Análise de variância ictioplâncton
Teste do fator : Biótopo para ovos

▼File: Untitled1.syz

```
IMPORT successfully completed. Processed 7 variables and 107 cases.
```

```
> REM -- Following commands were produced by the ANOVA dialog:
> ANOVA
> DEPEND OVOS
> SUBCAT BIOTOPO / EFFECT
> COVAR
> SAVE 'C:\Users\FernandaT\SYSTAT\SYSTAT_13\Data\biotovores' / RESIDUALS
> ESTIMATE / SS = TYPE3
```

▼Analysis of Variance

```
Effects coding used for categorical variables in model.
The categorical values encountered during processing are

Variables          ¦        Levels
-------------------+----------------------
BIOTOPO (3 levels) ¦ 1,000   5,000   6,000

4 case(s) are deleted due to missing data.

Dependent Variable ¦  OVOS
N                  ¦   103
Multiple R         ¦ 0,218
Squared Multiple R ¦ 0,048
```

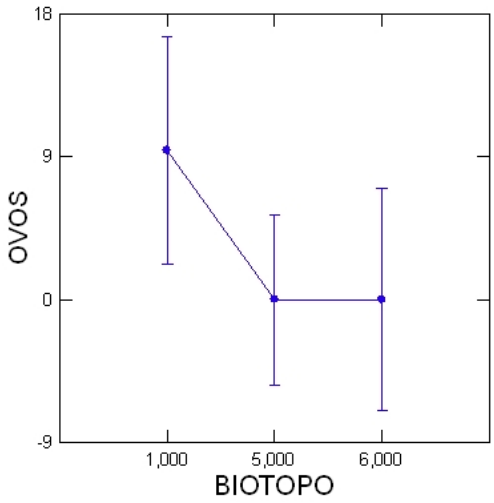
Estimates of Effects B = (X'X)⁻¹X'Y

```
Factor   ¦ Level     OVOS
---------+---------------
CONSTANT ¦          3,128
BIOTOPO  ¦ 1,000    6,253
BIOTOPO  ¦ 5,000   -3,126
```

Analysis of Variance

```
Source  ¦ Type III SS    df   Mean Squares   F-Ratio   p-Value
--------+-----------------------------------------------------
BIOTOPO ¦   1.752,778     2        876,389     2,499     0,087
Error   ¦  35.066,648   100        350,666
```

Least Squares Means



*** WARNING *** :

Case 54 is an Outlier (Studentized Residual : 39,043)

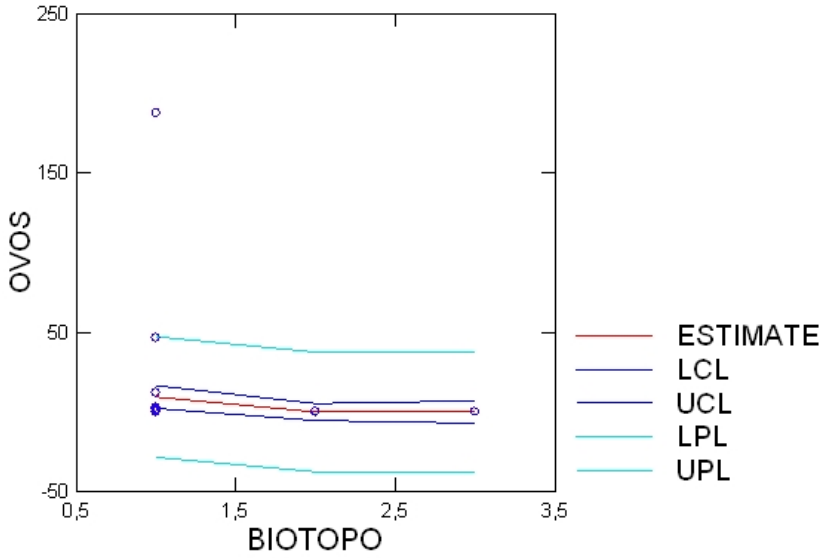
Durbin-Watson D-Statistic	1,614
First Order Autocorrelation	0,192

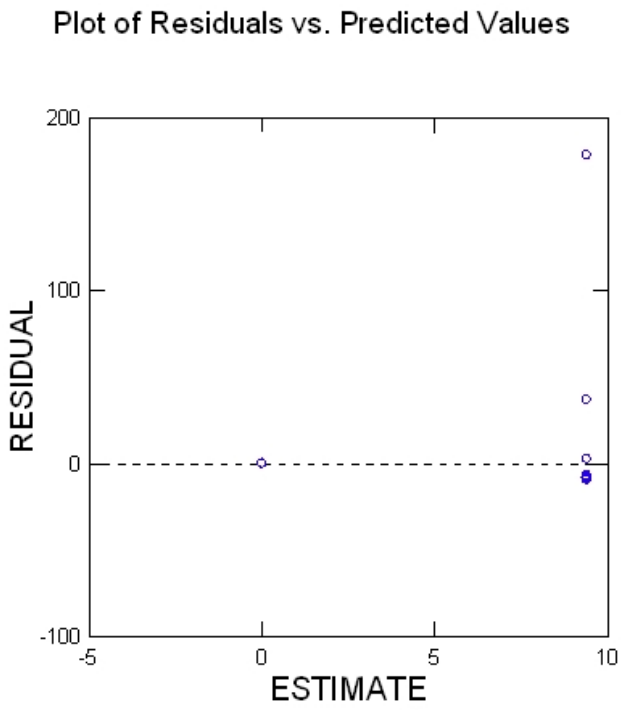
Information Criteria

AIC	900,820
AIC (Corrected)	901,228
Schwarz's BIC	911,359

Residuals have been saved.

Confidence Interval and Prediction Interval






```
> REM -- End of commands from the ANOVA dialog
> REM -- Following commands were produced by the ANOVAHYPO dialog:
> HYPOTHESIS
```

▼Hypothesis Tests

Test for effect called: BIOTOPO

Test of Hypothesis

Source	SS	df	Mean Squares	F-Ratio	p-Value
BIOTOPO	1.752,778	2	876,389	2,499	0,087
Error	35.066,648	100	350,666		

```
> EFFECT BIOTOPO
> TEST / CONFI = 0.95

> REM -- End of commands from the ANOVAHYPO dialog
```

Teste do fator : Coleta para ovos

▼File: Untitled1.syz

```
IMPORT successfully completed. Processed 7 variables and 107 cases.

> REM -- Following commands were produced by the ANOVA dialog:
> ANOVA
> DEPEND OVOS
> SUBCAT COLETA / EFFECT
> COVAR
> SAVE 'E:\coletovosres.syz' / RESIDUALS
> ESTIMATE / SS = TYPE3
```

▼Analysis of Variance

Effects coding used for categorical variables in model.
The categorical values encountered during processing are

Variables	Levels
COLETA (4 levels)	1,000 2,000 3,000 4,000

4 case(s) are deleted due to missing data.

Dependent Variable	OVOS
N	103
Multiple R	0,220
Squared Multiple R	0,049

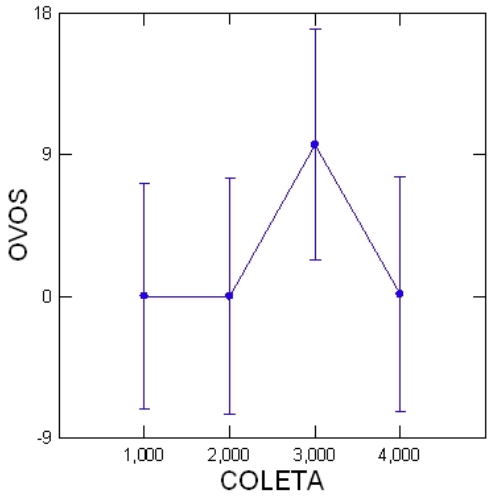
Estimates of Effects B = (X'X)$^{-1}$X'Y

Factor	Level	OVOS
CONSTANT		2,438
COLETA	1,000	-2,438
COLETA	2,000	-2,438
COLETA	3,000	7,189

Analysis of Variance

Source	Type III SS	df	Mean Squares	F-Ratio	p-Value
COLETA	1.786,447	3	595,482	1,683	0,176
Error	35.032,979	99	353,868		

