Antimicrobial Properties of Two Varieties of Long Pepper: *Capsicum frutescens* and *Capsicum annuum* in Nigeria.

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Introduction

➢ **Medicinal plants:**

- Richest resource of drugs in traditional medicine (Ncube *et al.*, 2008).

➢ ***Capsicum* spp.**

- Ethnomedical treatment of conditions and diseases.
- Capsaicin and hydro-capsaicin form about 80% of its alkaloids (Victor and Chidi, 2009).
- Capscinoids (capsaicin and its derivatives) produce the pungency in chili pepper.

➢**Development of resistance to commercial antimicrobial chemotherapeutic agent.**

➢**Alternative antimicrobial chemotherapeutic agent is important.**

➢**The antimicrobial characteristics of *Capsicum frutescens* and *Capsicum annuum* cultivated in Nigeria.**

Objective

The research specific objective:

- determine the antimicrobial effects of:
- *Capsicum frutescens;* and
- *Capsicum annuum* on some clinical bacteria and fungi.

Methodology

➢**Plant materials:**

- *Capsicum frutescens* and *Capsicum annuum*

➢**Clinical isolates:**

- **Bacteria:**

Escherichia coli *Pseudomonas aeruginosa* *Proteus mirabilis*

Salmonella enterica *Staphylococcus aureus* *Klebsiella pneumoniae*

Proteus vulgaris *Enterococcus faecalis* *Staphylococcus epidermidis*

- **Fungi:**

Aspergillus niger *Aspergillus flavus* *Aspergillus fumigatus* *Candida albicans*

Methodology

➢**Preparation of Plant Extract (Bello *et al.*, 2015)**

➢**Determination of Antimicrobial Activity of Extracts:**

- Agar Well Diffusion Technique (Shiva *et al.*, 2017)

➢**Purification of Extracts**

Experimental Setting

➢**Determination of Antimicrobial Activity of Pure Extracts:**
Agar Well Diffusion Technique (Shiva *et al.*, 2017)

➢ **Statistical Analysis: IBM SPSS Statistics, 24.**

Results and Discussion

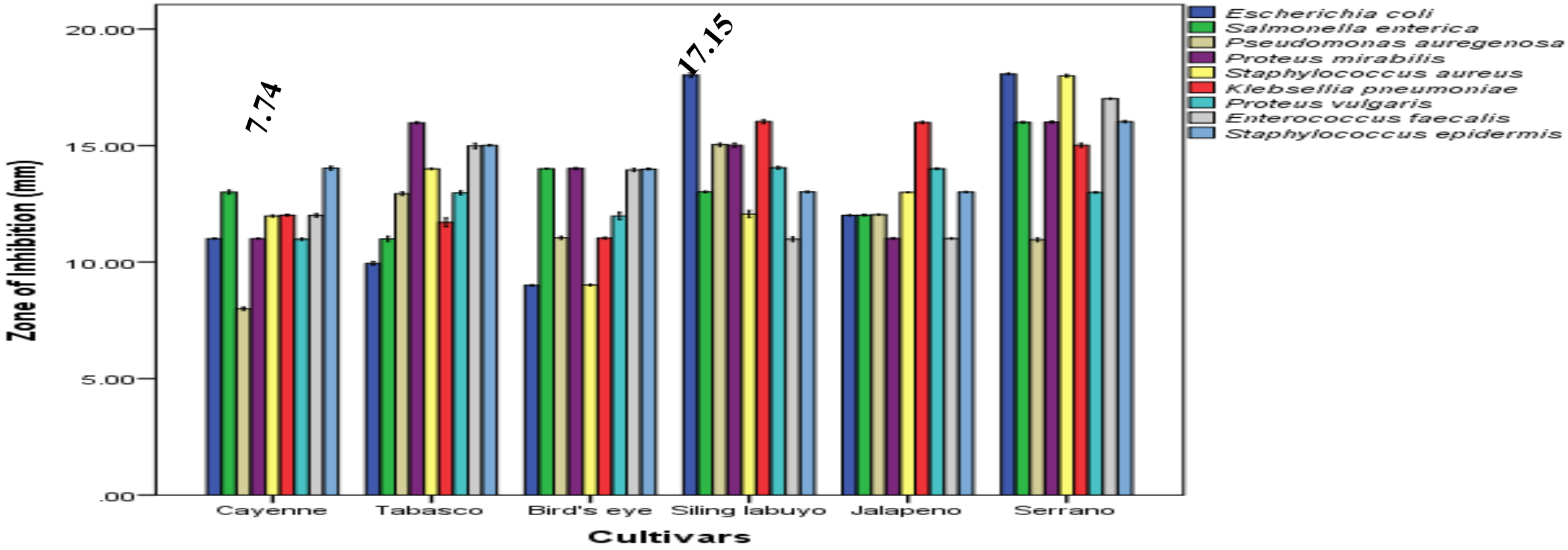

Figure 1:Antibacterial Activity of the Crude Extracts of Long Pepper Prepared with Ethanol

