Short Paper

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Abstract

This is the abstract.

It consists of two paragraphs.

Methods

All analysis were carried away with the R Statistical Software (R Core Team 2016), all meta-analyses were made on the metafor package (Viechtbauer 2010). Our estimations were based on the use of random/mixed-effects models form of meta-analyses, which provide an unconditional inference about a larger set of studies from which the k studies included in the meta-analysis are assumed to be a random sample (L. V. Hedges and Vevea 1998). This estimations do not assume that this larger set consists only of studies that have actually been conducted, but instead envision a hypothetical population of studies that comprises studies that have been conducted, that could have been conducted, or that may be conducted in the future (L. V. Hedges and Vevea 1998).

We used the *escalc* function of the metafor package to estimate the effect size estimates (Viechtbauer 2010), we used the *standardized mean difference with heteroscedastic population variances in the two groups* (SDMH) as our estimator for effect size (Bonett 2009), the metafor package also corrects the slight positive bias of the estimation following (Wasserman, Hedges, and Olkin 1988). To be extra conservative we used the unbiased estimates of the sampling variances. In all cases the residual heterogeneity estimator was Hedges.

Since we used mixed effect models we used the The Knapp and Hartung adjustment **(Knapp and Hartung, 2003)** to test the individual coefficients of the model.

Test for (Residual) Heterogeneity

For each model we tested for residual heterogeneity, if we used models without moderators, then the Cochran's Q-test (Cochran 1954) was used to test whether the variability in the observed effect sizes or outcomes is larger than would be expected based on sampling variability alone. *A significant test suggests that the true effects or outcomes are heterogeneous.* When moderators were included in the models the Q_E-test for residual heterogeneity was used, this tests whether the variability in the observed effect sizes or outcomes not accounted for by the moderators included in the model is larger than would be expected based on sampling variability alone. When using moderators to explain more variability a pseudo R squared was computed following (Raudenbush 2009).

Results

As we can see in figure 1, the most common type of performance measured in studies was abundance, with 101 estimations, followed by reproduction with 44 estimation, behavior with 23, and finally survival and condition with 16 each.

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Table 1: effect size of the Standardized mean difference for each type of estimation of performance, it's standard error and p-value

estimate	ci.ub	ci.lb	group	p	n	I2	pvalCT
-0.917	-0.423	-1.410	Abundance	0.000	101	90.594	0
-2.508	0.940	-5.957	Behavior	0.154	23	99.742	0
-5.319	-1.556	-9.083	Survival	0.006	16	98.756	0
-3.366	13.710	-20.441	Reproduction	0.699	44	99.995	0
-1.078	-0.128	-2.027	Condition	0.026	16	98.597	0

Overall effect size

As we can see in table 1 and figure 2, all estimations of the effects are negative. However, only abundance, survival and condition have significative negative effects. Survival has the highest effect size, with a mean difference estimation of -5.32

Estimations using moderators:

Abundance

Comparison of models

Table 2: Comparison of models taking into account p value, Pseudo R squared and AICc

model	p_value	R_squared	AICc	deltaAICc	Weight
y ~ Concentration [g/kg] + Nesting Area + Functional Group	0.013	0.37	132.095	0.000	0.363
y ~ Concentration [g/kg] + Functional group	0.017	0.32	132.421	0.326	0.309
y ~ Concentration [g/kg]	0.019	0.27	132.915	0.820	0.241
y ~ Concentration [g/kg] + Nesting Area	0.052	0.26	134.968	2.872	0.086
y ~ Concentration [kg/ha] + Nesting Area + Functional Group	0.019	0.36	164.602	32.507	0.000
y ~ Concentration [Kg/Ha]	0.165	0.04	164.902	32.807	0.000
y ~ 1	0.000	0.00	463.583	331.488	0.000
y ~ Functional group	0.106	0.06	464.017	331.922	0.000
y ~ Nesting Area	0.532	0.00	466.648	334.553	0.000
y ~ Order + Functional group	0.028	0.17	472.253	340.158	0.000

Behaviour

Comparison of models

Table 3: Comparison of models taking into account p value, Pseudo R squared and AICc

model	p_value	R_squared	AICc	deltaAICc	Weight
y ~ Concentration [ppb]	0.107	0.05	142.911	0.000	0.54
y ~ Concentration + neonic type	0.090	0.15	143.231	0.320	0.46
y ~ study type	0.110	0.08	166.687	23.776	0.00
y ~ neonic type	0.181	0.04	167.467	24.556	0.00

model	p_value	R_squared	AICc	deltaAICc	Weight
y ~ Treatment type	0.460	0.00	170.758	27.847	0.00
y ~ Treatment type + Functional group	0.375	0.02	175.035	32.124	0.00