Least Squares Means



*** WARNING *** :

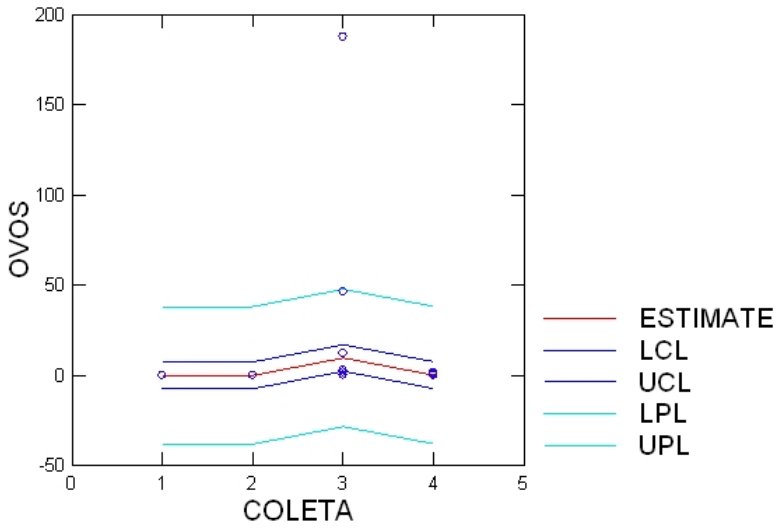
Case 54 is an Outlier (Studentized Residual : 38,744)

Durbin-Watson D-Statistic	1,603
First Order Autocorrelation	0,198

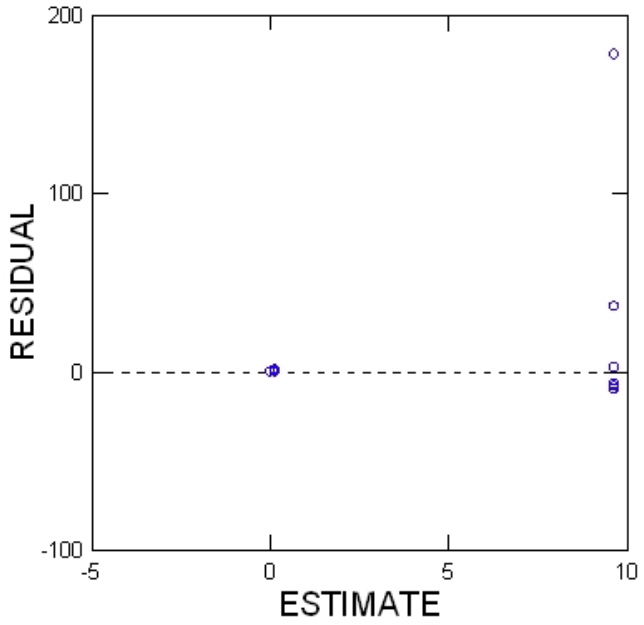
Information Criteria

```
AIC              ¦ 902,721
AIC (Corrected)  ¦ 903,339
Schwarz's BIC    ¦ 915,895

Residuals have been saved.
```

Confidence Interval and Prediction Interval



Plot of Residuals vs. Predicted Values




```
> REM -- End of commands from the ANOVA dialog
> REM -- Following commands were produced by the ANOVAHYPO dialog:
> HYPOTHESIS
```

▼Hypothesis Tests

Test for effect called: COLETA

Test of Hypothesis

Source	SS	df	Mean Squares	F-Ratio	p-Value
COLETA	1.786,447	3	595,482	1,683	0,176
Error	35.032,979	99	353,868		

```
> EFFECT COLETA
> TEST / CONFI = 0.95

> REM -- End of commands from the ANOVAHYPO dialog
```

Teste do fator : eixo para ovos

▼File: Untitled1.syz

```
IMPORT successfully completed. Processed 7 variables and 107 cases.

> REM -- Following commands were produced by the ANOVA dialog:
> ANOVA
> DEPEND OVOS
> SUBCAT EIXO / EFFECT
> COVAR
> SAVE 'E:\ovoeixores' / RESIDUALS
> ESTIMATE / SS = TYPE3
```

▼Analysis of Variance

```
Effects coding used for categorical variables in model.
The categorical values encountered during processing are
```

Variables	Levels
EIXO (2 levels)	1,000 2,000

```
4 case(s) are deleted due to missing data.
```

Dependent Variable	OVOS
N	103
Multiple R	0,196
Squared Multiple R	0,038

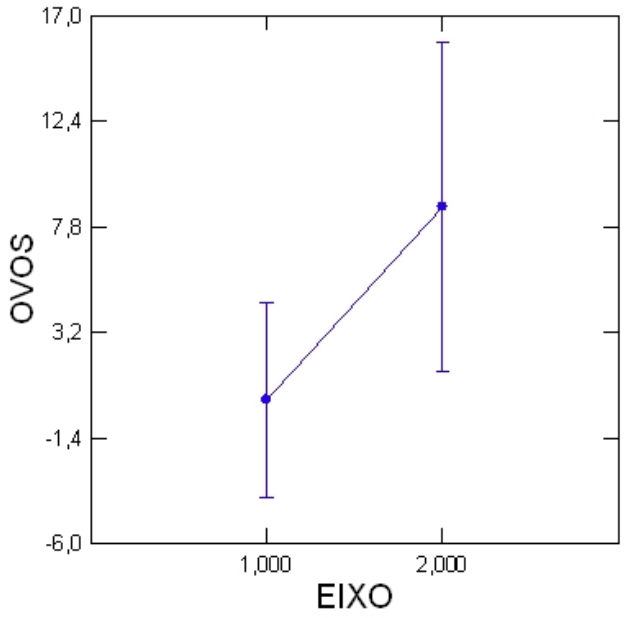
Estimates of Effects B = (X'X)$^{-1}$X'Y

Factor	Level	OVOS
CONSTANT		4,459
EIXO	1,000	-4,203

Analysis of Variance

Source	Type III SS	df	Mean Squares	F-Ratio	p-Value
EIXO	1.407,397	1	1.407,397	4,014	0,048
Error	35.412,029	101	350,614		

Least Squares Means



*** WARNING *** :

Case 54 is an Outlier (Studentized Residual : 38,691)

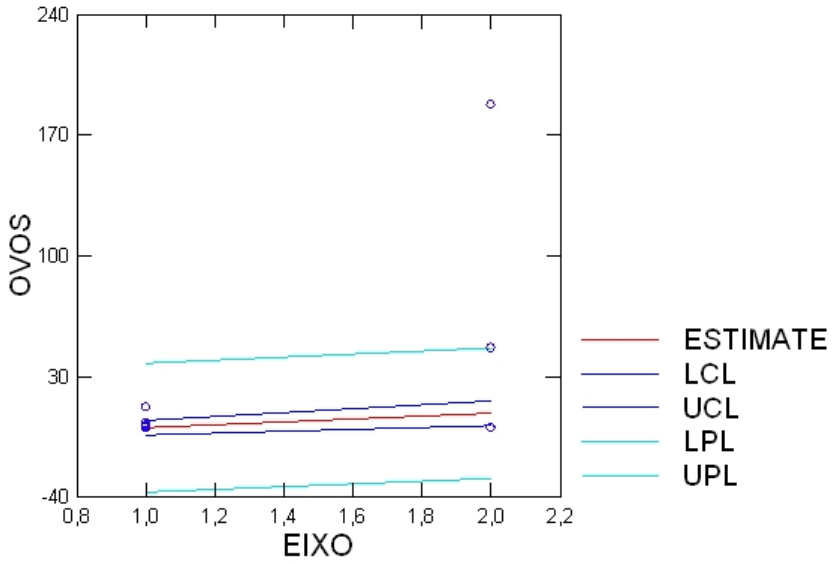
Durbin-Watson D-Statistic	1,582
First Order Autocorrelation	0,207

Information Criteria

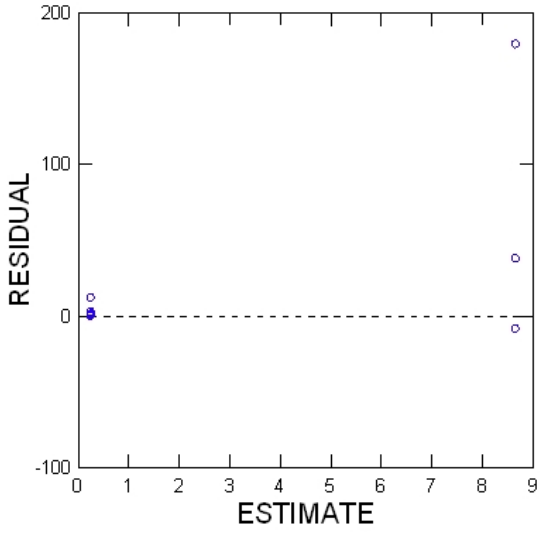
AIC	899,829
AIC (Corrected)	900,072
Schwarz's BIC	907,734

Residuals have been saved.

