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Alternation in clotting time in blood of *Felis domesticus* and *Funambulus palmarum* with reference to natural and artificial diet

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Abstract: The present study deals with an experiment on the alteration in clotting time of the blood which shows that when the animals (*Felis domesticus*, a carnivore and *Funambulus palmarum*, a herbivore) were fed with artificial diet that contains food preservatives (BHA), artificial dyes (food colourant-Red Led, Copper Arsenite), food additives (Melatonin), showed a significant (P<0.05) decrease in clotting time in the blood of both mammals, *Felis domesticus* and *fumambulus palmarum* during summer, rainy and winter seasons.

Keywords: *Felis domesticus* • *Funambulus palmarum* • artificial diet • natural diet • red led • copper arsenite

Introduction

Present study deals with an experiment on modification of clots tissue in the blood of a mammalion carnivorous *Felis domesticus* and herbivore *Funambulus palmarum*. It was found that a significant decrease (P< 0.05) in clotting time of blood of *Felis domesticus* and *Funambulus palmarum* was recorded in summer, rainy and winter season under artificial diet.

The phenomenon of Coagulation is of enormous physiological importance. Its purpose is to stop further hemorrhage. Under normal circumstances there is no clotting as thrombin the main elements responsible for clotting is present in inactive form Prothrombin. But when the blood is shed Thromboplatin comes into action and helps in production of Thrombin which causes to make fibrin (clot). Various blood parameters are stududies in past on *Felis domesticus* and herbivore *Funambulus palmarum* with comparison on the bases of natural and artificial diet (Agarwal, 2015, 2016). Present study is pointed on clotting times which is a important for life saving.

Materials and Methods

In the present investigation two which mammals namely *Felis domesticus* (a carnivore) and *Funambulus palmarum* (a herbivore) were selected as experimental animals. Both selected mammals may prove to be good experimental objects to denote the variations in the blood composition.

As twenty *Felis domesticus* (cat) with an average starting weight of 2.8 kg and *Funambulus palmarum* (Squirrel) with an average starting weight 95 g were selected for the laboratory stock. Both the mammals were allowed to acclimatized to the laboratory condition for 10 days. During

acclimatization, the *Felis domesticus* and *Funambulus palmarum* fed with natural diet. *Felis domesticus* (domestic cat) was fed with a diet of kill birds, mice, grasshoppers. *Funambulus palmarum* was fed with a diet of fruit, nut, insect, birds egg and buds Both group of mammals were housed in two group of 10 separately.

Second group of *Felis domesticus* was transported to laboratory. *Felis domesticus* was fed with a diet of cat food (Premium cat food of PETCO) mixed with 3% BHA (food preservative) and 2% artificial dyes (food colourant – Red Led, Copper Arsenite). The second group of *Funambulus palmarum* were also transported to laboratory and fed with a mixed diet of ground nut water adlibitum, 3% BHA (food preservative) and 2% artificial dyes (food colourant- Red Led, Copper Arsenite). The mammals were given 2-3 days acclimation period before taking blood for haematological and biological studies, each animal of both mammals was weighted to nearest gram.

For the determination of coagulation time we used capillary tube. The tip of capillary tube (about 100mm in length & 1mm in diameter) placed directly on the oozing blood from the ventricle or from the vein. The time of its filling will be noted. now the tube will be broken from the tip at regular intervals (one or two minutes or more) when the fibrin strands appear between the broken ends, the time will be noted. The period between the appearance of blood in the finger and the formation of this thread is taken as the coagulation time. The average time by this method is 3-4 minute. This experiment was be repeated several time to get the mean values.

Results

It was observed that under natural diet in case of *Felis domesticus,* the time of coagulation in the blood was 148.50 in summer, 155.00 in rainy season and 145.50 in winter season. In *Funambulus palmarum*, the time of coagulation in blood was 128.00 in summer, 132.50 in rainy season and 125.50 in winter season under natural diet.

