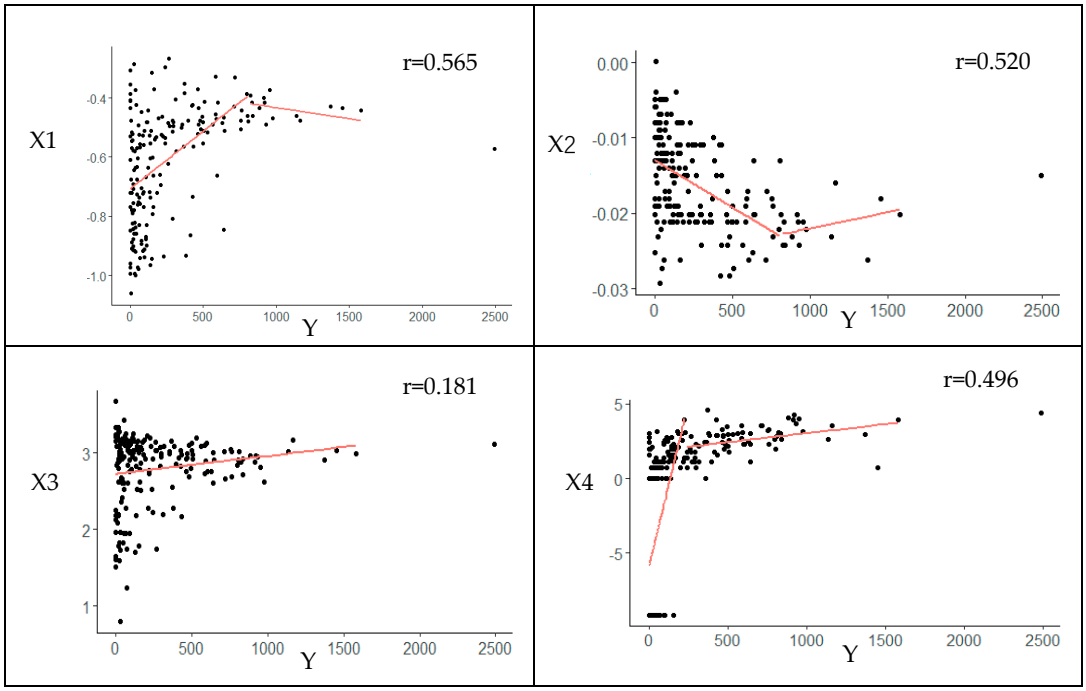
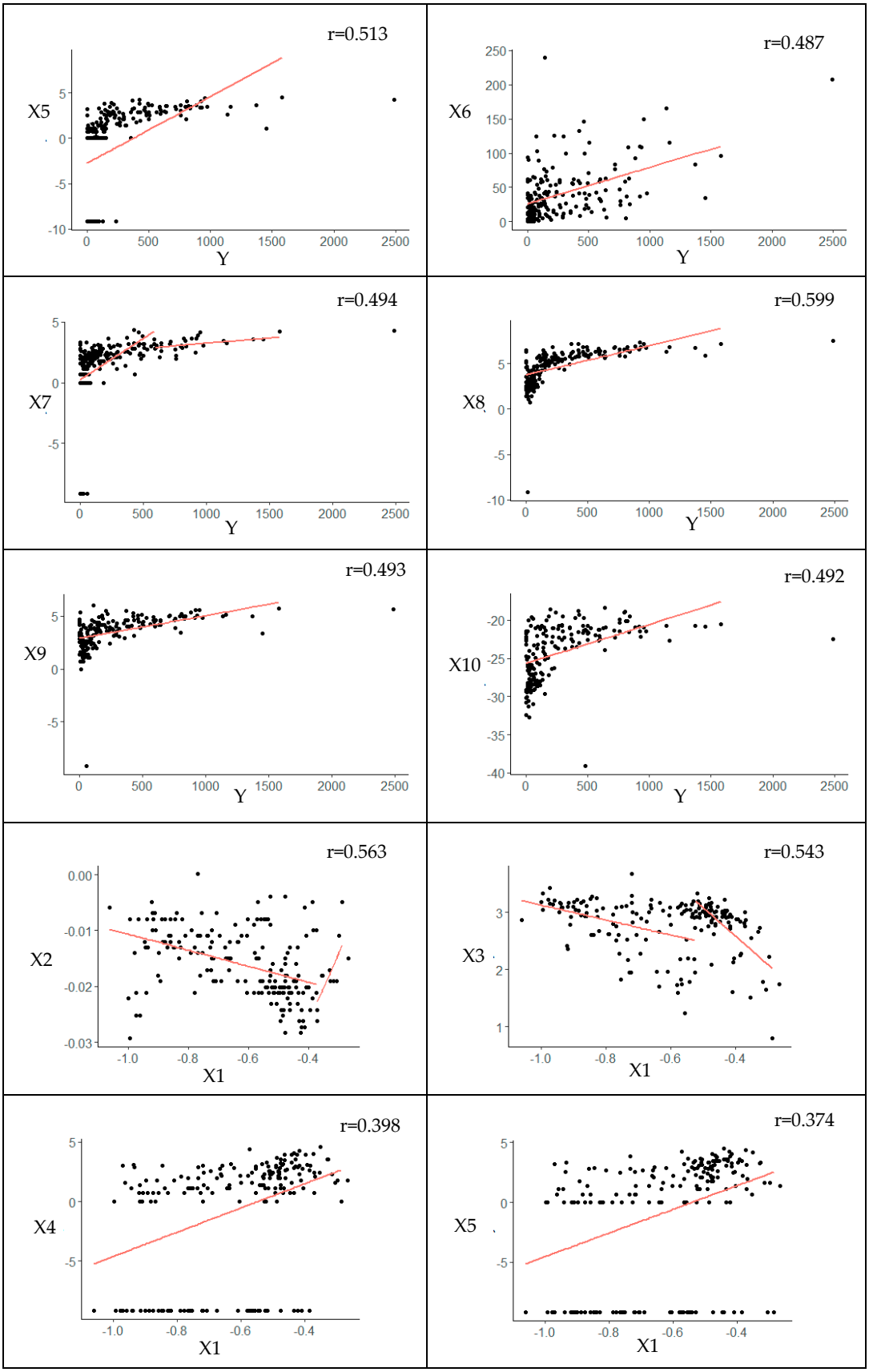
Supplementary Information

The non-linear correlation test between variables.

We use the "nlcor" package in R to explore the potential non-linear correlation between variables. The results of correlation test are shown in the Supplementary Information. The "nlcor" package works by adaptively identifying multiple local regions of linear correlations to estimate the overall nonlinear correlation, and returns non-linear correlation estimate, adjusted p-value, and a plot visualizing the non-linear relationships. The correlation estimate is between 0 and 1. The higher the value the more is the nonlinear correlation. All correlation coefficients are significant at least at $p<0.05$ level. The results indicate 4 out of 10 independent variables (non-local population, SR, internet bar and billiard room, convenience store/supermarket/shopping mall) have piecewise linear correlations with larceny-theft. Particularly, the correlation between crime and X_1 changes its direction after a point, the same applies to the correlation between crime and X_2. Non-uniform piecewise linear correlations also exist between X_1 and X_2, and between X_3 and X_4-X_{10}.

Note: Y: dependent variable. X_1: non-local population, X_2: SR. X_3: DINP. X_4: internet bars and billiard rooms. X_5: bars/card rooms/bath centers/KTV. X_6: bus stops and metro stations. X_7: convenience stores/supermarkets/shopping malls. X_8: restaurants. X_9: industrial plants/public security organs. X_{10}: mean of NTL.

