

SUM GOVERNMENT DEGREE COLLEGE

KONDANAGULA, NAGARKURNOOL (DIST)



Certificate

This is to certify that the **BSC, BZC III Year Students** has successfully completed a study Project on “**Blood Groups Identification in BSC LIFE SCIENCE 1 YEAR STUDENTS**” of this college for the academic year 2020-21, under the supervision of Department of Zoology. As a part of **Departmental Innovative and Best Practices**.

Hence, it is certified.


PRINCIPAL
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**SUM GOVERNMENT DEGREE
COLLEGE**
KONDANAGULA, NAGARKURNOOL (DIST)



Department of Zoology
Departmental Innovative and Best Practices.
A.Y-2020-21.

**A STUDY PROJECT ON ‘IDENTIFICATION OF
BLOOD GROUPS IN BSC(LIFE SCIENCE
STUDENTS)-I YEARS**

S.NO	H.T.NO	NAME OF THE STUDENT	GROUP
1	18033051445001	C. Devi	BZC-III YEAR
2	18033051445002	J. Rajitha	BZC-III YEAR
3	18033051445007	S. Kumar	BZC-III YEAR
4	18033051445501	A. Kavitha	BZC-III YEAR
5	18033051445505	G. Lalitha	BZC-III YEAR

By

B.JOHNBAU
LECTURER IN ZOOLOGY
SUM GDC
KONDANAGULA

INTRODUCTION

A & B antigens are called Agglutinogens two antigen type 'A' and type 'B' occur on the surfaces of the red blood cells of the population. In the blood transfusion reactions, these antigens are inherited.

Two genes one on each of paired chromosomes determine O, A & B blood groups. Type 'O' Gene is functionless. No significant type 'O' agglutinin on the RBC. The 'A' & 'B' genes can cause strange agglutinin on the cells. There are possible combinations of genes OO, OA, OB, AA, BB, & AB.

MATERIALS AND METHODS

Reagents: ABO Grouping sera are usually obtained from selected donors whose antibody levels suitable for use a laboratory reagent. Reagent must be specific for antigen to be detected and the serum to be used for grouping should have anti A and B and anti D sera and EDTA.

Specimen: Collection of student/faculty blood samples.

Other materials:

1. 3 No glass slides, plastic sticks blood, Collected from surface of finger tip.
2. To clean the blood collected site with Spirit, allow to dry the skin. It is punctured by a lancet or a short sharp needle. The first drop is shed off because it contains tissue fluid.
3. The collected blood will be mixed with EDTA (ethyle diamine tetra acetic Acid) and placed on their difference glass slides having mark of A, B & D.
4. Add one drop of anti 'A' serum on 'A' mark blood glass slide, one drop & anti 'B' serum on 'B' mark blood slide, one drop of anti 'D' serum on 'D' mark blood glass slide.

INTRODUCTION

- Blood groups were discovered in 1902 by Carl Land Steiner.
- They are of A, B, AB & O Types.
- A, B & AB are detected by the antigens present on RBC.
- O group is without antigens.
- Human blood groups are controlled by the genes located on 9th chromosome.

A, B, O Blood Groups and Their Antigens:

Blood Group	Antigen on RBC	Antibody in Plasma	Genotypes
A	A	Anti -B	OA, AA
B	B	Anti - A	OB, BB
AB	A & B	NIL	AB
O	NIL	Anti – A & Anti - B	OO

A & B Antigens-Agglutinogens:

A and B Antigens occur on the surfaces of the red blood cells of the population they cause blood transfusion reactions. These antigens are inherited.

Major A,B,O blood types depending on the presence or absence of A and B agglutinogens. If both antigens are absent, the blood group is type-O. When only 'A' type antigen is present, the blood group is type-A. When only 'B' type antigen is present blood group is type-B. When both A and B antigens are present, the blood group is type AB.

Relative Frequencies of the Different Blood Types:

The prevalence of different blood types among college students is approximately as follows.

O-group: 47%

A-group: 41%

B-group: 9%

AB-group: 3%

Genetic Determination of Blood Groups:

Two genes one on each of paired chromosomes determine A,B,O blood groups. Type-O gene is functionless. Type O do not cause any significant agglutination. A and B genes cause strong agglutination of the cells. There are six possible combinations of genes viz.OO,OA, OB, AA, BB and AB.

GENOTYPE	PHENOTYPE (BLOOD GROUP)
AA	A
OA	A
BB	B
OB	B
AB	AB
OO	O

Agglutinogens:

Antigens A and B are called agglutinogens.

Agglutinins:

When type-A agglutinogen is not present on RBC, antibodies known anti-A agglutinin develop in the plasma. When type-B agglutinogen is not present on RBC antibodies known as anti-B agglutinin develop in the plasma called isoantobody.

Landsteiner's Law: A given persons blood contain two substances i.e.agglutinogen and agglutinin. Agglutinogen is present on RBC and agglutinins are present in plasma.

Compatibility between Different Blood Groups:

Donor Group	Recipient Group			
	A	B	AB	O
O	-	-	-	-
A	-	+	-	+
B	+	-	-	+
AB	+	+	-	+

Note:

- 1) - = No agglutination

2) + = Agglutination occurs.

Agglutination Reactions in Transfusion Reactions:

Agglutinins Anti-A and Anti-B plasma attach to the RBC because have two binding sites in Ig G, 10 sites in IgM. Single agglutinin can attach to two or more different RBC at the same time. This causes the cells to clump together, which is the process of agglutination.

