**R SOFTWARE UTILIZED FOR STATISTICAL ANALYSIS OF DIETARY FIBER DETERMINATION OF NANOCRYSTALS AND ANALYTICAL SIGNIFICANCE OF SHAPIRO-WiIK TEST.**

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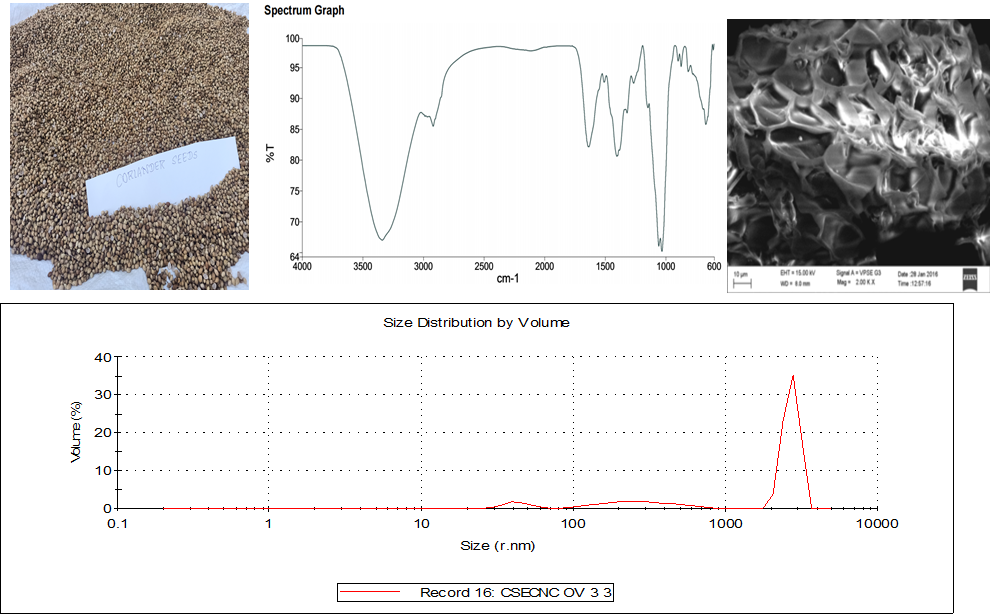
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**ABSTRACT**

The potential use of agro based nutraceuticals of Coriander sativum seed synthesised enzymatically to obtained a nanocrystals. The potential use of agro based nutraceuticals nanomaterials for drug delivery, nanofillers, as agro-foods and biomedical applications. The raw materials of agro based nutraceutical principal active component of coriander seed fabrication of amorphous nanocrystal powder obtained by processing under optimized condition. Statistical data done by using ‘R software Packages CRAN. R software is an integrated suite for calculation, data analysis, graphical display functions of input and output operators ;user -defined functions with simple and effective programming language. The normality distribution done using Shapiro-wilk test.

Keywords: R software, nanocrystals, nutraceuticals, shapiro-wilk test.



Graphical Abstract

**INTRODUCTION**

New Statistical Procedure for testing a complete sample for Normality. (Shapiro and wilk 1965) test statistic obtained by dividing the square of an appropriate linear combination of the sample order statistics by the usual symmetric estimate of variance. The W test for normality indication of Probability plots. In a Probability plot the regression of the observations on the expected values of order statistics from a Standardized of the hypothesized distribution plot tending to be linear if the hypothesis is true (Shapiro and wilk 1965).

To perform a shapiro-wilk test on a dataset with sample size n=100 in which the Poisson distribution values were obtained. Shapiro – Wilk’s test is a normality test. Suppose a sample attained a1, a2, a3…..an from normally distributed population. the p value ranges indicate p is equal to or less than 0.05 then the normality would be rejected in the hypothesis.

Shapio –wilk’s test null hypothesis test:

W= (Єn x=1 qi x (i)2 / (Єni=1 xi-x)2

**STATISTICAL METHOD FOR ANALYSING THE DATA**

Syntax: **Sample t-test/ Welch test:**

R code for t-test

t.test(x, y=NULL, alternative= c(“ two.sided”, “less”,”greater”), mu=0, paired=FALSE, var.equal=FALSE, conf.level = 0.95,…..)

Running t-test for the data set:

t.test(store$Q12a, y=NULL, alternative=c(“greater”),mu=4.1,paired=FALSE, var.equal=FALSE,conf.level=0.95)

Kruskal.test(): used to perform Kruskal- Wallis test as alternative to ANOVA.

Similarly, the same function can be used to test other hypotheses. As per the standard procedure, one has to check the assumption of normality before using t-test. The following code is used to test the assumption of normality. We use Shapiro-wilk test for normality. Here the null hypothesis we test the variable follows normal distribution.

