

Antifungal activity of *Allium sativum* and *Zingiber officinale* against *Tinea capitis* among Primary school pupils in Balanga, Gombe State Nigeria

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Background

Allium sativum and *Zingiber officinale* are known to have antifungal activity. Fungal infection (dermatophytosis) of the scalp is a prevalent infection that constitutes a public health challenge among children.

Aim

This study evaluated *in-vitro* antifungal activity of *Allium sativum* and *Zingiber officinale* against *Tinea capitis*.

Methods

Sixty (60) specimen were gotten from the affected scalp of primary school pupils in Balanga, Gombe State. Isolation, identification and susceptibility test using *Allium sativum* and *Zingiber officinale* against the isolated *Tinea capitis* and *A. niger* were carried out using Griseofulvin as control.

The specimen were collected and transferred into a well labelled sterile containers, ready for isolation (microscopy and culture)

The Microscopy was done under low (10x) and high (40x) objectives. For the culture, each specimen was inoculated into a pair of MycoselR agar plates to establish the growth of dermatophytes at room temperature and 35-37°C.

Allium sativum and *Zingiber officinale* were collected, identified and extraction procedures were carried out using water, ethanol and methanol as solvents

For the susceptibility testing, anti-dermatophytic activity of ethanolic, methanolic and aqueous extracts of garlic/ginger was done using well in agar method, filled with 0.2 ml each. 1mg/ml of Griseofulvine was used as control. All were incubated at 28 °C for 24 hours and results taken.

Figure 1: Methodology Flow Diagram

Results

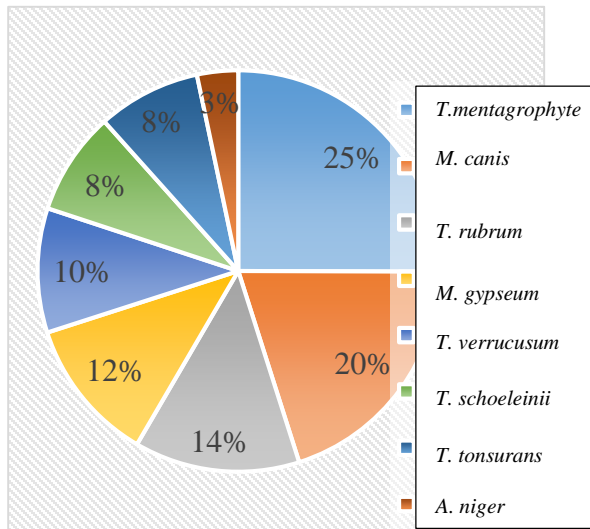


Figure 2: Results from microscopy and culture of dermatophyte isolates

Fungi isolate	Meth.	Eth.	Aqu.	Gris.
<i>M. canis</i>	22.44	19.63	16.40	0.00
<i>M. gypseum</i>	24.22	23.67	16.53	0.00
<i>T. tonsurans</i>	19.88	20.95	0.00	0.00
<i>T. schoeleinii</i>	20.07	21.82	15.66	31.00
<i>T. rubrum</i>	25.87	24.81	18.33	0.00
<i>T. verrucosum</i>	21.33	22.33	15.67	0.00
<i>T. mentagrophyte</i>	24.00	20.40	12.93	0.00

Table 1: Zone of inhibition in mm for Methanolic (Meth.), Ethanolic (Eth.) and aqueous (Aqu.) extract of garlic (*Allium sativum*). Griseofulvin (Gris.) as control.

Fungi isolate	Meth.	Eth.	Aqu.	Gris.
<i>M. canis</i>	20.62	19.61	15.30	0.00
<i>M. gypseum</i>	21.86	23.44	15.56	0.00
<i>T. tonsurans</i>	20.80	20.51	0.00	0.00
<i>T. schoeleinii</i>	24.93	22.81	14.26	31.00
<i>T. rubrum</i>	21.33	20.19	12.00	0.00
<i>T. verrucosum</i>	20.92	20.61	14.54	0.00
<i>T. mentagrophyte</i>	23.03	24.60	0.00	0.00

Table 1: Zone of inhibition in mm for Methanolic (Meth.), Ethanolic (Eth.) and aqueous (Aqu.) extract of garlic (*Zingiber officinale*). Griseofulvin (Gris.) as control.

More Results

Eight (8) organisms were isolated: *Trichophyton mentagrophyte* (25%), *Micrrosporium canis* (20%), *Trichophyton rubrum* (14%), *Microsporium gypseum* (12%), *Trichophyton schoenleinii* (8%), *Trichophyton verrucosum* (10%), *Trichophyton tonsurans* (8%) and *Aspergillus niger* (8%). That is 58 pupils (96.33%) infection positive with *Tinea capitis* and 2 pupils (3.33%) infection were contaminated with *Aspergillus niger*. Methanolic, ethanolic and aqueous extract of garlic inhibited the fungi with zones ranging from 12.93- 25.87mm. And methanolic, ethanolic and aqueous extract of ginger inhibited the fungi with zones ranging from 12.00- 24.6mm.

Conclusions

The prevalent causative agent of *Tinea capitis* in Balanga LGA was found to be *Trichophyton mentagrophytes*. Anthropophilic and zoophilic dermatophyte were found to be responsible for *Tinea capitis*. The findings of this study showed that the extracts of garlic and ginger had a marked significance in inhibiting the isolated organisms. This can be compared favourably with previous studies on antifungal activity of garlic and ginger, the plants are promising source of drugs for treatment of dermatophytic infections.