Results and Discussion

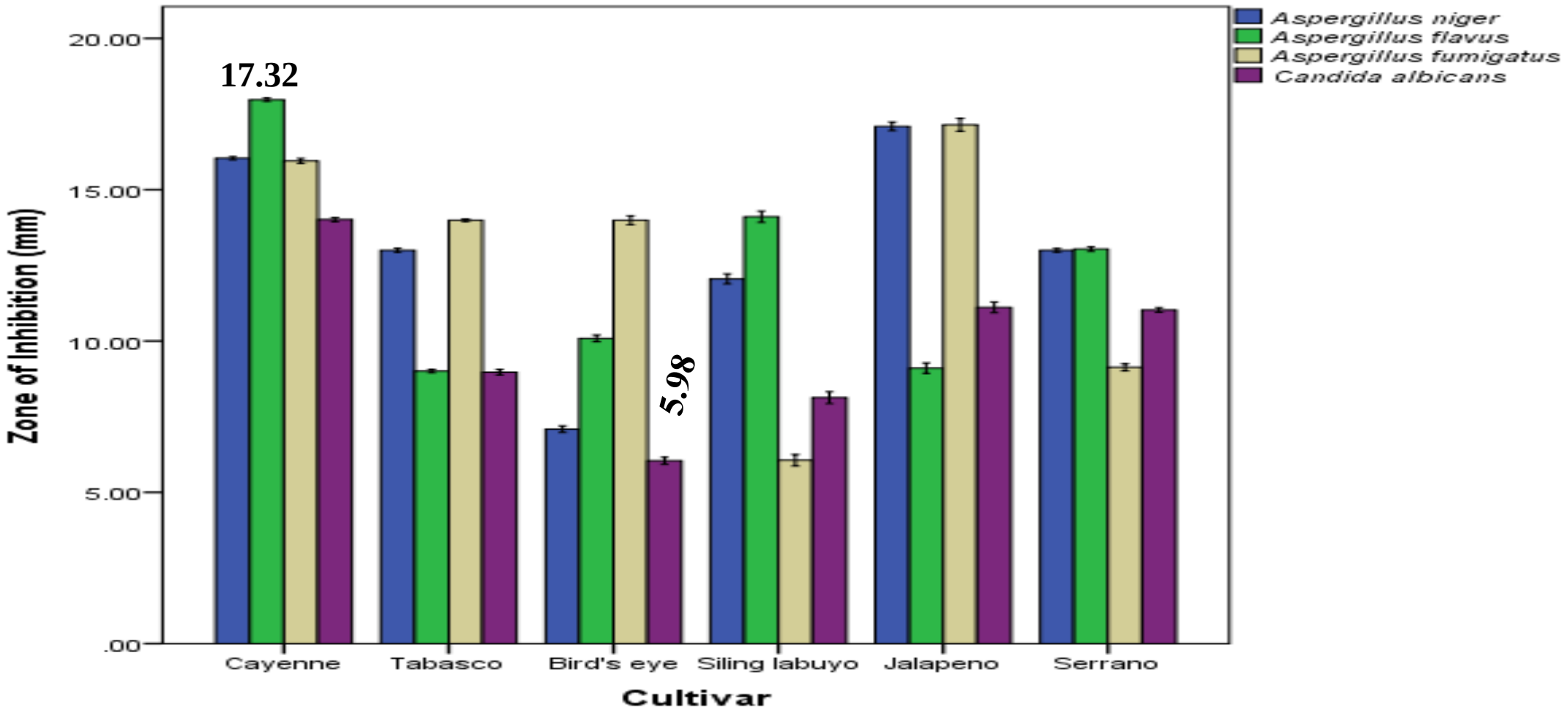

Figure 2:Antifungal Activity of the Crude Extracts of Long Pepper Prepared with Ethanol

Results and Discussion

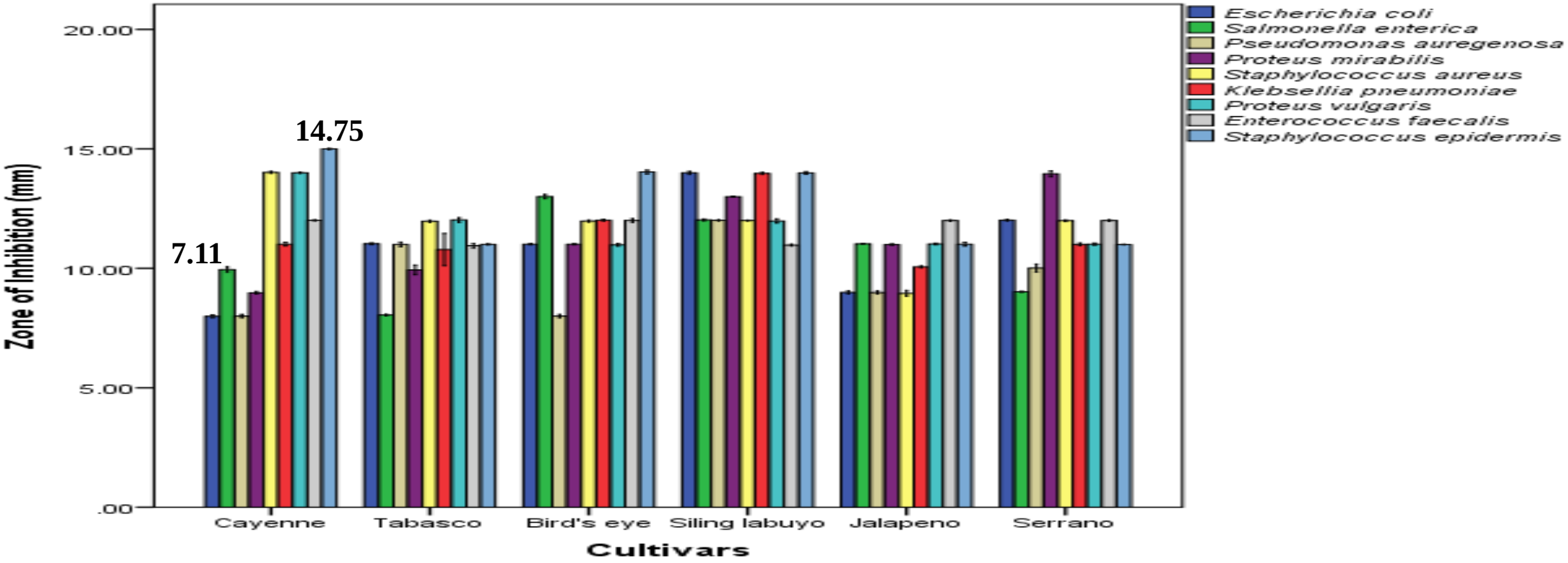

Figure 3:Antibacterial Activity of the Crude Extracts of Long Pepper Prepared with Acetone