Reproduction

Comparison of models

Table 4: Comparison of models taking into account p value, Pseudo R squared and AICc

model	p_value	R_squared	AICc	deltaAICc	Weight
y ~ Concentration [ppb] + Neonic type	0.000	0.43	213.923	0.000	1
y ~ Concentration [ppb]	0.194	0.01	235.285	21.362	0
y ~ Order + Nesting Area	0.940	0.00	471.357	257.434	0
y ~ Order + Functional group	0.513	0.08	476.834	262.912	0

References

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List of Figures

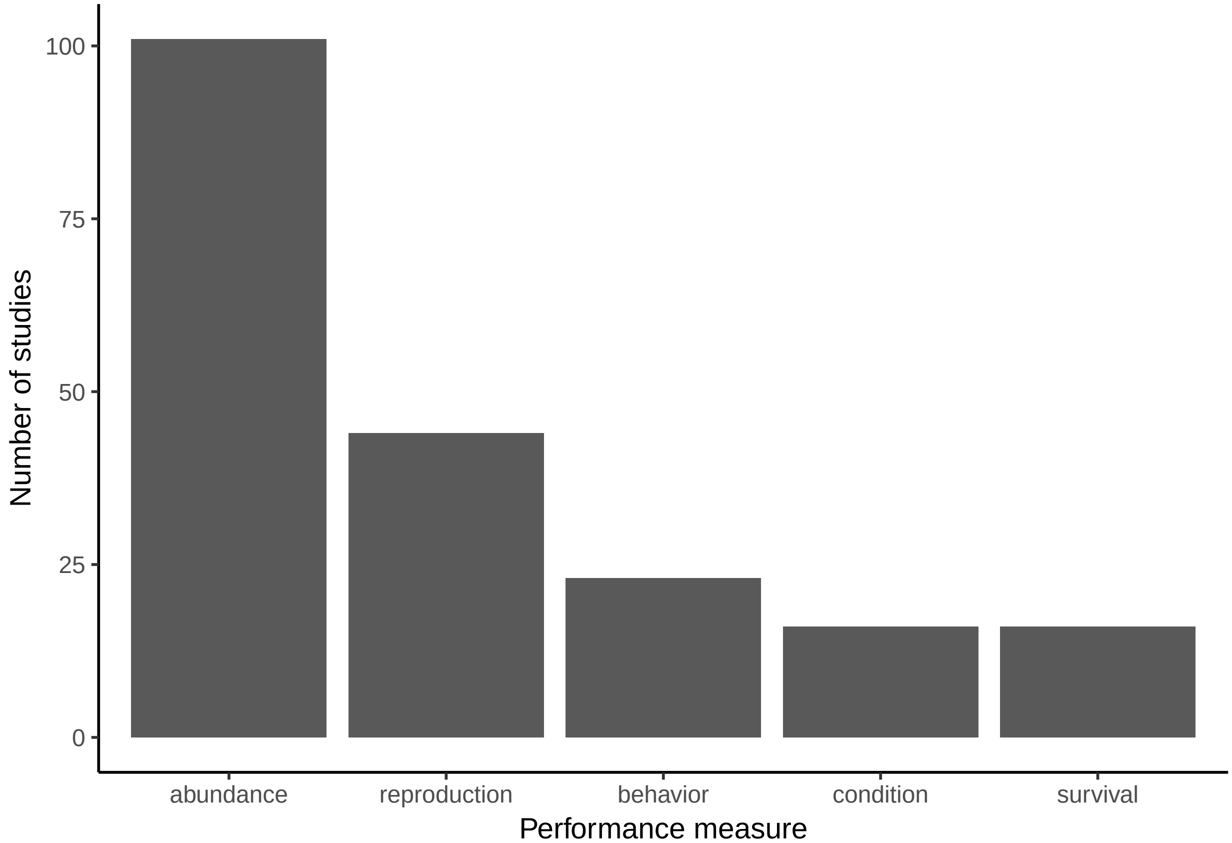

Figure 1: Number of estimation of effect size within the meta-analyses

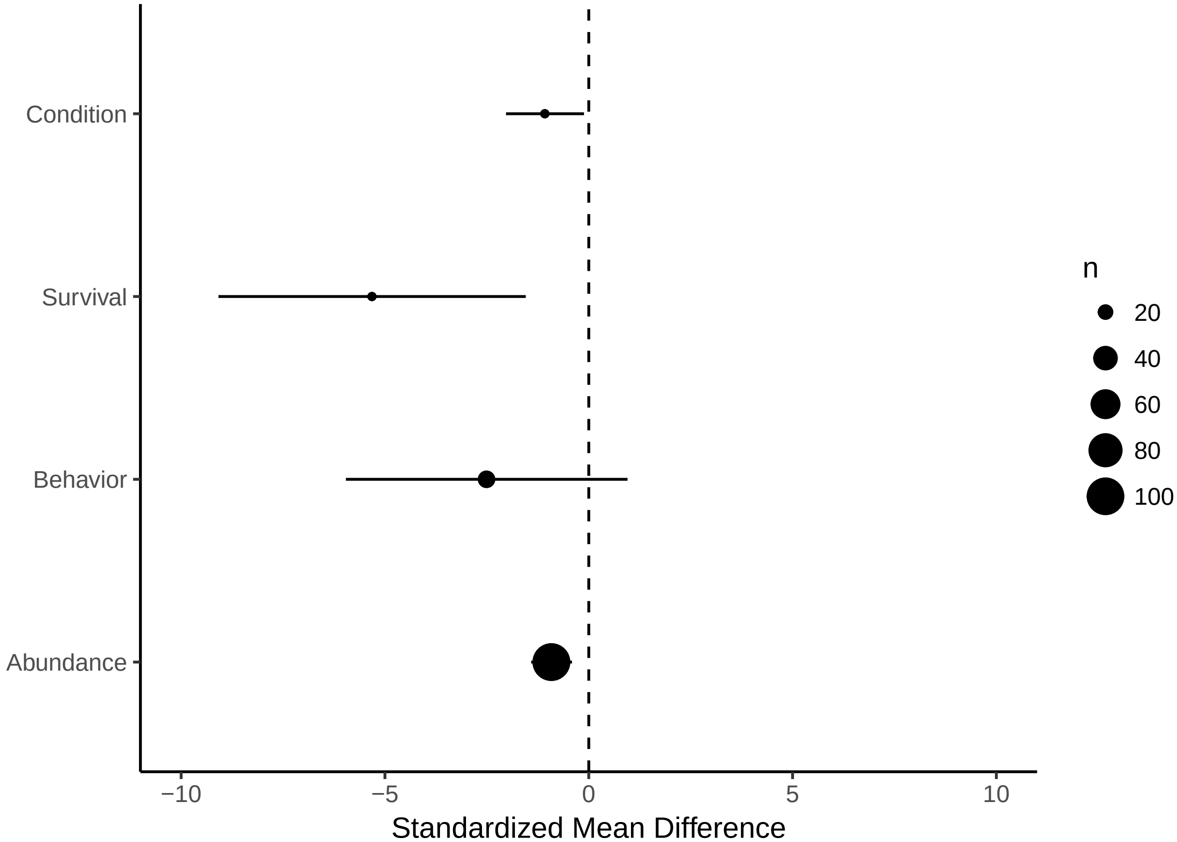

Figure 2: effect size of the Standardized mean difference for each type of estimation of performance and it's standard error

