



Mini Review

Chemical components isolated from the ethyl acetate extraction of the roots of radix *Actinidia chinensis*

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ABSTRACT

Cancer is the second leading cause of death, responsible for almost one in six deaths globally, and it has been a great threat to human survival. Many efforts have been made to combat cancer, and many technological and scientific advances have been achieved to improve the survival and quality of life of people living with the disease. However, the multidrug resistance is unavoidable and some anticancer drugs used in clinics are too toxic together with various side-effects. At present, it is a mainstream to discover new drugs or lead compounds from the natural products. The Roots of Radix *Actinidia chinensis* has ever been used in the folk for the treatment of cancer. In our previous study, we screened the biological fraction with higher anticancer activity. We isolated three compounds from the selected fraction in this study to provide the scientific evidence for its anticancer activity.

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Key words: Roots of radix *Actinidia chinensis*, chemical composition, isolation, structures confirmation.

DISCUSSION

Cancer is the second leading cause of death, responsible for almost one in six deaths globally. It is estimated that about 1,688,780 new cancer cases will be diagnosed in the United States in 2017 and 600,920 cancer cases are expected to die, which is about 1,650 people per day. For all sites combined, the cancer incidence rate is 20% higher in men than in women, while the cancer death rate is 40% higher (Rebecca et al., 2017). It has been reported that 4,292,000 new cancer cases and 2,814,000 cancer deaths occurred in 2015 in China, with lung cancer being the most common incident cancer and the leading cause of cancer death. Stomach, esophageal, and liver cancers were also commonly diagnosed and were identified as leading causes of cancer death (Chen et al., 2016).

The aim of technological and scientific advances is to improve the survival and quality of life of people living with the disease. Oncology drug discovery and development remain a challenge for all scientists working in this field. Many kinds of Chinese traditional plant medicines have ever been used in clinical for treatment cancer. Thus it is a

main stream to discovery the new drugs or drug candidates with anticancer activity from Chinese traditional plant.

The Roots of Radix *Actinidia chinensis* has been reported to exhibit a wide spectrum of anticancer activity against several cancer cell lines (Li et al., 2017). During our previous study, we obtained different extractions (Ethylacetate extraction, Trichloromethane extraction, Dichloromethane extraction, Methanol extraction and water extraction) from the Roots of Radix *A. chinensis* and evaluated their *in vitro* anticancer activity. The results showed that the ethylacetate extraction exhibited higher anticancer activity against A549, HCT116 and MCF-7 cell lines at 50 µg/m (Zheng et al., 2018). Based on this study, we continue to isolate the single compounds from this extraction to make a foundation for its biological activity. In this study, we isolated and confirmed three known compounds (the names and structures are shown in **Figure 1**) from the ethyl acetate extraction. The detailed isolation processes are shown in **Figure 2**. The spectral data of the isolated compounds are in agreement with the results of

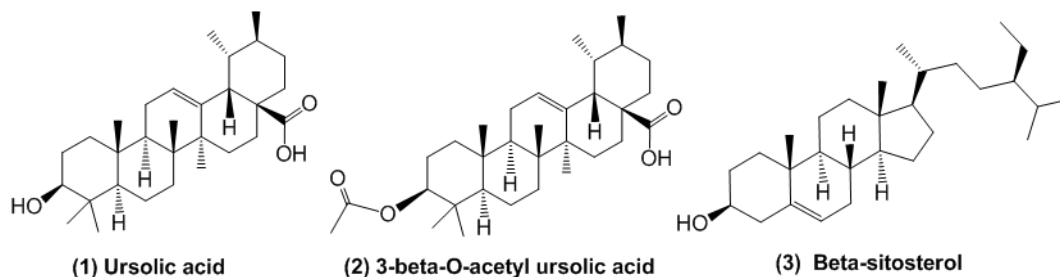


Figure 1: The names and structures of isolated compounds.