Results and Discussion

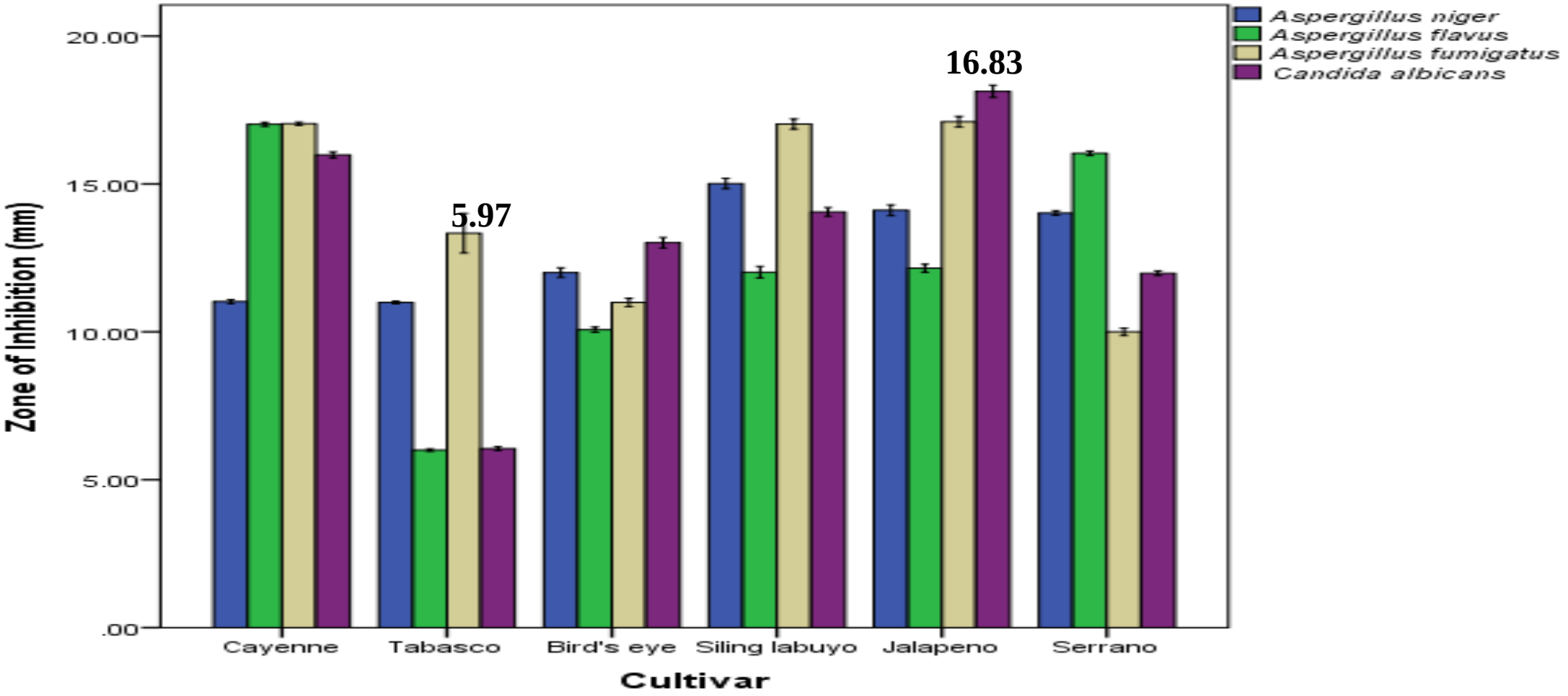

Figure 4:Antifungal Activity of the Crude Extracts of Long Pepper Prepared with Acetone

Results and Discussion

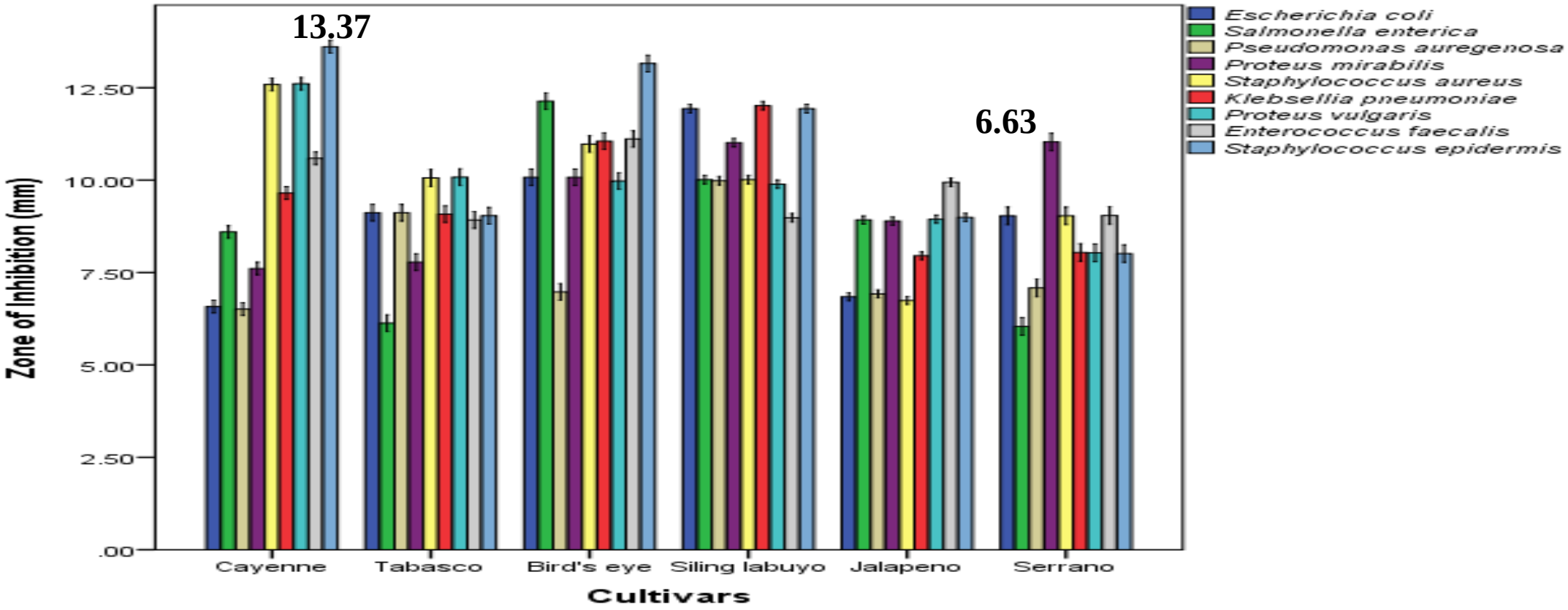

Figure 5:Antibacterial Activity of the Crude Extracts of Long Pepper Prepared with Water