Shapiro.test (store$data)

Output:

Shapiro-Wilk normality test

Based on the F-test , we conclude that the equality of variances assumption is satisfied by the data.

Pacakage(“dplyr”)

Set.seed(1234)

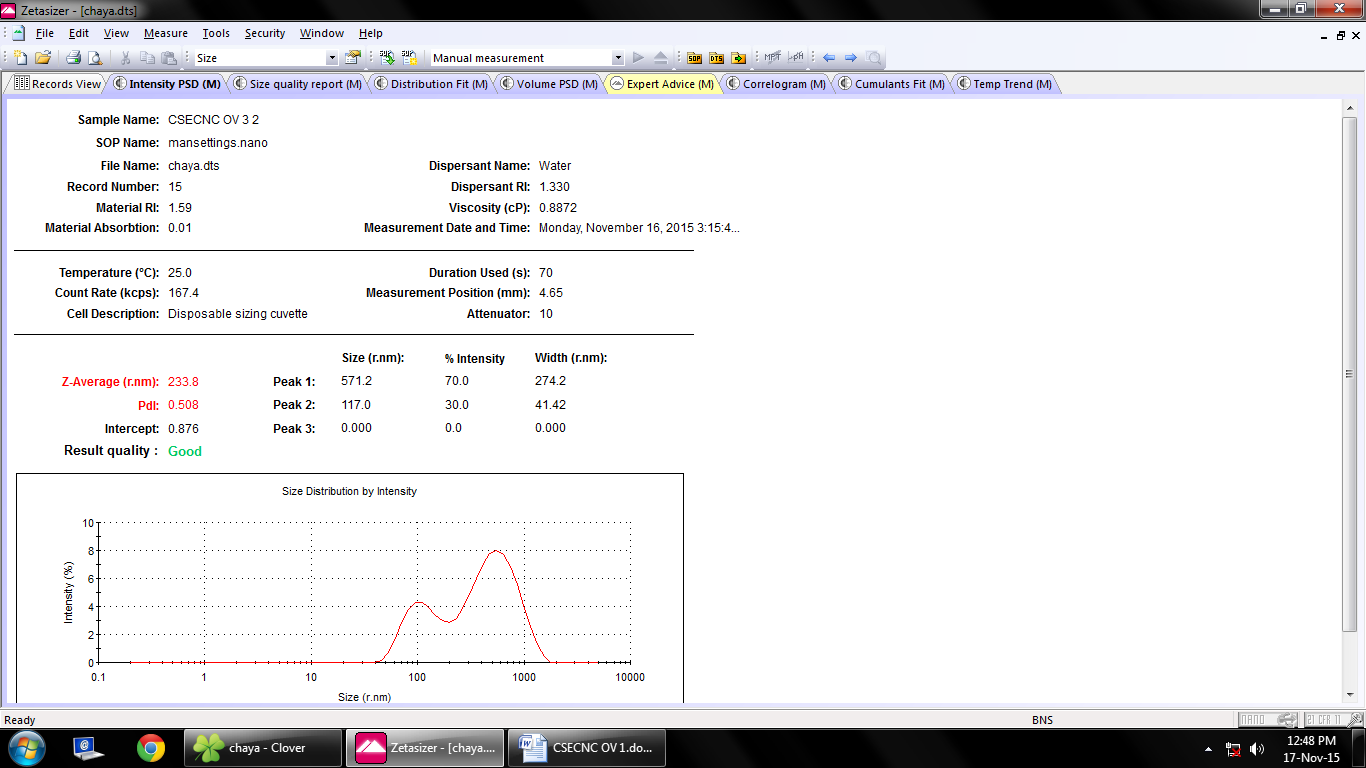
Dplyr: sample\_n(my\_data,10)

