Presenter

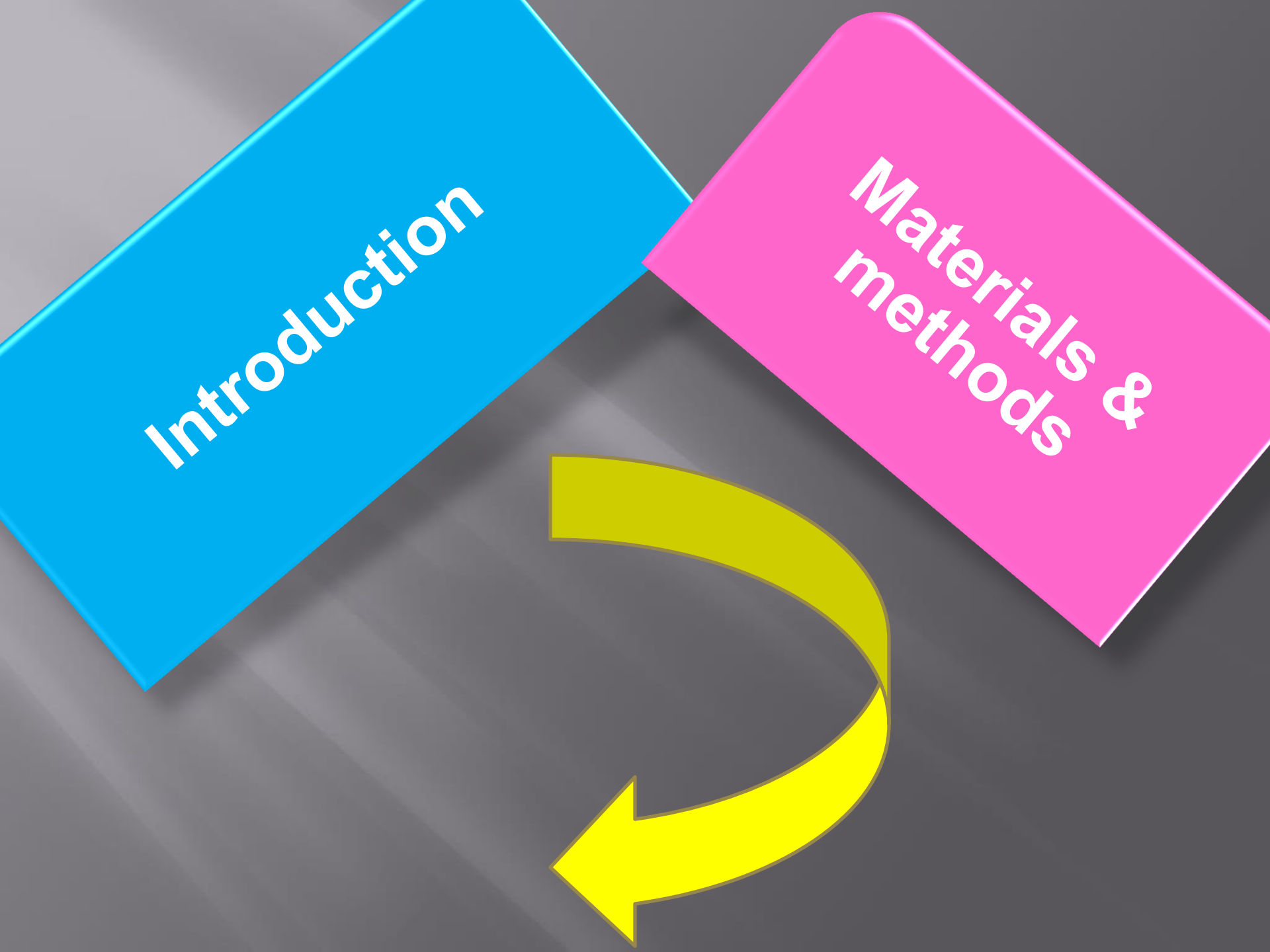
DR. MARYAM NIYYATI
PARASITOLOGYST

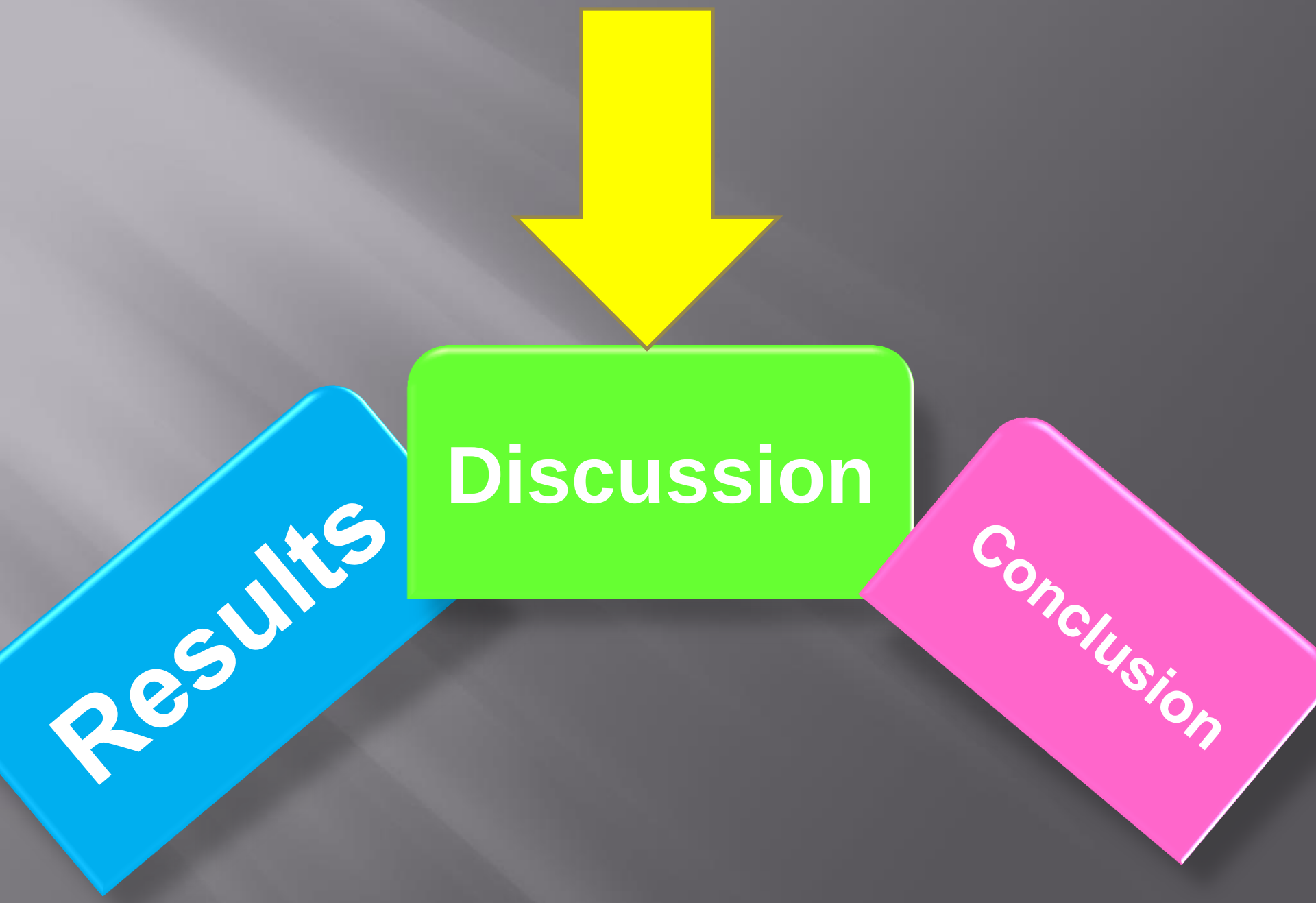
SHAHID BEHESHTI UNIVERSITY OF MEDICAL SCIENCES
TEHRAN, IRAN

RECREATIONAL WATER SOURCES AND HEALTH HAZARD

(CONTAMINATION OF RECREATIONAL WATER SOURCES TO PATHOGENIC ACANTHAMOEBA IN IRAN)

Maryam Niyyati[a], Nazar Mahdieh[a], Ali Haghighi[a], Zohreh Lasjerdi[a]


