

## Abstract

**Objective:** The main mission of this study is to enhance the River Nile resources and to investigate the unexplored River Nile habitat since we found that the literature to date showed little information about the chemistry and biology of the River Nile derived microorganisms. So it was claimed to isolate a number of microorganisms, using the modern hyphenated techniques for chemical profiling of crude extracts of some isolates which were also evaluated for their antimicrobial, antimalarial, antileishmanial and antitrypanosomal activities. also isolation of major bioactive constituents from River Nile derived fungus *Aspergillus awamori*.

**Methods:** A number of microorganisms has been isolated, Ultra-pure DNA was extracted from some bacterial cultures for identification using bacterial 16S rRNA and fungal 18S rRNA gene sequences and using LC-HR-ESI-MS spectroscopy for chemical profiling of crude extracts of selected isolates which were also subjected to *in-vitro* antimicrobial, antimalarial, antileishmanial and antitrypanosomal assays. On the other hand different chromatographic techniques were used for isolation of bioactive metabolites from large scale fermented broth of the River Nile derived fungus *Aspergillus amowri*; the structure of the isolated compound was elucidated based on spectroscopic analysis.

**Results:** Success of isolation of about **34** versatile isolates was achieved, from which seven were successfully identified. The ethyl acetate (EtOAc) extracts of one isolate (**RN-008**) showed activity against Methicillin-resistant *Staphylococcus aureus* (MRSA) ( $IC_{50} = 167.2248 \mu\text{g/ml}$ ) and against VRE ( $IC_{50} = 93.514 \mu\text{g/ml}$ ). Also (**RN-008** & **RN-003**) showed activity

against both *Plasmodium falciparum* D6 and *P. falciparum* W2 (IC<sub>50</sub>=21.009 & 25.939 and 16.283 & 27.278 µg/ml, respectively). Some isolates showed good antitrypanosomal activity (IC<sub>50</sub> of **RN-205, RN-008 and RN-011** were <0.8, <0.8 & 0.96 µg/ml respectively). Four compounds had been isolated from the fungus *Aspergillus awamori*; the aromatic ester di-(2-ethylhexyl) Phthalate (DEHP), one steroid compound; ergosterol and two unsaturated fatty acids notably; α-oleic and α-linoleic acids. The major isolated metabolite, DEHP, exhibited prominent activity against *Candida albicans* (zone of inhibition= 20 mm) fungi and Gram positive bacteria *Sarcina lutea* (zone of inhibition= 23 mm). It also showed cytotoxic activity against some carcinoma cell lines (human breast carcinoma (IC<sub>50</sub>= 6.525 µg/ml), human liver carcinoma cells (IC<sub>50</sub>= 26.73 µg/ml) and human cervix carcinoma cells (IC<sub>50</sub>= 42.2958 µg/ml)).

**Conclusion:** The River Nile could be considered as a great source for bioactive metabolites and intriguing subject for further studies.

**Keywords:** River Nile, *Aspergillus*, 16S rRNA, LC-HRESIMS, antimicrobial, cytotoxic, antiprotozoal.