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# Incidence of Strongyle infection in cattle and pig with relevance to rainfall in Meghalaya

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# Incidence of Strongyle infection in cattle and pig with relevance to rainfall in Meghalaya

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## Abstract

A Study was conducted to know the effect of meteorological parameters on strongyle infection in cattle and pig in Meghalaya. Faecal samples, collected from three Govt. farms during years 2001 – 2002, were screened for the presence of strongyle parasitic egg. Incidence of strongle infection in relation to meteorological parameters was done by regression analysis. Occurrence of strongyle infection is 50 per cent dependent on rainfall in Meghalaya. One per cent increase in rainfall predict 0.03 per cent increase in strongyle infection. Minimum and maximum temperature contributed only 20 per cent for the occurrence of the disease. Proper control measures should be undertaken during monsoon season. As strongyle infestation is positively correlated with level of precipitation, anthelmintic coverage should be done during seasonal and occasional off-season precipitation period.

## Introduction

Eradication of helminthes infections is impractical. The aim of any parasite control programme must therefore be ensured that parasite populations do not exceed levels compatible with economic production**.** The parasitological monitoring (e.g. faecal egg counts or pasture sampling) at intervals, forecasting on the basis of meteorological data and computer simulation provide an alternate approach to control parasitic infection in a given geographical area (Brunsdon, 1980)

The most common gastrointestinal parasite prevalent throughout the year in Meghalaya, India is Strongyle infection. This is because of the high rainfall and humidity prevalent in the North Eastern region.

As the prevalence of this infection is mainly dependent on rainfall and humidity, study is being initiated to identify the relationship between rainfall and strongyle infection. The study would be also helpful in predicting/forecasting the disease occurrence based on the prevailing pattern of rainfall in a particular location.

## Methods

A total of 303 cattle and 253 pig faecal samples were collected from Govt. livestock farms located at Kyrdemkulai, Upper Shillong and Jowai in Meghalaya during the year 2001 and 2002. Meteorological data were collected from Govt. Meteorological department of Shillong. Samples were collected in the early morning and were processed and examined using standard parasitological procedures viz. sedimentation technique and salt floatation technique. The egg per gram of faeces (epg) were counted using stoll egg counting method (Anonymous, 1986).

## Results Discussion

The incidence of strongyle infection in different areas of Meghalaya and the Meteorological parameters are presented in Table 1. Rainfall and egg per gram of faeces (epg) of strongyle infection has shown a linear and positive relationship. Rainfall contributed maximum effect on parasitic infection as compared to maximum and minimum temperature (Fig 1,2 and 3). Rainfall contributed more than 50 per cent for the occurrence of the parasitic infection in cattle and pig but maximum and minimum environmental temperature contributed above 25 percent for the occurrence of strongyle infection in animals (Table 2). Regression analysis between strongyle infection and rainfall showed that 1 percent increase in rainfall predict 0.03 percent increase in strongyle infection. Similar relationship between the frequency of spring rainfall and severity of *Fasciola hepatica* infection in sheep and cattle also observed (Pitois and Leimbacher, 1973)

The predicted strongyle infection was calculated using the equation depicted in the regression analysis (Fig 1) which showed a higher strongyle infection than the observed infection ( Fig 2). This might be due to anthelmintic treatment and other control measures taken by the Govt. farm for preventing the parasitic infection. This might also be due to the fact that 50 percent of strongyle infection is dependent on rainfall. The same prediction between environmental temperature and development of parasites on pasture

was reported using Stochastic Development Fraction Model (SDFM) (Onyiah LC, 1985).

Finally the multiple regression of disease infected with all the above-mentioned parameters were analysed. The coefficient of multiple determination ( $R^2$) explained more when we include temperature (max, min) and rainfall together as compared to single multiple regression of individual factor like rainfall, maximum temperature and minimum temperature. Interestingly, except rainfall, all other factors are statistically insignificant both at 5 per cent and 10 per cent probability level, whereas, the coefficient of rainfall is significant at 1 per cent probability level. From the above discussion it may be concluded that the occurrence of the strongyle infection can mainly be predicted through rainfall instead of temperature.

# References

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development of the nematode parasite of sheep, Haemonchus contortus from egg to infective larvae under the influence of temperature. J –Therm Biol 1985; 10: 191-97.