Introduction
Materials & methods


Results
Discussion
Conclusion

Introduction

ACANTHAMOEBA MORPHOLOGY



WIDE Environmental distribution

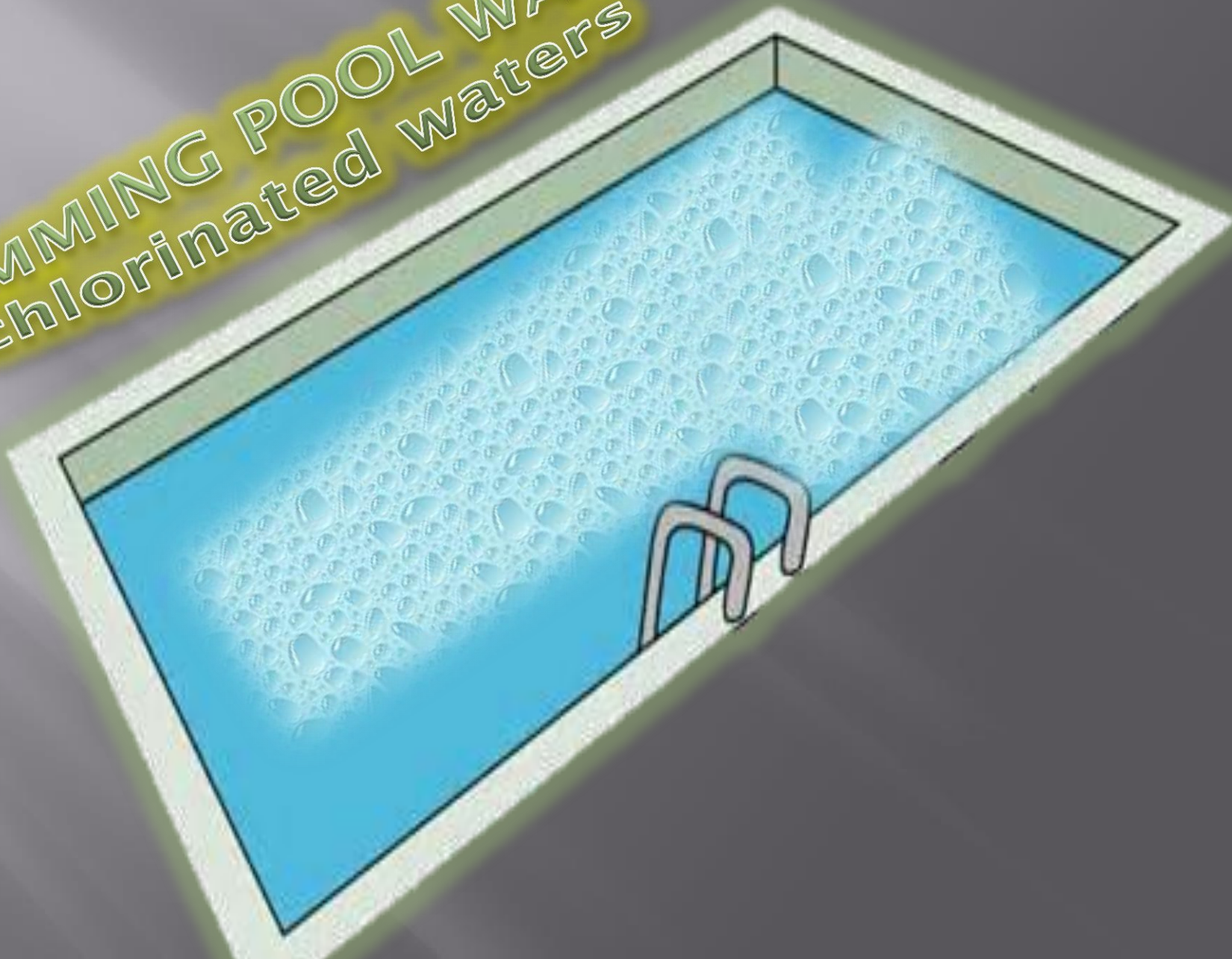







WATER
SOURCES

SWIMMING POOL WATER
chlorinated waters



EYE & BRAIN EATING AMOEBA

Acanthamoeba

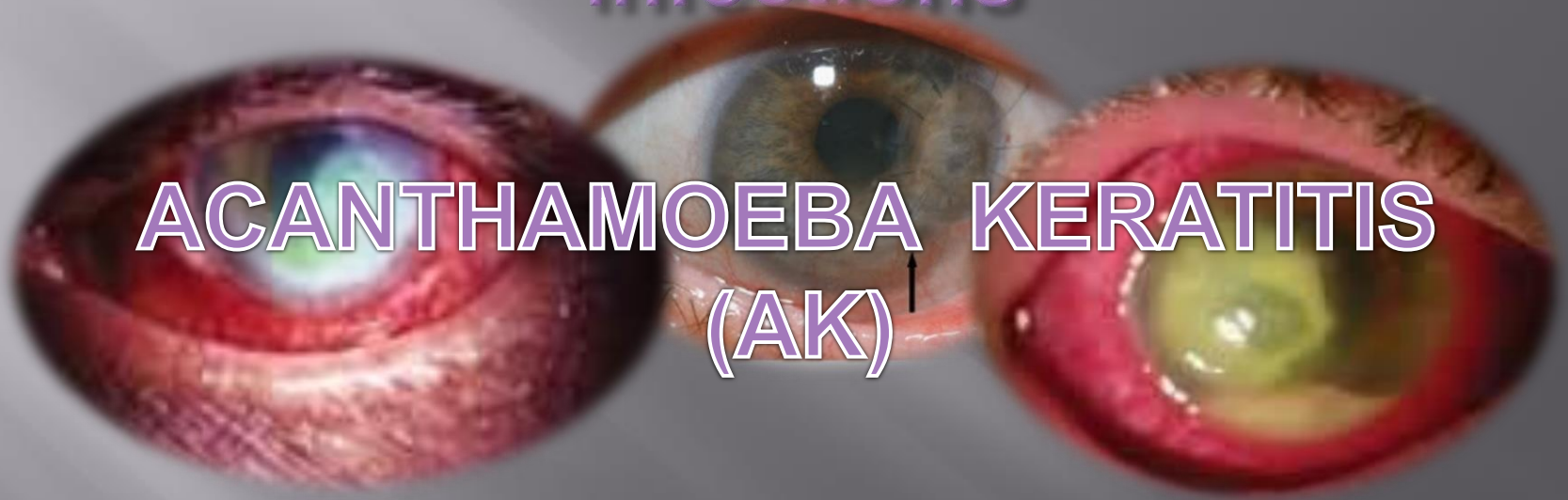
Granulomatose Encephalitis (GE)





Leading to death

Acanthamoeba spp. infections

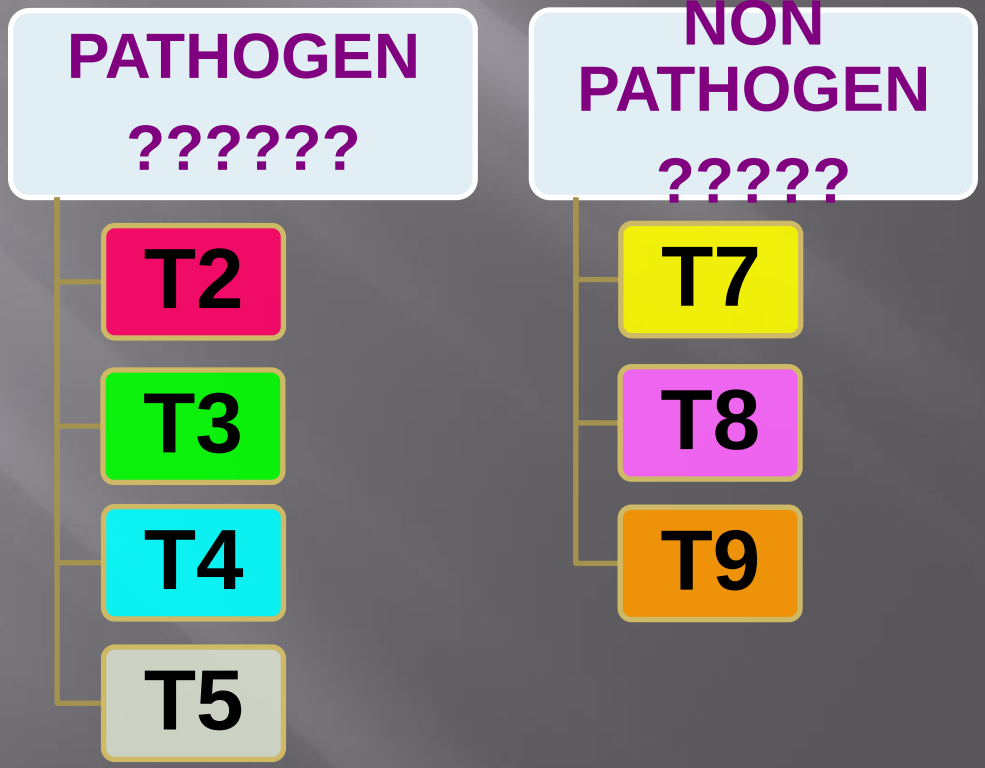


ACANTHAMOEBA KERATITIS (AK)

Excruciating pain
Radial neuritis
Photophobia

GENOTYPES

- ✓ Based on : 18s rDNA
- ✓ 18 Genotypes (T1-T18)



Display Settings: Abstract

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See 1 citation found by title matching your search:

Zentralbl Bakteriol. 1997 Apr;285(4):541-57.

Isolation of an Acanthamoeba strain with intracellular Burkholderia pickettii infection.

Michel R[1], Hauröder B.