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X6
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X7
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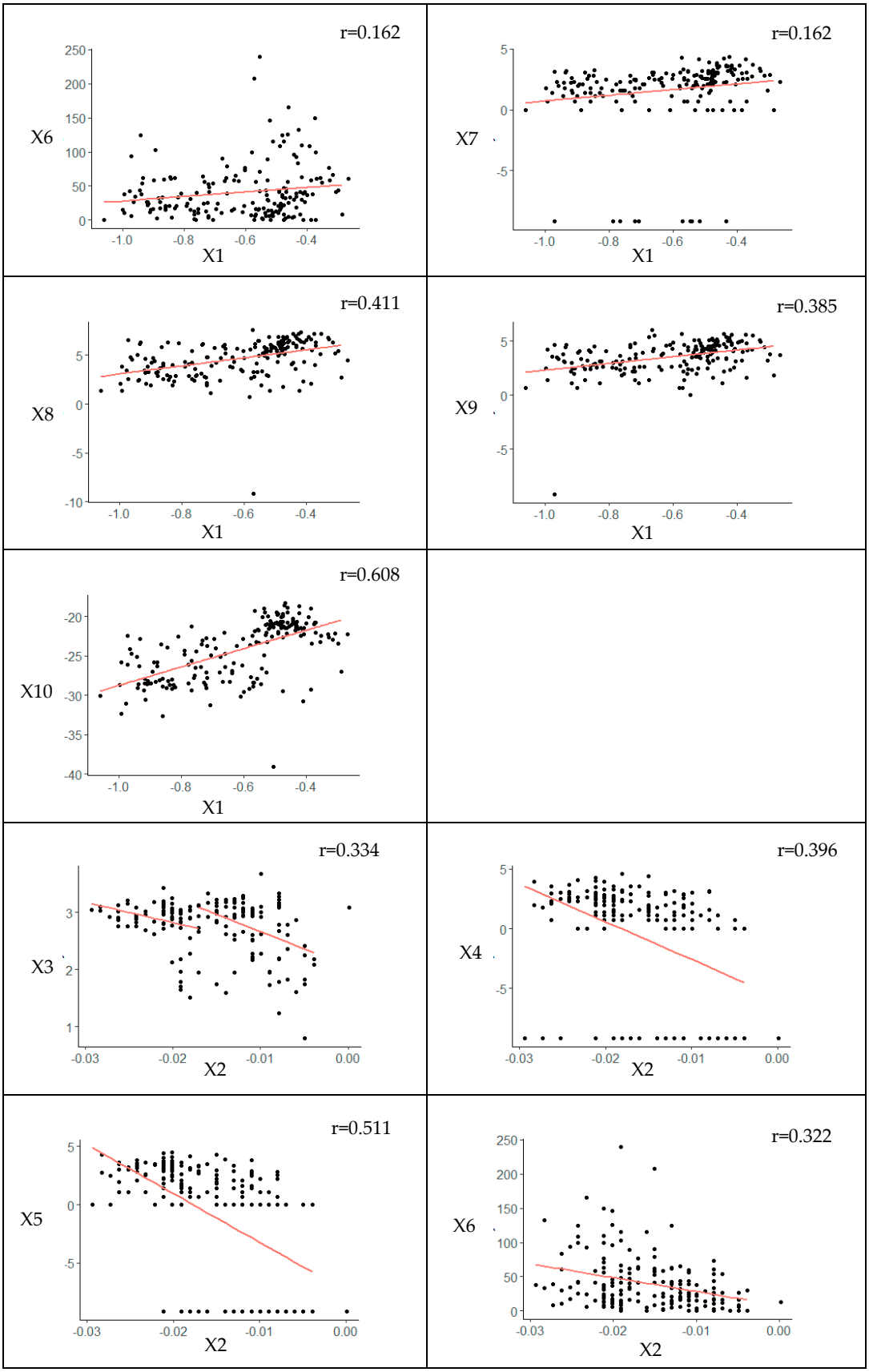
X8
Y
r=0.493
X9
Y
r=0.492
X10
Y
r=0.563
X2
X1
r=0.543
X3
X1
r=0.398
X4
X1
r=0.374
X5
X1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X10
X1