# Illustrations

## Illustration 1

Table 1 : Egg per gram of faeces (epg) of strongyle parasite and meteorological parameters in Govt.

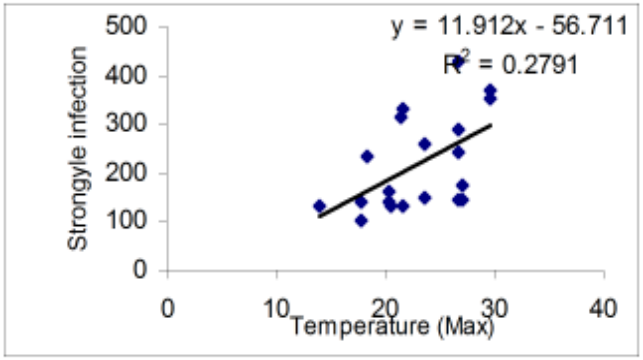
**Table 1. Monthly Egg per gram of faeces (epg) of strongyle infection and meteorological parameters in Govt pig and cattle Farms in Meghalaya during 2001 – 02**

| Areas | Animals | Months | | Meteorological data | | |
|---|---|---|---|---|---|---|
| | | | ***Strongyle sp.*** | **Temp. ( $^{O}$C) (Max)** | **Temp. ( $^{O}$C) (Min)** | **Rainfall ( $^{O}$C) (mm)** |
| Jowai | Pig | Apr-Jun | 240 | 26.72 | 18.9 | 341.4 |
| Kyrdemkulai | | Jul-Sept. | 426.66 | 26.67 | 20.09 | 693.4 |
| | | Oct – Dec. | 330 | 21.59 | 14.2 | 91.5 |
| | | Jan - Mar | 140 | 17.8 | 10.36 | 28 |
| | | Apr. – Jun | 175 | 27.12 | 20.81 | 116 |
| | | Jul-Sept. | 370 | 29.55 | 23.63 | 417.7 |
| | | Oct – Dec. | 260 | 23.65 | 17.89 | 63.3 |
| | | Jan - Mar | 140 | 20.42 | 12.89 | 73.7 |
| Jowai | Cattle | Apr-Jun | 142.85 | 26.72 | 18.9 | 341.4 |
| Kyrdemkulai | | Jul-Sept. | 287.5 | 26.67 | 20.09 | 693.4 |
| | | Oct – Dec. | 133.33 | 21.59 | 14.2 | 91.5 |
| Upper | | Jan - Mar | 100 | 17.8 | 10.36 | 28 |

# Illustration 2

Table 2. Statistical analysis of parasitic infection and meteorological parameters

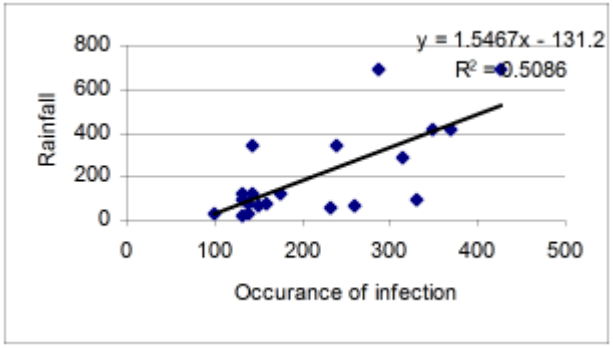
**Fig 2. Relationship between maximum temperature and occurrence of Strongyle Infection**



# Illustration 3

Fig 1. Relationship between rainfall and occurrence of Strongyle infection in Meghalaya during 2001

**Fig 1. Relationship between rainfall and occurrence of Strongyle infection in Meghalaya during 2001 – 02**



# Illustration 4

Fig 2. Relationship between maximum temperature and occurrence of Strongyle infection