Author information

Abstract

Burkholderia pickettii is a facultative pathogen that has been isolated from patient sources and environmental sources including respiratory therapy solutions, deionized water and aqueous disinfectants. The organism has been associated with septicemia and respiratory tract infections. In our investigation, Burkholderia pickettii (biovar 2) was for the first time isolated from Acanthamoeba sp. (group II), a free living amoeba species recovered from the wet area of a physiotherapy unit. Pathogenic strains of acanthamoebae may cause amoebic-encephalitis (AE) and keratitis. Light and electron microscopic examinations showed that in a first step, the bacterial were phagocytized by the amoebae. In contrast to Enterobacter cloacae and Escherichia coli that were used as food organisms and digested within food vacuoles, Burkholderia pickettii caused the amoebae to develop large vacuoles filled with completely intact and motile bacteria. 3-5 days after infection, Pseudomonas pickettii had multiplied within the enlarging parasitophorous vacuoles. Ultrastructural changes in the host cells occurred and the amoebae finally underwent rupture or lysis. In cocultivation assays we could not only reinfect the original host amoeba but Acanthamoeba strains from other habitats could successfully be infected with Burkholderia pickettii as well.

PMID: 9144916 [PubMed - indexed for MEDLINE]

No report in Iran

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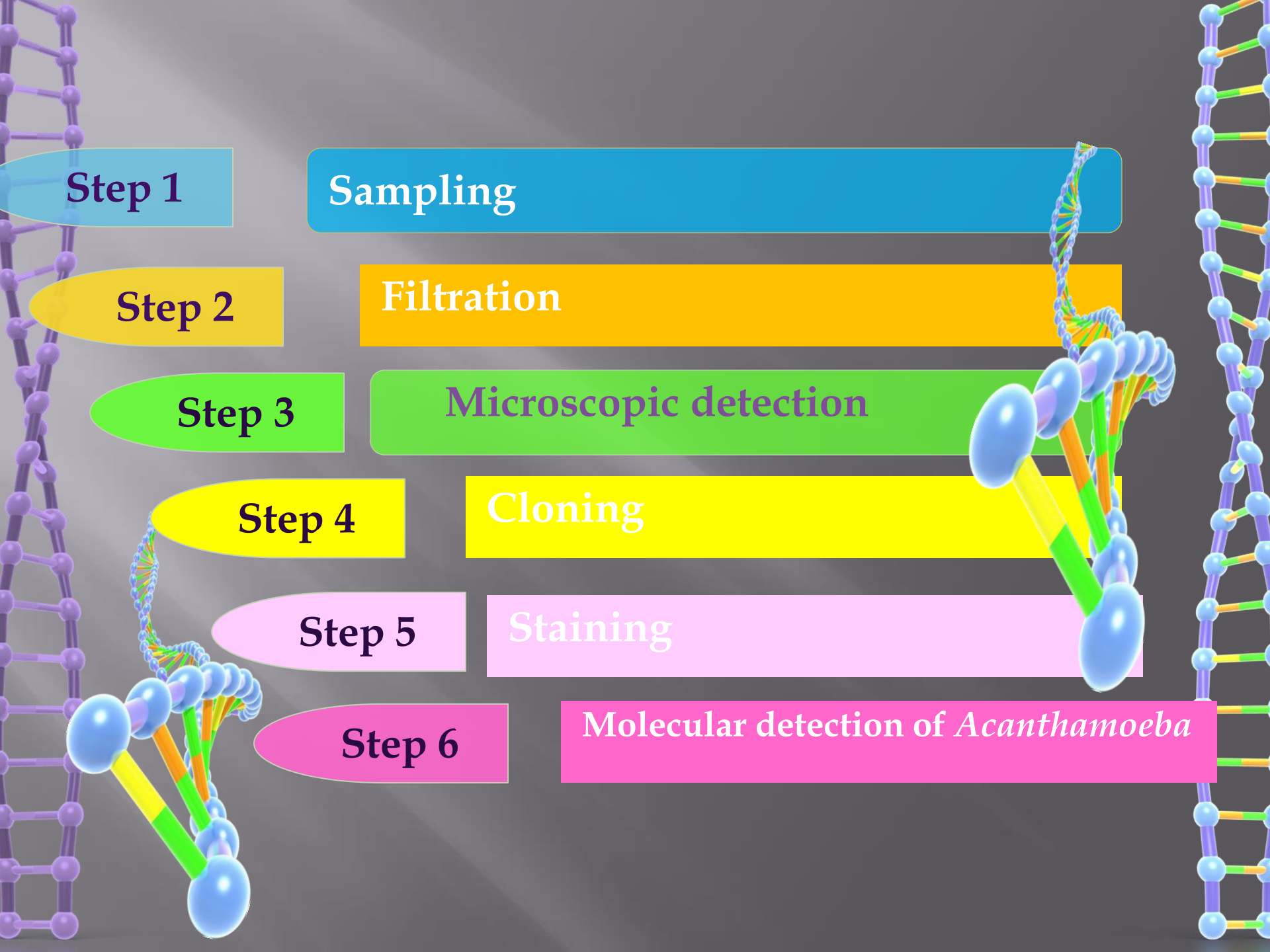
PMID: 9144916 [PubMed - indexed for MEDLINE]

objectives

1-Do recreational water sources IN NORTH OF IRAN contaminated to *Acanthamoeba*?

2- WHAT ARE THE GENOTYPES?

Materials & Methods

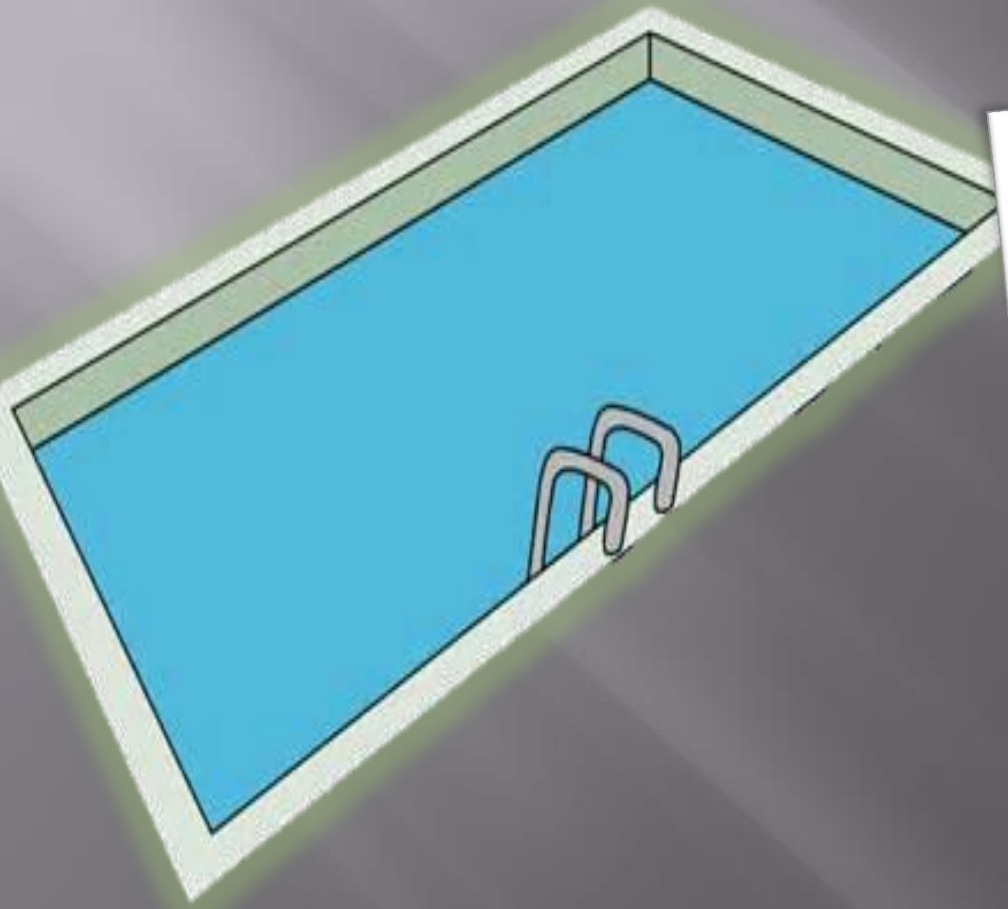

Step 1
Sampling
Step 2
Filtration
Step 3
Microscopic detection
Step 4
Cloning
Step 5
Staining
Step 6
Molecular detection of *Acanthamoeba*

Sampling

Sample sites: PONDS OF PARKS NORTH OF IRAN (GILAN PROVINCE)

