Data in Brief 16 (2018) 732–751

Contents lists available at ScienceDirect

Data in Brief

journal homepage: www.elsevier.com/locate/dib

Data Article

Data on DNA gel sample load, gel electrophoresis, PCR and cost analysis

Ramona Kuhn *, Jörg Böllmann, Kathrin Krahl, Isaac Mbir Bryant, Marion Martienssen

Brandenburg University of Technology Cottbus-Senftenberg, Institute of Environmental Technology, Chair of Biotechnology of Water Treatment, 03046 Cottbus, Germany

ARTICLE INFO

Article history:
Received 19 October 2017
Received in revised form
7 November 2017
Accepted 28 November 2017
Available online 5 December 2017

Keywords:
Cost analysis
DNA sample load
Gel electrophoresis

ABSTRACT

The data presented in this article provide supporting information to the related research article "Comparison of ten different DNA extraction procedures with respect to their suitability for environmental samples" (Kuhn et al., 2017) [1]. In that article, we compared the suitability of ten selected DNA extraction methods based on DNA quality, purity, quantity and applicability to universal PCR. Here we provide the data on the specific DNA gel sample load, all unreported gel images of crude DNA and PCR results, and the complete cost analysis for all tested extraction procedures and in addition two commercial DNA extraction kits for soil and water.

Specifications Table

Subject area	*Biology*
More specific subject area	*Molecular Biology*
Type of data	*Tables, figures, equations*
How data was acquired	*Bio View Biostep transilluminator*
Data format	*Raw and analyzed*

DOI of original article: https://doi.org/10.1016/j.mimet.2017.10.007
* Corresponding author.
E-mail address: Kuhnr@b-tu.de (R. Kuhn).

https://doi.org/10.1016/j.dib.2017.11.082

Experimental factors	*Sample were preserved at −20 °C before DNA extraction*
Experimental features	*DNA extraction, universal PCR, DNA visualization, cost analysis*
Data source location	*Cottbus, Germany*
Data accessibility	*Data is within this article*

Value of the data

- The data on the gel sample load are valuable to serve as indirect control for DNA quantification with fluorescence stain called PicoGreen.
- This data provide additional gel images of crude DNA and PCR of the tested DNA extraction procedures.
- The cost analysis of the DNA extraction procedures provided are valuable for further economical comparison.

1. Data

Table 1 presents the DNA sample load (in μL) necessary to visualize the crude DNA on the agarose gels. Different DNA loads were used in order to achieve comparable DNA concentrations ranging between 250 and 300 ng on the gel. Higher DNA loads were necessary for visualization on the agarose gels, especially for the crude DNA extracts from the Havel River sediment (procedure A, D, F, G, and H).

The visual DNA quality control of crude DNA extracts and PCR of procedures B, C, D, E, H, I and J is presented in Figs. 1–4. The results for crude DNA extracts and PCR amplification of procedure B and C (method according to [2]) were almost similar. In both cases, intensive fragmentation was found for crude DNA extracts of the activated sludge and no distinct genomic DNA band was visible (Fig. 1, D1 & E1). The crude DNA of the sediment and anaerobic digestion sludge indicated a good quality with lower content of impurities, while the quality of the crude DNA for the nitrifying sludge was lower. A higher content of impurities was visible on both gel images. Positive PCR amplification was only feasible for the anaerobic digestion sludge and showed a very good quality of the amplicon (Fig. 1, D2 & E2).

The results for the crude DNA extracts of procedure D and E (method according to [3,4]) were also almost similar (Fig. 2, F1 & G1). For procedure D, no distinct genomic DNA band was visible on the agarose gel but instead, fragmentation and higher content of undefined impurities (Fig. 2, F1). The

Table 1
Sample load in μL on the agarose gel for visualization of crude DNA extracts.

Extraction protocol according to first author		Origin of samples			
		Activated sludge	Havel River sediment	Anaerobic digestion sludge	Nitrifying sludge
A	Bourrain	4	15	5	8
B	Gabor harsh	2	8	5	8
C	Garbor soft	2	8	5	15
D	Shan	4	12	10	20
E	Orsini/Spica	4	8	6	15
F	Singka	4	12	15	15
G	Soya method	1	20	3	15
H	Tabatabaei	2	10	12	8
I	Tresse	1	6	6	10
J	Wilson	2	4	12	8

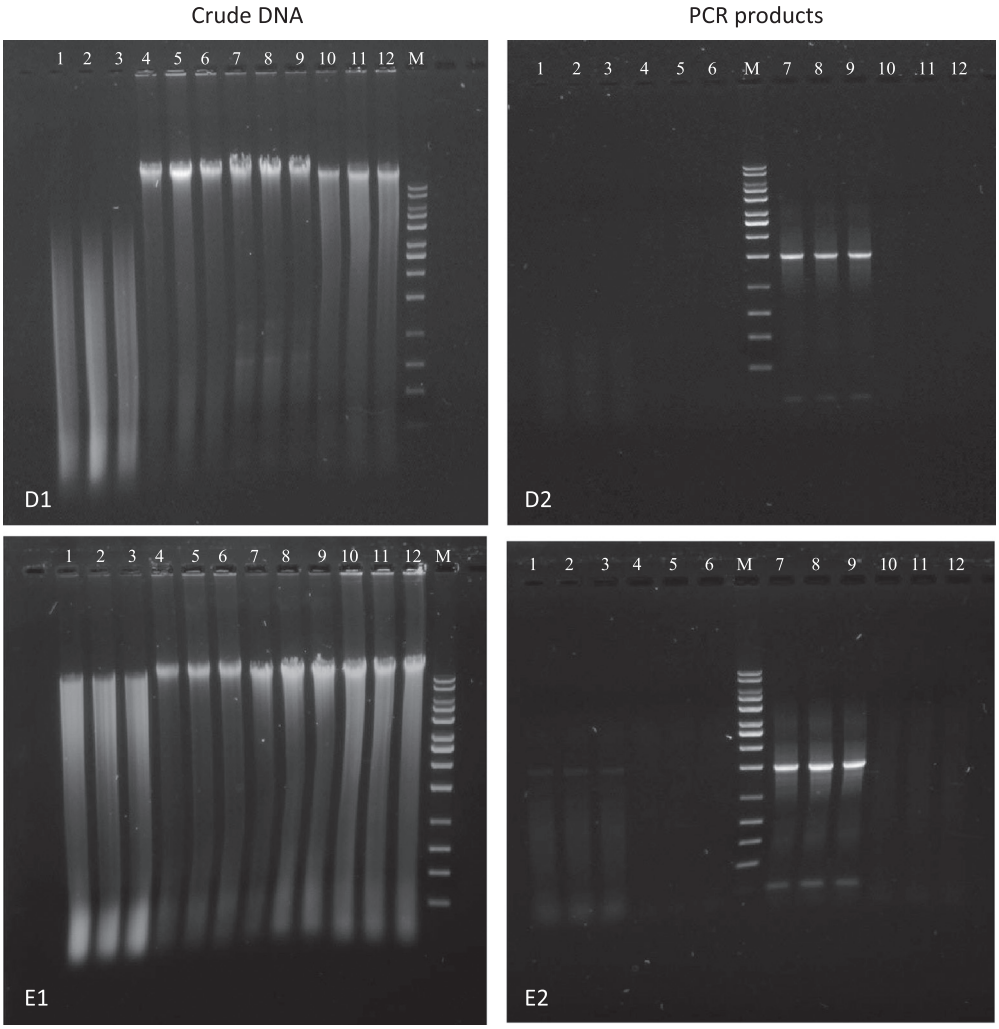

Fig. 1. Agarose gel electrophoresis of crude DNA (D1 & E1) and universal PCR (D2 & E2) using universal primer set 27f and 1525r. D1 & D2: Procedure B (Gabor harsh). E1 & E2: Procedure C (Gabor soft). Lane declaration for all crude DNA and universal PCR gel images: lane 1 to 3 activated sludge; lane 4 to 6 Havel River sediment; lane 7 to 9 anaerobic digestion sludge; lane 10 to 12 nitrifying sludge; M in all gel images: 10 kb MassRuler DNA ladder.

pattern for the nitrifying sludge, especially, indicated complete failure of the extraction procedure. The gel image of the crude DNA extraction for procedure E occurred almost similar to procedure D with one exception. The crude DNA extract of the activated sludge showed a slight distinct genomic DNA band, however, the background staining indicated the presence of impurities (Fig. 2, G1). Nevertheless, positive PCR amplification was obtained for the crude DNA extract from activated sludge for procedure E (Fig. 2, G2). Surprisingly, positive amplification of the nitrifying sludge was also obtained for both procedure D and E (Fig. 2, F2).