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X3
X2
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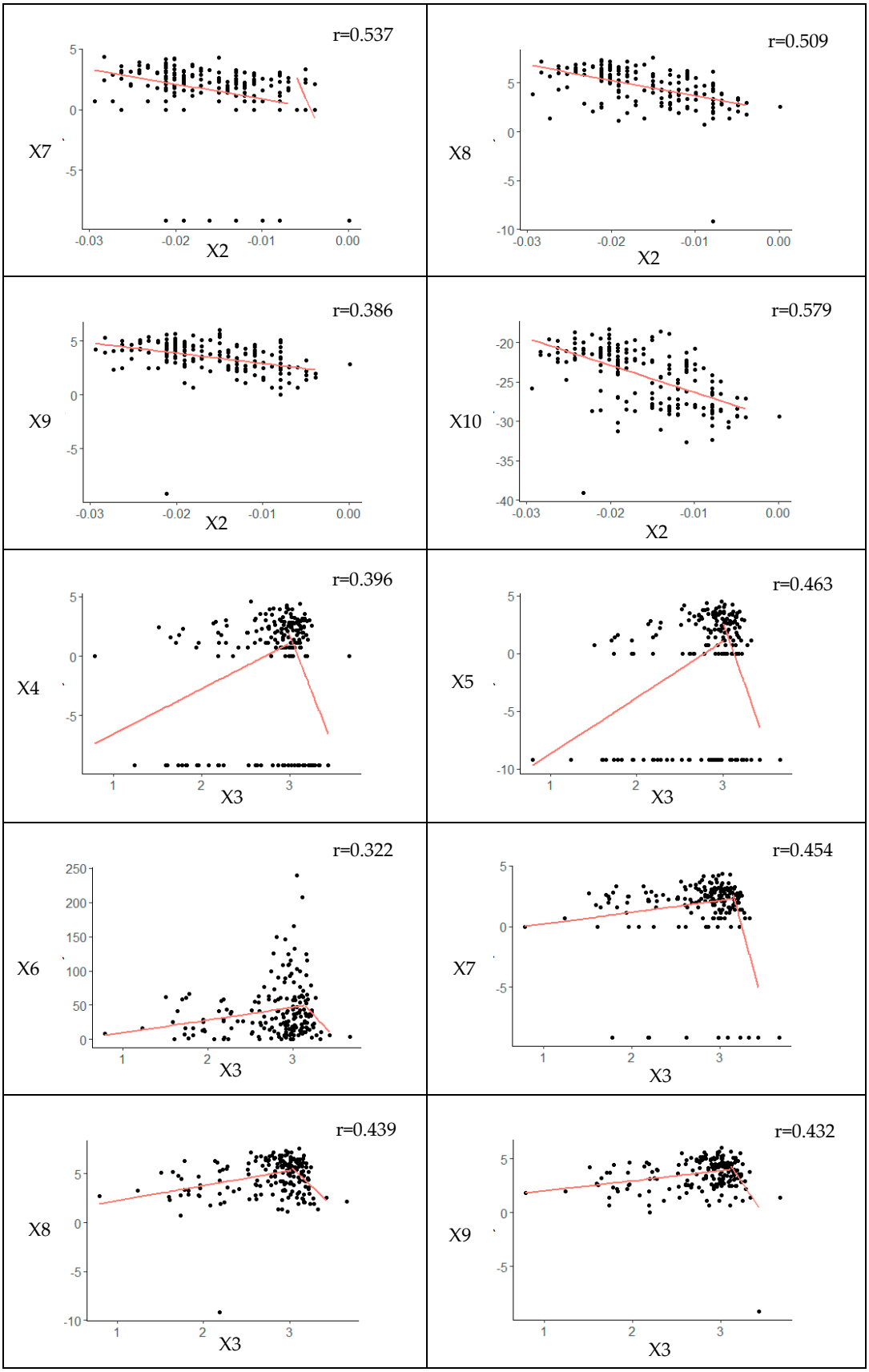
X4
X2
r=0.511
X5
X2
r=0.322
X6
X2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X10
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X4
X3
r=0.463
X5
X3
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X7