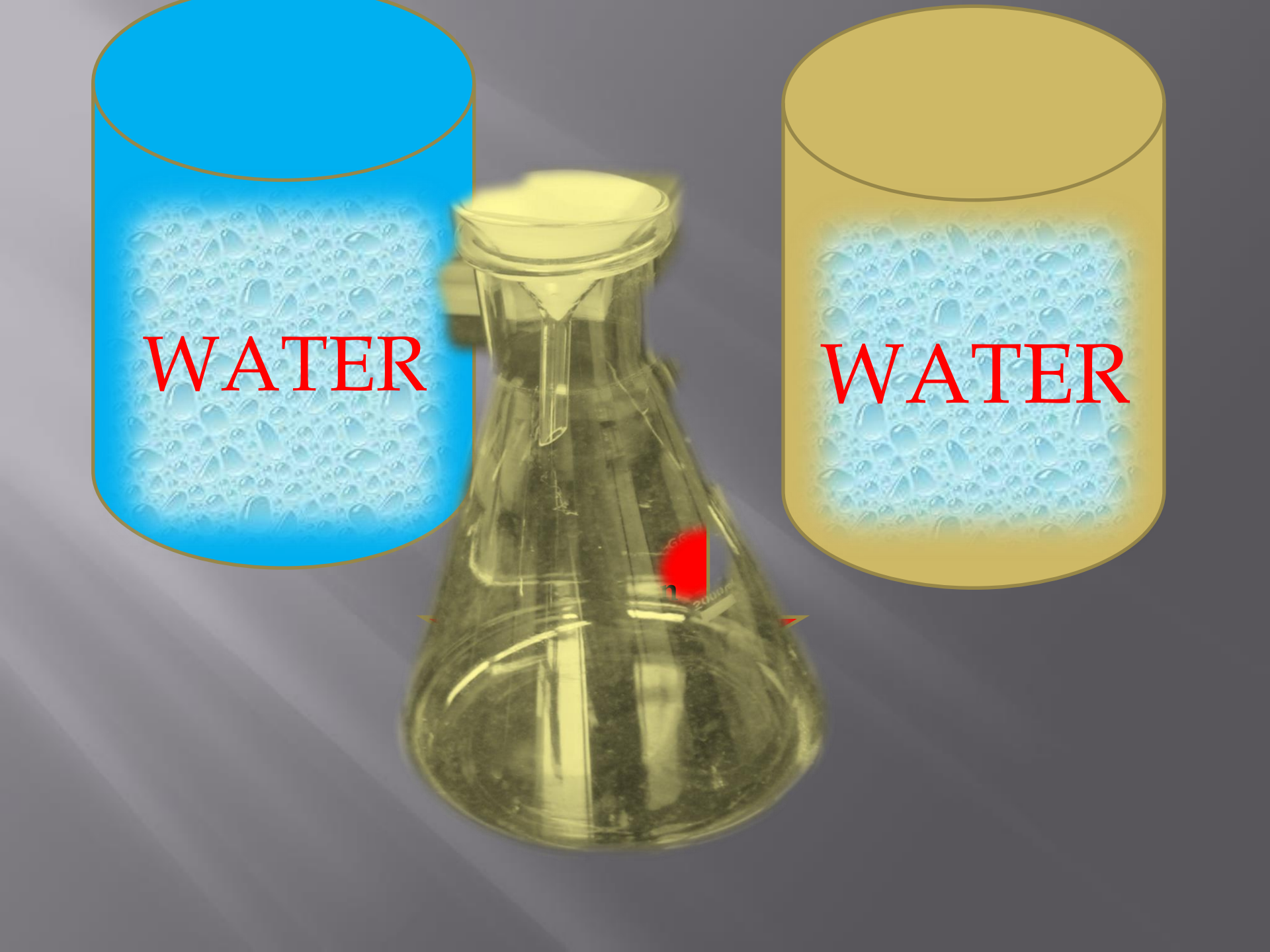
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Sampling from water sources including ponds & IN GILAN province