The results of the crude DNA extracts of procedure H and I (method according to [5,6]) are presented in Fig. 3. All crude DNA extracts of procedure H indicate a slight distinct genomic DNA band and higher content of impurities through background staining (Fig. 3, H1). Positive PCR amplification was only obtained for the crude DNA extract of the anaerobic digestion sludge. PCR amplification of

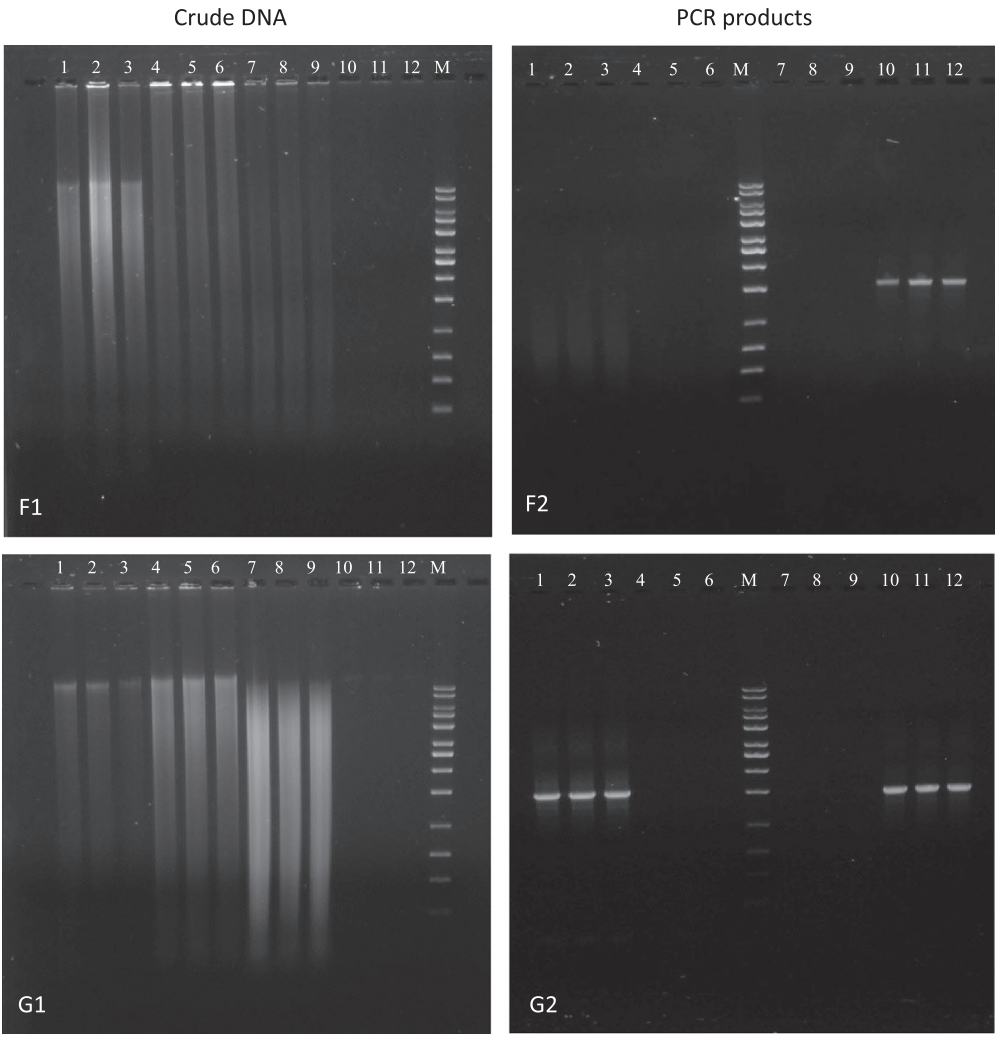

Fig. 2. Agarose gel electrophoresis of crude DNA (F1 & G1) and universal PCR (F2 & G2) using universal primer set 27f and 1525r. F1 & F2: Procedure D (Shan). G1 & G2: Procedure E (Orsini & Romano-Spica). Lane declaration for all crude DNA and universal PCR gel images: lane 1 to 3 activated sludge; lane 4 to 6 Havel River sediment; lane 7 to 9 anaerobic digestion sludge; lane 10 to 12 nitrifying sludge; M in all gel images: 10 kb MassRuler DNA ladder.

the crude DNA extracts of the activated sludge, Havel River sediment and nitrifying sludge failed (Fig. 3, H2). The quality of crude DNA extracts of procedure I was different between the four environmental samples (Fig. 3, I1). A distinct genomic DNA band without higher content of visible impurities was obtained for the activated sludge. The degree of increased impurities occurred slightly for the crude DNA extracts of the Havel River sediment, but a distinct genomic DNA band was still good visible on the gel image. The crude DNA extract of the anaerobic digestion sludge showed higher content of DNA fragmentation as well as possible impurities in the background of the gel. Besides a distinct DNA band higher background smearing was also visible for the crude DNA extract of the nitrifying sludge. Positive PCR amplification was only obtained for the crude DNA extract of the activated sludge (Fig. 3, I2).

The results of the crude DNA extracts of procedure J are presented in Fig. 4 (method according to [7]). The gel image indicated distinct genomic DNA bands with lower content of background smearing

