Antiradical Action and Oxidative Stability of Black cumin, Coriander and Niger Crude Seed Oils and Their Fractions.

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Crude vegetable oils are usually oxidatively more stable than the corresponding refined oils. Tocopherols, phospholipids (PL), phytosterols and phenols are the most important natural antioxidants in crude oils. Processing of vegetable oils, moreover, could induce the formation of antioxidants. Black cumin (*Nigella sativa* L.), coriander (*Coriandrum sativum* L.) and niger (*Guizotia abyssinica* Cass.) crude seed oils were extracted with *n*-hexane and the oils were further fractionated into neutral lipids (NL), glycolipids (GL) and PL. Crude oils and their fractions were investigated for their radical scavenging activity (RSA) toward the stable galvinoxyl radical by electron spin resonance (ESR) spectrometry and toward 1,1-diphenyl-2-picrylhydrazyl (DPPH) radical by spectrophotometric method. Coriander seed oil and its' fractions exhibited the strongest RSA compared to black cumin and niger seed oils. The data correlated well with the total content of polyunsaturated fatty acids, unsaponifiables and PL as well as the initial peroxide values of crude oils. In overall ranking, RSA of oil fractions showed similar patterns wherein the PL exhibited greater activity to scavenge both free radicals followed by GL and NL, respectively. A positive relationship observed between the RSA of crude oils and their color intensity suggests the Maillard reaction products may have contributed to the RSA of seed oils and their polar fractions **[1]**. Moreover, oxidative stability of crude and stripped seed oils was investigated and compared. The progress of oxidation during three weeks at 60 °C was followed by recording the ultraviolet absorptivity and measuring the formation of oxidative products (peroxide and *p*-anisidine values). Inverse relationships were noted between peroxide values and oxidative stabilities and also between secondary oxidation products, measured by *p*-anisidine value and stabilities at termination of the storage. Absorptivity at 232 nm and 270 nm increased gradually with the increase in time. In general, oxidative stabilities of crude oils were stronger than their stripped counterparts and the order of oxidative stability was as follow: coriander > black cumin > niger seed. Levels of polar lipids in crude oils correlated with oxidative stability. Thus, the major factor that may contributed to the better oxidative stability of crude oils was the carry-over of their polar lipids **[2]**. The results demonstrate the importance of minor components in crude seed oils on their oxidative stability which will reflect on their food value and shelf life. As part of the effort

to assess the potential of these seed oils, the information is also of importance in processing and utilizing the crude oils and their by-products.

Literature:

1. Ramadan M. F., Kroh L. W. and Mörsel J.-T. (2003) *J. Agric. Food Chem.* 51:6961-6969.

2. Ramadan M. F. and Mörsel J.-T. (2004) *Eur. J. Lipid Sci. Technol.* 106:35-43.