Practical 5: Poisson Regression Models

The data to be used in this practical are taken from an experiment to assess the effectiveness of insect sprays. The data are the counts of insects in agricultural experimental units treated with 6 different insecticides (labelled A – F).

Attach the data file: `attach(InsectSprays)`
View the variables: `names(InsectSprays)`
View the data: `InsectSprays`

1. Why might a Poisson regression model be appropriate to analyse these data?

2. Preliminary/exploratory analyses: Obtain a box-plot of the counts versus insecticide. Interpret this plot.
```
boxplot(count~spray)
```

3. What type of predictor should spray be? Fit a GLM to insect counts with spray as a predictor.

```
glm1<-glm(count~spray,family=poisson
(link=log))
summary(glm1)
```

4. What is the reduction in deviance for the fitted model? Test whether the reduction in deviance equals zero. What do you conclude?

5. Formally specify the generalized linear model you have fitted.

6. What is the interpretation of the intercept term?

7. What is the interpretation of the estimated effect for spray B? Is the effect significant?

8. Which spray appears to be the most effective?

9. Consider the residual deviance for the model. Comment on the fit of the model.