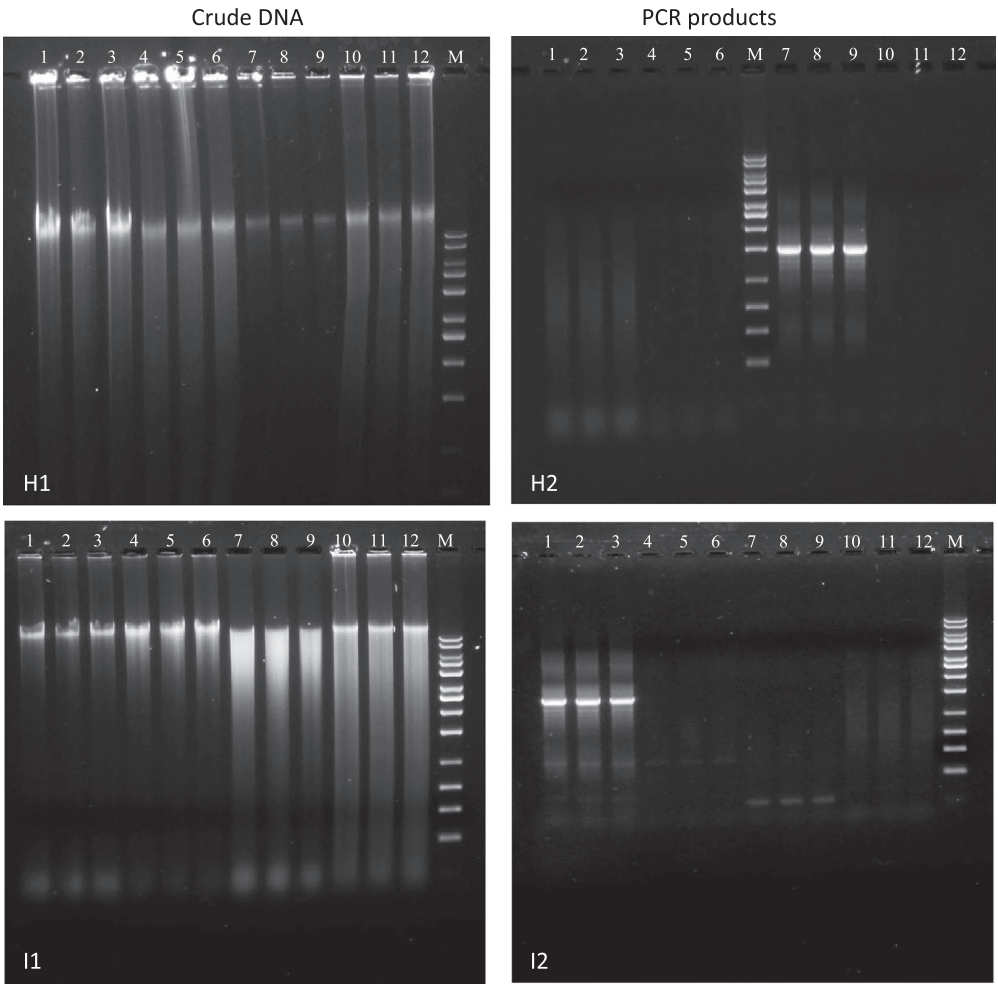

Fig. 3. Agarose gel electrophoresis of crude DNA (H1, I1) and universal PCR (H2, I2) using universal primer set 27f and 1525r. H1 & H2: Procedure H (Tabatabaei). I1 & I2: Procedure I (Tresse). Lane declaration for all crude DNA and universal PCR gel images: lane 1 to 3 activated sludge; lane 4 to 6 Havel River sediment; lane 7 to 9 anaerobic digestion sludge; lane 10 to 12 nitrifying sludge; M in all gel images: 10 kb MassRuler DNA ladder.

for the activated sludge, Havel River sediment and the nitrifying sludge. A higher degree of possible DNA fragmentation and/or background impurities were observed for the crude DNA extract of the anaerobic digestion sludge (Fig. 4, J1). Positive PCR amplification was obtained from the activated sludge, Havel River sediment and the nitrifying sludge, while the amplification for the anaerobic digestion sludge failed (Fig. 4, J2).

The cost analysis of the ten DNA extraction procedures and the two commercial DNA extraction kits is presented in detail in Tables 2–13. Our cost analysis is based on cost estimation. Therefore a cost range between lowest and highest prices is presented. We assumed that the real extraction price will be in this cost range. The presented results show that every extraction procedure has its specific cost range, which is mainly dependent on the extraction time and therefore also on the cost of the laboratory staff. We calculated the lowest laboratory staff cost ranging between 3.65 € and 5.10 € for procedure J (Table 11), and the highest ranging between 8.68 and 12.15 for procedure A (Table 2). We

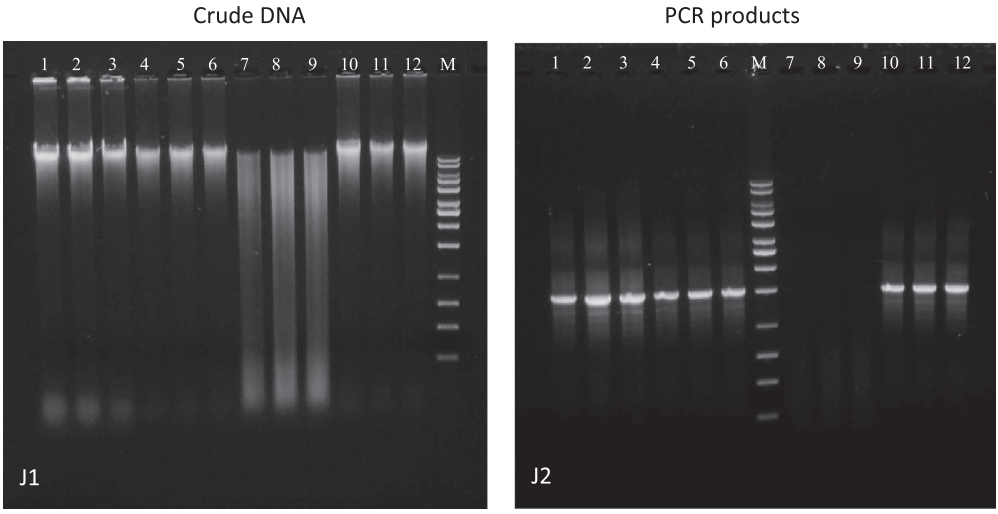

Fig. 4. Agarose gel electrophoresis of crude DNA (J1) and universal PCR (J2) using universal primer set 27f and 1525r. G1 & G2: Procedure J (Wilson). Lane declaration for all crude DNA and universal PCR gel images: lane 1 to 3 activated sludge; lane 4 to 6 Havel River sediment; lane 7 to 9 anaerobic digestion sludge; lane 10 to 12 nitrifying sludge; M in all gel images: 10 kb MassRuler DNA ladder.

calculated the lowest cost for the chemicals needed ranging between 0.13 € to 0.31 € for procedure D (Table 5) and the highest cost ranging between 0.47 € to 0.96 € for procedure I (Table 10). The cost for the other consumables such as gloves, tubes and tips were almost similar for all analyzed extraction procedures and extraction kits.

2. Experimental design, materials and methods

The sample preservation, DNA extraction, PCR performance and gel electrophoresis were described elsewhere [1]. For the cost analysis, a cost range was estimated ranging between minimum and maximum prices for all needed consumables. The number of required tubes and tips per extraction was counted. In all equations that follow, an index was included identifying low or high cost calculations, respectively. For clarification, the letter *x* represents all low cost calculations and the letter *y* represents all high cost calculations. The individual cost per chemical needed for every DNA extraction was calculated either with Eqs. (1) or (2), where $m_{extraction}$ is the chemical weight required for a single DNA extraction and $m_{total,fix\ cost}$ is the total weight corresponding to the fix cost. The individual cost for additional consumables such as gloves, tubes and/or tips was calculated either with Eqs. (3) or (4).

$$Chemical\ costs_x\left[€/prep\right] = \frac{m_{extraction}\tilde{n}Fixcost_x}{m_{total,\ \ fixcostx}} \tag{1}$$

$$Chemical\ costs_y\left[€/prep\right] = \frac{m_{extraction}\tilde{n}Fixcost_y}{m_{total,\ \ fixcosty}} \tag{2}$$

$$Additional\ concumable\ costs_x\left[€/prep\right] = \frac{Consumbleused_{extraction}\tilde{n}Fixcost_x}{Totalconsumable_{fixcostx}} \tag{3}$$

$$Additional\ concumable\ costs_y\left[€/prep\right] = \frac{Consumbleused_{extraction}\tilde{n}Fixcost_y}{Totalconsumable_{fixcosty}} \tag{4}$$

The cost for the lab staff was calculated either with Eqs. (5) or (6). The calculation is based on a total of 12 extractions per staff and the individual extraction time of the tested extraction procedures.

$$Labstaff_x[€/prep] = \left(\frac{Coststaff_x/Hour}{12 \quad extractions}\right)\tilde{n}\left(\frac{Extractiontime}{60 \quad min}\right) \tag{5}$$

$$Labstaff_y[€/prep] = \left(\frac{Coststaff_x/Hour}{12 \quad extractions}\right)\tilde{n}\left(\frac{Extractiontime}{60 \quad min}\right) \tag{6}$$

The sum of total costs of chemicals was calculated either with Eqs. (7) or (8). The total costs of all additional consumables needed per extraction was calculated either with Eqs. (9) or (10). The final price per preparation was then calculated either with Eqs. (11) or (12) considering the cost for the lab staff, for all chemicals and additional consumables needed.

$$Total\ chemcial\ costs_x[€/prep] = \sum Chemical\ costs_x \tag{7}$$

$$Total\ chemcial\ costs_y[€/prep] = \sum Chemical\ costs_y \tag{8}$$

$$Total\ additional\ consumables\ costs_x[€/prep] = \sum Additional\ consumable\ costs_x \tag{9}$$

$$Total\ additional\ consumables\ costs_y[€/prep] = \sum Additional\ consumable\ costs_y \tag{10}$$

$$Final\ price_x[€/prep] = Lab\ staff_x + \sum Chemical\ costs_x + \sum Additional\ consumable\ costs_x \tag{11}$$

$$Final\ price_y[€/prep] = Lab\ staff_y + \sum Chemical\ costs_y + \sum Additional\ consumable\ costs_y \tag{12}$$

2.1. Cost analysis

See Tables 2–13.

