Solution to Exercise 2.2 (Version 1, 16/09/14)

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Exercise 2.2

Obtain a histogram of the beetle widths (mm) given in Table 2.1 (and variate *Width* in file WILLOW.DAT). Do these data seem consistent with a normal distribution, as asserted in Example 2.3b?

Solution 2.2

A histogram of the beetle widths (as relative frequencies) is shown in Figure S2.2.1.
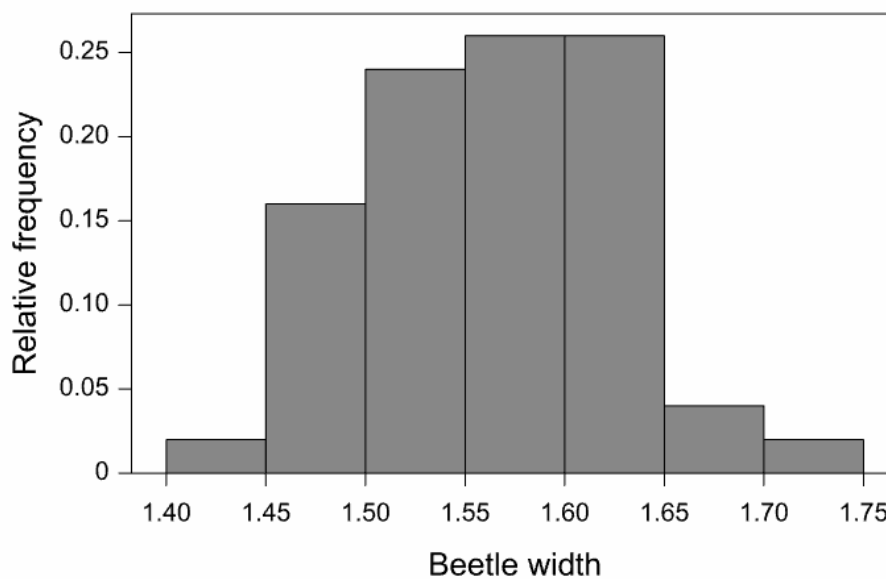

Figure S2.2.1. Histogram of relative frequencies for widths (mm) of a sample of 50 willow beetles.

The histogram of widths appears slightly asymmetric with wider beetles being less prevalent than narrower ones. The distribution does have a central peak without very long tails and appears reasonably consistent with a normal distribution. In addition, the mean width (1.585 mm) is quite close to the median width (1.60 mm) as would be expected for a normal (or any other symmetric) distribution.

We might be slightly suspicious of the apparent asymmetry in the distribution but be willing to take the assumption of a normal distribution as a reasonable working hypothesis.

Additional information

This conclusion is supported by a boxplot of the data (as introduced in the solution to Exercise 2.1) shown in Figure S2.2.2 below. Although the lower tail (corresponding to the narrower beetles) is longer, the median is situated midway between the upper and lower quartiles.
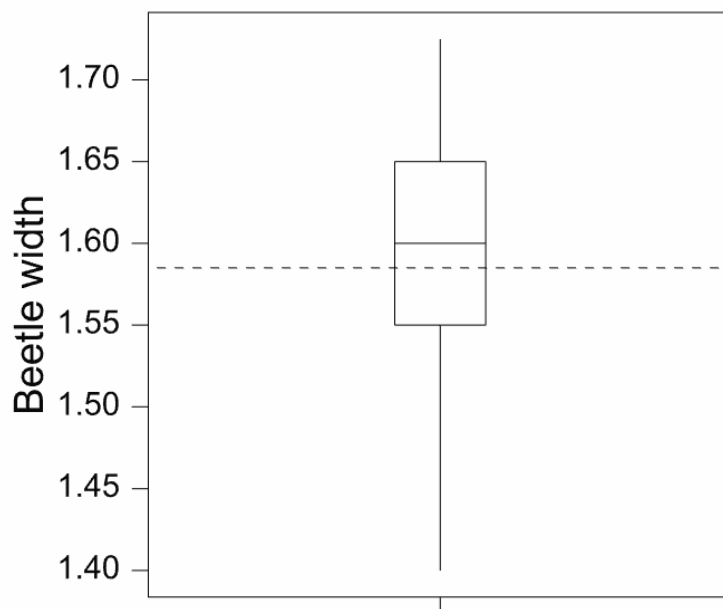

Figure S2.2.2. Box-and-whisker plot for widths (mm) of a sample of 50 willow beetles.