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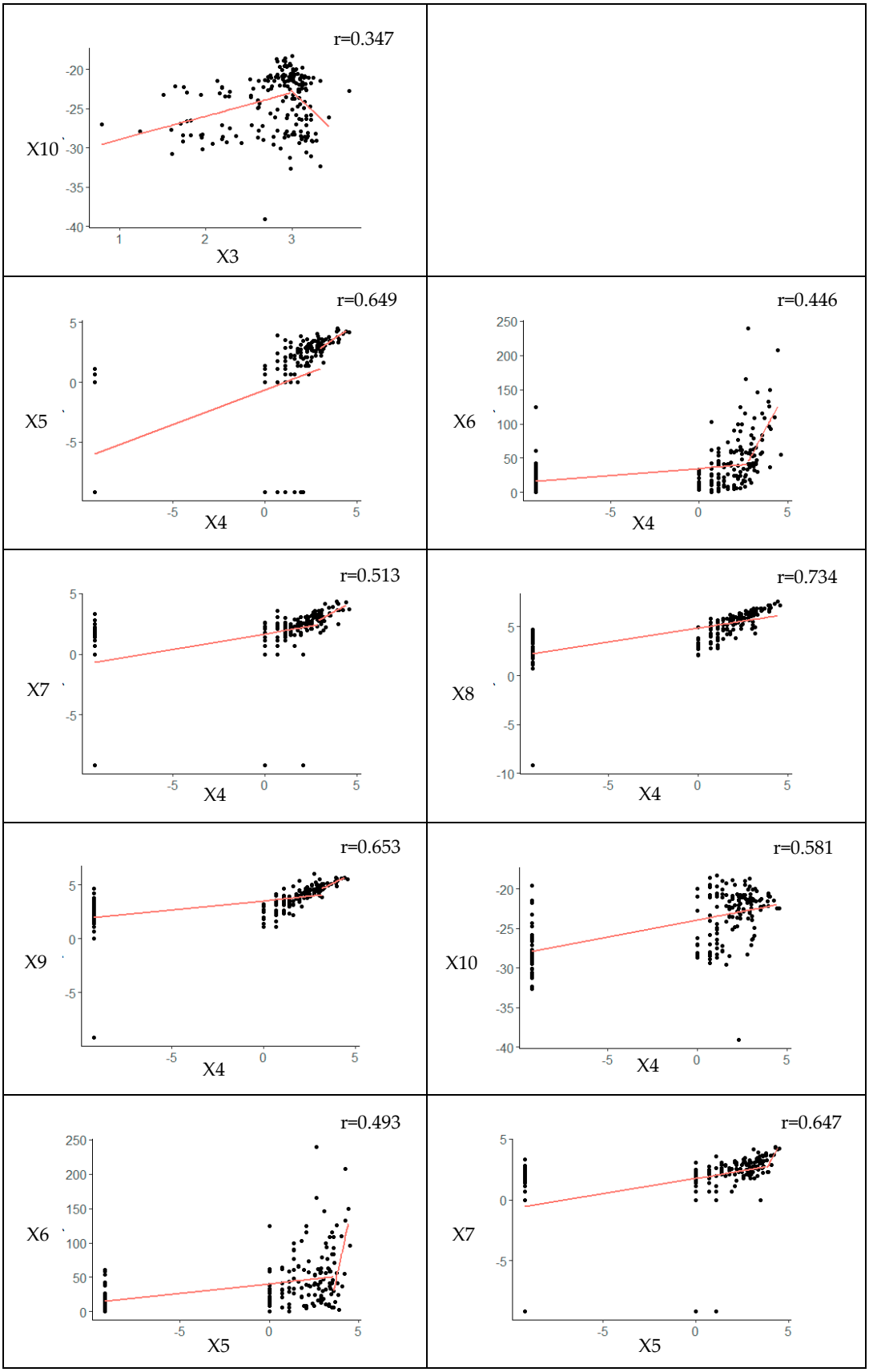
X8
X3
r=0.432
X9
X3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X4
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X4
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X7
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X8
X4
r=0.653
