

Janata Shikshan Sanstha's
KISAN VEER MAHAVIDYALAYA, WAI
Department of Zoology
LIST OF THE PROJECT

Class - B.Sc. III

Paper III

YEAR - 2022-2023


Sr. No	Roll No	Name	Project Title
1	75	Gaikwad Dhiraj j	Diabetes
2	87	Jaykar Neha P	Detection of Haemins Crystals
3	88	Patane Sanket G	Detection of Haemins Crystals
4	96	Khumbhar Shreya J	Diabetes
5	97	Pawar Rani S	Body Mass Index
6	103	Awade Bhyagyashree A	Detection of Haemins Crystals



Teacher Incharge
Dr. H. D. Kanase



Head of ZOOLOGY
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JANATA SHIKSHAN SANSTHA
**KISAN VEER
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DISTRICT SATARA



SHIVAJI UNIVERSITY, KOLHAPUR

PROJECT YEAR (2022-23)

B.Sc.III(Zoology)

PROJECT TITLE

DIABETES

Represented By –

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JANATA SHIKSHAN SANSTHA
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Certificate

This is to certify that **Miss. Shreya Jagannath Kumbhar & Mr. Dhiraj Jagannath Gaikwad** has successfully completed the project work on “**DIABETES**” which is being submitted here as a partial fulfillment for the award of degree of bachelor of Science in Zoology, Shivaji University, Kolhapur.

This Project is the result of data information collected from respective source & we have verified the obtained during the academic year 2022-2023 under my guidance and to best of my knowledge and belief of any degree.

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**KISAN VEER
MAHAVIDYALAYA, WAI**

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SHIVAJI UNIVERSITY, KOLHAPUR

PROJECT YEAR (2022-23)

B.Sc.III(Zoology)

PROJECT TITLE

BODY MASS INDEX

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Certificate

This is to certify that Miss. **Rani Santosh Pawar** has successfully completed the project work on "**BODY MASS INDEX**" which is being submitted here as a partial fulfillment for the award of degree of bachelor of Science in Zoology, Shivaji University, Kolhapur.

This Project is the result of data information collected from respective source & we have verified the obtained during the academic year 2022-2023 under my guidance and to best of my knowledge and belief of any degree.

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SHIVAJI UNIVERCITY, KOLHAPUR

PROJECT YEAR(2022-2023)

B.Sc.III (Zoology)

PROJECT TITLE

DETECTION OF HAEMIN CRYSTAL

Represented by-

Sr.No.	Name Of Students	Roll No.	Seat No.
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03	Patne Sanket Gulab	88	38957

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This is to certify that Miss. Awade Bhagyashree Ananda, Miss. Jaykar Neha Prakash, Mr. Patne Sanket Gulab has successfully completed the project work on "DETECTION OF HAEMIN CRYSTAL" which is being submitted here as a partial fulfillment for the award of degree of bachelor of science in Zoology, Shivaji University, Kolhapur.

This project is the result of data information collected from respective source & we have verified the obtained during the academic year 2022-2023 under my guidance and to best of my knowledge and belief of any degree.

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Title of project: Detection of Haemin Crystal.

Aim of project:

- ❖ Comparative studies of Haemin crystal of Mammals Detection of Structural and Statistical Analysis.

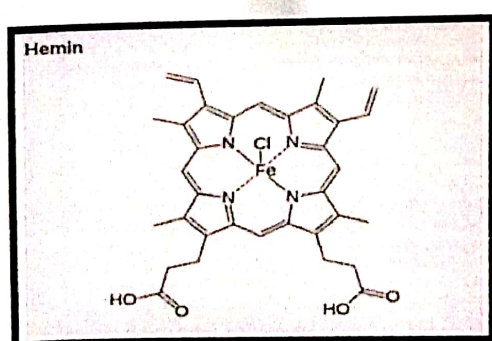
Introduction

HAEME is the iron containing split portion haemoglobin when a sodium chloride, a drop of glacial acetic and some blood are heated on a slide a typical microscopic redish brown crystal- $C_{34}H_{32}Cl Fe N_4O_4$. Feclis fromed

Hemin is protoporphyrin IX containing a ferric iron (Fe^{3+})ion with a coordinating chloride ligand.

