

Screening of some plants used in traditional medicine in Niger for antiparasitic and antifungal activities

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INTRODUCTION

In the present study, we focus on 25 plants commonly used as decoction in sahelien area for their antiprotozoal, schistosomicidal and antifungal activities.¹

According to traditional practices, extracts of roots, leaves, stem barks, aerial parts or the whole plant were tested *in vitro*, against a panel of human pathogenic fungi and protozoa.

MATERIALS AND METHODS

PLANTS MATERIAL

25 plants have been taken in Niger flora and identified botanically.

EXTRACTS TESTED

– Aceton and methanol/H₂O (80:20) extracts of the 25 plants were tested against Protozoa, in concentration ranging from 500 µg/ml to 50 µg/ml.

Table 1
Plants material taken in Niger flora and identified botanically

Number	Species	Family	Parts of plant used	Auteurs des noms bota.
1	<i>Acacia nilotica</i> (de <i>Acacia arabica</i> Willd.)	<i>Mimosaceae</i>	leaves	Dal.
2	<i>Balanites aegyptiaca</i> (syn. de <i>Balanites roxburghii</i> Planck)	<i>Balanitaceae</i> ou <i>Zygophyllaceae</i>	stem bark	(L.) Delile
3	<i>Boerhavia erecta</i>	<i>Nyctaginaceae</i>	aerial part	L.
4	<i>Boscia angustifolia</i>	<i>Capparidaceae</i>	stem bark	Rich.
5	<i>Cadaba farinosa</i>	<i>Capparidaceae</i>	leaves	Forsk.
6	<i>Cassia nigricans</i>	<i>Caesalpiniaceae</i>	aerial part	Vahl
7	<i>Celosia trigyna</i>	<i>Amaranthaceae</i>	aerial part	L.
8	<i>Centaurea perrotteii</i> DC. syn. de <i>Centaurea calcitropa</i> L.	<i>Asteraceae</i>	whole plant	
9	<i>Chrozophora brocchiana</i>	<i>Euphorbiaceae</i>	whole plant	Vis.
10	<i>Combretum aculeatum</i>	<i>Combretaceae</i>	leaves	Vent.
11	<i>Combretum micranthum</i>	<i>Combretaceae</i>	leaves	G. Don
12	<i>Combretum nigricans</i>	<i>Combretaceae</i>	leaves	Lepr.
13	<i>Commiphora africana</i>	<i>Burseraceae</i>	stem bark	Engl.
14	<i>Cucumis prophetarum</i>	<i>Cucurbitaceae</i>	whole plant	L.
15	<i>Indigofera tinctoria</i>	<i>Papilionaceae</i>	roots, leaves	L.
16	<i>Khaya senegalensis</i>	<i>Meliaceae</i>	stem bark	Juss.
17	<i>Mitracarpus scaber</i>	<i>Rubiaceae</i>	whole plant	Zucc.
18	<i>Momordica balsamina</i>	<i>Cucurbitaceae</i>	aerial part	L.
19	<i>Paullinia pinnata</i>	<i>Sapindaceae</i>	aerial part	L.
20	<i>Piliostigma reticulatum</i>	<i>Caesalpiniaceae</i>	whole plant	Hochst.
21	<i>Polycarpaea linearifolia</i>	<i>Caryophyllaceae</i>	whole plant	DC.
22	<i>Prosopis africana</i>	<i>Mimosaceae</i>	leaves, stem bark	Taub.
23	<i>Pupalia lappaceae</i>	<i>Amaranthaceae</i>	whole plant	Juss.
24	<i>Sclerocarya birrea</i>	<i>Anacardiaceae</i>	stem bark	Hoch
25	<i>Securidaca longipedunculata</i>	<i>Polygalaceae</i>	roots	Fres.

- Methanol/H₂O (80:20) extracts of the 25 plants were tested against yeast at the concentration of 500 µg/ml
- Only aqueous extracts of *Boerhavia erecta* and *Mitracarpus scaber* were tested against dermatophyte in concentration ranging from 1 500 µg/ml to 500 µg/ml.

TESTED MICRO-ORGANISMS

Yeast strains

Candida albicans (ATCC 2091 and Y 0109), *C. krusei* (LM 86), *C. tropicalis* (LM 772), *C. pseudotropicalis* (YO 601), *C. glabrata* (LM 774), *C. parapsilopsis*, *C. zeylanoides*, *Cryptococcus neoformans*, *Trichosporon cutaneum* (clinical isolates).

Dermatophyte strain

Trichophyton mentagrophytes (clinical isolate)

Protozoal strains

Trichomonas vaginalis (TV R87), *Entamoeba histolytica minuta* form (Rahman) (clinical isolates).

ASSAY MEDIA

- Antifungal activity was evaluated *in vitro* with the agar dilution method using Yeast nitrogen base YNB (Difco) and Sabouraud chloramphenicol agar (Pasteur) as a culture medium for yeast and dermatophyte species respectively.^{5,7}
- Jone's liquid media and oxoid (code CM 161) liquid media were used as culture media for *Entamoeba histolytica* and *Trichomonas vaginalis* respectively.^{3,6,2}

The minimal inhibitory concentration (MIC : µg/ml) was recorded as the lowest concentration of extract which inhibited fungi or protozoa.

RESULTS

Antifungal activity

- Methanol/H₂O (80:20) extracts of the plants did not show any activity against yeasts growth.
- *Mitracarpus scaber* aqueous extracts exhibited an inhibitory activity against *Trichophyton mentagrophytes* (MIC: 1 500 µg/ml).

Antiprotozoal activity

Table 2
Antiprotozoal activity (MIC = µg/ml)

Plants number (cf. Table 1)	<i>Trichomonas vaginalis</i>		<i>Entamoeba histolytica</i>	
	MeOH/H ₂ O (80:20)	Aceton	MeOH/H ₂ O (80:20)	Aceton
2	100	–	250	500
6	250	–	500	–
8	500	–	–	500
10	250	–	–	–
11	250	–	–	–
12	250	–	–	–
13	250	–	100	100
14	250	–	–	–
15 (leaves)	250	–	–	–
15 (roots)	250	–	–	500
16	250	–	–	–
17	250	–	–	–
18	250	–	–	500
19	250	–	250	100
20	250	–	500	–
21	250	–	–	–
22 (leaves)	250	–	–	–
22 (stem bark)	250	–	–	–
24	250	–	500	500
25	250	–	–	–

– : no activity revealed

DISCUSSION

– No significant activity was obtained with acetonic extract against *Trichomonas vaginalis*. However Methanol/H₂O (80:20) extract of *Balanites aegyptiaca* was active on this protozoa (MIC: 100 µg/ml) and 18 others extracts were active at 250 µg/ml (see result table).

– *Balanites aegyptiaca* stem bark, *Commiphora africana* stem bark, and *Paullinia pinnata* aerial part extracts inhibited *Entamoeba histolytica* growth in vitro at a concentration of 100 µg/ml. Against this protozoa growth, 8 others extracts were active at 500 µg/ml.

– Antifungal activity screening on 25 plants pointed out that only *Mitracarpus scaber* had some antidermatophytic activity as described by Crockett C.O. and C-workers.⁴

CONCLUSION

The screening of 25 plants used in traditional medicine in NIGER for their antiparasitic and antifungal activities pointed out 4 species active *in vitro* against protozoal and dermatophyte growth.

These plant species have to undergo on further investigations in order to isolate and to elucidate the chemical structures of active principes from the primary hydromethanolic, acetonic and aqueous extract

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