Applied and Environmental Microbiology

Supporting Online Material for

Microbial odor profile of polyester and cotton clothes after a fitness session

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References

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SUPPORTING MATERIALS & METHODS

Optimization bacterial extraction procedure

To choose the best bacterial extraction procedure, two different extraction buffers were tested and two different concentration procedures were tested. TNE buffer and 1x PBS + 0.2% Tween 80 buffer (1) were chosen as buffers. One technique to concentrate the bacteria was by means of vacuum pumping the water through a bacterium-impermeable sterile filter. Another technique was by means of centrifugation into a bacterial pellet. Figure S1 represents the DGGE pattern of one clothing textile worn by one person for two days. The bacteria were extracted using the PBS and TNE buffers. The UltraClean Water DNA isolation kit (MoBio Laboratories, Inc., CA) was used to extract the DNA. From the results, the pelletized TNE buffer method was chosen as most efficient method.

Optimization DNA extraction procedure

Several DNA extraction protocols were tested for their efficacy and their result on DGGE: the CTAB extraction (2, 3), UltraClean Water DNA isolation kit (MoBio Laboratories, Inc., CA), the DNeasy Blood & Tissue kit (Qiagen, CA) and the DNA extraction for textiles according Teufel *et al*. (1). Full protocols can be found in the references or are according manufacturers protocol. Figure S2 represents the DGGE results for four different clothes for the four DNA extraction protocols. From this result, the UltraClean Water DNA isolation kit was chosen for further analysis.

SUPPORTING FIGURES

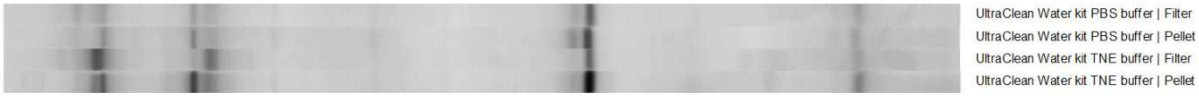

Figure S1: Comparison of two different concentration techniques and bacterial extraction buffers.

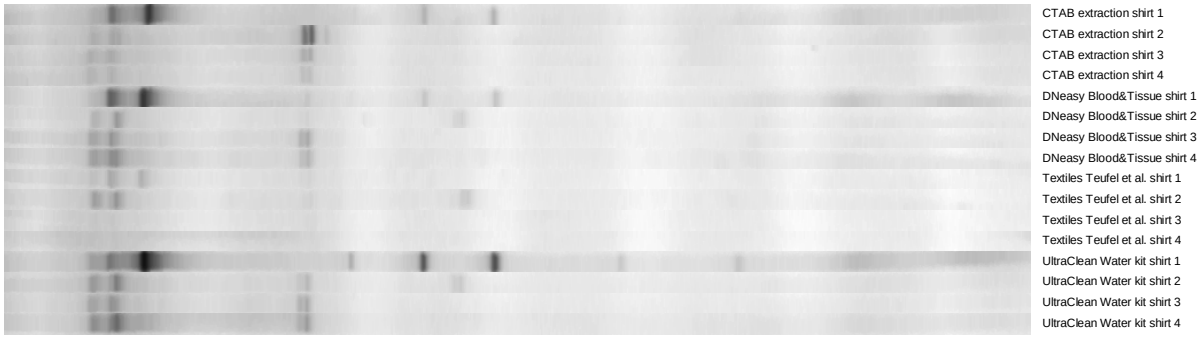

Figure S2: Comparison of four different DNA extraction techniques for shirt 1 = tanktop worn by person 1 during exercise; shirt 2 = T-shirt where person 1 did sport exercise for half an hour; shirt 3 = T-shirt from person 1 worn during a warm day; shirt 4 = shirt from person 1 worn during a warm day.