Chemically, hemin differs from the related heme – compound hematin chiefly in that the coordinating ion is a chloride ion in hemin, whereas the coordinating ion is a hydroxide ion in hematin. The iron ion in haem is ferrous (Fe^{2+}) whereas it is ferric (Fe^{3+}) in both hemin and hematin. Hemin is endogenous of old red blood cells. It can form inappropriately as a result of hemolysis or vascular injury. Several proteins in human blood bind to hemin such as hemopexin and serum albumin.

Haemin (haemin ; ferric chloride heme) is an iron- containing porphyrin with chlorine that can be formed from a haem group, such as haem b found in the hemoglobin of human blood. Hemin.



Molecular formula – $C_{34}H_{32}Cl Fe N_4O_4$.

Molecular Weight 651.949 g/mols

Chemical names – Chlorohemin ; Heminchlorid

(1)

History of isolation

Haemin was first crystallized out of blood in 1853 by Ludwik Karol Teichmann. Teichmann discovered that blood pigments can form microscopic crystals. Thus, crystals of hemin are occasionally referred to as Teichmann crystals. Hans Fischer synthesized haemin, for which he was awarded the Nobel Prize in Chemistry in 1930. Fischer's procedure involves treating defibrinated blood with a solution of sodium chloride in acetic acid.

Objectives

The objective of this work is to study

- i. The specific character of haemin crystal of some mammals.
- ii. Difference in shape of haemin crystal of some mammals in comparison to that of human being.
- iii. Determination of standard deviation in size and correlation.

Materials and Method

Materials utilized were

- a) Sterilized pricking needle
- b) Syringe
- c) Anti – coagulant
- d) Spirit lamp slide coverslip
- e) Glacial acetic aci

Method / Procedure

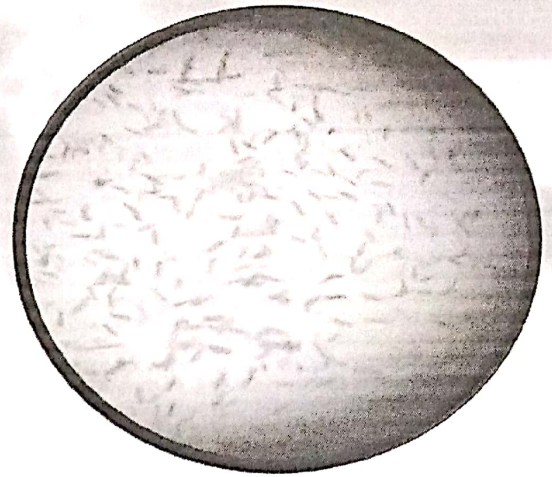
In case of human being tip of the finger is picked in case of mammals others than human being blood is taken from the blood vessels present near the neck region.

- Take slides and put one drop of blood in center of each slide and dry in air properly.
- Put a drop Glacial acetic acid on dry blood drop.
- Put cover slip and heat the slide very gently on the flame in a wave like manner
Avoid continuous heating so as to prevent blood from burning.
- Heat the slide till the fumes (bubbles) appear around the edges of the cover slip
- Stop heating and wait till the slides cool down.
- Observe the slide under microscope first in low power 10x then in high power 45x

Observation

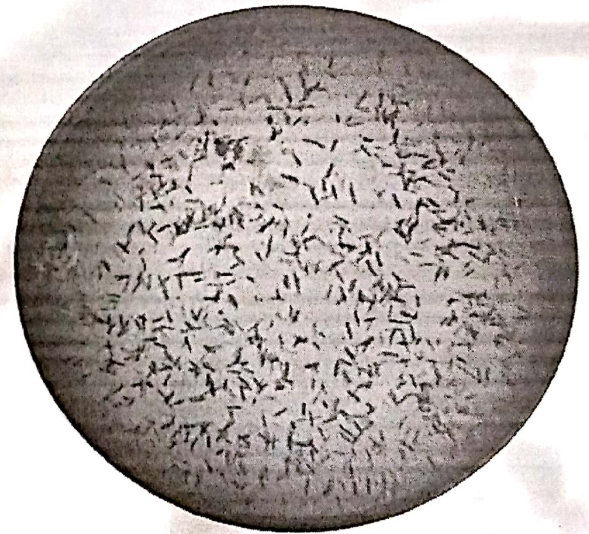
1. Human Being-

- The shape of hemins crystals of human being is rectangular in shape.
- The Rhomboidal plates are observe in human being hemins crystals.
- Length is - 0.21 mm
- Breadth is - 0.064 mm



