

## **Phytochemical, anti-Acanthamoeba, and anti-adhesion properties of *Garcinia mangostana* flower as preventive contact lens solution**

### **ABSTRACT**

Acanthamoeba keratitis infection extends due to the growing number of contact lens users. Indigenous plants including *Garcinia mangostana* play a vital role in human health and well being. Many species of this plant have been reported with myriads of potent medicinal properties. However, the aims of this study were, for the first time, to isolate compounds from the flower of *G. mangostana* and to test their anti-Acanthamoeba and antiadhesion activity against *Acanthamoeba triangularis*. Powdered flowers of *G. mangostana* were extracted and chromatographed on a silica gel column. The structures of the compounds were established with the aid of  $^1\text{H}$  NMR. More so, the anti-Acanthamoeba and anti-adhesion properties were tested on a 96-well polystyrene microtiter plate and soft contact lenses. Scanning electron microscope (SEM) was used to determine the features of *A. triangularis* on contact lenses. Eight pure compounds were obtained, namely 9-hydroxycalabaxanthone, tovophillin A, garcinone E, garcinone B,  $\alpha$ -mangostin, gartinin, 8-deoxygartinin and  $\gamma$ -mangostin. The extract and pure compounds exhibited anti-Acanthamoeba activity with MIC values in the range of 0.25–1 mg/mL. In addition, the extract and  $\alpha$ -mangostin displayed significant activity against the adhesion of *A. triangularis* trophozoites both in polystyrene plate and in contact lenses at  $0.5 \times \text{MIC}$  (0.25 mg/mL). Furthermore,  $\alpha$ -mangostin has the potential to remove *A. triangularis* adhesion in contact lenses similar to a commercial multipurpose solution (MPS). SEM study confirmed that crude extract and  $\alpha$ -mangostin are effective as solutions for contact lenses, which removed *A. triangularis* trophozoites within 24 h. Alpha-mangostin was non-toxic to Vero cells at a concentration below 39  $\mu\text{M}$  in 24 h. Crude extract of *G. mangostana* flower and its  $\alpha$ -mangostin serve as candidate compounds in the treatment of Acanthamoeba infection or as lens care solution, since they can be used as a source of natural products against Acanthamoeba and virulence factor associated with the adhesion of *A. triangularis*.