Results and Discussion

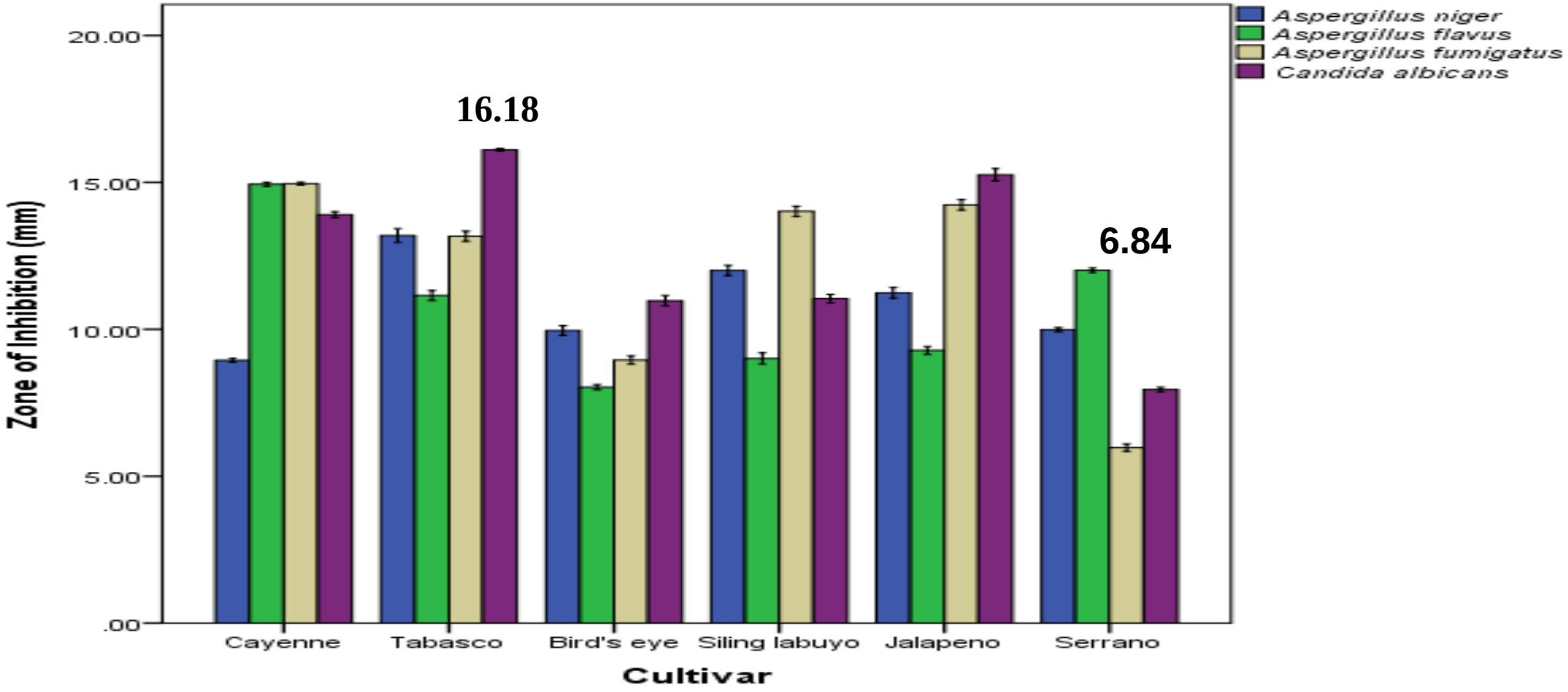

Figure 6:Antifungal Activity of the Crude Extracts of Long Pepper Prepared with Water

