Table S1: Information on the gender, size, location of capture, and reference number of the snakes whose venom was used in this study

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Species name** | **Common name** | **Family** | **Reference number** | **Size/age** | **Gender** | **Location of capture** |
| *Naja ashei* | Large brown spitting cobra | Elapidae | BK16189  BK16648  BK17678 | Adult  Adult  Adult | Female  Female  Male | Watamu  Kilifi  Watamu |

Table S2: Details of the antivenoms used in svPLA2 and brine shrimp lethality neutralization assays of *Naja ashei* venom

|  |  |  |  |
| --- | --- | --- | --- |
| **Brand** | **Manufacturer** | **Characteristics** | **Label claim** |
| Snake Venom Antiserum African HIS  (Antivenom I) | Vins Bioproducts Limited,  Telangana, India | Lyophilized  Equine F(ab’)2  Batch number: 07AS18001  Date of manufacture: 01/2018  Expiry date:12/2021 | Each ml has the capacity to neutralize 20 LD50’s of the venoms of *N. melanoleuca, N. nigricollis* and 25 LD50’s of the venoms of *N. haje, D. polylepis, D. viridis, D. jamesoni, B. gabonica, B. arietans,* and *E. ocellatus* |
| PAN AFRICA Inoserp®  (Antivenom II) | Veteria Labs SA de C.V  Juarez Colony, Mexico City,  Mexico | Lyophilized  Equine F(ab’)2  Batch number: 9 IT06001  Date of manufacture: 06/2019  Expiry date:06/2022 | Each ml neutralizes 500DL50 of the venom of *E. ocellatus, B. arietans, N. nigricollis, D. polylepis* and is recommended in the event of envenomation by *E. ocellatus, E. leucogaster, E. pyramidum, B. arietans, B. rhinoceros, B. nascicornis, B. gabonica, D. polylepis, D. viridis, D. angusticeps, D. jamesoni, N. nigricollis, N. melanoleuca, N. haje, N. pallida, N. nubiae, N. katiensis,* and *N. senegalensis* |

Table S3: Determination of the protein content of *Naja ashei* venom, Vins bioproducts and Pan Africa Inoserp antivenoms by using UV-Visible spectrophotometric readings of bovine serum albumin protein standard

|  |  |  |
| --- | --- | --- |
| **Concentration (mg/ml) of bovine serum albumin** | **Absorbance** | **Protein content (mg/ml)** |
| 0.05 | 0.030±0.003 | - |
| 0.1 | 0.055±0.002 | - |
| 0.2 | 0.101±0.007 | - |
| 0.4 | 0.161±0.011 | - |
| 0.8 | 0.272±0.011 | - |
| 1.2 | 0.358±0.008 | - |
| 1.6 | 0.434±0.013 | - |
| 2 | 0.500±0.034 | - |
| *N. ashei* | 0.215±0.008 | 0.69 |
| Vins Bioproducts antivenom | 0.160±0.005 | 0.47 |
| PAN African Inoserp antivenom | 0.710±0.004 | 0.10 |

SD: Standard deviation

Table S4: Absorbance readings of different treatments in svPLA2 neutralization assays of Naja ashei venom

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Time** | **0 minutes** | | | | **30 minutes** | | | | **D** |
| **Sample** | **A1** | **A2** | **A3** | **Mean±SD** | **A1** | **A2** | **A3** | **Mean±SD** |  |
| V only | 0.978 | 0.980 | 0.995 | 0.983±0.006 | 0.769 | 0.841 | 0.829 | 0.813±0.039 | 0.17 |
| V+25µlAV1 | 1.206 | 1.190 | 1.185 | 1.194±0.011 | 1.091 | 1.068 | 1.068 | 1.076±0.013 | 0.118 |
| V+50µlAV1 | 0.968 | 0.980 | 1.017 | 0.988±0.026 | 0.806 | 0.842 | 0.848 | 0.832±0.023 | 0.156 |
| V+100µlAV1 | 0.970 | 0.983 | 0.995 | 0.983±0.013 | 0.836 | 0.840 | 0.821 | 0.832±0.010 | 0.151 |
| V+200µlAV1 | 0.980 | 0.965 | 0.967 | 0.971±0.008 | 0.893 | 0.902 | 0.919 | 0.905±0.005 | 0.066 |
| V+400µlAV1 | 0.972 | 1.000 | 0.972 | 0.981±0.016 | 0.925 | 0.959 | 0.906 | 0.93±0.027 | 0.051 |
| V+25µlAV2 | 1.008 | 0.992 | 0.964 | 0.988±0.022 | 0.856 | 0.839 | 0.801 | 0.832±0.028 | 0.156 |
| V+50µlAV2 | 0.981 | 0.966 | 0.995 | 0.981±0.015 | 0.837 | 0.813 | 0.842 | 0.831±0.016 | 0.150 |
| V+100µlAV2 | 0.970 | 0.993 | 0.995 | 0.986±0.014 | 0.820 | 0.843 | 0.871 | 0.845±0.026 | 0.141 |
| V+200µlAV2 | 0.969 | 0.968 | 0.962 | 0.966±0.004 | 0.872 | 0.894 | 0.885 | 0.884±0.008 | 0.082 |
| V+400µlAV2 | 0.975 | 1.003 | 0.975 | 0.984±0.016 | 0.907 | 0.916 | 0.899 | 0.907±0.009 | 0.077 |

V: Venom; AV1: Antivenom I; AV2: Antivenom II; A1: Absorbance reading 1; A2: Absorbance reading 2; A3: Absorbance reading 3; SD: Standard deviation; D: Differences in the mean absorbance (absorbance at 30 minutes-absorbance at 0 minutes/background absorbance)

**Data output 1: Descriptive statistics and comparison of the mean protein content of *Naja ashei* venom, Vins Bio products and PAN Africa Inoserp antivenoms by analysis of variance and Tukey’s post hoc tests (Genstat15th edition)**

Summary statistics for Protein\_ content: *(Naja ashei)*

Number of values = 3

Mean = 0.693

Median = 0.686

Minimum = 0.665

Maximum = 0.728

Range = 0.0624

Lower quartile = 0.670

Upper quartile = 0.717

Standard deviation = 0.0318

Summary statistics for Protein\_ content: Vins bio products

Number of values = 3

Mean = 0.465

Median = 0.474

Minimum = 0.441

Maximum = 0.482

Range = 0.0416

Lower quartile = 0.449

Upper quartile = 0.480

Standard deviation = 0.0220

Summary statistics for Protein\_ content: Pan Africa Inoserp

Number of values = 3

Mean = 0.0939

Median = 0.0869

Minimum = 0.0828

Maximum = 0.112

Range = 0.0291

Lower quartile = 0.0838

Upper quartile = 0.106

Standard deviation = 0.0158

Analysis of variance

Variate: Protein\_content

Source of variation d.f. s.s. m.s. v.r. F pr.