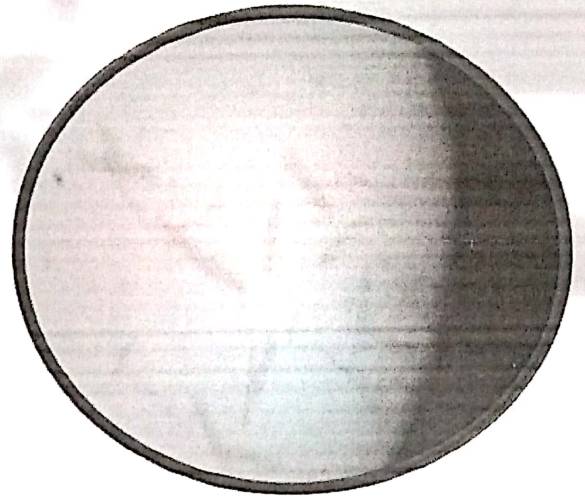
2. Cow -

- Haemin crystal of cow is brown in colour. The crystals are rectangular in shape with sharp edge projecting out word.
- Length is - 0.28 mm.
- Breadth is - 0.05 mm



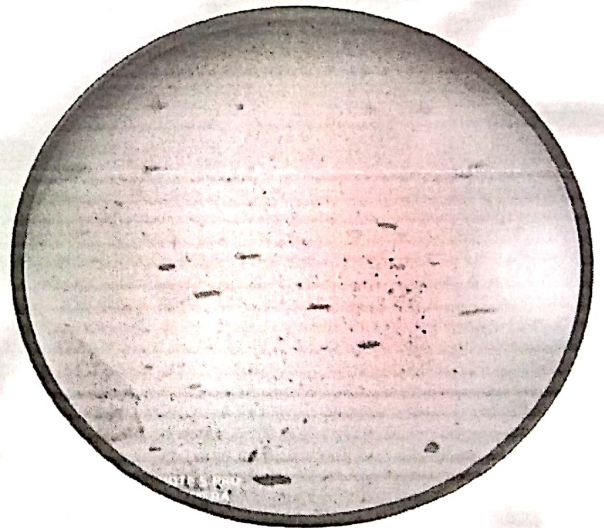
3. Goat -

- Rectangle in sharp with sharp edges
- Breadth portion is somewhat inwardly projected.
- Length is - 0.29 mm
- Breadth is - 0.10 mm



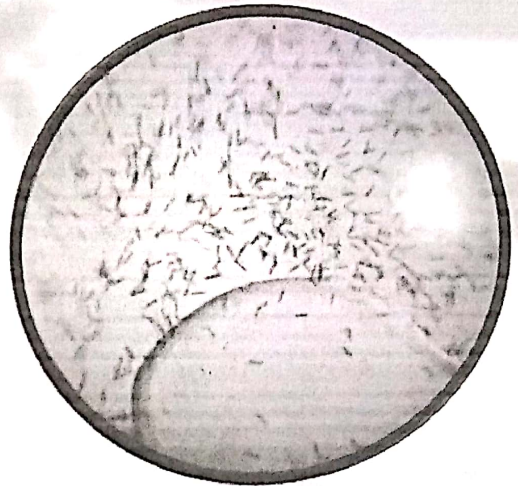
4. Dog -

- Spindo – Rhomboidal plates.
- Length is - 0.20 mm
- Breadth is - 0.08 mm



5. Rat -

- Same what circular and narrow plates with varying width.
- Length is - 0.284 mm
- Breadth is - 0.096 mm



Statistical Analysis

1) Human beings

Obs No.	Length	Breadth (in mm)
1	0.20	0.08
2	0.24	0.08
3	0.19	0.04
4	0.19	0.08
5	0.22	0.04