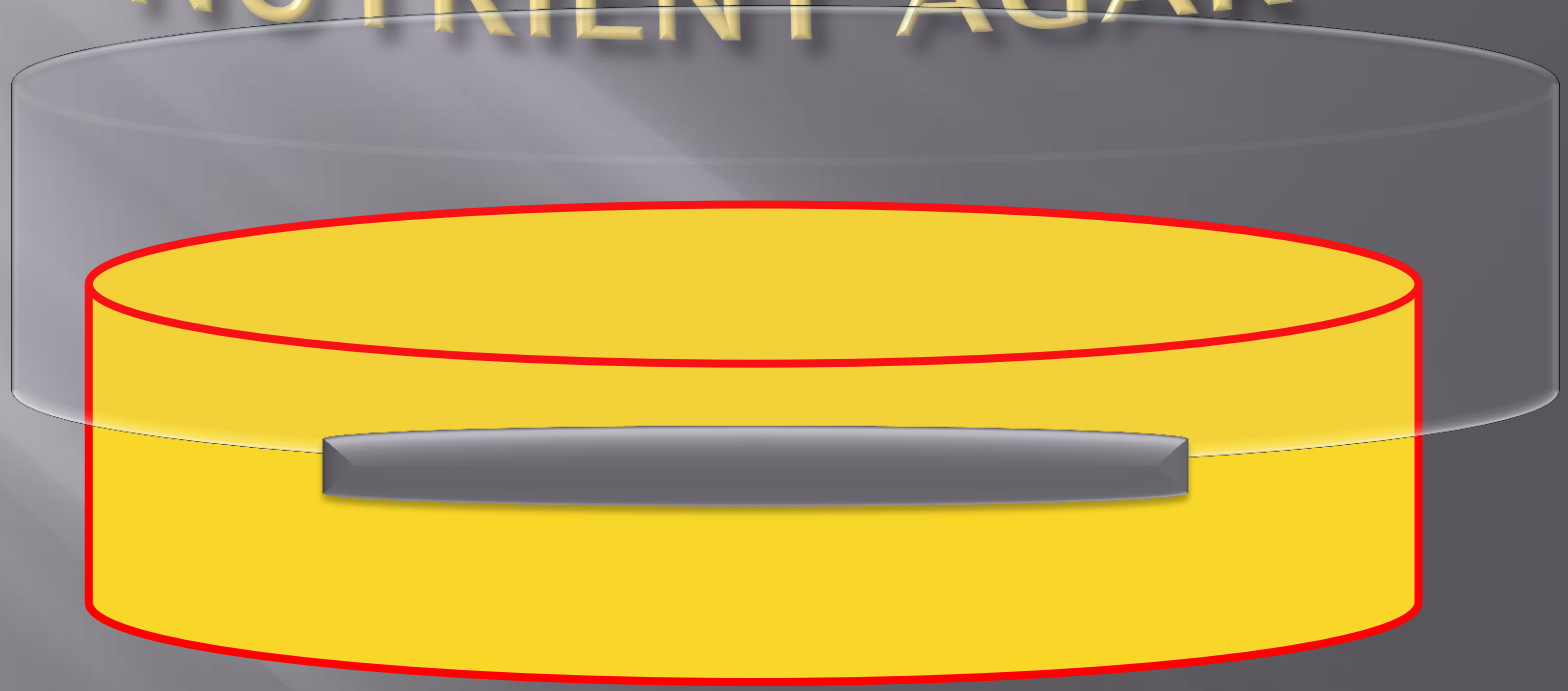




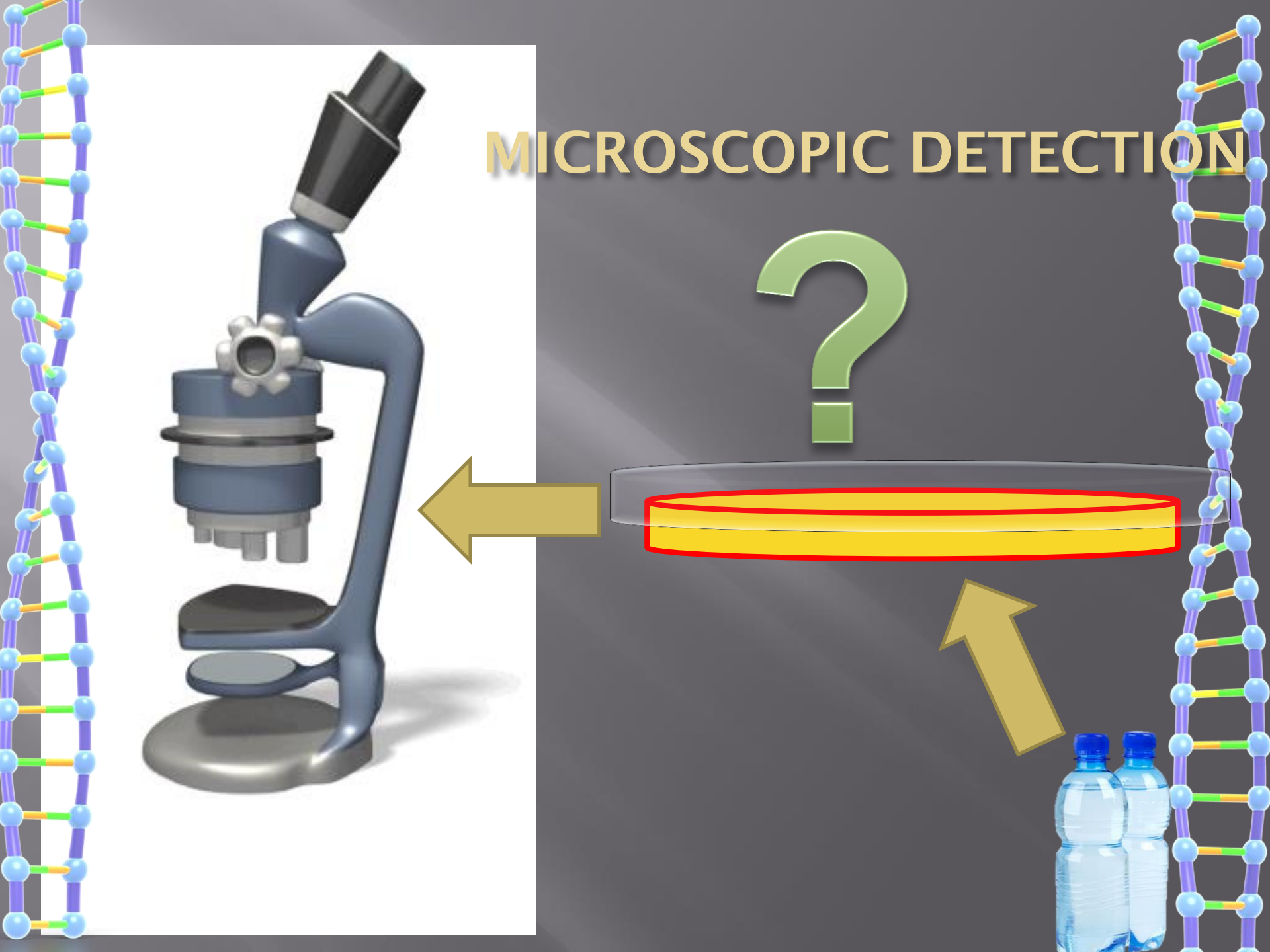

250 CC
CONTAINERS


WATER
WATER

CULTIVATION ON NON NUTRIENT AGAR

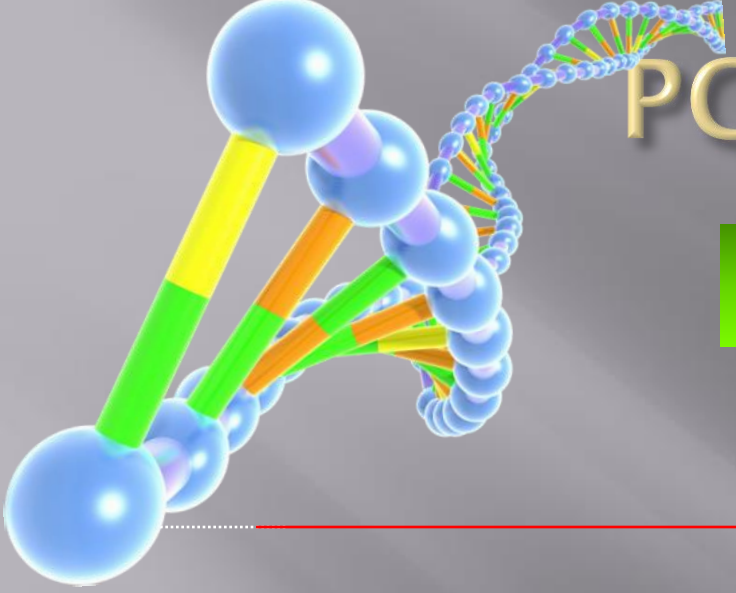


MICROSCOPIC DETECTION



CLONING

Reagent	Amount
Buffer 10 X	3
$MgCl_2$	1.2
dNTPs	3
Primer (F)	0.5
Primer (R)	0.5
DNA	3
Taq DNA Polymerase	0.25
D.W	21.8



PCR REACTION

18S rRNA

DF_3

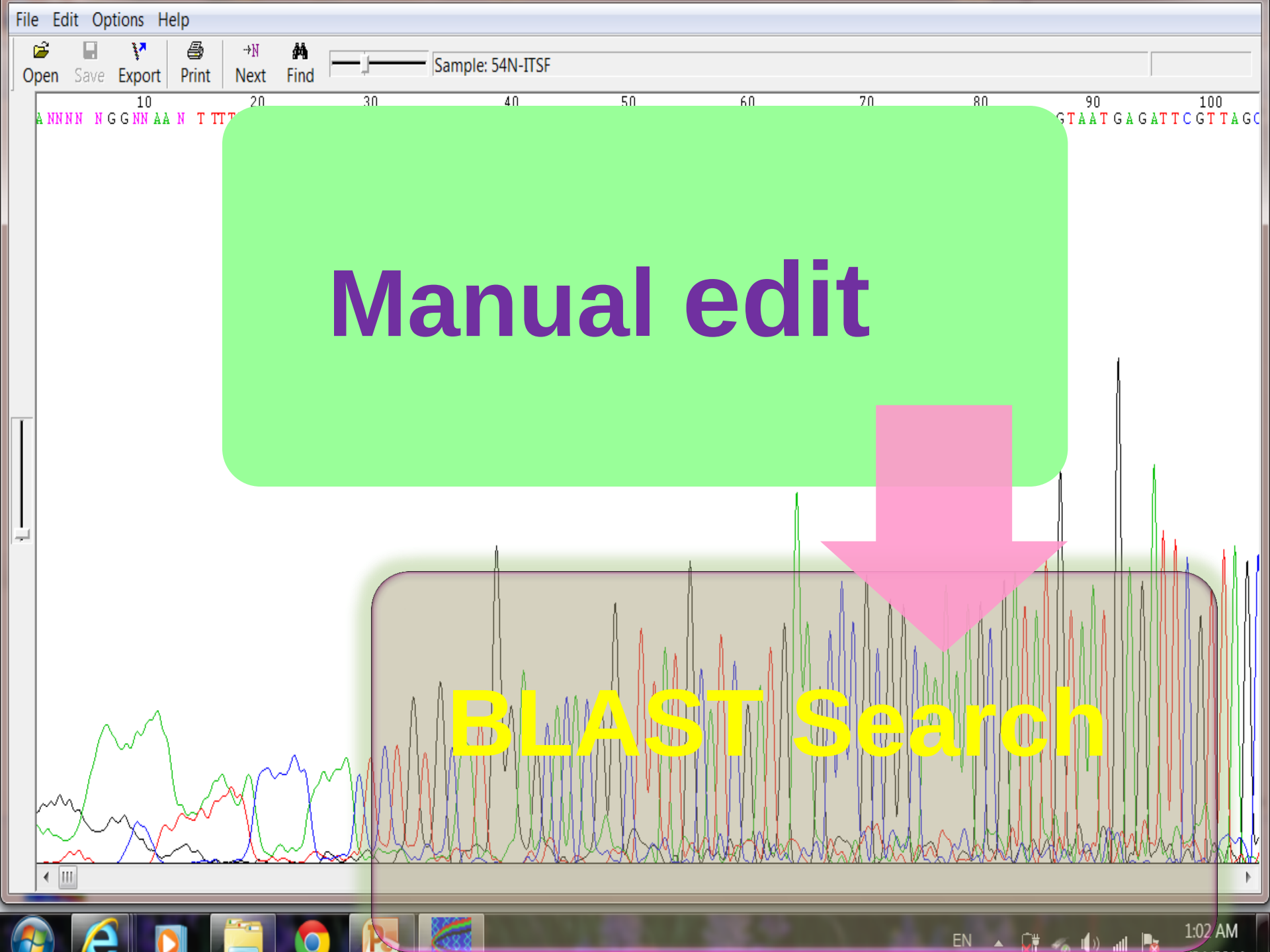
5-GGCCCAGATCGTTTACCGTGAA-3
5-TCTCACAAGCTGCTAGGGGAGTCA-3

JDP
PRIMERS

500 bp

sequencing




File Edit Options Help
Open
Save
Export
Print
Next
Find
Sample: 54N-ITSF
Manual edit
BLAST Search