Sample 2 0.5485432 0.2742716 472.25 <.001

Residual 6 0.0034846 0.0005808

Total 8 0.5520279

Tables of effects

Variate: Protein\_content

Sample effects, e.s.e. 0.01391, rep. 3

Sample 1 2 3

0.2754 0.0481 -0.3235

Tables of means

Variate: Protein\_content

Grand mean 0.4174

Sample 1 2 3

0.6928 0.4655 0.0939

Standard errors of differences of means

Table Sample

rep. 3

d.f. 6

s.e.d. 0.01968

Tukey's 95% confidence intervals

Sample

Difference Lower 95% Upper 95% Significant

Comparison

3 vs 2 -0.3716 -0.4320 -0.3112 yes

3 vs 1 -0.5990 -0.6593 -0.5386 yes

2 vs 1 -0.2274 -0.2877 -0.1670 yes

Mean

3 0.0939 a

2 0.4655 b

1 0.6928 c

**Data output 2: Evaluation of the outliers in the svPLA2 activity data of *Naja ashei* venom (SPSS v20.0).**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Case Processing Summary** | | | | | | |
|  | Cases | | | | | |
| Valid | | Missing | | Total | |
| N | Percent | N | Percent | N | Percent |
| svPLA2 Response | 66 | 100.0% | 0 | 0.0% | 66 | 100.0% |
| svPLA2% response | 66 | 100.0% | 0 | 0.0% | 66 | 100.0% |

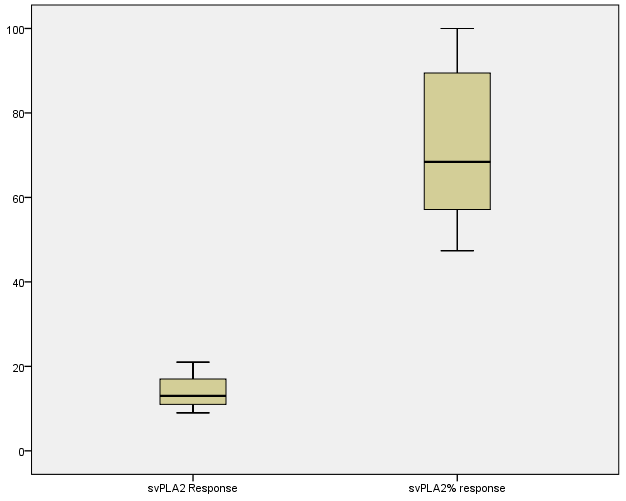


Figure S1: Box and whisker plots to check for outliers in the svPLA2 assay study data

**Data output 3: Regression analysis of the %svPLA2 activity on log concentration of *Naja ashei* venom (SPSS v20.0)**

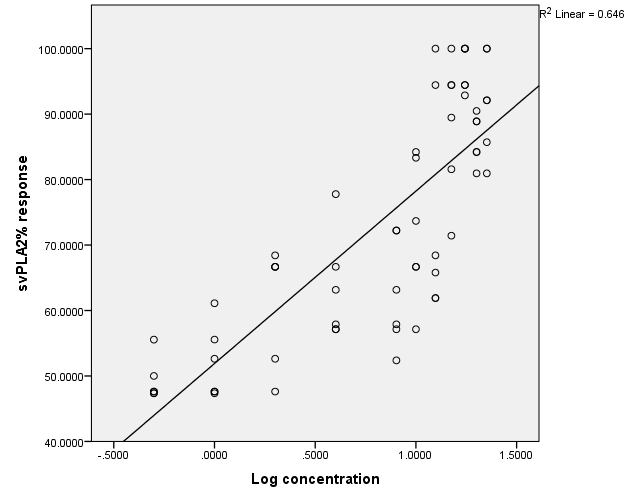


Figure S2: Regression curve of the %svPLA2 activity against log concentration of *Naja ashei* venom

|  |  |  |  |
| --- | --- | --- | --- |
| **Descriptive Statistics** | | | |
|  | Mean | Std. Deviation | N |
| svPLA2% response | 72.676364 | 17.7320028 | 66 |
| Log concentration | .788582 | .5410521 | 66 |

|  |  |  |  |
| --- | --- | --- | --- |
| **Correlations** | | | |
|  | | svPLA2% response | Log concentration |
| Pearson Correlation | svPLA2% response | 1.000 | .804 |
| Log concentration | .804 | 1.000 |
| Sig. (1-tailed) | svPLA2% response | . | .000 |
| Log concentration | .000 | . |
| N | svPLA2% response | 66 | 66 |
| Log concentration | 66 | 66 |

|  |  |  |  |
| --- | --- | --- | --- |
| **Variables Entered/Removeda** | | | |
| Model | Variables Entered | Variables Removed | Method |
| 1 | Log concentrationb | . | Enter |
| a. Dependent Variable: svPLA2% response | | | |
| b. All requested variables entered. | | | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Model Summaryb** | | | | | |
| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
| 1 | .804a | .646 | .640 | 10.6339480 | 1.063 |
| a. Predictors: (Constant), Log concentration | | | | | |
| b. Dependent Variable: svPLA2% response | | | | | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **ANOVAa** | | | | | | |
| Model | | Sum of Squares | df | Mean Square | F | Sig. |
| 1 | Regression | 13200.381 | 1 | 13200.381 | 116.734 | .000b |
| Residual | 7237.174 | 64 | 113.081 |  |  |
| Total | 20437.555 | 65 |  |  |  |
| a. Dependent Variable: svPLA2% response | | | | | | |
| b. Predictors: (Constant), Log concentration | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Coefficientsa** | | | | | | | | |
| Model | | Unstandardized Coefficients | | Standardized Coefficients | T | Sig. | 95.0% Confidence Interval for B | |
| B | Std. Error | Beta | Lower Bound | Upper Bound |
| 1 | **(Constant)`** | **51.906** | 2.326 |  | 22.318 | .000 | 47.260 | 56.552 |
| **Log concentration** | **26.339** | 2.438 | .804 | 10.804 | .000 | 21.469 | 31.209 |
| a. Dependent Variable: svPLA2% response | | | | | | | | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Residuals Statisticsa** | | | | | |
|  | Minimum | Maximum | Mean | Std. Deviation | N |
| Predicted Value | 43.977989 | 87.521439 | 72.676364 | 14.2507115 | 66 |
| Residual | -23.3126450 | 19.2002449 | 0E-7 | 10.5518313 | 66 |
| Std. Predicted Value | -2.014 | 1.042 | .000 | 1.000 | 66 |
| Std. Residual | -2.192 | 1.806 | .000 | .992 | 66 |
| a. Dependent Variable: svPLA2% response | | | | | |

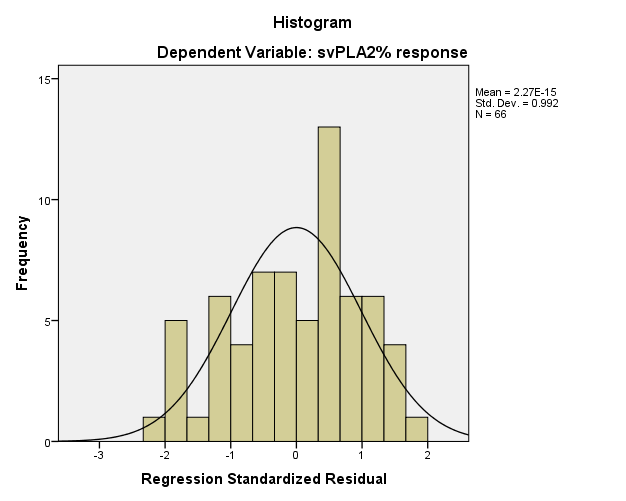


Figure S3: Curve showing the distribution of the %svPLA2 activity data of Naja ashei venom