Table 2
Cost analysis for DNA extraction procedure A (according to Bourrain et al., 1999).

Consumables	Volumes	Units	Concentration	Volumes	/Weight	High costs			Low costs			Low cost	High cost
						Amount	Unit	Fix cost (€)	Amount	Unit	Fix cost (€)	per prep (€)	per prep (€)
Gloves (any size)	1	pair	–	–	–	50	pair	8.20	50	pair	4.50	0.090	0.1640
Tubes	5	–	–	2.0	mL	500	pieces	11.9	1000	pieces	21.90	0.1095	0.1190
Tips	12	–	–	1000	µL	500	pieces	5.08	1000	pieces	7.70	0.0924	0.1218
Tips	1	–	–	200	µL	500	pieces	5.40	1000	pieces	8.19	0.0082	0.0108
Lysozyme buffer	0.75	mL	0.15 M NaCl	6,6	mg	500	g	15.84	1000	g	24.19	0.0002	0.0002
			0.1 M Na2EDTA	27.9	mg	100	g	23.50	1000	g	59.70	0.0017	0.0066
			15 mg mL-1 Lysozyme	15.0	mg	1.0	g	23.89	10	g	96.04	0.1441	0.3584
SDS solution	0.75	mL	0.1 M NaCl	4.4	mg	500	g	15.84	1000	g	24.19	0.0001	0.0001
			0.5 M Tris–HCl	45.4	mg	500	g	93.40	1000	g	128.00	0.0058	0.0085
			w/v 10% SDS	0.075	mg	100	g	16.56	1000	g	56.48	0.0000	0.0000
Tris–HCl saturated phenol	1.0	mL	0.1 M Tris–HCl	12.1	mg	500	g	93.40	1000	g	128.00	0.0016	0.0023
			Phenol	1.0	g	100	g	18.00	1000	g	64.40	0.0644	0.1800
Phenol:Chloroform: Isoamyl	1.0	mL	25′ Phenol	0.5	g	100	g	18.00	1000	g	64.40	0.0322	0.0900
(25:24:1 v/v)			24′ Chloroform	0.48	mL	500	mL	50.62	2500	mL	100.66	0.0193	0.0486
			1′ Isoamyl	0.02	mL	25	mL	13.92	1000	mL	108.00	0.0022	0.0111
Chloroform:Isoamyl	1.0	mL	24′ Chloroform	0.96	mL	500	mL	50.62	2500	mL	100.66	0.0387	0.0972
(24:1 v/v)			1′ Isoamyl	0.04	mL	25	mL	13.92	1000	mL	108.00	0.0043	2.2E-05
Isopropanol	1.0	mL	100%	2.0	mL	1000	mL	30.30	2500	mL	61.70	0.0494	6.1E-02
TE buffer	0.1	mL	10 mM Tris–HCl	0.12	mg	500	g	93.40	1000	g	128.00	1.6E-05	2.3E-05
			1 mM EDTA	0.03	mg	100	g	34.08	1000	g	245.23	7.2E-06	1.0E-05
RNaseA treatment	5.0	µL	0.2 µg µL-1	1.0	µg	250	mg	94.40	1000	mg	292.00	0.0003	3.8E-04
Extracted samples	12					–		–	–		–	–	–
Extraction time	250	min				–		–	–		–	–	–
Lab staff (per hour)						–		35.00	–		25.00	–	–
Lab staff (€/extraction)												**8.68**	**12.15**
Chemicals (€/extraction)												**0.36**	**0.86**
Gloves, tubes, tips (€/extraction)												**0.30**	**0.42**
Final price per extraction including extraction time, lab staff and all consumables (€)												**9.34**	**13.43**

Table 3
Cost analysis for DNA extraction procedure B (according to Gabor et al. [2]; harsh method).

Consumables	Volumes	Units	Concentration	Volumes	/Weight	High costs			Low costs			Low cost	High cost
						Amount	Unit	Fix cost (€)	Amount	Unit	Fix cost (€)	per Prep (€)	per Prep (€)
Gloves (any size)	1	pair	–	–	–	50	pair	8.20	50	pair	4.50	0.0900	0.1640
Tubes	3	–	–	2.0	mL	500	pieces	11.90	1000	pieces	21.90	0.0657	0.0714
Tips	10			1000	µL	500	pieces	5.08	1000	pieces	7.70	0.0770	0.1015
Tips	4			200	µL	500	pieces	5.40	1000	pieces	8.19	0.0328	0.0432
Tips	1			10	µL	1000	pieces	27.14	2000	pieces	43.42	0.0217	0.0271
Silica beads	0.1	mm	–	700	mg	1000	g	24.30	25000	g	202.00	0.0057	0.0170
Lysozyme buffer	1.25	mL	100 mM Tris	15.1	mg	500	g	93.40	1000	g	128.00	0.0019	0.0028
		mL	100 mM sodium EDTA	46.5	mg	100	g	23.50	1000	g	59.70	0.0028	0.0109
			100 M NaCl	109.6	mg	500	g	15.84	1000	g	24.19	0.0027	0.0035
			1% w/v CTAB	12.5	µg	100	g	22.64	1000	g	89.11	0.0011	0.0028
Lysozyme	0.04	mL	50 mg mL^{-1}	2.0	mg	1.0	g	23.89	10	g	96.04	0.0192	0.0478
Proteinase K	0.01	mL	10 mg mL^{-1}	0.1	mg	0.1	g	67.68	0.5	g	259.62	0.0519	0.0677
SDS	0.2	mL	w/v 20%	0.04	mg	100	g	16.56	1000	g	56.48	2.3E-06	6.6E-06
Chloroform (1:1 v/v)	1.0	mL	100%	1.0	mL	500	mL	50.62	2500	mL	100.66	0.0403	0.1012
Isopropanol (0.6:1 v/v)	0.6	mL	100%	0.6	mL	1000	mL	30.30	2500	mL	61.70	0.0148	0.0182
Ethanol	0.5	mL	70%	0.375	mL	250	mL	47.56	2500	mL	246.58	0.0345	0.0666
TE buffer	0.1	mL	10 mM Tris–HCl	0.12	mg	500	g	93.40	1000	g	128.00	1.6E-05	2.3E-05
			1 mM EDTA	0.03	mg	100	g	34.08	1000	g	245.23	7.2E-06	1.0E-05
Extracted samples	12					–		–	–		–	–	–
Extraction time	235	min				–		–	–		–	–	–
Lab staff (per hour)						–		35.00	–		25.00	–	–
Lab staff (€/extraction)												**8.16**	**11.42**
Chemicals (€/extraction)												**0.17**	**0.34**
Gloves, tubes, tips (€/extraction)												**0.29**	**0.41**
Final price per extraction including extraction time, lab staff and all consumables (€)												**8.62**	**12.17**

Table 4
Cost analysis for DNA extraction procedure C (according to Gabor et al. [2]; soft method).