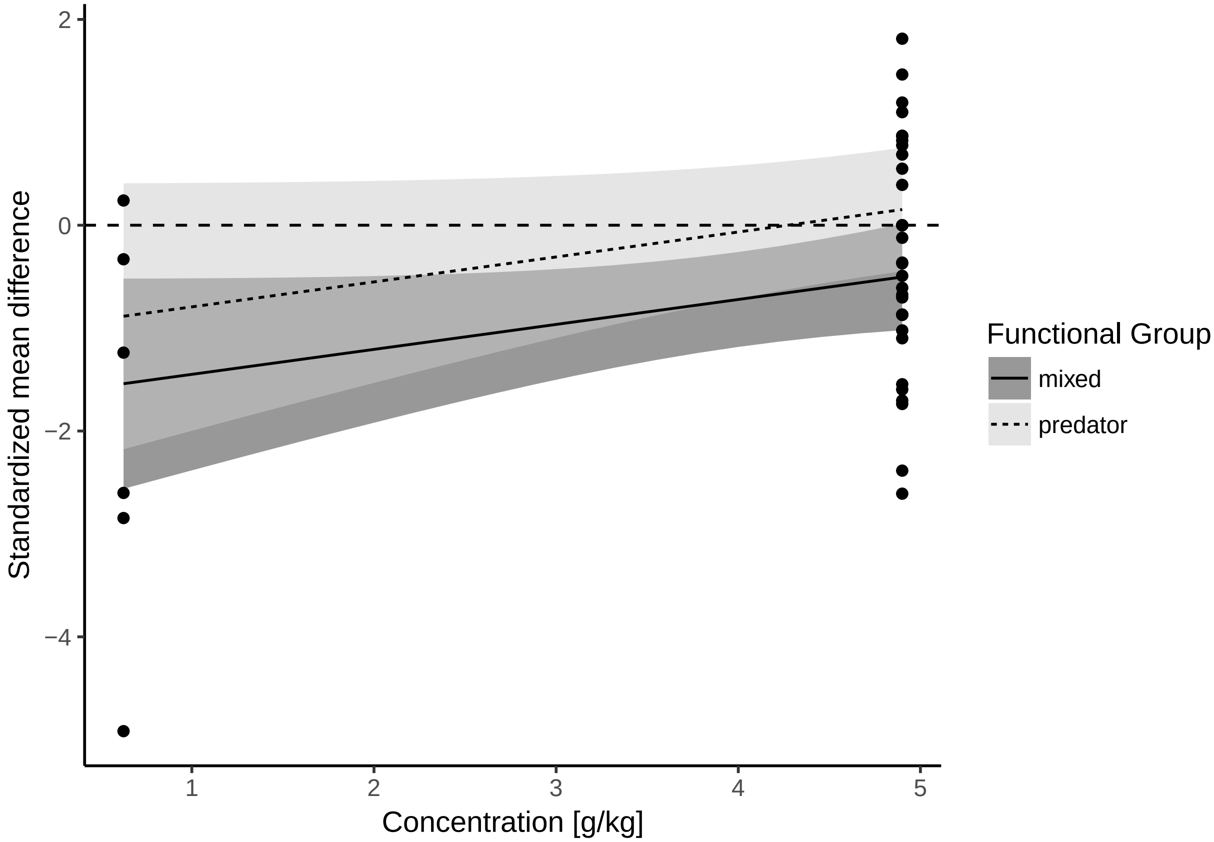

Figure 3: effect size of the Standardized mean difference of Abundance and concentration [g/Kg]