Results and Discussion

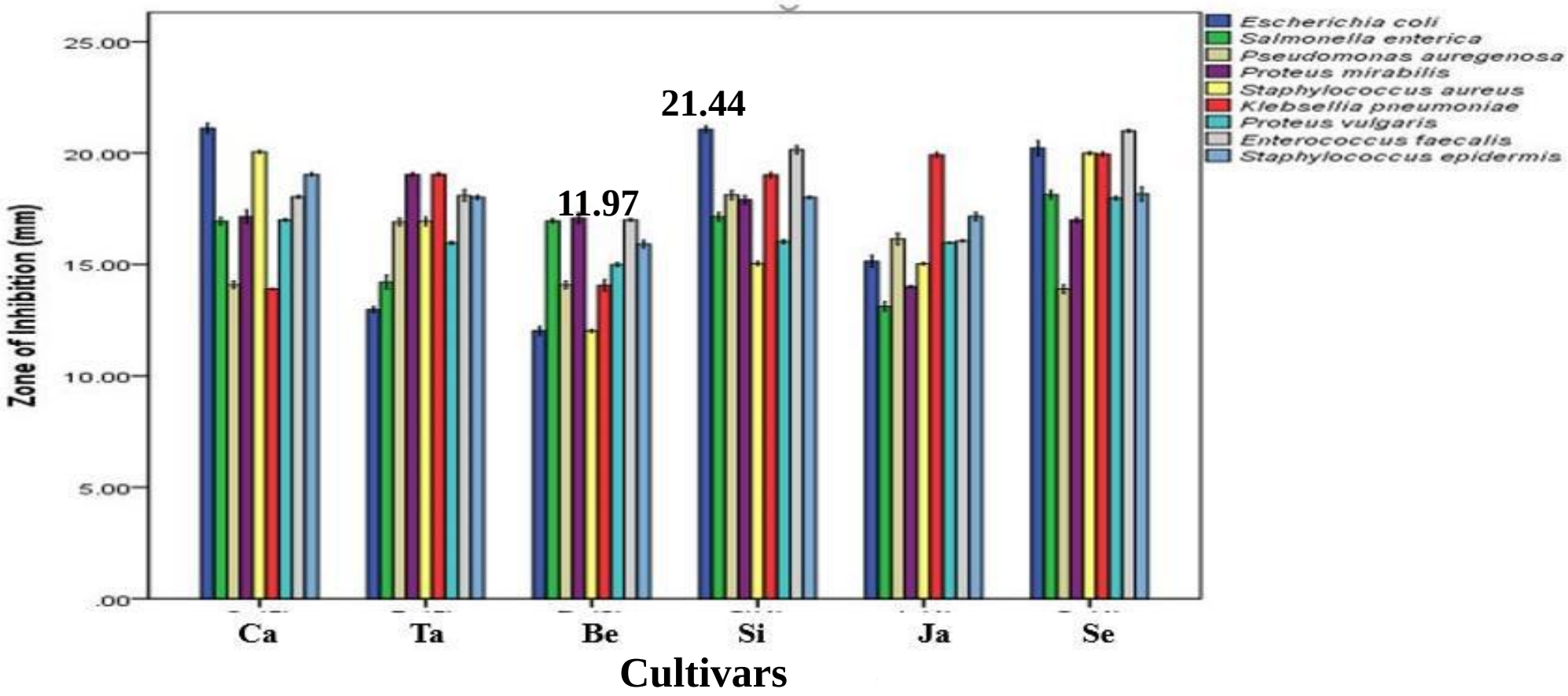

Figure 7Antibacterial Activity of the Pure Extracts of Long Pepper Prepared with Ethanol

Results and Discussion

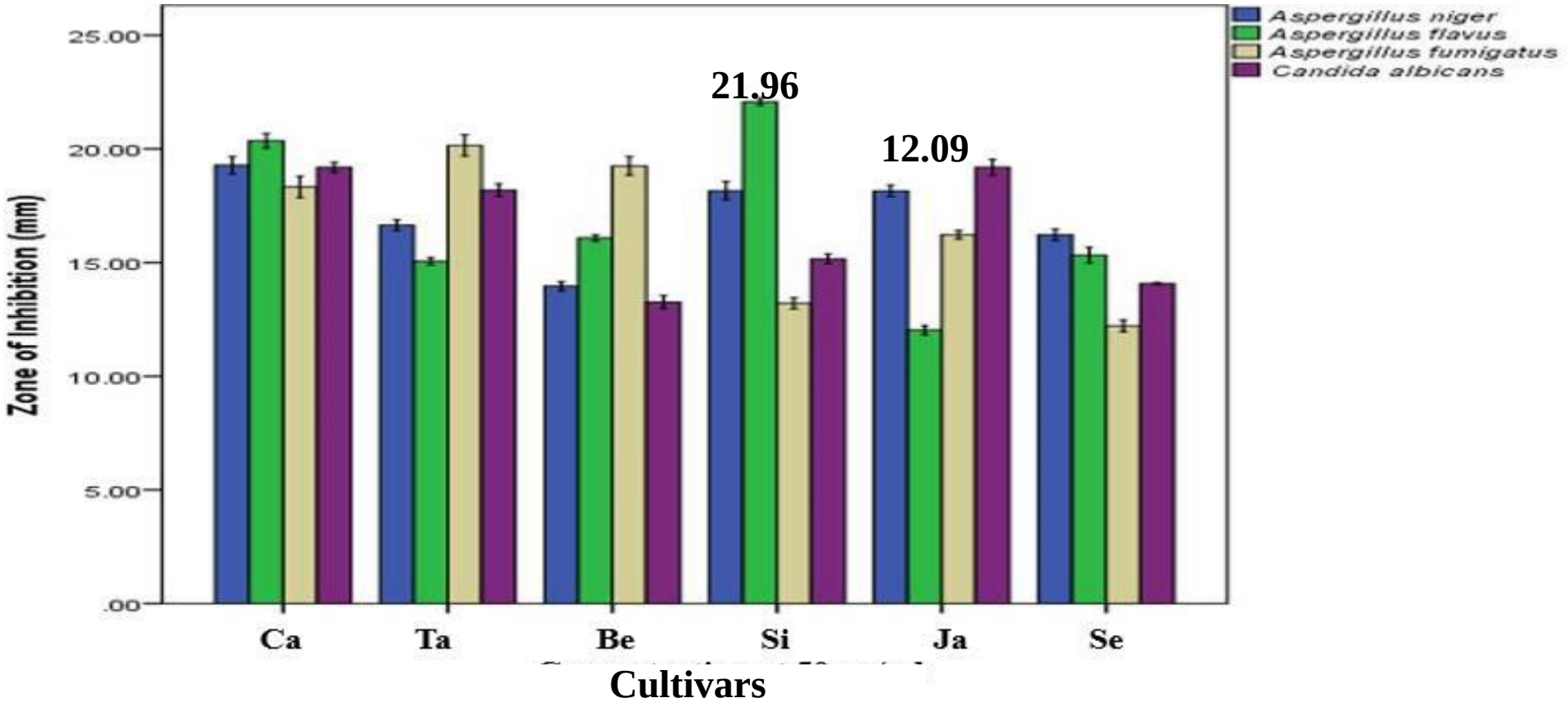

Figure 8:Antifungal Activity of the Pure Extracts of Long Pepper Prepared with Ethanol