**Data output 4: Descriptive statistics and comparison of the dose-dependent mean svPLA2 responses of *Naja ashei* venom by analysis of variance and Tukey’s post hoc test (Genstat15th edition)**

Summary statistics for svPLA2\_Response: Log\_ concentration -0.301

Number of values = 6

Mean = 9.5

Median = 9.5

Minimum = 9

Maximum = 10

Range = 1

Standard deviation = 0.548

Variance = 0.3

Summary statistics for svPLA2\_Response: Log\_ concentration 0.000

Number of values = 6

Mean = 10

Median = 10

Minimum = 9

Maximum = 11

Range = 2

Standard deviation = 0.632

Variance = 0.4

Summary statistics for svPLA2\_Response: Log\_ concentration 0.301

Number of values = 6

Mean = 11.83

Median = 12

Minimum = 10

Maximum = 14

Range = 4

Standard deviation = 1.602

Variance = 2.567

Summary statistics for svPLA2\_Response: Log\_ concentration 0.602

Number of values = 6

Mean = 12.17

Median = 12

Minimum = 11

Maximum = 14

Range = 3

Standard deviation = 0.983

Variance = 0.967

Summary statistics for svPLA2\_Response: Log\_ concentration 0.903

Number of values = 6

Mean = 12

Median = 12

Minimum = 11

Maximum = 13

Range = 2

Standard deviation = 0.894

Variance = 0.8

Summary statistics for svPLA2\_Response: Log\_ concentration 1.000

Number of values = 6

Mean = 13.83

Median = 14

Minimum = 12

Maximum = 16

Range = 4

Standard deviation = 1.602

Variance = 2.567

Summary statistics for svPLA2\_Response: Log\_ concentration 1.097

Number of values = 6

Mean = 14.42

Median = 13

Minimum = 12.5

Maximum = 18

Range = 5.5

Standard deviation = 2.417

Variance = 5.842

Summary statistics for svPLA2\_Response: Log\_ concentration 1.176

Number of values = 6

Mean = 17.08

Median = 17

Minimum = 15

Maximum = 21

Range = 6

Standard deviation = 2.108

Variance = 4.442

Summary statistics for svPLA2\_Response: Log\_ concentration 1.243

Number of values = 6

Mean = 18.75

Median = 19

Minimum = 17

Maximum = 21

Range = 4

Standard deviation = 1.541

Variance = 2.375

Summary statistics for svPLA2\_Response: Log\_ concentration 1.301

Number of values = 6

Mean = 16.67

Median = 16

Minimum = 16

Maximum = 19

Range = 3

Standard deviation = 1.211

Variance = 1.467

Summary statistics for svPLA2\_Response: Log\_ concentration 1.352

Number of values = 6

Mean = 17.67

Median = 17.75

Minimum = 17

Maximum = 18

Range = 1

Standard deviation = 0.408

Variance = 0.167

Summary statistics for svPLA2%\_response: Log\_ concentration -0.301

Number of values = 6

Mean = 49.25

Median = 47.62

Minimum = 47.36

Maximum = 55.55

Range = 8.19

Standard deviation = 3.247

Variance = 10.54

Summary statistics for svPLA2%\_response: Log\_ concentration 0.000

Number of values = 6

Mean = 51.98

Median = 50.12

Minimum = 47.36

Maximum = 61.11

Range = 13.75

Standard deviation = 5.585

Variance = 31.19

Summary statistics for svPLA2%\_response: Log\_ concentration 0.301

Number of values = 6

Mean = 61.45

Median = 66.67

Minimum = 47.62

Maximum = 68.42

Range = 20.8

Standard deviation = 8.937

Variance = 79.88

Summary statistics for svPLA2%\_response: Log\_ concentration 0.602

Number of values = 6

Mean = 63.30

Median = 60.52

Minimum = 57.14

Maximum = 77.78

Range = 20.64

Standard deviation = 8.077

Variance = 65.24

Summary statistics for svPLA2%\_response: Log\_ concentration 0.903

Number of values = 6

Mean = 62.50

Median = 60.52

Minimum = 52.38

Maximum = 72.22

Range = 19.84

Standard deviation = 8.268

Variance = 68.36

Summary statistics for svPLA2%\_response: Log\_ concentration 1.000

Number of values = 6

Mean = 71.95

Median = 70.18

Minimum = 57.14

Maximum = 84.21

Range = 27.07

Standard deviation = 10.56

Variance = 111.6

Summary statistics for svPLA2%\_response: Log\_ concentration 1.097

Number of values = 6

Mean = 75.41

Median = 67.11

Minimum = 61.9

Maximum = 100

Range = 38.1

Standard deviation = 17.17

Variance = 294.7

Summary statistics for svPLA2%\_response: Log\_ concentration 1.176

Number of values = 6

Mean = 88.56

Median = 91.95

Minimum = 71.43

Maximum = 100

Range = 28.57

Standard deviation = 10.42

Variance = 108.6

Summary statistics for svPLA2%\_response: Log\_ concentration 1.243

Number of values = 6

Mean = 96.96

Median = 97.22

Minimum = 92.86

Maximum = 100

Range = 7.14

Standard deviation = 3.383

Variance = 11.45

Summary statistics for svPLA2%\_response: Log\_ concentration 1.301

Number of values = 6

Mean = 86.27

Median = 86.55

Minimum = 80.95

Maximum = 90.48

Range = 9.53

Standard deviation = 3.694

Variance = 13.65

Summary statistics for svPLA2%\_response: Log\_ concentration 1.352

Number of values = 6

Mean = 91.81

Median = 92.11

Minimum = 80.95

Maximum = 100

Range = 19.05

Standard deviation = 7.609

Variance = 57.90

Analysis of variance

Variate: svPLA2\_Response

Source of variation d.f. s.s. m.s. v.r. F pr.