Calculation :-

Mean of length of Haemin crystal in human

$$\begin{aligned} X &= \text{mean of length} = \frac{\sum x}{n} \\ &= \frac{0.20+0.24+0.19+0.19+0.22}{5} \\ &= \frac{1.04}{5} \\ &= 0.208 \text{ mm} \\ &= 0.21 \text{ mm} \end{aligned}$$

Mean of breath of haemincristalin human

$$\begin{aligned} X &= \frac{\sum x}{n} \\ &= \frac{0.08+0.08+0.04+0.08+0.04}{5} \\ &= \frac{0.32}{5} \\ &= 0.064 \text{ mm} \end{aligned}$$

(8)

2) Cow

Obs No.	Length	Breadth (in mm)
1	0.29	0.05
2	0.26	0.04
3	0.30	0.06
4	0.28	0.07
5	0.26	0.04

Calculation :-

Mean of length of Haemin crystal of cow

$$\begin{aligned} X &= \frac{\sum x}{n} \\ &= \frac{0.29+0.26+0.30+0.28+0.26}{5} \\ &= \frac{1.39}{5} \\ &= 0.278. \\ &= 0.28 \text{ mm} \end{aligned}$$

Mean of breadth of hemin crystal of cow

$$\begin{aligned} X &= \frac{\sum x}{n} \\ &= \frac{0.05+0.04+0.06+0.07+0.04}{5} \\ &= \frac{0.26}{5} \\ &= 0.052 \\ &= 0.05 \text{ mm} \end{aligned}$$

(9)

3) Goat

Obs No.	Length	Breadth (in mm)
1	0.30	0.12
2	0.28	0.10
3	0.36	0.09

Calculation:-

Mean of length of Haemin crystal of goat

$$\begin{aligned} X &= \frac{\sum x}{n} \\ &= \frac{0.30+0.28+0.36+0.28+0.26}{5} \\ &= \frac{1.48}{5} \\ &= 0.298. \\ &= 0.29 \text{ mm} \end{aligned}$$

Mean of Breadth of Haemin crystal of Goat

$$\begin{aligned} X &= \frac{\sum x}{n} \\ &= \frac{0.12+0.10+0.09+0.10+0.11}{5} \\ &= \frac{0.52}{5} \\ &= 0.104. \\ &= 0.10 \text{ mm} \end{aligned}$$

(10)

4) Dog

Obs No.	Length	Breadth (in mm)
1	0.18	0.07
2	0.22	0.08
3	0.24	0.08
4	0.19	0.09
5	0.20	0.10

Calculation:-

Mean of length of Haemin crystal of Dog

$$\begin{aligned} X &= \frac{\sum x}{n} \\ &= \frac{0.18+0.22+0.24+0.19+0.20}{5} \\ &= \frac{1.03}{5} \\ &= 0.206. \\ &= 0.20 \text{ mm} \end{aligned}$$

Mean of Breadth of Haemin crystal of Goat

$$\begin{aligned} X &= \frac{\sum x}{n} \\ &= \frac{0.07+0.08+0.08+0.09+0.10}{5} \\ &= \frac{0.42}{5} \\ &= 0.206. \\ &= 0.08 \text{ mm} \end{aligned}$$

5) Rat

Obs No.	Length	Breadth(in mm)
1	0.36	0.12
2	0.24	0.08
3	0.28	0.12
4	0.28	0.08
5	0.26	0.08

Calculation:-

Mean of length of Haemin crystal of Rat

$$\begin{aligned} X &= \frac{\sum x}{n} \\ &= \frac{0.36+0.24+0.28+0.28+0.26}{5} \\ &= \frac{1.42}{5} \\ &= 0.284 \text{ mm} \end{aligned}$$