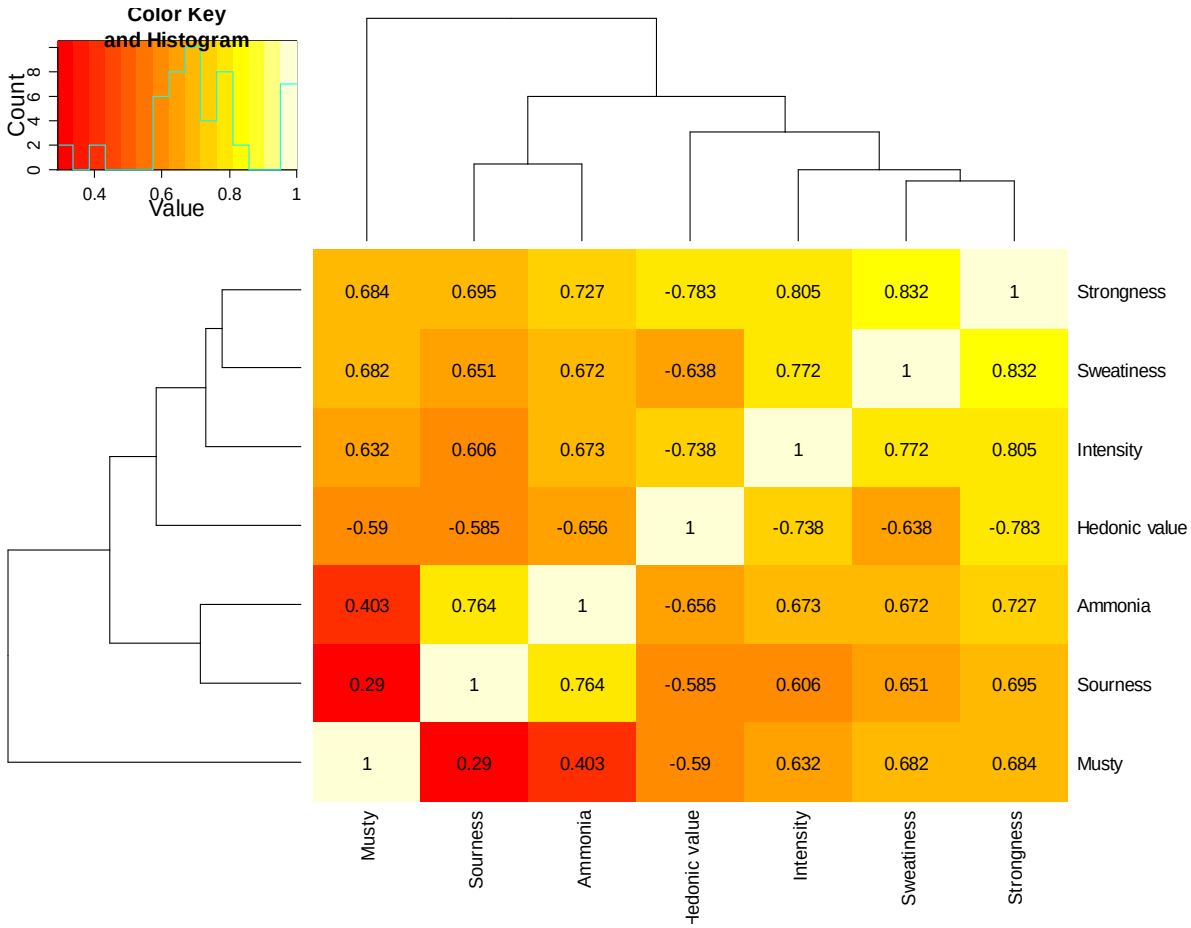

Figure S3: Heatmap with the correlations between the factors hedonic value, intensity, sweatiness, ammonia, sourness, musty, strongness for the 100% cotton and 100% polyester T-shirts. The heatmap shows the correlations/differences between the different odor characteristics. No characteristics were identical, proving their value in the odor assessment.

