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BACKGROUND

The identification of new compounds with potential anticancer activity derived from herbaceous food or medicinal plant extracts has been widely explored in recent years. Over 75% of the currently used anticancer agents are derived from natural sources such as plants, marine organisms and microorganisms (Tariq *et al.*, 2017). However, only a small portion of higher plants have been prospected for bioactive compounds. Studies have already shown that cytotoxic substances targeting cancer cells are good candidates for the development of new anticancer drugs (Sriwiryajan *et al.*, 2014). Therefore, further studies are needed to identify more efficient, with less side effects, new compounds in cancer prevention and treatment (Tomani *et al.*, 2018).

AIM OF THE STUDY

The present study aims at addressing at the molecular and functional levels the antiinflammatory and the antileukemic-like activities of R01Yob, a plant of the rwandese pharmacopeia.

To investigate the influence of R01Yob extract on cell viability the Cell Titer Glo technology of *Promega* was employed using the indicated cells. Results obtained show a strong reduction of the viability of suspension cancer cells but no effect on normal blood cells (PBMc) and adherent cell lines.

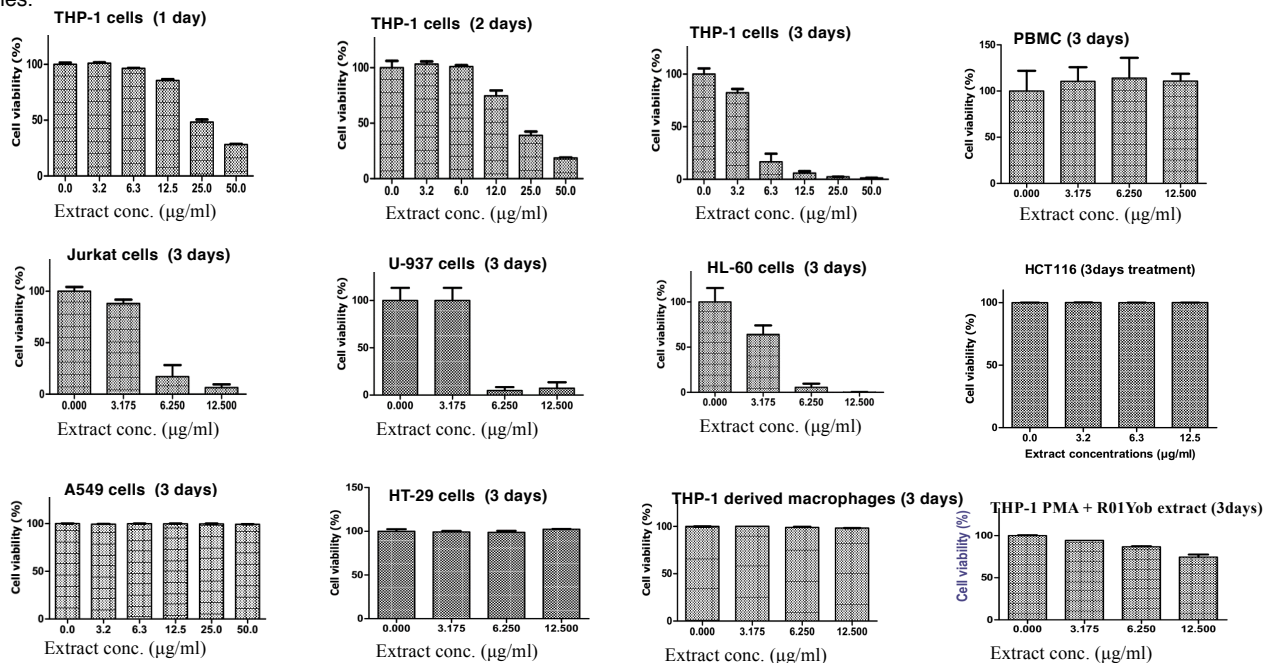


Fig. 2: Selective antileukemia-like activity of R01Yob extract. The plant extract has selectively shown strong time- and dose-dependent viability inhibition against leukemic/lymphoma derived suspension cancer cells (jurkat, U-937, THP-1 and HL-60) but not normal peripheral blood monocytes (PBMc) and adherent cancer cells (A549, HT-29, HCT-116, THP-1-derived macrophages).

CONCLUSION AND PERSPECTIVE

Taken together, this study has shown that R01Yo could be a potential source of anticancer drug. Its inhibitory effect on the caspase-1 activity suggest that it could also be used in the treatment of the inflammasome-caused diseases. Further investigations are needed to characterize active molecules and their mechanisms of action.

REFERENCES

- Sriwiryajan, S.; Ninpesh, T.; Sukpondma, Y.; Nasomyon, T.; Graidist, P. 2014. Cytotoxicity screening of plants of genus Piper in breast cancer cell lines. *Trop. J. Pharm. Res.* 13, 921–928.
- Akash Tariq, Sehrish Sadia, Kaiwen Pan, Ihteram Ullah, Sakina Mussarat, Feng Sun, Olatunji Olusanya Abiodun, Altanzagas Batbaatar, Zilong Li, Dagang Song, Qilin Xiong, Riaz Ullah, Suliman Khan, Buddha Bahadur Basnet, Brawin Kumar, Rabiul Islam and Muhammad Adnan, 2017. A systematic review on ethnomedicines of anticancer plants. *Phytother. Res.* 31: 202–264.
- TOMANI JCD, Tchouate GLO, NSHUTIYAYESU S, MUKAZAYIRE MJ, RIBEIRO SO, STEVIGNY C, FREDERICH M, MUGANGA R, and SOUOPGUI J (2018) An ethnobotanical survey and inhibitory effects on NLRP3 inflammasomes/Caspase-1 of herbal recipes' extracts traditionally used in Rwanda for asthma treatment. *Journal of Ethnopharmacology*. DOI: 10.1016/j.jep.2018.08.016.

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RESULTS

The antiinflammatory activities of R01Yob extract was performed using the Caspase-1 Glo assays (*Promega*) and the THP-1 cells. At 25ug/ml the extract revealed inhibitory effect but this was lost with higher doses, suggesting cell death leading to inflammation.

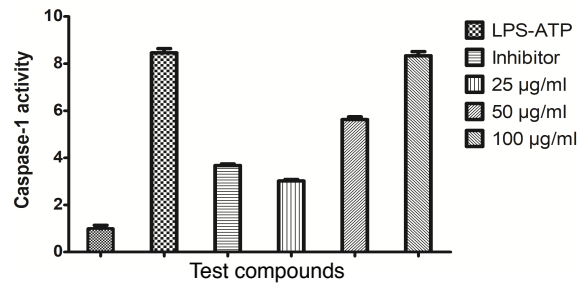


Fig.1: Inhibition of the caspase-1 activity by R01Yob extract. The plant extract inhibited the inflammasome/caspase-1 activity in THP-1 derived macrophages. However, the activity decreases due to the low solubility of the extract in water.