Consumables	Volumes	Units	Concentration	Volumes	/Weight	High costs			Low costs			Low cost	High Cost
						Amount	Unit	Fix cost (€)	Amount	Unit	Fix cost (€)	per Prep (€)	per Prep (€)
Gloves (any size)	1	pair	–	–	–	50	pair	8.20	50	pair	4.50	0.090	0.164
Tubes	3	–	–	2.0	mL	500	pieces	11.90	1000	pieces	21.90	0.066	0.071
Tips	10			1000	µL	500	pieces	5.08	1000	pieces	7.70	0.077	0.102
Tips	4			200	µL	500	pieces	5.40	1000	pieces	8.19	0.033	0.043
Tips	1			10	µL	1000	pieces	27.14	2000	pieces	43.42	0.022	0.027
Silica beads	0.1	mm	ID	700	mg	1000	g	24.30	25000	g	202.00	0.0057	0.0170
Lysozyme buffer	1.25	mL	100 mM Tris	15.1	mg	500	g	93.40	1000	g	128.00	0.0019	0.0028
		mL	100 mM sodium EDTA	46.5	mg	100	g	23.50	1000	g	59.70	0.0028	0.0109
			100 M NaCl	109.6	mg	500	g	15.84	1000	g	24.19	0.0027	0.0035
			1% w/v CTAB	12.5	µg	100	g	22.64	1000	g	89.11	0.0011	0.0028
Lysozyme	0.04	mL	50 mg mL-1	2.0	mg	1.0	g	23.89	10	g	96.04	0.0192	0.0478
Proteinase K	0.01	mL	10 mg mL-1	0.1	mg	0.1	g	67.68	0.5	g	259.62	0.0519	0.0677
SDS	0.2	mL	w/v 20%	0.04	mg	100	g	16.56	1000	g	56.48	2.3E-06	6.6E-06
Chloroform (1:1 v/v)	1.0	mL	100%	1.0	mL	500	mL	50.62	2500	mL	100.66	0.0403	0.1012
Isopropanol (0.6:1 v/v)	0.6	mL	100%	0.6	mL	1000	mL	30.30	2500	mL	61.70	0.0148	0.0182
Ethanol	0.5	mL	70%	0.375	mL	250	mL	47.56	2500	mL	246.58	0.0345	0.0666
TE buffer	0.1	mL	10 mM Tris–HCl	0.12	mg	500	g	93.40	1000	g	128.00	1.6E-05	2.3E-05
			1 mM EDTA	0.03	mg	100	g	34.08	1000	g	245.23	7.2E-06	1.0E-05
Extracted samples	12					–		–	–		–	–	–
Extraction time	230	min				–		–	–		–	–	–
Lab staff (per hour)						–		35.00	–		25.00	–	–
Lab staff (€/extraction)												**7.99**	**11.18**
Chemicals (€/extraction)												**0.17**	**0.34**
Gloves, tubes, tips (€/extraction)												**0.29**	**0.41**
Final price per extraction including extraction time, lab staff and all consumables (€)												**8.45**	**11.93**

Table 5
Cost analysis for DNA extraction procedure D (according to Shan et al. [3]).

Consumables	Volumes	Units	Concentration	Volumes	/Weight	High costs			Low costs			Low cost	High cost
						Amount	Unit	Fix cost (€)	Amount	Unit	Fix cost (€)	per Prep (€)	per Prep (€)
Gloves (any size)	1	pair	–	–	–	50	pair	8.20	50	pair	4.50	0.0900	0.1640
Tubes	3	–	–	2.0	mL	500	pieces	11.90	1000	pieces	21.90	0.0657	0.0714
Tips	8			1000	µL	500	pieces	5.08	1000	pieces	7.70	0.0616	0.0812
Tips	2			200	µL	500	pieces	5.40	1000	pieces	8.19	0.0164	0.0216
Tips	1			10	µL	1000	pieces	27.14	2000	pieces	43.42	0.0217	0.0271
TENP Puffer	0.4	mL	50 mM Tris	2.42	mg	500	g	93.40	1000	g	128.00	0.0003	0.0005
			20 mM EDTA	2.34	mg	100	g	34.08	1000	g	245.23	0.0006	0.0008
			100 mM NaCl	2.34	mg	500	g	15.84	1000	g	24.19	0.0001	0.0001
			10 mg mL-1 PVP	4.00	mg	100	g	45.30	1000	g	224.00	0.0009	0.0018
SDS	50	µL	w/v 20%	10.0	µg	10]0	g	16.56	1000	g	56.48	5.6E-07	1.7E-06
CTAB Puffer	0.5	mL	0,7 M NaCl	20.5	mg	500	g	15.84	1000	g	24.19	0.0005	0.0006
			10% CTAB	50.0	µg	100	g	22.64	1000	g	89.11	4.5E-06	1.1E-05
KH_2PO_4	0.25	mL	240 mM	8.16	mg	250	g	19.66	1000	g	56.66	4.6E-07	0.0006
Phenol:Chloroform:Isoamyl	1.0	mL	100 mM Tris	12.1	mg	500	g	93.40	1000	g	128.00	0.0016	0.0023
(25:24:1 v/v)			Phenol	0.50	g	100	g	18.00	1000	g	64.40	0.0322	0.0900
			Chloroform	0.48	mL	500	mL	50.62	2500	mL	100.66	0.0193	0.0486
			Isoamyl	0.02	mL	25	mL	13.92	1000	mL	108.00	0.0022	0.0111
Chloroform:Isoamyl	1.0	mL	Chloroform	0.96	mL	500	mL	50.62	2500	mL	100.66	0.0387	0.0972
(24:1 v/v)			Isoamyl	0.04	mL	25	mL	13.92	1000	mL	108.00	0.0043	0.0223
Isopropanol	1.0	mL	100%	1.0	mL	1000	mL	30.30	2500	mL	61.70	0.0247	0.0303
TE buffer	0.1	mL	10 mM Tris–HCl	0.12	mg	500	g	93.40	1000	g	128.00	1,6E-05	2.3E-05
			1.0 mM EDTA	0.03	mg	100	g	34.08	1000	g	245.23	7.2E-06	1.0E-05
Extracted samples	12					–		–	–			–	–
Extraction time	210	min				–		–	–		–	–	–
Lab staff (per hour)						–		35.00	–		25.00	–	–
Lab staff (€/extraction)												**7.29**	**10.21**
Chemicals (€/extraction)												**0.13**	**0.31**
Gloves, tubes, tips (€/extraction)												**0.26**	**0.37**
Final price per extraction including extraction time, lab staff and all consumables (€)												**7.67**	**10.88**

Table 6
Cost analysis for DNA extraction procedure E (according to Orsini and Romano-Spica [4]).

Consumables	Volumes	Units	Concentration	Volumes	/Weight	High costs			Low costs			Low cost	High cost
						Amount	Unit	Fix cost (€)	Amount	Unit	Fix cost (€)	per Prep (€)	per Prep (€)
Gloves (any size)	1	pair	–	–	–	50	pair	8.20	50	pair	4.50	0.0900	0.1640
Tubes	2	–	–	2.0	mL	500	pieces	11.90	1000	pieces	21.90	0.0438	0.0476
Tips	9		–	1000	µL	500	pieces	5.08	1000	pieces	7.70	0.0693	0.0914
Tips	3		–	200	µL	500	pieces	5.40	1000	pieces	8.19	0.0246	0.0324
Tips	0		–	10	µL	1000	pieces	27.14	2000	pieces	43.42	0,0000	0.0000
Wash solution	1.0	mL	50 mM Tris–HCl	6.1	mg	500	g	93.40	1000	g	128.00	0.0008	0.0011
			25 mM EDTA	7.3	mg	100	g	34.08	1000	g	245.23	0.0018	0.0025
			0.1% w/v SDS	1.0	µg	100	g	16.56	1000	g	56.48	5.6E-08	1.7E-07
			0.1% w/v PVP	1.0	µg	100	g	45.30	1000	g	224.00	2.2E-07	4.5E-07
Lysis buffer	0.1	mL	50 mM Tris–HCl	0.61	mg	500	g	93.40	1000	g	128.00	7.8E-05	1.1E-04
			25 mM EDTA	0.73	mg	100	g	34.08	1000	g	245.23	1.8E-04	2.5E-04
			3% w/v SDS	30.0	µg	100	g	16.56	1000	g	56.48	1.7E-06	5.0E-06
			1.2% w/v PVP	12.0	µg	100	g	45.30	1000	g	224.00	2.7E-06	5.4E-06
Extraction buffer	0.8	mL	10 mM Tris–HCl	9.7	mg	500	g	93.40	1000	g	128.00	0.0012	0.0018
			1 mM EDTA	0.23	mg	100	g	34.08	1000	g	245.23	0.0001	0.0001
			0.3 M NaOAc	19.7	mg	250	g	22.47	1000	g	56.30	0.0011	0.0018
			1.2% PVP	9.6	µg	100	g	45.30	1000	g	224.00	2.2E-06	4.3E-06
Phenol:Chloroform	1.0	mL	Phenol	0.5	g	100	g	18.00	1000	g	64.40	0.0322	0.0900
(1:1 v/v)			Chloroform	0.5	mL	500	mL	50.62	2500	mL	100.66	0.0201	0.0506
Sodiumacetate	0.08	mL	3 M	19.7	mg	250	g	22.47	1000	g	56.30	0.0011	0.0018
Isopropanol	0.9	mL	100%	0.9	mL	1000	mL	30.30	2500	mL	61.70	0.0222	0.0273
Ethanol	2.0	mL	70%	1.4	mL	250	mL	47.56	2500	mL	246.58	0.1381	0.2663
TE buffer	0.1	mL	10 mM Tris–HCl	0.12	mg	500	g	93.40	1000	g	128.00	1.6E-05	2.3E-05
			1.0 mM EDTA	0.03	mg	100	g	34.08	1000	g	245.23	7.2E-06	1.0E-05
Extracted samples	12					–		–	–		–	–	–
Extraction time	150	min				–		–	–		–	–	–
Lab staff (per hour)						–		35.00	–		25.00	–	–
Lab staff (€/extraction)												**5.21**	**7.29**
Chemicals (€/extraction)												**0.22**	**0.44**
Gloves, tubes, tips (€/extraction)												**0.23**	**0.34**
Final price per extraction including extraction time, lab staff and all consumables (€)												**5.65**	**8.07**