Log concentration 10 606.788 60.679 30.49 <.001

Residual 55 109.458 1.990

Total 65 716.246

Tables of effects

Variate: svPLA2\_Response

Log\_ concentration effects, e.s.e. 0.576, rep. 6

Log\_concentration -0.301 0.000 0.301 0.602 0.903 1.000

-4.49 -3.99 -2.16 -1.83 -1.99 -0.16

Log\_concentration 1.097 1.176 1.243 1.301 1.352

0.42 3.09 4.76 2.67 3.67

Tables of means

Variate: svPLA2\_Response

Grand mean 13.99

Log\_concentration -0.301 0.000 0.301 0.602 0.903 1.000

9.50 10.00 11.83 12.17 12.00 13.83

Log\_concentration 1.097 1.176 1.243 1.301 1.352

14.42 17.08 18.75 16.67 17.67

Standard errors of differences of means

Table Log\_concentration

rep. 6

d.f. 55

s.e.d. 0.814

Tukey's 95% confidence intervals

Log\_ concentration

Difference Lower 95% Upper 95% Significant

Comparison

-0.301 vs 0.000 -0.500 -3.235 2.235 no

-0.301 vs 0.301 -2.333 -5.068 0.401 no

-0.301 vs 0.903 -2.500 -5.235 0.235 no

-0.301 vs 0.602 -2.667 -5.401 0.068 no

-0.301 vs 1.000 -4.333 -7.068 -1.599 yes

-0.301 vs 1.097 -4.917 -7.651 -2.182 yes

-0.301 vs 1.301 -7.167 -9.901 -4.432 yes

-0.301 vs 1.176 -7.583 -10.318 -4.849 yes

-0.301 vs 1.352 -8.167 -10.901 -5.432 yes

-0.301 vs 1.243 -9.250 -11.985 -6.515 yes

0.000 vs 0.301 -1.833 -4.568 0.901 no

0.000 vs 0.903 -2.000 -4.735 0.735 no

0.000 vs 0.602 -2.167 -4.901 0.568 no

0.000 vs 1.000 -3.833 -6.568 -1.099 yes

0.000 vs 1.097 -4.417 -7.151 -1.682 yes

0.000 vs 1.301 -6.667 -9.401 -3.932 yes

0.000 vs 1.176 -7.083 -9.818 -4.349 yes

0.000 vs 1.352 -7.667 -10.401 -4.932 yes

0.000 vs 1.243 -8.750 -11.485 -6.015 yes

0.301 vs 0.903 -0.167 -2.901 2.568 no

0.301 vs 0.602 -0.333 -3.068 2.401 no

0.301 vs 1.000 -2.000 -4.735 0.735 no

0.301 vs 1.097 -2.583 -5.318 0.151 no

0.301 vs 1.301 -4.833 -7.568 -2.099 yes

0.301 vs 1.176 -5.250 -7.985 -2.515 yes

0.301 vs 1.352 -5.833 -8.568 -3.099 yes

0.301 vs 1.243 -6.917 -9.651 -4.182 yes

0.903 vs 0.602 -0.167 -2.901 2.568 no

0.903 vs 1.000 -1.833 -4.568 0.901 no

0.903 vs 1.097 -2.417 -5.151 0.318 no

0.903 vs 1.301 -4.667 -7.401 -1.932 yes

0.903 vs 1.176 -5.083 -7.818 -2.349 yes

0.903 vs 1.352 -5.667 -8.401 -2.932 yes

0.903 vs 1.243 -6.750 -9.485 -4.015 yes

0.602 vs 1.000 -1.667 -4.401 1.068 no

0.602 vs 1.097 -2.250 -4.985 0.485 no

0.602 vs 1.301 -4.500 -7.235 -1.765 yes

0.602 vs 1.176 -4.917 -7.651 -2.182 yes

0.602 vs 1.352 -5.500 -8.235 -2.765 yes

0.602 vs 1.243 -6.583 -9.318 -3.849 yes

1.000 vs 1.097 -0.583 -3.318 2.151 no

1.000 vs 1.301 -2.833 -5.568 -0.099 yes

1.000 vs 1.176 -3.250 -5.985 -0.515 yes

1.000 vs 1.352 -3.833 -6.568 -1.099 yes

1.000 vs 1.243 -4.917 -7.651 -2.182 yes

1.097 vs 1.301 -2.250 -4.985 0.485 no

1.097 vs 1.176 -2.667 -5.401 0.068 no

1.097 vs 1.352 -3.250 -5.985 -0.515 yes

1.097 vs 1.243 -4.333 -7.068 -1.599 yes

1.301 vs 1.176 -0.417 -3.151 2.318 no

1.301 vs 1.352 -1.000 -3.735 1.735 no

1.301 vs 1.243 -2.083 -4.818 0.651 no

1.176 vs 1.352 -0.583 -3.318 2.151 no

1.176 vs 1.243 -1.667 -4.401 1.068 no

1.352 vs 1.243 -1.083 -3.818 1.651 no

Mean

-0.301 9.50 a

0.000 10.00 a

0.301 11.83 ab

0.903 12.00 ab

0.602 12.17 ab

1.000 13.83 b

1.097 14.42 bc

1.301 16.67 cd

1.176 17.08 cd

1.352 17.67 d

1.243 18.75 d

**Data output 5: Evaluation of outliers in the data set on neutralization of svPLA2 by antivenom I (Vins Bio products)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Case Processing Summary** | | | | | | |
|  | Cases | | | | | |
| Valid | | Missing | | Total | |
| N | Percent | N | Percent | N | Percent |
| svPLA2 absorbance | 15 | 100.0% | 0 | 0.0% | 15 | 100.0% |
| svPLA2% response | 15 | 100.0% | 0 | 0.0% | 15 | 100.0% |

**svPLA2% response**

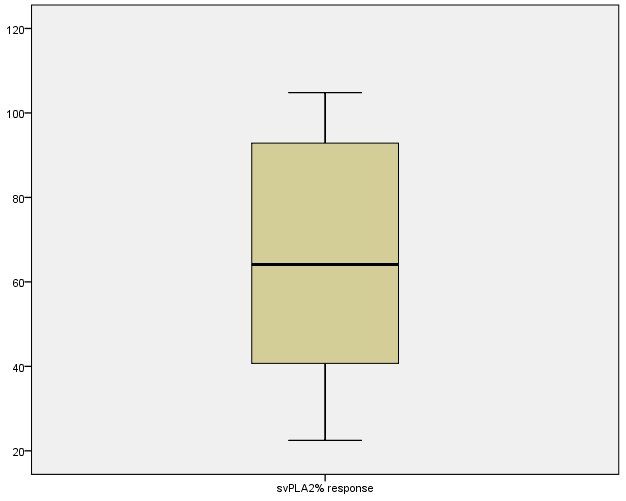


Figure S4: Box and whisker plot to check for outliers in the data on neutralization of svPLA2 activity in Naja ashei venom by Vins bioproducts antivenom (antivenom I)

**Data output 6: Regression analysis of the %svPLA2 activity on log concentration of a mixture of a fixed dose of *Naja ashei* venom and variable doses of Vins bio products antivenom; antivenom I (SPSS software v20.0)**

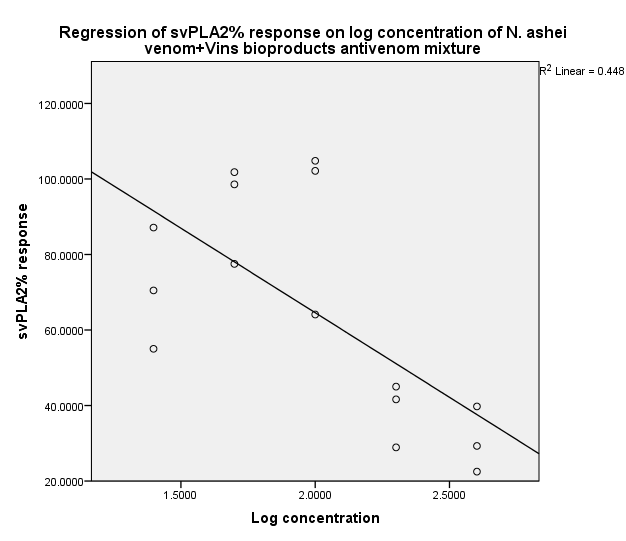


Figure S5: Regression curve showing negative correlation between the %svPLA2 response and the log concentration of the mixture of a fixed dose of *N ashei* venom and varied doses of Vins bio products antivenom (antivenom I)