Present investigation reveals a significant decrease in clotting time in the blood in *Felis domesticus* was 130.00 in summer, 140.00 in rainy season and 128.50 in winter season under artificial diet. In *Funambulus palmarum*, the clotting time in the blood was 118.50 in summer, 120.00 in rainy seasons and 115.50 in winter season under artificial diet (Table 1).

Table 1 Alteration in the Clotting Time (%) in the blood of *Felis domesticus* and *Funambulus palmarum* under natural and artificial diet during summer, rainy and winter seasons.

S. No.	Mammals	Summer		Rainy		Winter	
		ND	AD	ND	AD	ND	AD
1	*Felis domesticus*	148.50 ± 1.20	130.00 ± 1.115	155.00 ± 1.10	140.00 ± 1.25	145.50 ± 1.00	128.50 ± 0.90
2	*Funambulus palmarum*	128.00 ± 0.75	118.50 ± 0.85	132.50 ± 0.80	120.00 ± 0.88	125.50 ± 0.60	115.50 ± 0.90

Values given in the table are the mean of 9 observations each.
Values are significant at <0.05.
ND= Natural Diet, AD= Artificial Diet

After artificial feeding there was a significant decrease in clotting time in the blood in *Felis domesticus* and *Funambulus palmarum* in three seasons (summer, rainy and winter seasons) (Fig. 1 & 2). After artificial feeding there was a significant decrease in clotting time in the blood in *Felis domesticus* was -12.45% in summer, -9.67% in rainy season and -11.68% in winter seasons. Similarly in *Funambulus palmarum* the decreasing in clotting time in the blood was -7.43% in summer -9.43% in rainy seasons and -7.96% in winter season under artificial diet (Table 2).

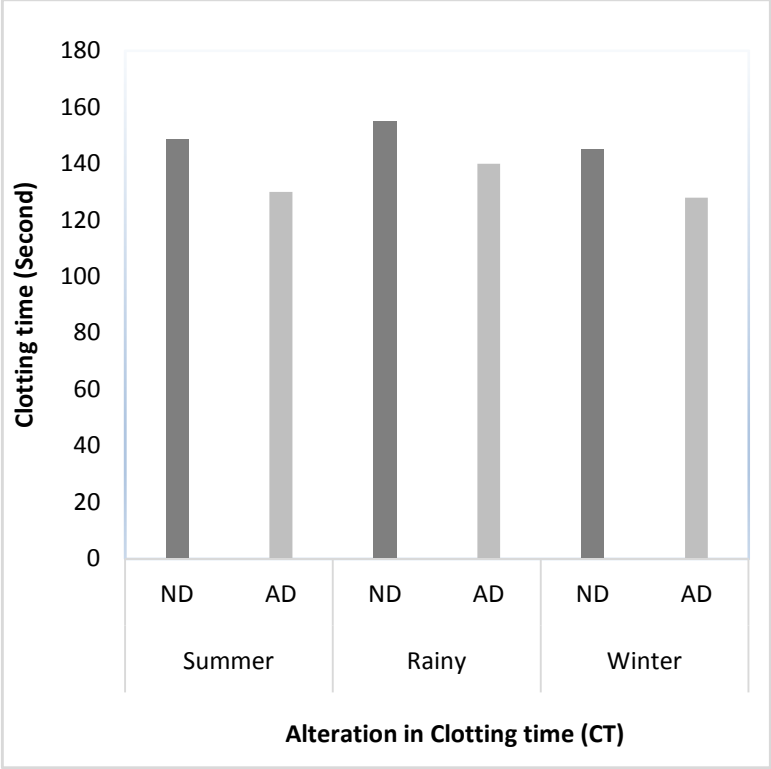

Figure 1 In *Felisdomesticus* under artificial diet during summer, rainy and winter seasons. Index # ND= Natural Diet; # AD= Artificial Diet

