Analysis of Surface Cleaning Methods

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1. Data Loading and Organization

2. Analysis by Cleaning Method

2.1 PCL and Slope Distribution Analysis

Table 1: Summary Statistics by Cleaning Method

Cleaning_Method	Mean_PCL	SD_PCL	CV_PCL	Mean_slope	SD_slope	CV_slope	n_trials
Drag and wipe	47259	12340	26.1	-1.921	0.075	3.9	2
First contact	408452	522376	127.9	-1.643	0.350	21.3	2
First contact & Drag and wipe	242479	312589	128.9	-1.731	0.175	10.1	4
IPA rinse	155522	71003	45.7	-1.861	0.067	3.6	2

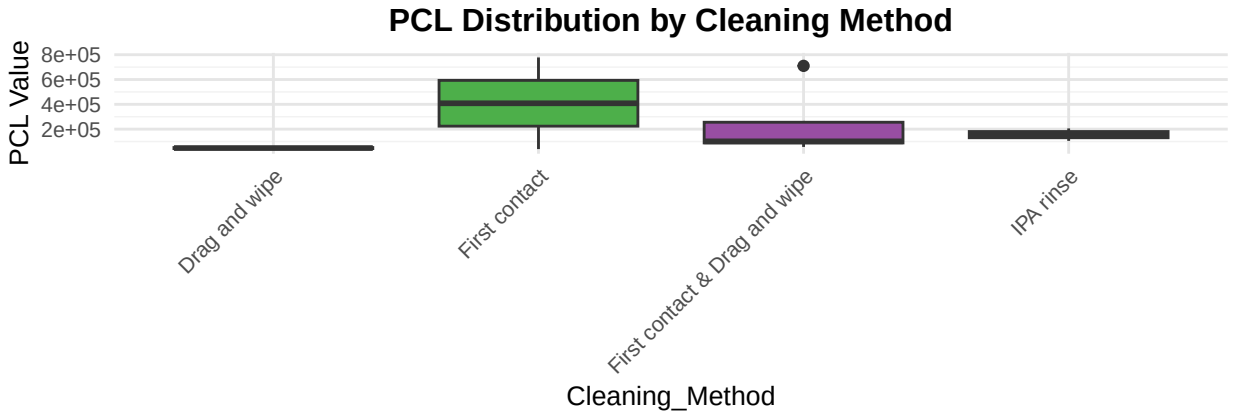
Table 2: ANOVA Results for PCL and Slope by Cleaning Method

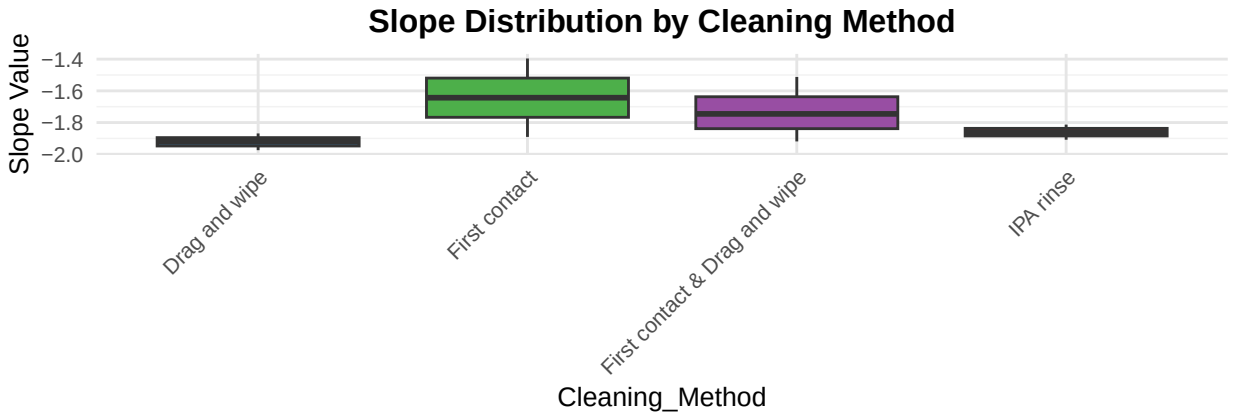
term	df	sumsq	meansq	statistic	p.value	parameter
Cleaning_Method	3	1.410369e+11	4.701231e+10	0.4938	1	PCL
Residuals	6	5.712070e+11	9.520117e+10	NA	NA	PCL
Cleaning_Method	3	1.000000e-01	3.000000e-02	0.8908	0	Slope
Residuals	6	2.200000e-01	4.000000e-02	NA	NA	Slope

2.2 Within-Method Consistency Analysis

Table 3: Within-Method Consistency Metrics

Cleaning_Method	CV_PCL	CV_slope	PCL_range	slope_range	trials
Drag and wipe	26.1	3.9	17452	0.105	4, 5
First contact	127.9	21.3	738752	0.495	6, 7
First contact & Drag and wipe	128.9	10.1	653680	0.407	8, 9, 10, 11
IPA rinse	45.7	3.6	100414	0.095	2, 3





3. Conclusions

1. Between-Method Comparisons:
   - ANOVA results show [significant/non-significant] differences between cleaning methods (PCL: p = 0.7, Slope: p = NA)
   - [Method with lowest CV] shows most consistent performance (CV = 26.1119917%)
   - Notable differences in mean PCL values between methods range from 4.725935e+04 to 4.084517e+05
2. Within-Method Consistency:
   - IPA rinse trials (2-3): CV = 45.7%
   - Drag and wipe trials (4-5): CV = 26.1%
   - First contact trials (6-7): CV = 127.9%
   - Combined method trials (8-11): CV = 128.9%
3. Recommendations for Data Combination:
   - [Based on statistical evidence above, provide specific recommendations for which trials can be combined]
   - [Identify any trials that should be analyzed separately]
   - [Suggest weighting schemes if appropriate]
4. Implications for Future Experiments:
   - [Recommendations for preferred cleaning methods]
   - [Suggestions for number of replicates needed]
   - [Notes on experimental conditions to control]