|  |  |  |  |
| --- | --- | --- | --- |
| **Descriptive Statistics** | | | |
|  | Mean | Std. Deviation | N |
| svPLA2% response | 64.579333 | 29.5062539 | 15 |
| Log concentration | 2.000000 | .4406774 | 15 |

|  |  |  |  |
| --- | --- | --- | --- |
| **Correlations** | | | |
|  | | svPLA2% response | Log concentration |
| Pearson Correlation | svPLA2% response | 1.000 | -.669 |
| Log concentration | -.669 | 1.000 |
| Sig. (1-tailed) | svPLA2% response | . | .003 |
| Log concentration | .003 | . |
| N | svPLA2% response | 15 | 15 |
| Log concentration | 15 | 15 |

|  |  |  |  |
| --- | --- | --- | --- |
| **Variables Entered/Removeda** | | | |
| Model | Variables Entered | Variables Removed | Method |
| 1 | Log concentrationb | . | Enter |
| a. Dependent Variable: svPLA2% response | | | |
| b. All requested variables entered. | | | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Model Summaryb** | | | | | |
| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
| 1 | .669a | .448 | .405 | 22.7595188 | 1.065 |
| a. Predictors: (Constant), Log concentration | | | | | |
| b. Dependent Variable: svPLA2% response | | | | | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **ANOVAa** | | | | | | |
| Model | | Sum of Squares | df | Mean Square | F | Sig. |
| 1 | Regression | 5454.722 | 1 | 5454.722 | 10.530 | .006b |
| Residual | 6733.944 | 13 | 517.996 |  |  |
| Total | 12188.666 | 14 |  |  |  |
| a. Dependent Variable: svPLA2% response | | | | | | |
| b. Predictors: (Constant), Log concentration | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Coefficientsa** | | | | | | | | |
| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | 95.0% Confidence Interval for B | |
| B | Std. Error | Beta | Lower Bound | Upper Bound |
| 1 | (Constant) | 154.164 | 28.225 |  | 5.462 | .000 | 93.188 | 215.140 |
| Log concentration | -44.792 | 13.803 | -.669 | -3.245 | .006 | -74.612 | -14.972 |
| a. Dependent Variable: svPLA2% response | | | | | | | | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Residuals Statisticsa** | | | | | |
|  | Minimum | Maximum | Mean | Std. Deviation | N |
| Predicted Value | 37.610004 | 91.548660 | 64.579333 | 19.7388708 | 15 |
| Residual | -36.5286598 | 40.2406654 | 0E-7 | 21.9316210 | 15 |
| Std. Predicted Value | -1.366 | 1.366 | .000 | 1.000 | 15 |
| Std. Residual | -1.605 | 1.768 | .000 | .964 | 15 |
| a. Dependent Variable: svPLA2% response | | | | | |

**Charts**

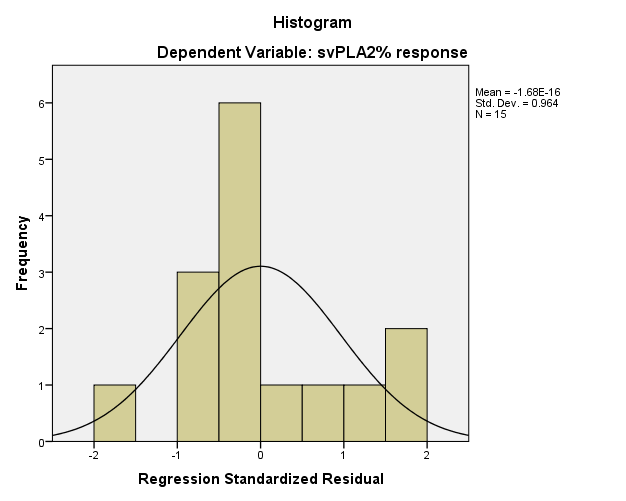


Figure S6: Curve showing the distribution of the %svPLA2 activity data of a mixture of the fixed dose of Naja ashei venom and varied concentrations of Vins bioproducts antivenom (antivenom I)

**Data output 7: Evaluation of outliers in the svPLA2 activity data of a mixture of the fixed dose of *Naja ashei* venom and varied concentrations of Pan Africa Inoserp antivenom (antivenom II) (SPSS software v20.0).**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Case Processing Summary** | | | | | | |
|  | Cases | | | | | |
| Valid | | Missing | | Total | |
| N | Percent | N | Percent | N | Percent |
| svPLA2% response | 15 | 100.0% | 0 | 0.0% | 15 | 100.0% |
| svPLA2 absorbance | 15 | 100.0% | 0 | 0.0% | 15 | 100.0% |

**svPLA2% response**

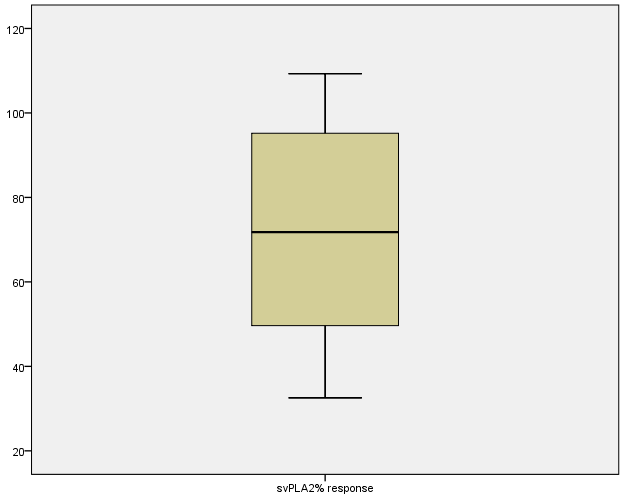


Figure S7: Box and whisker plot to check for outliers in the data on neutralization of svPLA2 activity in Naja ashei venom by Pan Africa Inoserp antivenom (antivenom II)

**Data output 8: Regression analysis of the %svPLA2 activity on log concentration of a mixture of a fixed dose of *Naja ashei* venom and variable doses of PAN Africa Inoserp antivenom; antivenom II (SPSS software v20.0)**

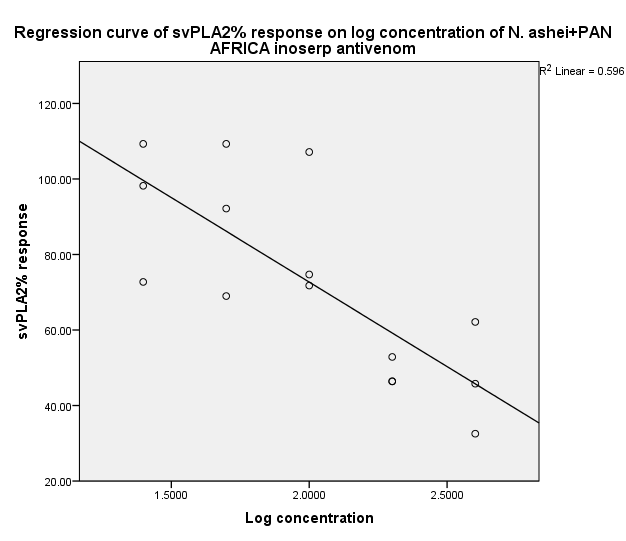


Figure S8: Regression curve showing negative correlation between the %svPLA2 response and the log concentration of the mixture of a fixed dose of *N ashei* venom and varied doses of Pan Africa Inoserp antivenom (antivenom II)

