

Potensi bawang putih, petai, jengkol, tomat dan N-asetil sistein dalam melindungi tikus terhadap stres oksidatif akibat radiasi gamma = The potency of garlic, petai bean, jengkol bean, tomato and N-acetyl cysteine on the protection against oxidative stress due to gamma irradiation in rats

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Abstrak

Pemanfaatan teknologi nuklir terutama radiasi gamma telah menjadi bagian penting di bidang kedokteran. Radiasi gamma dapat menghasilkan spesies oksigen reaktif (ROS) yang menyebabkan kerusakan biologis pada sel normal. Antioksidan adalah senyawa kimia yang dapat mencegah reaksi berantai radikal bebas. Pada penelitian ini dilakukan eksplorasi kemampuan dari bawang putih, petai, jengkol, tomat dan NAC dalam melindungi sel terhadap radiasi gamma. Kelompok perlakuan terdiri atas: A (kontrol), B (radiasi), C (bawang putih+radiasi), D (petai+radiasi), E (jengkol+radiasi), F (tomat+radiasi) dan G (NAC+radiasi). Tiap kelompok terdiri atas 4 ekor tikus jantan. Paparan radiasi gamma dilakukan setelah pemberian bahan alam selama 8 hari berturut-turut. Uji biokimia berupa pengukuran konsentrasi Malondialdehid (MDA), Glutathion (GSH), 8-hidroksi-2-deoksiganosin (8-OHdG), aktivitas spesifik Glutathion Peroksidase (GPx), Katalase (CAT) serta uji immunofluoresensi foci \hat{I}^3H2AX pada limfosit dan plasma. Hasil penelitian menunjukkan bahwa paparan radiasi gamma dapat menyebabkan peningkatan signifikan pada konsentrasi MDA, GSH, 8-OHdG dan jumlah foci \hat{I}^3H2AX serta penurunan signifikan pada aktivitas spesifik GPx dan CAT ($p < 0.05$). Sementara itu, pemberian ekstrak bawang putih, jengkol, tomat dan NAC mampu secara signifikan mengurangi radikal bebas akibat radiasi gamma. Kesimpulan dari penelitian ini adalah bawang putih, jengkol, tomat dan NAC mampu melindungi tikus terhadap stres oksidatif akibat radiasi gamma.

.....Application of nuclear technology, especially gamma radiation, has become an important part of the medical field. Gamma radiation exposure can produce reactive oxygen species (ROS) which cause biological damage to normal cells. Antioxidants are chemical compounds that can prevent free radical chain reaction. This study has been focused to explore the capability some materials of garlic, petai, jengkol, tomatoes and N-acetylcystein (NAC) in counteracting free radicals caused by gamma radiation. This research was divided into 7 treatment groups, namely A (control), B (radiation), C(garlic+radiation), D(petai+radiation), E(jengkol+radiation), F(tomato+radiation) and G(NAC+radiation). Each group consists of 4 male rats. The irradiation were given after 8 days the suplement had been given. Detection of malondialdehyde (MDA), glutathione (GSH), glutathione peroxidase (GPx), catalase (CAT), 8-hydroxy-2-deoxyguanosine (8-OHdG) by biochemical, and \hat{I}^3-H2AX foci by immunoflouresence assay were made from lymphocytes and plasma. The results showed that gamma radiation cause a significant increase in MDA, GSH, 8-OHdG concentration and the number of foci \hat{I}^3H2AX and a significant decrease in GPx and CAT specific activity ($p < 0.05$). Giving garlic extract, jengkol bean, tomato and NAC can significantly reduce free radicals due to gamma radiation. The conclusion is garlic, jengkol bean, tomato and NAC can protect mice against oxidative stress due to gamma radiation.