World Academy of Science, Engineering and Technology
International Journal of Mathematical and Computational Sciences
Vol:14, No:12, 2020

# In vitro Assessment of Bioactive Properties and Dose-Dependent Antioxidant Activities of Commercial Grape Cultivars in Taiwan

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**Abstract :** Grapes are excellent sources of bioactive compounds, which have been suggested to be responsible for lowering the risk of chronic diseases. Fresh and freeze-dried extracts of Kyoho and Jubilee, commercial grape varieties available in Taiwan and attractive for their quality berries, were investigated for their total phenolics and total flavonoids contents and related dose-dependent antioxidants properties using various in vitro assays. The efficiency of the extraction yield ranged from 7.10 % to 25.53 % (w/w), depending on solvent used. Fresh samples of Kyoho and Jubilee exhibited total polyphenolic contents (351.56 ± 23.08 and 328.67 ± 16.54 µg GAE/mL, respectively), whereas Kyoho freeze-dried methanol: water extracts contains the good levels of total flavonoids (4767.82 ± 22.20 µg QE/mL). Kyoho and Jubilee freeze-dried extracts exhibited the highest total flavonoid contents. There was a weak correlation between total phenolic and flavonoid assays ($r = -0.05$, $R2 = 0.02$, $p > 0.05$). Kyoho fresh and freeze-dried samples showed the DPPH (11.51 – 77.82 %), superoxide scavenging activity (33.61 – 81.95 %), and total antioxidant inhibition (92.01 – 99.28 %), respectively. Total flavonoids were statistically correlated with EC50 DPPH scavenging radicals ($r = 0.91$, $p < 0.01$), EC50 nitric oxide ($r = 0.25$, $p > 0.05$), and EC50 lipid peroxidation radicals ($r = 0.38$, $p > 0.05$). These results suggested that the two commercial grape cultivars in Taiwan could be used as a good source of natural antioxidants. Thus, consumption of grapes as a source antioxidant might lower the risk of chronic diseases. Moreover, future studies will investigate and develop phenolic acid profile for the cultivars in Taiwan.

**Keywords :** antioxidants, EC50 radical scavenging activity, grape cultivars, total phenolics
**Conference Title :** ICSRD 2020 : International Conference on Scientific Research and Development
**Conference Location :** Chicago, United States
**Conference Dates :** December 12-13, 2020

Open Science Index, Mathematical and Computational Sciences Vol:14, No:12, 2020 publications.waset.org/abstracts/78841.pdf