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The Amount of Organic Phosphates (Like DPG) Existing In Blood Is Determinative Factor of Mammals' Bulk

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Abstract: It is essential that oxygen is transported through the blood to all cells of a mammal at any moment. This ensures survival of all cells in a mammal's body. In case a mammal's bulk is large, the distance between cells in different tissues and the mammals' heart is farther. Therefore, red blood cells in bulky mammals' bodies should be capable of conveying oxygen to farther distances. To make it practical, oxygen should be glued to red blood cells tenaciously. In other words, the cohesion of oxygen to red blood cells should be stronger in bulky than in small mammals. In mammals' bodies, the controlling factor of the amount of cohesion of oxygen to red blood cells, are organic phosphates (like DPG). The less DPG in red blood cells of a mammal, the more cohesion of oxygen to red blood cells at the same rate. If oxygen is glued more tenaciously to red blood cells, then it is being carried to farther distance allowing mammals to have larger bulk at the same rate. The amount of organic phosphates (eg. DPG) of red blood cells decreases respectively due to the size from mouse, rat, cat, fox, sheep, horse, to elephant.

Key words: mammals' size, Animals size, Organic phosphates, DPG, Red blood cell, Metabolism

1. Introduction

Mammals are found in different sizes in nature. Most of scientists believe that environmental circumstances and mammals' living style determine their body size. So scientists haven't been looking forward to find a physiological factor for this size difference among mammals. But my research on animals and plants size has specified that there is a direct relationship between animals/plants size and blood/fluid circulatory system.[1][2][3][4][5].

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2. Mammal Species/Oxygen Pressure in Blood

The oxygen molecules enter into the blood from lungs and stick to red cells. After moving a distance they reach the tissues and get separated from red cells and then the cell uses it. How the oxygen molecules combine with hemoglobin and stick to red cells? What causes the oxygen molecules to get separated from the hemoglobin in tissues? And the most important point is that, what causes the oxygen molecules to get separated from red cells sooner or later?

The transfer of oxygen to blood is done by circulation. So the reason is the oxygen's thickness or pressure. The oxygen's pressure in lungs is more than the lung's capillaries. So the oxygen enters into the blood from the lungs. These oxygen molecules are mixed with hemoglobin in red cells, then move to the heart and afterwards, move to tissues. When these molecules reach near tissues, they get separated from red cells because of paucity of oxygen pressure.[6] But this separation is different among the mammals' species. Most of oxygen molecules are separated from red cell's hemoglobin in mouse's body in 45 mmHg. But this happens in 22.5 mmHg in elephant's body. (Fig. 1).

3. The Organic Phosphate/The Combination of Oxygen and Hemoglobin

It means that the oxygen molecules combine with hemoglobin very weakly in mouse's body. Getting a little far from the lungs, the oxygen's thickness gets weaker and so they get separated from the hemoglobin and so red cells can not move to longer distances.

But in elephant's body stickiness is stronger between oxygen and hemoglobin; the oxygen's pressure gets lower by getting far from the lungs. But most of oxygen molecules still stick to the hemoglobin's and move to the farther tissues. On the other hand, the mouse's tissues can not be far from the lungs and heart because the oxygen can not move a long distance but it is different in whale and elephant's body because they are sure that all their tissues will receive oxygen. Now we have the question, why we are witnesses of this difference in stickiness among the mammals? To say it simply, why the combination of oxygen molecules and hemoglobin is stronger in elephant's blood than the mouse's?

The answer to the question is related to the organic phosphates (like DPG) which exists in mammal's blood. The more organic phosphate, the less the stickiness between oxygen and hemoglobin, such as the hemoglobin of mouse. On the contrary, the less these organic phosphates, the more the stickiness power, like in the elephants body.[8]

Simply, organic phosphates make the stickiness between the oxygen molecules and hemoglobin weaker, so there is a reverse relationship between the amount of organic phosphate and the stickiness power. The less the amount of organic phosphates, the larger the size of mammals.

