Tagetes spp.: a source of biologically active substances

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Marigold (*Tagetes* spp.), belonging to the Asteraceae family, is a well known ornamental plant widespread all over the world with numerous species. In recent years, the interest in natural substances contributed to the re-evaluation of the *Tagetes* .This genus is recognized as a source of very interesting biologically active products i.e. carotenoids used as food colorants and feed additives (Timberlake and Henry, 1986) and possessing anticancer and antiageing effects (Block et al., 1992), essential oils known for their antibacterial and insecticidal properties (Piccaglia et al., 1996), thiophenes with a marked biocidal activity (Hulst et al., 1989) and flavonoids having pharmacological properties (Terschuk et al., 1997). In our work, several *Tagetes* species cultivated in North Italy, were evaluated for the yields and for the contents of aforesaid secondary metabolites which were extracted from different parts of the plant and characterized by HPLC and GC/MS. The most important carotenoids used as natural colors, lutein and lutein fatty acid esters, were determined in flower heads and relevant quantitative differences were found among the marigold types which had a total content of pigments ranging from 17 to 570 mg100 g^{-1} in the petals and from 0.4 to 18.6 mg100 g^{-1} in the calyces.The essential oils, isolated from flowers and leaves showed different compositions among the species, in particular *T.filifolia* and *T.lucida* were characterized by methylchavicol as main compound.The thiophenes were extracted from the roots and were found, as total content, in a range from 12 to 230 mg $100g^{-1}$ in the different species and with the highest amount in *T.lucida*. The flavonoids were determined both in flowers and leaves showing quali-quantitative differences between these parts of the plant and among the species.The highest values of total flavonoids were found in the flowers of *T.erecta* (3560 mg $100g^{-1}$) and in the leaves of *T.lucida* (1550 mg $100g^{-1}$).

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