



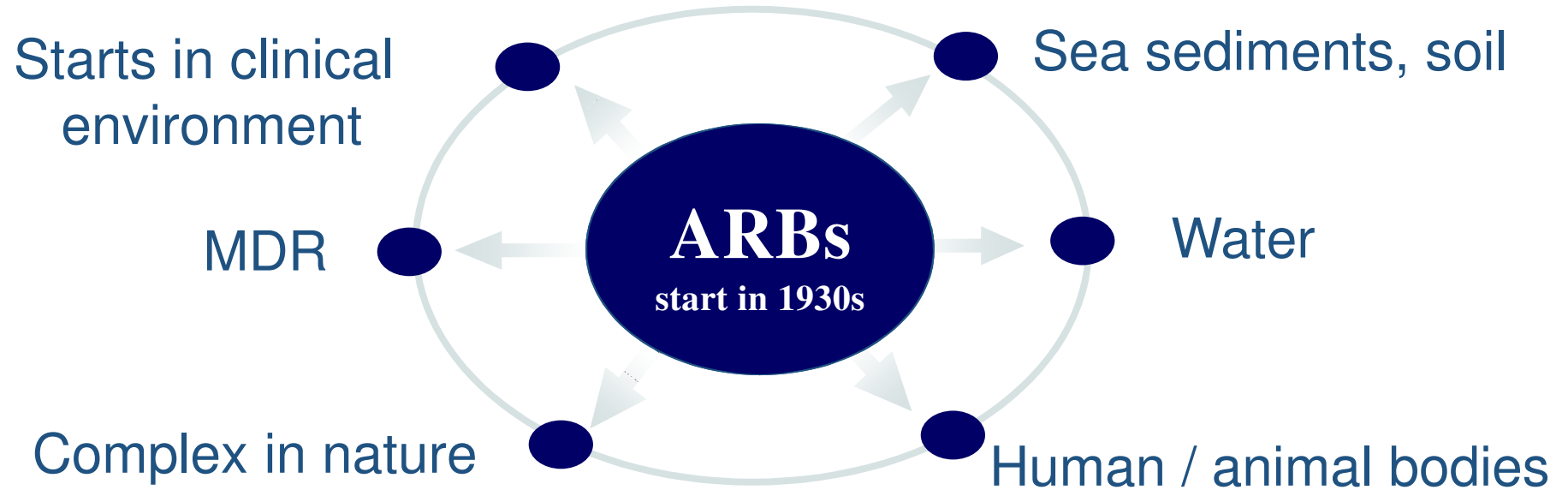
ARGs in Water Distribution System in Glasgow: Does the problem really exist?

Sadia Khan and Charles W. Knapp

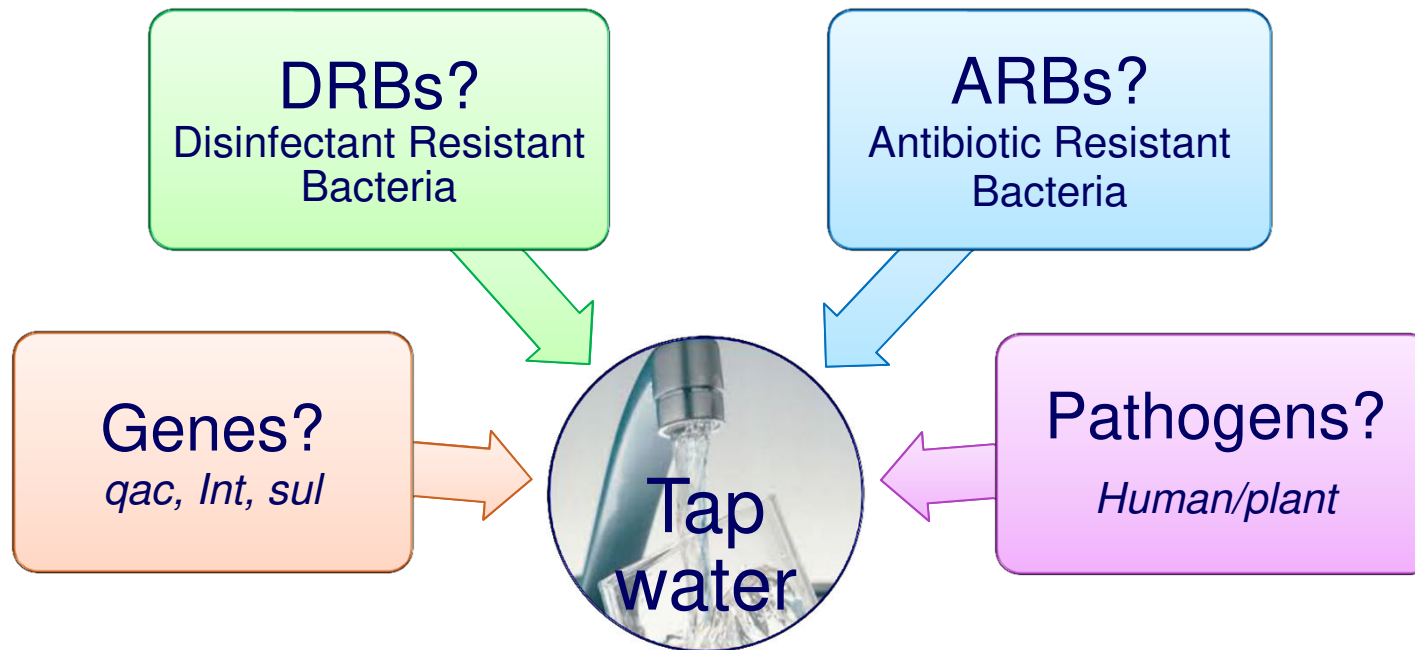
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Introduction



