooler. This cools the air from the fan and sends warmer water back into the cooler. You could also use an actual heat exchanger designed to cool a computer CPU, or an inexpensive automotive transmission cooler. The cooler in a sericulture monitoring system! That's an interesting component. In sericulture, maintaining the right temperature and humidity levels is crucial for the healthy growth of silkworms and the production of high-quality silk.

The cooler is an essential part of the sericulture monitoring system as it helps regulate the temperature in the silkworm rearing area. It works by cooling down the air and maintaining a comfortable environment for the silkworms.

Typically, the cooler in a sericulture monitoring system is connected to a controller or a central monitoring unit. The controller monitors the temperature and humidity levels in the rearing area and activates the cooler when necessary.

When the temperature rises above a certain threshold, the controller signals the cooler to start cooling the air. The cooler then circulates the air, bringing down the temperature and maintaining the desired level. This helps prevent heat stress and ensures optimal conditions for the silkworms' growth.

The cooler in a sericulture monitoring system is an important tool for sericulturists to create a favorable environment for silkworm rearing. It helps them achieve better yield and quality of silk. n sericulture, the cooler is usually an air conditioning system or an evaporative cooler. It helps to regulate the temperature by cooling down the air in the rearing area. This is important because silkworms are sensitive to extreme temperatures and can suffer from heat stress or cold stress if the environment is not properly controlled.

The cooler is connected to a controller or a central monitoring unit, which continuously monitors the temperature and humidity levels in the rearing area. Based on the readings, the controller determines whether the cooler needs to be activated.

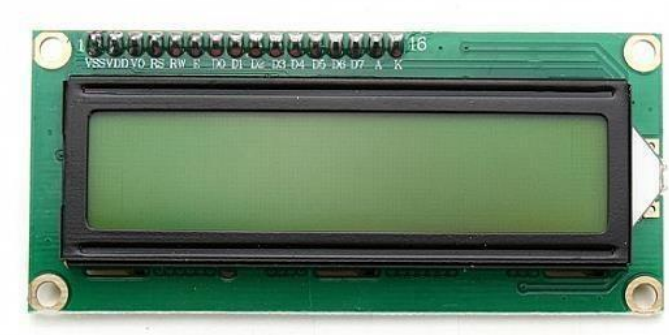
When the temperature rises above the desired range, the controller signals the cooler to start working. The cooler then circulates the air, bringing down the temperature and maintaining a comfortable level for the silkworms. It also helps to control the humidity levels, as excessive humidity can lead to disease outbreaks among the silkworms.

The cooler in a sericulture monitoring system is designed to be energy-efficient and reliable, ensuring that the temperature remains stable throughout the rearing process. It helps sericulturists create an optimal environment for the silkworms, leading to healthier growth and higher silk production.

Specifications :

Fan Connector	4-pin PWM
Trigger Current (mA)	20
Fan Rated Voltage	12 VDC
Fan Rated Current	0.13 A
Fan Power Consumption	1.56 W
Fan Speed	500~3050 RPM±10%
Fan Dimensions	92×92×25 mm
Weight (gm)	304g

LCD DISPLAY



An electronic device that is used to display data and the message is known as LCD 16×2. As the name suggests, it includes 16 Columns & 2 Rows so it can display 32 characters (16×2=32) in total & every character will be made with 5×8 (40) Pixel Dots. So the total pixels within this LCD can be calculated as 32 x 40 otherwise 1280 pixels.
16 X2 displays mostly depend on multi-segment LEDs. There are different types of displays available in the market with different combinations such as 8×2, 8×1, 16×1, and 10×2, however, the LCD 16×2 is broadly used in devices, DIY circuits, electronic projects due to less cost, programmable friendly & simple to access.

The basic working principle of LCD is passing the light from layer to layer through modules. These modules will vibrate & line up their position on 90° that permits the polarized sheet to allow the light to pass through it.

These molecules are accountable for viewing the data on every pixel. Every pixel utilizes the method of absorbing light to illustrate the digit. To display the value, the position of molecules must be changed to the angle of light.

