In terms of structure, the abstract follows a version of the IMRaD model (Introduction-Method-Results-and-Discussion) typical of abstracts and research articles in STEM fields.

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Fatty acid composition of lipids in pot marigold (*Calendula officinalis* L.) seed genotypes

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Dulf et al. begin with the "Background" section to provide an overview of the site of study.

The authors use the word "concentrated" to emphasize, for readers, the significance and timeliness of research in this area.

Abstract

Background: *Calendula officinalis* L. (pot marigold) is an annual aromatic herb with yellow or golden-orange flowers, native to the Mediterranean climate areas. Their seeds contain significant amounts of oil (around 20%), of which about 60% is calendic acid. For these reasons, in Europe concentrated research efforts have been directed towards the development of pot marigold as an oilseed crop for industrial purposes.

Results: The oil content and fatty acid composition of major lipid fractions in seeds from eleven genotypes of pot marigold (*Calendula officinalis* L.) were determined. The lipid content of seeds varied between 13.6 and 21.7 g oil/100 g seeds. The calendic and linoleic acids were the two dominant fatty acids in total lipid (51.4 to 57.6% and 28.5 to 31.9%) and triacylglycerol (45.7 to 54.7% and 22.6 to 29.2%) fractions. Polar lipids were also characterised by higher unsaturation ratios (with the PUFAs content between 60.4 and 66.4%), while saturates (consisted mainly of palmitic and very long-chain saturated fatty acids) were found in higher amounts in sterol esters (ranging between 49.3 and 55.7% of total fatty acids).

Conclusions: All the pot marigold seed oils investigated contain high levels of calendic acid (more than 50% of total fatty acids), making them favorable for industrial use. The compositional differences between the genotypes should be considered when breeding and exploiting the pot marigold seeds for nutraceutical and pharmacological purposes.

Keywords: *Calendula officinalis* L., Conjugated linolenic acids, Pot marigold, Seed oils, Fatty acids, Polar lipids, Triacylglycerols, Sterol esters, GC-MS

In this section of the abstract, Dulf et al. describe the methodology used in the study, and then move to a detailed iteration of their findings.

In the "Conclusions" section of the abstract, Dulf et al. present the principal conclusions of their study as inextricable from its real-world significance, as denoted by their phrase "favorable for industrial use." They also use the *obligation modal* "should" to make a recommendation to other scientists: take into account the genotype when growing this plant to make seed oil.

Obligation Modals (should, must, ought to, have to). A type of directive, these parts of speech act as calls-to-action (obligations) and sometimes may even compel moral obligations.

Note the *agentless expression* "were found." These sentence structures are typical of this abstract and of writing in the STEM disciplines.

Background

Calendula officinalis L. (pot marigold), a member of the *Asteraceae* family, is an annual aromatic herb with yellow or golden-orange flowers, native to the Mediterranean climate areas, being also successfully cultivated in temperate regions of the Earth for ornamental and medicinal purposes [1]. The species have been reported to contain a variety of phytochemicals, including carbohydrates, lipids, phenolic compounds, steroids, terpenoids, tocopherols, carotenoids and quinones [2-5] with potential health benefits [1,6-10].

Besides the usual fatty acids, a few plants are capable to biosynthesize some unusual fatty acids, with special chemical structure. Usually these fatty acids accumulate in storage tissues, while in green organs they are absent or present in very small amounts. The presence of unusual fatty acids is genetically determined and they are highly significant indicators of phylogenetic relationships [11,12]. The seeds of pot marigold have a significant oil content (around 20%), of which about 60% is the unusual calendic acid (8 *t*, 10 t, 12c-18:3) [13-16]. Several studies demonstrated that calendic acid is synthesized in *Calendula* seeds via desaturation of linoleic acid [17-21]. Due to its special structure – with three conjugated double bonds – calendic acid and *Calendula* seeds oil exhibit interesting chemical and physiological properties.

The seed oils such of *Calendula officinalis* L., *Momordica charantia* L. or *Aleurites fordii* Hemsl., rich in conjugated linolenic acids (CLNAs) have a high rate of oxidation and are used as raw materials in paints and coatings industry, and have applications in the manufacture of cosmetics and some industrial polymers [19,22-24]. For these reasons, in the last few years, a concentrated research effort in Europe has been directed towards the development of *Calendula officinalis* L. as an oilseed crop for industrial purposes [25] and for the engineering of

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