Aims and Objectives



Experimental



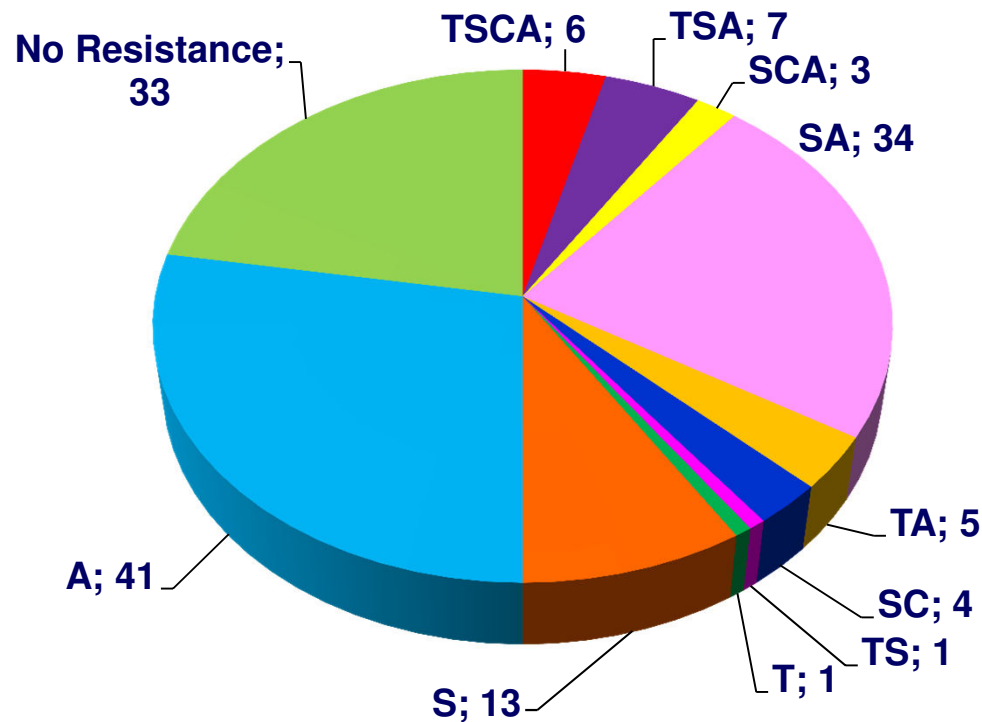
1. Membrane filtration (0.22 μ m, 100mL sample)

2. Agar dilution for MIC against 4 antibiotics (Tetracycline, sulfamethoxazole, ciprofloxacin, Amoxicillin)

3. Suspension test for chlorine and monochloramine (200mL PBS, pH 7 and 8)

4. Identification of bacteria and genes detection (gene sequencing and PCR)

Figure-1: Bacterial Resistance Against Antibiotics



Quadruple: 6
Triple: 10
Double: 44
Single: 55

Standard*/Control
Tet: $\geq 16 \mu\text{g/mL}$
Sulf: $\geq 512 \mu\text{g/mL}$
Cip: $\geq 4 \mu\text{g/mL}$
Amox: $\geq 32 \mu\text{g/mL}$