At present, LCDs are used frequently in CD/DVD players, digital watches, computers, etc. In screen industries, LCDs have replaced the CRTs (Cathode Ray Tubes) because these displays use more power as compared to LCD, heavier & larger.

The displays of LCDs are thinner as compared to CRTs. As compared to LED screens, LCD has less power consumption because it functions on the fundamental principle of blocking light instead of dissipating.

Specifications :-

- The operating voltage of this display ranges from 4.7V to 5.3V
- The display bezel is 72 x 25mm
- The operating current is 1mA without a backlight
- PCB size of the module is 80L x 36W x 10H mm
- HD47780 controller
- LED color for backlight is green or blue
- Number of columns – 16

- Number of rows – 2
- Number of LCD pins – 16
- Characters – 32
- It works in 4-bit and 8-bit modes
- Pixel box of each character is 5×8 pixel
- Font size of character is 0.125Width x 0.200height

BATTERY

Lithium polymer battery, also known as polymer lithium battery, is a kind of lithium ion battery of chemical battery. Compared with other batteries, it has the characteristics of high energy, miniaturization, and light weight. For the ultra-thin characteristics, it can be made into batteries of different shapes and capacities to meet the needs of some products.

Lithium polymer battery usually consists of several identical parallel secondary cells to increase the discharge current, or several battery packs in series to increase the available voltage.

We have been producing and selling Lithium Polymer Batteries for more than 10 years. The LP3768125 3.7V 3800mAh battery is one of our most popular 3.7V li polymer batteries. Buy some batteries for you device or prototyping. Our MOQ is only 5pcs, kind to the all of start-up companies in the world.

As we all know, today this new type of our lithium polymer batteries are mainly used in portable devices, radio controlled devices, personal electronics, samrt wearable devices, Bluetooth headset/speakers, GPS tracker, E-book, laptops, mobile phones, digital cameras, digital camcorders, and gaming types of equipment.

These round high capacity cells have been mainly used in flashlight type applications but with its capability to be used as a drop-in Rechargeable cell at 3.7V. This is a great battery option for those of you who need a simple to install and replace cell with a lot of juice Over discharge may cause damage Full voltage is not higher than the recommended 4.2V, and the discharge voltage is not less than 2.75V.

Specifications :-

- Nominal Voltage : (V) 3.7
- Capacity: 3800mAh
- External Dimension: 18mm x 65 mm
- Made in China
- Type: Flat Top Battery
- Max. Charge Voltage: 4.2±0.05V
- Rechargeable: Yes
- Cycle life: 1000 Times
- Operating Temperature Range : (deg. C)** –20 to +85
- Used Condition: New (Original - Super Power battery)

Warning :-

- Do not incinerate;
- Do not disassemble;
- Do not short positive and negative contacts;
- Do not expose to heat;
- Do not completely discharge;
- Do not use force to install a lithium battery;
- Use only high quality battery charger;
- Charge fully before first use;
- Store in cold and dry place at approximately nominal voltage

When using a sericulture monitoring system, there are a few important warnings to keep in mind:

1. Electrical Safety: Ensure that all electrical connections and components of the monitoring system are properly installed and maintained. Avoid any contact with water or other liquids to prevent electrical hazards.

2. System Calibration: Regularly calibrate and check the accuracy of the sensors, controllers, and other components of the monitoring system. This will help ensure that the readings and measurements are reliable and accurate.

3. Data Monitoring: Keep a close eye on the data collected by the monitoring system. Look for any abnormalities or sudden changes in temperature or humidity levels that could indicate a problem. Promptly address any issues to prevent potential harm to the silkworms or silk production.

