

P 8: Productivity of different thyme varieties (*Thymus vulgaris* L.) in the condition of non-chernozem-zone of Russian Federation



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Abstract

Creeping thyme (*Thymus serpyllum* L.) is mostly used as a medicinal plant in the Russian Federation. It has much more winter hardiness than common thyme (*Thymus vulgaris* L.), which is similarly used in Europe. However, *T. vulgaris* is interesting as a plant in food industry and in medicine. *T. vulgaris* contains two to three times more essential oil (2 %) than *T. serpyllum* L. and a higher content of thymol in its essential oil (up to 35-40 % depending on the genotype). The objectives of the present study are to determine the total essential oil content, the total polyphenol content, the total flavonoid content and the yield from 8 varieties of thyme during two years.

We found that the 'Colchida' and 'Lemon' varieties are characterized by high yields. The maximum amounts of essential oil were found in 'Deutscher Winter' (1.3 %), 'Médoc' and 'Lemon' (1.19 %), flavonoids content in plants was 1.27-2.87 %. Our studies have shown that *T. vulgaris* can be considered as a potential medicinal and aromatic plant for growing in the non-chernozem zone of the Russian Federation.

Keywords: essential oil, thymol, flavonoids

Introduction

Thymus L. is one of the most important genera regarding the number of species (more than 200) within the family Lamiaceae, but only a few species are of medicinal importance. Creeping thyme (*T. serpyllum* L.) is mostly used as a medicinal plant in the Russian Federation. It has much more winter hardiness than common thyme (*T. vulgaris* L.), which is similarly used in Europe. *T. vulgaris* contains two to three times more essential oil (2 %) than *T. serpyllum* L., and a higher content of thymol in its essential oil (up to 35-40 % depending on the genotype). *T. vulgaris* is more technological crop for growing in the field, because of its compact habitus and suitability for mechanized harvesting of raw material and row cultivation.

Materials and Methods

During two years the objectives of the present study are to determine the total essential oil content, the total polyphenol content and the yield from 8 varieties of thyme, including such popular ones as Duska tyuanova (Czech Republic, Sevaseed), 'Deutscher Winter' (Germany, Mayer's), *T. vulgaris* variety and genotypes from Germany (a country with similar climatic conditions of non-chernozem zone of the Russian Federation) and varieties of Russian and German firms: 'Lemon' (AF Aelita), 'Medoc' (AF Gavrish), 'Di Roma' (Germany), 'Colchida' (Company ZeDeK), 'Quedlinburger' (Germany), *T. vulgaris* (AF Gavrish).

The essential oil content was determined in dry herb of thyme by the distillation method presented in Pharmacopoeia. of Russian Federation. The total polyphenol content was determined colorimetrically using the method of Folin-Ciocalteu.

The amount of flavonoids was determined spectrophotometrically following the reaction with aluminum chloride. After sufficient mixing of the sample and the reagent, the mixture is incubated for 10 minutes at ambient temperature and the absorbance of the solution is read at 440 nm. Flavonoid content is expressed in mg/g of rutin.

Results

It is important that herbs must be harvested at the time of intense flowering for the preparation of medicinal raw material. During the study, thyme began to bloom in the first decade of June, although the length of the blooming is different. It was revealed that the varieties 'Duska tynuanova' (Czech Republic) and 'Deutscher Winter' (Germany) were characterized by a maximum height of 26.7 ± 2.9 cm and 24.6 ± 3.1 cm, respectively. The varieties 'Colchida' and 'Lemon' were characterized by high yields (84.0 ± 9.6 g/plant, and 75.0 ± 4.7 g/plant,, respectively). The maximum content of essential oil was found in 'Deutscher Winter' variety (1.3 % in dry raw materials) and the 'Médoc' and 'Lemon' (1.19 % in both samples). It is slightly lower than in the southern regions of Russia and in the European Union, but meeting the requirements of Russian Pharmacopoeia for a medicinal raw materials and requirements PhEur (12 ml / kg) for 'Deutscher Winter' variety. The highest content of flavonoids was detected in *T. vulgaris* of AF 'Gavrish' (2.87 ± 0.11 %) and Quedlinburger (2.83 ± 0.12 %).

Thus, *T. vulgaris* can be recommended as a potential medicinal and aromatic plant for the non-chernozem zone of the Russian Federation.