Figure-2: Zone of inhibition (mm) against NaOCl



Figure-3: Bacteria Identified by Gene Sequencing

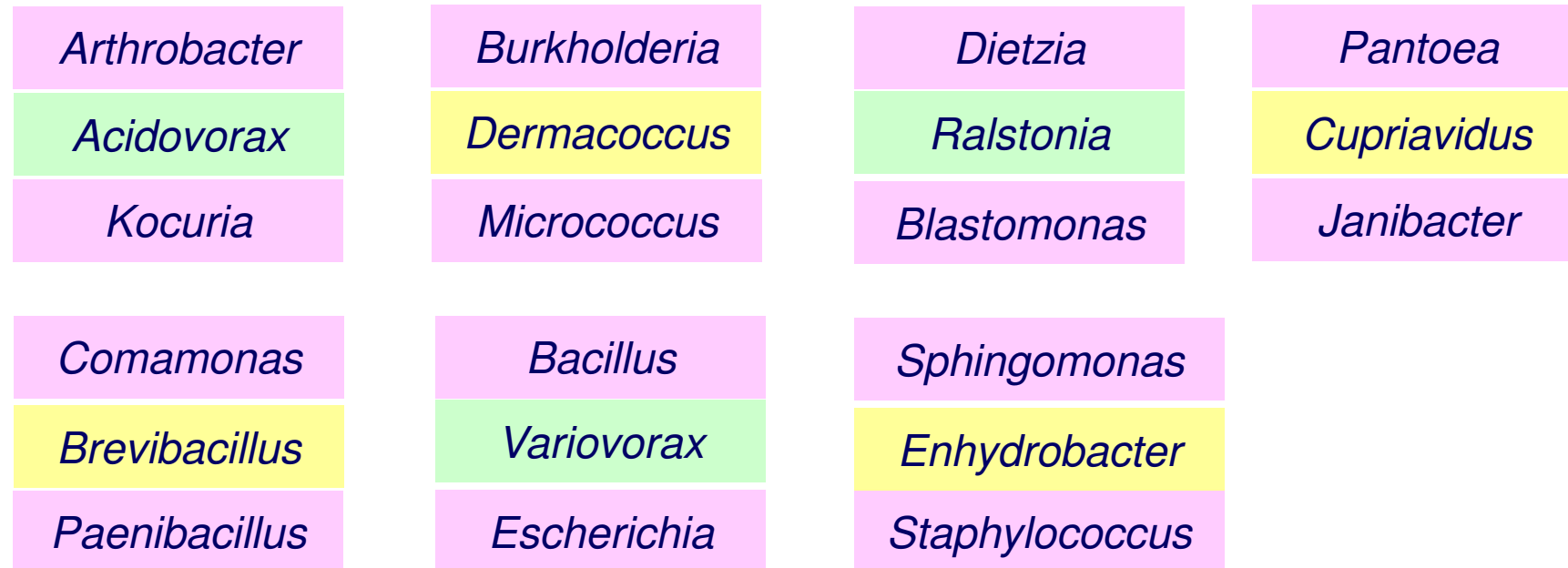


Table-1: Genes detection (*qac*, *Int-1*, *Int-2*, *sul1*, *sul2*)

Genes	Found in organisms
<i>qac</i>	Not found
<i>Int-1</i>	<i>Arthrobacter</i> , <i>Dermacoccus</i> , <i>Micrococcus</i> , <i>Kocuria</i> , <i>Cupriavidus</i> , <i>Variovorax</i> (9)
<i>Int-2</i>	Not found
<i>sul1</i>	<i>Dermacoccus</i> , <i>Staphylococcus</i> , <i>Kocuria</i> , <i>Cupriavidus</i> , <i>Bacillus</i> , <i>Paenibacillus</i> , (8)
<i>sul2</i>	<i>Micrococcus</i> , <i>Cupriavidus</i> , <i>Ralstonia</i> , <i>Bacillus</i> (4)
<i>Int-1 + sul1</i>	<i>Dermacoccus</i> (1)
<i>Int-1 + sul2</i>	<i>Micrococcus</i> (1)