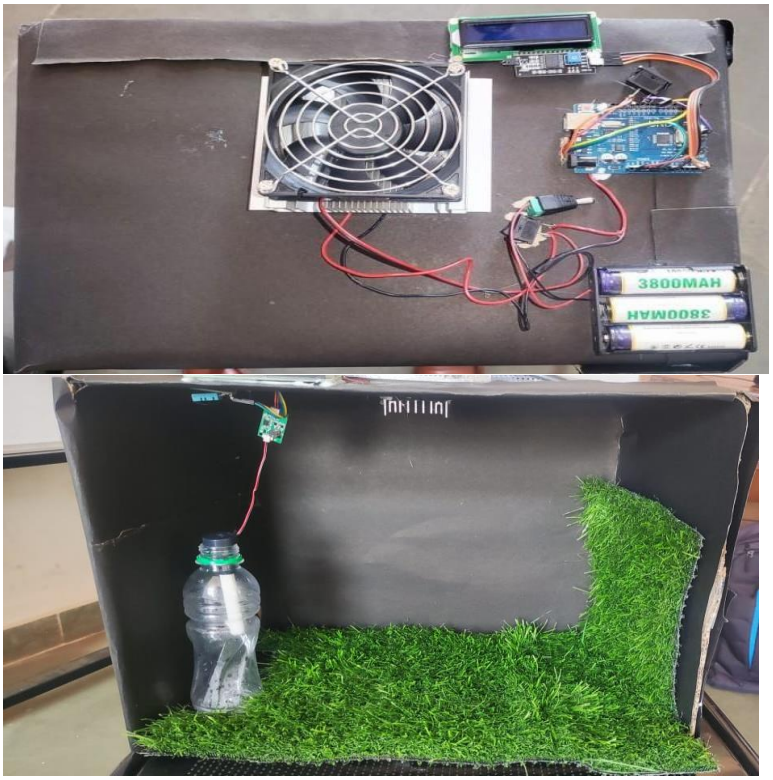
4. Maintenance and Cleaning: Regularly clean and maintain the monitoring system to prevent dust, debris, or other contaminants from affecting its performance. Follow the manufacturer's instructions for maintenance and cleaning procedures.

Humidifier

- Arduino is connected to a humidity sensor placed within the sericulture environment.
- Arduino is programmed to control the operation of the humidifier based on the humidity readings.
- If the humidity drops below the desired level, Arduino sends a signal to activate the humidifier.
- Upon receiving the signal from Arduino, the humidifier turns on and releases moisture into the environment.
- This helps in increasing the humidity level to the optimal range required for silkworm rearing.
- The humidifier in a sericulture monitoring system! It's an essential component for maintaining the optimal humidity levels in the rearing area.

  The humidifier in sericulture helps to regulate and control the humidity levels required for the silkworms' growth and development. It works in conjunction with the monitoring system to ensure that the environment remains suitable for the silkworms throughout their lifecycle.

SILKWORM INCUBTOR



- Silkworm incubator is device used to provide the optimal conditions for silkworm egg to hatch and grow.
- Previously we were not able to identify the condition of the silkworm these monitering system works by using various sensor and device to collect the data on environmental condition.
- These sensor can measure parameter like Temperature, Humidity, cooler, Humidifier.
- Incubator is very important for growth rate and development of silkworm it ranges around 77-86 F.
- A silkworm incubator is a specialized device designed to create the perfect environment for silkworm eggs to hatch and grow. It typically consists of a temperature-controlled chamber with adjustable settings for temperature, humidity, and ventilation. These factors are crucial for the healthy development of silkworms.
- The temperature setting in the incubator is important because it influences the growth rate and development of the silkworms. Generally, a temperature range of around 77 to 86 degrees Fahrenheit (25 to 30 degrees Celsius) is considered optimal for their growth. This temperature range helps ensure that the silkworms progress through their life stages at a normal pace.
- In addition to temperature, humidity is another key factor. Silkworm eggs require a specific level of humidity for successful hatching. Typically, a humidity level of around 80% is maintained in the incubator during the early stages.

- As the silkworms grow, the humidity is gradually reduced to around 60% to simulate the natural environment In addition to temperature, humidity is another key factor. Silkworm eggs require a specific level of humidity for successful hatching.
- Proper ventilation is also essential in the incubator to ensure a fresh supply of oxygen for the silkworms. It helps maintain a healthy environment and prevents the buildup of moisture or harmful gases.
- By providing the ideal conditions for silkworm development, an incubator increases the chances of successful hatching and healthy growth. It's a fascinating tool that helps silk producers ensure a consistent and high-quality silk production process.