Table 7
Cost analysis for DNA extraction procedure F (according to Singka et al., 2012).

Consumables	Volumes	Units	Concentration	Volumes	/Weight	High costs			Low costs			Low cost	High cost
						Amount	Unit	Fix cost (€)	Amount	Unit	Fix cost (€)	per Prep (€)	per Prep (€)
Gloves (any size)	1	pair	–	–	–	50	pair	8.20	50	pair	4.50	0,.900	0.1640
Tubes	4	–	–	1.5	mL	500	pieces	8.20	1000	pieces	14.90	0.0596	0.0656
Tips	12		–	1000	µl	500	pieces	5.08	1000	pieces	7.70	0.0924	0.1218
Tips	2		–	200	µL	500	pieces	5.40	1000	pieces	8.19	0.0164	0.0216
Glass beads 0.1 mm	0.5	g	–	5.0	g	1000	g	24.30	25000	g	202.00	0.0404	0.1215
CTAB extraction buffer	0.5	mL	0.7 M NaCl	10.2	mg	500	g	15.84	1000	g	24.19	0.0002	0.0003
(1:1 v/v) 10% w/v (CTAB in NaCl)			10% w/v CTAB	2,5	µg	100	g	22.64	1000	g	89.11	2.2E-07	5.7E-07
to KH_2PO_4			240 mM KH2PO4	8.2	mg	250	g	19.66	1000	g	56.66	0.0005	0.0006
Phenol:Chloroform:Isoamyl	1.0	mL	25′ Phenol	0.5	g	100	g	18.00	1000	g	64.40	0.0322	0.0900
(25:24:1 v/v)			24′ Chloroform	0.48	mL	500	mL	50.62	2500	mL	100.66	0.0193	0.0486
			1′ Isoamyl	0.02	mL	25	mL	13.92	1000	mL	108.00	0.0022	0.0111
Chloroform:Isoamyl	0.5	mL	24' Chloroform	0.48	mL	500	mL	50.62	2500	mL	100.66	0.0193	0.0486
(24:1 v/v)			1′ Isoamyl	0.02	mL	25	mL	13.92	1000	mL	108.00	0.0022	0.0111
Sodium acetate (0.1:1 v/v)	0.05	mL	3 M	12.3	mg	250	g	22.47	1000	g	56.30	0.0007	0.0011
Isopropanol (0.6: 1 v/v)	0.3	mL	100%	0.3	mL	1000	mL	30.30	2500	mL	61.70	0.0074	0.0091
Ethanol	1.5	mL	70%	1.05	mL	250	mL	47.56	2500	mL	246.58	0.1036	0.1998
TE buffer	0.1	mL	10 mM Tris–HCl	0.12	mg	500	g	93.40	1000	g	128.00	1.6E-05	2.3E-05
			1 mM EDTA	0.03	mg	100	g	34.08	1000	g	245.23	7.2E-06	1.0E-05
Extracted samples	12					–			–			–	–
Extraction time	195	min				–		–	–		–	–	–
Lab staff (per hour)						–		35.00	–		25.00	–	–
Lab staff (€/extraction)												**6.77**	**9.48**
Chemicals (€/extraction)												**0.19**	**0.42**
Gloves, tubes, tips (€/extraction)												**0.30**	**0.49**
Final price per extraction including extraction time, lab staff and all consumables (€)												**7.26**	**10.39**

Table 8
Cost analysis for DNA extraction procedure G (according to Saxony State Method).

Consumables	Volumes	Units	Concentration	Volumes	/Weight	High costs			Low costs			Low cost	High Cost
						Amount	Unit	Fix cost (€)	Amount	Unit	Fix cost (€)	per Prep (€)	per Prep (€)
Gloves (any size)	1	pair	–	–	–	50	pair	8.20	50	pair	4.50	0.0900	0.1640
Tubes	3	–	–	2.0	mL	500	pieces	11.90	1000	pieces	21.90	0.0657	0.0714
	1	–	–	1.5	mL	500	pieces	8.20	1000	pieces	14.90	0.0149	0.0164
Tips	13		–	1000	µL	500	pieces	5.08	1000	pieces	7.70	0.1001	0.1320
Tips	1		–	200	µL	500	pieces	5.40	1000	pieces	8.19	0.0082	0.0108
Tips	1		–	10	µL	1000	pieces	27.14	2000	pieces	43.42	0.0217	0.0271
Extraction buffer	1.0	mL	2% w/v CTAB	20.0	µg	100	g	22.64	1000	g	89.11	1.8E-06	4.5E-06
			0.1 M Tris–HCl	12.1	mg	500	g	93.40	1000	g	128.00	0.0016	0.0023
			0.02 M EDTA	5.8	mg	100	g	34.08	1000	g	245.23	0.0014	0.0020
			1.4 M NaCl	81.8	mg	500	g	15.84	1000	g	24.19	0.0020	0.0026
RNase A	0.02	mL	20 mg mL-1	0.4	mg	250	mg	94.40	1000	mg	292.00	0.1168	0.1510
Chloroform	0.75	mL	100%	0.75	mL	500	mL	50.62	2500	mL	100.66	0.0302	0.0759
Precipitation solution	1.0	mL	0.5% w/v CTAB	0.5	µg	100	g	22.64	1000	g	89.11	4.5E-08	1.1E-07
			40 mM NaCL	2.3	mg	500	g	15.84	1000	g	24.19	0.0001	0.0001
NaCl	0.35	mL	1.2 M NaCl	24.5	mg	500	g	15.84	1000	g	24.19	0.0006	0.0008
Chloroform	0.35	mL	100%	0.35	mL	500	mL	50.62	2500	mL	100.66	0.0141	0.0354
Isopropanol (0.6:1 v/v)	0.15	mL	100%	0.15	mL	250	mL	47.56	2500	mL	246.58	0.0148	0.0285
Ethanol	1.5	mL	70%	1.05	mL	250	mL	47.56	2500	mL	246.58	0.1036	0.1998
TE buffer	0.1	mL	10 mM Tris–HCl	0.12	mg	500	g	93.40	1000	g	128.00	1.6E-05	2.3E-05
			1.0 mM EDTA	0.03	mg	100	g	34.08	1000	g	245.23	7.2E-06	1.0E-05
Extracted samples	12					–		–	–		–	–	–
Extraction time	175	min				–		–	–		–	–	–
Lab staff (per hour)						–		35.00	–		25.00	–	–
Lab staff (€/extraction)												**6.08**	**8.51**
Chemicals (€/extraction)												**0.29**	**0.50**
Gloves, tubes, tips (€/extraction)												**0.30**	**0.42**
Final price per extraction including extraction time, lab staff and all consumables (€)												**6.66**	**9.43**

Table 9
Cost analysis for DNA extraction procedure H (according to Tabatabaei et al. [5]).