Results and Discussion

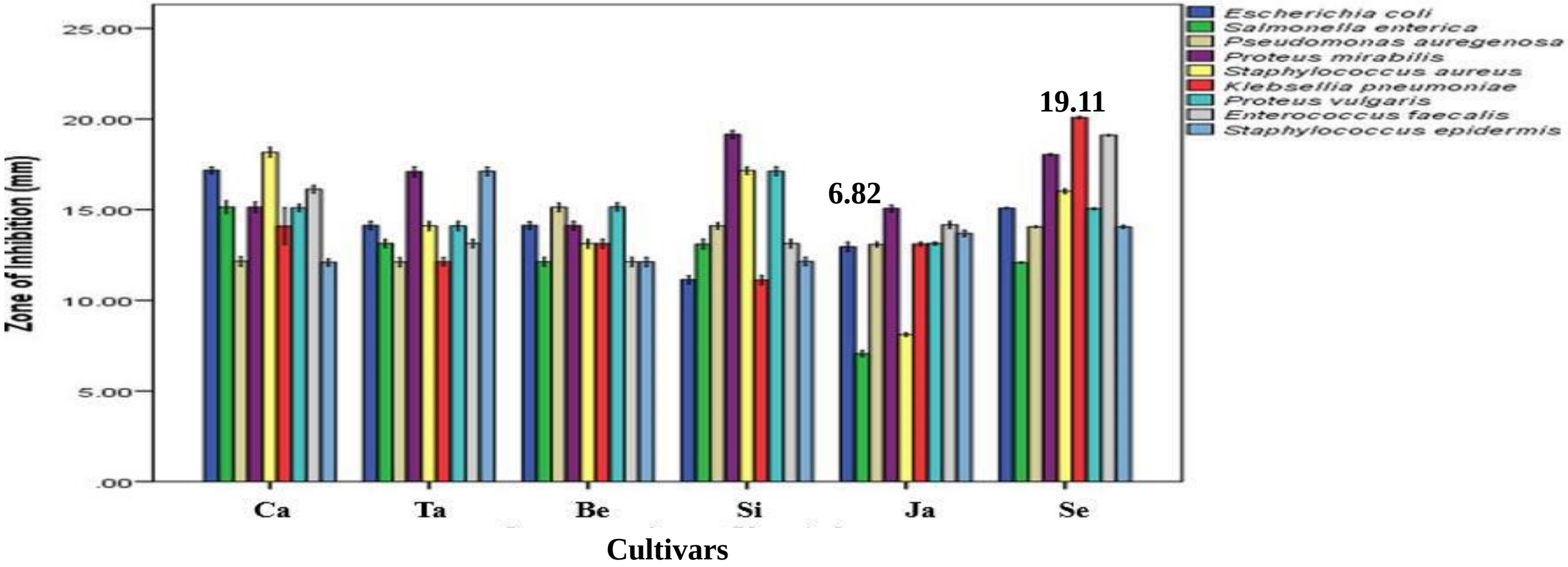

Figure 9:Antibacterial Activity of the Pure Extracts of Long Pepper Prepared with Acetone

Results and Discussion

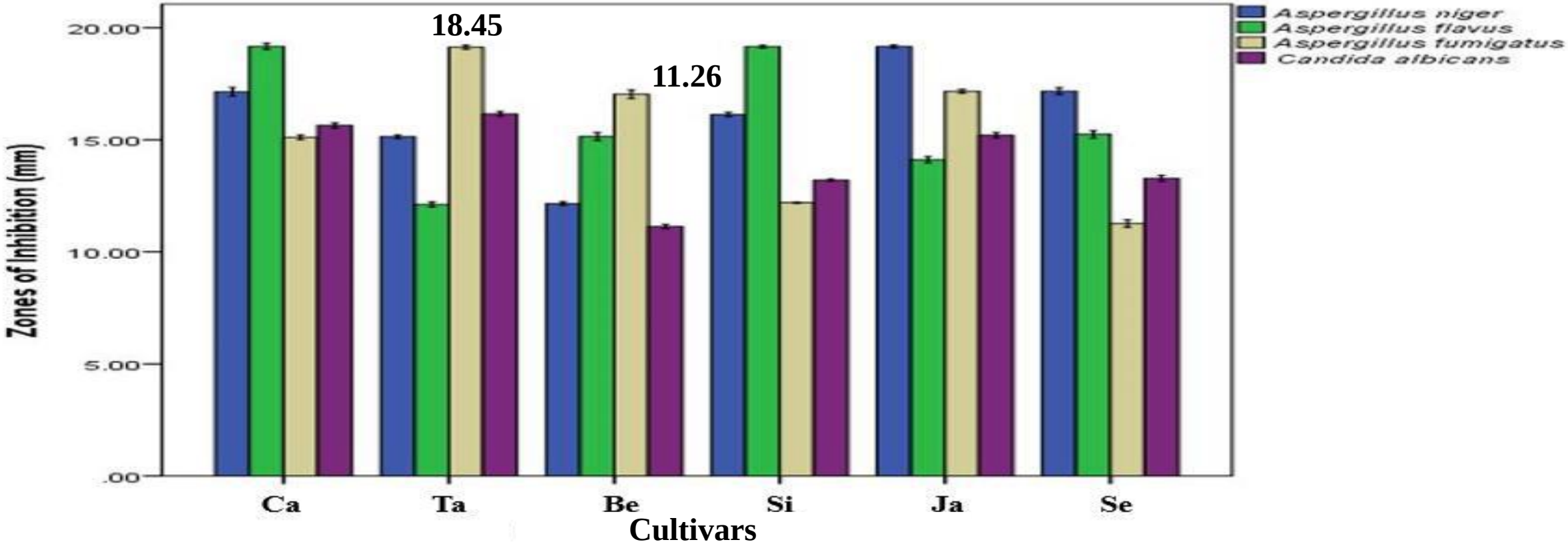

Figure 10:Antifungal Activity of the Pure Extracts of Long Pepper Prepared with Acetone.