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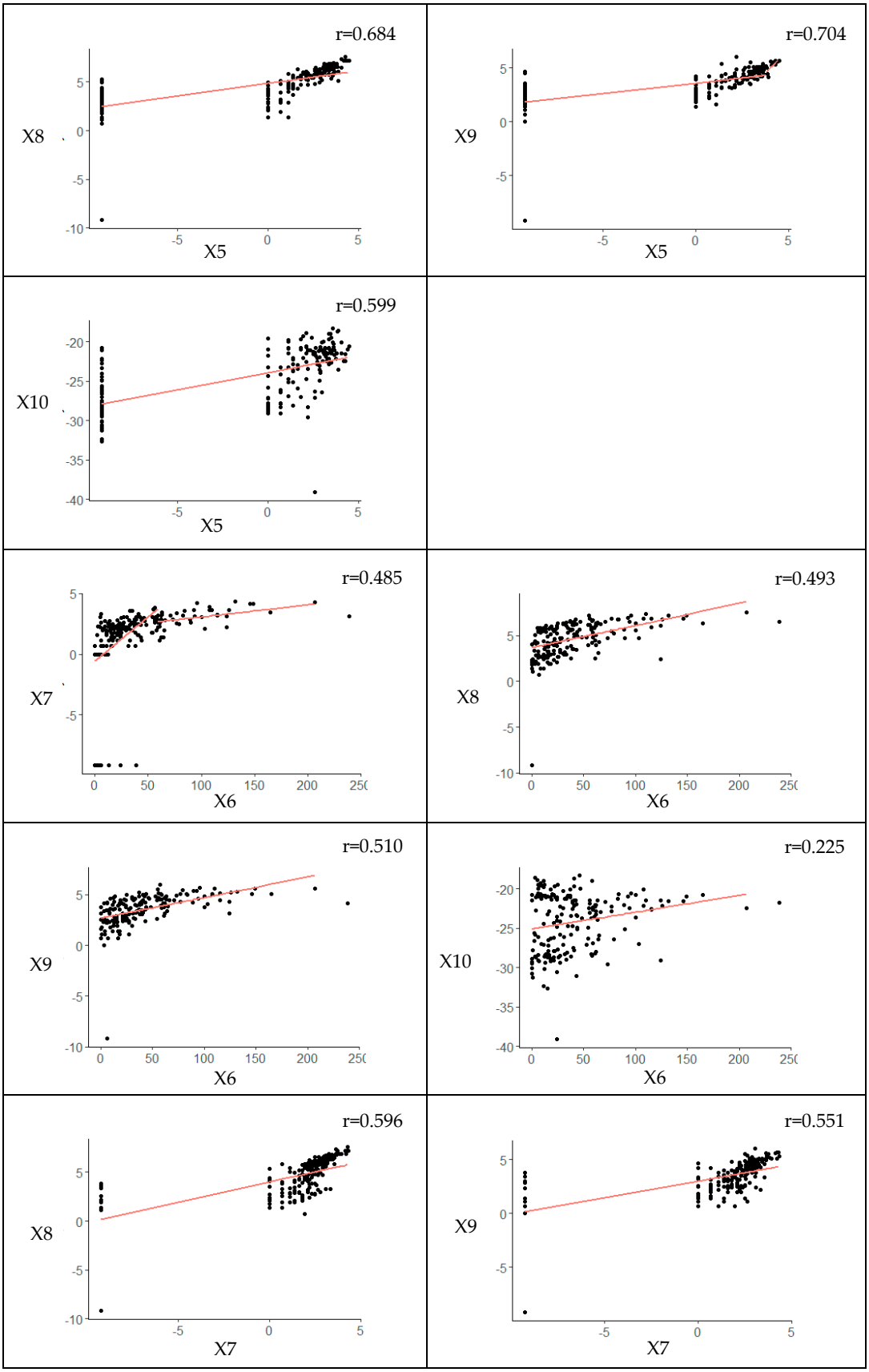
X4
r=0.581
X10
X4
r=0.493
X6
X5
r=0.647
X7
X5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X5
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X9
X5
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X10
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X7
X6
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X8
