LATITUDE PREDICTS SPECIES RICHNESS IN FOREST RED MILLIPEDES *CENTROBOLUS* COOK, 1897

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Abstract: Latitude, latitudinal species richness, and precipitation were tested for a relationship in red millipedes, *Centrobolus,* using Multivariate Statistical Analysis. Results of the multiple linear regression indicated that there was a powerful collective significant effect between the latitude, precipitation, and latitudinal species richness ($F(1, 38) = 567.87$, $p < 0.001$, $R^2 = 0.94$, $R^2adj = 0.94$). Latitude (and not precipitation) predicted latitudinal species richness best.

Keywords: ocean, temperature, Red Millipedes, species.

I. INTRODUCTION

Red millipedes are found in the southern African subregion, with northern limits on the east coast being about -17° latitude S and southern limits being -35° latitude S. They are well represented in the littoral forests of the eastern half of the subcontinent. It consists of taxonomically important species, with 12 species considered threatened, and includes nine vulnerable and three endangered species. It occurs in all the forests of the coastal belt from the Cape Peninsula to Beira in Mozambique. These worm-like millipedes have female-biased sexual size dimorphism.

Here, latitude, latitudinal species richness, and precipitation are tested for a relationship in *Centrobolus*.

II. MATERIALS AND METHODS

Latitude, precipitation, and latitudinal species richness measurements for 40 species of southern African *Centrobolus* were checked for a correlation at https://www.statskingdom.com/410multi_linear_regression.html.

III. RESULTS

Results of the multiple linear regression indicated that there was a very strong collective significant effect between the latitude, precipitation, and latitudinal species richness ($F(1, 38) = 567.87$, $p < .001$, $R^2 = 0.94$, $R^2adj = 0.94$). Average latitude was -29.9111 degrees South. Average species richness was 10.4 species per unit latitude (3.733425 degrees). Latitude predicted latitudinal species richness, ($R^2 = 0.94$, $F(1,38) = 567.87$, $p < 0.001$) ($\beta = -0.94$, $p < 0.001$, $\alpha = -17.8$, $p < 0.001$) (Figure 1).
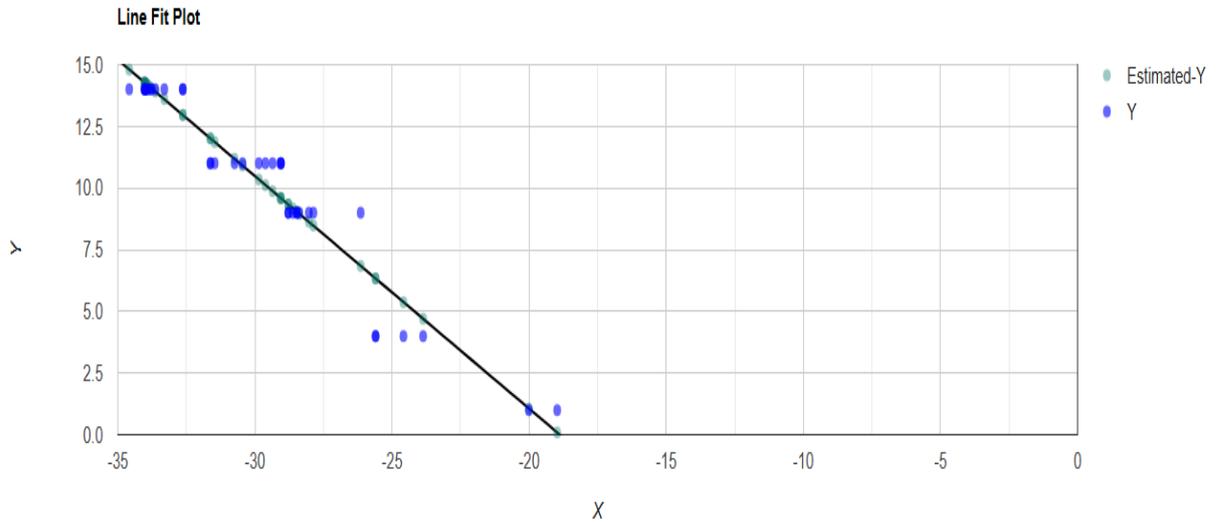
Fig. 1. Latitude regressed with latitudinal species richness in forest red millipedes, *Centrobolus* Cook, 1897.

IV.   DISCUSSION

Results of the multiple linear regression indicated a very strong, significant collective effect of latitude, precipitation, and latitudinal species richness in *Centrobolus*. Correlations between the pairs of the three factors failed to find these relationships among the 40 species in this genus. Latitude (and not precipitation) predicted latitudinal species richness best. Although precipitation is not a good predictor of latitudinal species richness, the highest number of rainy days per month can predict latitudinal species richness.