Consumables	Volumes	Units	Concentration	Volumes	/Weight	High costs			Low costs			Low cost	High cost
						Amount	Unit	Fix cost (€)	Amount	Unit	Fix cost (€)	per Prep (€)	per Prep (€)
Gloves (any size)	1	pair	–	–	–	50	pair	8.20	50	pair	4.50	0.0900	0.1640
Tubes	3	–	–	2.0	mL	500	pieces	11.90	1000	pieces	21.90	0.0657	0.0714
Tips	12		–	1000	µL	500	pieces	5.08	1000	pieces	7.70	0.0924	0.1218
Tips	1		–	200	µL	500	pieces	5.40	1000	pieces	8.19	0.0082	0.0108
Tips	0		–	10	µL	1000	pieces	27.14	2000	pieces	43.42	0.0000	0.0000
EDTA	0.4	mL	0.5 EDTA	58.4	mg	100	g	34.08	1000	g	245.23	0.0143	0.0199
Lysis buffer	0.4	mL	10 mM Tris	0.48	mg	500	g	93.40	1000	g	128.00	0.0001	0.0001
			1 mM EDTA	0.12	mg	100	g	34.08	1000	g	245.23	3.E-05	4.E-05
			2 mg mL-1 Lysozyme	0.80	mg	1,0	g	23.89	10	g	96.04	0.0077	0.0191
SDS	0.05	mL	10% w/v	0.005	mg	100	g	16.56	1000	g	56.48	2.8E-07	8.3E-07
Phenol:Chloroform	0.8	mL	Phenol	0.4	g	100	g	18.00	1000	g	64.40	0.0258	0.0720
(1:1 v/v)			Chloroform	0.4	mL	500	mL	50.62	2500	mL	100.66	0.0161	0.0405
Sodium acetate	0.08	mL	3 M	19.7	mg	250	g	22.47	1000	g	56.30	0.0011	0.0018
Isopropanol	0.9	mL	100%	0.9	mL	1000	mL	30.30	2500	mL	61.70	0.0222	0.0273
Ethanol	1.5	mL	70%	1.05	mL	250	mL	47.56	2500	mL	246.58	0.1036	0.1998
TE buffer	0.1	mL	10 mM Tris–HCl	0.12	mg	100	g	34.08	1000	g	245.23	3.0E-05	4.1E-05
			1.0 mM EDTA	0.03	mg	500	g	93.40	1000	g	128.00	3.7E-06	5.5E-06
Extracted samples	12					–			–		–	–	–
Extraction time	210	min				–		–	–		–	–	–
Lab staff (per hour)						–		35.00	–		25,00	–	–
Lab staff (€/extraction)												**7.29**	**10.21**
Chemicals (€/extraction)												**0.19**	**0.38**
Gloves, tubes, tips (€/extraction)												**0.26**	**0.37**
Final price per extraction (€)												**7.74**	**10.96**

Table 10
Cost analysis for DNA extraction procedure I (according to Tresse et al. [6]).

Consumables	Volumes	Units	Concentration	Volumes	/Weight	High costs			Low costs			Low cost	High cost
						Amount	Unit	Fix cost (€)	Amount	Unit	Fix cost (€)	per Prep (€)	per Prep (€)
Gloves (any size)	1	pair	–	–	–	50	pair	8.20	50	pair	4.50	0.0900	0.1640
Tubes	3	–	–	2.0	mL	500	pieces	11.90	1000	pieces	21.90	0.0657	0.0714
	4	–	–	1.5	mL	500	pieces	8.20	1000	pieces	14.90	0.0596	0.0656
Tips	14		–	1000	µL	500	pieces	5.08	1000	pieces	7.70	0.1078	0.1421
Tips	4		–	200	µL	500	pieces	5.40	1000	pieces	8.19	0.0328	0.0432
Tips	1		–	10	µL	1000	pieces	27.14	2000	pieces	43.42	0.0217	0.0271
TEN buffer	0.7	mL	100 mM Tris	8.48	mg	500	g	93.40	1000	g	128.00	0.0011	0.0016
			100 mM EDTA	20.45	mg	100	g	34.08	1000	g	245.23	0.0050	0.0070
			100 mM NaCl	4.09	mg	500	g	15.84	1000	g	24.19	9.9E-05	1.3E-04
			5 mg mL-1 Lysozyme	3.5	mg	1.0	g	23.89	10	g	96.04	0.0336	0.0836
SDS	0.035	mL	20% w/v	0.007	mg	100	g	16.56	1000	g	56.48	4.0E-07	1.2E-06
Proteinase K	0.01	mL	20 mg mL-1	0.2	mg	100	mg	67.68	500	mg	259.62	0.1038	0.1354
Silica beads	–		ID 0.1 mm	250	mg	1000	g	24.30	25000	g	202.00	2.0E-03	0.0061
Silica beads	–		ID 0.5 mm	250	mg	1000	g	25.23	20000	g	227.18	0.0028	0.0063
Silica beads	2	beads	ID 6.0 mm	69	mg	500	g	34.20	1000	g	12.35	0.0009	0.0047
Ammoniumacetate	0.145	mL	10 M	111.8	mg	250	g	15.30	1000	g	45.29	0.0051	0.0068
RNase A	0.005	mL	1 mg mL-1	0.005	mg	250	mg	94.40	1000	mg	292.00	0.0015	0.0019
Phenol:Chloroform:Isoamyl (25:24:1 v/v)	1.5	mL	25' Phenol	0.75	g	100	g	18.00	1000	g	64.40	0.0483	0.1350
			24' Chloroform	0.72	mL	500	mL	50.62	2500	mL	100.66	0.0290	0.0729
			1' Isoamyl	0.03	mL	25	mL	13.92	1000	mL	108.00	0.0032	0.0167
Chloroform:Isoamyl (24:1 v/v)	0.7	mL	24' Chloroform	0.672	mL	500	mL	50.62	2500	mL	100.66	0.0271	0.0680
			1' Isoamyl	0.028	mL	25	mL	13.92	1000	mL	108.00	0.0030	0.0156
Sodiumaceate (1:10 v/v)	0.07	mL	3 M	17.2	mg	250	g	22.47	1000	g	56.30	0.0010	0.0015
Ethanol (2:1 v/v)	1.4	mL	98%	1.37	mL	250	mL	47.56	2500	mL	246.58	0.1353	0.2610
Ethanol	1.0	mL	70%	0.7	mL	250	mL	47.56	2500	mL	246.58	0.0690	0.1332
TE buffer	0.1	mL	10 mM Tris–HCl	0.12	mg	100	g	34.08	1000	g	245.23	3.0E-05	4.1E-05
			1.0 mM EDTA	0.03	mg	500	g	93.40	1000	g	128.00	3.7E-06	5.5E-06
Extracted samples	12					–			–		–	–	–
Extraction time	170	min				–		–	–		–	–	–
Lab staff (per hour)						–		35.00	–		25.00	–	–
Lab staff (€/extraction)												**5.90**	**8.26**
Chemicals (€/extraction)												**0.47**	**0.96**
Gloves, tubes, tips (€/extraction)												**0.38**	**0.51**
Final price per extraction including extraction time, lab staff and all consumables (€)												**6.75**	**9.73**

Table 11
Cost analysis for DNA extraction procedure J (according to Wilson [7]).