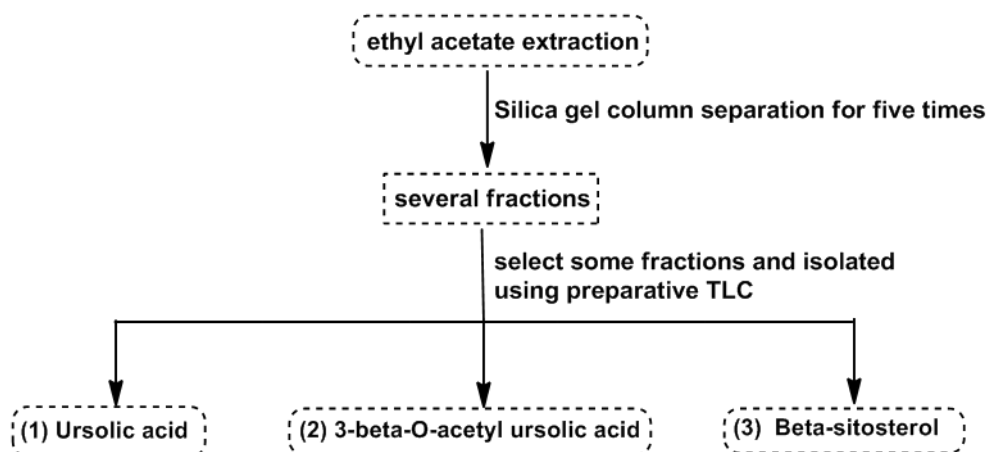


Figure 2: The detailed isolation processes of compounds (1-3).

previous study (Meng et al., 2017). The compounds **1** and **2** possess higher anticancer activity (Cha et al., 2011; Uto et al., 2013; Norihiro et al., 2005; Kim et al., 2009), which explain the reason that the ethyl acetate extraction showed higher anticancer activity against A549, HCT116 and MCF-7 cell lines than other extraction in our previous study (Zheng et al., 2018).

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REFERENCES

- Cha DS, Shin TY, Eun JS (2011). Anti-metastatic properties of the leaves of *Eriobotrya japonica*. Arch. Pharm. Res. 34(3): 425-436.
- Chen WQ, Zheng RS, Peter DB, Zhang SW, Zeng HM, Bary F, Jemal A, Yu XQ, He J (2016). Cancer Statistics in China, 2015. CA Cancer J. Clin. 66(2): 115-132.
- Kim MS, You MK, Rhuy DY (2009). Loquat (*Eriobotrya japonica*) extracts suppress the adhesion, migration and invasion of human breast cancer cell line. Nutr. Res. Pract. 3(4): 259-264.

- Li J, Xu Y, Yang XD, Liu Y, Luan YT, Lin YF, Han T (2017). Chinese Archives of Traditional Chinese Medicine. 35(11): 2745-2747.
- Meng N, Huang S, Hu DD, Xu YL, Wang YF, Wang JL (2017). Chemical constituents from *Nepetaangustifolia*. Chin. Tradit. Pat. Med. 39(5): 976-980.
- Norihiro B, Toshihiro A, Harukuni T, (2005). Anti-inflammatory and antitumor-promoting effects of the triterpene acids from the leaves of *Eriobotrya japonica*. Biol. Pharm. Bull. 28(10): 1995-1999.
- Rebecca LS, Kimberly DM, Ahmedin J (2017). Cancer Statistics.CA Cancer J. Clin. 67(1): 3-30.
- Uto T, Ayana S, Nguyen HT (2013). Anti-proliferative activities and apoptosis induction by triterpenes derived from *Eriobotrya japonica* in human leukemia cell lines. Int. J. Mol. Sci. 14(2): 4106-4120.
- Zheng HZ, Chen J, Yang Y, Yong JP, Huang W (2018). Screening the effective extractions of the roots of radix (*Actinidia chinensis*) with anticancer activity. J. Med. Ther. 2(3): 1-2.