Results and Discussion

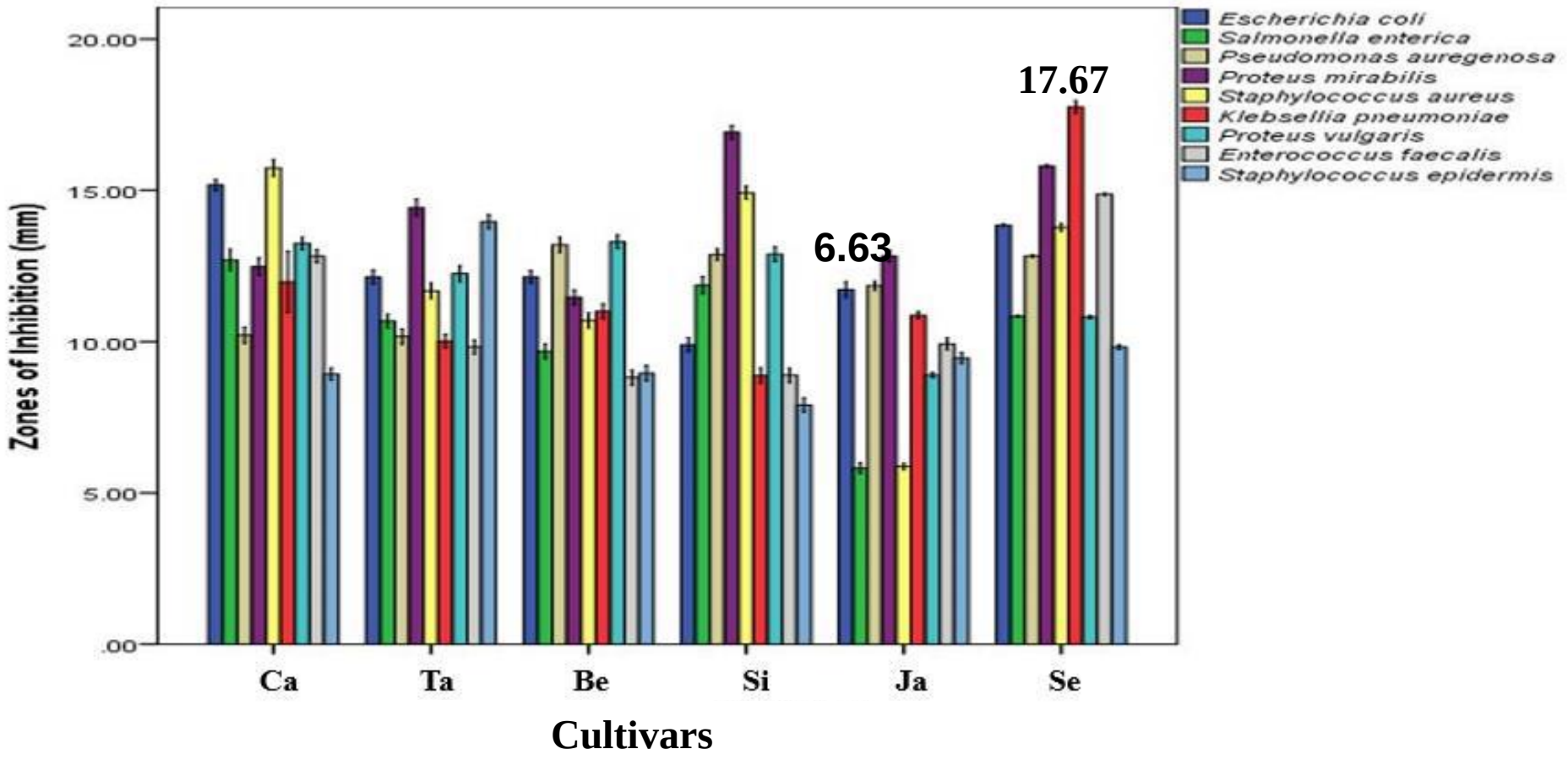

Figure 11:Antibacterial Activity of the Pure Extracts of Long Pepper Prepared with Water