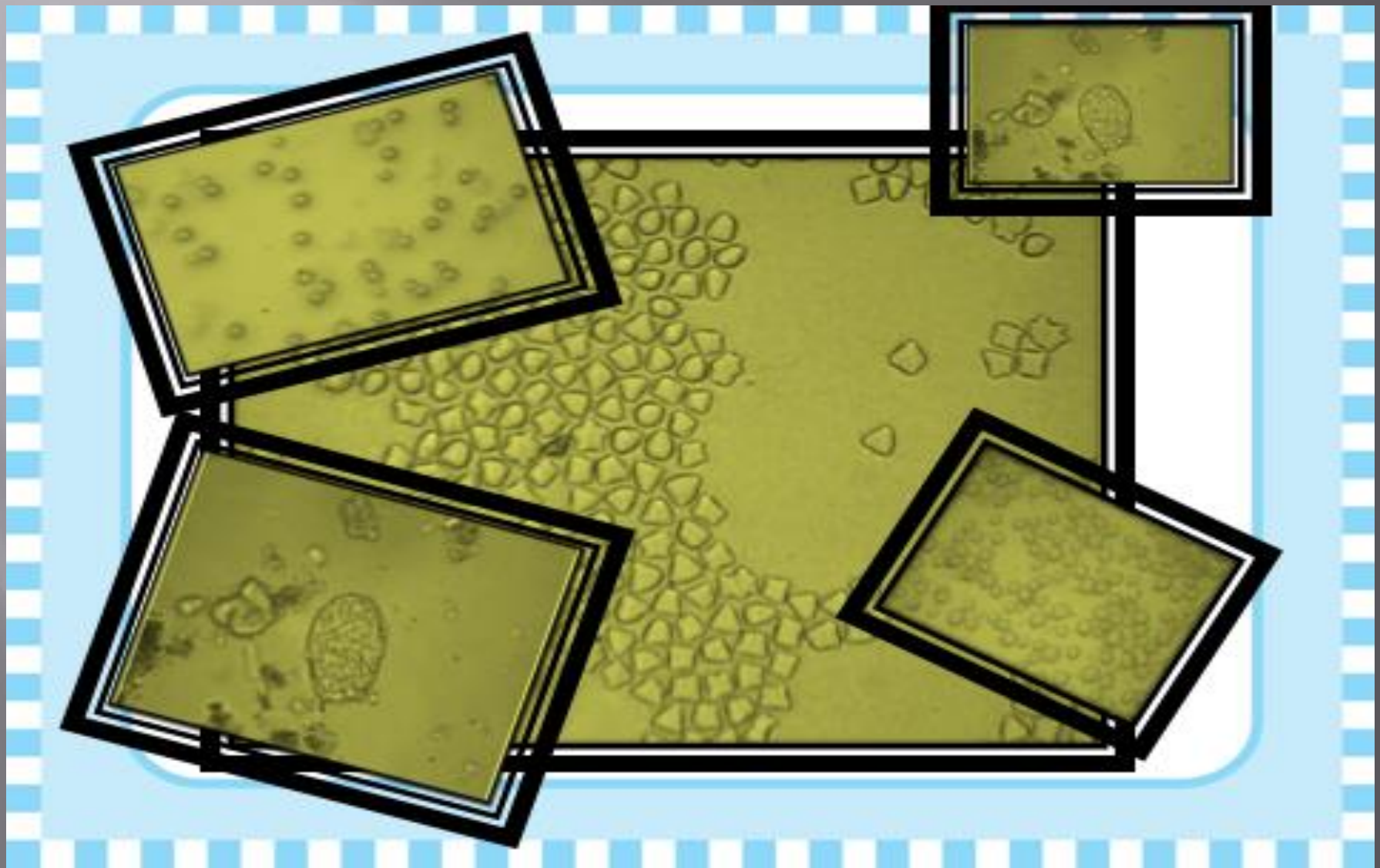
Results



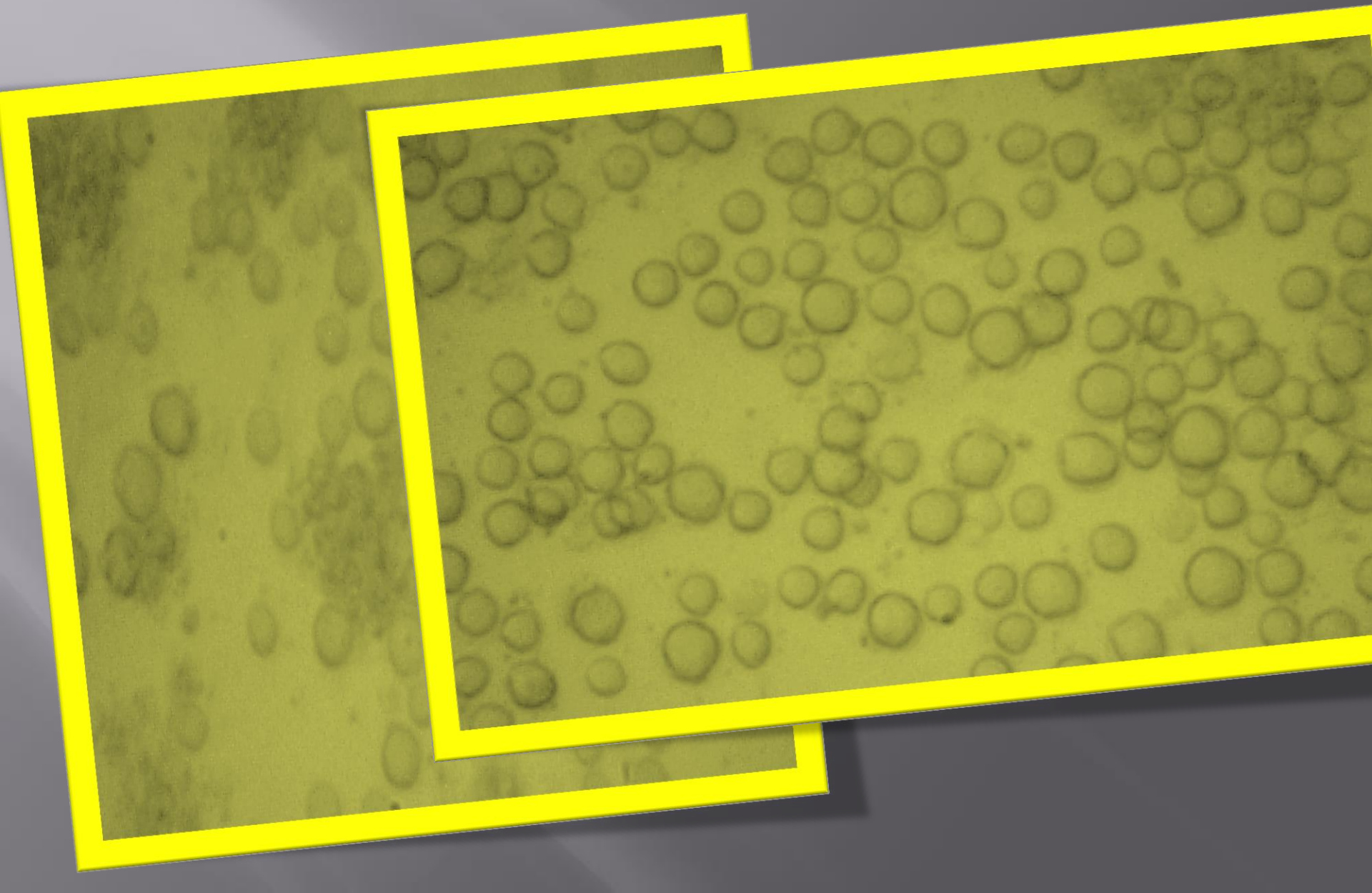
15 PLATE

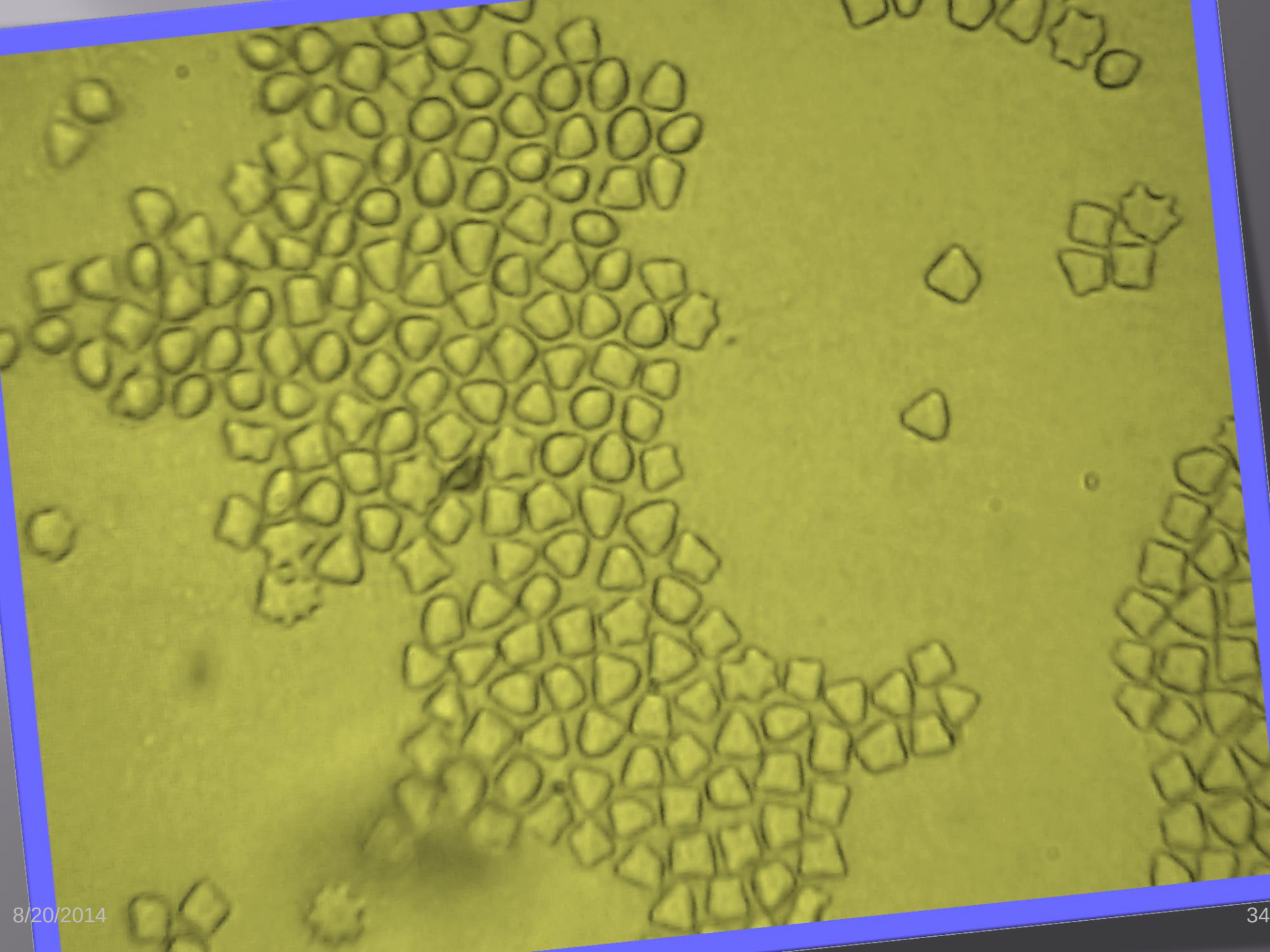
(30 %)