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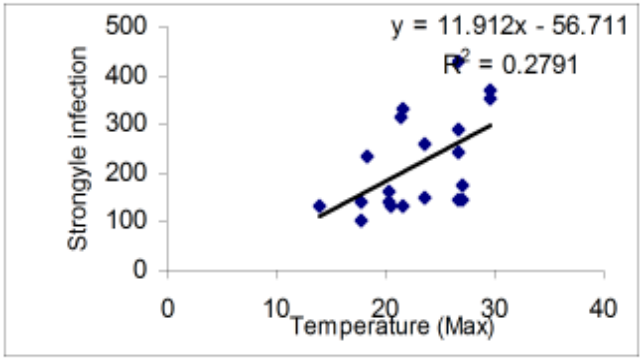
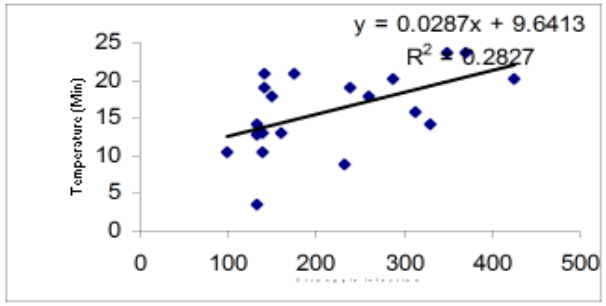


# Illustration 5

Fig 3. Relationship between minimum Temperature and occurrence of Strongyle infection

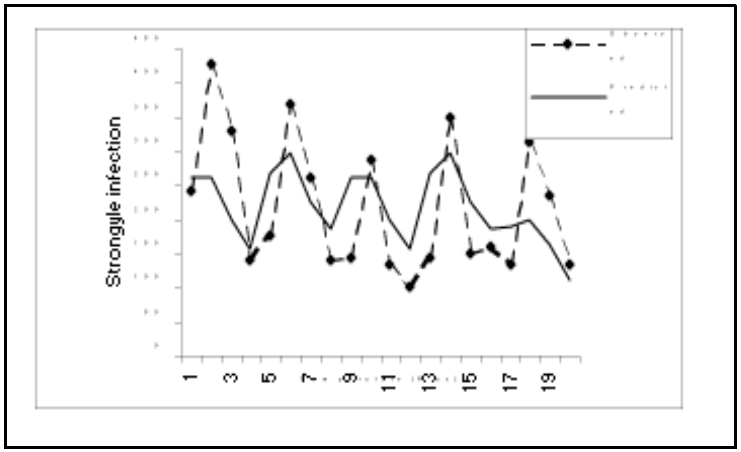
**Fig 3. Relationship between minimum Temperature and occurrence of Strongyle infection**



# Illustration 6

Fig 4. Predicted Strongyle infection depending on maximum temperature

**Fig 4. Predicted Strongyle infection depending on maximum temperature**



# Illustration 7

Fig 5. Predicted and observed Strongyle infection in relation to minimum temperature

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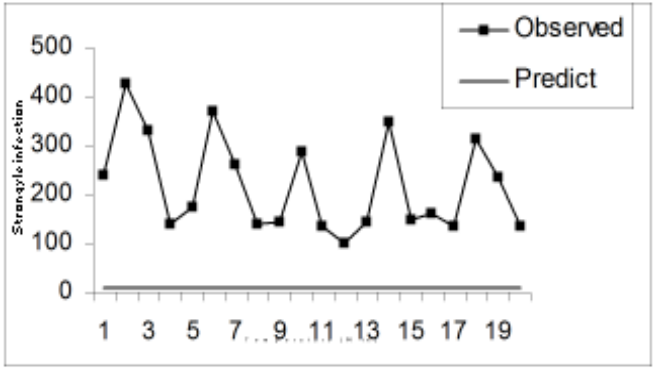
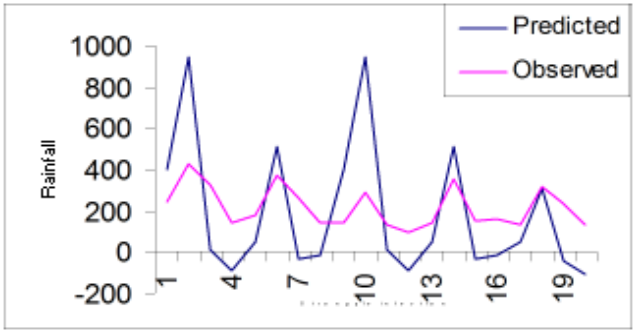


# Illustration 8

Fig 6. Predicted and observed Strongyle infection in relation to rainfall

**Fig 6. Predicted and observed Strongyle infection in relation to rainfall**



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