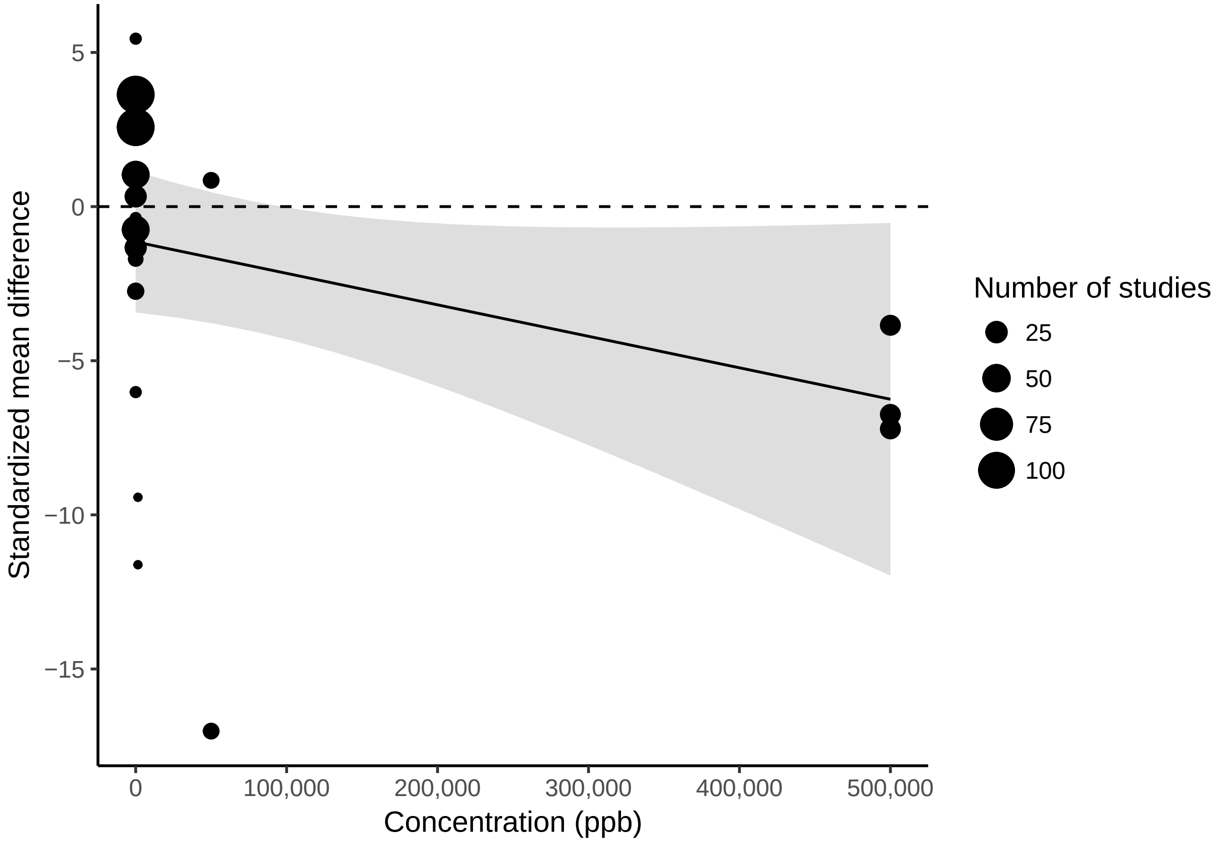

Figure 4: effect size of the Standardized mean difference of behavior and concentration (ppb)