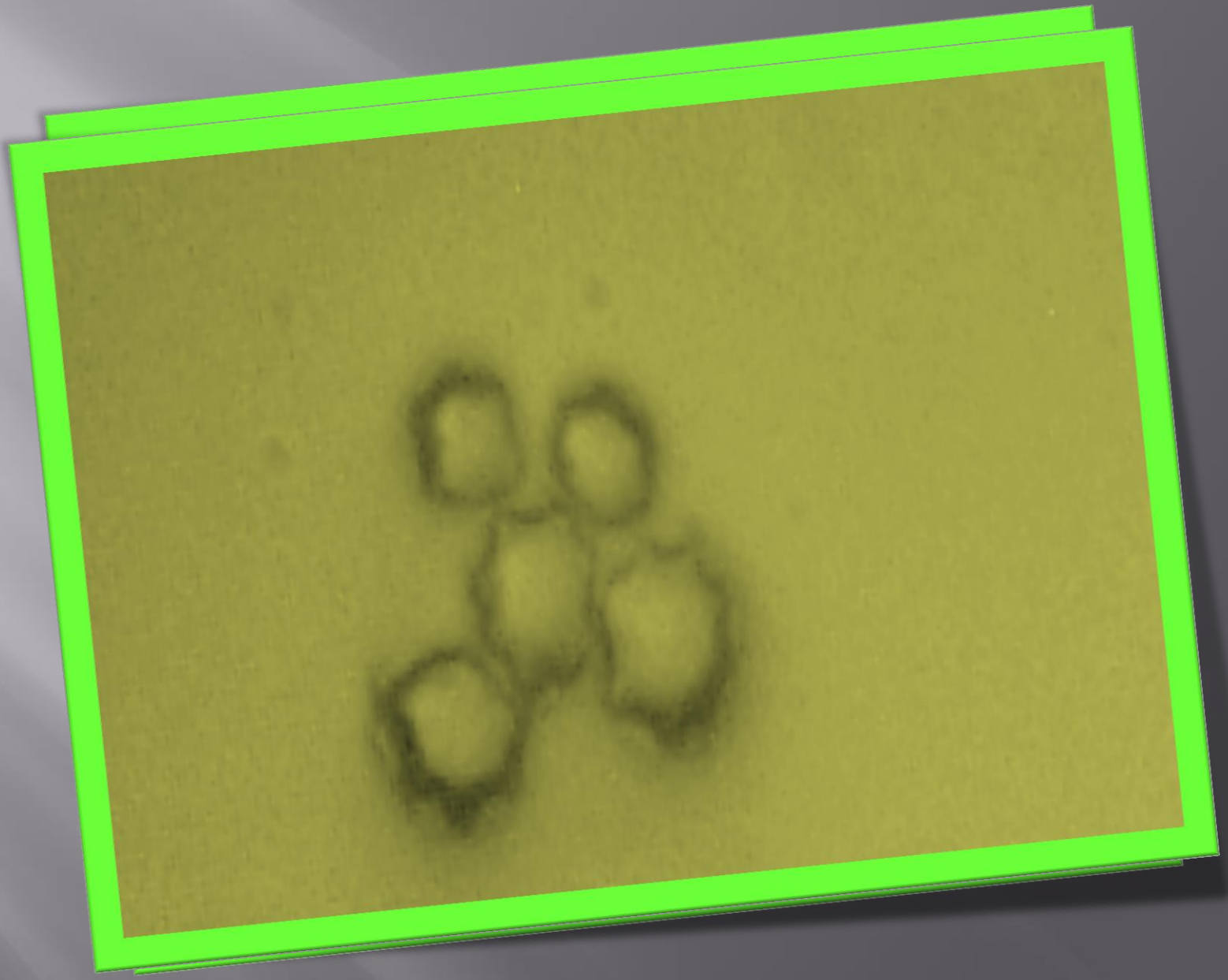
Mixed & OTHER AMOEBAE plates



Acanthamoeba







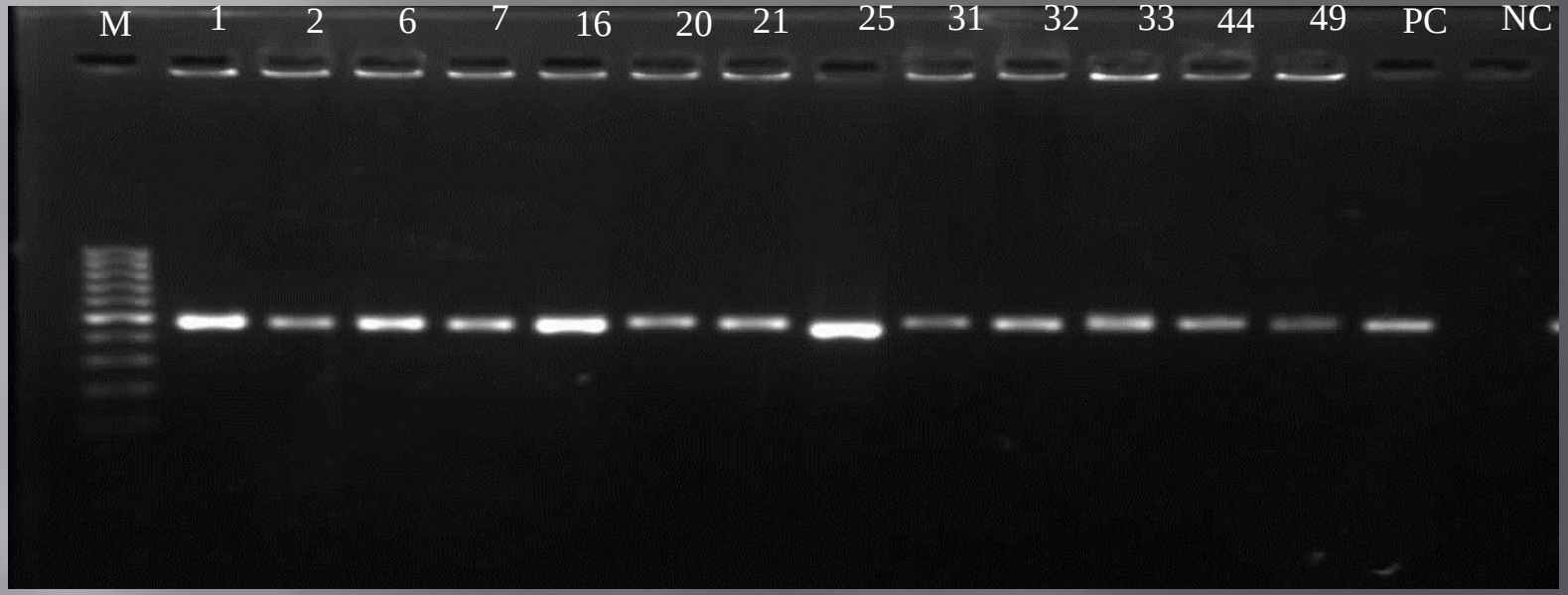
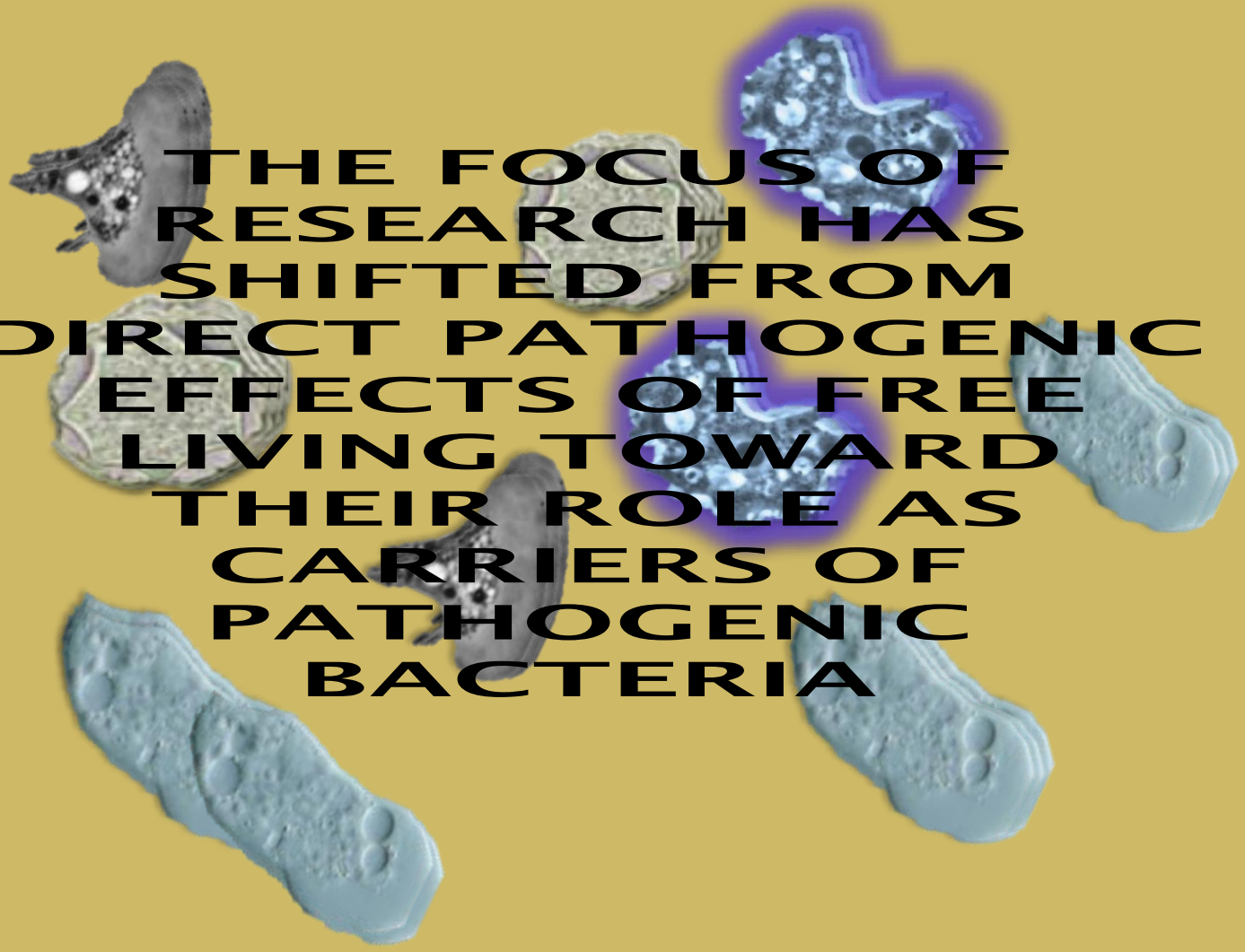