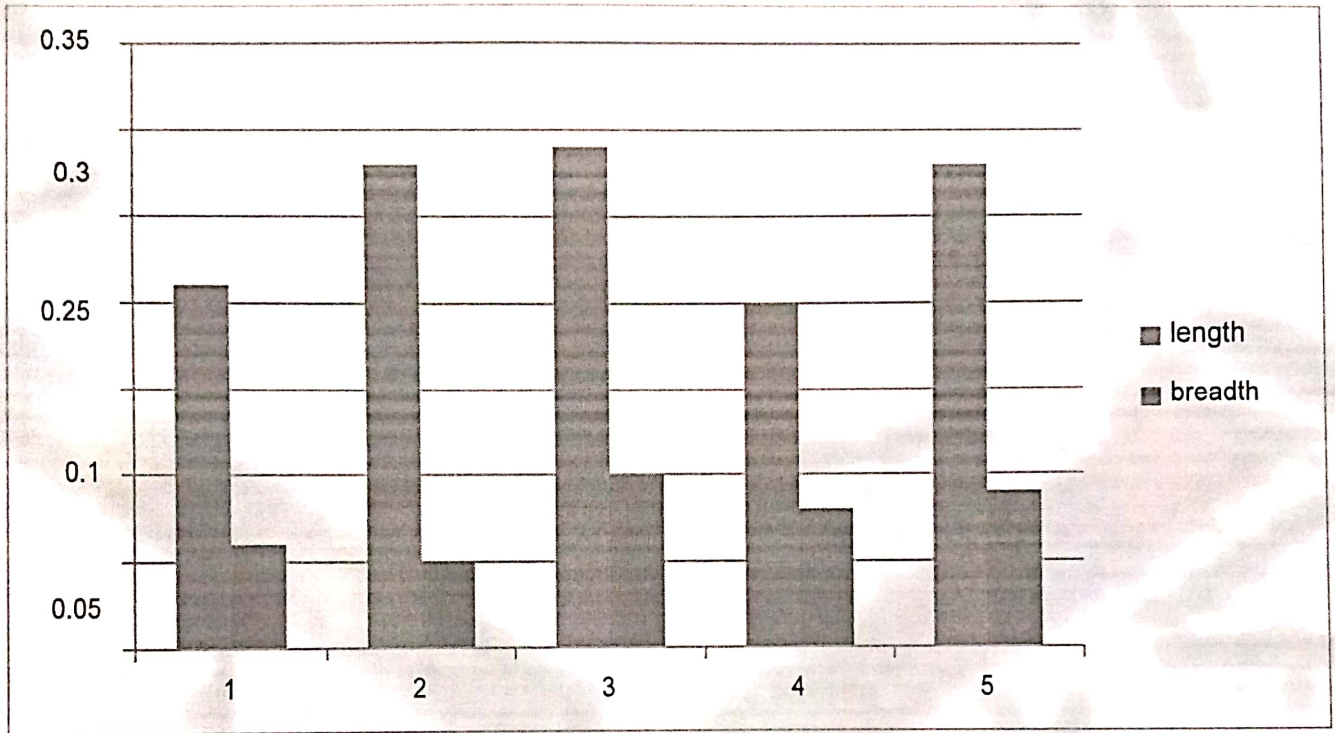
Mean of Breadth of Haemin crystal of Rat

$$\begin{aligned} X &= \frac{\sum x}{n} \\ &= \frac{0.12+0.08+0.12+0.08+0.08}{5} \\ &= \frac{0.48}{5} \\ &= 0.096 \text{ mm} \end{aligned}$$

(12)

Scale

Length (Inmm) Breadth (Inmm)



Importance

- It is important in medico – legal test for the detection of blood their formation has many years represented one of the most important tests for blood coloring matter
- It helps to given an opinion as to proof whether as stain is blood or something else
- It is also useful in the difference of blood of difference species depending upon the shape of the crystal.

Result

By standard deviation it is seen that breadth shows consistency in measurement in av four mammalion species.

But length shows difference

It indicates that as per as breadth is concern in maintains consistency.

Conclusion

Crystals of hydro chlorate of haemat in are observed in case of cows haemin crystal the difference with human haemin crystal is non – significant similar non – significant difference is seen in comparison with dogs haemin crystal to that of human beings blood

Standard deviation in length is seen in breadth there is no dispersion

Acknowledgment

We would also like to express our special thanks to our principle Dr. G.J.Fagare K. V. M. Wai. Department of Zoology Dr. H.D.Kanase for their inspiration & all Zoology Dr. H.D.Kanase for their inspiration & all kinds of co – operation

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Lastly we would like to thanks all our friends, our family teaching & non- teaching staff of Department of Zoology K. V. M. WaiSpecially thanks for kudal veterinary Hospital, Khandala veterinary hospital.

References

- 1) Biochemistry book
- 2) Zoology practical handbook
- 3) Statistical analysis by T. L. Kanshal.