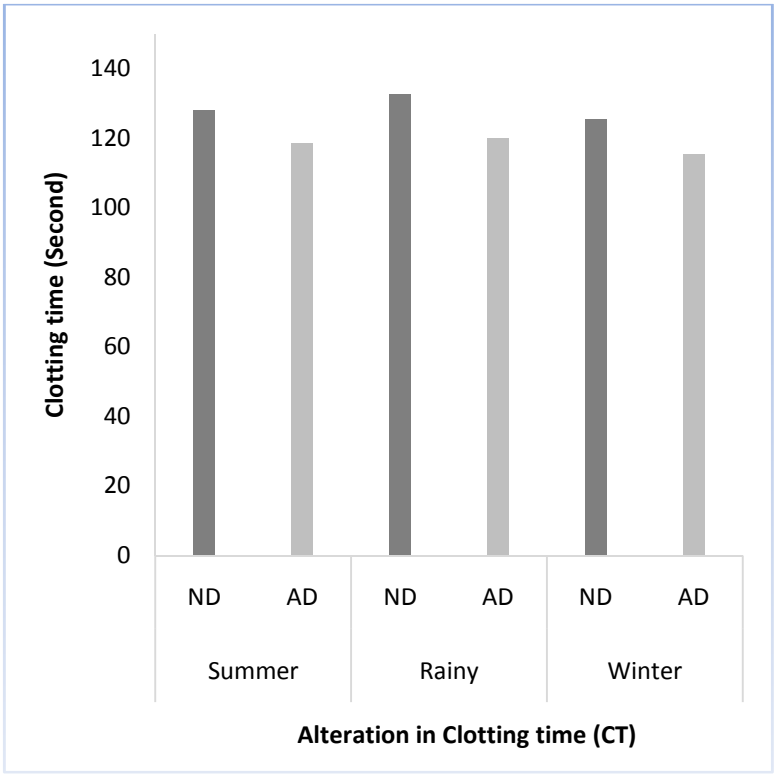

Figure 2 In *Funambuluspalmarum* under artificial diet during summer, rainy and winter seasons Index # ND= Natural Diet; # AD= Artificial Diet

Table 2 Percentage alteration in the Clotting Time in the blood of *Felis domesticus* and *Funambulus palmarum* under artificial diet during summer, rainy and winter seasons.

S. No.	Mammals	Summer	Rainy	Winter
1.	*Felis domesticus*	-12.45%	-9.67%	-11.68%
2.	*Funambulus palmarum*	-7.43%	-9.43%	-7.96%

Discussion

The present investigation shows a significant ($P < 0.05$) decrease in clotting time in the blood of *Felis domesticus and Funambulus palmarum under* artificial diet during summer, rainy and winter seasons.

The decrease in clotting time suggesting hyper coagulability have been reported by Srivastava and Agrawal (1979) in *Colisa fasciatus* acutely exposed to cobalt. Doo little and Surgenor (1962) studied the role of thrombocyte in the mechanism of blood coagulation of fish as in other vertebrate. Srivastava and Mishra (1979) observed hyper coagulation in the blood of cadmium exposed to *Colisa fasciatus*. Lindane. Rautela and Joshi (1987) observed decrease in clotting time in female birds. Higher mean value of clotting time in the female white leg harn than male was equally conspicuous. Almost similar value of clotting time have been reported in male and female *Calandrella brachydactyla* (Banerjee and Yadav, 1976). Van Den and Punt (2000) studied on regulation and expression of the Aspergillus niger benzoate-Para-hydroxylase cytochrome, *Felis domesticus and Funambulus palmarum* (Cat), normal haematology with comments on response to disease (Jain, 1986). A single gene from the food spoilage yeast zygosaccharomyces bacilli, heterologously expressed in *Saccharomyces cerevisiae* cells, can enable growth of the latter on benzoate, sorbate and phenylalanine (Deak, 1991).

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