Fig 1. Gel electrophoresis of PCR products of 13 *Acanthamoeba* strains isolated from water sources of Gilan Province, Iran

Isolates code	City	source	Culture	PCR	Genotype	Accession number
***NW1**	Rasht	Pond	+	+	T4	JN399011
NW2	Rasht	Pond	+	+	T4	JN399012
NW6	Roodbar	Pond	+	+	T4	JN399013
NW7	Lahijan	Waterfall	+	+	T4	JN399014
NW16	Lahijan	Pool	+	+	T4	JN399015
NW20	Anzali	Stream	+	+	T4	JN399016
NW21	Anzali	Sea	+	+	T4	JN399017
NW25	Rasht	Sea	+	+	T4	JN399018
NW31	Astara	Sea	+	+	T4	JN399019
NW32	Astara	Sea	+	+	T4	JN399020
NW33	Astara	Pond	+	+	T4	JN399021
NW44	Rezvan shahr	Pond	+	+	T4	JN399022
NW49	Rezvan shahr	Stream	+	+	T4	JN399023
NW 38	Astara	Stream	+	**ND	---	-----
NW 50	Anzali	Pool	+	**ND	---	-----

Discussion

FREE LIVING AMOEBAE



THE FOCUS OF RESEARCH HAS SHIFTED FROM DIRECT PATHOGENIC EFFECTS OF FREE LIVING TOWARD THEIR ROLE AS CARRIERS OF PATHOGENIC BACTERIA

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Abstract

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J Water Health. 2012 Mar;10(1):140-6. doi: 10.2166/wh.2011.068.

Screening of recreational areas of rivers for potentially pathogenic free-living amoebae in the suburbs of Tehran, Iran.

Niyyati M[1], Lasjerdi Z, Nazar M, Haghighi A, Nazemalhosseini Mojarad E.

Author information

Abstract

A survey was conducted to determine the presence of free-living amoebae (FLA), especially Acanthamoeba and Naegleria, in river recreation areas in Tehran Province, Iran. All rivers surveyed were associated with human activity, and two were also a source of municipal tap water. Fifty-five water samples from 10 major rivers were screened for FLA and identified by morphological characters, PCR amplification targeting specific genes for Acanthamoeba (DF3 region of Rns gene) and other FLA (ITS PCR), and homology analysis. The percentage of positive FLA isolates was 27.3%, of which 80% were Acanthamoeba, assigned to the T4 and T15 genotype, and 20% were Naegleria. Isolation of Acanthamoeba T4 genotype (91.7%) from recreation areas could be a health threat and a sanitary risk associated with human activity where young people and tourists congregate in summer. Posting of warning signs and education of high-risk individuals are important for disease prevention. To the best of our knowledge this is the first report of genotype T15 (clustered with A. jacobsi) identified in Iran and the first report of the distribution of FLA such as Naegleria (N. pagei, N. clarki and N. fultoni) in recreation areas in rivers of Tehran Province using molecular methods.

PMID: 22361709 [PubMed - indexed for MEDLINE]

See 1 citation found using an alternative search:

Trop Biomed. 2010 Dec;27(3):566-77.

Detection of free living amoebae, Acanthamoeba and Naegleria, in swimming pools, Malaysia.

Init I[1], Lau YL, Arin Fadzlun A, Foead Al, Neilson RS, Nissapatorn V.

Author information

Abstract

This study reports the detection of Acanthamoeba and Naegleria species in 14 swimming pools around Petaling Jaya and Kuala Lumpur, Malaysia. Sampling was carried out at 4 sites (the platforms (P), wall (W), 1 meter from the wall (1) and middle (2)) of each swimming pool. These free living amoebae (FLA) were detected under light and inverted microscopes after being cultured on the surface of non-nutrient agar lawned with Escherichia coli. Acanthamoeba species were detected in higher number of culture plates from all sampling sites of all the swimming pools. While Naegleria, were detected in fewer culture plates at 3 sampling sites (absent at site P) of 8 swimming pools. This suggested that the thick double-walled cysts of Acanthamoeba were more resistant, thus remaining viable in the dry-hot areas of the platforms and in chlorinated water of the swimming pools whereas Naegleria cysts, that are fragile and susceptible to desiccation, preferred watery or moist areas for growth and proliferation. The prevalence of both FLA was highest at site W (76.2%), followed by site 1 (64.7%), lowest at site 2 (19.4%), and could be detected at all 3 sampling levels (top, middle and bottom) of these 3 sites. The surface of site W might act as a bio-film that accumulated all kinds of microbes providing sufficient requirement for the FLA to develop and undergo many rounds of life cycles as well as moving from top to bottom in order to graze food. Other factors such as human activities, the circulating system which was fixed at all swimming pools, blowing wind which might carry the cysts from surroundings and the swimming flagellate stage of Naegleria could also contribute to the distribution of the FLA at these sampling sites. Both FLA showed highest growth (80.4%) at room temperature (25-28 ºC) and lesser (70.0%) at 37 ºC which might be due to the overgrowth of other microbes (E. coli, fungi, algae, etc). While at 44 ºC, only Acanthamoeba species could survive thus showing that our swimming pools are free from potentially pathogenic Naegleria species. However, further study is needed in order to confirm the virulence levels of these amoebae isolates.

PMID: 21399599 [PubMed - indexed for MEDLINE] Free full text

Acanthamoeba isolated from pools were lower then ponds

Some strains are sensitive to chlorination

Sanitary issues

Present study

50

SAMPLES

15

GENOTYPES

T4









conclusion

THIS RESULTS HIGHLIGHT THE IMPORTANCE OF AMOEBAE IN WATERS AS RESERVOIR OF POTENTIALLY PATHOGENS

The most isolated amoebae was

T4 genotype: Potentially pathogen

water contained
PATHOGENIC Acanthamoeba


LA NARIZ
WARNING
DO NOT ALLOW WATER TO
ENTER YOUR NOSE
NAEGLERIA FOWLERI
AN AMOEBA COMMON TO THERMAL
POOLS MAY ENTER CAUSING A
RARE INFECTION AND DEATH


GEOTHERMAL POOL
KEEP YOUR HEAD
ABOVE WATER
PREVENT AMOEBIC MENINGITIS
diving, splashing or ducking


NO
SWIMMING

Suggestions

- Awareness of Health Authorities
- Water Replacement Of Ponds….

THANKS FOR YOUR ATTENTION