Results and Discussion

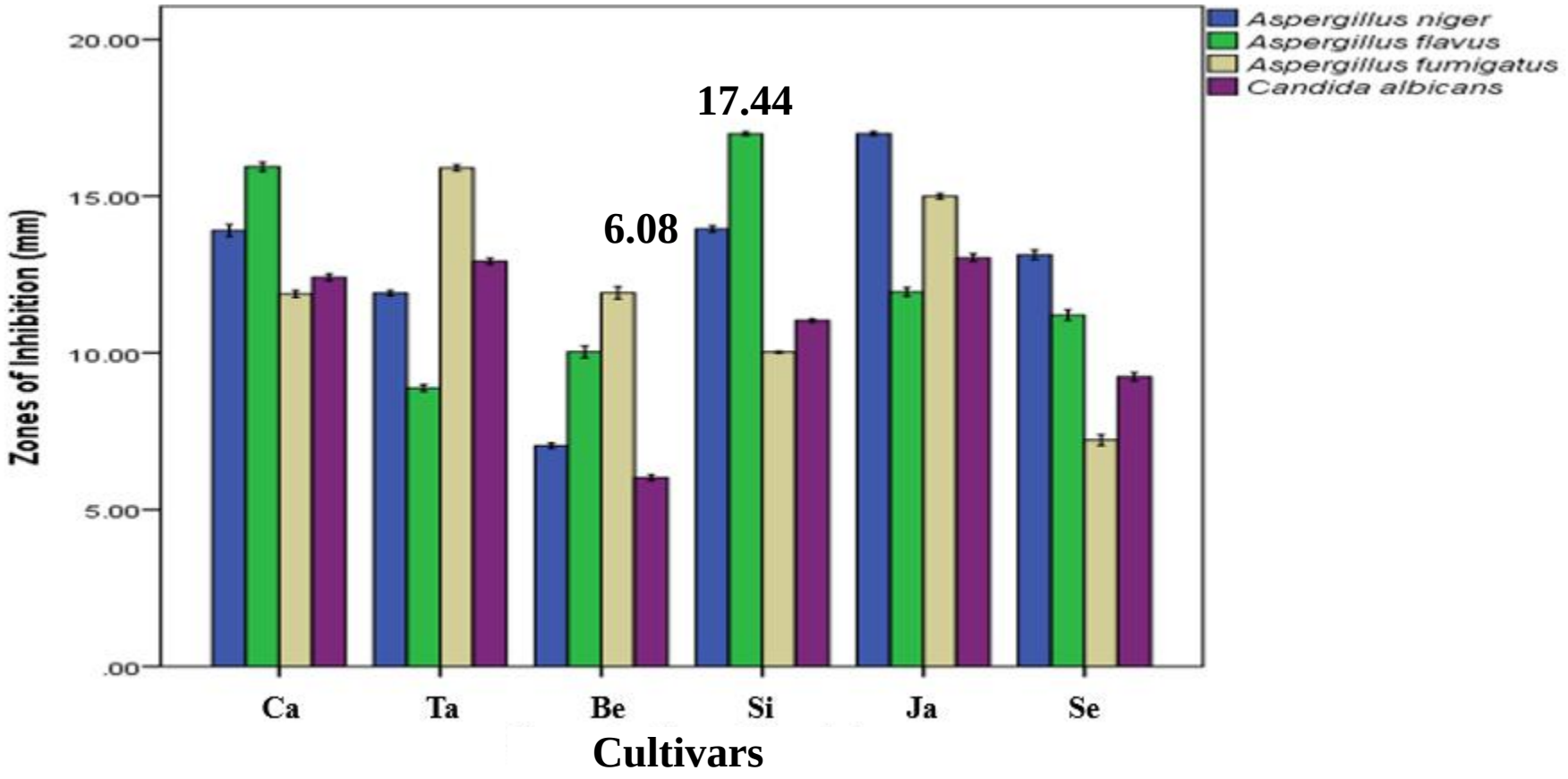

Figure 12:Antifungal Activity of the Pure Extracts of Long Pepper Prepared with Water

Results and Discussion

Table 1: Range of Antimicrobial Activity of the Crude and Pure Extracts of Long Pepper Used

		Zone of Inhibition (mm)						
	Pepper	Ethanol		Acetone		Water		Remark
		Highest	Lowest	Highest	Lowest	Highest	Lowest	
Cayenne	Crude Extract	17.32/AFL	7.12/PSA	17.43/AFL	7.91/ESC	14.89/AFL	7.25/ESC	Acetone (17.43/AFL)
	Pure Extract	21.95/ESC	13.83/KLP	18.51/AFL	12.17/PSA	16.69/AFL	10.85/PSA	Ethanol (21.95/ESC)
Tabasco	Crude Extract	20.05/AFL	12.41/ESC	7.87/AFU	5.97/AFL	16.18/CAA	6.84/SAE	Ethanol (20.05/AFL)
	Pure Extract	16.49/SAE	6.17/CAA	18.45/AFU	11.14/PSA	14.22/AFU	7.84/AFL	Ethanol (16.49/SAE)
Bird's eye	Crude Extract	19.87/AFU	11.97/STA	13.51/STE	7.23PSA	12.49/STE	6.19/PSA	Ethanol (19.87/AFU)
	Pure Extract	17.09/ESC	5.97/AFU	16.97/AFU	11.25/CAA	13.42/PRV	5.53/CAA	Ethanol (17.09/ESC)
Siling labuyo	Crude Extract	21.96/AFL	13.76/AFU	16.91AFU	10.24/ENF	13.22/AFU	7.93/ENF	Ethanol (21.96/AFL)
	Pure Extract	16.74/AFU	8.19/AFL	18.1/PRM	11.61/KLP	17.44/AFL	8.37/STE	Ethanol (16.74/AFU)
Jalapeno	Crude Extract	18.89/KLP	12.09/AFL	16.83/CAA	8.87/ESC	16.94/CAA	6.51/STA	Ethanol (18.89/KLP)
	Pure Extract	17.15/ESC	8.77/AFU	17.93/ANI	6.82/SAE	19.11/KLP	7.04/CAA	Water (19.11/KLP)
Serrano	Crude Extract	21.64/ENF	13.69/AFU	15.05/AFL	8.93/SAE	10.25/PRM	6.43/SAE	Ethanol (21.64/ENF)
	Pure Extract	20.05/AFL	12.41/ESC	19.11/KLP	11.93/AFL	17.67/KLP	6.84/AFU	Ethanol (20.05/AFL)

Legend: ANI: *Aspergillus niger,* AFG: *Aspergillus fumigatus,* AFL: *Aspergillus flavus,* CAA: *Candida albicans,* PSA: *Pseudomonas aeruginosa,* ESC: *Escherichia coli,* PRM: *Proteus mirabilis,* KLP: *Klebsiella pneumoniae,* STE: *Staphylococcus epidermidis.,* PRV: *Proteus vulgaris,* STA: *Staphylococcus aureus,* ENF: *Enterococcus faecalis,* Hi: highest, Lo: lowest.

Results and Discussion

Table 2: Comparison of the Pure Extract with Commercial Chemotherapeutic Antimicrobial Agents

	Zone of Inhibition (mm)			
	Antibacterial		Antifungal	
Cultivars (50mg/ml)	Pure Extract	Ciprofloxacin	Pure Extract	Fluconazole
Cayenne	17.45	6.19	17.38	14.32
Tabasco	15.56		14.08	
Bird's eye	14.88		15.56	
Siling labuyo	18.03		17.04	
Jalapeno	12.92		14.35	
Serrano	18.44		16.28	

Conclusions & Recommendations

- **This study confirms the antimicrobial property of *Capsicum frutescens and Capsicum annuum* against the test clinical microorganisms.**

- **Hence, can be used as an alternative for the current antimicrobial chemotherapeutic agents.**

References

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