Figure-4: Chlorine Suspension Test

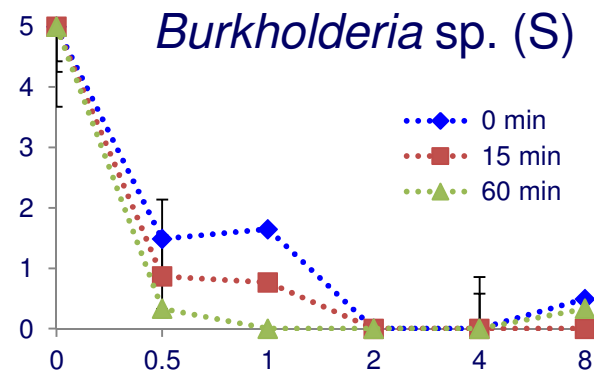
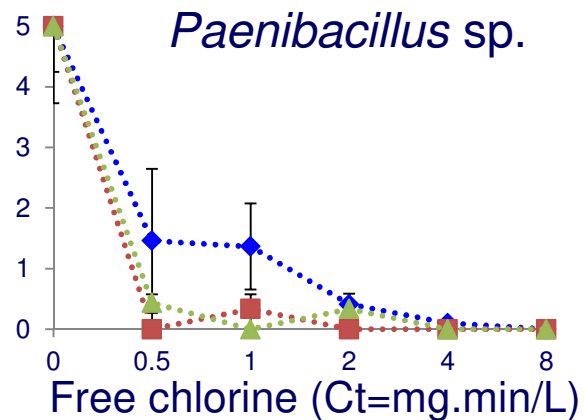
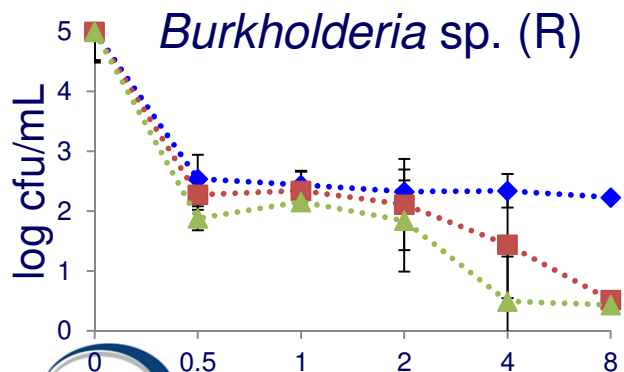
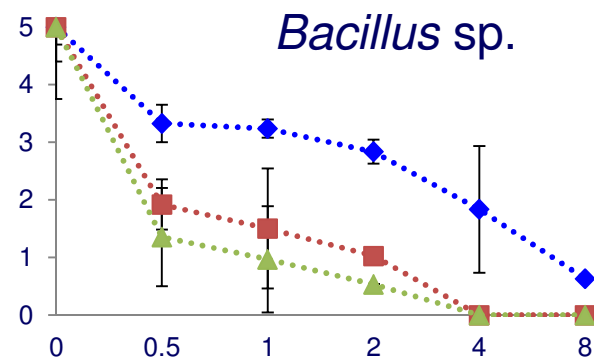
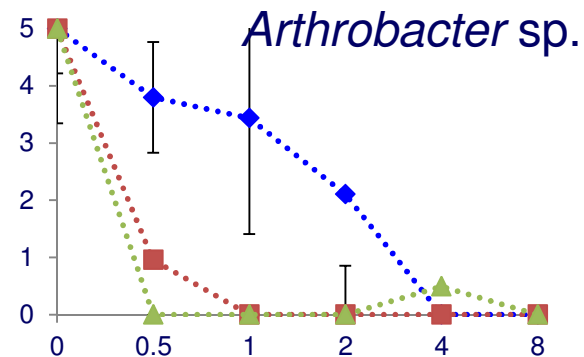