|  |  |  |  |
| --- | --- | --- | --- |
| **Descriptive Statistics** | | | |
|  | Mean | Std. Deviation | N |
| svPLA2% response | 72.6933 | 25.54712 | 15 |
| Log concentration | 2.000000 | .4406774 | 15 |

|  |  |  |  |
| --- | --- | --- | --- |
| **Correlations** | | | |
|  | | svPLA2% response | Log concentration |
| Pearson Correlation | svPLA2% response | 1.000 | -.772 |
| Log concentration | -.772 | 1.000 |
| Sig. (1-tailed) | svPLA2% response | . | .000 |
| Log concentration | .000 | . |
| N | svPLA2% response | 15 | 15 |
| Log concentration | 15 | 15 |

|  |  |  |  |
| --- | --- | --- | --- |
| **Variables Entered/Removeda** | | | |
| Model | Variables Entered | Variables Removed | Method |
| 1 | Log concentrationb | . | Enter |
| a. Dependent Variable: svPLA2% response | | | |
| b. All requested variables entered. | | | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Model Summaryb** | | | | | |
| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
| 1 | .772a | .596 | .565 | 16.84490 | 2.012 |
| a. Predictors: (Constant), Log concentration | | | | | |
| b. Dependent Variable: svPLA2% response | | | | | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **ANOVAa** | | | | | | |
| Model | | Sum of Squares | df | Mean Square | F | Sig. |
| 1 | Regression | 5448.420 | 1 | 5448.420 | 19.201 | .001b |
| Residual | 3688.758 | 13 | 283.751 |  |  |
| Total | 9137.177 | 14 |  |  |  |
| a. Dependent Variable: svPLA2% response | | | | | | |
| b. Predictors: (Constant), Log concentration | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Coefficientsa** | | | | | | | | |
| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | 95.0% Confidence Interval for B | |
| B | Std. Error | Beta | Lower Bound | Upper Bound |
| 1 | (Constant) | 162.226 | 20.890 |  | 7.766 | .000 | 117.096 | 207.356 |
| Log concentration | -44.766 | 10.216 | -.772 | -4.382 | .001 | -66.837 | -22.696 |
| a. Dependent Variable: svPLA2% response | | | | | | | | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Residuals Statisticsa** | | | | | |
|  | Minimum | Maximum | Mean | Std. Deviation | N |
| Predicted Value | 45.7396 | 99.6471 | 72.6933 | 19.72746 | 15 |
| Residual | -26.91708 | 34.44667 | .00000 | 16.23215 | 15 |
| Std. Predicted Value | -1.366 | 1.366 | .000 | 1.000 | 15 |
| Std. Residual | -1.598 | 2.045 | .000 | .964 | 15 |
| a. Dependent Variable: svPLA2% response | | | | | |

**Charts**



Figure S9: Curve showing the distribution of the %svPLA2 activity data of a mixture of the fixed dose of Naja ashei venom and varied concentrations of Pan Africa Inoserp antivenom (antivenom II)

**Data output 9: Regression analysis to determine the safety of Vins bio products antivenom in the 48-hour brine shrimp lethality assay (MS Excel 2013)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SUMMARY OUTPUT |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| *Regression Statistics* | |  |  |  |  |  |  |  |
| Multiple R | 0.401824228 |  |  |  |  |  |  |  |
| R Square | 0.161462711 |  |  |  |  |  |  |  |
| Adjusted R Square | 0.096959842 |  |  |  |  |  |  |  |
| Standard Error | 1.083909441 |  |  |  |  |  |  |  |
| Observations | 15 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 1 | 2.9408929 | 2.9408929 | 2.503186517 | 0.137631291 |  |  |  |
| Residual | 13 | 15.27317579 | 1.174859676 |  |  |  |  |  |
| Total | 14 | 18.21406869 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 3.181293333 | 0.740451112 | 4.296425899 | 0.000869009 | 1.58164596 | 4.780940707 | 1.58164596 | 4.780940707 |
| X Variable 1 | 0.5423 | 0.342762261 | 1.582146174 | 0.137631291 | -0.198192845 | 1.282792845 | -0.198192845 | 1.282792845 |

**Data output 10: Regression analysis to determine the safety of Vins bio products antivenom in the 72-hour brine shrimp lethality assay (MS Excel 2013)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SUMMARY OUTPUT |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| *Regression Statistics* | |  |  |  |  |  |  |  |
| Multiple R | 0.458352678 |  |  |  |  |  |  |  |
| R Square | 0.210087178 |  |  |  |  |  |  |  |
| Adjusted R Square | 0.149324653 |  |  |  |  |  |  |  |
| Standard Error | 1.65630921 |  |  |  |  |  |  |  |
| Observations | 15 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 1 | 9.485201664 | 9.485201664 | 3.457512312 | 0.085741319 |  |  |  |
| Residual | 13 | 35.66368259 | 2.743360199 |  |  |  |  |  |
| Total | 14 | 45.14888425 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 1.385133333 | 1.131474595 | 1.22418421 | 0.242605708 | -1.059268918 | 3.829535584 | -1.059268918 | 3.829535584 |
| X Variable 1 | 0.97392 | 0.523770961 | 1.859438709 | 0.085741319 | -0.157618368 | 2.105458368 | -0.157618368 | 2.105458368 |

**Data output 11: Regression analysis to determine the safety of Pan Africa Inoserp antivenom in the 48-hour brine shrimp lethality assay (MS Excel 2013)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SUMMARY OUTPUT |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| *Regression Statistics* | |  |  |  |  |  |  |  |
| Multiple R | 0.131287214 |  |  |  |  |  |  |  |
| R Square | 0.017236333 |  |  |  |  |  |  |  |
| Adjusted R Square | -0.058360873 |  |  |  |  |  |  |  |
| Standard Error | 1.20902718 |  |  |  |  |  |  |  |
| Observations | 15 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 1 | 0.333281536 | 0.333281536 | 0.228002246 | 0.640937312 |  |  |  |
| Residual | 13 | 19.00270739 | 1.461746723 |  |  |  |  |  |
| Total | 14 | 19.33598893 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 3.422306667 | 0.825922799 | 4.143615686 | 0.001154921 | 1.638008938 | 5.206604395 | 1.638008938 | 5.206604395 |
| X Variable 1 | 0.18256 | 0.382327964 | 0.477495807 | 0.640937312 | -0.64340935 | 1.00852935 | -0.64340935 | 1.00852935 |

**Data output 12: Regression analysis to determine the safety of Pan Africa Inoserp antivenom in the 72-hour brine shrimp lethality assay (MS Excel 2013)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SUMMARY OUTPUT |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| *Regression Statistics* | |  |  |  |  |  |  |  |
| Multiple R | 0.263835667 |  |  |  |  |  |  |  |
| R Square | 0.069609259 |  |  |  |  |  |  |  |
| Adjusted R Square | -0.001959259 |  |  |  |  |  |  |  |
| Standard Error | 1.284192199 |  |  |  |  |  |  |  |
| Observations | 15 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 1 | 1.6040025 | 1.6040025 | 0.97262401 | 0.342027213 |  |  |  |
| Residual | 13 | 21.43894485 | 1.649149604 |  |  |  |  |  |
| Total | 14 | 23.04294735 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 4.251173333 | 0.877270282 | 4.845910569 | 0.000319477 | 2.355946112 | 6.146400555 | 2.355946112 | 6.146400555 |
| X Variable 1 | -0.4005 | 0.40609723 | -0.98621702 | 0.342027213 | -1.277819728 | 0.476819728 | -1.277819728 | 0.476819728 |