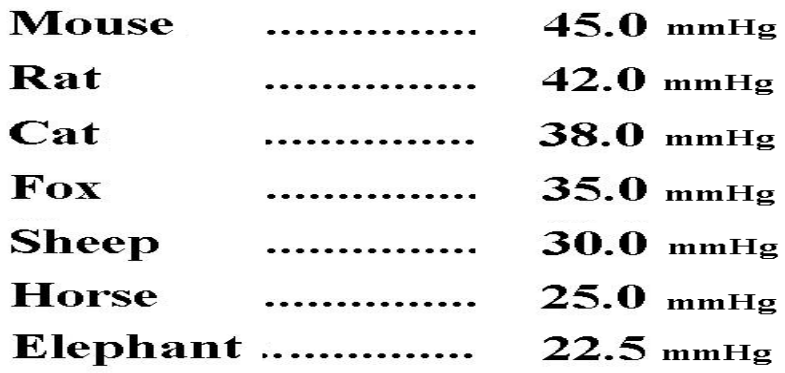


Fig. 1 The mammal species and the oxygen pressure in which the red cell's hemoglobin sends most of it's oxygen to tissues [7]. In elephant's body stickiness is stronger between oxygen and hemoglobin, the oxygen's pressure gets lower by getting far from the lungs. But most of oxygen molecules still stick to the hemoglobin's and move to the farther tissues. But the mouse's tissues can not be far from the lungs and heart because the oxygen can not move a long distance.