Here are some key features and components of a typical silkworm incubator:

1. Temperature Control: The incubator maintains a specific temperature range, usually between 25-30 degrees Celsius (77-86 degrees Fahrenheit). This temperature range is ideal for the eggs to hatch and for the silkworm larvae to thrive.

2. Humidity Control: Silkworm eggs require a specific level of humidity for proper development. The incubator maintains the required humidity level, usually around 80-85%, to ensure the eggs do not dry out and the larvae can hatch successfully.

3. Ventilation: Proper airflow and ventilation are crucial in the incubator to maintain a fresh and oxygen-rich environment for the developing silkworms. It helps prevent the buildup of excess moisture and ensures a healthy environment for their growth.

4. Egg Trays: The incubator typically includes trays or racks designed to hold the silkworm eggs. These trays provide a secure and organized space for the eggs to be placed, making it easier to monitor their development.

CHAPTER 4

ADVANTAGES

1. Enhanced Efficiency: A sericulture monitoring system can automate various tasks, such as temperature and humidity control, feeding schedules, and data logging. This automation helps streamline the sericulture process, saving time and effort for sericulturists.

2. Improved Precision: Monitoring systems provide accurate and real-time data on temperature, humidity, and other vital parameters. This enables sericulturists to maintain optimal conditions for silkworms, leading to better growth, higher survival rates, and improved silk production.

3. Early Detection of Issues: Monitoring systems can alert sericulturists to any deviations from the desired conditions. This early detection allows for timely intervention, preventing potential problems such as disease outbreaks or inadequate environmental conditions.

4. Data Analysis and Insights: The collected data from the monitoring system can be analyzed to identify patterns, trends, and correlations. This information can help optimize sericulture practices, identify areas for improvement, and make informed decisions to enhance productivity.

DISADVANTAGES

1. Cost: Implementing a sericulture monitoring system can involve upfront costs for purchasing the necessary equipment and setting up the infrastructure. Additionally, there may be ongoing costs for maintenance, upgrades, and software licenses.

2. Technical Complexity: Operating and maintaining a monitoring system requires technical knowledge and skills. Sericulturists may need training or assistance to effectively use the system and interpret the collected data.

3. Reliance on Technology: A monitoring system heavily relies on technology, such as sensors, data loggers, and software. Any technical failures or malfunctions can disrupt the monitoring process and potentially affect the well-being of the silkworms.

4. Limited Flexibility: Some monitoring systems may have limitations in terms of customization or adaptability to specific sericulture practices.

APPLICATIONS

1. Environmental Monitoring: The system can monitor and control parameters such as temperature, humidity, and light intensity in the sericulture facility. This ensures optimal conditions for silkworm rearing and cocoon production.

2. Feeding and Watering Management: The monitoring system can track feeding schedules and water supply, ensuring that silkworms receive the right amount of food and water at the appropriate times. This helps maintain their health and growth.

3. Disease Detection and Prevention: By continuously monitoring the sericulture environment, the system can detect early signs of disease outbreaks or pest infestations. This allows for timely intervention, preventing the spread of diseases and minimizing losses.

4. Cocoon Quality Assessment: The monitoring system can collect data on cocoon weight, size, and color, providing insights into the quality of silk produced. This information helps sericulturists make informed decisions about breeding, feeding, and other management practices.

5. Production Planning and Optimization: By analyzing the data collected over time, the monitoring system can provide valuable insights for production planning and optimization. This includes determining the optimal timing for rearing, harvesting, and processing silk, as well as identifying areas for improvement in the sericulture process.

6. Real-time Data Monitoring: The system can provide real-time monitoring of various parameters such as temperature, humidity, and air quality within the sericulture facility. This allows sericulturists to track and analyze data instantly, enabling them to make timely adjustments and interventions as needed.

CONCLUSION

- The concluded results are, Accepting temperature, humidity and display the same.Actions according to range specified:

  Temperature range: 27-30 degree Celsius

  Humidity range: 60-80%

- On effective utilization of our technology we can drastically reduce mortality rate of silkworm
- Increases the growth rate of silkworm
- Farmer in non supportive climatic condition area can also grow healty silkworm.

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