

# Efek Ekstrak Etanol Batang Mahkota Dewa (*Phaleria macrocarpa*) terhadap Pertumbuhan dan Ekspresi Protein Bcl-2 Sel HCT116 = The Effect of Ethanol Extract from Mahkota Dewa (*Phaleria macrocarpa*) Bark on Growth and Expression of Bcl-2 Protein in Cell Line HCT116

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## Abstrak

Pendahuluan. Kanker kolorektal menempati posisi keempat kanker dengan kasus baru di Indonesia, sehingga Kemenkes memiliki urgensi dalam menatalaksana kanker ini. Ekspresi protein Bcl-2 yang berlebihan pada pasien kanker kolorektal berperan dalam mekanisme proliferasi sel kanker, yaitu kegagalan kaskade apoptosis sel abnormal. Penanganan kanker kolorektal dapat berupa operasi eksisi atau terapi radiokemoterapi, namun beberapa obat memiliki efek samping yang dapat memperburuk prognosis pasien. Mahkota Dewa (*Phaleria macrocarpa*) diketahui memiliki aktivitas antikanker karena kandungan phalerin dan asam galatnya, namun belum banyak penelitian yang membahas efek batang *Phaleria macrocarpa* terhadap kanker kolorektal. Metode. Batang Mahkota Dewa (*Phaleria macrocarpa*) dimaserasi dengan pelarut etanol 96%. Efek ekstrak etanol batang *Phaleria macrocarpa* terhadap ekspresi protein Bcl-2 terhadap sel HCT116 dinilai melalui nilai H-score pada pewarnaan imunositokimia. Potensi aktivitas dan efektivitas senyawa-senyawa bioaktif yang terdapat di dalam batang *Phaleria macrocarpa* dalam menghambat kanker kolorektal melalui jalur pensinyalan Bcl-2 dievaluasi menggunakan metode docking molekuler. Hasil. Penurunan ekspresi Bcl-2 pada sel HCT116 dibuktikan dengan nilai rerata H-score sebesar 160,26 pada administrasi ekstrak etanol batang *Phaleria macrocarpa* dosis sedang (100 ppm) dan 130,57 pada dosis besar (200 ppm). Senyawa bioaktif 6,4'-dihydroxy-4-methoxybenzophenone-2-O- $\beta$ -D-glucopyrano dapat menghambat kanker kolorektal melalui jalur pensinyalan Bcl-2. Kesimpulan. Ekstrak etanol batang Mahkota Dewa (*Phaleria macrocarpa*) dosis 100 dan 200 ppm dapat menghambat pertumbuhan kanker kolorektal dan menurunkan ekspresi protein Bcl-2 pada sel HCT116. Senyawa bioaktif ekstrak etanol batang Mahkota Dewa (*Phaleria macrocarpa*) yang paling poten adalah 6,4'-dihydroxy-4-methoxybenzophenone-2-O- $\beta$ -D-glucopyrano.

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Preliminary. Colorectal cancer occupies the fourth position of cancer with new cases in Indonesia, so the Ministry of Health has urgency in managing this cancer. Overexpression of Bcl-2 protein in colorectal cancer patients plays a role in the mechanism of cancer cell proliferation, namely the failure of the apoptotic cascade of abnormal cells. Colorectal cancer can be treated with surgical excision or radiochemotherapy, but some drugs have side effects that can be severe may worsen the patient's prognosis. Crown of God (*Phaleria macrocarpa*) known to have anticancer activity due to the content of phalerin and gallic acid, but not many studies have discussed the effect of *Phaleria macrocarpa* stems on colorectal cancer. Method. Mahkota Dewa stem (*Phaleria macrocarpa*) was macerated with 96% ethanol as solvent. The effect of *Phaleria macrocarpa* stem ethanol extract on Bcl-2 protein expression on HCT116 cells was assessed by the H-score value on staining.

immunocytochemistry. The potential activity and effectiveness of the bioactive compounds contained in the stem of *Phaleria macrocarpa* in inhibiting colorectal cancer through the Bcl-2 signaling pathway were evaluated using the molecular docking method. Results. The decrease in Bcl-2 expression in HCT116 cells was evidenced by the mean value of

The H-score was 160.26 at the medium dose of *Phaleria macrocarpa* stem ethanol extract (100 ppm) and 130.57 at the large dose (200 ppm). The bioactive compound 6,4'-dihydroxy-4-methoxybenzophenone-2-O- $\beta$ -D-glucopyrano can inhibit colorectal cancer through the Bcl-2 signaling pathway. Conclusion. The ethanol extract of Mahkota Dewa (*Phaleria macrocarpa*) stems at doses of 100 and 200 ppm could inhibit the growth of colorectal cancer and reduce the expression of Bcl-2 protein in HCT116 cells. The most potent bioactive compound of Mahkota Dewa (*Phaleria macrocarpa*) stem ethanol extract was 6,4'-dihydroxy-4-methoxybenzophenone-2-O- $\beta$ -D-glucopyrano.