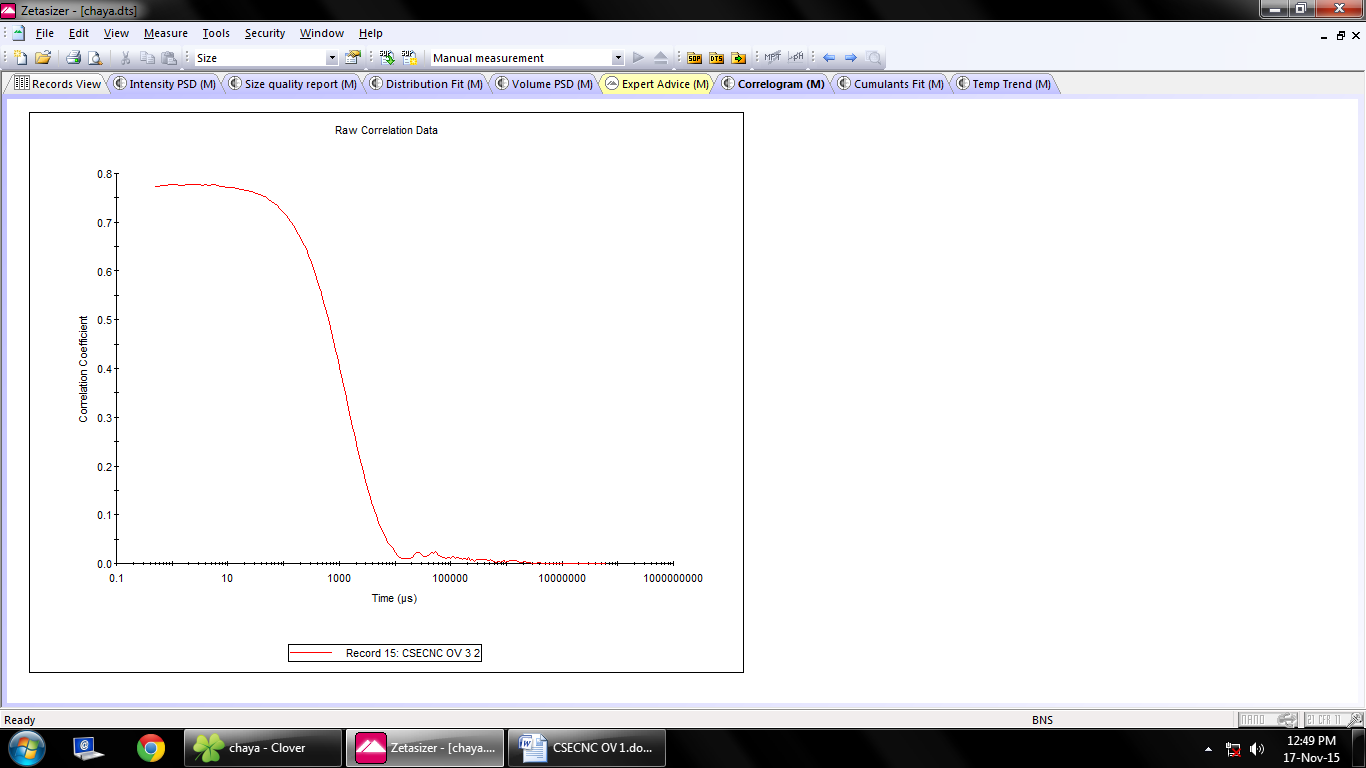
Shapiro.test(my\_data$len)

