

16s rDNA

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16S rDNA

PCR

(PCR)

Nested PCR

(LEG448-JRP) (LEG225-LEG858) ; (LEG448-LEG858)

LEG448-JRP

LEG858

LEG448-LEG858

LEG225-LEG858

DNA

Nested PCR

PCR

16s rRNA

PCR (- L

"

pH

PCR

(.)

PCR

(L

PCR

fl L

"

PCR

Wellinghausen

ñ / flÿ L

(- L

PCR

z y'

flÿ L Edagawa

fl L

(- L

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fl L

PCR

PCR

(Viable but non-culturable: VBNC)

PCR

fl L

PCR

(- L

(L

PCR

PCR

"

fl d L

5s rRNA

PCR

promega ,Wizard® Genomic DNA Purification Kit, Madison, USA (Promega

DNA PCR PCR

DNA mL

16s rRNA R₁ Eubac27F

DNA Nested PCR

PCR μL DNA

dNTP 1X; μM

Taq DNA / μM DNA μL polymerase

$$n=z^2s^2/d^2$$

°C

(PBS)

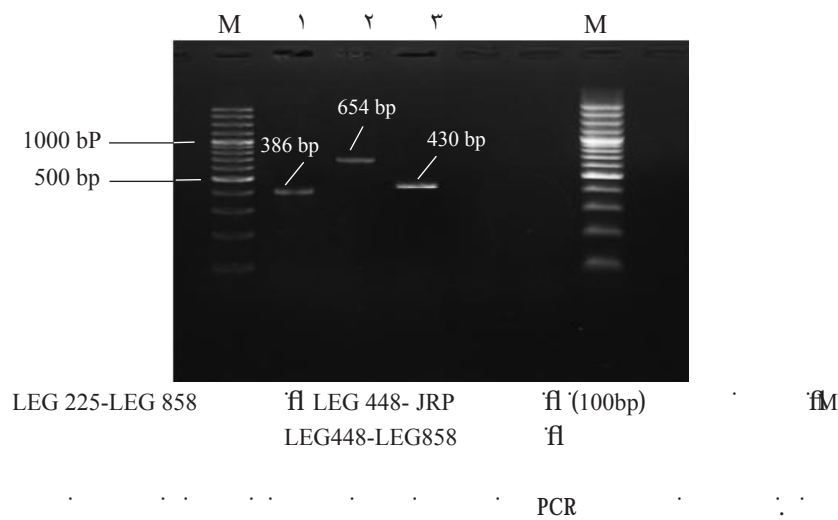
freez-thaw

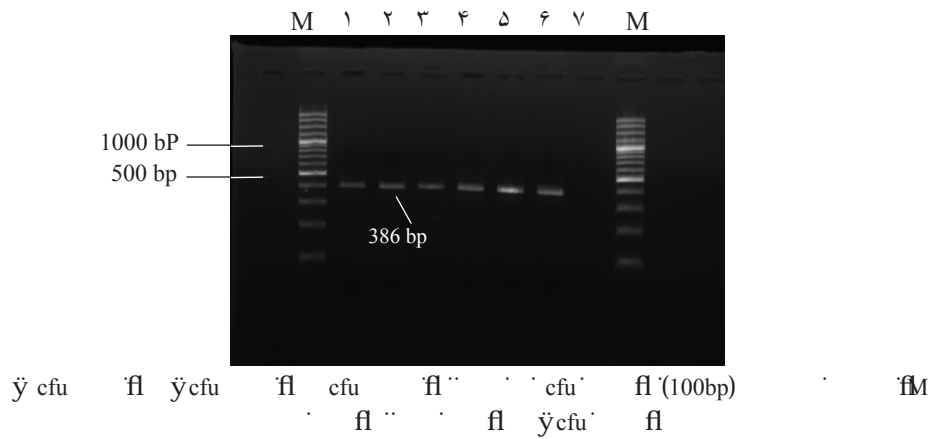
سايز محصولات (bp) PCR	ژن شناسايی	توالی پرایمرها	پرایمرها
حدود ۱۴۲۰ bp	16S rRNA	5'-AGA-GTT-TGA-TCC-TGG-CTC-A-<G>-3'	Eubac27 F 1429 R1
۶۵۴ bp	16S rRNA	5'-AAG-ATT-AGC-CTG-CGT-CCG-A-<T>-3'	LEG 225 LEG 858
۴۳۰ bp	16S rRNA	5'- AGG-GGT-TGA-TAG-GTT-AAG-AG-<C>-3'	LEG 448 LEG 858
۳۸۶bp	16S rRNA	5'- AGG-GGT-TGA-TAG-GTT-AAG-AG-<C>-3'	LEG 448 LEG JRP