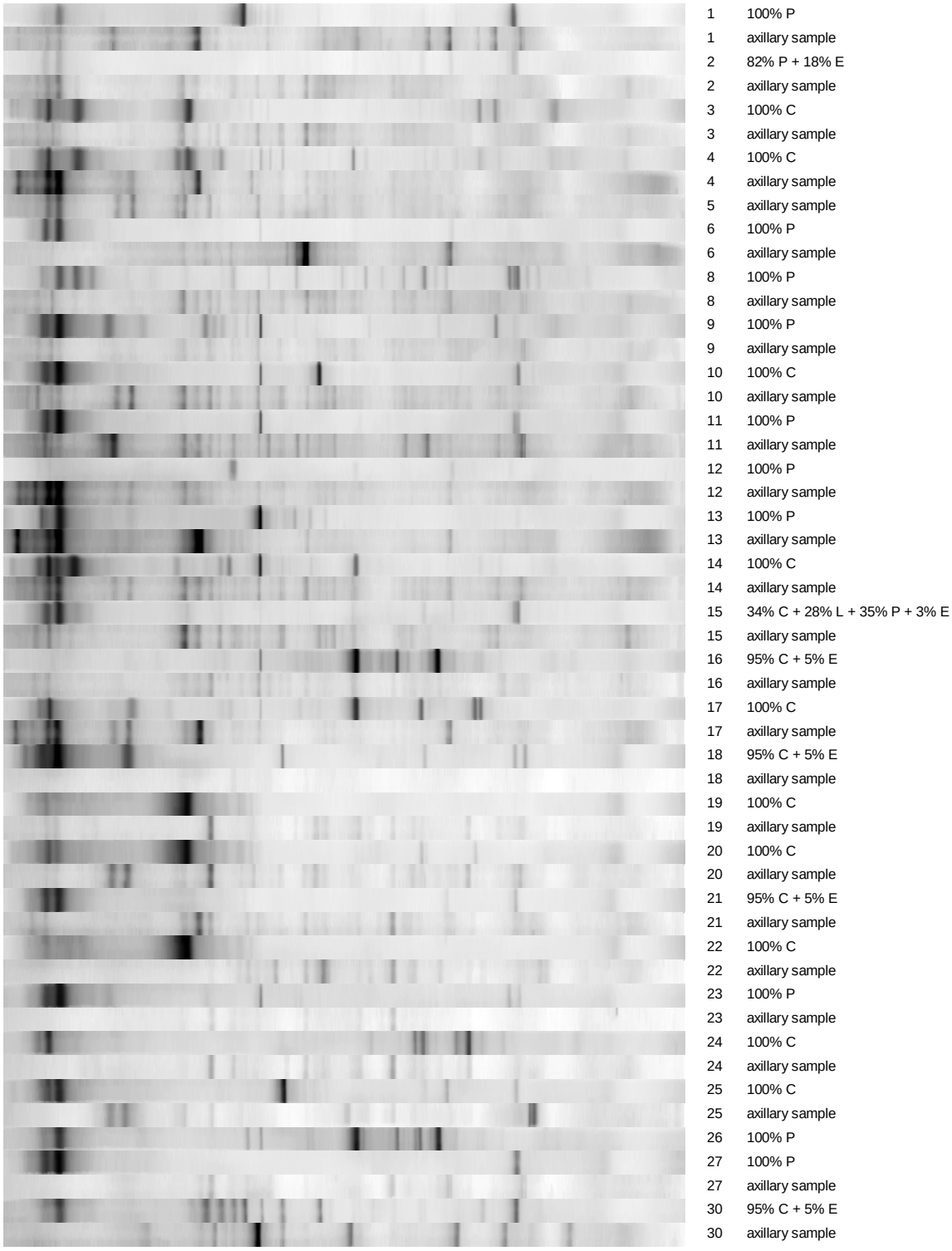

Figure S4: Comparison of DGGE results of the individual axillary samples with the individual clothing samples.

SUPPORTING TABLES

Table S1: Results of the odor panel of the different groups of T-shirts. Textile type C = cotton, P = polyester and E = elastin.

Total		Textile	Hedonic value	Intensity	Musty	Ammonia	Strongness	Sweatiness	Sourness
10	42%	100% P	-2.04±0.90	3.94±0.90	5.84±1.64	4.16±1.99	5.82±1.97	6.09±1.17	4.59±1.81
10	42%	100% C	-0.61±1.08	2.40±0.86	3.89±1.12	1.83±1.03	3.16±1.54	3.90±1.39	2.26±1.82
4	17%	95% C + 5% E	-0.60±0.55	2.55±0.34	3.71±0.84	1.05±0.39	2.21±0.76	3.40±0.70	1.64±0.31

Table S2: Contact angle between cellulose, PET, micrococci and water, diiodomethane, glycerol.

	Contact angle (°)		
	water	diiodomethane	glycerol
Cotton/cellulose	81.0	39.0	90.0
	84.0	47.0	87.9
	85.5	46.5	88.0
	84.8	47.1	92.1
	80.4	49.0	94.0
	87.6	46.7	86.5
	84.4	48.7	79.3
	80.5	43.3	80.1
	82.0		86.0
			82.5
Average	83.36 ±2.51	45.91 ±3.28	86.64 ±4.86
Rejected measurements	3	3	0
Polyester/ PET	79.5	28.75	65.4
	75.9	28.25	57.0
	68.5	28.0	57.0
	69.75	38.3	63.5
	75.0	33.2	64.5
	79.4	25.4	68.5
	75.7	22.0	66.1
	78.25	24.4	64.8
	75.42		64.6
			63.5
Average	75.27 ±3,89	28.54 ±5.17	63.49 ±3.71
Rejected measurements	3	2	1
Micrococci	24.0	69.7	22.0
	38.5	75.6	27.5
	26.0	62.3	26.0
	22.0	56.5	29.5
	21.5		
Average	26.60 ±6,92	66.02 ±8.38	26.25 ±3.18
Rejected measurements	10	7	6

Table S3: Calculated surface tension components for cellulose, PET and micrococci from the contact angle measurements.

(mJ/m²)	y^{LW}	y^{+}	y^{-}
Cotton / cellulose	36.52	0.00	4.14
Polyester / PET	44.81	0.08	6.58
Micrococci	25.12	5.92	43.38

SUPPORTING REFERENCES

1. **Teufel L, Schuster KC, Merschak P, Bechtold T, Redl B.** 2008. Development of a fast and reliable method for the assessment of microbial colonization and growth on textiles by DNA quantification. J. Mol. Microbiol. Biotechnol. **14:**193-200.
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3. **Griffiths RI, Whiteley AS, O'Donnell AG, Bailey MJ.** 2000. Rapid method for coextraction of DNA and RNA from natural environments for analysis of ribosomal DNA- and rRNA-based microbial community composition. Appl. Environ. Microbiol. **66:**5488-5491.