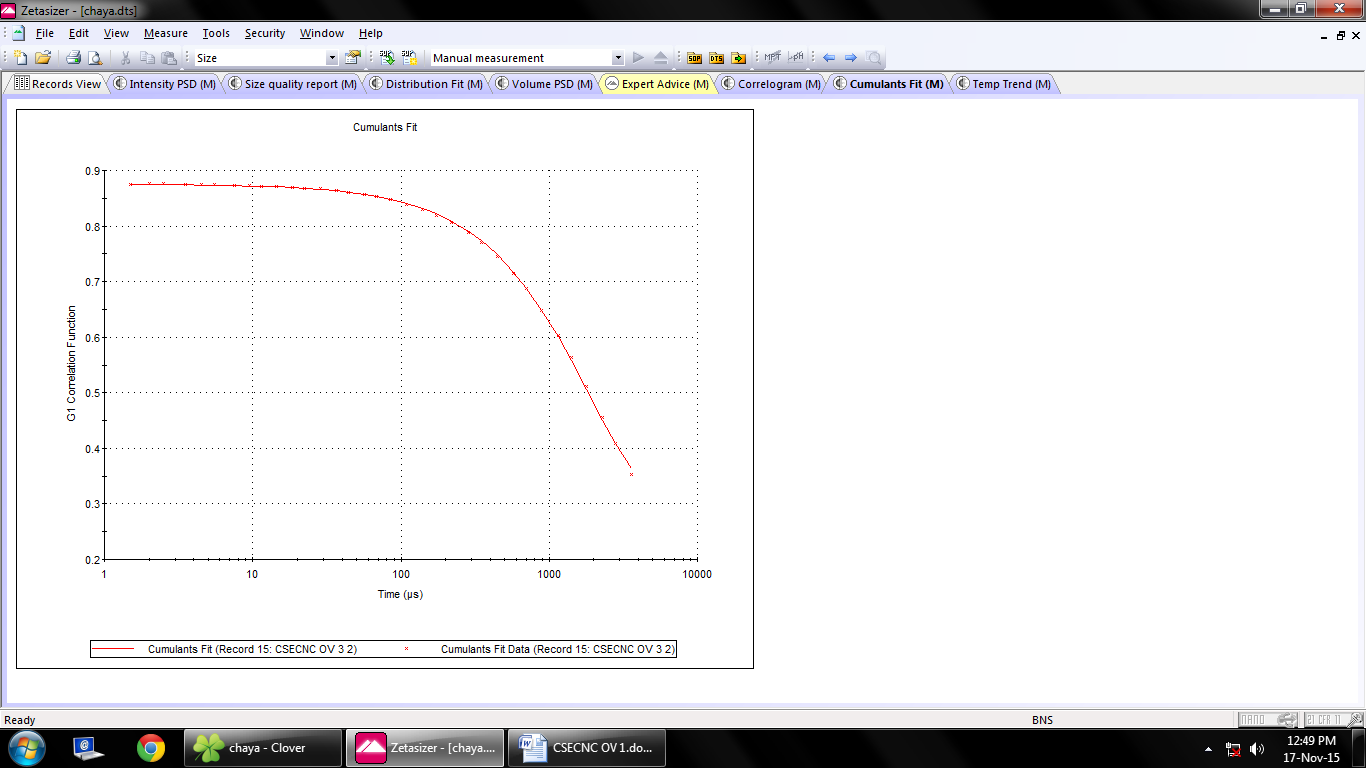
Shapiro-Wilknormality test

**RESULTS AND DISCUSSION**

Mathematical Operation:









**Intensity PSD [M]**





Distribution Fit [M]



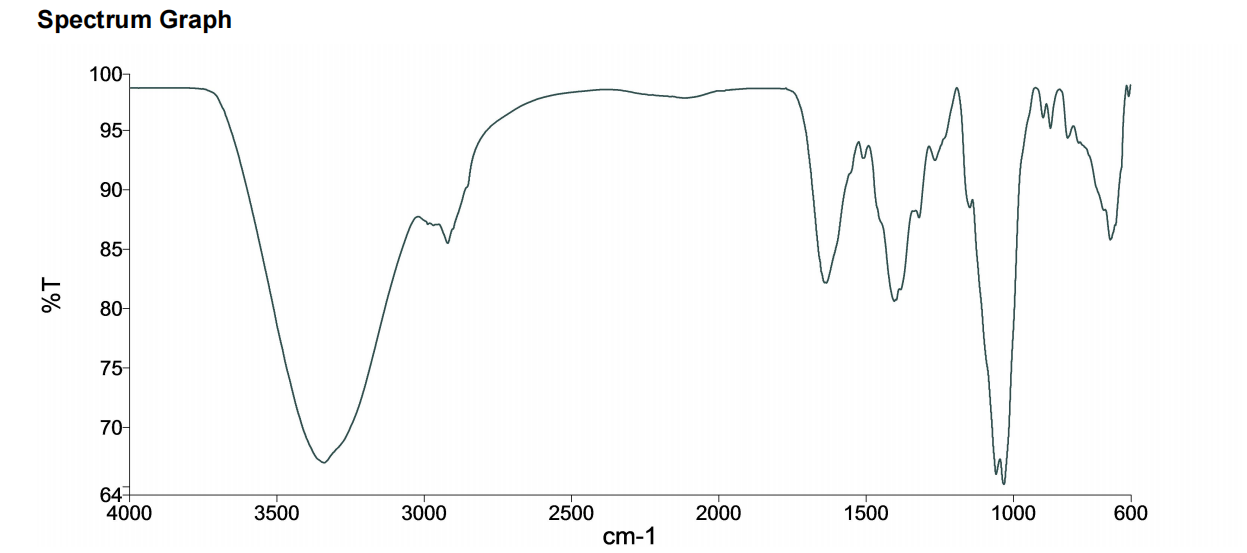
**Volume PSD [M]**



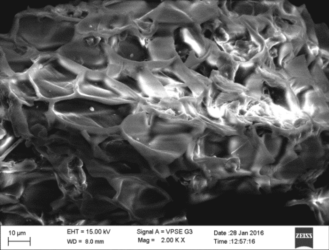
**Correlogram [M]**



**Cumulant Fit [M]**



**ATR-FTIR Agro-based Nutraceutical Nanocrystal FTIR Spectrum**



**SEM image of Agro-based Nutraceutical Nanocrystal**

**CONCLUSION**

The R built in function used various test for normality using Shapiro-Wilk test , F-test conclude equality of variances, used t-test followed by Welch -test; further like to conclude that in statistical data analysis if variable normality not satisfied then one can use Mann-Whitney U test. One can use the non-parametric test Wilcoxon-signed rank sum test.

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