Confidence Interval and Prediction Interval



Plot of Residuals vs. Predicted Values




```
> REM -- End of commands from the ANOVA dialog
> REM -- Following commands were produced by the ANOVAHYPO dialog:
> HYPOTHESIS
```

▼Hypothesis Tests

Test for effect called: EIXO

Test of Hypothesis

Source	SS	df	Mean Squares	F-Ratio	p-Value
EIXO	1.407,397	1	1.407,397	4,014	0,048

```
Error  ¦ 35.412,029   101        350,614
> EFFECT EIXO
> TEST / CONFI = 0.95

> REM -- End of commands from the ANOVAHYPO dialog
```

Teste do fator: pontos para ovos

▼File: Untitled1.syz

```
IMPORT successfully completed. Processed 7 variables and 107 cases.

> REM -- Following commands were produced by the ANOVA dialog:
> ANOVA
> DEPEND OVOS
> SUBCAT PTS / EFFECT
> COVAR
> SAVE 'E:\ovoptres' / RESIDUALS
> ESTIMATE / SS = TYPE3
```

▼Analysis of Variance

```
Effects coding used for categorical variables in model.
The categorical values encountered during processing are

Variables       ¦                   Levels
----------------+-------------------------------------------
PTS (33 levels) ¦  1,000    2,000    3,000    4,000    5,000
                ¦  6,000    7,000   11,000   12,000   13,000
                ¦ 14,000   15,000   16,000   17,000   18,000
                ¦ 19,000   20,000   21,000   22,000   23,000
                ¦ 24,000   25,000   26,000   27,000   28,000
                ¦ 29,000   30,000   31,000   32,000   33,000
                ¦ 34,000   35,000   36,000

4 case(s) are deleted due to missing data.

Dependent Variable ¦  OVOS
N                  ¦   103
Multiple R         ¦ 0,487
Squared Multiple R ¦ 0,238
```

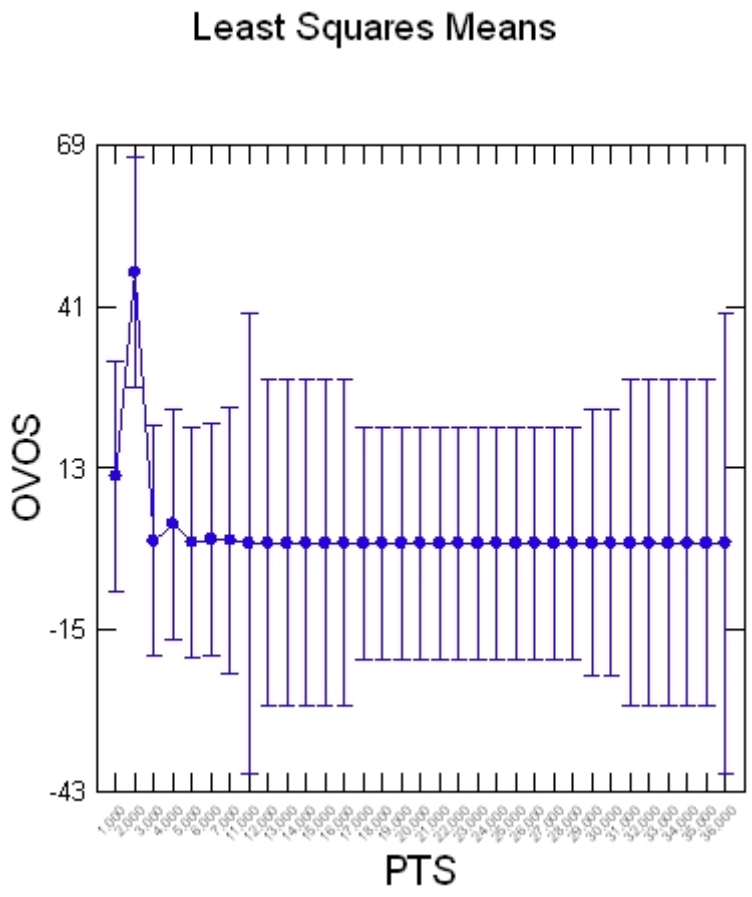
Estimates of Effects B = (X'X)⁻¹X'Y

Factor	Level	OVOS
CONSTANT		1,923
PTS	1,000	9,657
PTS	2,000	44,939
PTS	3,000	-1,523
PTS	4,000	1,394
PTS	5,000	-1,798
PTS	6,000	-1,248
PTS	7,000	-1,440
PTS	11,000	-1,923
PTS	12,000	-1,923
PTS	13,000	-1,923
PTS	14,000	-1,923
PTS	15,000	-1,923
PTS	16,000	-1,923

PTS	17,000	-1,923
PTS	18,000	-1,923
PTS	19,000	-1,923
PTS	20,000	-1,923
PTS	21,000	-1,923
PTS	22,000	-1,923
PTS	23,000	-1,923
PTS	24,000	-1,898
PTS	25,000	-1,923
PTS	26,000	-1,923
PTS	27,000	-1,923
PTS	28,000	-1,923
PTS	29,000	-1,923
PTS	30,000	-1,923
PTS	31,000	-1,923
PTS	32,000	-1,923
PTS	33,000	-1,923
PTS	34,000	-1,923
PTS	35,000	-1,923

Analysis of Variance

Source	Type III SS	df	Mean Squares	F-Ratio	p-Value
PTS	8.744,649	32	273,270	0,681	0,884
Error	28.074,777	70	401,068		



*** WARNING *** :

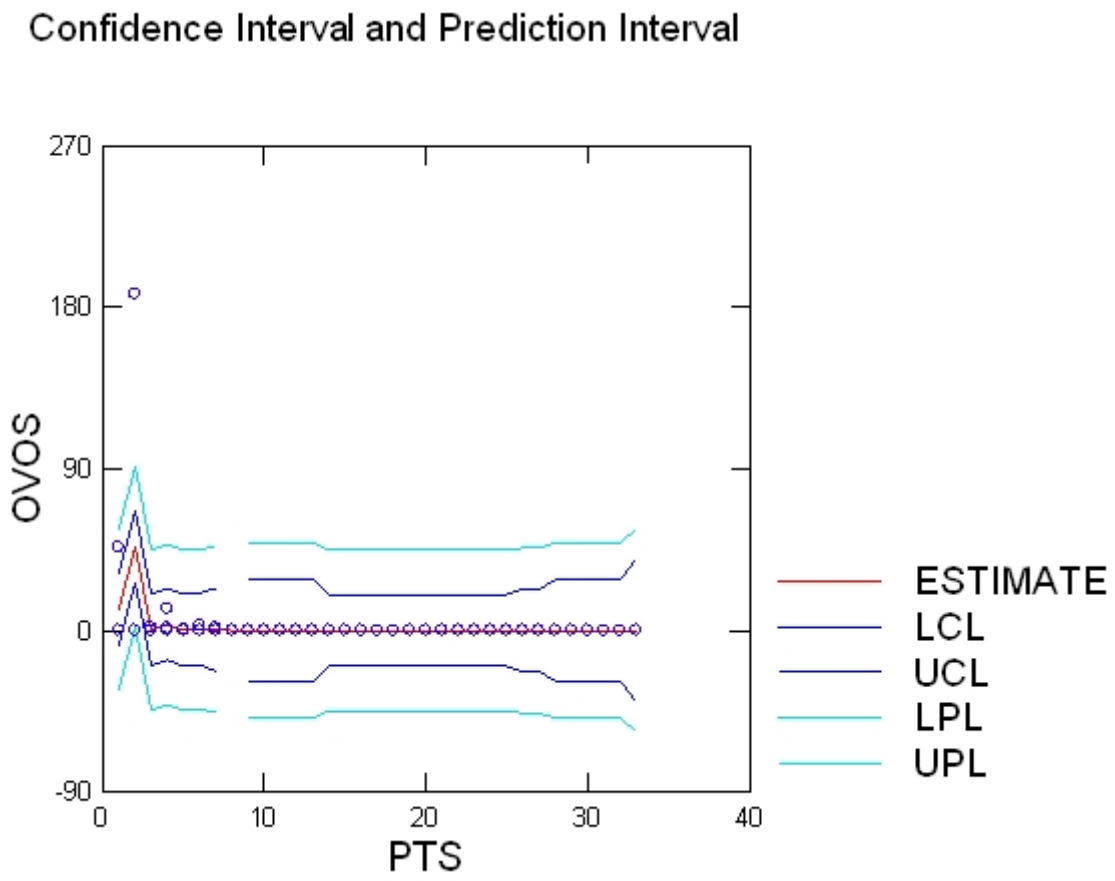
Case 54 is an Outlier (Studentized Residual : 32,499)