**Data output 13: Regression analysis to determine the 24-hour toxicity of *Naja ashei* venom in the brine shrimp lethality assay (MS Excel 2013)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SUMMARY OUTPUT |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| *Regression Statistics* | |  |  |  |  |  |  |  |
| Multiple R | 0.861737473 |  |  |  |  |  |  |  |
| R Square | 0.742591472 |  |  |  |  |  |  |  |
| Adjusted R Square | 0.722790816 |  |  |  |  |  |  |  |
| Standard Error | 1.906960804 |  |  |  |  |  |  |  |
| Observations | 15 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |  |  |
|  | *Df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 1 | 136.3810128 | 136.3810128 | 37.50337723 | 3.63682E-05 |  |  |  |
| Residual | 13 | 47.27449359 | 3.636499507 |  |  |  |  |  |
| Total | 14 | 183.6555064 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | -1.636066667 | 1.302702231 | -1.255902253 | 0.231254372 | -4.450383736 | 1.178250402 | -4.450383736 | 1.178250402 |
| X Variable 1 | 3.69298 | 0.603033955 | 6.124000101 | 3.63682E-05 | 2.390204345 | 4.995755655 | 2.390204345 | 4.995755655 |

**Data output 14: Regression analysis to determine the 48-hour toxicity of *Naja ashei* venom in the brine shrimp lethality assay (MS Excel 2013)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SUMMARY OUTPUT |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| *Regression Statistics* | |  |  |  |  |  |  |  |
| Multiple R | 0.754457108 |  |  |  |  |  |  |  |
| R Square | 0.569205527 |  |  |  |  |  |  |  |
| Adjusted R Square | 0.536067491 |  |  |  |  |  |  |  |
| Standard Error | 1.309374352 |  |  |  |  |  |  |  |
| Observations | 15 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |  |  |
|  | *Df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 1 | 29.44896245 | 29.44896245 | 17.17680315 | 0.001153034 |  |  |  |
| Residual | 13 | 22.28799553 | 1.714461194 |  |  |  |  |  |
| Total | 14 | 51.73695798 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 3.843173333 | 0.894472968 | 4.296578511 | 0.000868763 | 1.910781969 | 5.775564698 | 1.910781969 | 5.775564698 |
| X Variable 1 | 1.71607 | 0.414060526 | 4.144490699 | 0.001153034 | 0.821546617 | 2.610593383 | 0.821546617 | 2.610593383 |

**Data output 15: Regression analysis to determine the 72-hour toxicity of *Naja ashei* venom in the brine shrimp lethality assay (MS Excel 2013)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SUMMARY OUTPUT |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| *Regression Statistics* | |  |  |  |  |  |  |  |
| Multiple R | 0.404065903 |  |  |  |  |  |  |  |
| R Square | 0.163269254 |  |  |  |  |  |  |  |
| Adjusted R Square | 0.09890535 |  |  |  |  |  |  |  |
| Standard Error | 1.115153745 |  |  |  |  |  |  |  |
| Observations | 15 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 1 | 3.154507225 | 3.154507225 | 2.536658663 | 0.135243789 |  |  |  |
| Residual | 13 | 16.16638238 | 1.243567876 |  |  |  |  |  |
| Total | 14 | 19.32088961 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 5.054306667 | 0.761795035 | 6.634733012 | 1.62581E-05 | 3.40854855 | 6.700064783 | 3.40854855 | 6.700064783 |
| X Variable 1 | 0.56165 | 0.352642578 | 1.592689129 | 0.135243789 | -0.200187972 | 1.323487972 | -0.200187972 | 1.323487972 |

**Data output 16: Descriptive statistics and comparison of the 24-hour dose-dependent mortality of *Naja ashei* venom by analysis of variance and Tukey’s post hoc test (Genstat15th edition)**

Summary statistics for Adjusted\_%mortality: Concentration\_ug\_ml 10

Number of values = 5

Mean = 0

Median = 0

Minimum = 0

Maximum = 0

Range = 0

Lower quartile = 0

Upper quartile = 0

Standard deviation = 0

Summary statistics for Adjusted\_%mortality: Concentration\_ug\_ml 100

Number of values = 5

Mean = 94

Median = 100

Minimum = 80

Maximum = 100

Range = 20

Lower quartile = 87.5

Upper quartile = 100

Standard deviation = 8.944

Summary statistics for Adjusted\_%mortality: Concentration\_ug\_ml 1000

Number of values = 5

Mean = 98

Median = 100

Minimum = 90

Maximum = 100

Range = 10

Lower quartile = 97.5

Upper quartile = 100

Standard deviation = 4.472

Analysis of variance

Variate: Adjusted\_%mortality

Source of variation d.f. s.s. m.s. v.r. F pr.

Concentration\_ug\_ml 2 30760.00 15380.00 461.40 <.001

Residual 12 400.00 33.33

Total 14 31160.00

Tables of effects

Variate: Adjusted\_%mortality

Concentration\_ug\_ml effects, e.s.e. 2.58, rep. 5

Concentration\_ug\_ml 10 100 1000

-64.0 30.0 34.0

Tables of means

Variate: Adjusted\_%mortality

Grand mean 64.0

Concentration\_ug\_ml 10 100 1000

0.0 94.0 98.0

Standard errors of differences of means

Table Concentration\_ug\_ml

rep. 5

d.f. 12

s.e.d. 3.65

Tukey's 95% confidence intervals

Concentration\_ug\_ml

Difference Lower 95% Upper 95% Significant

Comparison

10 vs 100 -94.00 -103.74 -84.26 yes

10 vs 1000 -98.00 -107.74 -88.26 yes

100 vs 1000 -4.00 -13.74 5.74 no

Mean

10 0.00 a

100 94.00 b

1000 98.00 b

**Data output 17: Descriptive statistics and comparison of the 48-hour dose-dependent mortality of *Naja ashei* venom by analysis of variance and Tukey’s post hoc test (Genstat 15th edition)**

Summary statistics for Adjusted\_%mortality: Concentration\_ug\_ml 10

Number of values = 5

Number of observations = 5

Mean = 50

Median = 50

Minimum = 20

Maximum = 70

Range = 50

Lower quartile = 42.5

Upper quartile = 62.5

Standard deviation = 18.71

Summary statistics for Adjusted\_%mortality: Concentration\_ug\_ml 100

Number of values = 5

Number of observations = 5

Mean = 98

Median = 100

Minimum = 90

Maximum = 100

Range = 10

Lower quartile = 97.5

Upper quartile = 100

Standard deviation = 4.472

Summary statistics for Adjusted\_%mortality: Concentration\_ug\_ml 1000

Number of values = 5

Number of observations = 5

Mean = 98

Median = 100

Minimum = 90

Maximum = 100

Range = 10

Lower quartile = 97.5

Upper quartile = 100

Standard deviation = 4.472

Analysis of variance

Variate: Adjusted\_%mortality

Source of variation d.f. s.s. m.s. v.r. F pr.