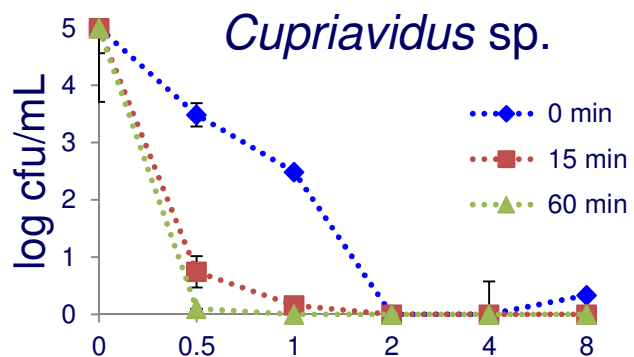
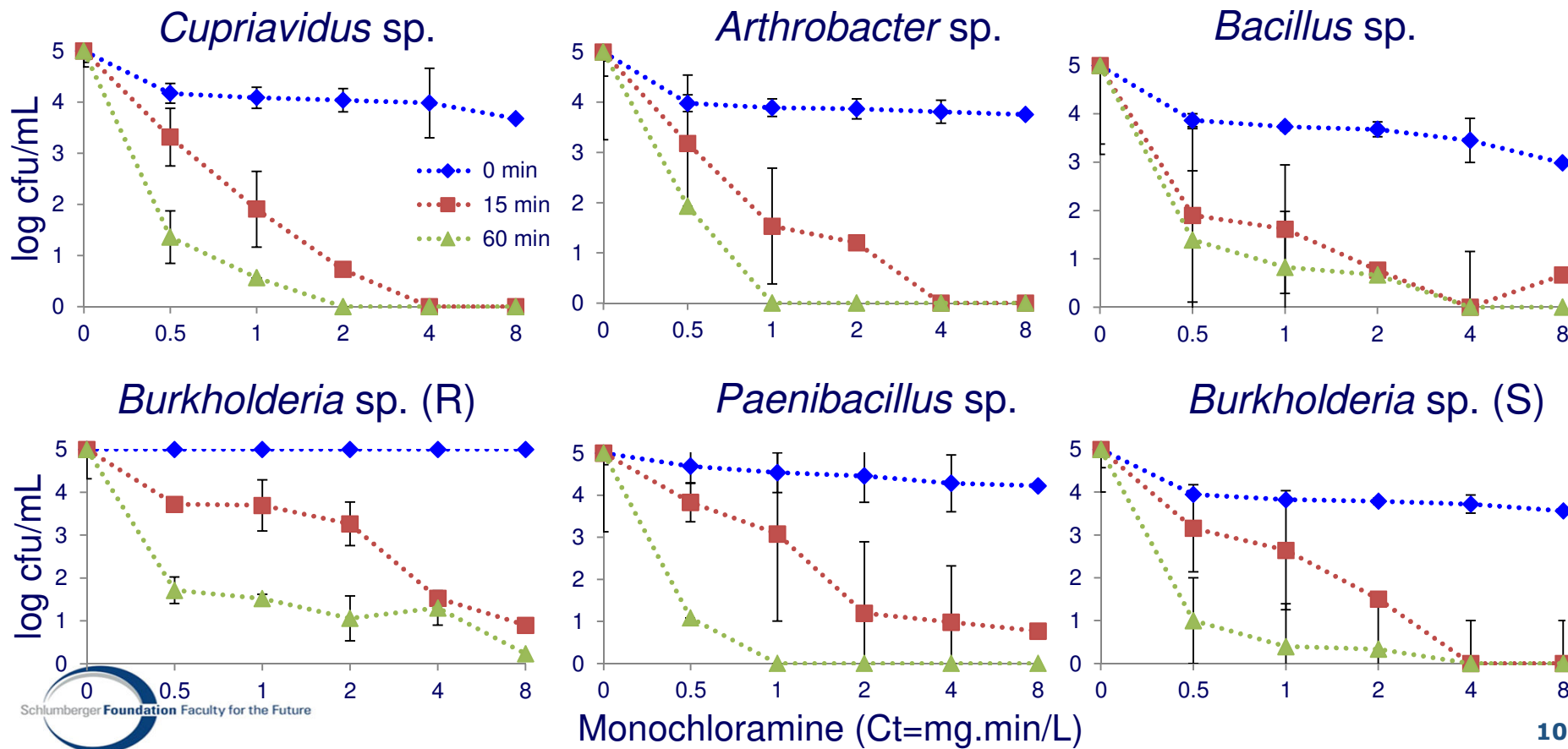


Figure-5: Monochloramine Suspension Test



Summary



DRBs/ ARBs

qac

Int-1/Int-2

su1

su2

Pathogen



Acknowledgement



THANK YOU !