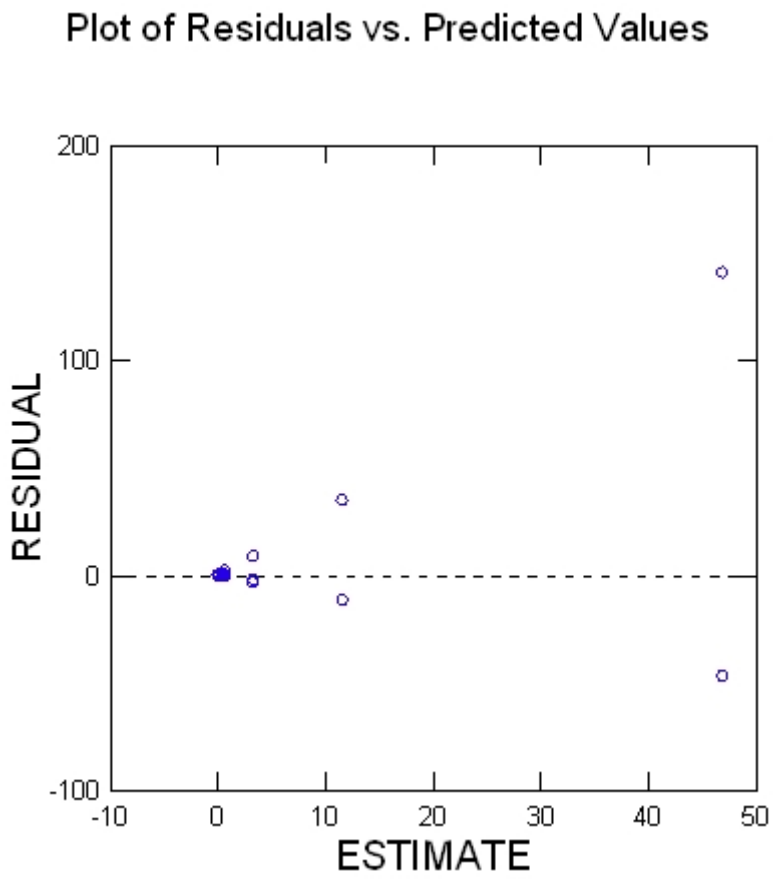
Durbin-Watson D-Statistic	1,514
First Order Autocorrelation	0,240

Information Criteria

AIC	937,915
AIC (Corrected)	972,915
Schwarz's BIC	1.027,496

Residuals have been saved.






```
> REM -- End of commands from the ANOVA dialog
> REM -- Following commands were produced by the ANOVAHYPO dialog:
> HYPOTHESIS
```

▼Hypothesis Tests

Test for effect called: PTS

Test of Hypothesis

Source	SS	df	Mean Squares	F-Ratio	p-Value
PTS	8.744,649	32	273,270	0,681	0,884
Error	28.074,777	70	401,068		

```
> EFFECT PTS
> TEST / CONFI = 0.95

> REM -- End of commands from the ANOVAHYPO dialog
```

Teste do fator : Biótopo para larvas

▼File: Untitled1.syz

```
IMPORT successfully completed. Processed 7 variables and 107 cases.

> REM -- Following commands were produced by the ANOVA dialog:
> ANOVA
> DEPEND LARVAS
> SUBCAT BIOTOPO / EFFECT
> COVAR
> SAVE 'E:\biolarvares' / RESIDUALS
> ESTIMATE / SS = TYPE3
```

▼Analysis of Variance

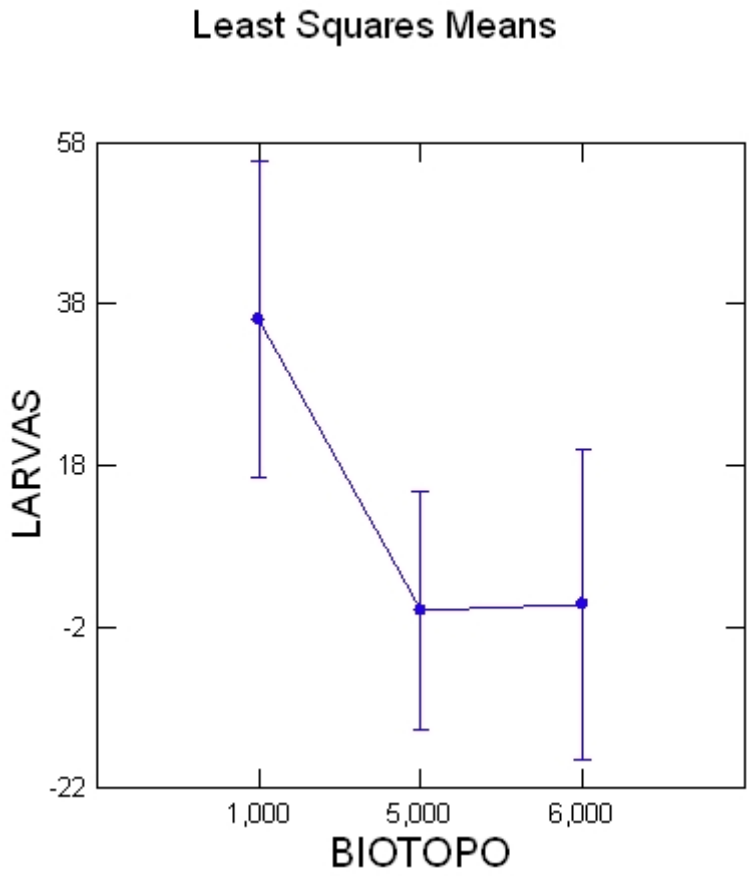
```
Effects coding used for categorical variables in model.
The categorical values encountered during processing are

Variables          ¦        Levels
-------------------+----------------------
BIOTOPO (3 levels) ¦ 1,000   5,000   6,000

4 case(s) are deleted due to missing data.

Dependent Variable ¦ LARVAS
N                  ¦    103
Multiple R         ¦  0,296
Squared Multiple R ¦  0,088
```

Estimates of Effects B = (X'X)⁻¹X'Y

Factor	Level	LARVAS
CONSTANT		12,265
BIOTOPO	1,000	23,750
BIOTOPO	5,000	-12,241

Analysis of Variance

Source	Type III SS	df	Mean Squares	F-Ratio	p-Value
BIOTOPO	25.430,689	2	12.715,344	4,806	0,010
Error	264.557,229	100	2.645,572		



*** WARNING *** :

Case 3 is an Outlier (Studentized Residual : 13,823)
Case 54 is an Outlier (Studentized Residual : 5,188)

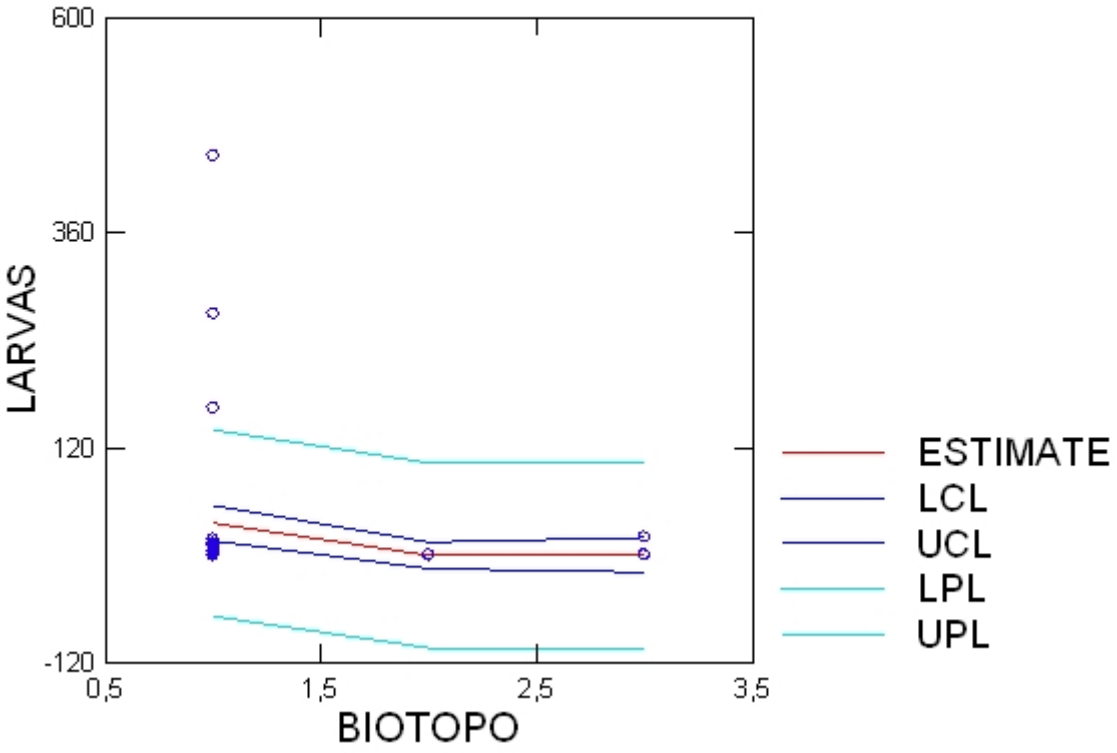
Durbin-Watson D-Statistic   ¦ 2,126
First Order Autocorrelation ¦ -0,094