PCR

تعداد مرحله و سیکل ها	تقسیمات فرعی هر مرحله	درجه حرارت	زمان
مرحله اول (۱ سیکل)	Pre- Denaturation	۹۵°C	۵min
	Denaturation	۹۴°C	۴۵s
مرحله دوم (۳۰ سیکل)	Annealing	۵۵°C	۱min
	Extention	۷۲°C	۱/ ۳۰min
مرحله سوم (۱ سیکل)	Final Extention	۷۲°C	۵min
مرحله چهارم (۱ سیکل)	Cooling	۴ °C	۳min

Loading Buffer / DNA
 DNA (UV Tech, France)
 DNA Nested PCR PCR
 DNA PCR





LEG 448-JRP

PCR

PCR

"

PCR

- 'cfu

PCR

DNA

PCR

SPSS

PCR

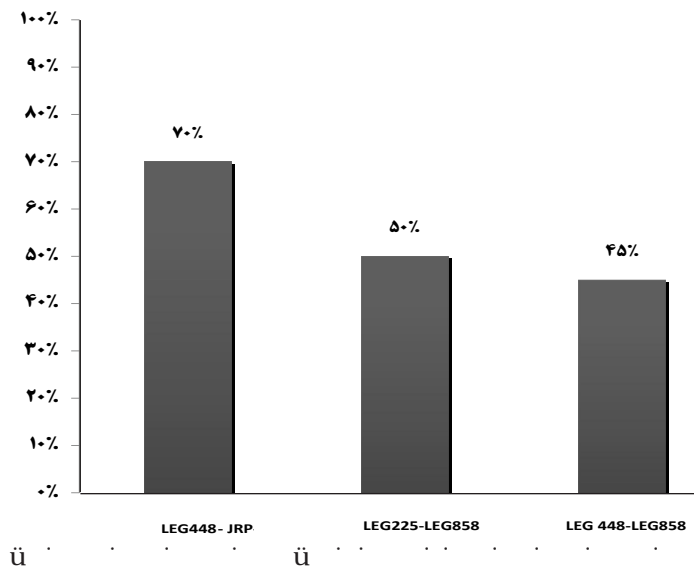
McNemar

$P < 0.05$

LEG448 -JRP

PCR

درصد فراوانی نمونه های مثبت با استفاده از پرایمرهای مختلف جهت بررسی لژیونلا



PCR

LEG225-LEG858) ، (LEG448-JRP

PCR

PCR

LEG448-LEG858

LEG225-LEG858

LEG448- JRP

JRP LEG448

McNemar

LEG448- JRP LEG225-LEG858

LEG448- JRP LEG448- LEG858

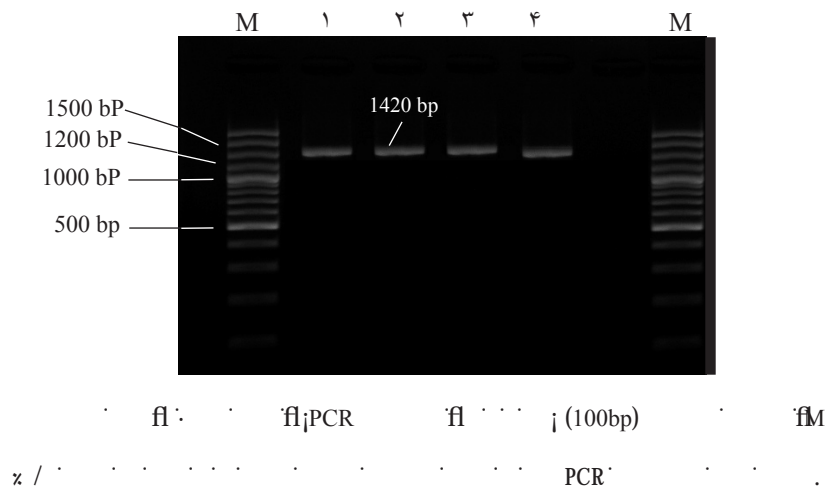
(P=)

LEG448-LEG858 LEG225-LEG858

LEG448- JRP

(LEG448-LEG858 LEG225-LEG858)

PCR



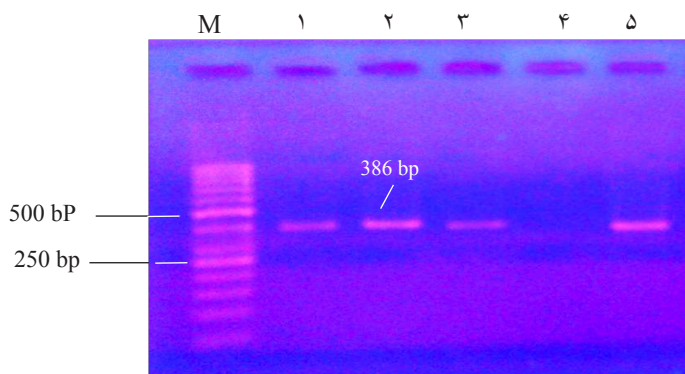


Figure 1: Agarose gel electrophoresis of PCR products. Lane M: DNA ladder (500 bp, 250 bp). Lanes 1-5: PCR products of JRP LEG448. Lane 1: JRP LEG448 DNA. Lane 2: JRP LEG448 DNA after 1st PCR. Lane 3: JRP LEG448 DNA after 2nd PCR. Lane 4: JRP LEG448 DNA after 3rd PCR. Lane 5: JRP LEG448 DNA after 4th PCR. A band at 386 bp is indicated.

Sharpness

LEG448-JRP

Nested PCR

DNA PCR LEG448-JRP

LEG225 - LEG858

PCR

DNA

PCR

PCR

PCR

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Sensitivity Comparison of Different 16s rDNA- Specific Primers for Detection of Legionella Species in Aquatic Samples

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ABSTRACT