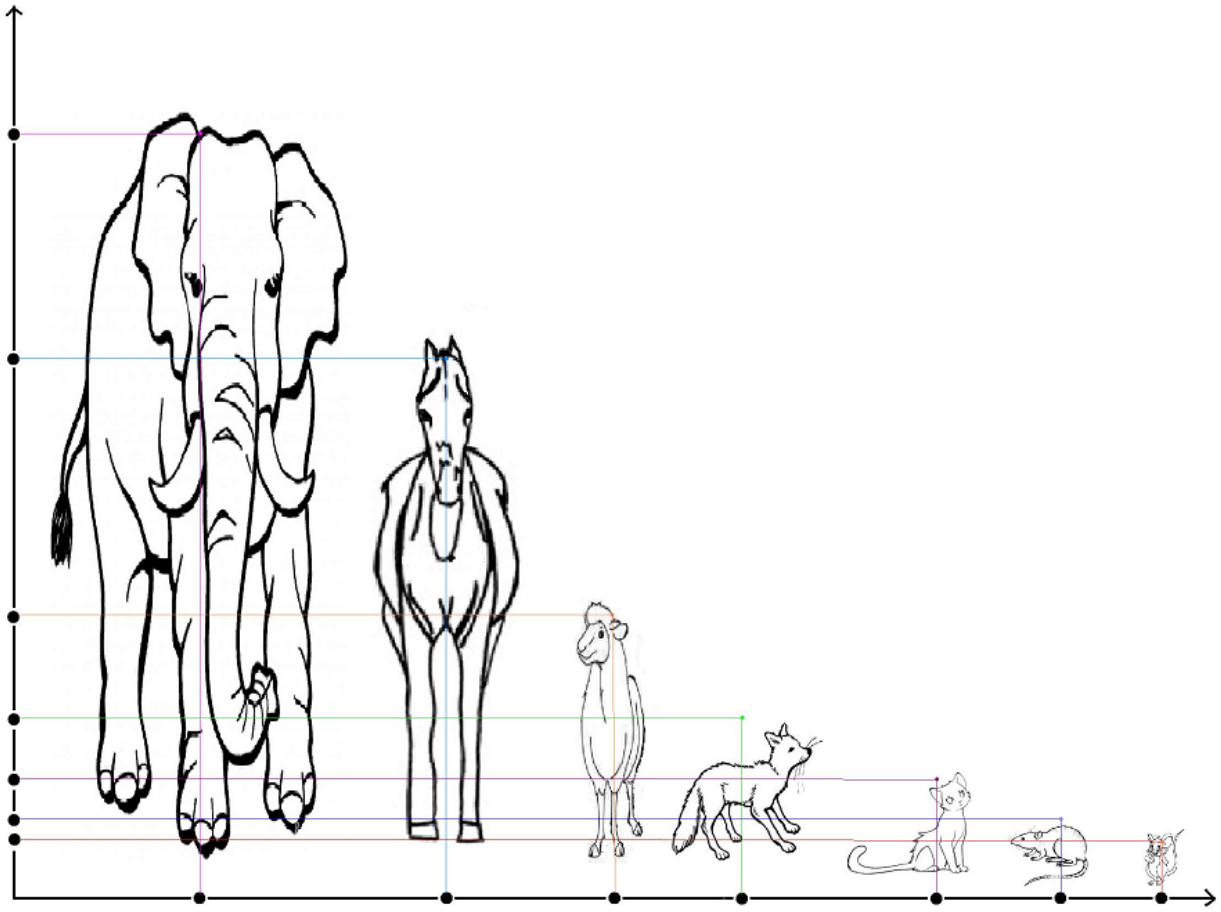


Fig. 2 “Y” axis represents body size of mammals. “X” axis represents the amount of organic phosphates (like DPG) existing in blood. Organic phosphates make the stickiness between the oxygen molecules and hemoglobin weaker, so there is a reverse relationship between the amount of organic phosphate and the stickiness power. The less the amount of organic phosphates, the larger the size of mammals.

4. Conclusion

Physiological factor of amount controlling a mammal’s bulk is the amount of organic phosphates (like DPG) existing in red blood cells of mammals. Organic phosphates make the stickiness between the oxygen molecules and hemoglobin weaker, so there is a reverse relationship between the amount of organic phosphate and the stickiness power. The less the amount of organic phosphates, the larger the size of mammals. (Fig. 2).

5. Scientific Application of this Science

We can use this science in applied sciences (like husbandry and nurturing domestic animals) and maximize or miniaturize body size (bulk) of domestic animals due to necessities of poulterers. Of course human has done this work previously unconsciously on domestic dogs. Human has created dogs in different sizes artificially without any awareness of mechanism of this action. (Figs. 3a, 3b) (Figs. 4a, 4b)

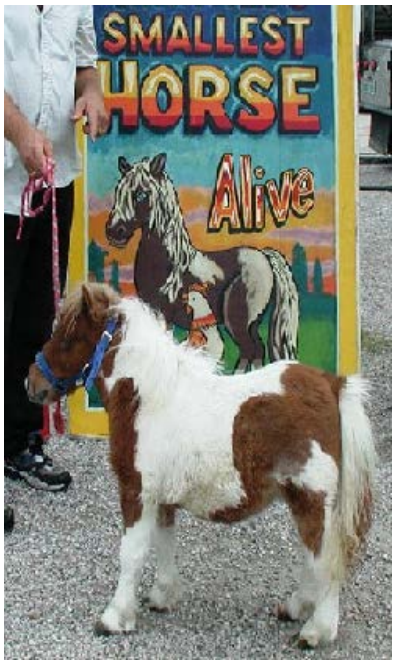
By the help of this science we will be able to create domestic animals in desired size consciously and open-eyed. (Figs. 5a, 5b) (Figs. 6a, 6b).

3a

3b

Fig. 3 Amount of DPG in the blood is low, therefore dog is large; (a) Amount of DPG in the blood is high, therefore dog is small; (b)

4a



4b

Fig. 4 Amount of DPG in the blood is low, therefore horse is large; (a) Amount of DPG in the blood is high, therefore horse is small; (b)

5a 5b

Fig. 5 Amount of DPG in sheep's blood is high, therefore sheep is small; (a) If amount of DPG decreases in sheep's blood, therefore sheep will be larger; (b)

6a 6b

Fig. 6 Amount of DPG in cow's blood is low, therefore cow is large; (a) If amount of DPG increases in cow's blood, therefore cow will be smaller; (b)

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