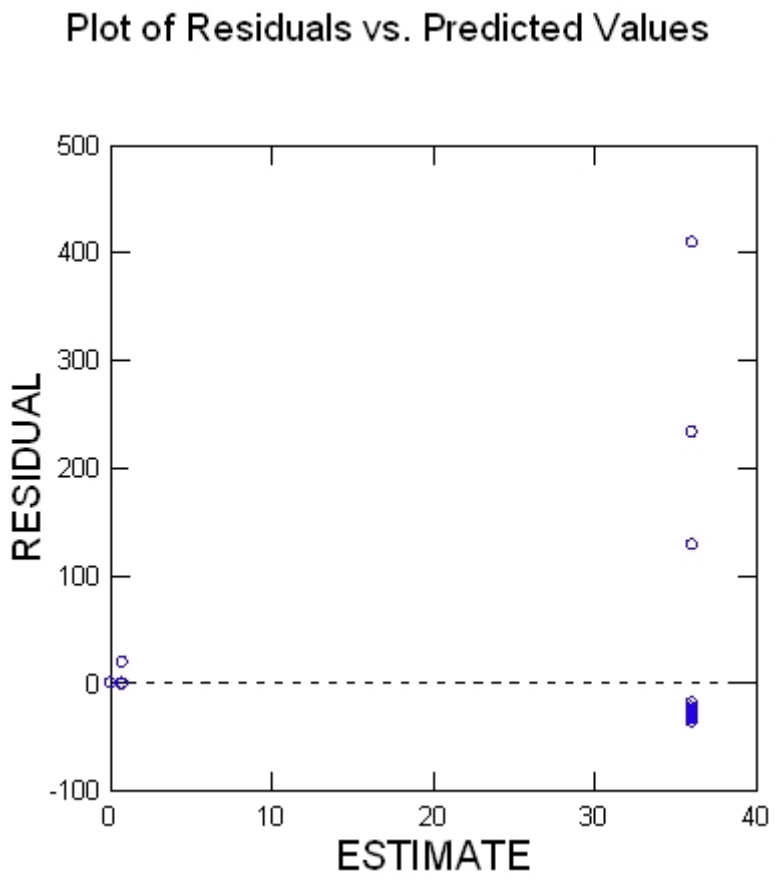
Information Criteria

AIC   ¦ 1.108,963
AIC (Corrected) ¦ 1.109,371
Schwarz's BIC   ¦ 1.119,502

Residuals have been saved.

Confidence Interval and Prediction Interval






```
> REM -- End of commands from the ANOVA dialog
> REM -- Following commands were produced by the ANOVAHYPO dialog:
> HYPOTHESIS
```

▼Hypothesis Tests

Test for effect called: BIOTOPO

Test of Hypothesis

Source	SS	df	Mean Squares	F-Ratio	p-Value
BIOTOPO	25.430,689	2	12.715,344	4,806	0,010
Error	264.557,229	100	2.645,572		

```
> EFFECT BIOTOPO
> TEST / CONFI = 0.95

> REM -- End of commands from the ANOVAHYPO dialog
```

Teste do fator: Coleta para larvas

▼File: Untitled1.syz

IMPORT successfully completed. Processed 7 variables and 107 cases.

```
> REM -- Following commands were produced by the ANOVA dialog:
> ANOVA
> DEPEND LARVAS
> SUBCAT COLETA / EFFECT
> COVAR
> SAVE 'E:\coletalarvares' / RESIDUALS
> ESTIMATE / SS = TYPE3
```

▼Analysis of Variance

Effects coding used for categorical variables in model.
The categorical values encountered during processing are

Variables	Levels
COLETA (4 levels)	1,000 2,000 3,000 4,000

4 case(s) are deleted due to missing data.

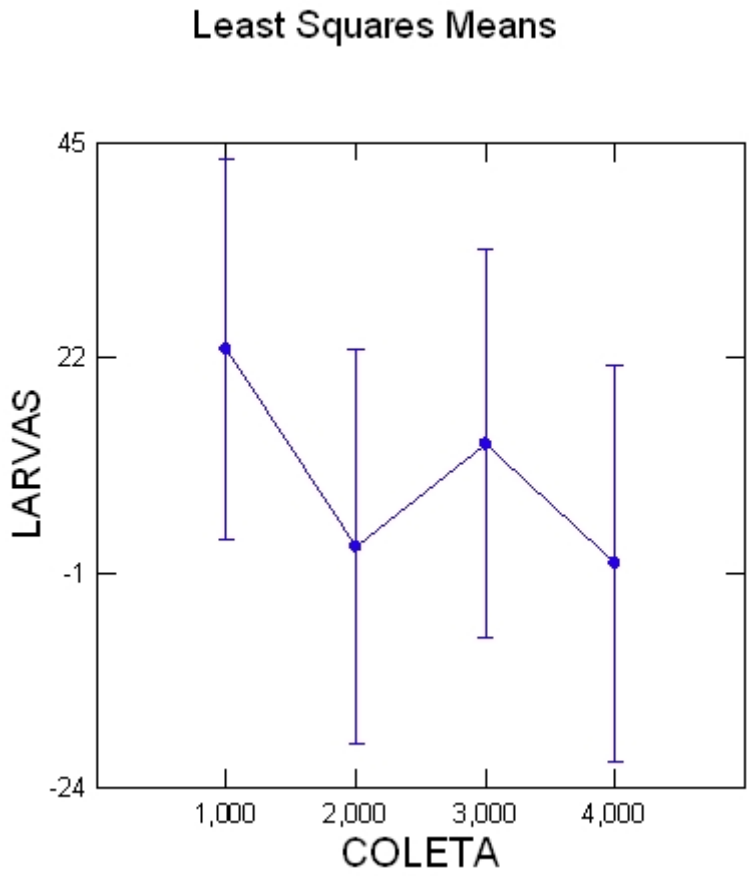
Dependent Variable	LARVAS
N	103
Multiple R	0,175
Squared Multiple R	0,030

Estimates of Effects B = (X'X)$^{-1}$X'Y

Factor	Level	LARVAS
CONSTANT		9,362
COLETA	1,000	13,521
COLETA	2,000	-7,578
COLETA	3,000	3,383

Analysis of Variance

Source	Type III SS	df	Mean Squares	F-Ratio	p-Value
COLETA	8.835,108	3	2.945,036	1,037	0,380
Error	281.152,809	99	2.839,927		



*** WARNING *** :

Case 3 is an Outlier (Studentized Residual : 13,798)
Case 54 is an Outlier (Studentized Residual : 5,619)