Consumables	Volumes	Units	Concentration	Volumes	/Weight	High costs			Low costs			Low cost	High cost
						Amount	Unit	Fix cost (€)	Amount	Unit	Fix cost (€)	per Prep (€)	per Prep (€)
Gloves (any size)	1	pair	–	–	–	50	pair	8.20	50	pair	4.50	0.0900	0.1640
Tubes	3	–	–	2.0	mL	500	pieces	11.90	1000	pieces	21.90	0.0657	0.0714
Tips	9		–	1000	µL	500	pieces	5.08	1000	pieces	7.70	0.0693	0.0914
Tips	4		–	200	µL	500	pieces	5.40	1000	pieces	8.19	0.0328	0.0432
Tips	1		–	10	µL	1000	pieces	27.14	2000	pieces	43.42	0.0217	0.0271
TE buffer	0.567	mL	10 mM Tris	0.69	mg	100	g	34.08	1000	g	245.23	0.0002	0.0002
			10 mM EDTA	1.66	mg	500	g	93.40	1000	g	128.00	0,0002	0.0003
SDS	0.03	mL	10% w/v	0.003	mg	100	g	16.56	1000	g	56.48	1.7E-07	5.0E-07
Proteinase K	0.003	mL	20 mg mL-1	0.06	mg	100	mg	67.68	500	mg	259.62	0.0312	0.0406
NaCl	0.1	mL	5 M	29.22	mg	500	g	15.84	1000	g	24.19	7.1E-04	9.3E-04
CTAB/NaCl	0.08	mL	0,7 M NaCl	3,3	mg	500	g	15.84	1000	g	24.19	0.0001	0.1037
			10% w/v CTAB	0.008	mg	100	g	22.64	1000	g	89.11	7.1E-07	1.8E-06
Chloroform:Isoamyl	1.0	mL	24' Chloroform	0.96	mL	500	mL	50.62	2500	mL	100.66	0.0387	0.0972
(24:1 v/v)			1' Isoamyl	0.04	mL	25	mL	13.92	1000	mL	108.00	0.0043	0.0223
Phenol:Chloroform:Isoamyl	0.9	mL	25' Phenol	0.45	g	100	g	18.00	1000	g	64.40	0.0290	0.0810
(25:24:1 v/v)			24' Chloroform	0.432	mL	500	mL	50.62	2500	mL	100.66	0.0174	0.0437
			1' Isoamyl	0.018	mL	25	mL	13.92	1000	mL	108.00	0.0019	0.0100
Isopropanol (0.6: 1 v/v)	0.3	mL	100%	0.3	mL	1000	mL	30.30	2500	mL	61.70	0.0074	0.0091
Ethanol	0.5	mL	70%	0.35	mL	250	mL	47.56	2500	mL	246.58	0.0345	0.0666
TE buffer	0.1	mL	10 mM Tris–HCl	0.12	mg	100	g	34.08	1000	g	245.23	3.0E-05	4.1E-05
			1.0 mM EDTA	0.03	mg	500	g	93.40	1000	g	128.00	3.7E-06	5.5E-06
Extracted samples	12					–		–	–		–	–	–
Extraction time	105	min				–		–	–		–	–	–
Lab staff (per hour)						–		35.00	–		25.00	–	–
Lab staff (€/extraction)												**3.65**	**5.10**
Chemicals (€/extraction)												**0.17**	**0.48**
Gloves, tubes, tips (€/extraction)												**0.28**	**0.40**
Final price per extraction including extraction time, lab staff and all consumables (€)												**4.09**	**5.98**

Table 12
Cost analysis for FastDNA SPIN Kit for Soil.

Consumables	**Volumes**	**Units**	**Concentration**	**Volumes**	**/Weight**	**High costs**			**Low costs**			**Low cost**	**High cost**
						Amount	**Unit**	**Fix cost (€)**	**Amount**	**Unit**	**Fix cost (€)**	**per Prep (€)**	**per Prep (€)**
Gloves (any size)	1	pair	–	–	–	50	pair	8.20	50	pair	4.50	0.090	0.164
Tips	12			1000	µl	500	pieces	5.08	1000	pieces	7.70	0.092	0.122
Tips	4			200	µL	500	pieces	5.40	1000	pieces	8.19	0.033	0.043
Tips	1			10	µl	1000	pieces	27.14	2000	pieces	43.42	0.022	0.027
Test Kit						50	extractions	390.00	100	extractions	820.00	8.20	7.80
Extracted samples	12											–	–
Extraction time	45	min						–			–	–	–
lab staff (per hour)								35.00			25.00	1.56	2.19
Lab staff (€/extraction)												**1.56**	**2.19**
Chemicals (€/extraction)												**8.20**	**7.80**
Gloves, tubes, tips (€/extraction)												**0.24**	**0.36**
Final price per extraction including extraction time, lab staff and all consumables (€)												**10.00**	**10.34**

Table 13
Cost analysis for DNeasy power water kit.

Consumables	Volumes	Units	Concentration	Volumes	/Weight	Amount	High costs			Low costs		Low cost	High cost
							Unit	Fix cost (€)	Amount	Unit	Fix cost (€)	per Prep (€)	per Prep (€)
Gloves (any size)	1	pair	–	–	–	50	pair	8.20	50	pair	4.50	0.090	0.164
Tips	12			1000	µl	500	pieces	5.08	1000	pieces	7.70	0.092	0.122
Tips	4			200	µL	500	pieces	5.40	1000	pieces	8.19	0.033	0.043
Tips	1			10	µl	1000	pieces	27.14	2000	pieces	43.42	0.022	0.027
Test Kit						50	extractions	558.61	100	extractions	1062.9	10.63	11.17
Extracted samples	12											–	–
Extraction time	40	min						–			–	–	–
lab staff (per hour)								35.00			25.00	1.39	1.94
Lab staff (€/extraction)												**1.39**	**1.94**
Chemicals (€/extraction)												**10.63**	**11.17**
Gloves, tubes, tips (€/extraction)												**0.24**	**0.36**
Final price per extraction including extraction time, lab staff and all consumables (€)												**12.25**	**13.47**

Transparency document. Supporting information

Transparency document associated with this article can be found in the online version at https://doi.org/10.1016/j.dib.2017.11.082.

References

[1] R. Kuhn, J. Böllmann, K. Krahl, I.M. Bryant, M. Martienssen, Comparison of ten different DNA extraction procedures with respect to their suitability for environmental samples, J. Microbiol. Methods 143 (2017) 78–86. http://dx.doi.org/10.1016/j.mimet2017.10.007.
[2] M.E. Gabor, E.J. de Vries, D.B. Janssen, Efficient recovery of environmental DNA for expression cloning by indirect extraction methods, FEMS Microbiol. Ecol. 44 (2003) 153–163. http://dx.doi.org/10.1016/S0168-6496(02)00462-2.
[3] G. Shan, W. Jin, E.K. Lam, X. Xing, Purification of total DNA extracted from activated sludge, J. Environ. Sci. 20 (2008) 80–87. http://dx.doi.org/10.1016/S1001-0742(08)60012-1.
[4] M. Orsini, V. Romano-Spica, A microwave-based method for nucleic acid isolation from environmental samples, Lett. Appl. Microbiol. 33 (2001) 17–20. http://dx.doi.org/10.1046/j.1472-765X.2001.00938.x.
[5] M. Tabatabaei, M.R. Zakaria, R.A. Rahim, N. Abdullah, D.G. Wright, Y. Shirai, M. Shamsara, K. Sakai, M.A. Hassan, Comparative study of methods for extraction and purification of environmental DNA from high-strength wastewater sludge, Afr. J. Biotechnol. 9 (2010) 4926–4937. http://dx.doi.org/10.5897/AJB10.281.
[6] O. Tresse, M.J. Lorrain, D. Roh, Population dynamics of free-floating and attached bacteria in a styrene-degrading bio-trickling filter analyzed by denaturating gradient gel electrophoresis, Appl. Microbiol. Biot. 59 (2002) 585–590. http://dx.doi.org/10.1007/s00253-002-1039-z.
[7] K. Wilson, Preparation of genomic DNA from bacteria, Curr. Proced. Mol. Biol. (2001), http://dx.doi.org/10.1002/0471142727.mb0204s56 00:I:2.4:2.4.1–2.4.5.