Rh Blood Types:

In A, B, O system agglutinins are responsible for causing transfusion reaction develop spontaneously. Where as in the Rh system spontaneous agglutinins never occur, the person must first be massively exposed.

Rh Antigens:

Rh+ve and Rh-ve have six common types of Rh antigens each of which is called Rh factor. These types are designated as C,D,E,c,d,e. A person who has a C antigen does not have the c antigens. The same is true for Dd and Ee. Antigen type D is widely prevalent. Anyone who has this type of antigen is said to be Rh+ve. The person who does not have D antigen is said to be Rh-ve. About 85 – 90 % of people are Rh+ve and 10 – 15% are Rh-ve. In India 95% are +ve.

Rh Immune Response:

Are injected into person whose blood does not contain the same factor Anti Rh agglutinins. When RBC contain Rh factor or even protein break down develop slowly. Maximum development will occur within 2 to 4 months to cause agglutination of transfused cells. Thus delayed transfusion reaction occurs, it is usually mild. On subsequent transfusion of Rh+ve blood transfusion reaction really enhanced.

Erythro Blastosis Foetalis:

The mother is Rh-ve the father is Rh+ve due baby inherited Rh+ve antigen from father and the mother has developed Anti-Rh agglutinins from exposure to the babys Rh+ve antigen. The mother agglutinins diffuse through the placenta into the foetus to cause RBC agglutination. 1st Rh+ve child does not develop sufficient Anti Rh agglutinins, however 3% of second +ve child exhibit signs of erythroblastosis foetalis, about 10% of third babies exhibit the disease.

Agglutinated blood cells hemolyse releasing heamoglobin in to the blood. Macrophases convert haemoglobin in to bilirubin, causes skin yellow. The antibodies also attack other cells of the body. The liver and spleen become enlarged. Severe anaemia of erythroblastosis foetalis is usually the cause of death. Who barely survive the anaemia exhibit

permanent mental impairment or damage to motor areas of the brain because of precipitation of bilirubin in the neuronal cells, causing their destruction, a condition called “Kernicterun”.



REPORT OF BZC&DAIRYSCIENCE BLOOD GROUPS:

1	20033051445001	B.PAVAN	B+
2	20033051445002	GAJJE KRISHNA	B+
3	20033051445003	GAJJE PRAVEEN	O+
4	20033051445004	K.SANTHOSH	O+
5	20033051445005	M.ARUNA	A+
6	20033051445007	P.DIVYA	B+
7	20033051445008	P.VAMSHI	A+
8	20033051445009	R.SWAPNA	O+
9	20033051445010	R.LAXMAN SINGH	O+
10	20033051445011	S.ARUN	AB+
11	20033051445012	T.KAVITHA	O+
12	20033051445013	T.VARALAXMI	O+
13	20033051445014	V.SRILATHA	B+
14	20033051909001	B.BHARATH	B+
15	20033051909002	B. UMADEVI	A+
16	20033051909003	B. VENKATA RAMANA	B+
17	20033051909004	C. BALAKRISHNA	O+
18	20033051909005	CH. LAVA KUMAR	O+
19	20033051909006	C. VARALAXMI	O+
20	20033051909007	D. VAMSHI	A+
21	20033051909008	G.ANJAMMA	O+
22	20033051909010	G. HARICHANDRA PRASAD	B+
23	20033051909013	I. SANDESH	B+
24	20033051909014	K.ARJUN RAO	A+
25	20033051909015	K. MAHENDER	O+
26	20033051909017	K. AMARNATH	O+
27	20033051909018	K. SRINU	A+
28	20033051909020	K. NAGA RAJU	A+
29	20033051909021	K. HANMANTHU	O+
30	20033051909022	K.SANDEEP	B+
31	20033051909023	M. ANUSHA	B+
32	20033051909024	M. MURALIDHAR	A+
33	20033051909025	M. SHIVA KUAMR	AB+
34	20033051909027	MD. NIYAMATH RASOOL	B+
35	20033051909028	M. NAGARAJU	O+
36	20033051909030	M. RAHUL	A+
37	20033051909032	M. SRINU	O+
38	20033051909034	N. SAI PALLAVI	O+
39	20033051909035	N. HIMA BINDHU	A+

40	20033051909036	N. JAYA SRI	B+
41	20033051909037	N. THULASHI RAM	B+
42	20033051909038	P. VAMSHI	O+
43	20033051909039	R. RAMESH	A+
44	20033051909041	S.PRIYANKA	O+
45	20033051909042	V. KRISHNA	A+
46	20033051909045	V. SHIVA	A+
47	20033051909046	V. SURESH	B+

**PERCENTAGE IDENTIFICATION BLOOD GROUPS IN BSC LIFE SCIENCE
1YEAR STUDENTS:**

S. No	Blood Group	Number	Percentage
1	A	12	25 %
2	B	15	32%
3	AB	2	0.4%
4	O	18	38 %
Total		47	100%

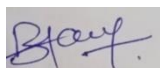
1) A Text book of Medical Physiology - Sembulingam and Premasembulingam

2) A Text book of Genetics - VeerabalaRastogi

3) A Text book of Genetics - P.K. Gupta

A Text book of Genetics - Dr. R.P.Meyyan

By




PRINCIPAL
Santhi Govt Degree College
MANDANAHOLE-506 401