X6
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X6
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X10
X6
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X8
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r=0.551
X9
X7

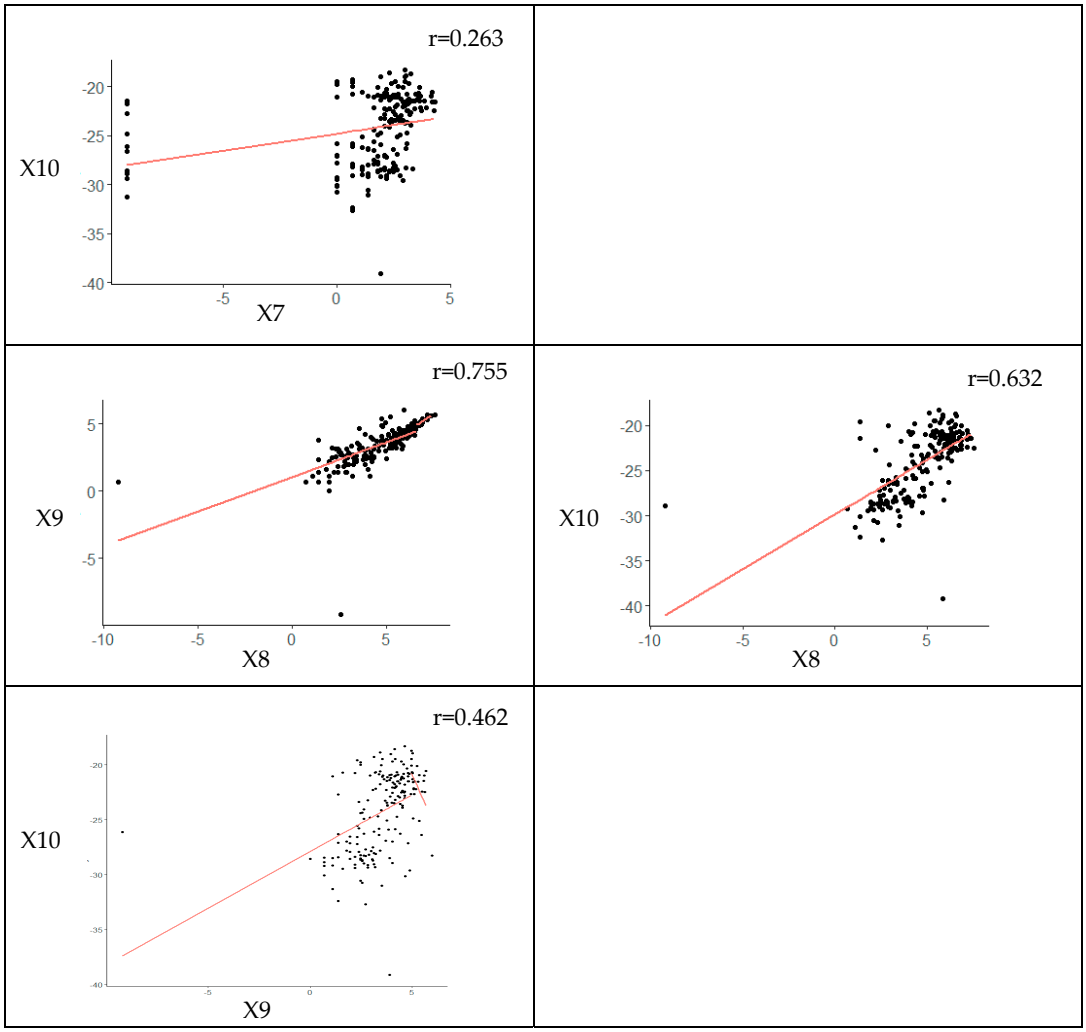

Figure S1. The results of non-linear correlation test using "nlcor" package