

Evaluation of species of Brassica oilseeds as industrial oil crops for the Mediterranean area

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A large overall market potential exists for the development of annually renewable domestic sources of high erucic acid industrial oils. Fatty acids derived from Brassica oilseeds are a good alternative to oil-derived products, both environmentally and technically, as they are renewable, biodegradable and suitable for industrial applications in the sector of lubricants, surfactants, emulsifiers, plastics and resins.

Interest in the Brassica species and other members of *Brassicaceae* has increased recently due to the fact that they contain significant quantities of thioglucosides known as glucosinolates (GSLs) in their tissues. GSLs are hydrolysed by the myrosinase enzyme (present endogenously in Brassica species tissues) to release a range of hydrolysis products including nitriles, thiocyanates and various forms of volatile isothiocyanates (ITCs). These hydrolysis products are known to have broad biocidal activity including insecticidal, nematocidal, fungicidal, antibiotic, phytotoxic and anti-tumoral effects.

Therefore, either a reduction or an enhancement in glucosinolate content might be helpful in developing brassica oilseeds as a domestic source of erucic acid.

Crop growth in many low-rainfall Mediterranean areas is restricted by a short growing season, coupled with low temperatures in the early part of the season and rising temperatures and declining soil moisture in spring. In these regions, Brassica oilseeds as industrial oils crops represent one of the possible options to increase farmers' choices, that of diversifying traditional crop rotations and consequently improving the use of farm resources.

The present research was conducted to evaluate accessions of seven species of Brassica in typical low-rainfall Mediterranean areas of the south of Italy. Significant variation existed among the *Brassica napus* var. *oleifera* Metzg., *Brassica rapa* L., *Brassica juncea* Czern. et Coss, *Brassica carinata* Braum, *Raphanus sativus* L. var. *oleifera*; *Sinapis alba* L., *Crambe abyssinica* Hoecst ex Freus., for yield and oil, erucic acid, and glucosinolate contents.

In general, the results indicate that plant material from *B. carinata* and *C. abyssinica* could be very promising as industrial oil crops for the Mediterranean environment.