Concentration\_ug\_ml 2 7680.0 3840.0 29.54 <.001

Residual 12 1560.0 130.0

Total 14 9240.0

Tables of effects

Variate: Adjusted\_%mortality

Concentration\_ug\_ml effects, e.s.e. 5.10, rep. 5

Concentration\_ug\_ml 10 100 1000

-32.0 16.0 16.0

Tables of means

Variate: Adjusted\_%mortality

Grand mean 82.0

Concentration\_ug\_ml 10 100 1000

50.0 98.0 98.0

Standard errors of differences of means

Table Concentration\_ug\_ml

rep. 5

d.f. 12

s.e.d. 7.21

Tukey's 95% confidence intervals

Concentration\_ug\_ml

Difference Lower 95% Upper 95% Significant

Comparison

10 vs 100 -48.00 -67.24 -28.76 yes

10 vs 1000 -48.00 -67.24 -28.76 yes

100 vs 1000 0.00 -19.24 19.24 no

Mean

10 50.00 a

100 98.00 b

1000 98.00 b

**Data output 18: Descriptive statistics and comparison of the 72-hour dose-dependent mortality of *Naja ashei* venom by analysis of variance and Tukey’s post hoc test (Genstat 15th edition)**

Summary statistics for %72hr\_adjusted\_%mortality\_: Concentration\_ug\_ml\_\_ 10

Number of values = 5

Number of observations = 5

Mean = 66

Median = 70

Minimum = 50

Maximum = 80

Range = 30

Lower quartile = 57.5

Upper quartile = 72.5

Standard deviation = 11.40

Summary statistics for %72hr\_adjusted\_%mortality\_: Concentration\_ug\_ml\_\_ 100

Number of values = 5

Number of observations = 5

Mean = 86

Median = 80

Minimum = 80

Maximum = 100

Range = 20

Lower quartile = 80

Upper quartile = 92.5

Standard deviation = 8.944

Summary statistics for %72hr\_adjusted\_%mortality\_: Concentration\_ug\_ml\_\_ 1000

Number of values = 5

Number of observations = 5

Mean = 86

Median = 80

Minimum = 80

Maximum = 100

Range = 20

Lower quartile = 80

Upper quartile = 92.5

Standard deviation = 8.944

Analysis of variance

Variate: %72hr\_adjusted\_%mortality\_

Source of variation d.f. s.s. m.s. v.r. F pr.

Concentration\_ug\_ml\_\_ 2 1333.33 666.67 6.90 0.010

Residual 12 1160.00 96.67

Total 14 2493.33

Tables of means

Variate: %72hr\_adjusted\_%mortality\_

Grand mean 79.3

Concentration\_ug\_ml\_\_ 10 100 1000

66.0 86.0 86.0

Standard errors of differences of means

Table Concentration\_ug\_ml\_\_

rep. 5

d.f. 12

s.e.d. 6.22

Tukey's 95% confidence intervals

Concentration\_ug\_ml\_\_

Difference Lower 95% Upper 95% Significant

Comparison

10 vs 100 -20.00 -36.59 -3.411 yes

10 vs 1000 -20.00 -36.59 -3.411 yes

100 vs 1000 0.00 -16.59 16.589 no

Mean

10 66.00 a

100 86.00 b

1000 86.00 b

Table S5: Evaluation of the capacity of antivenoms to neutralize Naja ashei venom-induced brine shrimp lethality

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Vins Bioproducts** | | **PAN Africa Inoserp** | |
| **Treatment** | **%Mortality** | **Probits** | **%Mortality** | **Probits** |
| 2LC50 only  2LC50 only  2LC50 only  2LC50 only  2LC50 only | 100  100  100  100  100 | 8.9538  8.9538  8.9538  8.9538  8.9538 | 100  100  100  100  100 | 8.9538  8.9538  8.9538  8.9538  8.9538 |
| 2LC50 of venom+25µL of antivenom  2LC50 of venom+25µL of antivenom  2LC50 of venom+25µL of antivenom  2LC50 of venom+25µL of antivenom  2LC50 of venom+25µL of antivenom | 100  100  100  100  100 | 8.9538  8.9538  8.9538  8.9538  8.9538 | 80  0  100  100  100 | 5.8416  1.0334  8.9538  8.9538  8.9538 |
| 2LC50 of venom +50µL of antivenom  2LC50 of venom +50µL of antivenom  2LC50 of venom +50µL of antivenom  2LC50 of venom +50µL of antivenom  2LC50 of venom +50µL of antivenom | 100  100  100  100  100 | 8.9538  8.9538  8.9538  8.9538  8.9538 | 100  90  80  90  100 | 8.9538  6.2816  5.8416  6.2816  8.9538 |
| 2LC50 of venom +100µL of antivenom  2LC50 of venom +100µL of antivenom  2LC50 of venom +100µL of antivenom  2LC50 of venom +100µL of antivenom  2LC50 of venom +100µL of antivenom | 100  100  100  100  100 | 8.9538  8.9538  8.9538  8.9538  8.9538 | 80  80  100  80  80 | 5.8416  5.8416  8.9538  5.8416  5.8416 |
| 2LC50 of venom +200µL of antivenom  2LC50 of venom +200µL of antivenom  2LC50 of venom +200µL of antivenom  2LC50 of venom +200µL of antivenom  2LC50 of venom +200µL of antivenom | 100  100  100  100  100 | 8.9538  8.9538  8.9538  8.9538  8.9538 | 0  70  80  90  100 | 1.0334  5.5244  5.8416  6.2816  8.9538 |
| 2LC50 of venom +400µL of antivenom  2LC50 of venom +400µL of antivenom  2LC50 of venom +400µL of antivenom  2LC50 of venom +400µL of antivenom  2LC50 of venom +400µL of antivenom | 100  100  100  100  100 | 8.9538  8.9538  8.9538  8.9538  8.9538 | 70  100  90  0  100 | 5.5244  8.9538  6.2816  1.0334  8.9538 |

**Data output 19: Regression analysis to determine the capacity of antivenom II to neutralize *Naja ashei* venom-induced brine shrimp lethality (MS Excel 2013)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SUMMARY OUTPUT |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| *Regression Statistics* | |  |  |  |  |  |  |  |
| Multiple R | 0.16989061 |  |  |  |  |  |  |  |
| R Square | 0.028862819 |  |  |  |  |  |  |  |
| Adjusted R Square | -0.013360536 |  |  |  |  |  |  |  |
| Standard Error | 2.506960924 |  |  |  |  |  |  |  |
| Observations | 25 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 1 | 4.296167 | 4.296167 | 0.683574743 | 0.41685384 |  |  |  |
| Residual | 23 | 144.5516 | 6.284853 |  |  |  |  |  |
| Total | 24 | 148.8478 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 8.377375596 | 2.408094 | 3.47884 | 0.002030047 | 3.395853143 | 13.3589 | 3.395853 | 13.3589 |
| X Variable 1 | -0.973681535 | 1.177671 | -0.82679 | 0.41685384 | -3.409879328 | 1.462516 | -3.40988 | 1.462516 |