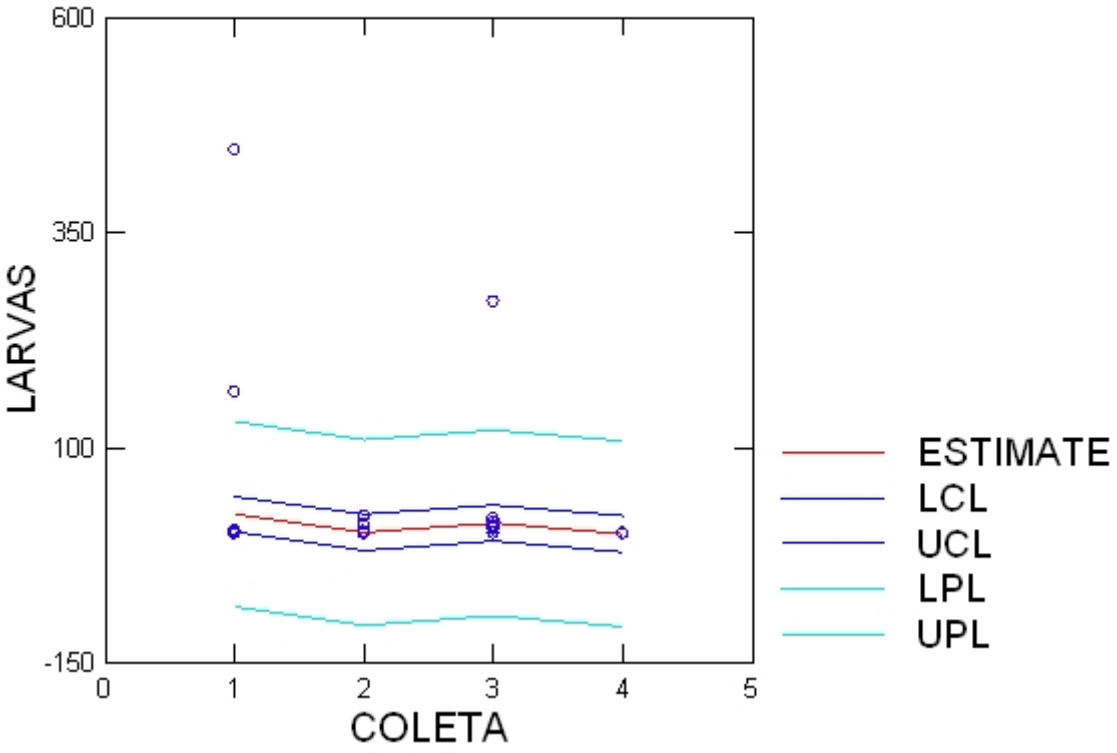
Durbin-Watson D-Statistic	1,976
First Order Autocorrelation	-0,024

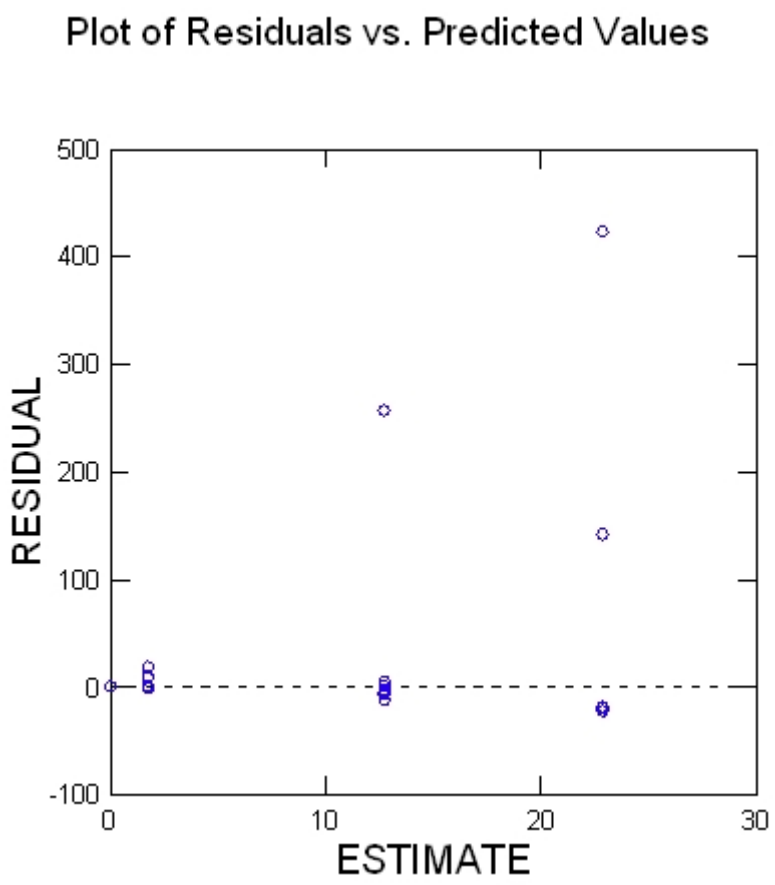
Information Criteria

AIC	1.117,230
AIC (Corrected)	1.117,848
Schwarz's BIC	1.130,403

Residuals have been saved.

Confidence Interval and Prediction Interval






```
> REM -- End of commands from the ANOVA dialog
> REM -- Following commands were produced by the ANOVAHYPO dialog:
> HYPOTHESIS
```

▼Hypothesis Tests

Test for effect called: COLETA

Test of Hypothesis

Source	SS	df	Mean Squares	F-Ratio	p-Value
COLETA	8.835,108	3	2.945,036	1,037	0,380
Error	281.152,809	99	2.839,927		

```
> EFFECT COLETA
> TEST / CONFI = 0.95

> REM -- End of commands from the ANOVAHYPO dialog
```

Teste do fator: eixo para larvas

▼File: Untitled1.syz

```
IMPORT successfully completed. Processed 7 variables and 107 cases.

> REM -- Following commands were produced by the ANOVA dialog:
> ANOVA
> DEPEND LARVAS
> SUBCAT EIXO / EFFECT
> COVAR
> SAVE 'E:\larvaeixores' / RESIDUALS
> ESTIMATE / SS = TYPE3
```

▼Analysis of Variance

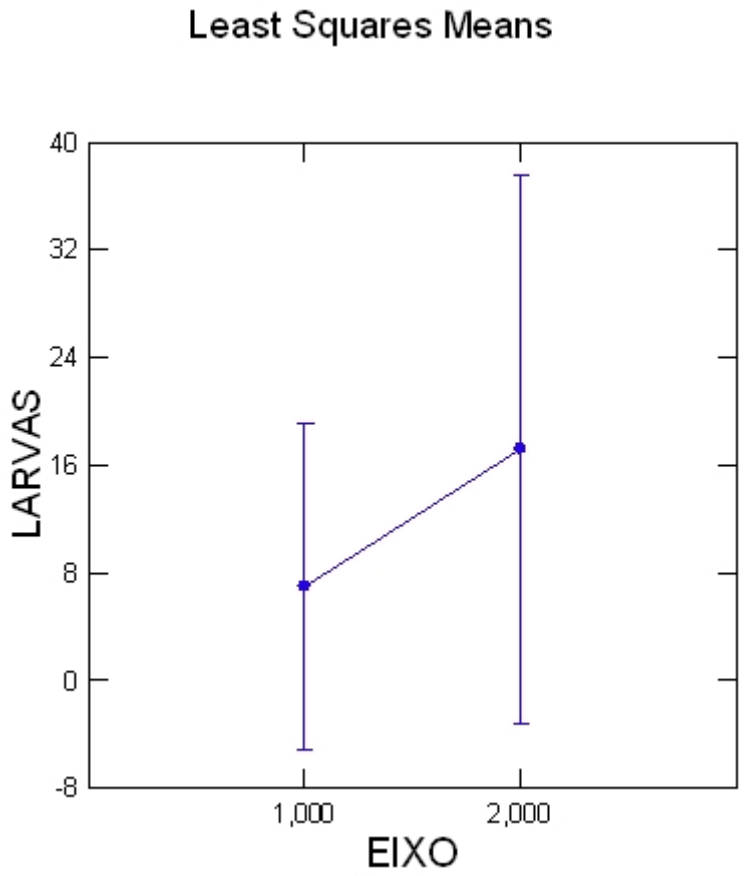
```
Effects coding used for categorical variables in model.
The categorical values encountered during processing are

Variables       ¦    Levels
----------------+--------------
EIXO (2 levels) ¦ 1,000   2,000

4 case(s) are deleted due to missing data.

Dependent Variable ¦ LARVAS
N                  ¦    103
Multiple R         ¦  0,085
Squared Multiple R ¦  0,007
```

Estimates of Effects B = (X'X)⁻¹X'Y

```
Factor   ¦ Level   LARVAS
---------+---------------
CONSTANT ¦         12,095
EIXO     ¦ 1,000   -5,123
```

Analysis of Variance

```
Source ¦ Type III SS    df   Mean Squares   F-Ratio   p-Value
-------+-----------------------------------------------------
EIXO   ¦   2.091,737     1      2.091,737     0,734     0,394
Error  ¦ 287.896,181   101      2.850,457
```



*** WARNING *** :

Case 3 is an Outlier (Studentized Residual : 14,490)
Case 54 is an Outlier (Studentized Residual : 5,456)