Background and Objectives: Legionella are gram-negative bacteria widely dispersed in natural and man-made water sources. Some Legionella species are pathogenic and could cause respiratory infections. Cultivation technique is the conventional method for the detection of Legionella spp. in aquatic samples. However, the method has low sensitivity and require prolonged incubation period. Therefore, Polymerase chain reaction (PCR) as a rapid method with extreme sensitivity is used. The present study was designed to evaluate the feasibility and sensitivity of PCR method for detection of Legionellas pp. in aquatic samples using three sets of primers.

Materials and Methods: In this study, 60 water samples were investigated for the presence of Legionella species using Nested- PCR technique. The sensitivity of this technique was evaluated for the detection of Legionella species in aquatic samples using three primer sets, including (LEG225-LEG858), (LEG448-LEG858), and (LEG448-JRP).

Results: The nested PCR assay revealed that detection percentage of Legionella in samples was 70 when LEG448-JRP primers were used, whereas this percentage reduced to 50 and 45 when we applied prime sets of LEG225-LEG858 and LEG448 - LEG858, respectively.

Conclusion: The results of the study showed that contamination of aquatic samples to the Legionella spp. could be easily and rapidly detected by nested PCR. However, selecting appropriate method for DNA extraction and choosing the primers are important factors in efficiency and sensitivity of detection method.

Keywords: PCR, Water, Detection, Legionella

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