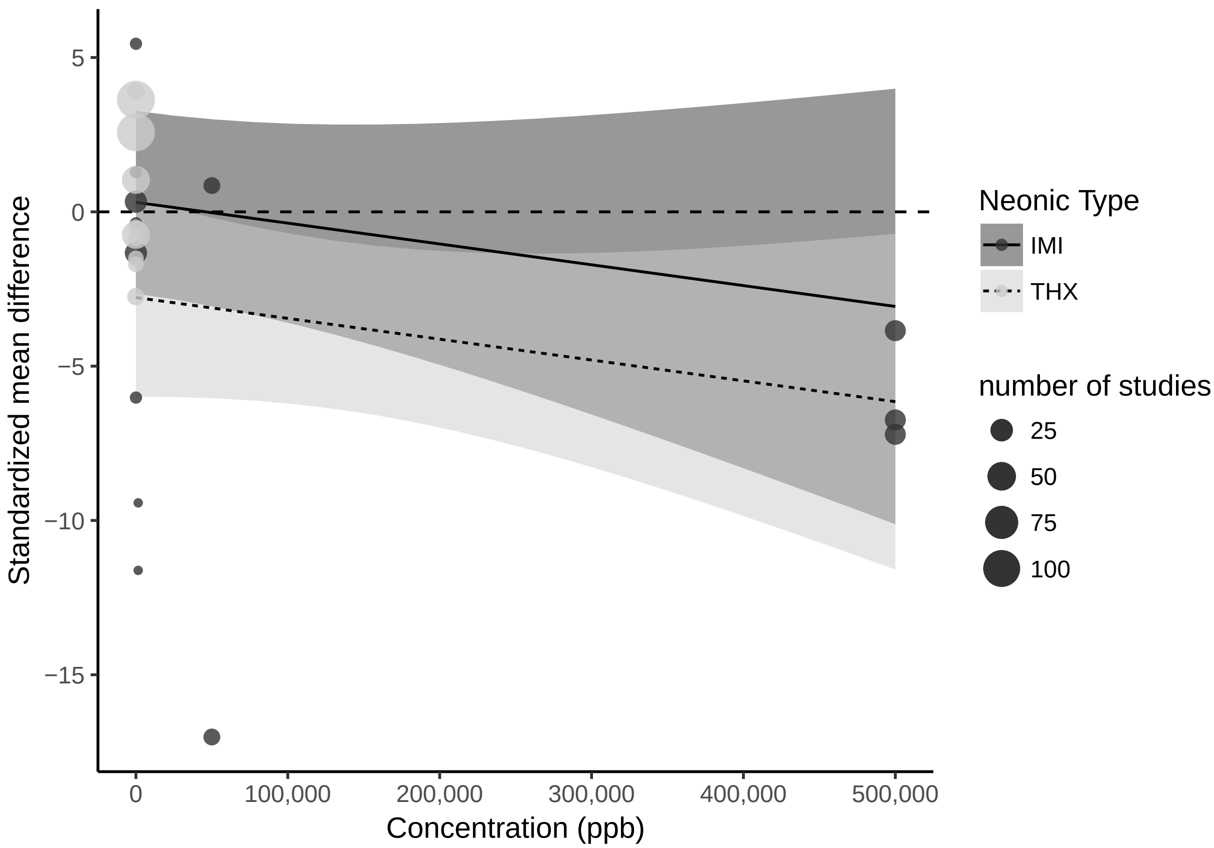

Figure 5: effect size of the concentration and neonic type on the behavior Standardized mean difference of abundance

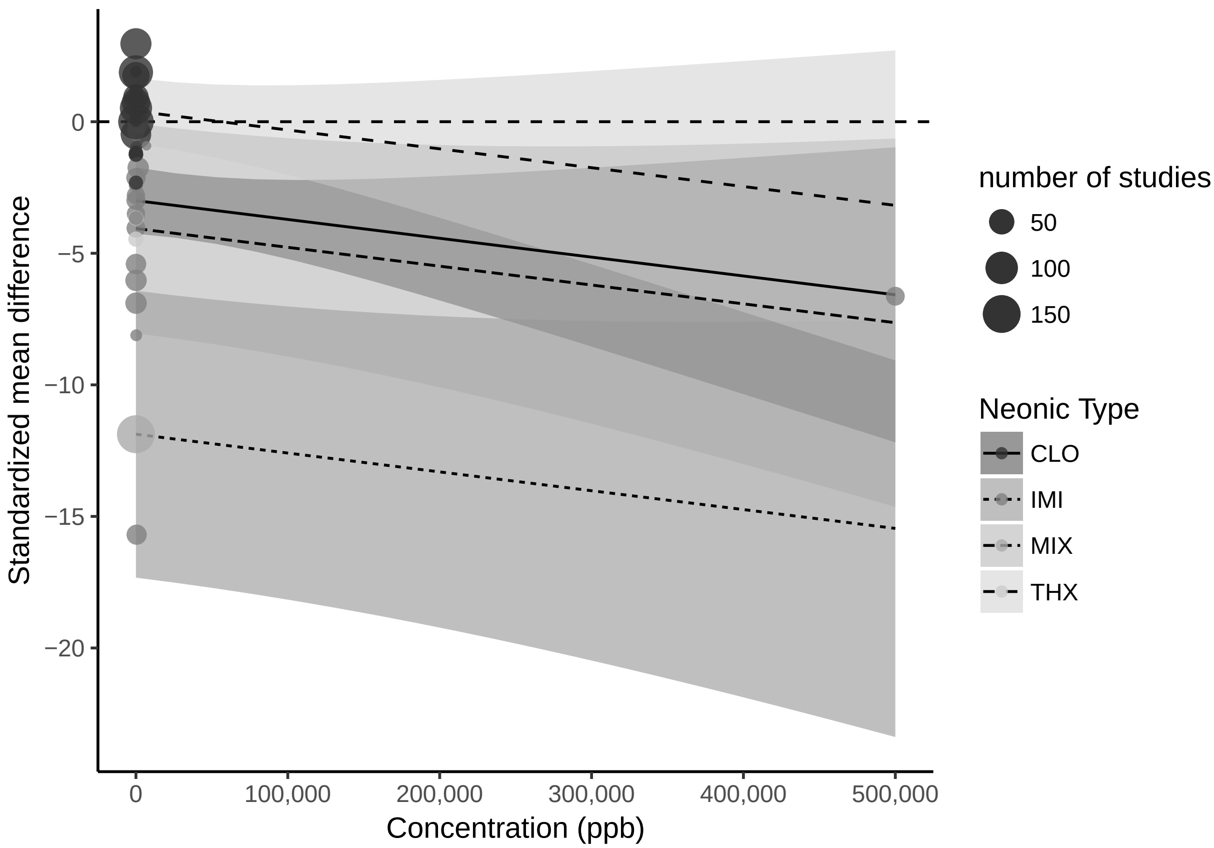

Figure 6: effect size of the concentration and neonic type on the reporoduction Standardized mean difference of abundance