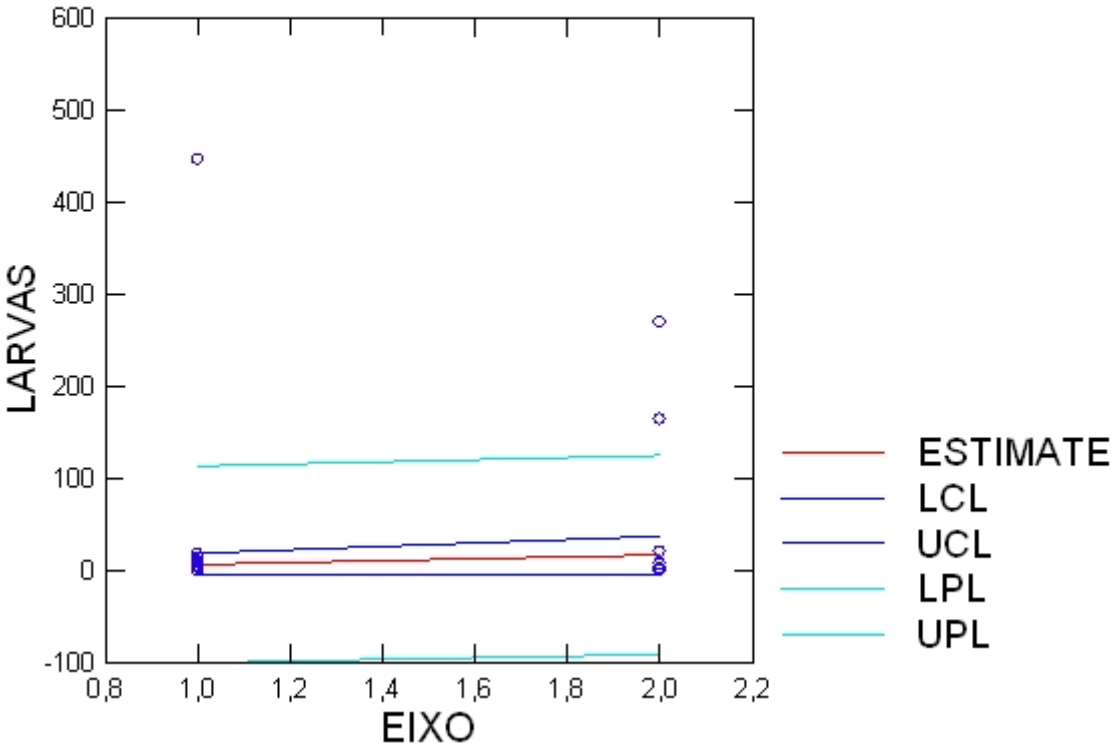
Durbin-Watson D-Statistic   ¦ 1,952
First Order Autocorrelation ¦ -0,014

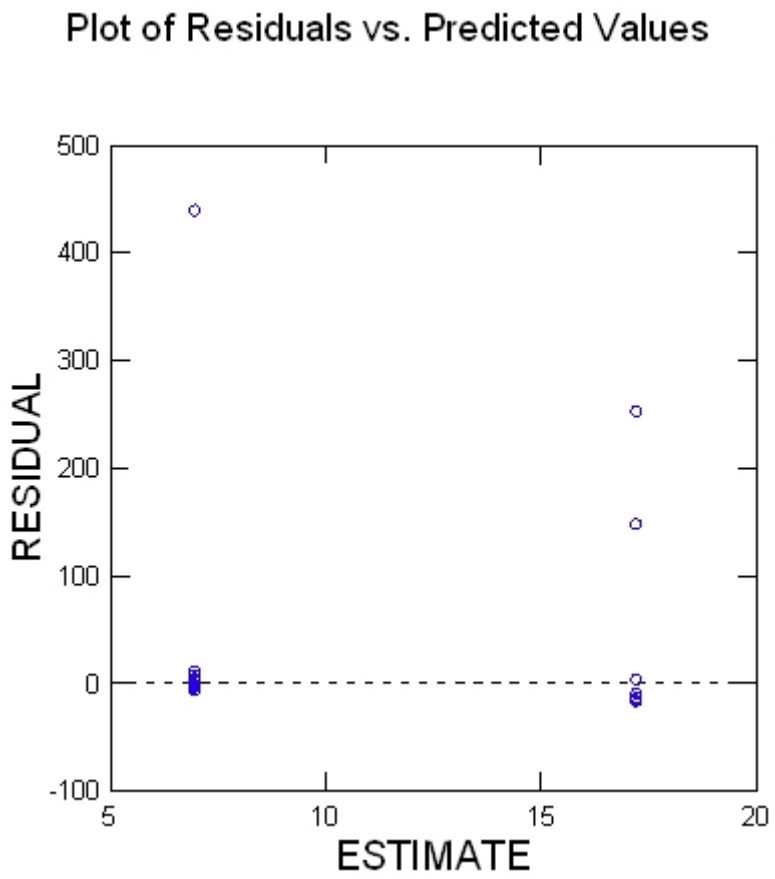
Information Criteria

AIC   ¦ 1.115,671
AIC (Corrected) ¦ 1.115,913
Schwarz's BIC   ¦ 1.123,575

Residuals have been saved.

Confidence Interval and Prediction Interval






```
> REM -- End of commands from the ANOVA dialog
> REM -- Following commands were produced by the ANOVAHYPO dialog:
> HYPOTHESIS
```

▼Hypothesis Tests

Test for effect called: EIXO

Test of Hypothesis

Source	SS	df	Mean Squares	F-Ratio	p-Value
EIXO	2.091,737	1	2.091,737	0,734	0,394
Error	287.896,181	101	2.850,457		

```
> EFFECT EIXO
> TEST / CONFI = 0.95

> REM -- End of commands from the ANOVAHYPO dialog
```

Teste do fator: pontos para larvas

▼File: Untitled1.syz

```
IMPORT successfully completed. Processed 7 variables and 107 cases.

> REM -- Following commands were produced by the ANOVA dialog:
> ANOVA
> DEPEND LARVAS
> SUBCAT PTS / EFFECT
> COVAR
> SAVE 'E:\larvaptres' / RESIDUALS
> ESTIMATE / SS = TYPE3
```

▼Analysis of Variance

```
Effects coding used for categorical variables in model.
The categorical values encountered during processing are

Variables       ¦                    Levels
----------------+-------------------------------------------
PTS (33 levels) ¦  1,000    2,000    3,000    4,000    5,000
                ¦  6,000    7,000   11,000   12,000   13,000
                ¦ 14,000   15,000   16,000   17,000   18,000
                ¦ 19,000   20,000   21,000   22,000   23,000
                ¦ 24,000   25,000   26,000   27,000   28,000
                ¦ 29,000   30,000   31,000   32,000   33,000
                ¦ 34,000   35,000   36,000

4 case(s) are deleted due to missing data.

Dependent Variable ¦ LARVAS
N                  ¦    103
Multiple R         ¦  0,492
Squared Multiple R ¦  0,242
```

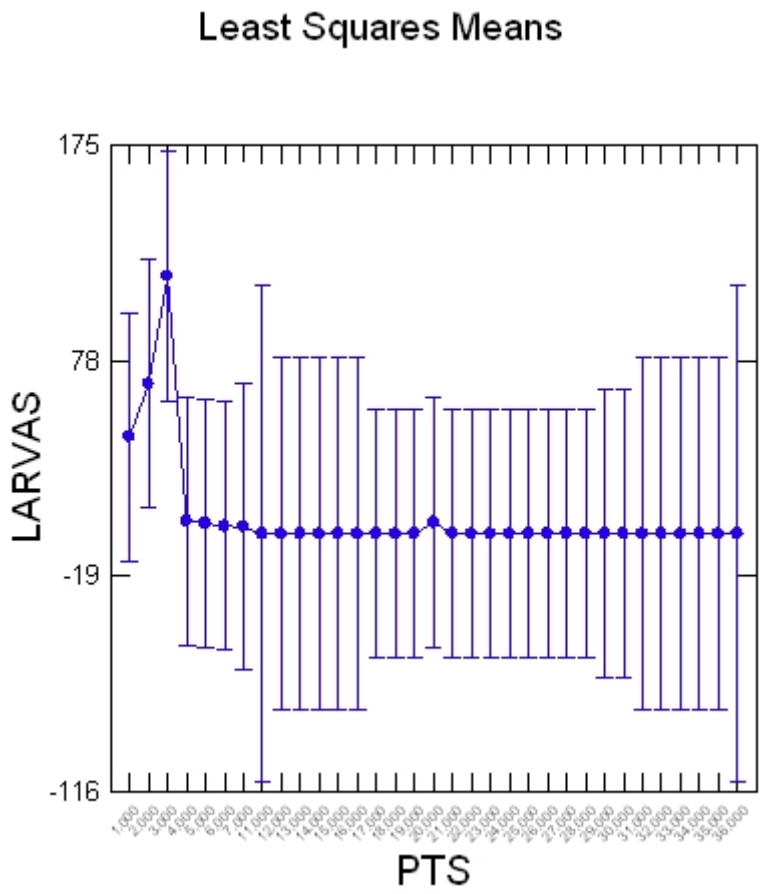
Estimates of Effects B = (X'X)$^{-1}$X'Y

Factor	Level	LARVAS
CONSTANT		7,560
PTS	1,000	36,027
PTS	2,000	59,835
PTS	3,000	108,295
PTS	4,000	-1,882
PTS	5,000	-2,801
PTS	6,000	-4,060
PTS	7,000	-4,453
PTS	11,000	-7,560
PTS	12,000	-7,560
PTS	13,000	-7,560
PTS	14,000	-7,560
PTS	15,000	-7,560
PTS	16,000	-7,560
PTS	17,000	-7,560
PTS	18,000	-7,560
PTS	19,000	-7,560
PTS	20,000	-2,504
PTS	21,000	-7,373
PTS	22,000	-7,560
PTS	23,000	-7,560
PTS	24,000	-7,560
PTS	25,000	-7,512
PTS	26,000	-7,560

PTS	27,000	-7,391
PTS	28,000	-7,455
PTS	29,000	-7,533
PTS	30,000	-7,560
PTS	31,000	-7,560
PTS	32,000	-7,560
PTS	33,000	-7,560
PTS	34,000	-7,560
PTS	35,000	-7,560

Analysis of Variance

Source	Type III SS	df	Mean Squares	F-Ratio	p-Value
PTS	70.250,031	32	2.195,313	0,699	0,867
Error	219.737,886	70	3.139,113		



*** WARNING *** :

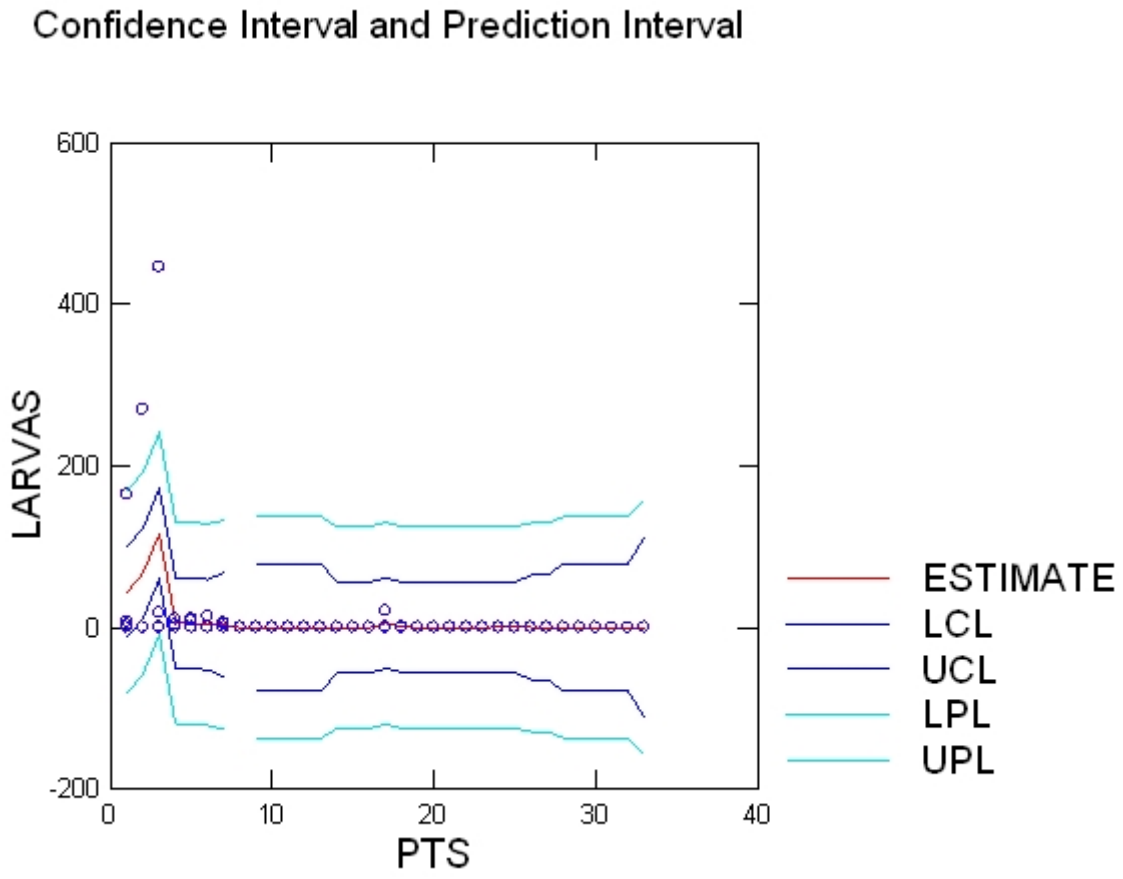
Case 3 is an Outlier (Studentized Residual : 11,573)
Case 54 is an Outlier (Studentized Residual : 4,765)

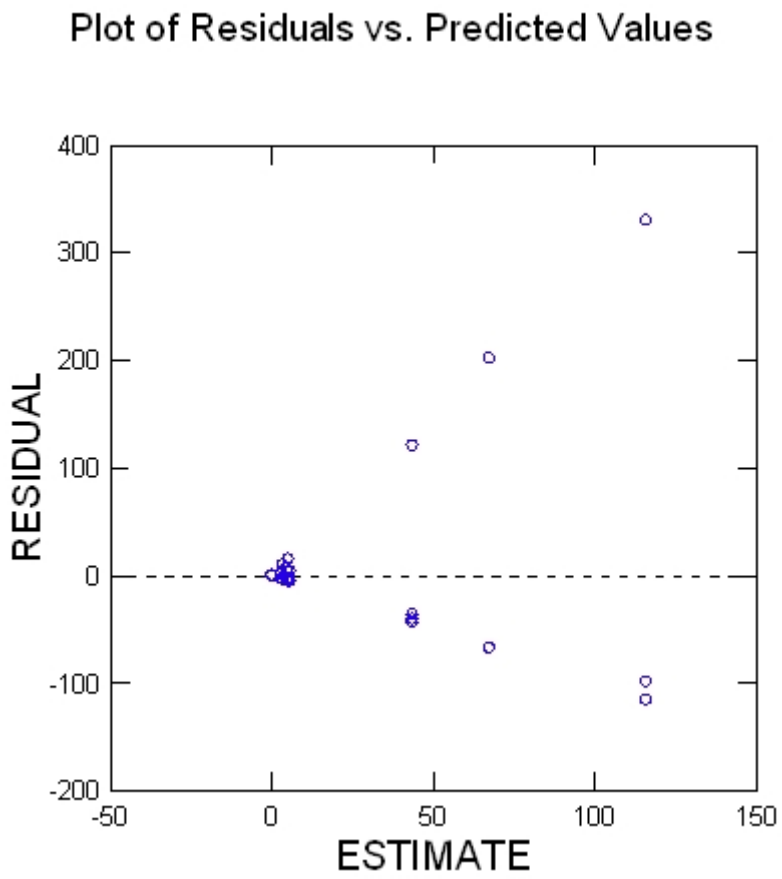
Durbin-Watson D-Statistic	2,273
First Order Autocorrelation	-0,169

Information Criteria

AIC	1.149,844
AIC (Corrected)	1.184,844
Schwarz's BIC	1.239,425

Residuals have been saved.






```
> REM -- End of commands from the ANOVA dialog
> REM -- Following commands were produced by the ANOVAHYPO dialog:
> HYPOTHESIS
```

▼Hypothesis Tests

Test for effect called: PTS

Test of Hypothesis

Source	SS	df	Mean Squares	F-Ratio	p-Value
PTS	70.250,031	32	2.195,313	0,699	0,867
Error	219.737,886	70	3.139,113		

```
> EFFECT PTS
> TEST / CONFI = 0.95

> REM -- End of commands from the ANOVAHYPO dialog
```